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NISSAN
350Z
MODEL Z33 SERIES

QUICK REFERENCE INDEX

A GENERAL INFORMATION	GI	General Information
B ENGINE	EM	Engine Mechanical
	LU	Engine Lubrication System
	CO	Engine Cooling System
	EC	Engine Control System
	FL	Fuel System
	EX	Exhaust System
	ACC	Accelerator Control System
C TRANSMISSION/ TRANSAXLE	CL	Clutch
	MT	Manual Transmission
	AT	Automatic Transmission
D DRIVELINE/AXLE	PR	Propeller Shaft
	RFD	Rear Final Drive
	FAX	Front Axle
	RAX	Rear Axle
E SUSPENSION	FSU	Front Suspension
	RSU	Rear Suspension
	WT	Road Wheels & Tires
F BRAKES	BR	Brake System
	PB	Parking Brake System
	BRC	Brake Control System
G STEERING	PS	Power Steering System
H RESTRAINTS	SB	Seat Belts
	SRS	Supplemental Restraint System (SRS)
I BODY	BL	Body, Lock & Security System
	GW	Glasses, Window System & Mirrors
	RF	Roof
	EI	Exterior & Interior
	IP	Instrument Panel
	SE	Seat
J AIR CONDITIONER	ATC	Automatic Air Conditioner
K ELECTRICAL	SC	Starting & Charging System
	LT	Lighting System
	DI	Driver Information System
	WW	Wiper, Washer & Horn
	BCS	Body Control System
	LAN	LAN System
	AV	Audio, Visual,Navigation & Telephone System
	ACS	Auto Cruise Control System
	PG	Power Supply, Ground & Circuit Elements
L MAINTENANCE	MA	Maintenance
M INDEX	IDX	Alphabetical Index

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FOREWORD

This manual contains maintenance and repair procedure for the 2004 NISSAN 350Z.

In order to assure your safety and the efficient functioning of the vehicle, this manual should be read thoroughly. It is especially important that the PRECAUTIONS in the GI section be completely understood before starting any repair task.

All information in this manual is based on the latest product information at the time of publication. The right is reserved to make changes in specifications and methods at any time without notice.

IMPORTANT SAFETY NOTICE

The proper performance of service is essential for both the safety of the technician and the efficient functioning of the vehicle.
The service methods in this Service Manual are described in such a manner that the service may be performed safely and accurately.
Service varies with the procedures used, the skills of the technician and the tools and parts available. Accordingly, anyone using service procedures, tools or parts which are not specifically recommended by NISSAN must first be completely satisfied that neither personal safety nor the vehicle's safety will be jeopardized by the service method selected.

NISSAN MOTOR CO., LTD.
Overseas Service Department
Tokyo, Japan

PLEASE HELP MAKE THIS SERVICE MANUAL BETTER!

Your comments are important to NISSAN and will help us to improve our Service Manuals.

Use this form to report any issues or comments you may have regarding our Service Manuals.

Please print this form and type or write your comments below. Mail or fax to:

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Technical Service Information
39001 Sunrise Drive, P.O. Box 9200
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FAX: (248) 488-3910

SERVICE MANUAL: Model: _____ **Year:** _____

PUBLICATION NO. (Refer to Quick Reference Index): _____

Please describe any Service Manual issues or problems in detail:

Page number(s) _____ *Note: Please include a copy of each page, marked with your comments.*

_____

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_____

Are the trouble diagnosis procedures logical and easy to use? (circle your answer) YES NO

If no, what page number(s)?_____*Note: Please include a copy of each page, marked with your comments.*

Please describe the issue or problem in detail: _____

_____

_____

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Is the organization of the manual clear and easy to follow? (circle your answer) YES NO

Please comment: _____

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What information should be included in NISSAN Service Manuals to better support you in servicing or repairing customer vehicles?

_____

_____

_____

_____

DATE: _____ YOUR NAME: _____ POSITION: _____

DEALER: _____ DEALER NO.: _____ ADDRESS: _____

CITY:_____ STATE/PROV./COUNTRY: _____ ZIP/POSTAL CODE: _____

INCH TO METRIC CONVERSION TABLE

(Rounded-off for automotive use)

inches	**mm**	inches	**mm**
.100	**2.54**	.610	**15.49**
.110	**2.79**	.620	**15.75**
.120	**3.05**	.630	**16.00**
.130	**3.30**	.640	**16.26**
.140	**3.56**	.650	**16.51**
.150	**3.81**	.660	**16.76**
.160	**4.06**	.670	**17.02**
.170	**4.32**	.680	**17.27**
.180	**4.57**	.690	**17.53**
.190	**4.83**	.700	**17.78**
.200	**5.08**	.710	**18.03**
.210	**5.33**	.720	**18.29**
.220	**5.59**	.730	**18.54**
.230	**5.84**	.740	**18.80**
.240	**6.10**	.750	**19.05**
.250	**6.35**	.760	**19.30**
.260	**6.60**	.770	**19.56**
.270	**6.86**	.780	**19.81**
.280	**7.11**	.790	**20.07**
.290	**7.37**	.800	**20.32**
.300	**7.62**	.810	**20.57**
.310	**7.87**	.820	**20.83**
.320	**8.13**	.830	**21.08**
.330	**8.38**	.840	**21.34**
.340	**8.64**	.850	**21.59**
.350	**8.89**	.860	**21.84**
.360	**9.14**	.870	**22.10**
.370	**9.40**	.880	**22.35**
.380	**9.65**	.890	**22.61**
.390	**9.91**	.900	**22.86**
.400	**10.16**	.910	**23.11**
.410	**10.41**	.920	**23.37**
.420	**10.67**	.930	**23.62**
.430	**10.92**	.940	**23.88**
.440	**11.18**	.950	**24.13**
.450	**11.43**	.960	**24.38**
.460	**11.68**	.970	**24.64**
.470	**11.94**	.980	**24.89**
.480	**12.19**	.990	**25.15**
.490	**12.45**	1.000	**25.40**
.500	**12.70**	2.000	**50.80**
.510	**12.95**	3.000	**76.20**
.520	**13.21**	4.000	**101.60**
.530	**13.46**	5.000	**127.00**
.540	**13.72**	6.000	**152.40**
.550	**13.97**	7.000	**177.80**
.560	**14.22**	8.000	**203.20**
.570	**14.48**	9.000	**228.60**
.580	**14.73**	10.000	**254.00**
.590	**14.99**	20.000	**508.00**
.600	**15.24**		

METRIC TO INCH CONVERSION TABLE

(Rounded-off for automotive use)

mm	inches	**mm**	inches
1	.0394	**51**	2.008
2	.079	**52**	2.047
3	.118	**53**	2.087
4	.157	**54**	2.126
5	.197	**55**	2.165
6	.236	**56**	2.205
7	.276	**57**	2.244
8	.315	**58**	2.283
9	.354	**59**	2.323
10	.394	**60**	2.362
11	.433	**61**	2.402
12	.472	**62**	2.441
13	.512	**63**	2.480
14	.551	**64**	2.520
15	.591	**65**	2.559
16	.630	**66**	2.598
17	.669	**67**	2.638
18	.709	**68**	2.677
19	.748	**69**	2.717
20	.787	**70**	2.756
21	.827	**71**	2.795
22	.866	**72**	2.835
23	.906	**73**	2.874
24	.945	**74**	2.913
25	.984	**75**	2.953
26	1.024	**76**	2.992
27	1.063	**77**	3.031
28	1.102	**78**	3.071
29	1.142	**79**	3.110
30	1.181	**80**	3.150
31	1.220	**81**	3.189
32	1.260	**82**	3.228
33	1.299	**83**	3.268
34	1.339	**84**	3.307
35	1.378	**85**	3.346
36	1.417	**86**	3.386
37	1.457	**87**	3.425
38	1.496	**88**	3.465
39	1.535	**89**	3.504
40	1.575	**90**	3.543
41	1.614	**91**	3.583
42	1.654	**92**	3.622
43	1.693	**93**	3.661
44	1.732	**94**	3.701
45	1.772	**95**	3.740
46	1.811	**96**	3.780
47	1.850	**97**	3.819
48	1.890	**98**	3.858
49	1.929	**99**	3.898
50	1.969	**100**	3.937

QUICK REFERENCE CHART 350Z

PFP:00000

ENGINE TUNE-UP DATA (VQ35DE)

ELS0003W

Engine model			VQ35DE			
Firing order			1-2-3-4-5-6			
Idle speed rpm A/T (In “P” or “N” position) M/T (In “Neutral” position)			650±50			
Ignition timing (BTDC at idle speed) A/T (In “P” or “N” position) M/T (In “Neutral” position)			15°± 5°			
CO% at idle			0.7 - 9.9 % and engine runs smoothly			
Drive belt	Deflection adjustment		Unit: mm (in)	Tension adjustment		Unit: N (kg, lb)
	Used belt		New belt	Used belt		New belt
	Limit	After adjustment		Limit	After adjustment	
Alternator and power steering oil pump belt	7 (0.28)	4 - 5 (0.16 - 0.20)	3.5 - 4.5 (0.138 - 0.177)	294 (30, 66)	730 - 818 (74.5 - 83.5, 164 - 184)	838 - 926 (85.5 - 94.5, 188 - 208)
A/C compressor belt	12 (0.47)	9 - 10 (0.35 - 0.39)	8 - 9 (0.31- 0.35)	196 (20, 44)	348 - 436 (35.5 - 44.5, 78 - 98)	470 - 559 (48 - 57, 106 - 126)
Applied pushing force	98 N (10kg, 22lb)			—		
Radiator cap relief pressure kPa (kg/cm^2 , psi)	Standard		78 - 98 (0.8 - 1.0, 11 - 14)			
	Limit		59 (0.6, 9)			
Cooling system leakage testing pressure kPa (kg/cm^2 , psi)			157 (1.6, 23)			
Compression pressure kPa (kg/cm^2 , psi)/rpm	Standard		1,275 (13.0, 185) / 300			
	Minimum		981 (10.0, 142) / 300			
	Differential limit between cylinders		98 (1.0, 14) / 300			
Spark plug	Standard type		PLFR5A - 11			
	Hot type		PLFR4A - 11			
	Cold type		PLFR6A - 11			
	Gap (Nominal) mm (in)		1.1 (0.043)			

FRONT WHEEL ALIGNMENT (Unladen*)

ELS0003X

Camber	Degree minute (Decimal degree)	Minimum	– 1° 20′ (– 1.33°)
		Nominal	– 0° 35′ (– 0.58°)
		Maximum	0° 10′ (0.17°)
		Left and right difference	45′ (0.75°)
Caster	Degree minute (Decimal degree)	Minimum	7° 25′ (7.42°)
		Nominal	8° 10′ (8.17°)
		Maximum	8° 55′ (8.92°)
		Left and right difference	45′ (0.75°)
Kingpin inclination	Degree minute (Decimal degree)	Minimum	4° 20′ (4.33°)
		Nominal	5° 05′ (5.08°)
		Maximum	5° 50′ (5.83°)
Total toe-in Distance (A – B)	mm (in)	Minimum	0 (0)
		Nominal	1 (0.04)
		Maximum	2 (0.08)
Wheel turning angle (Full turn)	Inside Degree minute (Decimal degree)	Minimum	35° 55′ (35.9°)
		Nominal	38° 55′ (38.9°)
		Maximum	39° 55′ (39.9°)
	Outside Degree minute (Decimal degree)	Nominal	30° 40′ (30.7°)

* : Fuel, engine coolant and engine oil are full. Spare tire, jack, hand tools and mats are located in designated positions.

REAR WHEEL ALIGNMENT (Unladen*)

ELS0003Y

Camber	Degree minute (Decimal degree)	Minimum	– 2° 05′ (– 2.08°)
		Nominal	– 1° 35′ (– 1.58°)
		Maximum	– 1° 05′ (– 1.08°)
Total-in Distance (A – B)	mm (in)	Minimum	0.2 mm (0.008 in) [17 inch tire] 1.1 mm (0.043 in) [18 inch tire]
		Nominal	1.0 mm (0.039 in) [17 inch tire] 1.9 mm (0.075 in) [18 inch tire]
		Maximum	1.8 mm (0.071 in) [17 inch tire] 2.7 mm (0.106 in) [18 inch tire]

* : Fuel, engine coolant and oil full. Spare tire, jack, hand tools and mats in designated positions.

BRAKE

ELS0003Z

Unit : mm (in)

Front brake	Pad wear limit	2.0 (0.079)
	Rotor repair limit	CLZ25VD : 22.0 (0.866) OPB27VA : 28.4 (1.118)
Rear brake	Pad wear limit	2.0 (0.079)
	Rotor repair limit	AD14VE : 14.0 (0.551) OPB13VB : 20.2 (0.795)
Pedal free height		M/T : 154 - 164 (6.06 - 6.46) A/T : 162 - 172 (6.38 - 6.77)
Pedal depressed height*		M/T : More than 90 (3.54) A/T : More than 95 (3.74)

* : Under force of 490 N(50 kg, 110 lb) with engine running.

REFILL CAPACITIES

ELS00040

UNIT		Liter	US measure
Fuel tank		76	20 - 1/8 gal
Engine coolant (With reservoir tank)		8.7	9 - 1/4 qt
Engine	Drain and refill		
	With oil filter change	4.7	5 qt
	Without oil filter change	4.4	4 - 5/8 qt
	Dry engine (Overhaul)	5.4	5 - 3/4 qt
Transmission	A/T	10.3	10 - 7/8 qt
	M/T	2.9	3 - 1/8 qt
Differential carrier		1.4	3 pt
Power steering system		1.0	1 - 1/8 qt
Air conditioning system	Compressor oil	0.18	6.0 fl oz
	Refrigerant	0.55 kg	1.21 lb

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GENERAL INFORMATION

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PRECAUTIONS

PFP:00001

Description

AAS0001D

Observe the following precautions to ensure safe and proper servicing. These precautions are not described in each individual section.

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

AAS0001E

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for NVIS/IVIS (NISSAN/INFINITI VEHICLE IMMOBILIZER SYSTEM - NATS) (If Equipped)

AAS0001F

NVIS/IVIS (NATS) will immobilize the engine if someone tries to start it without the registered key of NVIS/IVIS (NATS).
Both of the originally supplied ignition key IDs have been NVIS/IVIS (NATS) registered.
The security indicator is located on the instrument panel. The indicator blinks when the immobilizer system is functioning.
Therefore, NVIS/IVIS (NATS) warns outsiders that the vehicle is equipped with the anti-theft system.

- When NVIS/IVIS (NATS) detects trouble, the security indicator lamp lights up while ignition switch is in "ON" position.
  This lighting up indicates that the anti-theft is not functioning, so prompt service is required.
- When servicing NVIS/IVIS (NATS) (trouble diagnoses, system initialization and additional registration of other NVIS/IVIS (NATS) ignition key IDs), CONSULT-II hardware and CONSULT-II NVIS/IVIS (NATS) software is necessary.
  Regarding the procedures of NVIS/IVIS (NATS) initialization and NVIS/IVIS (NATS) ignition key ID registration, refer to CONSULT-II operation manual, NVIS/IVIS (NATS).

Therefore, CONSULT-II NVIS/IVIS (NATS) software (program card and operation manual) must be kept strictly confidential to maintain the integrity of the anti-theft function.

- When servicing NVIS/IVIS (NATS) (trouble diagnoses, system initialization and additional registration of other NVIS/IVIS (NATS) ignition key IDs), it may be necessary to re-register original key identification. Therefore, be sure to receive all keys from vehicle owner. A maximum of four or five key IDs can be registered into NVIS/IVIS (NATS).
- When failing to start the engine first time using the key of NVIS/IVIS (NATS), start as follows.

1. Leave the ignition key in "ON" position for approximately 5 seconds.
2. Turn ignition key to "OFF" or "LOCK" position and wait approximately 5 seconds.
3. Repeat step 1 and 2 again.
4. Restart the engine while keeping the key separate from any others on key-chain.

Precautions for Battery Service

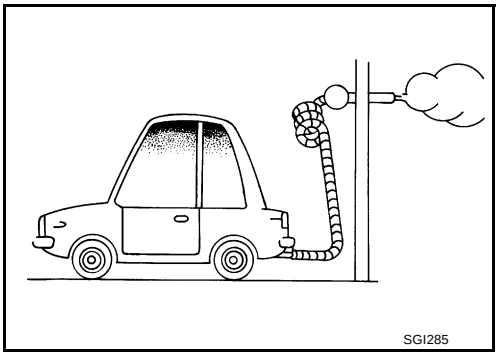
AAS00077

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

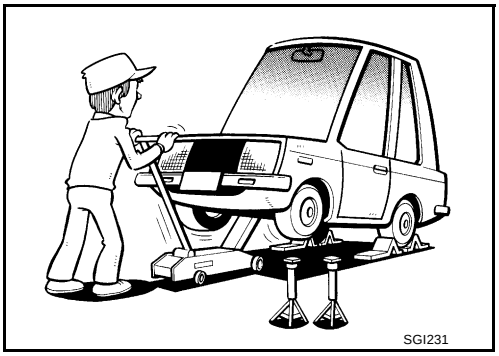
General Precautions

AAS0001G

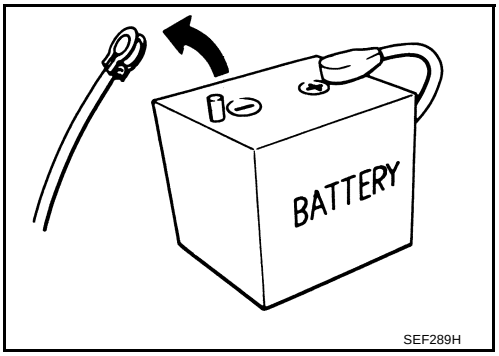
- Do not operate the engine for an extended period of time without proper exhaust ventilation.
  Keep the work area well ventilated and free of any inflammable materials. Special care should be taken when handling any inflammable or poisonous materials, such as gasoline, refrigerant gas, etc. When working in a pit or other enclosed area, be sure to properly ventilate the area before working with hazardous materials.
  Do not smoke while working on the vehicle.


SGI285

- Before jacking up the vehicle, apply wheel chocks or other tire blocks to the wheels to prevent the vehicle from moving. After jacking up the vehicle, support the vehicle weight with safety stands at the points designated for proper lifting before working on the vehicle.
  These operations should be done on a level surface.
- When removing a heavy component such as the engine or transaxle/transmission, be careful not to lose your balance and drop them. Also, do not allow them to strike adjacent parts, especially the brake tubes and master cylinder.

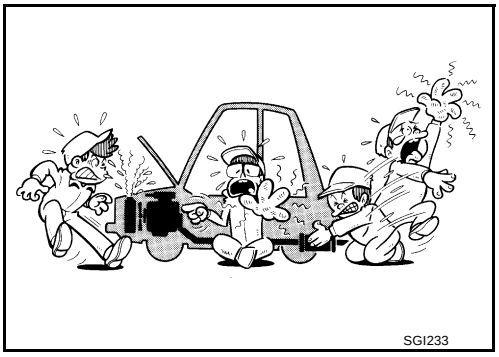

SGI231

- Before starting repairs which do not require battery power:
  Turn off ignition switch.
  Disconnect the negative battery terminal.
- If the battery terminals are disconnected, recorded memory of radio and each control unit is erased.



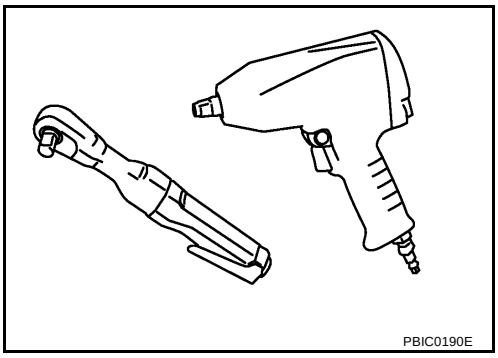
SEF289H

- To prevent serious burns:
  Avoid contact with hot metal parts.
  Do not remove the radiator cap when the engine is hot.
- Dispose of drained oil or the solvent used for cleaning parts in an appropriate manner.
- Do not attempt to top off the fuel tank after the fuel pump nozzle shuts off automatically.
  Continued refueling may cause fuel overflow, resulting in fuel spray and possibly a fire.
- Clean all disassembled parts in the designated liquid or solvent prior to inspection or assembly.

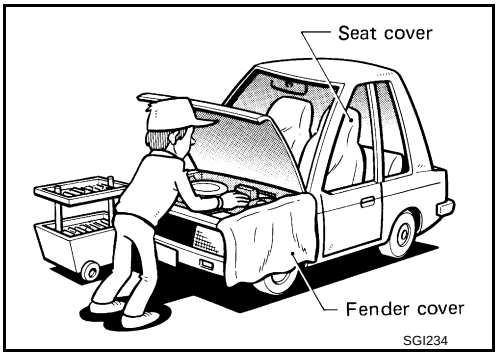

SGI233

- Replace oil seals, gaskets, packings, O-rings, locking washers, cotter pins, self-locking nuts, etc. with new ones.
- Replace inner and outer races of tapered roller bearings and needle bearings as a set.

- Arrange the disassembled parts in accordance with their assembled locations and sequence.
- Do not touch the terminals of electrical components which use microcomputers (such as ECM). Static electricity may damage internal electronic components.
- After disconnecting vacuum or air hoses, attach a tag to indicate the proper connection.
- Use only the fluids and lubricants specified in this manual.
- Use approved bonding agent, sealants or their equivalents when required.
- Use hand tools, power tools (disassembly only) and recommended special tools where specified for safe and efficient service repairs.
- When repairing the fuel, oil, water, vacuum or exhaust systems, check all affected lines for leaks.


PBIC0190E

- Before servicing the vehicle:
  Protect fenders, upholstery and carpeting with appropriate covers.
  Take caution that keys, buckles or buttons do not scratch paint.



SGI234

WARNING:
To prevent ECM from storing the diagnostic trouble codes, do not carelessly disconnect the harness connectors which are related to the engine control system and TCM (transmission control module) system. The connectors should be disconnected only when working according to the WORK FLOW of TROUBLE DIAGNOSES in EC and AT sections.

Precautions for Three Way Catalyst

AAS0001H

If a large amount of unburned fuel flows into the catalyst, the catalyst temperature will be excessively high. To prevent this, follow the instructions.

- Use unleaded gasoline only. Leaded gasoline will seriously damage the three way catalyst.
- When checking for ignition spark or measuring engine compression, make tests quickly and only when necessary.
- Do not run engine when the fuel tank level is low, otherwise the engine may misfire, causing damage to the catalyst.

Do not place the vehicle on flammable material. Keep flammable material off the exhaust pipe and the three way catalyst.

Precautions for Fuel (Unleaded Premium Gasoline Required)

AAS0001I

Use unleaded premium gasoline with an octane rating of at least 91 AKI (Anti-Knock Index) number (Research octane number 96).

If unleaded premium gasoline is not available, unleaded regular gasoline with an octane rating of at least 87 AKI number (Research octane number 91) can be used, but only under the following precautions:

- have the fuel tank filled only partially with unleaded regular gasoline, and fill up with unleaded premium gasoline as soon as possible.
- avoid full throttle driving and abrupt acceleration.

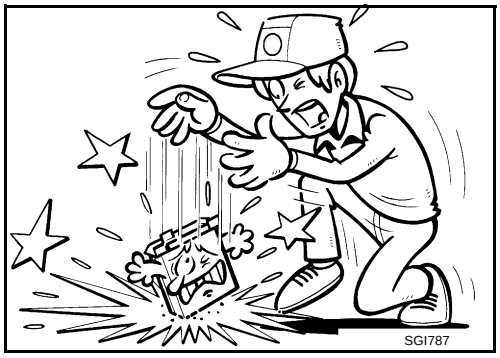
However, for maximum vehicle performance, the use of unleaded premium gasoline is recommended.

CAUTION:
Do not use leaded gasoline. Using leaded gasoline will damage the three way catalyst. Using a fuel other than that specified could adversely affect the emission control devices and systems, and could also affect the warranty coverage validity.

Precautions for Multiport Fuel Injection System or Engine Control System

AAS0001J

- Before connecting or disconnecting any harness connector for the multiport fuel injection system or ECM:
  Turn ignition switch to “OFF” position.
  Disconnect negative battery terminal.
  Otherwise, there may be damage to ECM.
- Before disconnecting pressurized fuel line from fuel pump to injectors, be sure to release fuel pressure.
- Be careful not to jar components such as ECM and mass air flow sensor.

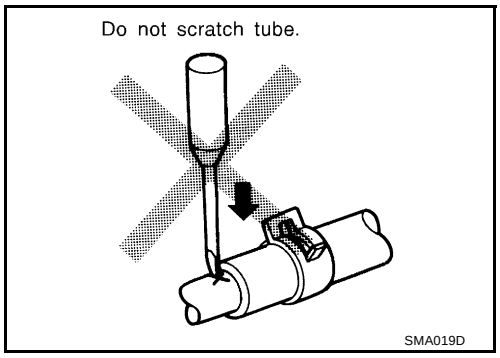

SGI787

Precautions for Hoses

AAS0001L

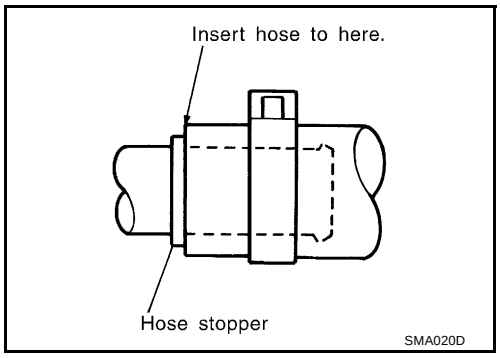
HOSE REMOVAL AND INSTALLATION

- To prevent damage to rubber hose, do not pry off rubber hose with tapered tool or screwdriver.



SMA019D

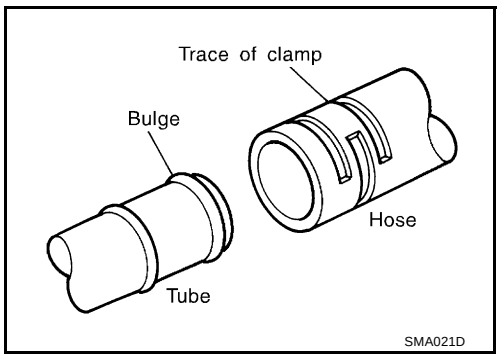
- To reinstall the rubber hose securely, make sure that hose insertion length and orientation is correct. (If tube is equipped with hose stopper, insert rubber hose into tube until it butts up against hose stopper.)



SMA020D

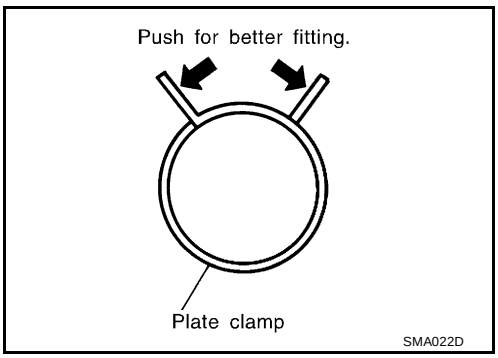
HOSE CLAMPING

- If old rubber hose is re-used, install hose clamp in its original position (at the indentation where the old clamp was). If there is a trace of tube bulging left on the old rubber hose, align rubber hose at that position.
- Discard old clamps; replace with new ones.



SMA021D

- After installing plate clamps, apply force to them in the direction of the arrow, tightening rubber hose equally all around.



Precautions for Engine Oils

AAS0001M

Prolonged and repeated contact with used engine oil may cause skin cancer. Try to avoid direct skin contact with used oil.
If skin contact is made, wash thoroughly with soap or hand cleaner as soon as possible.

HEALTH PROTECTION PRECAUTIONS

- Avoid prolonged and repeated contact with oils, particularly used engine oils.
- Wear protective clothing, including impervious gloves where practicable.
- Do not put oily rags in pockets.
- Avoid contaminating clothes, particularly underpants, with oil.
- Heavily soiled clothing and oil-impregnated footwear should not be worn. Overalls must be cleaned regularly.
- First aid treatment should be obtained immediately for open cuts and wounds.
- Use barrier creams, applying them before each work period, to help the removal of oil from the skin.
- Wash with soap and water to ensure all oil is removed (skin cleansers and nail brushes will help). Preparations containing lanolin replace the natural skin oils which have been removed.
- Do not use gasoline, kerosene, diesel fuel, gas oil, thinners or solvents for cleaning skin.
- If skin disorders develop, obtain medical advice without delay.
- Where practical, degrease components prior to handling.
- Where there is a risk of eye contact, eye protection should be worn, for example, chemical goggles or face shields; in addition an eye wash facility should be provided.

ENVIRONMENTAL PROTECTION PRECAUTIONS

Dispose of used oil and used oil filters through authorized waste disposal contractors to licensed waste disposal sites, or to the waste oil reclamation trade. If in doubt, contact the local authority for advice on disposal facilities.
It is illegal to pour used oil on to the ground, down sewers or drains, or into water sources.
The regulations concerning pollution vary between regions.

Precautions for Air Conditioning

AAS0001N

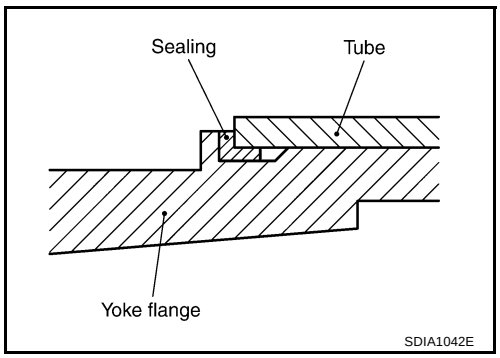
Use an approved refrigerant recovery unit any time the air conditioning system must be discharged. Refer to ATC/MTC section “HFC-134a (R-134a) Service Procedure”, “REFRIGERANT LINES” for specific instructions.

Precautions for Propeller Shaft

AAS0006P

- If propeller shaft is dropped, replace propeller shaft with new one.
- Do not hit, impact, or damage tube.

- If damage such as cracks or peeling off in sealing (joint between yoke and tube) is found, replace propeller shaft with new one.
- If there is chipping or looseness in tube, replace propeller shaft with new one.
- Protect propeller shaft with protector (special service tool) during work.



HOW TO USE THIS MANUAL

PFP:00008

Description

AAS000JK

This volume explains “Removal, Disassembly, Installation, Inspection and Adjustment” and “Trouble Diagnoses”.

Terms

AAS000JL

- The captions **WARNING** and **CAUTION** warn you of steps that must be followed to prevent personal injury and/or damage to some part of the vehicle.
  WARNING indicates the possibility of personal injury if instructions are not followed.
  CAUTION indicates the possibility of component damage if instructions are not followed.
  BOLD TYPED STATEMENTS except **WARNING** and **CAUTION** give you helpful information.
  Standard value:Tolerance at inspection and adjustment.
  Limit value:The maximum or minimum limit value that should not be exceeded at inspection and adjustment.

Units

AAS000JM

- The **UNITS** given in this manual are primarily expressed as the SI UNIT (International System of Unit), and alternatively expressed in the metric system and in the yard/pound system.
  Also with regard to tightening torque of bolts and nuts, there are descriptions both about range and about the standard tightening torque.

  “Example”
  Range

  Outer Socket Lock Nut : 59 - 78 N-m (6.0 - 8.0 kg-m, 43 - 58 ft-lb)

  Standard

  Drive Shaft Installation Bolt : 44.3 N-m (4.5 kg-m, 33 ft-lb)

Contents

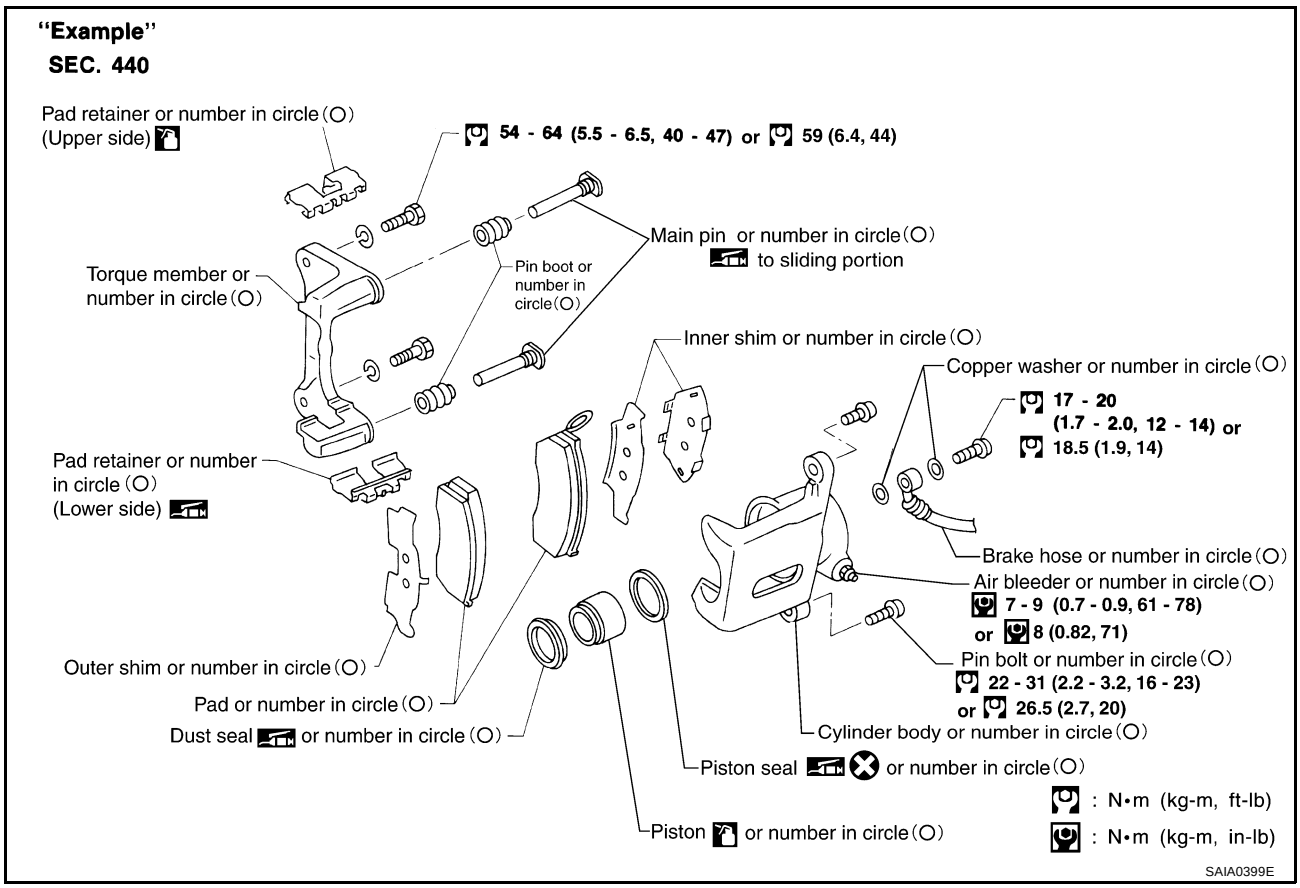
AAS000JN

- **ALPHABETICAL INDEX** is provided at the end of this manual so that you can rapidly find the item and page you are searching for.
- **A QUICK REFERENCE INDEX**, a black tab (e.g. BR) is provided on the first page. You can quickly find the first page of each section by matching it to the section's black tab.
- **THE CONTENTS** are listed on the first page of each section.
- **THE TITLE** is indicated on the upper portion of each page and shows the part or system.
- **THE PAGE NUMBER** of each section consists of two or three letters which designate the particular section and a number (e.g. “BR-5”).
- **THE SMALL ILLUSTRATIONS** show the important steps such as inspection, use of special tools, knacks of work and hidden or tricky steps which are not shown in the previous large illustrations.
  Assembly, inspection and adjustment procedures for the complicated units such as the automatic transaxle or transmission, etc. are presented in a step-by-step format where necessary.

Components

AAS000KG

- **THE LARGE ILLUSTRATIONS** are exploded views (See the following) and contain tightening torques, lubrication points, section number of the **PARTS CATALOG** (e.g. SEC. 440) and other information necessary to perform repairs.
  The illustrations should be used in reference to service matters only. When ordering parts, refer to the appropriate **PARTS CATALOG** .
  Components shown in an illustration may be identified by a circled number. When this style of illustration is used, the text description of the components will follow the illustration.



SYMBOLS

SYMBOL	DESCRIPTION
	Tightening torque The tightening torque specifications of bolts and nuts may be presented as either a range or a standard tightening torque.
	Should be lubricated with grease. Unless otherwise indicated, use recommended multi-purpose grease.
	Should be lubricated with oil.
	Sealing point
	Checking point
	Always replace after every disassembly.
P	Apply petroleum jelly.
ATF	Apply ATF.
★	Select with proper thickness.
☆	Adjustment is required.

How to Follow Trouble Diagnoses

AAS000JP

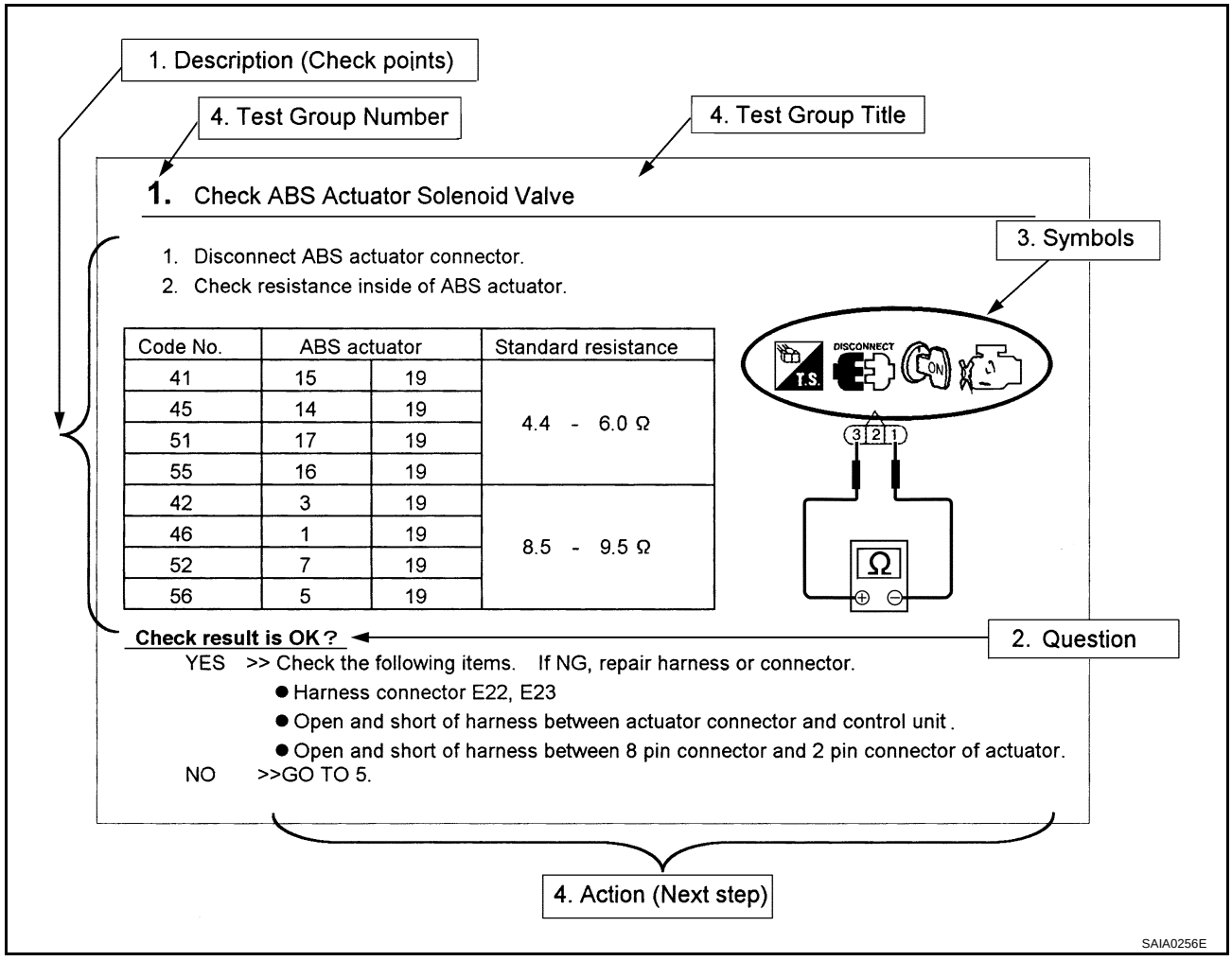
DESCRIPTION

NOTICE:

Trouble diagnoses indicate work procedures required to diagnose problems effectively. Observe the following instructions before diagnosing.

1. **Before performing trouble diagnoses, read the "Preliminary Check", the "Symptom Chart" or the "Work Flow".**
2. **After repairs, re-check that the problem has been completely eliminated.**
3. **Refer to Component Parts and Harness Connector Location for the Systems described in each section for identification/location of components and harness connectors.**
4. **Refer to the Circuit Diagram for quick pinpoint check.**
   If you need to check circuit continuity between harness connectors in more detail, such as when a sub-harness is used, refer to Wiring Diagram in each individual section and Harness Layout in PG section for identification of harness connectors.
5. **When checking circuit continuity, ignition switch should be OFF.**
6. **Before checking voltage at connectors, check battery voltage.**
7. **After accomplishing the Diagnostic Procedures and Electrical Components Inspection, make sure that all harness connectors are reconnected as they were.**

HOW TO FOLLOW TEST GROUPS IN TROUBLE DIAGNOSES



1. **Work and diagnostic procedure**
   Start to diagnose a problem using procedures indicated in enclosed test groups.
2. **Questions and required results**
   Questions and required results are indicated in bold type in test group.
   The meaning of are as follows:

a. Battery voltage → 11 - 14V or approximately 12V

b. Voltage : Approximately 0V → Less than 1V

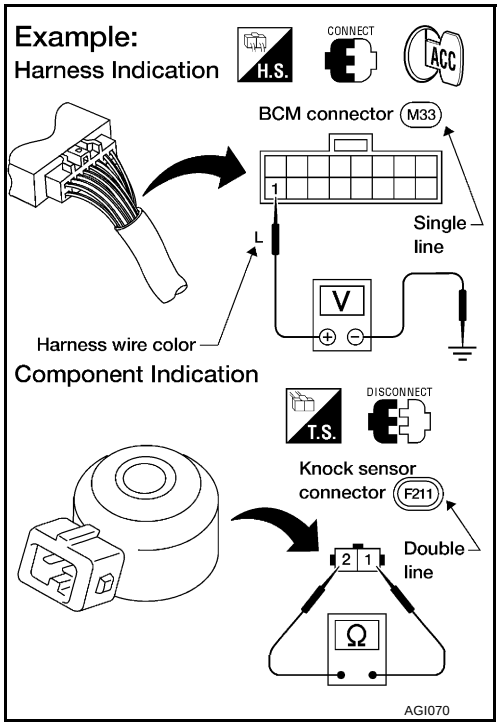
3. **Symbol used in illustration**
   Symbols included in illustrations refer to measurements or procedures. Before diagnosing a problem, familiarize yourself with each symbol. Refer to "Connector Symbols" in GI Section and "KEY TO SYMBOLS SIGNIFYING MEASUREMENTS OR PROCEDURES" below.
4. **Action items**
   Next action for each test group is indicated based on result of each question. Test group number is shown in the left upper portion of each test group.

HARNESS WIRE COLOR AND CONNECTOR NUMBER INDICATION

There are two types of harness wire color and connector number indication.

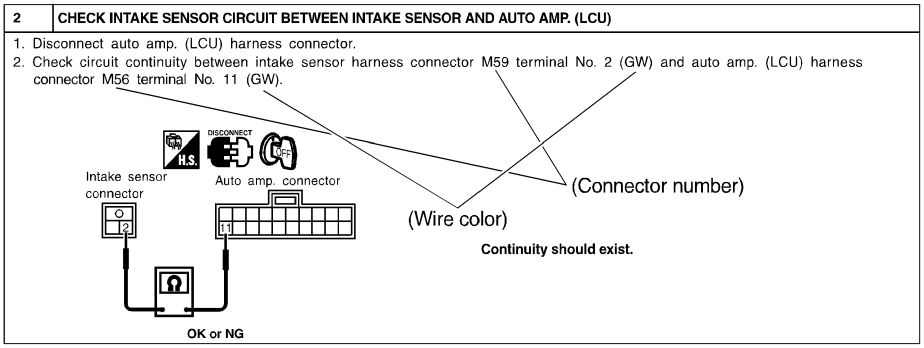
TYPE 1: Harness Wire Color and Connector Number are Shown in Illustration

- Letter designations next to test meter probe indicate harness wire color.
- Connector numbers in a single circle (e.g. M33) indicate harness connectors.
- Connector numbers in a double circle (e.g. F211) indicate component connectors.

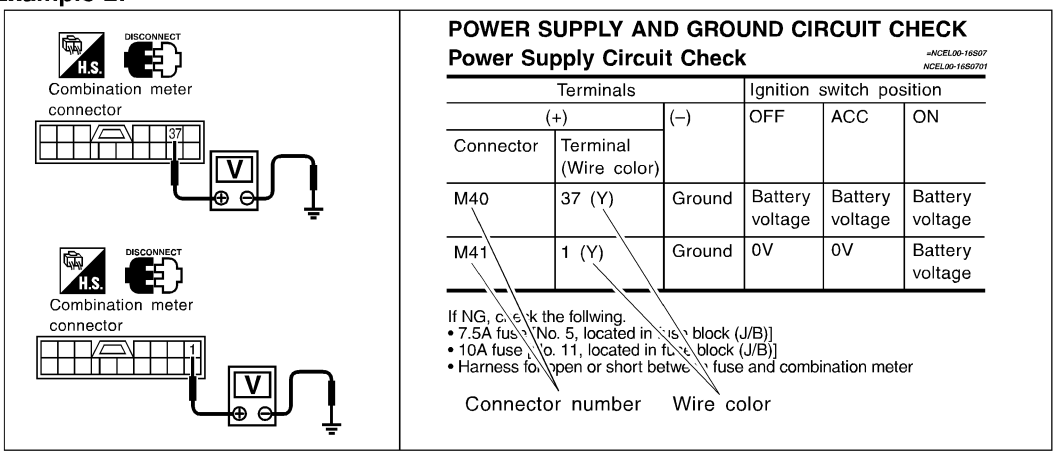


TYPE 2: Harness Wire Color and Connector Number are Shown in Text

Example 1:



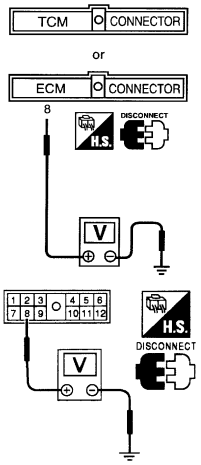
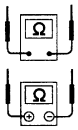
Example 2:



SGI144A

KEY TO SYMBOLS SIGNIFYING MEASUREMENTS OR PROCEDURES

Symbol	Symbol explanation	Symbol	Symbol explanation
DISCONNECT	Check after disconnecting the connector to be measured.	GST	Procedure with Generic Scan Tool (GST, OBD-II scan tool)
CONNECT	Check after connecting the connector to be measured.	NO TOOLS	Procedure without CONSULT, CONSULT-II or GST
	Insert key into ignition switch.	A/C	A/C switch is “OFF”.
	Remove key from ignition switch.	A/C	A/C switch is “ON”.
OFF	Turn ignition switch to “OFF” position.		REC switch is “ON”.
ON	Turn ignition switch to “ON” position.		REC switch is “OFF”.
ST	Turn ignition switch to “START” position.		Fan switch is “ON”. (At any position except for “OFF” position)
OFF ACC	Turn ignition switch from “OFF” to “ACC” position.		Fan switch is “OFF”.
ACC OFF	Turn ignition switch from “ACC” to “OFF” position.	FUSE BAT	Apply positive voltage from battery with fuse directly to components.

Symbol	Symbol explanation	Symbol	Symbol explanation
	Turn ignition switch from “OFF” to “ON” position.		Drive vehicle.
	Turn ignition switch from “ON” to “OFF” position.		Disconnect battery negative cable.
	Do not start engine, or check with engine stopped.		Depress brake pedal.
	Start engine, or check with engine running.		Release brake pedal.
	Apply parking brake.		Depress accelerator pedal.
	Release parking brake.		Release accelerator pedal.
	Check after engine is warmed up sufficiently.		Pin terminal check for SMJ type ECM and TCM connectors. **For details regarding the terminal arrangement, refer to the “ELECTRICAL UNITS” electrical reference page at the end of the manual.**
	Voltage should be measured with a voltmeter.		
	Circuit resistance should be measured with an ohmmeter.		
	Current should be measured with an ammeter.		
	Pulse signal should be checked with an oscilloscope.		
	Procedure with CONSULT-II		
	Procedure without CONSULT-II		

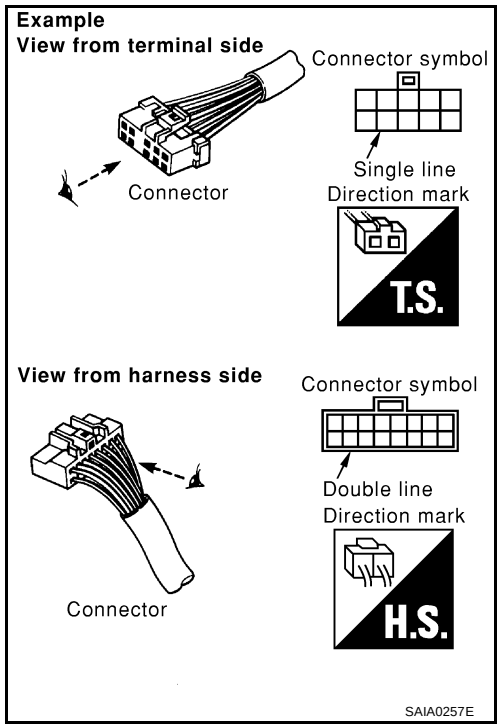
How to Read Wiring Diagrams

AAS000JQ

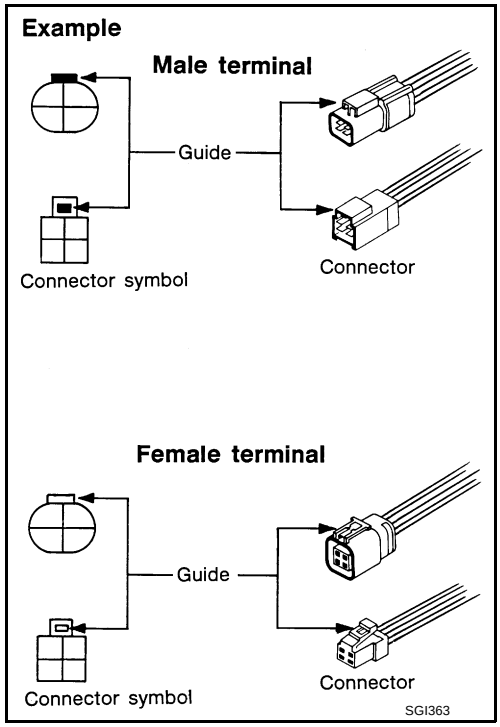
CONNECTOR SYMBOLS

Most of connector symbols in wiring diagrams are shown from the terminal side.

- Connector symbols shown from the terminal side are enclosed by a single line and followed by the direction mark.
- Connector symbols shown from the harness side are enclosed by a double line and followed by the direction mark.
- Certain systems and components, especially those related to OBD, may use a new style slide-locking type harness connector. For description and how to disconnect, refer to PG section, “Description”, “HARNESS CONNECTOR”.

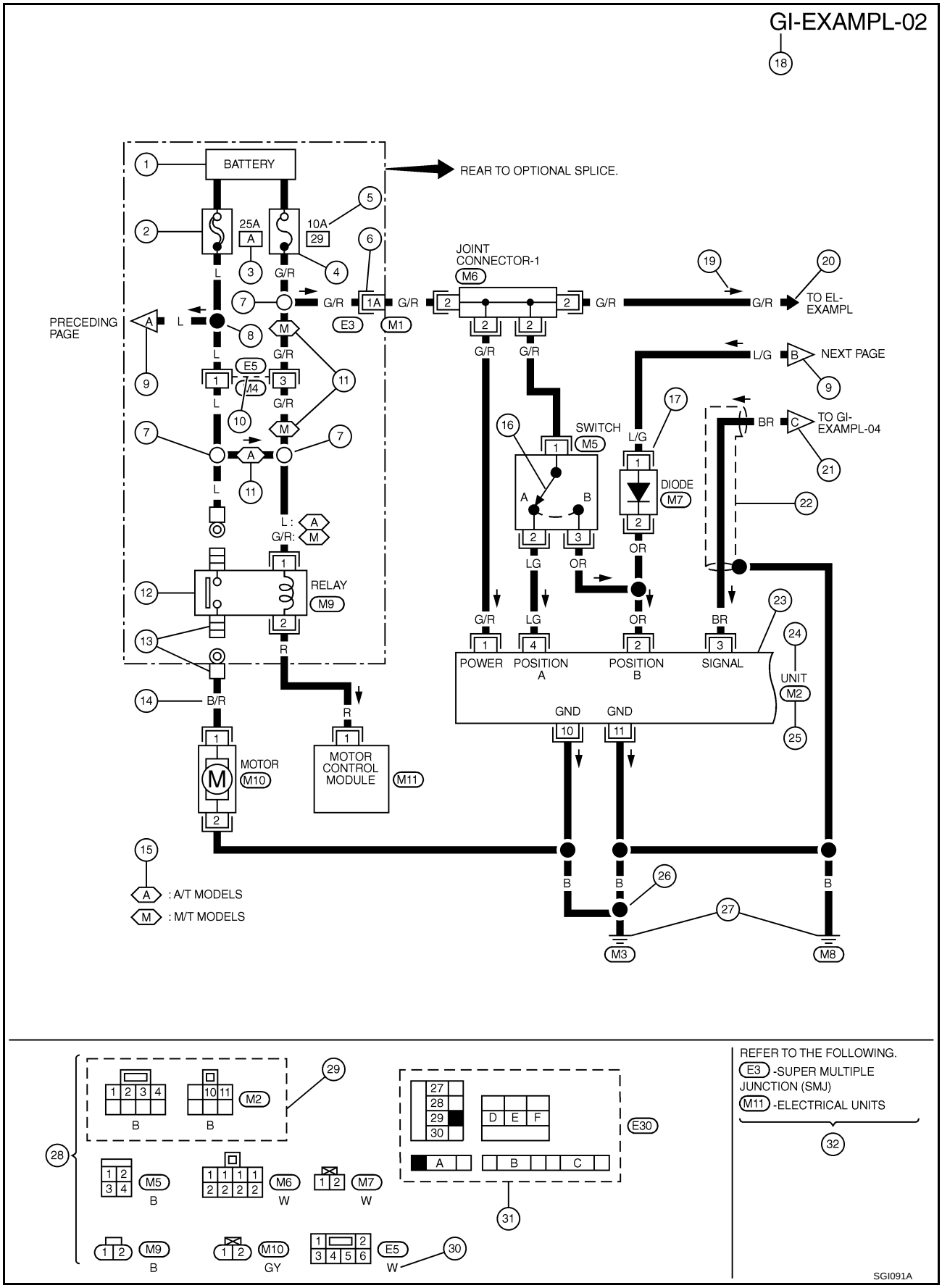


- Male and female terminals
  Connector guides for male terminals are shown in black and female terminals in white in wiring diagrams.

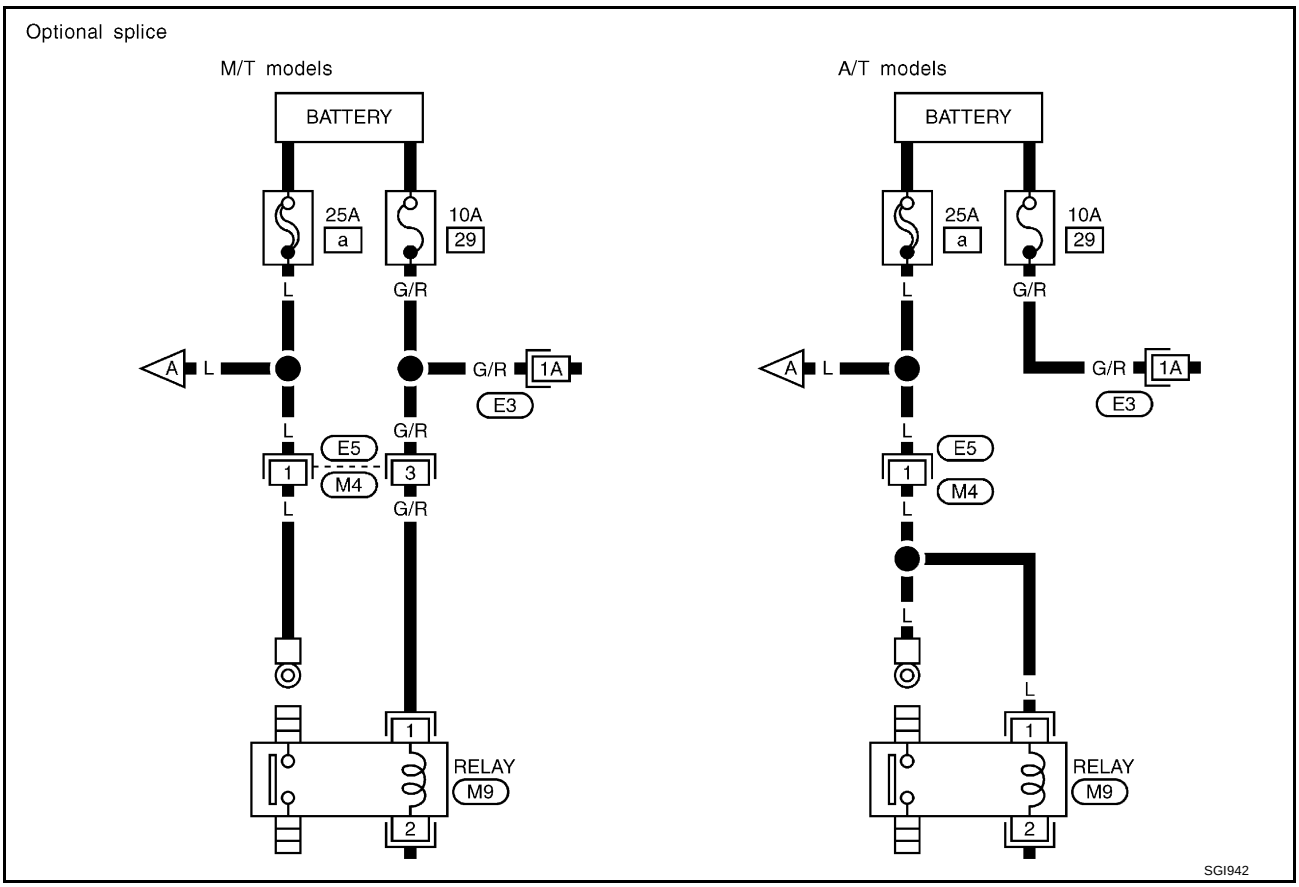


SAMPLE/WIRING DIAGRAM - EXAMPL -

- For detail, refer to following “DESCRIPTION”.



Optional Splice



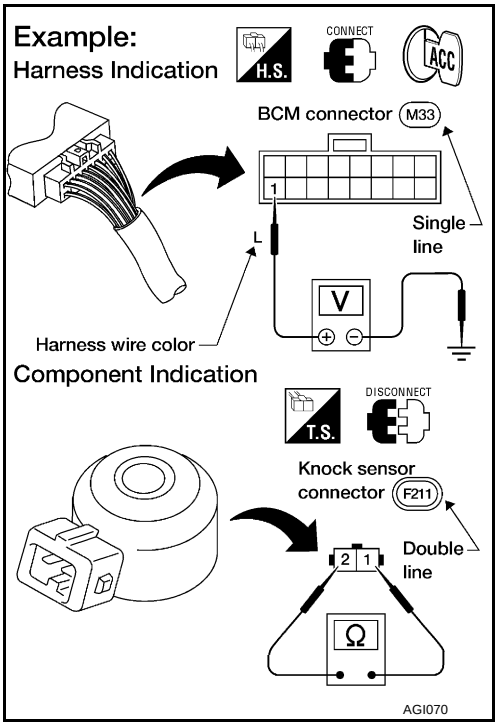
DESCRIPTION

Number	Item	Description
1	Power condition	● This shows the condition when the system receives battery positive voltage (can be operated).
2	Fusible link	● The double line shows that this is a fusible link. ● The open circle shows current flow in, and the shaded circle shows current flow out.
3	Fusible link/fuse location	● This shows the location of the fusible link or fuse in the fusible link or fuse box. For arrangement, refer to PG section, POWER SUPPLY ROUTING.
4	Fuse	● The single line shows that this is a fuse. ● The open circle shows current flow in, and the shaded circle shows current flow out.
5	Current rating	● This shows the current rating of the fusible link or fuse.
6	Connectors	● This shows that connector E3 is female and connector M1 is male. ● The G/R wire is located in the 1A terminal of both connectors. ● Terminal number with an alphabet (1A, 5B, etc.) indicates that the connector is SMJ connector. Refer to PG section, SMJ (SUPER MULTIPLE JUNCTION).
7	Optional splice	● The open circle shows that the splice is optional depending on vehicle application.
8	Splice	● The shaded circle shows that the splice is always on the vehicle.
9	Page crossing	● This arrow shows that the circuit continues to an adjacent page. ● The A will match with the A on the preceding or next page.
10	Common connector	● The dotted lines between terminals show that these terminals are part of the same connector.
11	Option abbreviation	● This shows that the circuit is optional depending on vehicle application.
12	Relay	● This shows an internal representation of the relay. For details, refer to PG section, STANDARDIZED RELAY.
13	Connectors	● This shows that the connector is connected to the body or a terminal with bolt or nut.

Number	Item	Description
14	Wire color	● This shows a code for the color of the wire.
		B = Black W = White R = Red G = Green L = Blue Y = Yellow LG = Light Green BR = Brown OR or O = Orange P = Pink PU or V (Violet) = Purple GY or GR = Gray SB = Sky Blue CH = Dark Brown DG = Dark Green
		When the wire color is striped, the base color is given first, followed by the stripe color as shown below: Example: L/W = Blue with White Stripe
15	Option description	● This shows a description of the option abbreviation used on the page.
16	Switch	● This shows that continuity exists between terminals 1 and 2 when the switch is in the A position. Continuity exists between terminals 1 and 3 when the switch is in the B position.
17	Assembly parts	● Connector terminal in component shows that it is a harness incorporated assembly.
18	Cell code	● This identifies each page of the wiring diagram by section, system and wiring diagram page number.
19	Current flow arrow	● Arrow indicates electric current flow, especially where the direction of standard flow (vertically downward or horizontally from left to right) is difficult to follow. ● A double arrow “ ↔ ” shows that current can flow in either direction depending on circuit operation.
20	System branch	● This shows that the system branches to another system identified by cell code (section and system).
21	Page crossing	● This arrow shows that the circuit continues to another page identified by cell code. ● The C will match with the C on another page within the system other than the next or preceding pages.
22	Shielded line	● The line enclosed by broken line circle shows shield wire.
23	Component box in wave line	● This shows that another part of the component is also shown on another page (indicated by wave line) within the system.
24	Component name	● This shows the name of a component.
25	Connector number	● This shows the connector number. ● The letter shows which harness the connector is located in. ● Example: **M** : main harness. For detail and to locate the connector, refer to PG section "Main Harness", “Harness Layout”. A coordinate grid is included for complex harnesses to aid in locating connectors.
26	Ground (GND)	● The line spliced and grounded under wire color shows that ground line is spliced at the grounded connector.
27	Ground (GND)	● This shows the ground connection. For detailed ground distribution information, refer to "Ground Distribution" in PG section.
28	Connector views	● This area shows the connector faces of the components in the wiring diagram on the page.
29	Common component	● Connectors enclosed in broken line show that these connectors belong to the same component.
30	Connector color	● This shows a code for the color of the connector. For code meaning, refer to wire color codes, Number 14 of this chart.
31	Fusible link and fuse box	● This shows the arrangement of fusible link(s) and fuse(s), used for connector views of "POWER SUPPLY ROUTING" in PG section. The open square shows current flow in, and the shaded square shows current flow out.
32	Reference area	● This shows that more information on the Super Multiple Junction (SMJ) and Joint Connectors (J/C) exists on the PG section. Refer to "Reference Area" for details.

Harness Indication

- Letter designations next to test meter probe indicate harness (connector) wire color.
- Connector numbers in a single circle M33 indicate harness connectors.



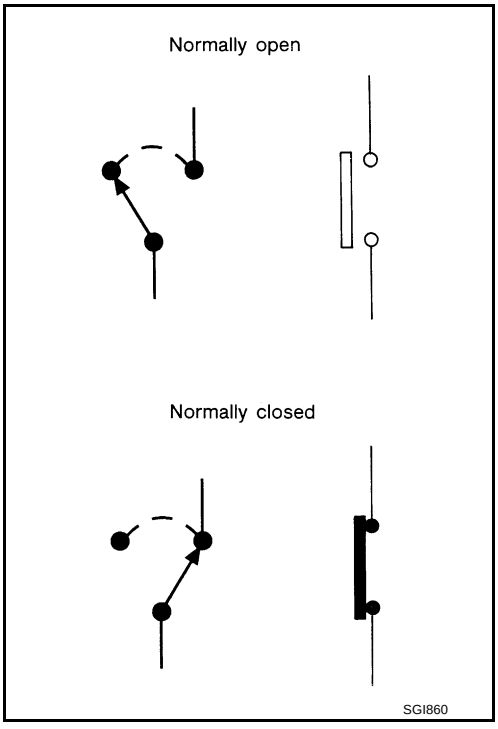
Component Indication

Connector numbers in a double circle F211 indicate component connectors.

Switch Positions

Switches are shown in wiring diagrams as if the vehicle is in the “normal” condition.
A vehicle is in the “normal” condition when:

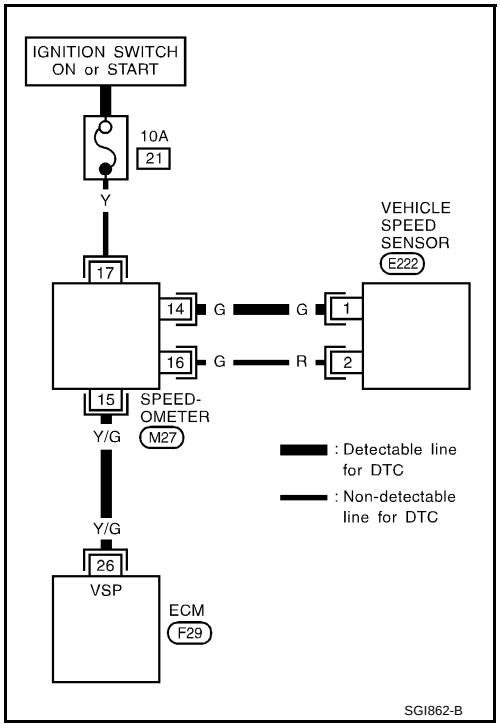
- ignition switch is “OFF”,
- doors, hood and trunk lid/back door are closed,
- pedals are not depressed, and
- parking brake is released.



Detectable Lines and Non-Detectable Lines

In some wiring diagrams, two kinds of lines, representing wires, with different weight are used.

- A line with regular weight (wider line) represents a “detectable line for DTC (Diagnostic Trouble Code)”. A “detectable line for DTC” is a circuit in which ECM can detect its malfunctions with the on board diagnostic system.
- A line with less weight (thinner line) represents a “non-detectable line for DTC”. A “non-detectable line for DTC” is a circuit in which ECM cannot detect its malfunctions with the on board diagnostic system.



Multiple Switch

The continuity of multiple switch is described in two ways as shown below.

- The switch chart is used in schematic diagrams.
- The switch diagram is used in wiring diagrams.

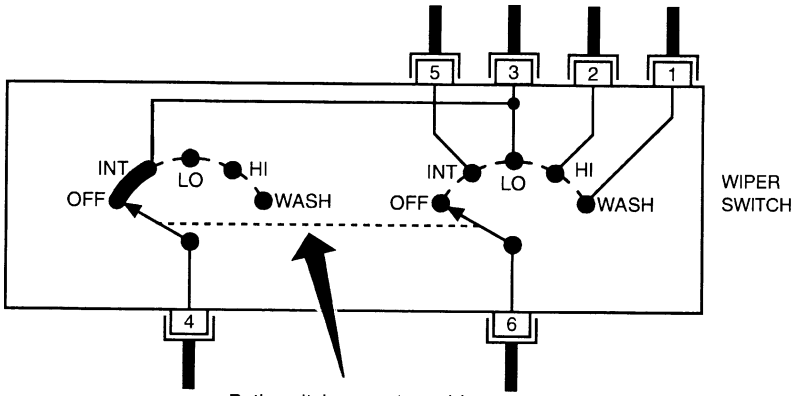
Example

(SWITCH CHART)

WIPER SWITCH

	OFF	INT	LO	HI	WASH
1					○
2				○	
3	○	○	○		
4	○	○			
5		○			
6		○	○	○	○

(SWITCH DIAGRAM)



Both switches are turned in combination.

Continuity circuit of wiper switch

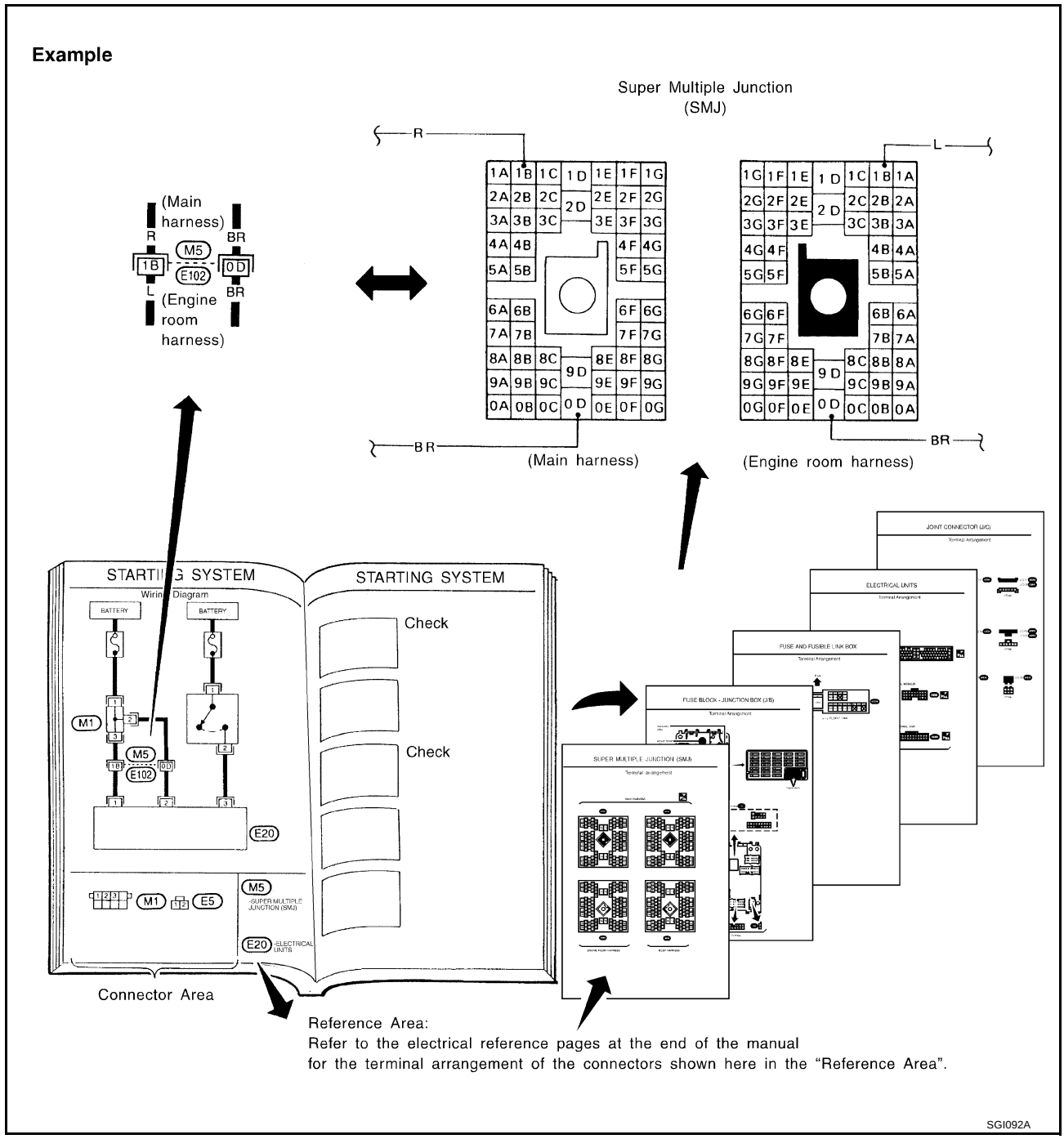
SWITCH POSITION	CONTINUITY CIRCUIT
OFF	3 - 4
INT	3 - 4, 5 - 6
LO	3 - 6
HI	2 - 6
WASH	1 - 6

SGI875

Reference Area

The Reference Area of the wiring diagram contains references to additional electrical reference pages at the end of the manual. If connector numbers and titles are shown in the Reference Area of the wiring diagram, these connector symbols are not shown in the Connector Area.

Example



Abbreviations

AAS000JR

The following **ABBREVIATIONS** are used:

ABBREVIATION	DESCRIPTION
A/C	Air Conditioner
A/T	Automatic Transaxle/Transmission
ATF	Automatic Transmission Fluid
D_1	Drive range 1st gear
D_2	Drive range 2nd gear
D_3	Drive range 3rd gear
D_4	Drive range 4th gear
FR, RR	Front, Rear
LH, RH	Left-Hand, Right-Hand
M/T	Manual Transaxle/Transmission
OD	Overdrive
P/S	Power Steering
SAE	Society of Automotive Engineers, Inc.
SDS	Service Data and Specifications
SST	Special Service Tools
2WD	2-Wheel Drive
2_2	2nd range 2nd gear
2_1	2nd range 1st gear
1_2	1st range 2nd gear
1_1	1st range 1st gear

SERVICE INFORMATION FOR ELECTRICAL INCIDENT

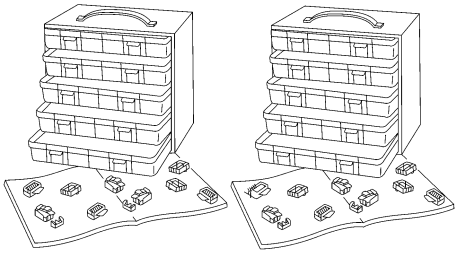
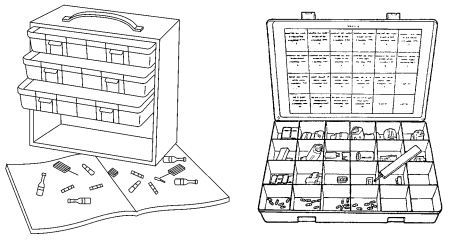
PFP:00000

How to Check Terminal

AAS0001W

CONNECTOR AND TERMINAL PIN KIT

Use the connector and terminal pin kits listed below when replacing connectors or terminals.
The connector and terminal pin kits contain some of the most commonly used NISSAN/INFINITI connectors and terminals. For detailed connector and terminal pin replacement procedures, refer to the latest NISSAN/INFINITI CONNECTOR AND TERMINAL PIN SERVICE MANUAL.

Tool number (Kent-Moore No.) Tool name	Description
- (J38751-95NI) Connector and terminal pin kit (NISSAN) - (J38751-95INF) Connector and terminal pin kit (INFINITI) - (J42992-98KIT) OBD and terminal repair kit - (J42992-2000UPD) OBD-II Connector Kit Update	J38751-95NI J38751-95INF  WAIA0004E J42992-98KIT J42992-2000UPD  WAIA0005E

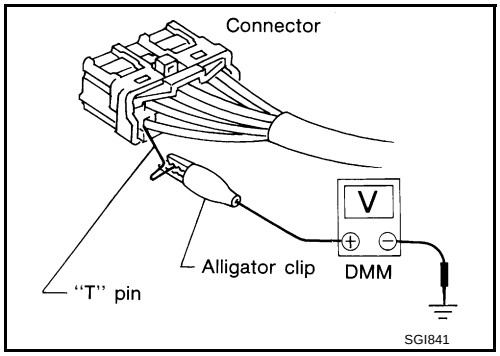
HOW TO PROBE CONNECTORS

Connector damage and an intermittent connection can result from improperly probing of the connector during circuit checks.
The probe of a digital multimeter (DMM) may not correctly fit the connector cavity. To correctly probe the connector, follow the procedures below using a “T” pin. For the best contact grasp the “T” pin using an alligator clip.

Probing from Harness Side

Standard type (not waterproof type) connector should be probed from harness side with “T” pin.

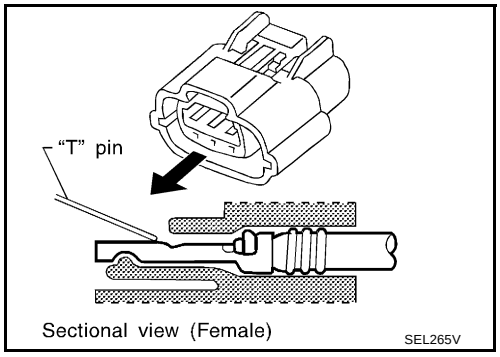
- If the connector has a rear cover such as a ECM connector, remove the rear cover before probing the terminal.
- Do not probe waterproof connector from harness side. Damage to the seal between wire and connector may result.



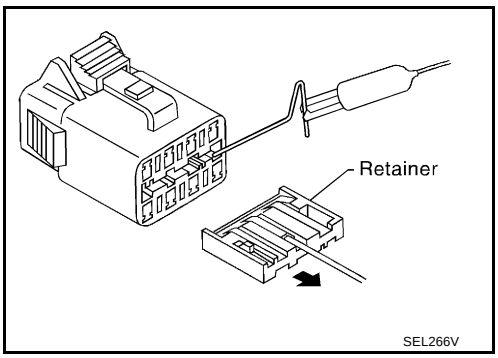
Probing from Terminal Side

FEMALE TERMINAL

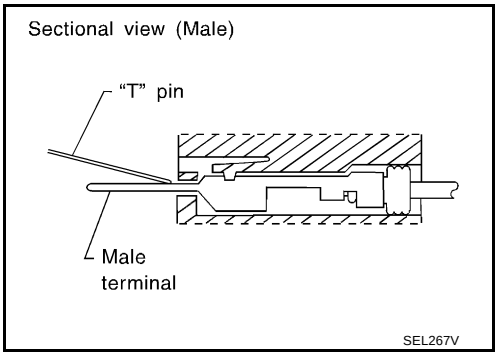
- There is a small notch above each female terminal. Probe each terminal with the “T” pin through the notch.
  Do not insert any object other than the same type male terminal into female terminal.



- Some connectors do not have a notch above each terminal. To probe each terminal, remove the connector retainer to make contact space for probing.



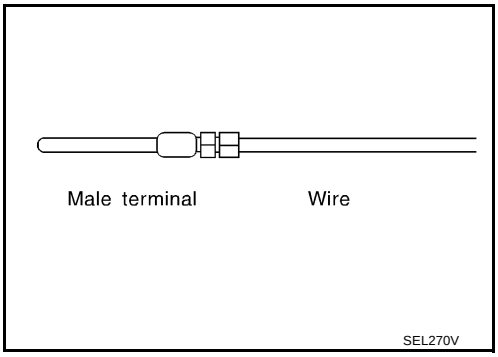
MALE TERMINAL
Carefully probe the contact surface of each terminal using a “T” pin.
Do not bend terminal.



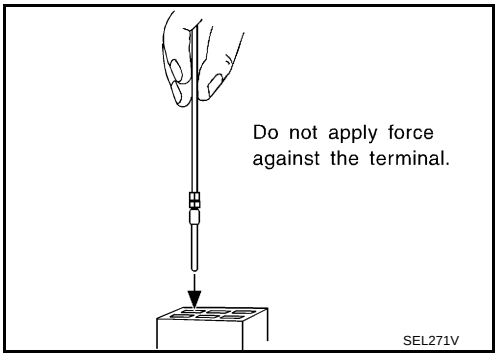
How to Check Enlarged Contact Spring of Terminal

An enlarged contact spring of a terminal may create intermittent signals in the circuit.
If the intermittent open circuit occurs, follow the procedure below to inspect for open wires and enlarged contact spring of female terminal.

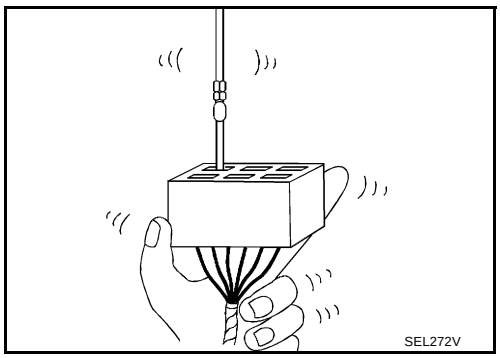
1. Assemble a male terminal and approx. 10 cm (3.9 in) of wire.
   Use a male terminal which matches the female terminal.
2. Disconnect the suspected faulty connector and hold it terminal side up.



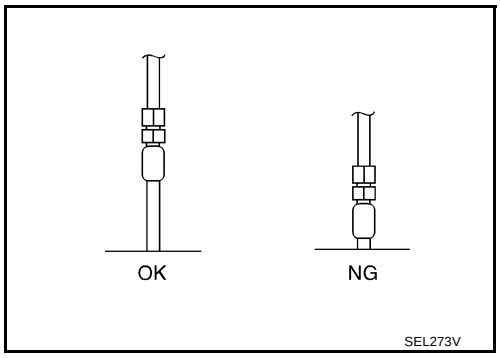
3. While holding the wire of the male terminal, try to insert the male terminal into the female terminal.
   Do not force the male terminal into the female terminal with your hands.



4. While moving the connector, check whether the male terminal can be easily inserted or not.


SEL272V

- If the male terminal can be easily inserted into the female terminal, replace the female terminal.



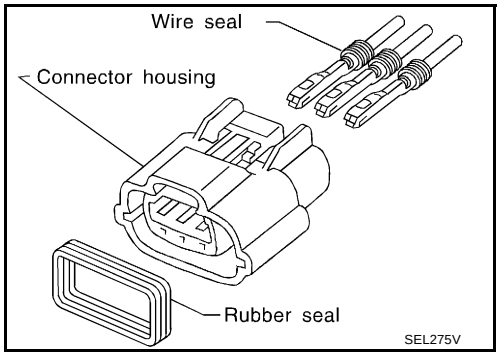
SEL273V

Waterproof Connector Inspection

If water enters the connector, it can short interior circuits. This may lead to intermittent problems. Check the following items to maintain the original waterproof characteristics.

RUBBER SEAL INSPECTION

- Most waterproof connectors are provided with a rubber seal between the male and female connectors. If the seal is missing, the waterproof performance may not meet specifications.
- The rubber seal may come off when connectors are disconnected. Whenever connectors are reconnected, make sure the rubber seal is properly installed on either side of male or female connector.



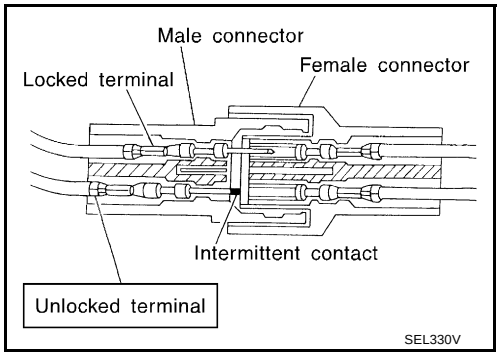
SEL275V

WIRE SEAL INSPECTION

The wire seal must be installed on the wire insertion area of a waterproof connector. Be sure that the seal is installed properly.

Terminal Lock Inspection

Check for unlocked terminals by pulling wire at the end of connector. An unlocked terminal may create intermittent signals in the circuit.

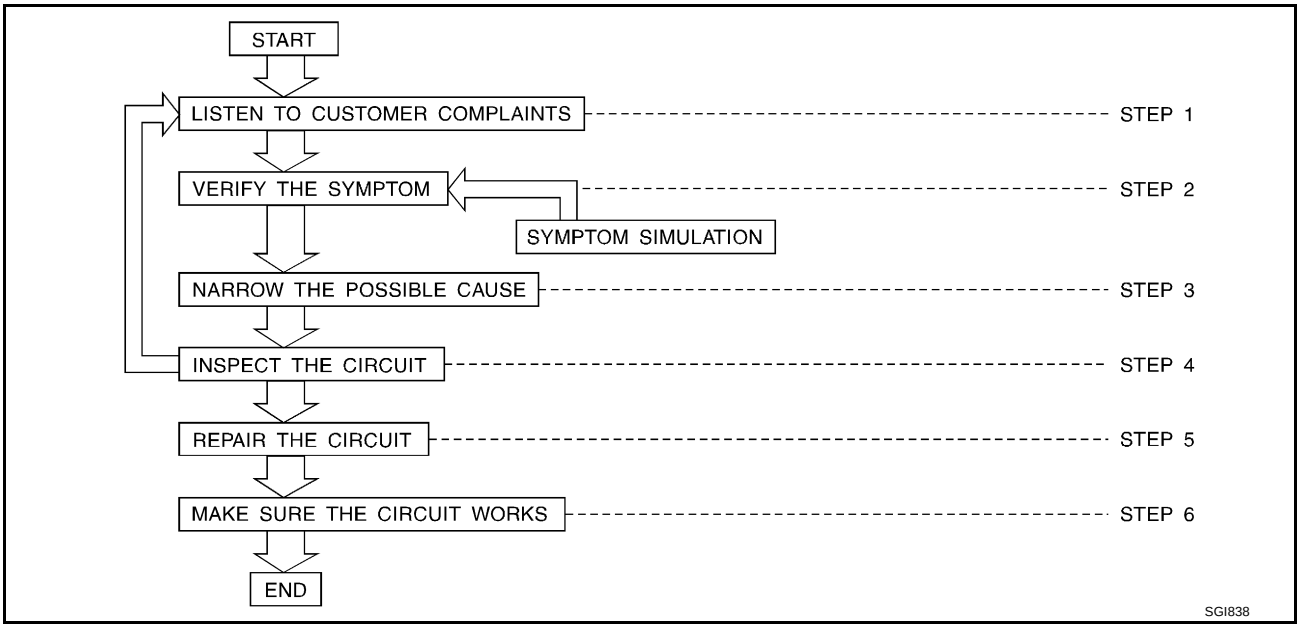


SEL330V

How to Perform Efficient Diagnosis for an Electrical Incident

AAS0001X

WORK FLOW



STEP	DESCRIPTION	
STEP 1	Get detailed information about the conditions and the environment when the incident occurred. The following are key pieces of information required to make a good analysis:	
	WHAT	Vehicle Model, Engine, Transmission/Transaxle and the System (i.e. Radio).
	WHEN	Date, Time of Day, Weather Conditions, Frequency.
	WHERE	Road Conditions, Altitude and Traffic Situation.
	HOW	System Symptoms, Operating Conditions (Other Components Interaction). Service History and if any After Market Accessories have been installed.
STEP 2	Operate the system, road test if necessary. Verify the parameter of the incident. If the problem cannot be duplicated, refer to “Incident Simulation Tests”.	
STEP 3	Get the proper diagnosis materials together including: ● Power Supply Routing ● System Operation Descriptions ● Applicable Service Manual Sections ● Check for any Service Bulletins Identify where to begin diagnosis based upon your knowledge of the system operation and the customer comments.	
STEP 4	Inspect the system for mechanical binding, loose connectors or wiring damage. Determine which circuits and components are involved and diagnose using the Power Supply Routing and Harness Layouts.	
STEP 5	Repair or replace the incident circuit or component.	
STEP 6	Operate the system in all modes. Verify the system works properly under all conditions. Make sure you have not inadvertently created a new incident during your diagnosis or repair steps.	

INCIDENT SIMULATION TESTS

Introduction

Sometimes the symptom is not present when the vehicle is brought in for service. If possible, re-create the conditions present at the time of the incident. Doing so may help avoid a No Trouble Found Diagnosis. The following section illustrates ways to simulate the conditions/environment under which the owner experiences an electrical incident.

The section is broken into the six following topics:

- Vehicle vibration
- Heat sensitive

- Freezing
- Water intrusion
- Electrical load
- Cold or hot start up

Get a thorough description of the incident from the customer. It is important for simulating the conditions of the problem.

Vehicle Vibration

The problem may occur or become worse while driving on a rough road or when engine is vibrating (idle with A/C on). In such a case, you will want to check for a vibration related condition. Refer to the following illustration.

CONNECTORS & HARNESS

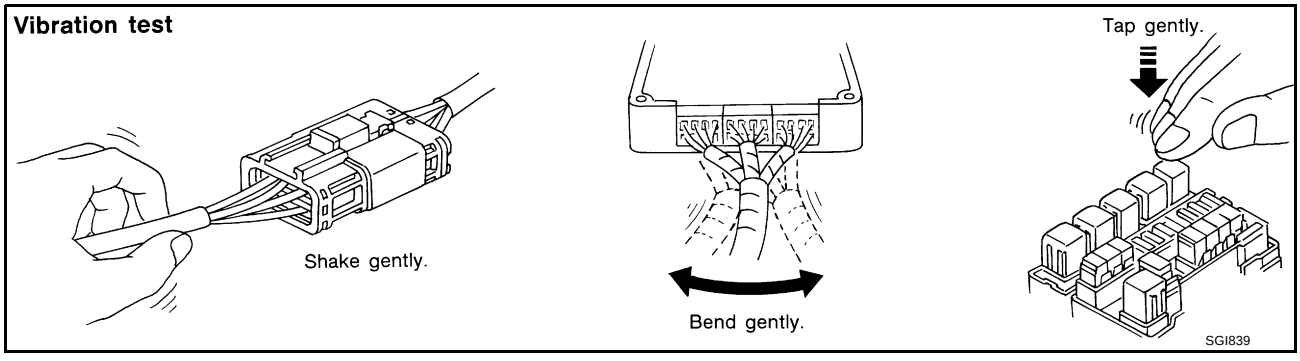
Determine which connectors and wiring harness would affect the electrical system you are inspecting. Gently shake each connector and harness while monitoring the system for the incident you are trying to duplicate. This test may indicate a loose or poor electrical connection.

HINT

Connectors can be exposed to moisture. It is possible to get a thin film of corrosion on the connector terminals. A visual inspection may not reveal this without disconnecting the connector. If the problem occurs intermittently, perhaps the problem is caused by corrosion. It is a good idea to disconnect, inspect and clean the terminals on related connectors in the system.

SENSORS & RELAYS

Gently apply a slight vibration to sensors and relays in the system you are inspecting.
This test may indicate a loose or poorly mounted sensor or relay.



ENGINE COMPARTMENT

There are several reasons a vehicle or engine vibration could cause an electrical complaint. Some of the things to check for are:

- Connectors not fully seated.
- Wiring harness not long enough and is being stressed due to engine vibrations or rocking.
- Wires laying across brackets or moving components.
- Loose, dirty or corroded ground wires.
- Wires routed too close to hot components.

To inspect components under the hood, start by verifying the integrity of ground connections. (Refer to Ground Inspection described later.) First check that the system is properly grounded. Then check for loose connection by gently shaking the wiring or components as previously explained. Using the wiring diagrams inspect the wiring for continuity.

BEHIND THE INSTRUMENT PANEL

An improperly routed or improperly clamped harness can become pinched during accessory installation. Vehicle vibration can aggravate a harness which is routed along a bracket or near a screw.

UNDER SEATING AREAS

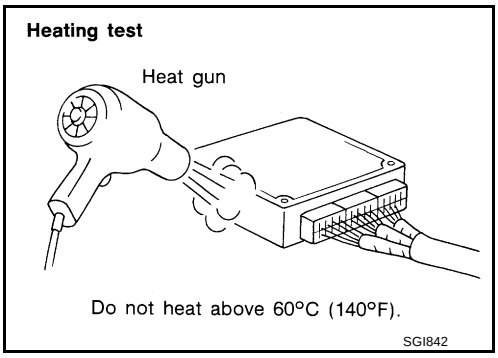
An unclamped or loose harness can cause wiring to be pinched by seat components (such as slide guides) during vehicle vibration. If the wiring runs under seating areas, inspect wire routing for possible damage or pinching.

Heat Sensitive

The customer's concern may occur during hot weather or after car has sat for a short time. In such cases you will want to check for a heat sensitive condition.

To determine if an electrical component is heat sensitive, heat the component with a heat gun or equivalent.

Do not heat components above 60°C (140°F). If incident occurs while heating the unit, either replace or properly insulate the component.

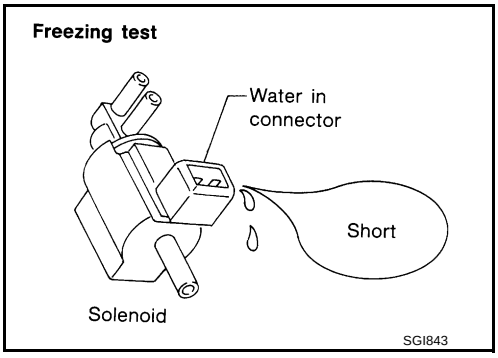


Freezing

The customer may indicate the incident goes away after the car warms up (winter time). The cause could be related to water freezing somewhere in the wiring/electrical system.

There are two methods to check for this. The first is to arrange for the owner to leave his car overnight. Make sure it will get cold enough to demonstrate his complaint. Leave the car parked outside overnight. In the morning, do a quick and thorough diagnosis of those electrical components which could be affected.

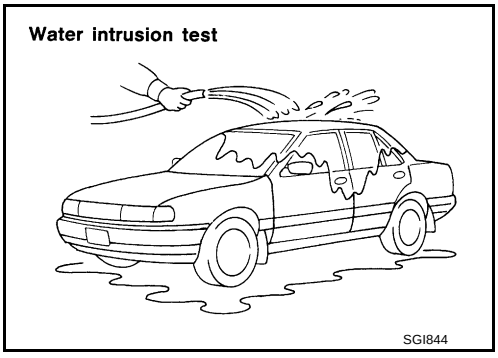
The second method is to put the suspect component into a freezer long enough for any water to freeze. Reinstall the part into the car and check for the reoccurrence of the incident. If it occurs, repair or replace the component.



Water Intrusion

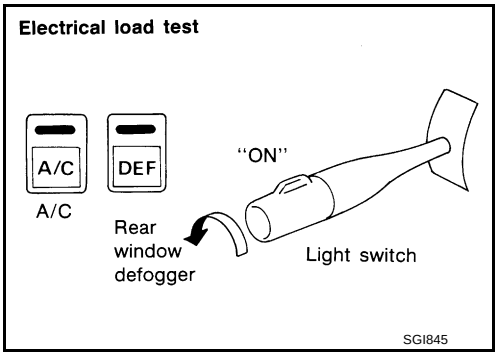
The incident may occur only during high humidity or in rainy/snowy weather. In such cases the incident could be caused by water intrusion on an electrical part. This can be simulated by soaking the car or running it through a car wash.

Do not spray water directly on any electrical components.



Electrical Load

The incident may be electrical load sensitive. Perform diagnosis with all accessories (including A/C, rear window defogger, radio, fog lamps) turned on.



Cold or Hot Start Up

On some occasions an electrical incident may occur only when the car is started cold, or it may occur when the car is restarted hot shortly after being turned off. In these cases you may have to keep the car overnight to make a proper diagnosis.

CIRCUIT INSPECTION

Introduction

In general, testing electrical circuits is an easy task if it is approached in a logical and organized method. Before beginning it is important to have all available information on the system to be tested. Also, get a thorough understanding of system operation. Then you will be able to use the appropriate equipment and follow the correct test procedure.
You may have to simulate vehicle vibrations while testing electrical components. Gently shake the wiring harness or electrical component to do this.

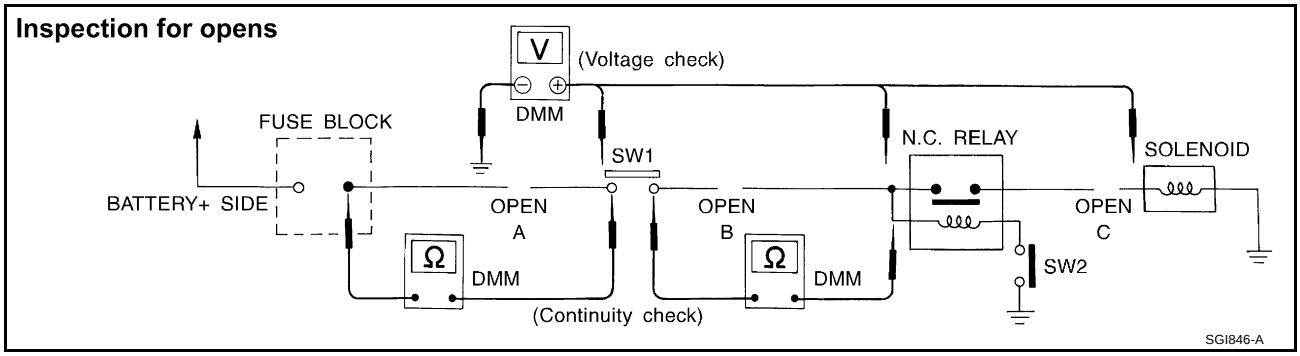
OPEN	A circuit is open when there is no continuity through a section of the circuit.	
SHORT	There are two types of shorts.	
	● SHORT CIRCUIT	When a circuit contacts another circuit and causes the normal resistance to change.
	● SHORT TO GROUND	When a circuit contacts a ground source and grounds the circuit.

NOTE:
Refer to “How to Check Terminal” to probe or check terminal.

Testing for “Opens” in the Circuit

Before you begin to diagnose and test the system, you should rough sketch a schematic of the system. This will help you to logically walk through the diagnosis process. Drawing the sketch will also reinforce your working knowledge of the system.

Inspection for opens



CONTINUITY CHECK METHOD
The continuity check is used to find an open in the circuit. The digital multimeter (DMM) set on the resistance function will indicate an open circuit as over limit (no beep tone or no ohms symbol). Make sure to always start with the DMM at the highest resistance level.
To help in understanding the diagnosis of open circuits, please refer to the previous schematic.

- Disconnect the battery negative cable.
- Start at one end of the circuit and work your way to the other end. (At the fuse block in this example)
- Connect one probe of the DMM to the fuse block terminal on the load side.
- Connect the other probe to the fuse block (power) side of SW1. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point A)
- Connect the probes between SW1 and the relay. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point B)
- Connect the probes between the relay and the solenoid. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point C)

Any circuit can be diagnosed using the approach in the previous example.

VOLTAGE CHECK METHOD

To help in understanding the diagnosis of open circuits please refer to the previous schematic.
In any powered circuit, an open can be found by methodically checking the system for the presence of voltage. This is done by switching the DMM to the voltage function.

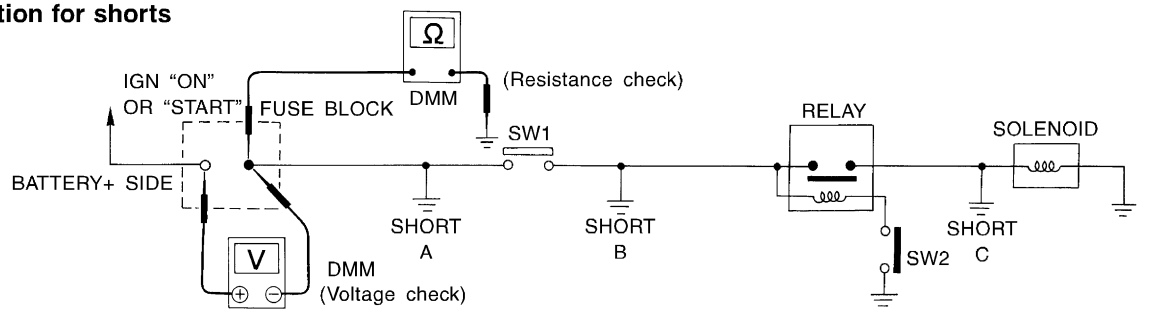
- Connect one probe of the DMM to a known good ground.
- Begin probing at one end of the circuit and work your way to the other end.
- With SW1 open, probe at SW1 to check for voltage.
  voltage; open is further down the circuit than SW1.
  no voltage; open is between fuse block and SW1 (point A).
- Close SW1 and probe at relay.
  voltage; open is further down the circuit than the relay.
  no voltage; open is between SW1 and relay (point B).
- Close the relay and probe at the solenoid.
  voltage; open is further down the circuit than the solenoid.
  no voltage; open is between relay and solenoid (point C).

Any powered circuit can be diagnosed using the approach in the previous example.

Testing for “Shorts” in the Circuit

To simplify the discussion of shorts in the system, please refer to the following schematic.

Inspection for shorts



RESISTANCE CHECK METHOD

- Disconnect the battery negative cable and remove the blown fuse.
- Disconnect all loads (SW1 open, relay disconnected and solenoid disconnected) powered through the fuse.
- Connect one probe of the DMM to the load side of the fuse terminal. Connect the other probe to a known good ground.
- With SW1 open, check for continuity.
  continuity; short is between fuse terminal and SW1 (point A).
  no continuity; short is further down the circuit than SW1.
- Close SW1 and disconnect the relay. Put probes at the load side of fuse terminal and a known good ground. Then, check for continuity.
  continuity; short is between SW1 and the relay (point B).
  no continuity; short is further down the circuit than the relay.
- Close SW1 and jump the relay contacts with jumper wire. Put probes at the load side of fuse terminal and a known good ground. Then, check for continuity.
  continuity; short is between relay and solenoid (point C).
  no continuity; check solenoid, retrace steps.

VOLTAGE CHECK METHOD

- Remove the blown fuse and disconnect all loads (i.e. SW1 open, relay disconnected and solenoid disconnected) powered through the fuse.
- Turn the ignition key to the ON or START position. Verify battery voltage at the battery + side of the fuse terminal (one lead on the battery + terminal side of the fuse block and one lead on a known good ground).
- With SW1 open and the DMM leads across both fuse terminals, check for voltage.
  voltage; short is between fuse block and SW1 (point A).

no voltage; short is further down the circuit than SW1.

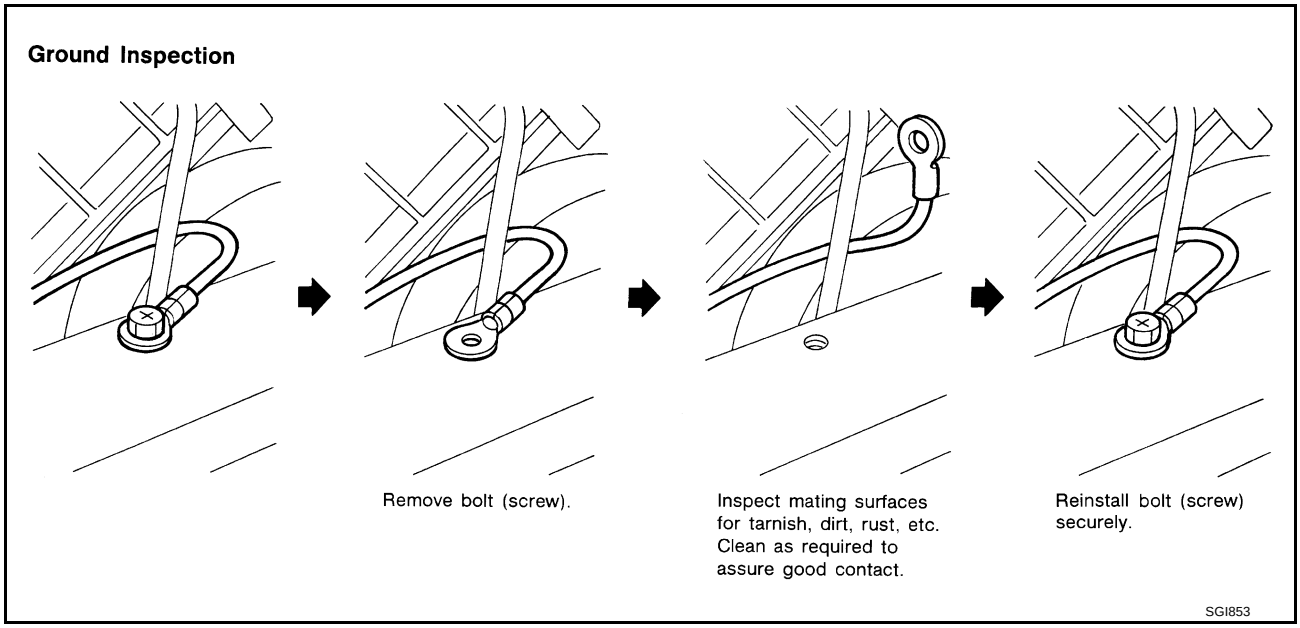
- With SW1 closed, relay and solenoid disconnected and the DMM leads across both fuse terminals, check for voltage.
  voltage; short is between SW1 and the relay (point B).
  no voltage; short is further down the circuit than the relay.
- With SW1 closed, relay contacts jumped with fused jumper wire check for voltage.
  voltage; short is down the circuit of the relay or between the relay and the disconnected solenoid (point C).
  no voltage; retrace steps and check power to fuse block.

Ground Inspection

Ground connections are very important to the proper operation of electrical and electronic circuits. Ground connections are often exposed to moisture, dirt and other corrosive elements. The corrosion (rust) can become an unwanted resistance. This unwanted resistance can change the way a circuit works.
Electronically controlled circuits are very sensitive to proper grounding. A loose or corroded ground can drastically affect an electronically controlled circuit. A poor or corroded ground can easily affect the circuit. Even when the ground connection looks clean, there can be a thin film of rust on the surface.
When inspecting a ground connection follow these rules:

- Remove the ground bolt or screw.
- Inspect all mating surfaces for tarnish, dirt, rust, etc.
- Clean as required to assure good contact.
- Reinstall bolt or screw securely.
- Inspect for “add-on” accessories which may be interfering with the ground circuit.
- If several wires are crimped into one ground eyelet terminal, check for proper crimps. Make sure all of the wires are clean, securely fastened and providing a good ground path. If multiple wires are cased in one eyelet make sure no ground wires have excess wire insulation.

For detailed ground distribution information, refer to “Ground Distribution” in PG section.



Voltage Drop Tests

Voltage drop tests are often used to find components or circuits which have excessive resistance. A voltage drop in a circuit is caused by a resistance when the circuit is in operation.
Check the wire in the illustration. When measuring resistance with DMM, contact by a single strand of wire will give reading of 0 ohms. This would indicate a good circuit. When the circuit operates, this single strand of wire is not able to carry the current. The single strand will have a high resistance to the current. This will be picked up as a slight voltage drop.
Unwanted resistance can be caused by many situations as follows:

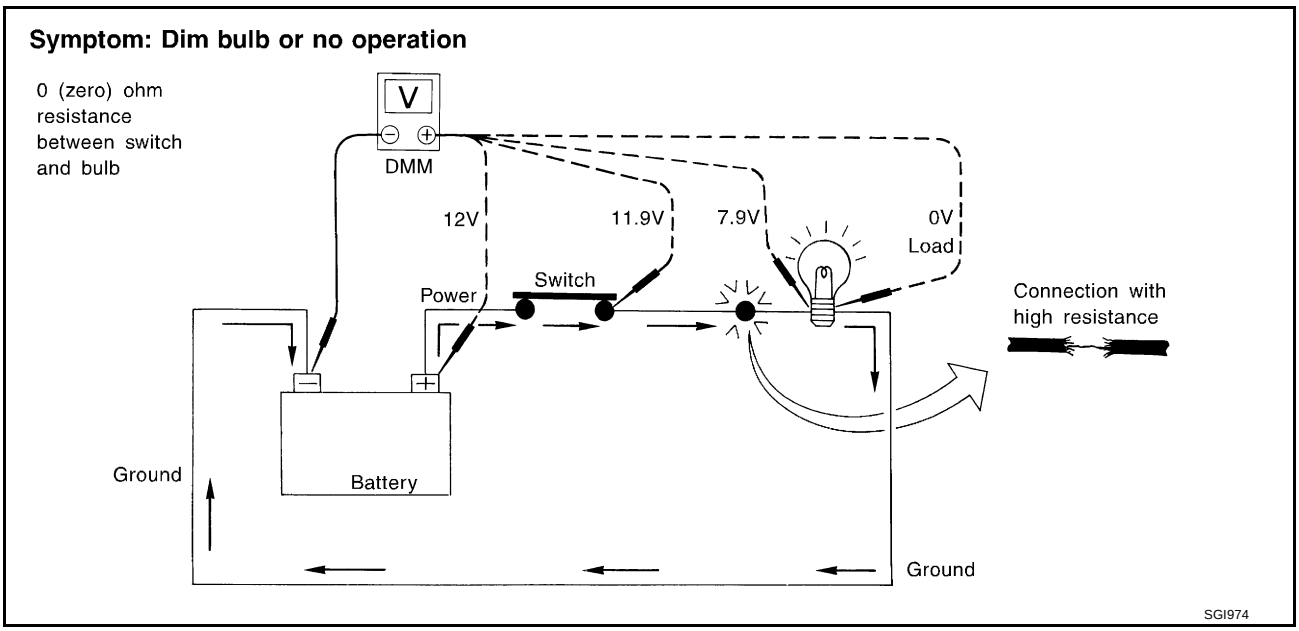
- Undersized wiring (single strand example)
- Corrosion on switch contacts
- Loose wire connections or splices.

If repairs are needed always use wire that is of the same or larger gauge.

MEASURING VOLTAGE DROP — ACCUMULATED METHOD

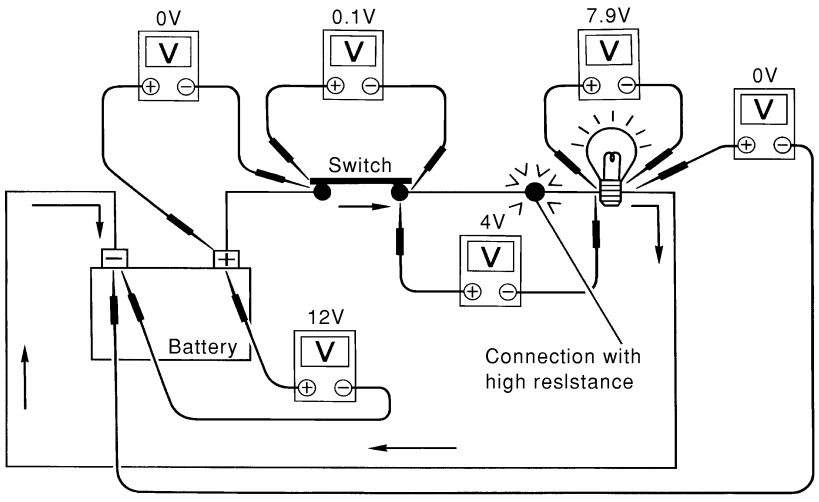
- Connect the DMM across the connector or part of the circuit you want to check. The positive lead of the DMM should be closer to power and the negative lead closer to ground.
- Operate the circuit.
- The DMM will indicate how many volts are being used to “push” current through that part of the circuit.

Note in the illustration that there is an excessive 4.1 volt drop between the battery and the bulb.



MEASURING VOLTAGE DROP — STEP-BY-STEP

The step-by-step method is most useful for isolating excessive drops in low voltage systems (such as those in “Computer Controlled Systems”).
Circuits in the “Computer Controlled System” operate on very low amperage.
The (Computer Controlled) system operations can be adversely affected by any variation in resistance in the system. Such resistance variation may be caused by poor connection, improper installation, improper wire gauge or corrosion.
The step by step voltage drop test can identify a component or wire with too much resistance.



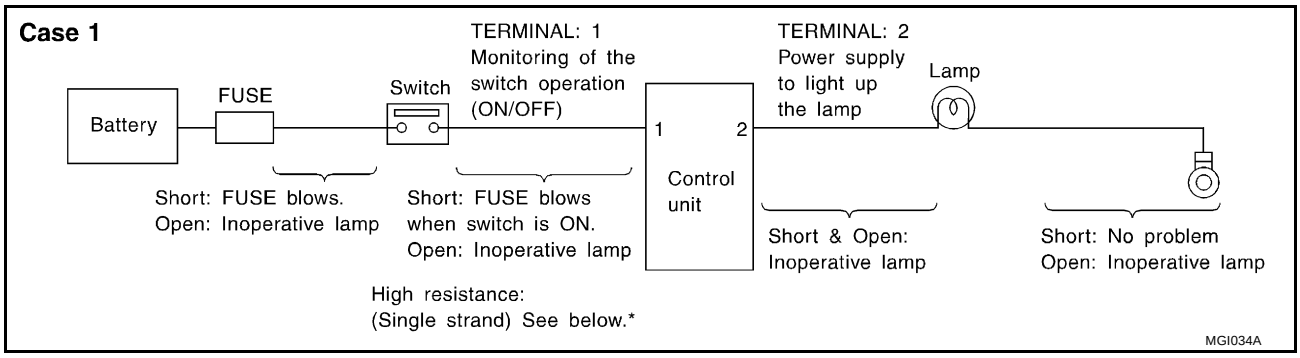
1. Connect the DMM as shown, starting at the battery and working your way around the circuit.
2. An unusually large voltage drop will indicate a component or wire that needs to be repaired, As you can see the illustration above, the poor connection causes a 4 volt drop.

The chart that follows illustrates some maximum allowable voltage drops. These values are given as a guideline, the exact value for each component may vary.

COMPONENT	VOLTAGE DROP
Wire	negligible < .001 volts
Ground Connections	Approx. 0.1 volts
Switch Contacts	Approx. 0.3 volts

Control Unit Circuit Test

System Description:When the switch is ON, the control unit lights up the lamp.

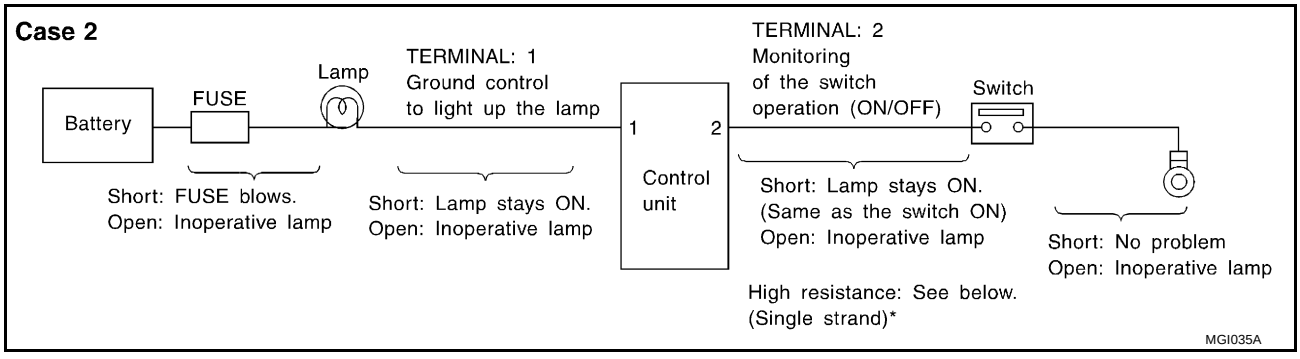


INPUT-OUTPUT VOLTAGE CHART

Pin No.	Item	Condition	Voltage value [V]	In case of high resistance such as single strand [V] *
1	Switch	Switch ON	Battery voltage	Lower than battery voltage Approx. 8 (Example)
		Switch OFF	Approx. 0	Approx. 0
2	Lamp	Switch ON	Battery voltage	Approx. 0 (Inoperative lamp)
		Switch OFF	Approx. 0	Approx. 0

The voltage value is based on the body ground.

*:If high resistance exists in the switch side circuit (caused by a single strand), terminal 1 does not detect battery voltage. Control unit does not detect the switch is ON even if the switch does not turn ON. Therefore, the control unit does not supply power to light up the lamp.



INPUT-OUTPUT VOLTAGE CHART

Pin No.	Item	Condition	Voltage value [V]	In case of high resistance such as single strand [V] *
1	Lamp	Switch ON	Approx. 0	Battery voltage (Inoperative lamp)
		Switch OFF	Battery voltage	Battery voltage
2	Switch	Switch ON	Approx. 0	Higher than 0 Approx. 4 (Example)
		Switch OFF	Approx. 5	Approx. 5

The voltage value is based on the body ground.

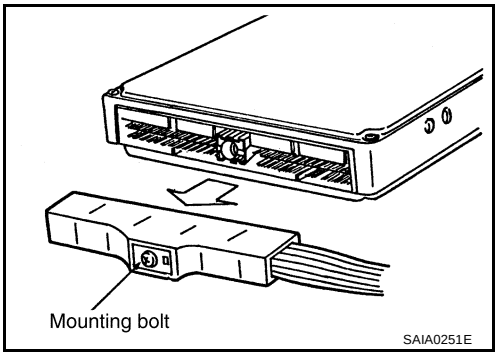
*:If high resistance exists in the switch side circuit (caused by a single strand), terminal 2 does not detect approx. 0V. Control unit does not detect the switch is ON even if the switch does not turn ON. Therefore, the control unit does not control ground to light up the lamp.

Control Units and Electrical Parts

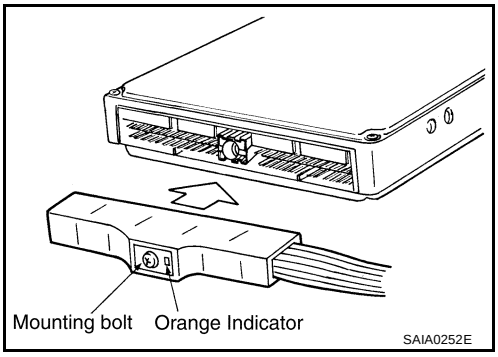
AAS000GZ

PRECAUTIONS

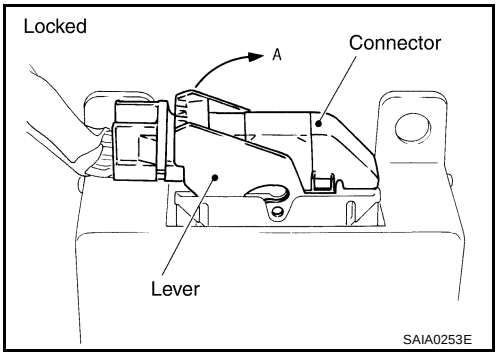
- Never reverse polarity of battery terminals.
- Install only parts specified for a vehicle.
- Before replacing the control unit, check the input and output and functions of the component parts.
- Do not apply excessive force when disconnecting a connector.
- If a connector is installed by tightening bolts, loosen bolt mounting it, then take it out by hand.



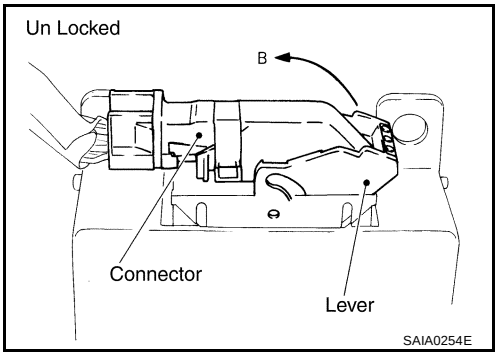
- Before installing a connector, make sure the terminal is not bent or damaged, and then correctly connect it.
  When installing a connector by tightening bolts, fix it by tightening the mounting bolt until the painted projection of the connector becomes even with the surface.



- For removal of the lever type connector, pull the lever up to the direction pointed to by the arrow A in the figure, and then remove the connector.

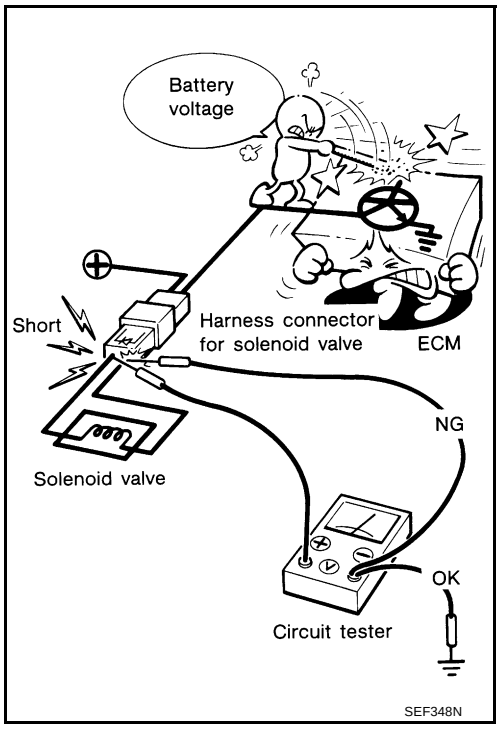


- For installation of the lever type connector, pull down the lever to the direction pointed by the arrow B in the figure, and then push the connector until a clicking noise is heard.



- Do not apply excessive shock to the control unit by dropping or hitting it.
- Be careful to prevent condensation in the control unit due to rapid temperature changes and do not let water or rain get on it. If water is found in the control unit, dry it fully and then install it in the vehicle.
- Be careful not to let oil to get on the control unit connector.
- Avoid cleaning the control unit with volatile oil.
- Do not disassemble the control unit, and do not remove the upper and lower covers.

- When using a DMM, be careful not to let test probes get close to each other to prevent the power transistor in the control unit from damaging battery voltage because of short circuiting.
- When checking input and output signals of the control unit, use the specified check adapter.



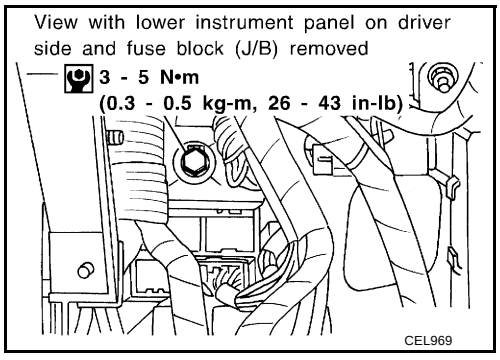
SMJ INSTALLATION

To install SMJ, tighten bolts until orange “fulltight” mark appears and then retighten to specified torque as required.

SMJ :3 - 5 N·m (0.3 - 0.5 kg-m, 26 - 43 in-lb)

CAUTION:

Do not overtighten bolts, otherwise, they may be damaged.



CONSULT-II CHECKING SYSTEM

PFP:00000

Description

AAS0001Z

- CONSULT-II is a hand-held type tester. When it is connected with a diagnostic connector equipped on the vehicle side, it will communicate with the control unit equipped in the vehicle and then enable various kinds of diagnostic tests.
- Refer to “CONSULT-II Software Operation Manual” for more information.

Function and System Application

AAS00020

Diagnostic test mode	Function	ENGINE	A/T	ABS (Including TCS)	ABS (Including VDC)	AIR BAG	BCM	METER A/C AMP	NATS	AIR PRESSURE MONITOR	IPDM E/R
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT-II.	x	-	-	x	-	x	-	-	x	-
Self-diagnostic results	Self-diagnostic results can be read and erased quickly.	x	x	x	x	x	x	x	x	x	x
Trouble diagnostic record	Current self-diagnostic results and all trouble diagnostic records previously stored can be read.	-	-	-	-	x	-	-	-	-	-
Data monitor	Input/Output data in the ECM can be read.	x	x	x	x	-	x	x	-	x	x
CAN diagnosis support monitor	Indicates the communicatioin condition of CAN communication line.	x	x	x	x	-	x	-	-	x	x
Active test	Diagnostic Test Mode in which CONSULT-II drives some actuators apart from the ECMs and also shifts some parameters in a specified range.	x	-	x	x	-	x	-	-	-	x
DTC confirmation	The results of SRT (System Readiness Test) and the self-diagnosis status/result can be confirmed.	x	-	-	-	-	-	-	-	-	-
DTC work support	Select the operating condition to confirm Diagnosis Trouble Codes.	-	x	-	-	-	-	-	-	-	-
ECM (ECU) part number	ECM (ECU) part number can be read.	x	x	x	x	-	-	-	-	x	-
ECU discriminated No.	Classification number of a replacement ECU can be read to prevent an incorrect ECU from being installed.	-	-	-	-	x	-	-	-	-	-
Function test	Conducted by CONSULT-II instead of a technician to determine whether each system is “OK” or “NG”.	x	x	x	x	x	-	-	-	-	-
Control unit initialization	All registered ignition key IDs in NATS components can be initialized and new IDs can be registered.	-	-	-	-	-	-	-	x	-	-

x: Applicable

Nickel Metal Hydride Battery Replacement

AAS00021

CONSULT-II contains a nickel metal hydride battery. When replacing the battery obey the following:

WARNING:

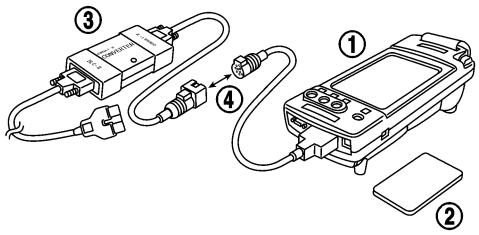
Replace the nickel metal hydride battery with Genuine CONSULT-II battery only. Use of another battery may present a risk of fire or explosion. The battery may present a fire or chemical burn hazard if mistreated. Do not recharge, disassemble or dispose of in fire.

Keep the battery out of reach of children and discard used battery conforming to the local regulations.

Checking Equipment

AAS00022

When ordering the following equipment, contact your NISSAN/INFINITI distributor.

Tool name	Description
NISSAN CONSULT-II 1. CONSULT-II unit (Tester internal soft: Resident version 3.3.0) and accessories 2. Program card AED03E and AEN03C (For NATS) To confirm the best combination of these softwares, refer to CONSULT-II Operation Manual. 3. CONSULT-II CONVERTER 4. “CONSULT-II Pigtail” Cable	 SAIA0363E

NOTE:

- The CONSULT-II must be used in conjunction with a program card. CONSULT-II does not require loading (Initialization) procedure.
- Be sure the CONSULT-II is turned off before installing or removing a program card.

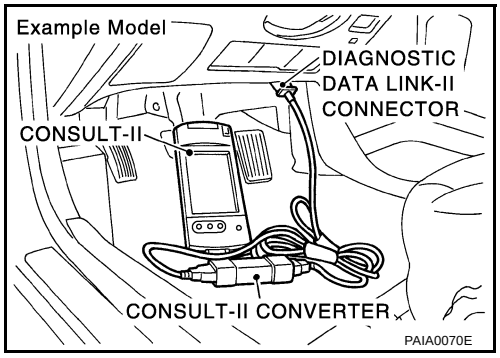
CAUTION:

- **If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carries out CAN communication.**
- **If CONVERTER is not connected with CONSULT-II, vehicle occur the "FAIL-SAFE MODE" which is "LIGHT UP the HEADLIGHT" and/or "Cooling FAN ROTATING" when CONSULT-II is started.**

CONSULT-II Start Procedure

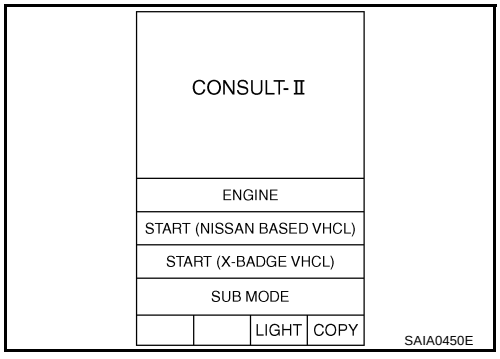
AAS00078

1. Turn off the ignition switch.
2. Connect CONSULT-II and CONSULT-II CONVERTER to the data link connector.



PAIA0070E

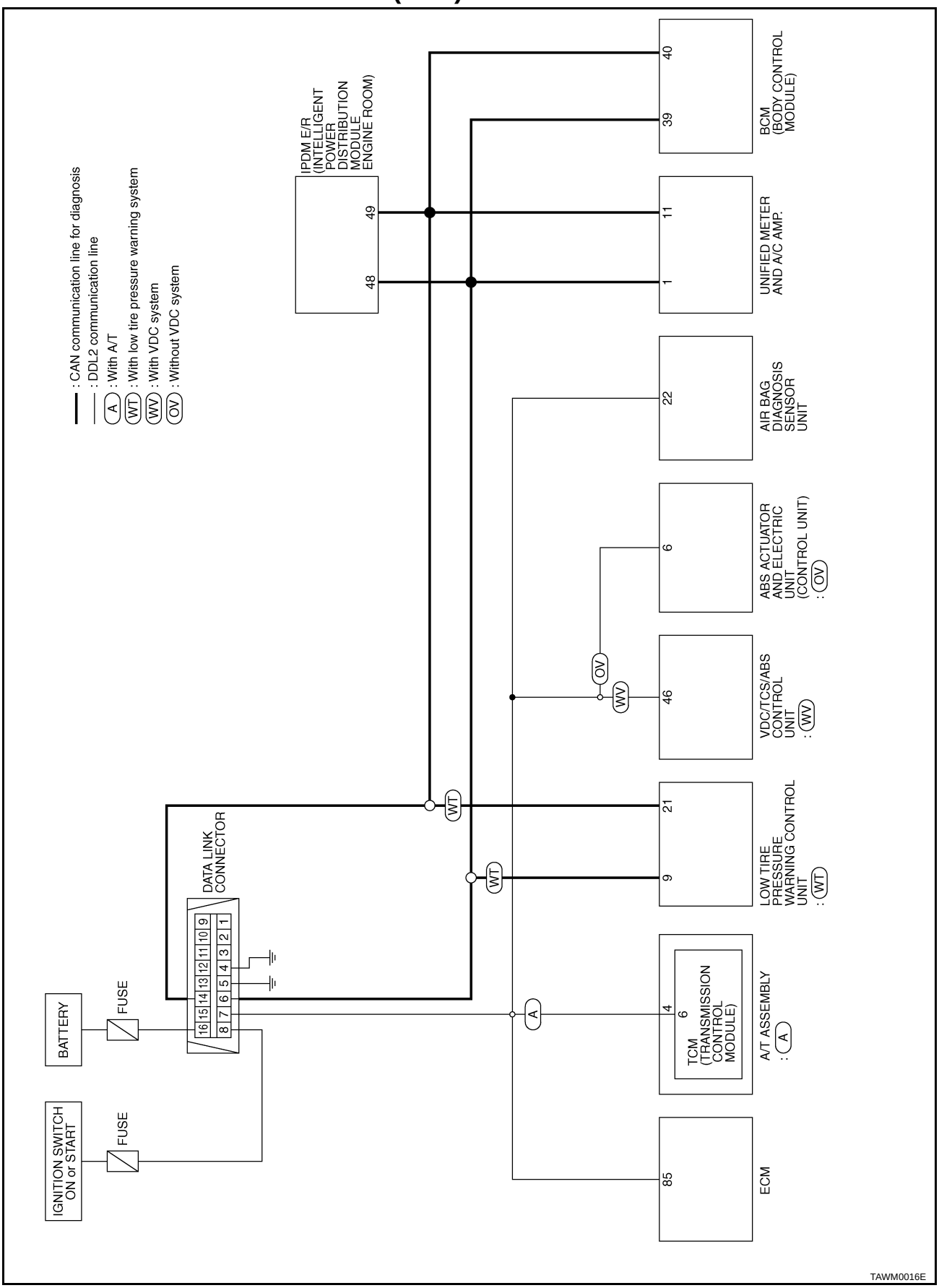
3. Turn on the ignition switch.
4. Touch “START(NISSAN BASED VHCL)” or “System Shortcut” (eg : ENGINE) on the screen.



SAIA0450E

CONSULT-II Data Link Connector (DLC) Circuit

AAS0006Q



INSPECTION PROCEDURE

If the CONSULT-II cannot diagnose the system properly, check the following items.

Symptom	Check item
CONSULT-II cannot access any system.	● CONSULT-II DLC power supply circuit (Terminal 8) and ground circuit (Terminal 4) (For detailed circuit, refer to “MIL & Data Link Connectors Wiring Diagram” in EC section.) ● CONSULT-II DLC cable and CONSULT-II CONVERTER.
CONSULT-II cannot access individual system. (Other systems can be accessed.)	● CONSULT-II program card (Check the appropriate CONSULT-II program card for the system. Refer to "Checking Equipment".) ● Power supply and ground circuit for the control unit of the system (For detailed circuit, refer to wiring diagram for each system.) ● Open or short circuit between the system and CONSULT-II DLC (For detailed circuit, refer to wiring diagram for each system.) ● Open or short circuit CAN communication. Refer to LAN-3, "Precautions When Using CONSULT-II" .

NOTE:

The DDL1 and DDL2 circuits from DLC pins 12, 13, 14 and 15 may be connected to more than one system. A short in a DDL circuit connected to a control unit in one system may affect CONSULT-II access to other systems.

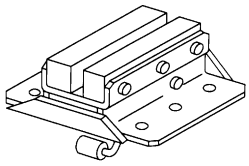
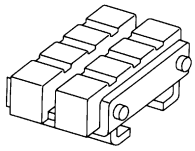
LIFTING POINT

PFP:00000

Special Service Tools

AAS00024

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
LM4086-0200 (-) Board on attachment	 S-NT001
LM4519-0000 (-) Safety stand attachment	 S-NT002

CAUTION:

- **Every time the vehicle is lifted up, maintain the complete vehicle curb condition.**
- **Since the vehicle's center of gravity changes when removing main parts on the front side (engine, transmission, suspension etc.), support a jack up point on the rear side garage jack with a mission jack or equivalent.**
- **Since the vehicle's center of gravity changes when removing main parts on the rear side (rear axle, suspension, etc.), support a jack up point on the front side garage jack with a mission jack or equivalent.**
- **Be careful not to smash or do not do anything that would affect piping parts.**

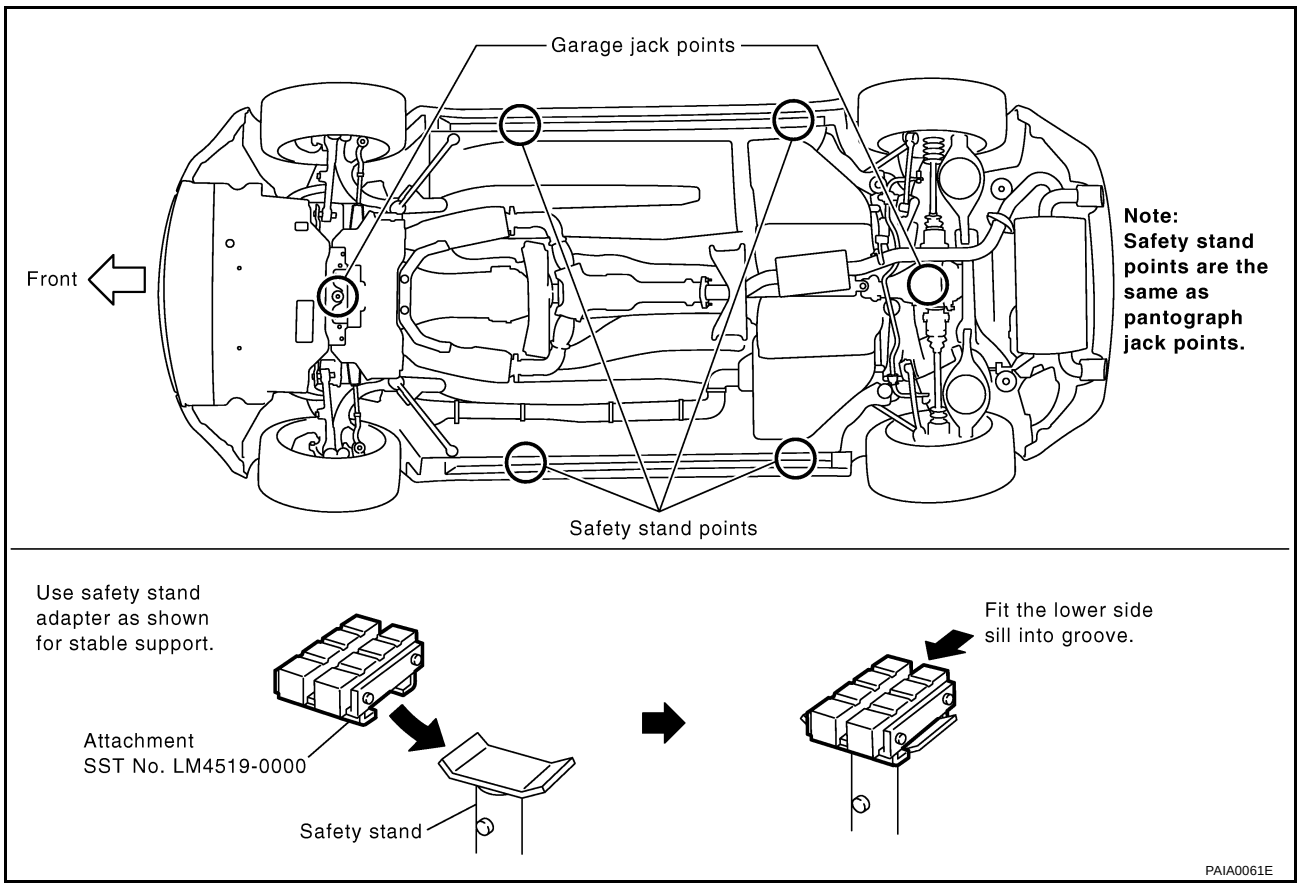
Garage Jack and Safety Stand

AAS00025

WARNING:

- **Park the vehicle on a level surface when using the jack. Make sure to avoid damaging pipes, tubes, etc. under the vehicle.**
- **Never get under the vehicle while it is supported only by the jack. Always use safety stands when you have to get under the vehicle.**

- **Place wheel chocks at both front and back of the wheels on the ground.**



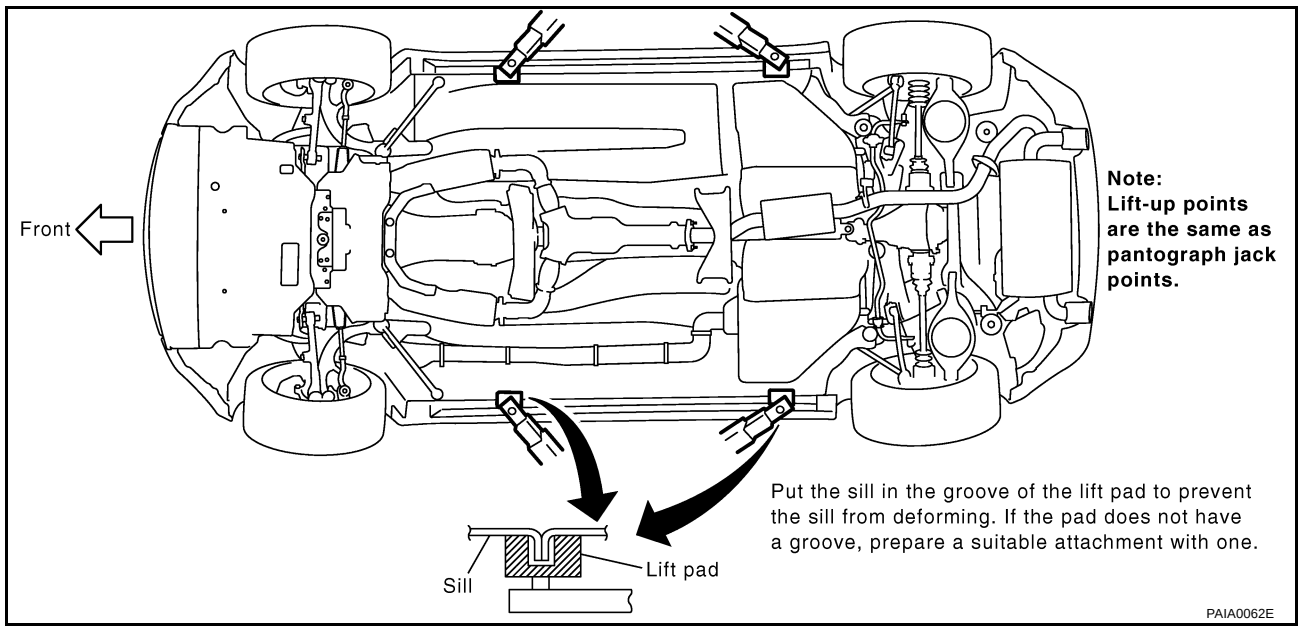
2-pole Lift

AAS00026

WARNING:

When lifting the vehicle, open the lift arms as wide as possible and ensure that the front and rear of the vehicle are well balanced.

When setting the lift arm, do not allow the arm to contact the brake tubes, brake cable, fuel lines and sill spoiler.



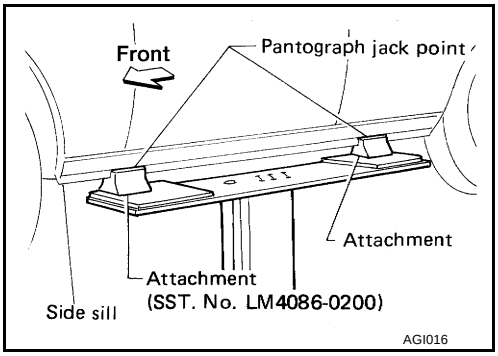
Board-on Lift

AAS00027

CAUTION:

Make sure vehicle is empty when lifting.

- **The board-on lift attachment (LM4086-0200) set at front end of vehicle should be set on the front of the sill under the front door opening.**
- **Position attachments at front and rear ends of board-on lift.**



TOW TRUCK TOWING

PFP:00000

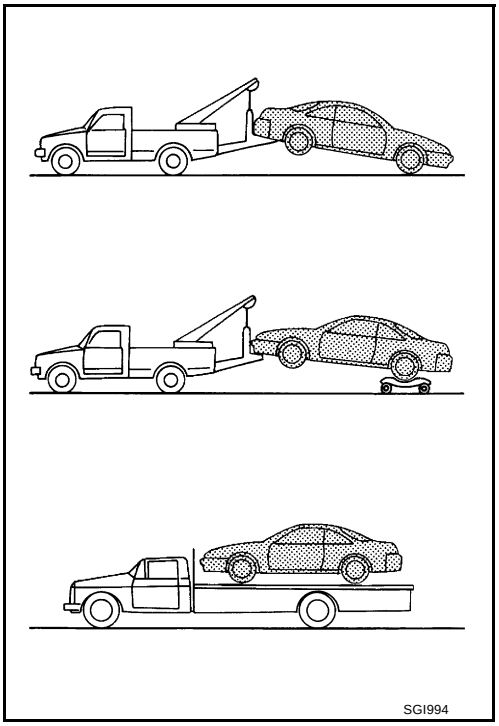
Tow Truck Towing

AAS00028

CAUTION:

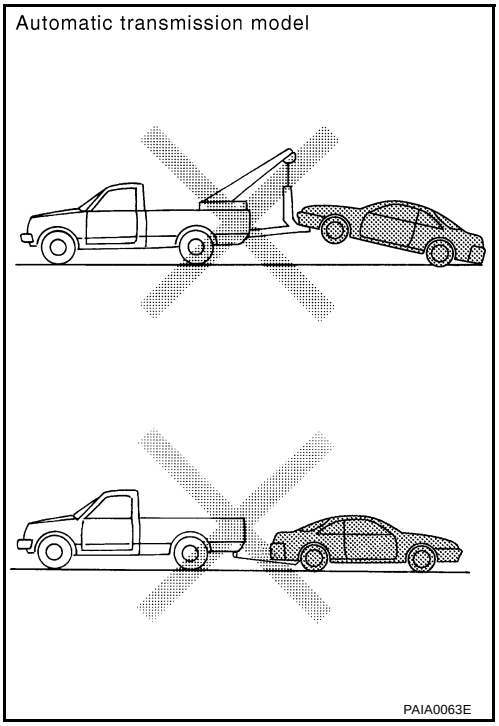
- **All applicable state or Provincial (in Canada) laws and local laws regarding the towing operation must be obeyed.**
- **It is necessary to use proper towing equipment to avoid possible damage to the vehicle during towing operation. Towing is in accordance with Towing Procedure Manual at dealer.**
- **Always attach safety chains before towing.**
- **When towing, make sure that the transmission, steering system and power train are in good order. If any unit is damaged, dollies must be used.**

NISSAN recommends that the vehicle be towed with the driving (rear) wheels off the ground as illustrated.


SGI994

CAUTION:

- **Never tow an automatic transmission model with the rear wheels or four wheels on the ground (forward or backward). This may cause serious and expensive damage to the transmission.**
- **When towing with the front wheels on the ground (if you do not use towing dollies), turn the ignition key to the OFF position, and secure the steering wheel in the straight-ahead position with a rope or similar device. Never place the ignition key in the LOCK position. This will result in damage to the steering lock mechanism.**
- **When towing a manual transmission model with the rear wheels on the ground (if you do not use towing dollies), release the parking brake and move the shift lever to the N (Neutral) position.**



PAIA0063E

Vehicle Recovery (Freeing a Stuck Vehicle)

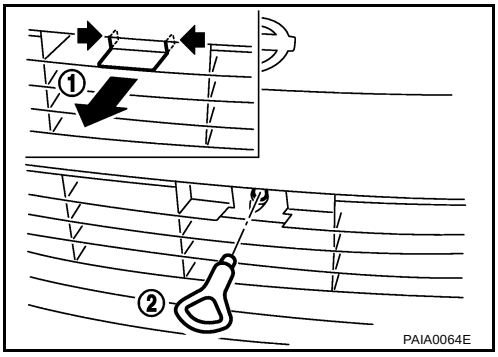
AAS00029

FRONT

After removing the front licence plate (if so equipped),

1. Remove the towing hook cover from the bumper.
2. Securely install the towing hook stored with jacking tools.

- Tow chains or cables must be attached only to the main structural members of the vehicle.
- Pulling devices should be routed so they do not touch any part of the suspension, steering, brake or cooling systems.
- Always pull the cable straight out from the front or rear of the vehicle. Never pull on the vehicle at an angle.
- Pulling devices such as ropes or canvas straps are not recommended for use in vehicle towing or recovery.
- Stand clear of a stuck vehicle.



REAR

- Towing hook is not available.

TIGHTENING TORQUE OF STANDARD BOLTS

PFP:00000

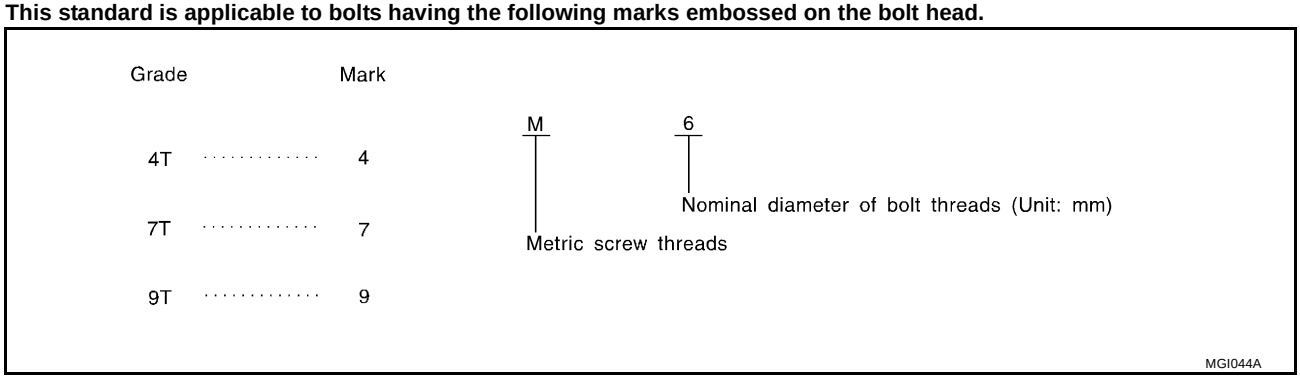
Tightening Torque Table

AAS0002A

Grade	Bolt size	Bolt diameter * mm	Pitch mm	Tightening torque (Without lubricant)							
				Hexagon head bolt				Hexagon flange bolt			
				N·m	kg-m	ft-lb	in-lb	N·m	kg-m	ft-lb	in-lb
4T	M6	6.0	1.0	5.5	0.56	4	49	7	0.71	5	62
	M8	8.0	1.25	13.5	1.4	10	—	17	1.7	13	—
			1.0	13.5	1.4	10	—	17	1.7	13	—
	M10	10.0	1.5	28	2.9	21	—	35	3.6	26	—
			1.25	28	2.9	21	—	35	3.6	26	—
	M12	12.0	1.75	45	4.6	33	—	55	5.6	41	—
			1.25	45	4.6	33	—	65	6.6	48	—
	M14	14.0	1.5	80	8.2	59	—	100	10	74	—
7T	M6	6.0	1.0	9	0.92	7	80	11	1.1	8	97
	M8	8.0	1.25	22	2.2	16	—	28	2.9	21	—
			1.0	22	2.2	16	—	28	2.9	21	—
	M10	10.0	1.5	45	4.6	33	—	55	5.6	41	—
			1.25	45	4.6	33	—	55	5.6	41	—
	M12	12.0	1.75	80	8.2	59	—	100	10	74	—
			1.25	80	8.2	59	—	100	10	74	—
	M14	14.0	1.5	130	13	96	—	170	17	125	—
9T	M6	6.0	1.0	11	1.1	8	—	13.5	1.4	10	—
	M8	8.0	1.25	28	2.9	21	—	35	3.6	26	—
			1.0	28	2.9	21	—	35	3.6	26	—
	M10	10.0	1.5	55	5.6	41	—	80	8.2	59	—
			1.25	55	5.6	41	—	80	8.2	59	—
	M12	12.0	1.75	100	10	74	—	130	13	96	—
			1.25	100	10	74	—	130	13	96	—
	M14	14.0	1.5	170	17	125	—	210	21	155	—

*: Nominal diameter

1. **Special parts are excluded.**
2. **This standard is applicable to bolts having the following marks embossed on the bolt head.**



RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS

PFP:00000

Recommended Chemical Products and Sealants

AAS0002B

Refer to the following chart for help in selecting the appropriate chemical product or sealant.

	Product Description	Purpose	Nissan North America Part No. (USA)	Nissan Canada Part No. (Canada)	Aftermarket Cross-reference Part Nos.
1	Rear View Mirror Adhesive	Used to permanently remount rear view mirrors to windows.	999MP-AM000P	99998-50505	Permatex 81844
2	Anaerobic Liquid Gasket	For metal-to-metal flange sealing. Can fill a 0.38 mm (0.015 inch) gap and provide instant sealing for most powertrain applications.	999MP-AM001P	99998-50503	Permatex 51813 and 51817
3	High Performance Thread Sealant	Provides instant sealing on any threaded straight or parallel threaded fitting. (Thread sealant only, no locking ability.) ● Do not use on plastic.	999MP-AM002P	999MP-AM002P	Permatex 56521
4	Silicone RTV	Gasket Maker	999MP-AM003P (Ultra Grey)	99998-50506 (Ultra Grey)	Permatex Ultra Grey 82194; Three Bond 1207,1215, 1216, 1217F and 1217G; Nissan RTV Part No. 999MP-A7007
		Gasket Maker for Maxima/ Quest 5-speed automatic transmission (RE5F22A)	–	–	Three Bond 1281B or exact equivalent in its quality
5	High Temperature, High Strength Thread Locking Sealant (Red)	Threadlocker	999MP-AM004P	999MP-AM004P	Permatex 27200; Three Bond 1360, 1360N, 1305 N&P, 1307N, 1335, 1335B, 1363B, 1377C, 1386B, D&E and 1388
6	Medium Strength Thread Locking Sealant (Blue)	Threadlocker (service tool removable)	999MP-AM005P	999MP-AM005P	Permatex 24200, 24206, 24240, 24283 and 09178; Three Bond 1322, 1322N, 1324 D&N, 1333D, 1361C, 1364D, 1370C and 1374

IDENTIFICATION INFORMATION

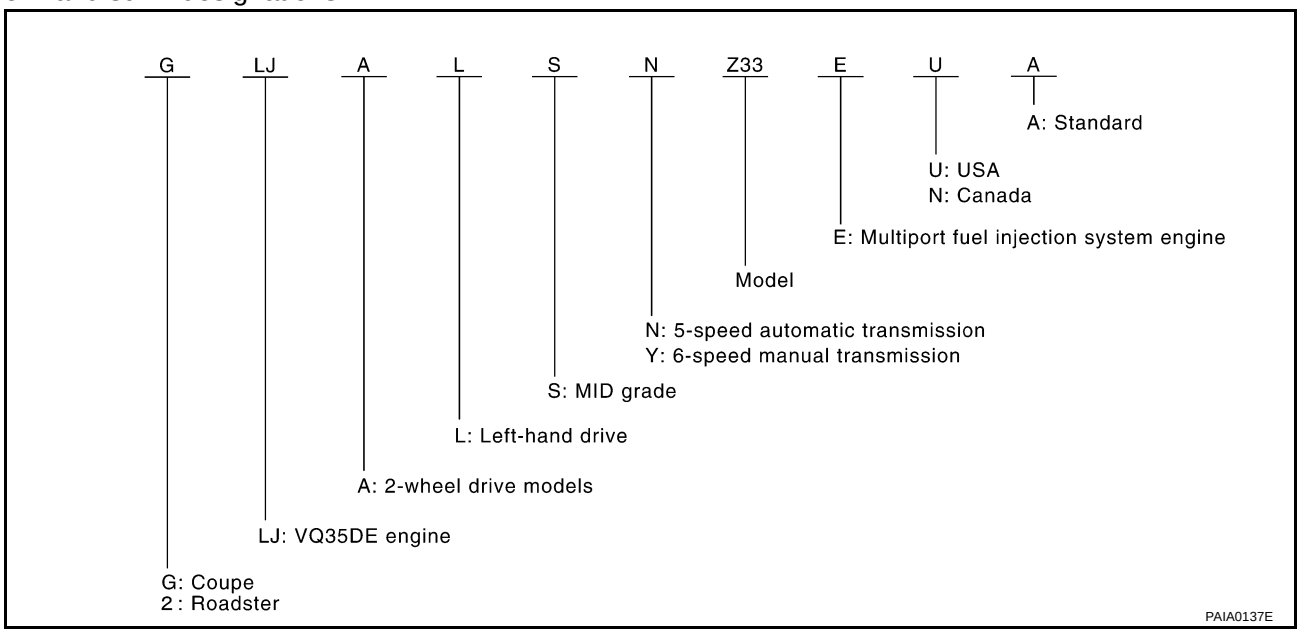
PFP:00010

Model Variation

AAS0002C

Body	Engine	Transmission	Destination	
			USA	Canada
Coupe	VQ35DE	RE5R05A (5A/T)	GLJALSN-EUA	GLJALSN-ENA
		FS6R31A (6M/T)	GLJALSY-EUA	GLJALSY-ENA
Roadster		RE5R05A (5A/T)	2LJALSN-EUA	2LJALSN-ENA
		FS6R31A (6M/T)	2LJALSY-EUA	2LJALSY-ENA

Prefix and suffix designations:



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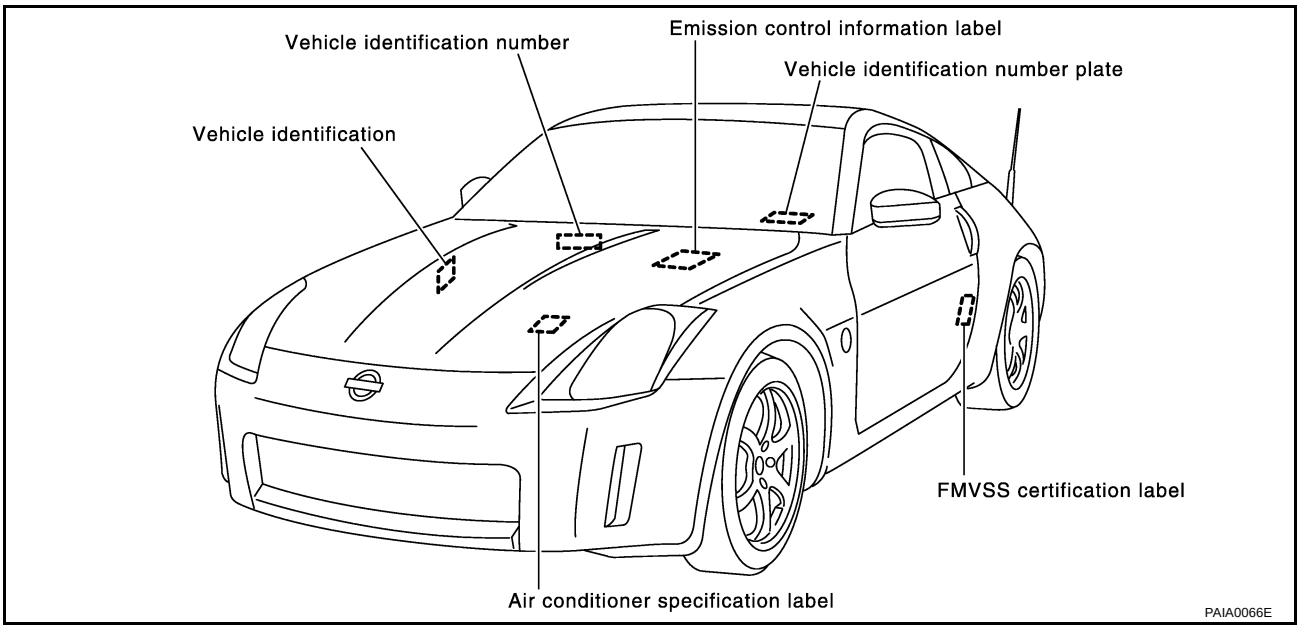
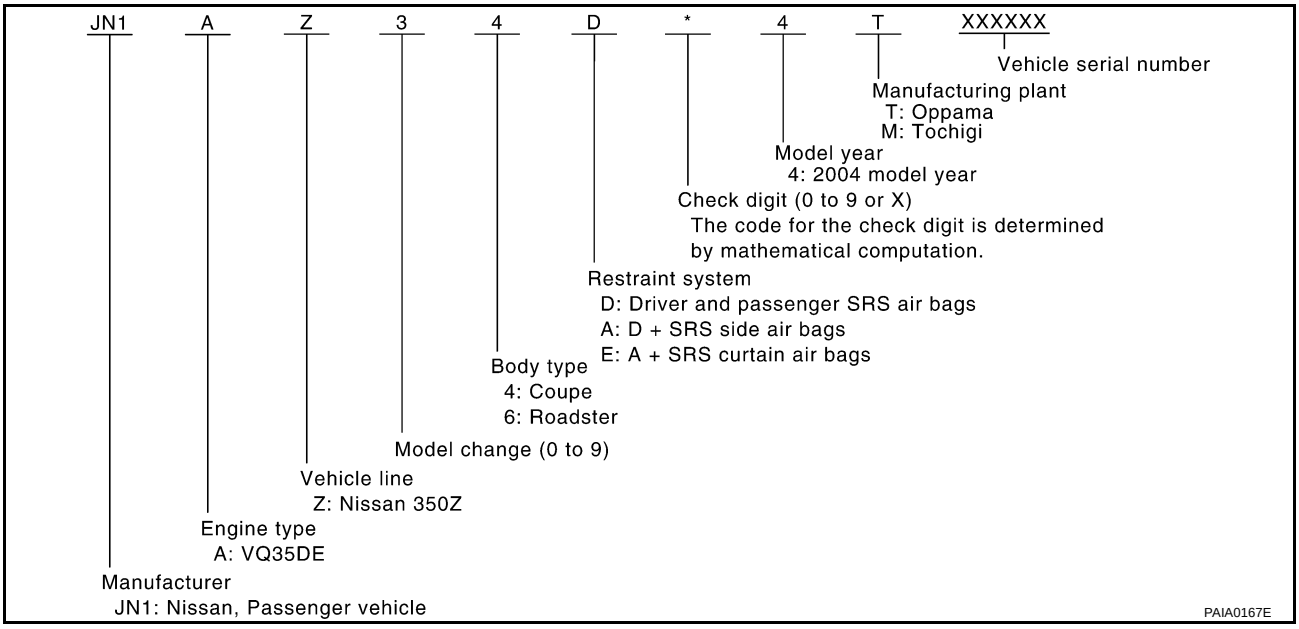


Vehicle Identification Number Arrangement



NOTE:
This service manual applies for 2004 model year vehicles on and after the following vehicle serial numbers:

Production at Oppama Plant (T)
(to be discontinued at the end of April 2004)

For Coupe models

- **JN1AZ34D*4T160001**
- **JN1AZ34E*4T060001**

For Roadster models

- **JN1AZ36D*4T110001**
- **JN1AZ36A*4T010001**

Production at Tochigi Plant (M)

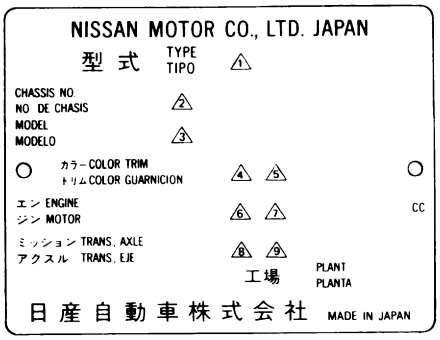
For Coupe models

- **JN1AZ34D*4M100001**
- **JN1AZ34E*4M150001**

For Roadster models

- **JN1AZ36D*4M200001**
- **JN1AZ36A*4M250001**

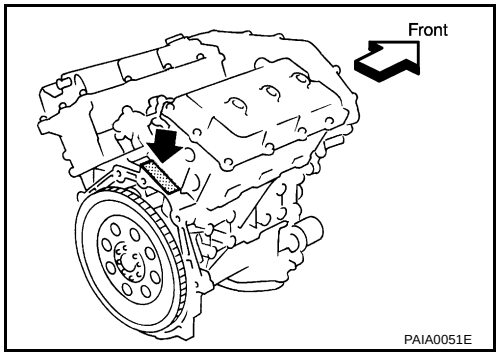
IDENTIFICATION PLATE



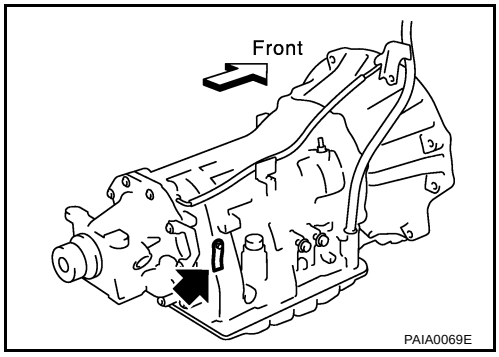
1 Type
2 Vehicle identification number (Chassis number)
3 Model
4 Body color code
5 Trim color code
6 Engine model
7 Engine displacement
8 Transmission model
9 Axle model

SGI315

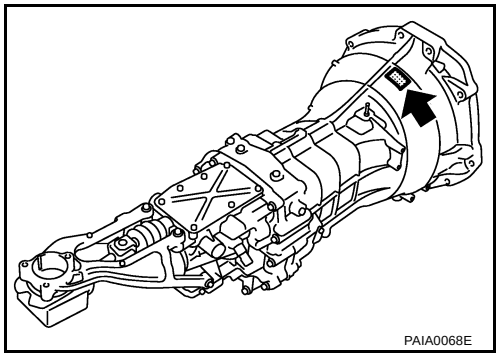
ENGINE SERIAL NUMBER



AUTOMATIC TRANSMISSION NUMBER



MANUAL TRANSMISSION NUMBER



Dimensions

AAS0002D

Unit: mm (in)

Model	Coupe	Roadster
Overall length	4,309 (169.6)	4,309 (169.6)
Overall width	1,815 (71.5)	1,815 (71.5)
Overall height	1,319 (51.9)	1,328 (52.3)
Front tread	1,535 (60.4)	1,535 (60.4)
Rear tread	1,539 (60.6)*1, 1,545 (60.8)*2	1,539 (60.6)*1, 1,545 (60.8)*2
Wheelbase	2,649 (104.3)	2,649 (104.3)

*1: The wheel offset is 1.30 in (33 mm).
*2: The wheel offset is 1.18 in (30 mm).

Wheels & Tires

AAS0002E

	Type		Size	Offset in (mm)
Road wheel	Aluminum	Front	17 X7 - 1/2 JJ	1.18 (30)
			18 X 8 JJ*1	
		Rear	17 X8 JJ	1.30 (33)
			18 X8 JJ*1	1.18 (30)
			18 X8 - 1/2 JJ*2	1.30 (33)
Tire	Conventional	Front	225/50R17 94W 225/45R18 91W*1	
		Rear	235/50R17 96W 245/45R18 96W*1	
	Spare		T145/96D 16 T155/80R 17*2	

*1: Option for Coupe and Roadster
*2: Option for Coupe

TERMINOLOGY

PFP:00011

SAE J1930 Terminology List

AAS0002F

All emission related terms used in this publication in accordance with SAE J1930 are listed. Accordingly, new terms, new acronyms/abbreviations and old terms are listed in the following chart.

NEW TERM	NEW ACRONYM / ABBREVIATION	OLD TERM
Air cleaner	ACL	Air cleaner
Barometric pressure	BARO	***
Barometric pressure sensor-BCDD	BAROS-BCDD	BCDD
Camshaft position	CMP	***
Camshaft position sensor	CMPS	Crank angle sensor
Canister	***	Canister
Carburetor	CARB	Carburetor
Charge air cooler	CAC	Intercooler
Closed loop	CL	Closed loop
Closed throttle position switch	CTP switch	Idle switch
Clutch pedal position switch	CPP switch	Clutch switch
Continuous fuel injection system	CFI system	***
Continuous trap oxidizer system	CTOX system	***
Crankshaft position	CKP	***
Crankshaft position sensor	CKPS	***
Data link connector	DLC	***
Data link connector for CONSULT-II	DLC for CONSULT-II	Diagnostic connector for CONSULT-II
Diagnostic test mode	DTM	Diagnostic mode
Diagnostic test mode selector	DTM selector	Diagnostic mode selector
Diagnostic test mode I	DTM I	Mode I
Diagnostic test mode II	DTM II	Mode II
Diagnostic trouble code	DTC	Malfunction code
Direct fuel injection system	DFI system	***
Distributor ignition system	DI system	Ignition timing control
Early fuel evaporation-mixture heater	EFE-mixture heater	Mixture heater
Early fuel evaporation system	EFE system	Mixture heater control
Electrically erasable programmable read only memory	EEPROM	***
Electronic ignition system	EI system	Ignition timing control
Engine control	EC	***
Engine control module	ECM	ECCS control unit
Engine coolant temperature	ECT	Engine temperature
Engine coolant temperature sensor	ECTS	Engine temperature sensor
Engine modification	EM	***
Engine speed	RPM	Engine speed
Erasable programmable read only memory	EPROM	***
Evaporative emission canister	EVAP canister	Canister
Evaporative emission system	EVAP system	Canister control solenoid valve
Exhaust gas recirculation valve	EGR valve	EGR valve

NEW TERM	NEW ACRONYM / ABBREVIATION	OLD TERM
Exhaust gas recirculation control-BPT valve	EGRC-BPT valve	BPT valve
Exhaust gas recirculation control-solenoid valve	EGRC-solenoid valve	EGR control solenoid valve
Exhaust gas recirculation temperature sensor	EGRT sensor	Exhaust gas temperature sensor
EGR temperature sensor		
Flash electrically erasable programmable read only memory	FEEPROM	***
Flash erasable programmable read only memory	FEPROM	***
Flexible fuel sensor	FFS	***
Flexible fuel system	FF system	***
Fuel pressure regulator	***	Pressure regulator
Fuel pressure regulator control solenoid valve	***	PRVR control solenoid valve
Fuel trim	FT	***
Heated Oxygen sensor	HO2S	Exhaust gas sensor
Idle air control system	IAC system	Idle speed control
Idle air control valve-air regulator	IACV-air regulator	Air regulator
Idle air control valve-auxiliary air control valve	IACV-AAC valve	Auxiliary air control (AAC) valve
Idle air control valve-FICD solenoid valve	IACV-FICD solenoid valve	FICD solenoid valve
Idle air control valve-idle up control solenoid valve	IACV-idle up control solenoid valve	Idle up control solenoid valve
Idle speed control-FI pot	ISC-FI pot	FI pot
Idle speed control system	ISC system	***
Ignition control	IC	***
Ignition control module	ICM	***
Indirect fuel injection system	IFI system	***
Intake air	IA	Air
Intake air temperature sensor	IAT sensor	Air temperature sensor
Knock	***	Detonation
Knock sensor	KS	Detonation sensor
Malfunction indicator lamp	MIL	Check engine light
Manifold absolute pressure	MAP	***
Manifold absolute pressure sensor	MAPS	***
Manifold differential pressure	MDP	***
Manifold differential pressure sensor	MDPS	***
Manifold surface temperature	MST	***
Manifold surface temperature sensor	MSTS	***
Manifold vacuum zone	MVZ	***
Manifold vacuum zone sensor	MVZS	***
Mass air flow sensor	MAFS	Air flow meter
Mixture control solenoid valve	MC solenoid valve	Air-fuel ratio control solenoid valve
Multiport fuel injection System	MFI system	Fuel injection control

NEW TERM	NEW ACRONYM / ABBREVIATION	OLD TERM
Nonvolatile random access memory	NVRAM	***
On board diagnostic system	OBD system	Self-diagnosis
Open loop	OL	Open loop
Oxidation catalyst	OC	Catalyst
Oxidation catalytic converter system	OC system	***
Oxygen sensor	O2S	Exhaust gas sensor
Park position switch	***	Park switch
Park/neutral position switch	PNP switch	Park/neutral switch Inhibitor switch Neutral position switch
Periodic trap oxidizer system	PTOX system	***
Positive crankcase ventilation	PCV	Positive crankcase ventilation
Positive crankcase ventilation valve	PCV valve	PCV valve
Powertrain control module	PCM	***
Programmable read only memory	PROM	***
Pulsed secondary air injection control solenoid valve	PAIRC solenoid valve	AIV control solenoid valve
Pulsed secondary air injection system	PAIR system	Air induction valve (AIV) control
Pulsed secondary air injection valve	PAIR valve	Air induction valve
Random access memory	RAM	***
Read only memory	ROM	***
Scan tool	ST	***
Secondary air injection pump	AIR pump	***
Secondary air injection system	AIR system	***
Sequential multiport fuel injection system	SFI system	Sequential fuel injection
Service reminder indicator	SRI	***
Simultaneous multiport fuel injection system	***	Simultaneous fuel injection
Smoke puff limiter system	SPL system	***
Supercharger	SC	***
Supercharger bypass	SCB	***
System readiness test	SRT	***
Thermal vacuum valve	TVV	Thermal vacuum valve
Three way catalyst	TWC	Catalyst
Three way catalytic converter system	TWC system	***
Three way + oxidation catalyst	TWC + OC	Catalyst
Three way + oxidation catalytic converter system	TWC + OC system	***
Throttle body	TB	Throttle chamber SPI body
Throttle body fuel injection system	TBI system	Fuel injection control
Throttle position	TP	Throttle position
Throttle position sensor	TPS	Throttle sensor
Throttle position switch	TP switch	Throttle switch
Torque converter clutch solenoid valve	TCC solenoid valve	Lock-up cancel solenoid Lock-up solenoid

NEW TERM	NEW ACRONYM / ABBREVIATION	OLD TERM
Transmission control module	TCM	A/T control unit
Turbocharger	TC	Turbocharger
Vehicle speed sensor	VSS	Vehicle speed sensor
Volume air flow sensor	VAFS	Air flow meter
Warm up oxidation catalyst	WU-OC	Catalyst
Warm up oxidation catalytic converter system	WU-OC system	***
Warm up three way catalyst	WU-TWC	Catalyst
Warm up three way catalytic converter system	WU-TWC system	***
Wide open throttle position switch	WOTP switch	Full switch

***: Not applicable

SECTION EM
ENGINE MECHANICAL

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PRECAUTIONS

PFP:00001

Precautions for Battery Service

ABS00B4N

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Drain Engine Coolant

ABS009Y1

Drain engine coolant when engine is cooled.

Precautions for Disconnecting Fuel Piping

ABS009Y2

- Before starting work, make sure no fire or spark producing items are in the work area.
- Release fuel pressure before disconnecting and disassembly.
- After disconnecting pipes, plug openings to stop fuel leakage.

Precautions for Removal and Disassembly

ABS009Y3

- When instructed to use special service tools, use specified tools. Always be careful to work safely, avoid forceful or uninstructed operations.
- Exercise maximum care to avoid damage to mating or sliding surfaces.
- Cover openings of engine system with tape or equivalent, if necessary, to seal out foreign materials.
- Mark and arrange disassembly parts in an organized way for easy troubleshooting and re-assembly.
- When loosening bolts and nuts, as a basic rule, start with the one furthest outside, then the one diagonally opposite, and so on. If the order of loosening is specified, do exactly as specified. Power tools may be used in the step.

Precautions for Inspection, Repair and Replacement

ABS009Y4

Before repairing or replacing, thoroughly inspect parts. Inspect new replacement parts in the same way, and replace if necessary.

Precautions for Assembly and Installation

ABS009Y5

- Use torque wrench to tighten bolts or nuts to specification.
- When tightening bolts and nuts, as a basic rule, equally tighten in several different steps starting with the ones in center, then ones on inside and outside diagonally in this order. If the order of tightening is specified, do exactly as specified.
- Replace with new gasket, packing, oil seal or O-ring.
- Thoroughly wash, clean, and air-blow each part. Carefully check engine oil or engine coolant passages for any restriction and blockage.
- Avoid damaging sliding or mating surfaces. Completely remove foreign materials such as cloth lint or dust. Before assembly, oil sliding surfaces well.
- Release air within route when refilling after draining engine coolant.
- After repairing, start engine and increase engine speed to check engine coolant, fuel, engine oil, and exhaust gases for leakage.

Parts Requiring Angle Tightening

ABS009Y6

- Use angle wrench [SST: KV10112100 (BT8653-A)] for the final tightening of the following engine parts:
  - Cylinder head bolts
  - Main bearing cap bolts
  - Connecting rod cap bolts
  - Crankshaft pulley bolt (No angle wrench is required as bolt flange is provided with notches for angle tightening)
- Do not use a torque value for final tightening.
- The torque value for these parts are for a preliminary step.
- Ensure thread and seat surfaces are clean and coated with engine oil.

Precautions for Liquid Gasket

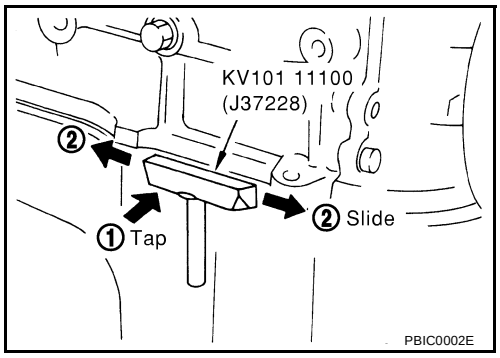
ABS009Y7

REMOVAL OF LIQUID GASKET SEALING

- After removing mounting bolts and nuts, separate the mating surface using seal cutter [SST] and remove old liquid gasket sealing.

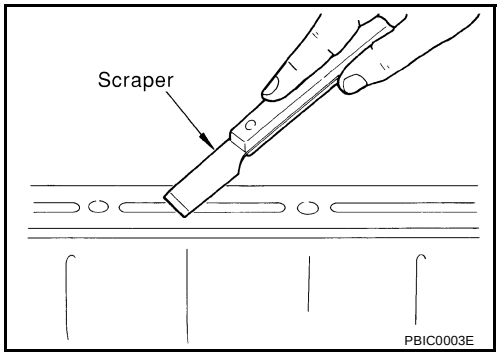
  CAUTION:
  Be careful not to damage the mating surfaces.
- Tap seal cutter to insert it, and then slide it by tapping on the side as shown in the figure.
- In areas where seal cutter [SST] is difficult to use, use plastic hammer to lightly tap the parts, to remove it.

  CAUTION:
  If for some unavoidable reason tool such as screwdriver is used, be careful not to damage the mating surfaces.

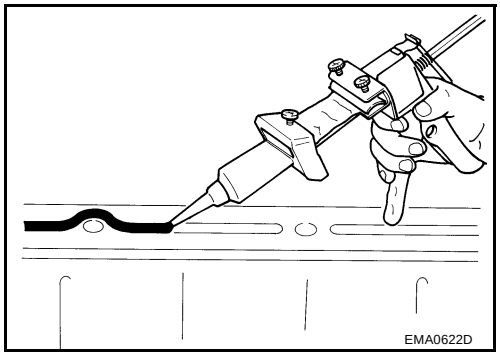


LIQUID GASKET APPLICATION PROCEDURE

1. Using scraper, remove old liquid gasket adhering to the gasket application surface and the mating surface.
   - Remove liquid gasket completely from the groove of the gasket application surface, mounting bolts, and bolt holes.
2. Wipe the liquid gasket application surface and the mating surface with white gasoline (lighting and heating use) to remove adhering moisture, grease and foreign materials.

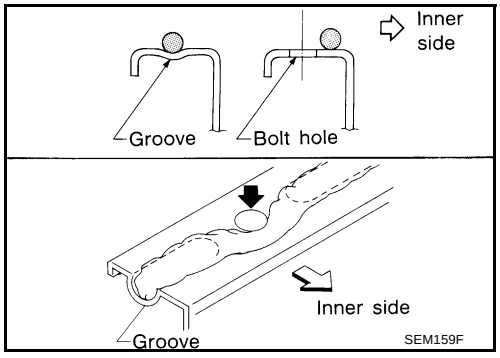


3. Attach liquid gasket tube to tube presser [SST: WS39930000 (—)].
   Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .
4. Apply liquid gasket without breaks to the specified location with the specified dimensions.
   - If there is a groove for liquid gasket application, apply liquid gasket to the groove.



   - As for bolt holes, normally apply liquid gasket inside the holes. Occasionally, it should be applied outside the holes. Make sure to read the text of this manual.
   - Within five minutes of liquid gasket application, install the mating component.
   - If liquid gasket protrudes, wipe it off immediately.
   - Do not retighten mounting bolts or nuts after the installation.
   - After 30 minutes or more have passed from the installation, fill engine oil and engine coolant.

   CAUTION:
   If there are specific instructions in this manual, observe them.



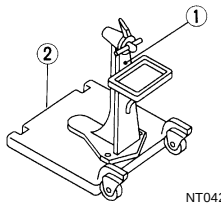
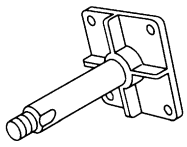
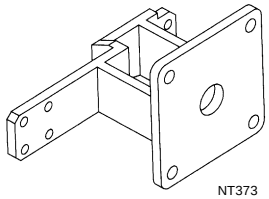
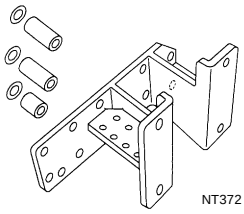
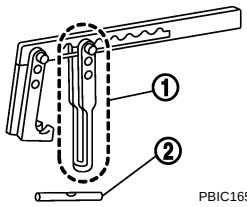
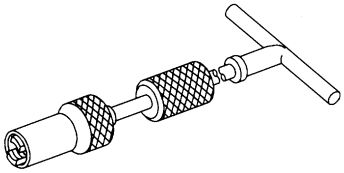
PREPARATION

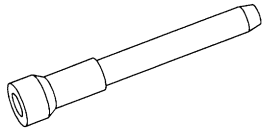
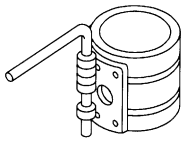
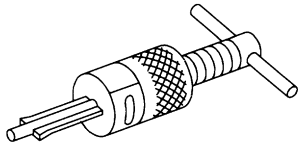
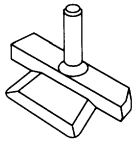
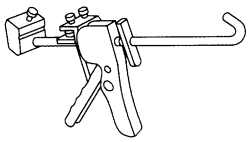
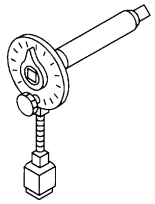
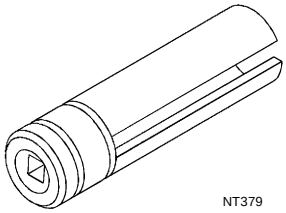
PFP:00002

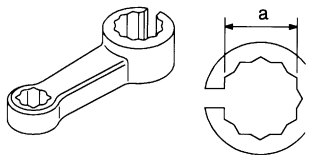
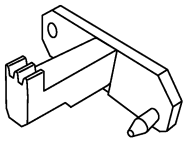
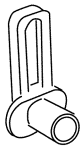
Special Service Tools

ABS009Y8

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

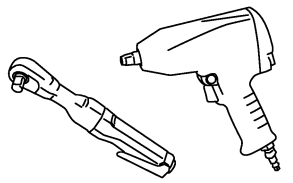
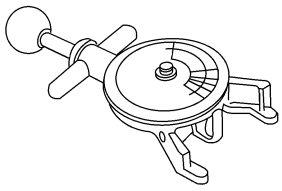
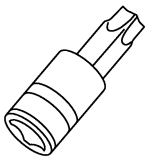
Tool number (Kent-Moore No.) Tool name		Description
ST0501S000 (—) Engine stand assembly 1. ST05011000 (—) Engine stand 2. ST05012000 (—) Base	 NT042	Disassembling and assembling engine
KV10106500 (—) Engine stand shaft	 NT028	
KV10117000 (J41262) Engine sub-attachment	 NT373	KV10117000 has been replaced with KV10117001 (KV10117000 is no longer in production, but it is usable).
KV10117001 (—) Engine sub-attachment	 NT372	Installing on cylinder block
KV10116200 (J26336-A) Valve spring compressor 1. KV10115900 (J26336-20) Attachment 2.KV10109220 (—) Adapter	 PBIC1650E	Disassembling valve mechanism Part (1) is a component of KV10116200 (J26336-A), but Part (2) is not so.
KV10107902 (J38959) Valve oil seal puller	 NT011	Replacing valve oil seal

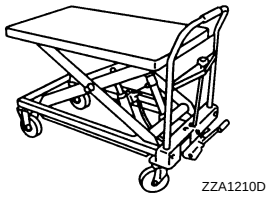
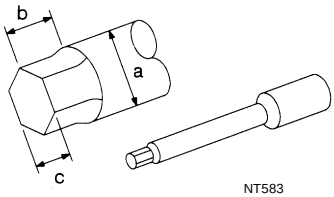
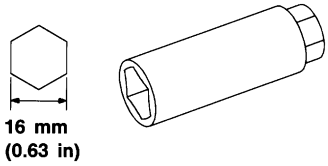
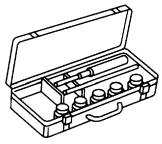
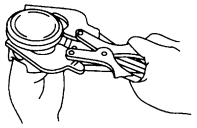
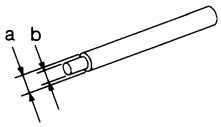
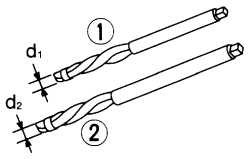
Tool number (Kent-Moore No.) Tool name	Description
— (J39386) Valve oil seal drift  NT024	Installing valve oil seal
EM03470000 (J8037) Piston ring compressor  NT044	Installing piston assembly into cylinder bore
ST16610001 (J23907) Pilot bushing puller  NT045	Removing pilot bushing (M/T models) or pilot converter (A/T models)
KV10111100 (J37228) Seal cutter  NT046	Removing oil pan (lower and upper), front and rear timing chain case, etc.
WS39930000 (—) Tube presser  NT052	Pressing the tube of liquid gasket
KV10112100 (BT8653-A) Angle wrench  NT014	Tightening bolts for bearing cap, cylinder head, etc. in angle
KV10117100 (J3647-A) Heated oxygen sensor wrench  NT379	Loosening or tightening heated oxygen sensor 2 **For 22 mm (0.87 in) width hexagon nut**

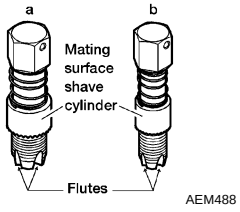
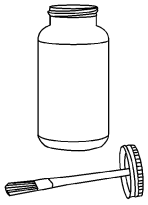
Tool number (Kent-Moore No.) Tool name	Description
KV10114400 (J38365) Heated oxygen sensor wrench  NT636	Loosening or tightening air fuel ratio sensor 1 **a: 22 mm (0.87 in)**
KV10117700 (J44716) Ring gear stopper  NT822	Removing and installing crankshaft pulley
— (J-45488) Quick connector release  PBIC0198E	Removing fuel tube quick connectors in engine room (Available in SEC. 164 of PARTS CATALOG: Part No. 16441 6N210)

Commercial Service Tools

ABS009Y9

(Kent-Moore No.) Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts
(BT3373-F) Belt tension gauge  AMA126	Checking drive belt tension
TORX socket  PBIC1113E	Removing and installing flywheel **Size: T55**

(Kent-Moore No.) Tool name	Description
(—) Manual lift table caddy  ZZA1210D	Removing and installing engine
(J24239-01) Cylinder head bolt wrench  NT583	Loosening and tightening cylinder head bolt, and used with angle wrench [SST: KV10112100 (BT8653-A)] **a: 13 (0.51) dia.** **b: 12 (0.47)** **c: 10 (0.39)** Unit: mm (in)
(—) Spark plug wrench  NT047	Removing and installing spark plug
(—) Valve seat cutter set  NT048	Finishing valve seat dimensions
(—) Piston ring expander  NT030	Removing and installing piston ring
(—) Valve guide drift  NT015	Removing and installing valve guide **Intake and Exhaust:** **a: 9.5 mm (0.374 in) dia.** **b: 5.5 mm (0.217 in) dia.**
(—) Valve guide reamer  NT016	(1): Reaming valve guide inner hole (2): Reaming hole for oversize valve guide **Intake and Exhaust:** **d_1 : 6.0 mm (0.236 in) dia.** **d_2 : 10.2 mm (0.402 in) dia.**

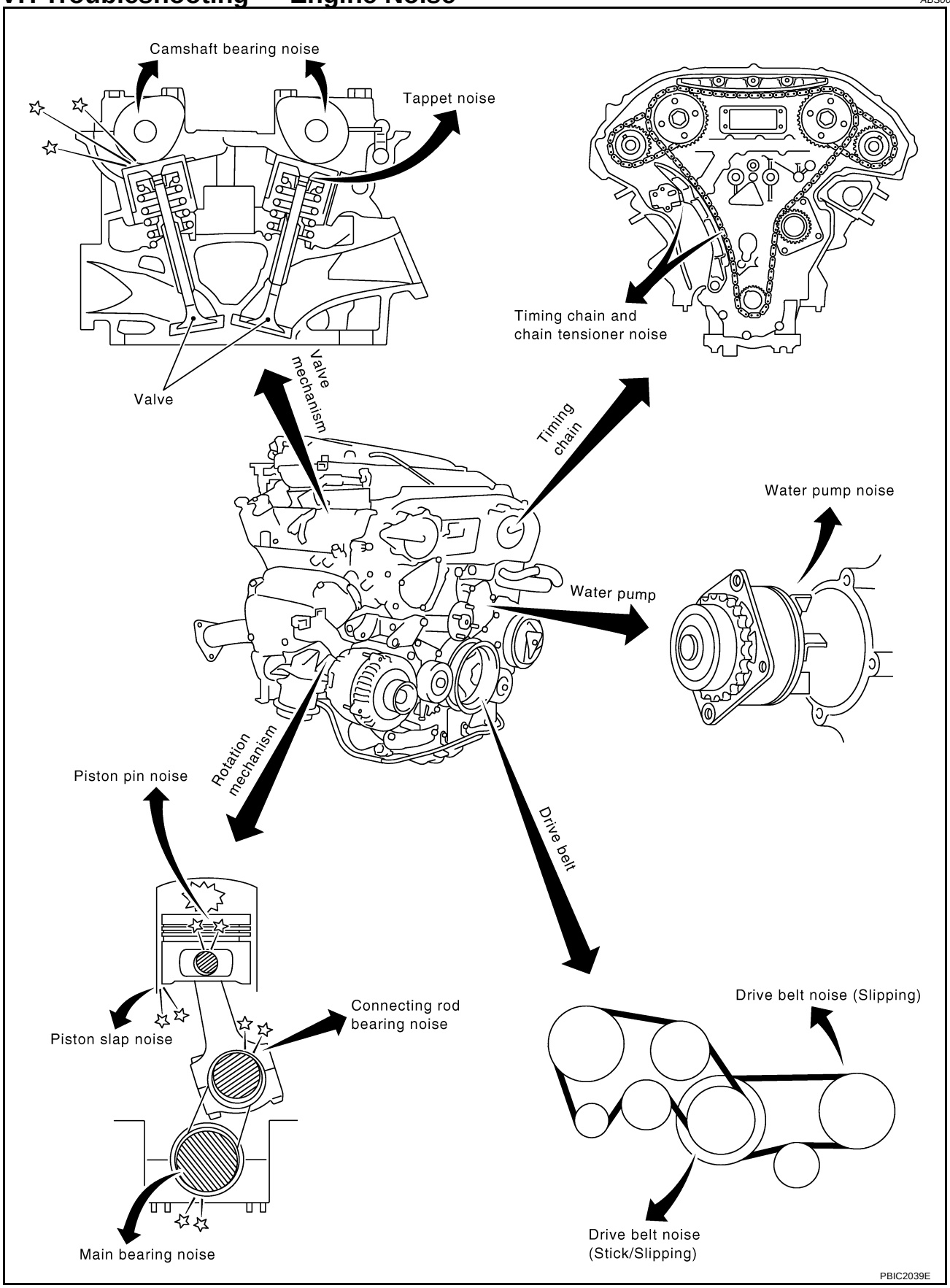
(Kent-Moore No.) Tool name	Description
(J-43897-18) (J-43897-12) Oxygen sensor thread cleaner  AEM488	Reconditioning the exhaust system threads before installing a new air fuel ratio sensor and heated oxygen sensor (Use with anti-seize lubricant shown below.) **a: J-43897-18 [18 mm (0.71 in) dia.] for zirconia heated oxygen sensor and air fuel ratio sensor** **b: J-43897-12 [12 mm (0.47 in) dia.] for titania heated oxygen sensor**
(—) Anti-seize lubricant (Permatex 133AR or equivalent meeting MIL specification MIL-A-907)  AEM489	Lubricating oxygen sensor thread cleaning tool when reconditioning exhaust system threads

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting — Engine Noise

ABS009YA



Use the Chart Below to Help You Find the Cause of the Symptom.

ABS009YB

1. Locate the area where noise occurs.
2. Confirm the type of noise.
3. Specify the operating condition of engine.
4. Check specified noise source.

If necessary, repair or replace these parts.

Location of noise	Type of noise	Operating condition of engine						Source of noise	Check item	Reference page
		Before warm-up	After warm-up	When starting	When idling	When racing	While driving			
Top of engine Rocker cover Cylinder head	Ticking or clicking	C	A	—	A	B	—	Tappet noise	Valve clearance	EM-84
	Rattle	C	A	—	A	B	C	Camshaft bearing noise	Camshaft runout Camshaft journal oil clearance	EM-78 EM-78
Crankshaft pulley Cylinder block (Side of engine) Oil pan	Slap or knock	—	A	—	B	B	—	Piston pin noise	Piston to piston pin oil clearance Connecting rod bushing oil clearance	EM-130 EM-132
	Slap or rap	A	—	—	B	B	A	Piston slap noise	Piston to cylinder bore clearance Piston ring side clearance Piston ring end gap Connecting rod bend and torsion	EM-134 EM-131 EM-131 EM-132
	Knock	A	B	C	B	B	B	Connecting rod bearing noise	Connecting rod bushing oil clearance Connecting rod bearing oil clearance	EM-132 EM-136
	Knock	A	B	—	A	B	C	Main bearing noise	Main bearing oil clearance Crankshaft runout	EM-137 EM-136
Front of engine Timing chain case	Tapping or ticking	A	A	—	B	B	B	Timing chain and chain tensioner noise	Timing chain cracks and wear Timing chain tensioner operation	EM-63 EM-55
Front of engine	Squeaking or fizzing	A	B	—	B	—	C	Drive belts (Sticking or slipping)	Drive belts deflection	EM-12
	Creaking	A	B	A	B	A	B	Drive belts (Slipping)	Idler pulley bearing operation	
	Squall Creak	A	B	—	B	A	B	Water pump noise	Water pump operation	CO-21, "WATER PUMP"

A: Closely related B: Related C: Sometimes related —: Not related

DRIVE BELTS

PFP:02117

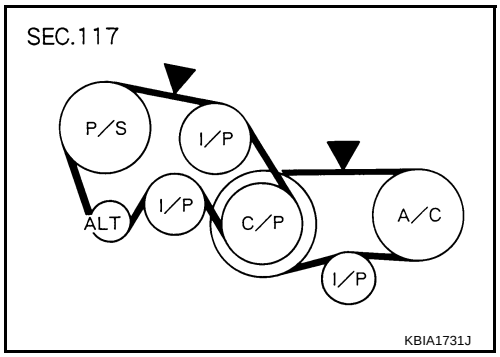
Checking Drive Belts

ABS009YC

WARNING:

Be sure to perform when engine is stopped.

1. Inspect belts for cracks, fraying, wear and oil. If necessary, replace.
2. Inspect drive belt deflection at a point on the belt midway between pulleys.
   - Inspection should be done only when engine is cold, or over 30 minutes after engine is stopped.
   - Measure belt tension with tension gauge (BT3373-F or equivalent) at points marked ▼ shown in the figure.
   - When measuring deflection, apply 98 N (10 kg, 22 lb) at the ▼ marked point.
   - Adjust if belt deflection exceeds the limit or if belt tension is not within specifications.



CAUTION:

- **When checking belt deflection or tension immediately after installation, first adjust it to the specified value. Then, after turning crankshaft two turns or more, re-adjust to the specified value to avoid variation in deflection between pulleys.**
- **Tighten idler pulley lock nut by hand and measure deflection or tension without looseness.**

Belt deflection and tension

	Deflection adjustment		Unit: mm (in)	Tension adjustment*		Unit: N (kg, lb)
	Used belt		New belt	Used belt		New belt
	Limit	After adjustment		Limit	After adjustment	
Alternator and power steering oil pump belt	7 (0.28)	4 - 5 (0.16 - 0.20)	3.5 - 4.5 (0.138 - 0.177)	294 (30, 66)	730 - 818 (74.5 - 83.5, 164 - 184)	838 - 926 (85.5 - 94.5, 188 - 208)
A/C compressor belt	12 (0.47)	9 - 10 (0.35 - 0.39)	8 - 9 (0.31 - 0.35)	196 (20, 44)	348 - 436 (35.5 - 44.5, 78 - 98)	470 - 559 (48 - 57, 106 - 126)
Applied pushing force	98 N (10 kg, 22 lb)			—		

*: If belt tension gauge cannot be installed at check points shown, check drive belt tension at different location on belt.

Tension Adjustment

ABS009YD

Portion	Belt tightening method for adjustment
Alternator and power steering oil pump belt	Adjusting bolt on idler pulley
A/C compressor belt	Adjusting bolt on idler pulley

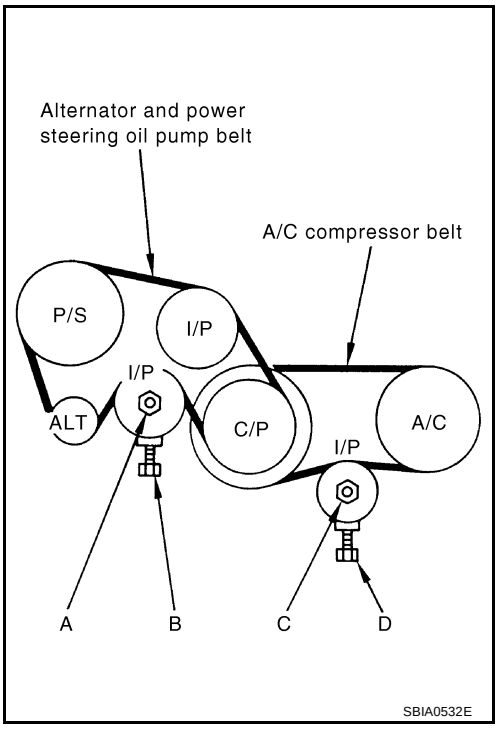
CAUTION:

- **When belt is replaced with a new one, adjust it to value for “New belt” to accommodate for insufficient adaptability with pulley grooves.**
- **When deflection or tension of belt being used exceeds “Limit”, adjust it to value for “After adjustment”.**
- **When checking belt deflection or tension immediately after installation, first adjust it to the specified value. Then, after turning crankshaft two turns or more, re-adjust to the specified value to avoid variation in deflection between pulleys.**
- **When installing belt, make sure that it is correctly engaged with pulley groove.**
- **Keep oil and water away from belt.**
- **Do not twist or bend belt excessively.**

ALTERNATOR AND POWER STEERING OIL PUMP BELT

1. Remove undercover with power tool.
2. Loosen idler pulley lock nut (A) and adjust tension by turning adjusting bolt (B).
   - For specified belt tension, refer to EM-12, "Checking Drive Belts" .
3. Tighten nut (A).

   : 31.4 - 38.2 N·m (3.2 - 3.9 kg-m, 24 - 28 ft-lb)



A/C COMPRESSOR BELT

1. Remove undercover with power tool.
2. Loosen idler pulley lock nut (C) and adjust tension by turning adjusting bolt (D).
   - For specified belt tension, refer to EM-12, "Checking Drive Belts" .
3. Tighten nut (C).

   : 30.4 - 39.2 N·m (3.1 - 4.0 kg-m, 23 - 28 ft-lb)

Removal and Installation

ABS009YE

REMOVAL

1. Remove undercover with power tool.
2. Remove alternator and power steering oil pump belt. Refer to EM-13, "ALTERNATOR AND POWER STEERING OIL PUMP BELT" .
3. Remove A/C compressor belt. Refer to EM-13, "A/C COMPRESSOR BELT" .

CAUTION:
Grease is applied to idler pulley adjusting bolt. Be careful to keep grease away from belt.

INSTALLATION

1. Install belts to pulley in the reverse order of removal.

CAUTION:
- **Make sure belt is correctly engaged with the pulley groove.**
- **Check for engine oil and engine coolant are not adhered belt and each pulley groove.**

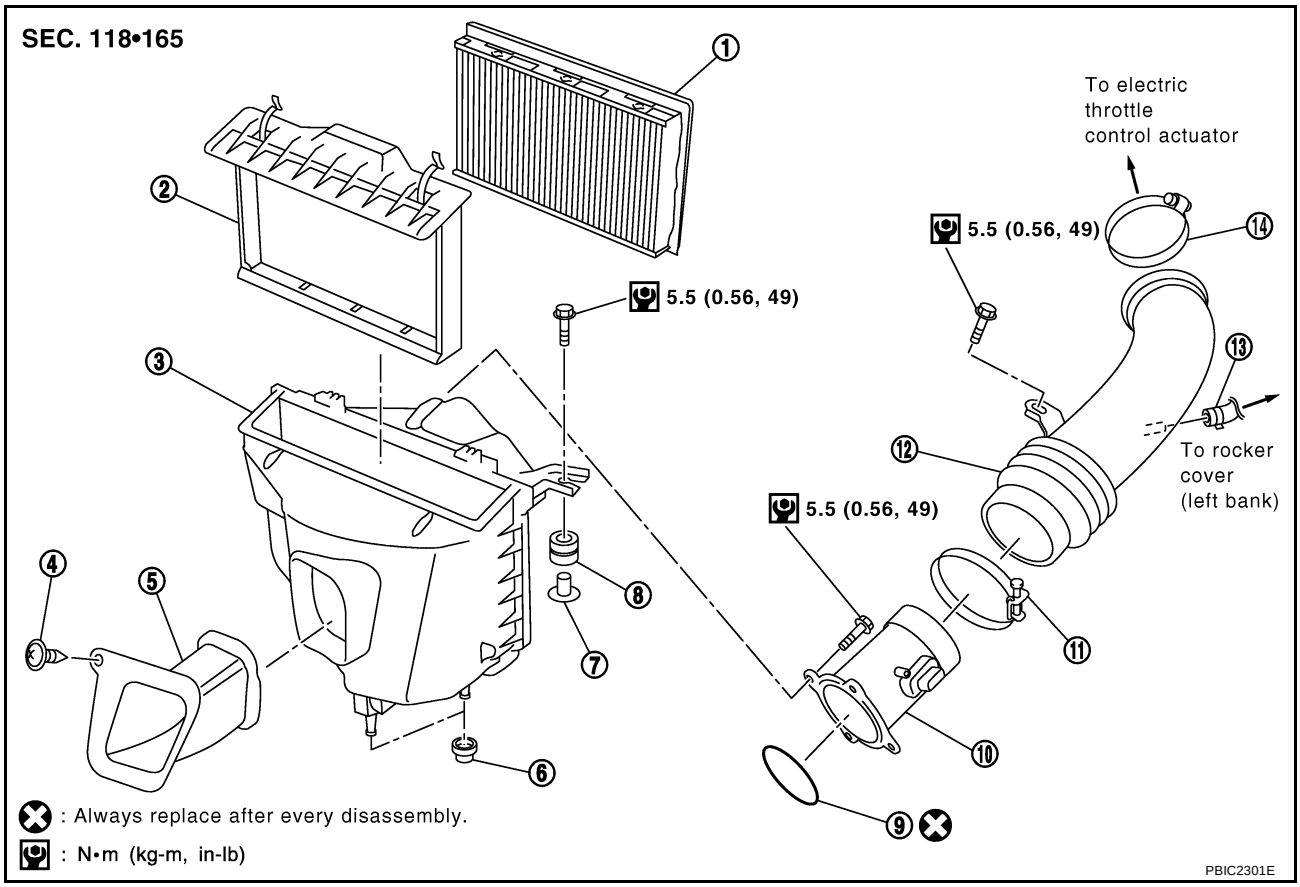
2. Adjust belt tension. Refer to EM-12, "Tension Adjustment" .
3. Tighten each nuts and bolts and nut to the specified torque.
4. Make sure that tension of each belt is within the standard.

AIR CLEANER AND AIR DUCT

PFP:16500

Removal and Installation

ABS009YF

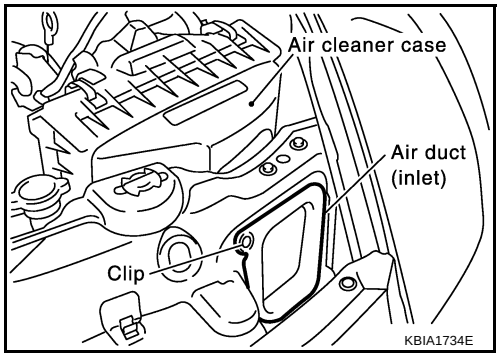


1. Air cleaner filter	2. Holder	3. Air cleaner case
4. Clip	5. Air duct (inlet)	6. Grommet
7. Collar	8. Grommet	9. O-ring
10. Mass air flow sensor	11. Clamp	12. Air duct
13. PCV hose	14. Clamp	

REMOVAL

1. Remove clips, and slide air duct (inlet) frontward, disengage clips and air cleaner case.

   NOTE:
   When removing air duct (inlet), remove front bumper and bumper fascia stay radiator core support center. Refer to EI-14, "FRONT BUMPER" and BL-19, "RADIATOR CORE SUPPORT" .



2. Disconnect harness connector from mass air flow sensor.
3. Disconnect PCV hose.
4. Remove air cleaner case/mass air flow sensor assembly and air duct assembly disconnecting their joints.
   - Add marks as necessary for easier installation.
5. Remove mass air flow sensor from air cleaner case.

   CAUTION:
   Handle mass air flow sensor with care.
   - **Do not shock it.**

- **Do not disassemble it.**
- **Do not touch its sensor.**

INSPECTION AFTER REMOVAL

Inspect air duct for crack or tear.

- If anything found, replace air duct.

INSTALLATION

Note the following, and install in the reverse order of removal.

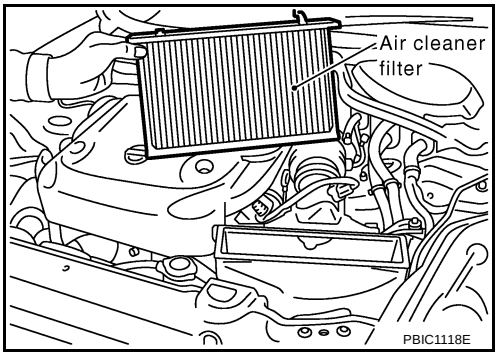
- Align marks. Attach each joint. Screw clamps firmly.

Changing Air Cleaner Filter

ABS009YG

REMOVAL

1. Unhook clips, and lift holder.
2. Remove air cleaner filter.



INSTALLATION

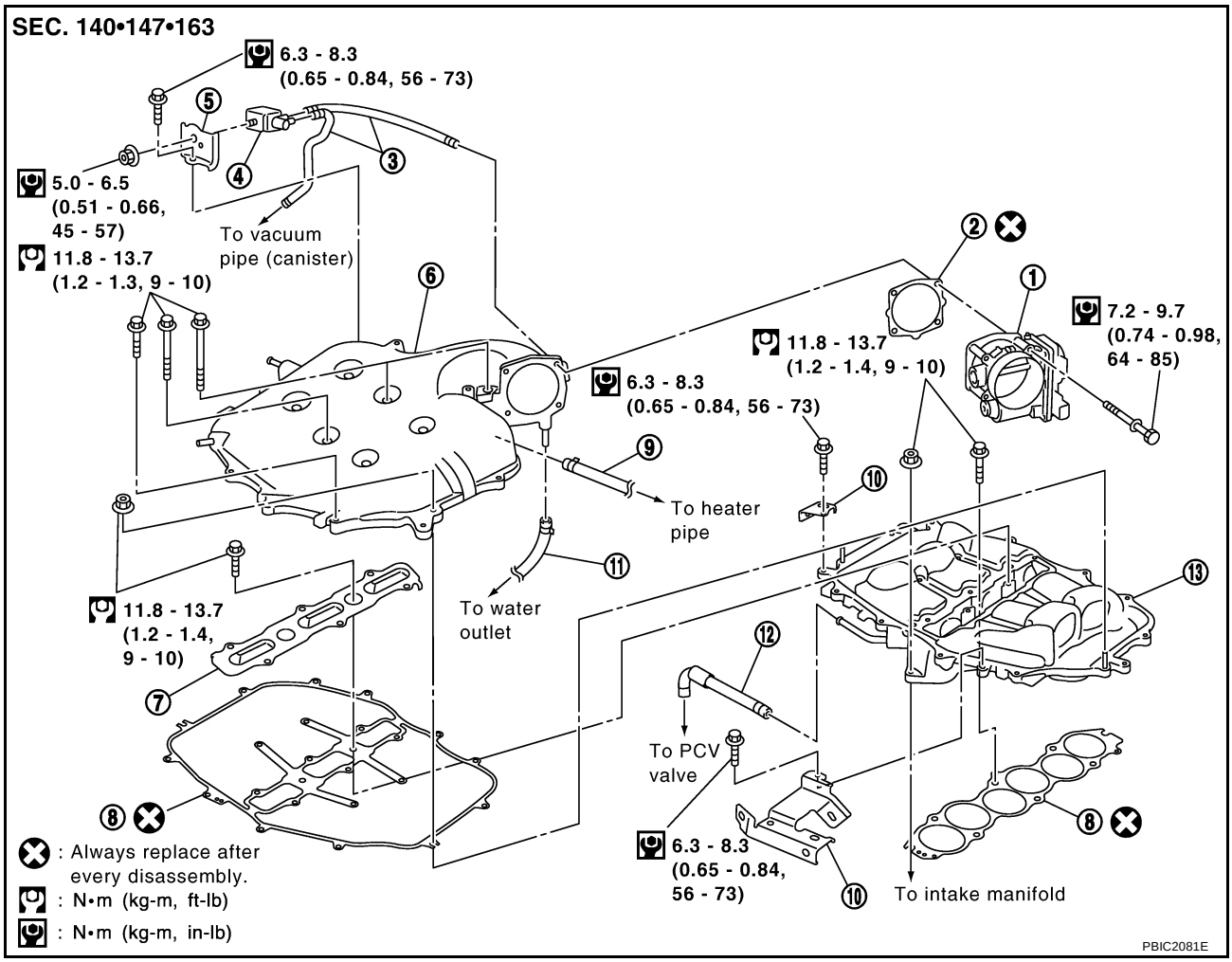
Install in the reverse order of removal.

INTAKE MANIFOLD COLLECTOR

PFP:14003

Removal and Installation

ABS009YH



1.	Electric throttle control actuator	2.	Gasket	3.	Vacuum hose
4.	EVAP canister purge volume control solenoid valve	5.	Bracket	6.	Intake manifold collector (upper)
7.	Intake manifold collector cover	8.	Gasket	9.	Water hose
10.	Bracket	11.	Water hose	12.	PCV hose
13.	Intake manifold collector (lower)				

REMOVAL

WARNING:

- **To avoid the danger of being scalded, do not drain the engine coolant when the engine is hot.**
- **Gasket for intake manifold collector (upper) is secured together with mounting bolt for intake manifold collector (lower). Thus, even when only gasket for upper side is replaced, gasket for lower side must be also replaced.**

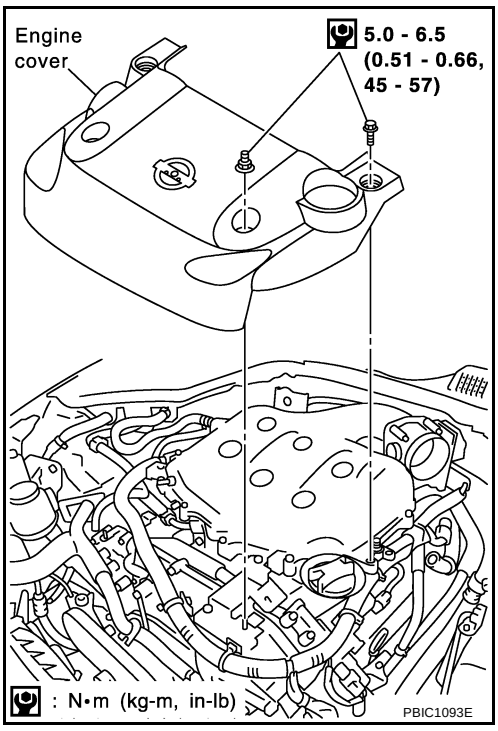
NOTE:

To remove intake manifold collector (upper) only, removing tower bar is unnecessary.

1. Remove tower bar. Refer to FSU-20, "TOWER BAR" .

2. Remove engine cover with power tool.

CAUTION:
When removing/installing engine cover with tower bar installed, remove and install carefully in order to prevent damage to top surface.



3. Drain engine coolant, or when water hose is disconnected, attach plug to prevent engine coolant leakage. Refer to CO-9, "Changing Engine Coolant" .

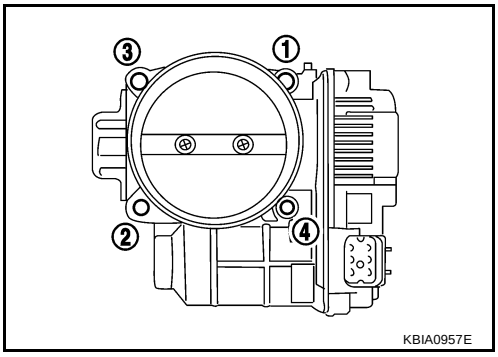
CAUTION:
- **Perform this step when engine is cold.**
- **Do not spill engine coolant on drive belts.**

4. Remove air cleaner case and air duct. Refer to EM-14, "AIR CLEANER AND AIR DUCT" .
5. Remove electric throttle control actuator as follows:

a. Disconnect harness connector.

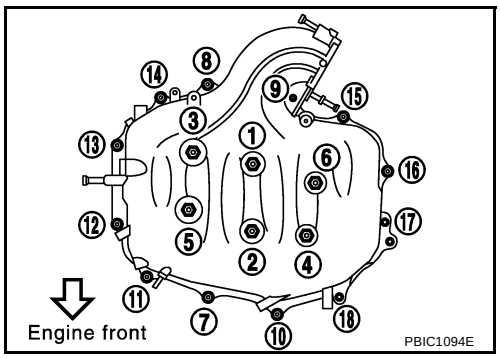
b. Loosen mounting bolts in reverse order as shown in the figure.

CAUTION:
- **Handle carefully to avoid any shock to electric throttle control actuator.**
- **Do not disassemble.**



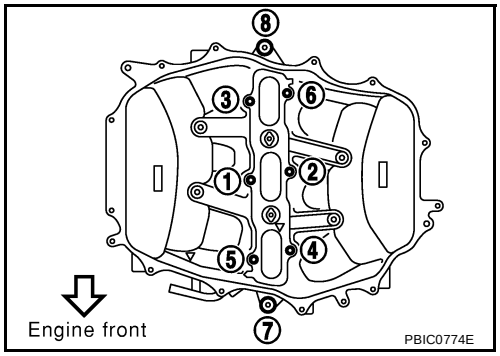
6. Remove fuel sub-tube mounting bolt to disconnect from rear of intake manifold collector (lower). Refer to EM-36, "FUEL INJECTOR AND FUEL TUBE" .
7. Disconnect vacuum hose and water hose from intake manifold collector (upper).
8. Remove EVAP canister purge volume control solenoid valve bracket mounting bolt from intake manifold collector (upper).

9. Loosen mounting bolts with power tool in reverse order as shown in the figure to remove intake manifold collector (upper).



10. Remove PCV hose [between intake manifold collector (lower) and rocker cover (right bank)].
11. Loosen mounting bolts with power tool in reverse order as shown in the figure, and remove the intake manifold collector cover, gasket, intake manifold collector (lower) and gasket.

CAUTION:
Cover engine openings to avoid entry of foreign materials.



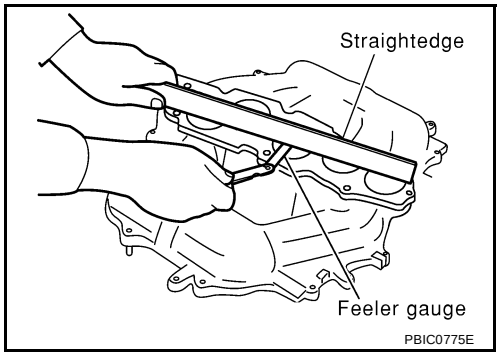
INSPECTION AFTER REMOVAL

Surface Distortion

- Check the surface distortion of both the intake manifold collector (upper and lower) mating surfaces with straightedge and feeler gauge.

  Limit : 0.1 mm (0.004 in)

- If it exceeds the limit, replace intake manifold collector (upper and/or lower).

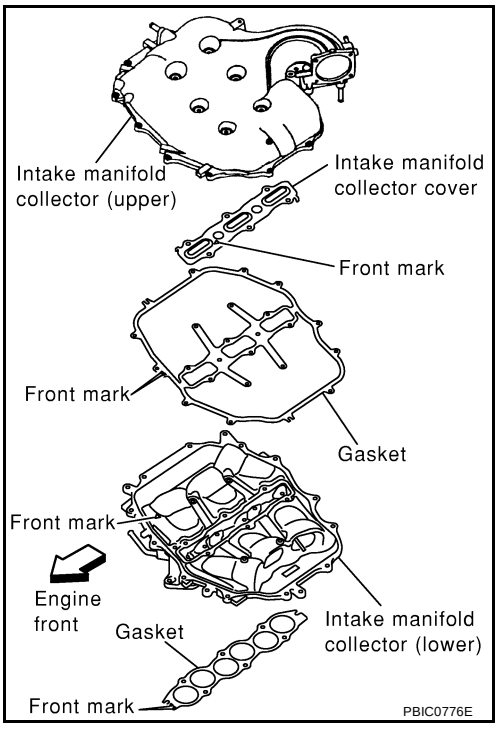


INSTALLATION

Note the following, and install in the reverse order of removal.

Part Installation Direction

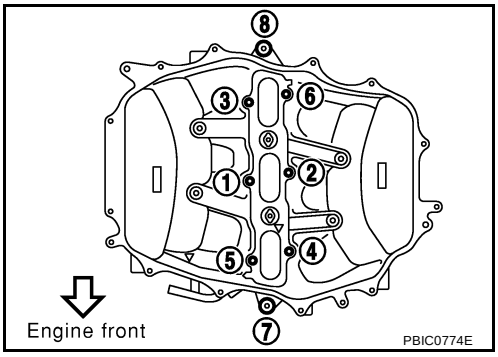
Referring to front marks, install parts shown in the figure.



Intake Manifold Collector (Lower)

Tighten mounting bolts in numerical order as shown in the figure.

NOTE:
Tighten mounting bolts to secure gasket (lower), intake manifold collector (lower), gasket (upper), and intake manifold collector cover.



Intake Manifold Collector (Upper)

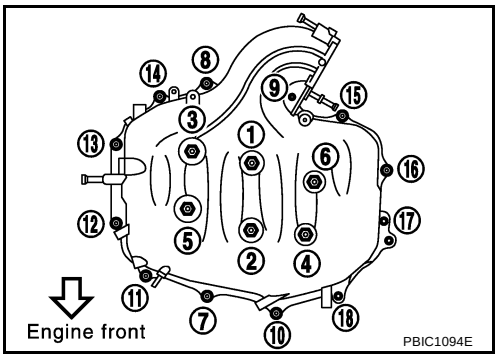
- If stud bolts were removed, install them and tighten to the specified torque below.

  : 4.9 - 6.9 N·m (0.5 - 0.7 kg-m, 44 - 61 in-lb)

- Shank length under bolt head varies with bolt location. Install mounting bolts while referring to numbers shown below and in the figure. (Bolt length does not include pilot portion.)

  Bolt

M6 × 25 mm (0.98 in)	**: 7, 8, 10, 11, 13, 14, 15, 16, 18**
M6 × 45 mm (1.77 in)	**: 2, 4, 5**
M6 × 60 mm (2.36 in)	**: 1, 3, 6, 9**
M6 Nut	**: 12, 17**



- Tighten mounting bolts in numerical order as shown in the figure.

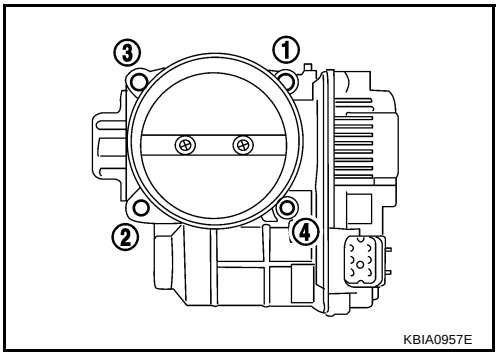
Water Hose

- Insert hose by 27 to 32 mm (1.06 to 1.26 in) from connector end.

- Clamp hose at location of 3 to 7 mm (0.12 to 0.28 in) from hose end.

Electric Throttle Control Actuator

- Install gasket with positioning no-protrusion surface upward or downward.
- Tighten mounting bolts in numerical order as shown in the figure.
- Perform the “Throttle Valve Closed Position Learning” when harness connector of electric throttle control actuator is disconnected. Refer to EC-42, "Throttle Valve Closed Position Learning" .
- Perform the “Idle Air Volume Learning” and “Throttle Valve Closed Position Learning” when electric throttle control actuator is replaced. Refer to EC-43, "Idle Air Volume Learning" .

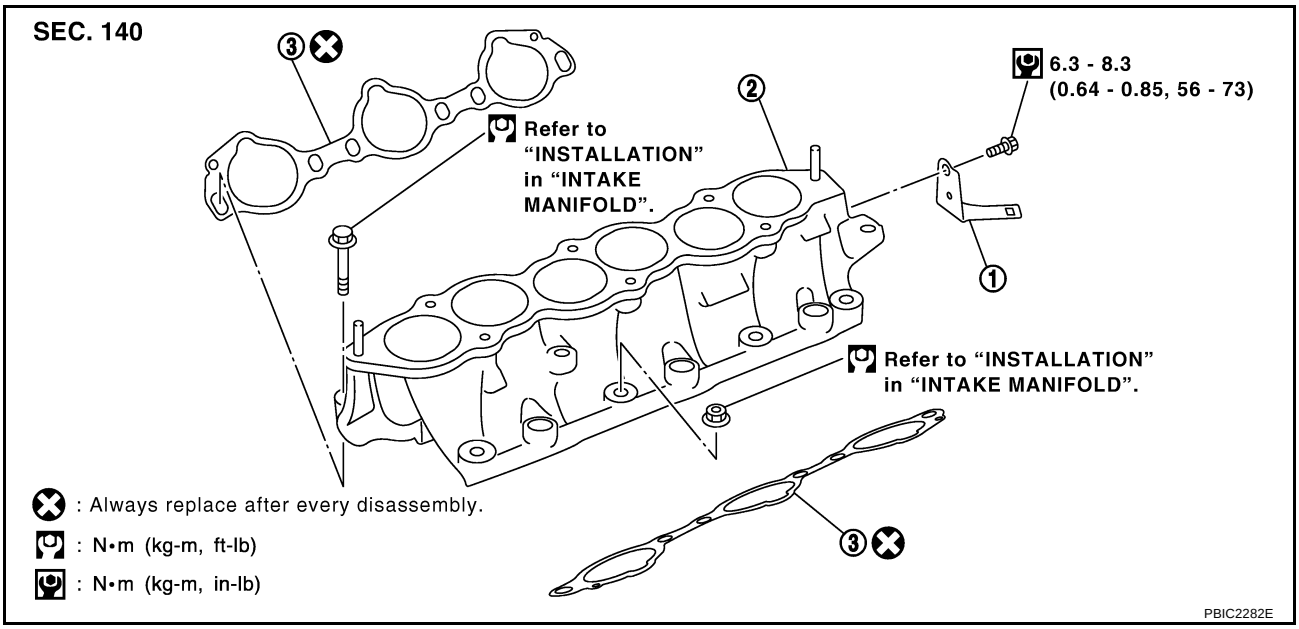


INTAKE MANIFOLD

PFP:14003

Removal and Installation

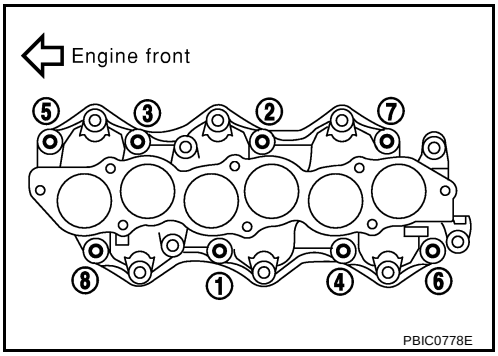
ABS009YI



1. Harness bracket
2. Intake manifold
3. Gasket

REMOVAL

1. Release fuel pressure. Refer to EC-45, "FUEL PRESSURE RELEASE" .
2. Remove intake manifold collectors (upper and lower). Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .
3. Remove fuel tube and fuel injector assembly. Refer to EM-36, "FUEL INJECTOR AND FUEL TUBE" .
4. Loosen mounting nuts and bolts with power tool in reverse order as shown in the figure to remove intake manifold.



5. Remove gaskets.

CAUTION:

Cover engine openings to avoid entry of foreign materials.

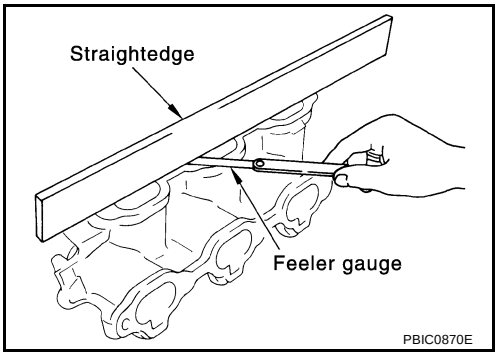
INSPECTION AFTER REMOVAL

Surface Distortion

- Check the surface distortion of the intake manifold mating surface with straightedge and feeler gauge.

  Limit : 0.1 mm (0.04 in)

- If it exceeds the limit, replace intake manifold.



INSTALLATION

Note the following, and install in the reverse order of removal.

Intake Manifold

- If stud bolts were removed, install them and tighten to the specified torque below.

  : 9.8 - 11.8 N·m (1.0 - 1.2 kg-m, 87 - 104 in-lb)

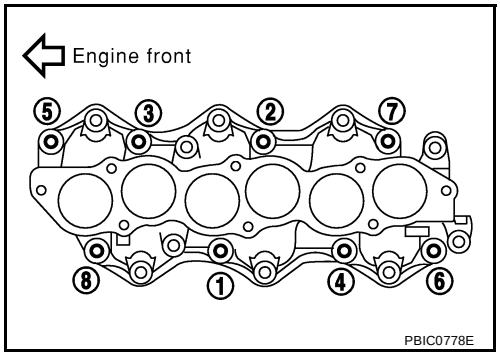
- Tighten all mounting nuts and bolts to the specified torque in two or more steps in numerical order shown in the figure.

  1st step

  : 4.9 - 9.8 N·m (0.5 - 1.0 kg-m, 4 - 7 ft-lb)

  2nd step and after

  : 26.5 - 31.4 N·m (2.7 - 3.2 kg-m, 20 - 23 ft-lb)

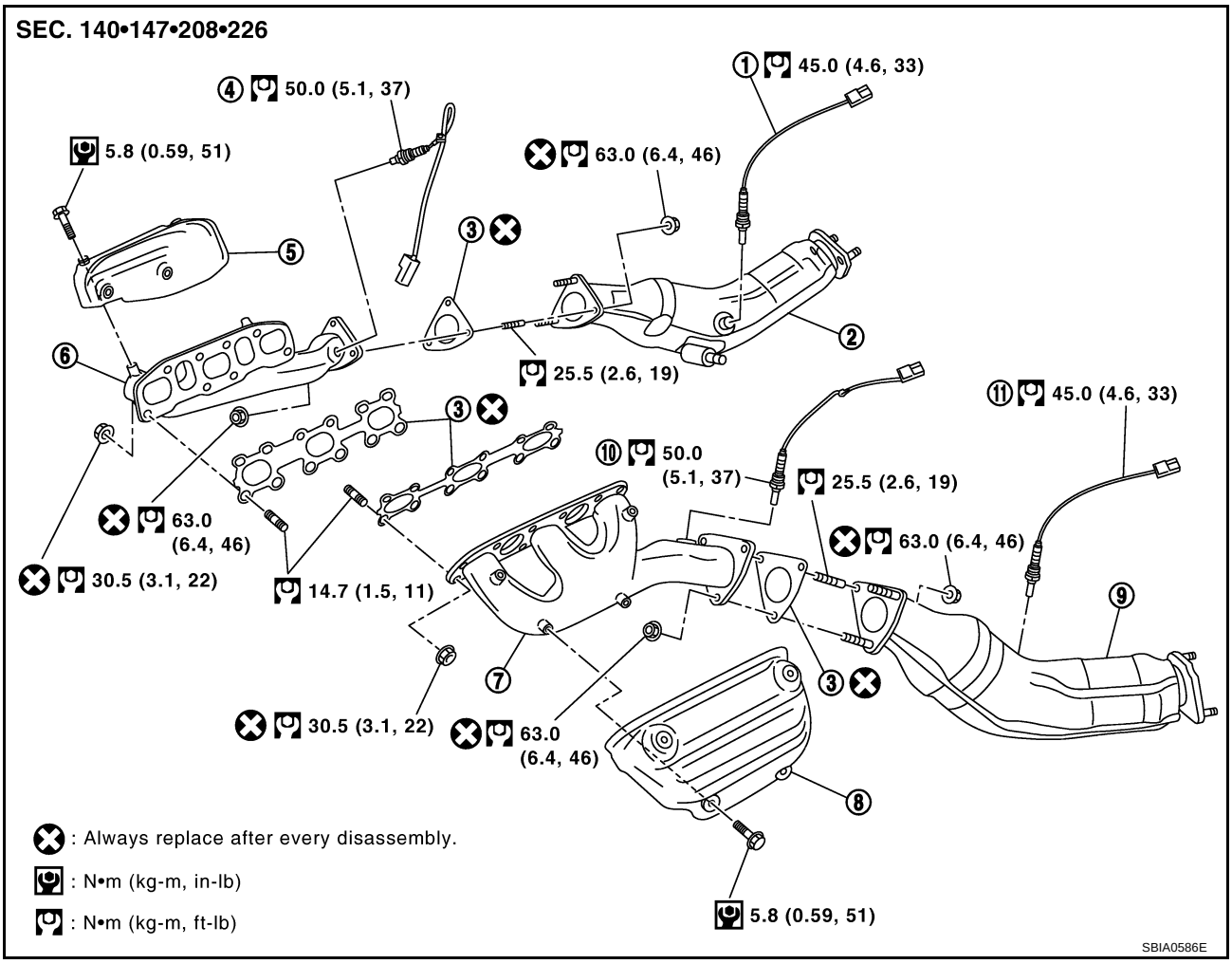


EXHAUST MANIFOLD AND THREE WAY CATALYST

PFP:14004

Removal and Installation

ABS009YJ



1. Heated oxygen sensor 2 (bank 1)
2. Three way catalyst (right bank)
3. Gasket
4. Air fuel ratio sensor 1 (bank 1)
5. Exhaust manifold cover (right bank)
6. Exhaust manifold (right bank)
7. Exhaust manifold (left bank)
8. Exhaust manifold cover (left bank)
9. Three way catalyst (left bank)
10. Air fuel ratio sensor 1 (bank 2)
11. Heated oxygen sensor 2 (bank 2)

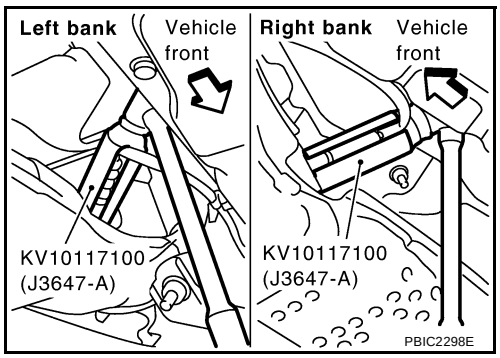
REMOVAL

1. Remove tower bar. Refer to FSU-20, "TOWER BAR" .
2. Remove engine cover with power tool. Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .
3. Drain engine coolant. Refer to CO-9, "Changing Engine Coolant" .

   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine coolant on drive belts.**
4. Remove air cleaner case and air duct. Refer to EM-14, "AIR CLEANER AND AIR DUCT" .
5. Remove undercover with power tool.

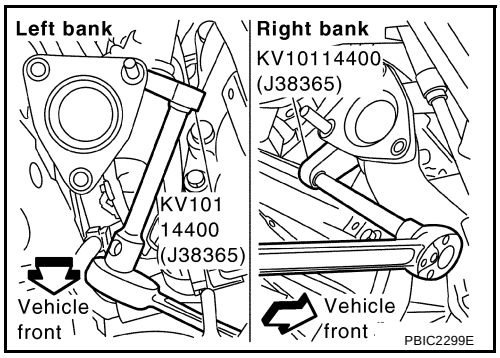
6. Disconnect harness connector and remove heated oxygen sensor 2 on both banks using heated oxygen sensor wrench [SST].
   - Put marks to identify installation positions of each heated oxygen sensor 2.

   CAUTION:
   - **Be careful not to damage heated oxygen sensor 2.**
   - **Discard any heated oxygen sensor 2 which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; replace with a new sensor.**



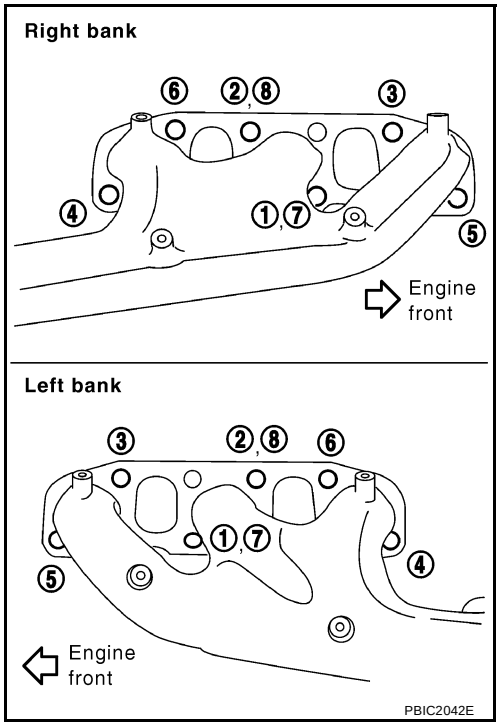
7. Remove exhaust mounting bracket between three way catalysts (right and left bank) and transmission. Refer to EX-3, "EXHAUST SYSTEM" .
8. Remove three way catalyst.
9. Disconnect harness connector and remove air fuel ratio sensor 1 on both banks using heated oxygen sensor wrench [SST].
   - Put marks to identify installation positions of each air fuel ratio sensor 1.

   CAUTION:
   - **Be careful not to damage air fuel ratio sensor 1.**
   - **Discard any air fuel ratio sensor 1 which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; replace with a new sensor.**



10. Remove water pipe and heater pipe on both right and left side. Refer to CO-27, "WATER OUTLET AND WATER PIPING" .
11. Remove exhaust manifold cover.
12. Loosen mounting nuts with power tool in reverse order as shown in the figure to remove exhaust manifold.

    NOTE:
    Disregard the numerical order No. 7 and 8 in removal.



13. Remove gaskets.

    CAUTION:
    Cover engine openings to avoid entry of foreign materials.

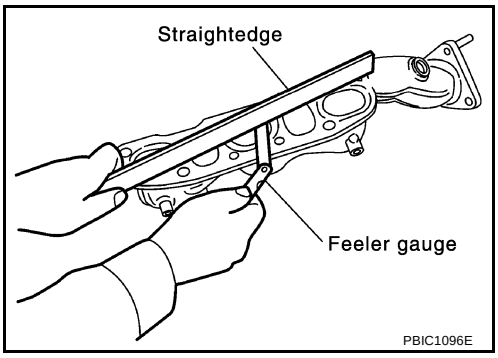
INSPECTION AFTER REMOVAL

Surface Distortion

- Check the surface distortion of the exhaust manifold mating surface with straightedge and feeler gauge.

  Limit : 0.3 mm (0.012 in)

- If it exceeds the limit, replace exhaust manifold.

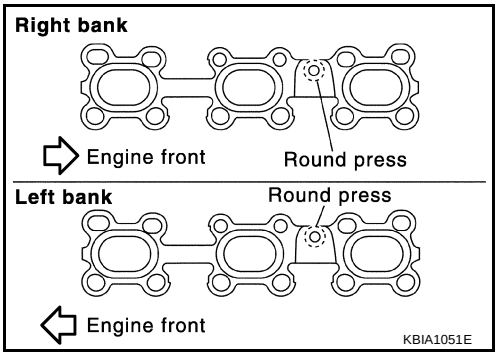


INSTALLATION

Note the following, and install in the reverse order of removal.

Exhaust Manifold Gasket

- Install in direction shown below. (Follow same procedure for both banks.)
- Locate thick side of port connecting part on right side from technician's view.
- Locate round press in thick side of port connecting part above center level line of port.



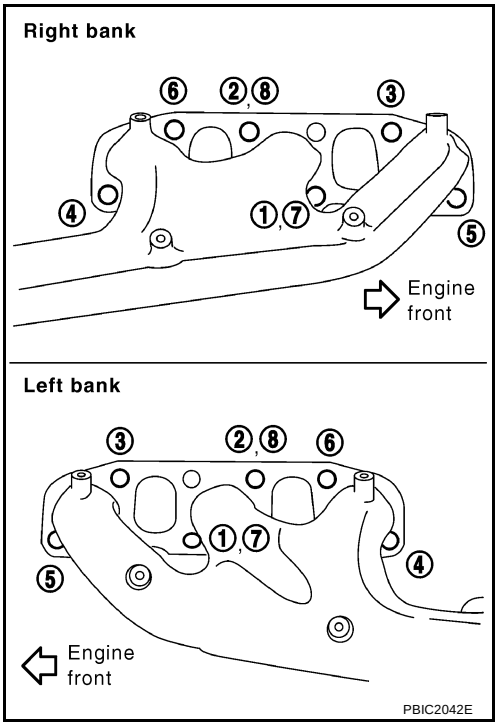
Exhaust Manifold

- If stud bolts were removed, install them and tighten to the specified torque below.

  : 12.7 - 16.7 N·m (1.3 - 1.7 kg-m, 10 - 12 ft-lb)

- Install mounting exhaust manifold in numerical order as shown in the figure.

  NOTE:
  Tighten nuts No. 1 and 2 in two steps. The numerical order No. 7 and 8 shown second step.



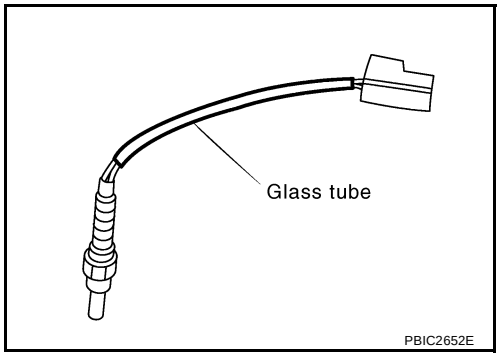
Air Fuel Ratio Sensor 1 and Heated Oxygen Sensor 2

- Install air fuel ratio sensor1 and heated oxygen sensor 2 in the original position.
- Install referring the following if the installation positions cannot be identified.

Glass tube color

Air fuel ratio sensor 1*	**: Black**
Heated oxygen sensor 2 (bank 1)	**: White**
Heated oxygen sensor 2 (bank 2)	**: White**

***: Air fuel ratio sensor 1 are same parts both bank 1 and bank 2.**



CAUTION:

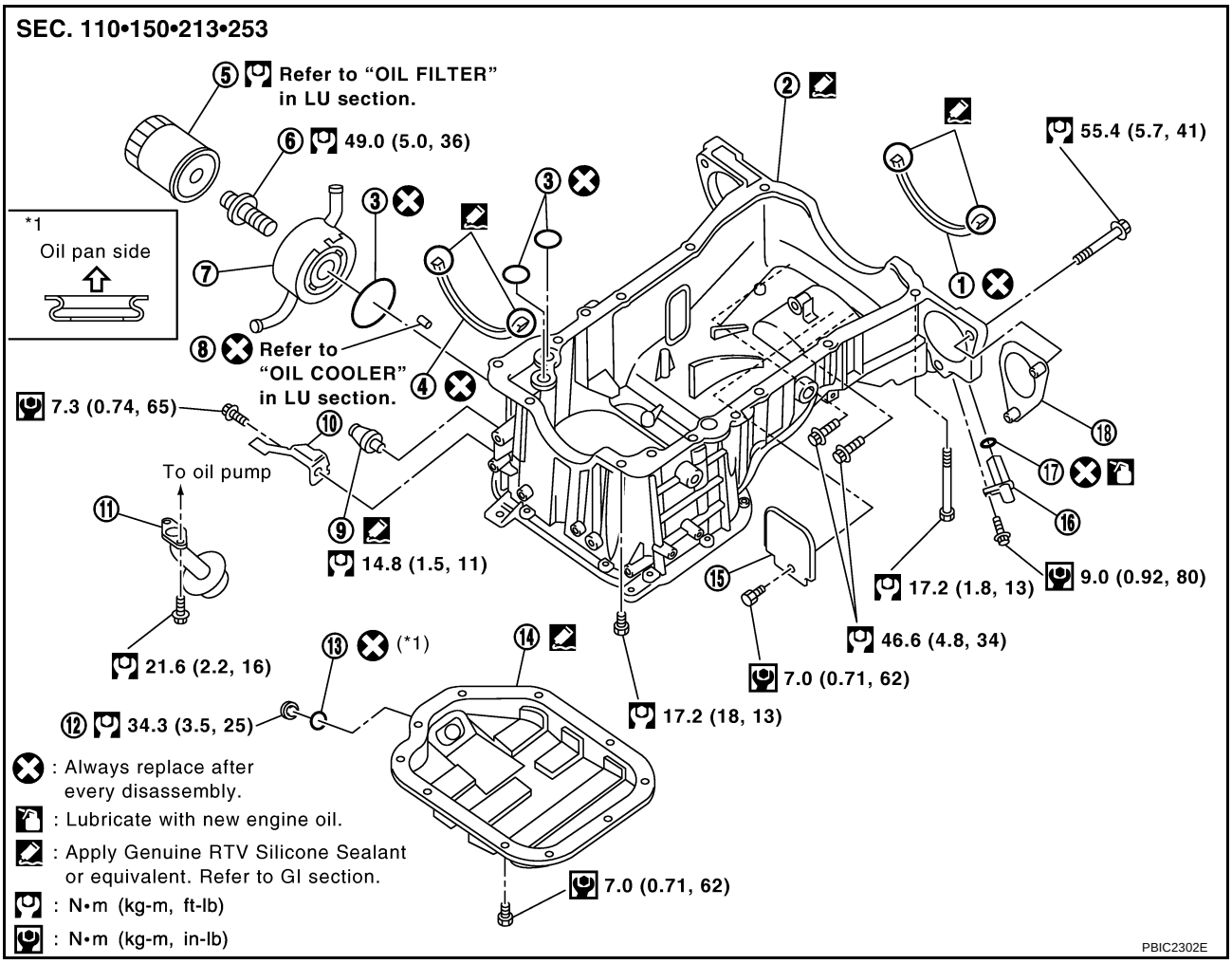
- **Before installing a new air fuel ratio sensor 1 and heated oxygen sensor 2, clean exhaust system threads using oxygen sensor thread cleaner (commercial service tool: J-43897-18 or J43897-12) and apply anti-seize lubricant (commercial service tool).**
- **Do not over torque air fuel ratio sensor 1 and heated oxygen sensor 2. Doing so may cause damage to air fuel ratio sensor 1 and heated oxygen sensor 2, resulting in the “MIL” coming on.**

OIL PAN AND OIL STRAINER

PFP:11110

Removal and Installation

ABS009YK



1. Oil pan gasket	2. Oil pan (upper)	3. O-ring
4. Oil pan gasket	5. Oil filter	6. Connector bolt
7. Oil cooler	8. Relief valve	9. Oil pressure sensor
10. Bracket	11. Oil strainer	12. Drain plug
13. Drain plug washer	14. Oil pan (lower)	15. Rear plate
16. Crankshaft position sensor (POS)	17. O-ring	18. Rear cover plate

REMOVAL

WARNING:

To avoid the danger of being scalded, do not drain engine oil when engine is hot.

NOTE:

To remove oil pan (lower) only, take step 5 and step 6, then step 19. Step 1 to 4 and 7 to 18 are unnecessary.

1. Remove hood assembly. Refer to BL-13, "HOOD" .
2. Remove tower bar. Refer to FSU-20, "TOWER BAR" .
3. Remove engine cover with power tool. Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .
4. Remove air duct. Refer to EM-14, "AIR CLEANER AND AIR DUCT" .
5. Drain engine oil. Refer to LU-8, "Changing Engine Oil" .

   CAUTION:

   - **Perform this step when engine is cold.**
   - **Do not spill engine oil on drive belts.**
6. Drain engine coolant. Refer to CO-9, "Changing Engine Coolant" .

CAUTION:

- **Perform this step when engine is cold.**
- **Do not spill engine coolant on drive belts.**

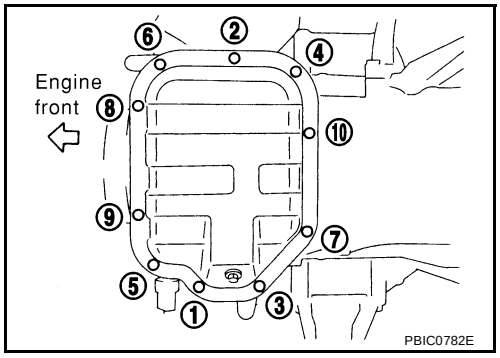
7. Remove undercover with power tool.
8. Install engine slinger to sling engine assembly for positioning. Refer to EM-105, "ENGINE ASSEMBLY" .
9. Remove front suspension member. Refer to FSU-19, "FRONT SUSPENSION MEMBER" .
10. Remove drive belts. Refer to EM-12, "DRIVE BELTS" .
11. Remove alternator. Refer to SC-21, "CHARGING SYSTEM" .
12. Remove starter motor. Refer to SC-10, "STARTING SYSTEM" .
13. Remove idler pulley and bracket assembly. Refer to EM-55, "TIMING CHAIN" .
14. Disconnect oil cooler water hoses, and remove oil cooler water pipe mounting bolt. Refer to LU-10, "OIL COOLER" .
15. Disconnect A/T fluid cooler hoses, and remove A/T fluid cooler tube (A/T models). Refer to AT-263, "TRANSMISSION ASSEMBLY" .
16. Remove crankshaft position sensor (POS).

CAUTION:

- **Handle carefully to avoid dropping and shocks.**
- **Do not disassemble.**
- **Do not allow metal powder to adhere to magnetic part at sensor tip.**
- **Do not place sensors in a location where they are exposed to magnetism.**

17. Remove oil filter, as necessary. Refer to LU-9, "OIL FILTER" .
18. Remove oil cooler, as necessary. Refer to LU-10, "OIL COOLER" .
19. Remove oil pan (lower) as follows:

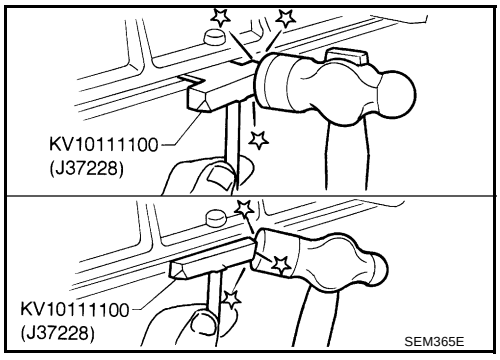
a. Loosen mounting bolts with power tool in reverse order as shown in the figure to remove.



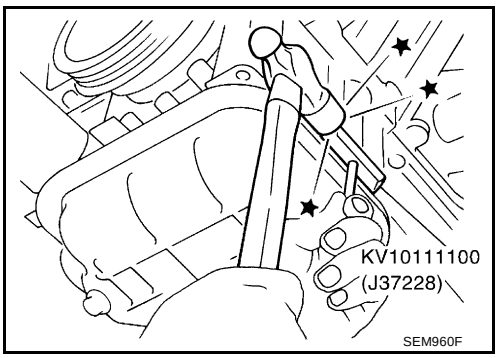
b. Insert seal cutter [SST] between oil pan (upper) and oil pan (lower).

CAUTION:

- **Be careful not to damage the mating surfaces.**
- **Do not insert flat-blade screwdriver, this will damage the mating surface.**

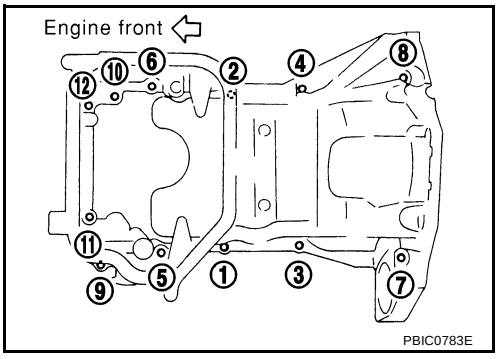


c. Slide seal cutter by tapping on the side of the tool with hammer. Remove oil pan (lower).

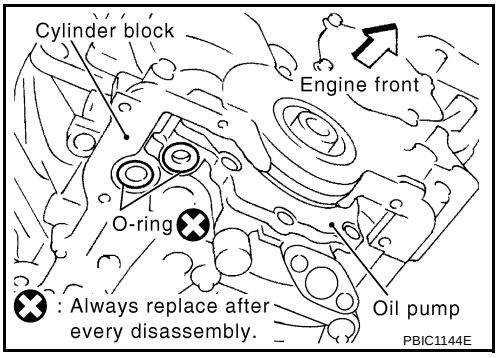


20. Remove oil strainer.
21. Remove transmission joint bolts which pierce oil pan (upper). Refer to MT-19, "TRANSMISSION ASSEMBLY" (M/T models) or AT-263, "TRANSMISSION ASSEMBLY" (A/T models).
22. Remove rear cover plate.
23. Loosen mounting bolts with power tool in reverse order as shown in the figure to remove oil pan (upper).
    - Insert seal cutter [SST: KV10111100 (J37228)] between oil pan (upper) and cylinder block. Slide seal cutter by tapping on the side of tool with hammer. Remove oil pan (upper).

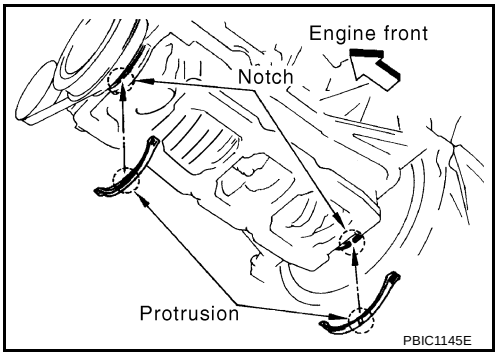
    CAUTION:
    Be careful not to damage mating surface.



24. Remove O-rings from bottom of cylinder block and oil pump.



25. Remove oil pan gaskets.



INSPECTION AFTER REMOVAL

Clean oil strainer if any object attached.

INSTALLATION

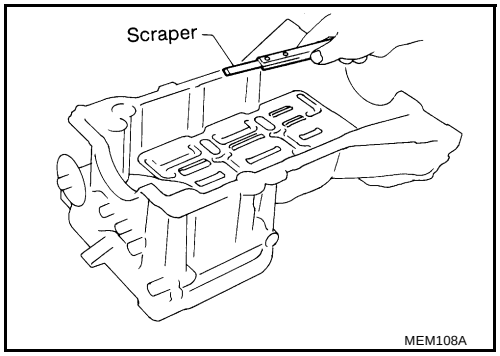
1. Install oil pan (upper) as follows:

a. Use scraper to remove old liquid gasket from mating surfaces.

- Also remove the old liquid gasket from mating surface of cylinder block.
- Remove old liquid gasket from the bolt holes and threads.

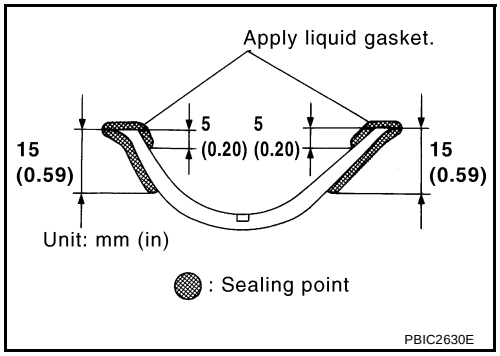
CAUTION:

Do not scratch or damage the mating surfaces when cleaning off old liquid gasket.

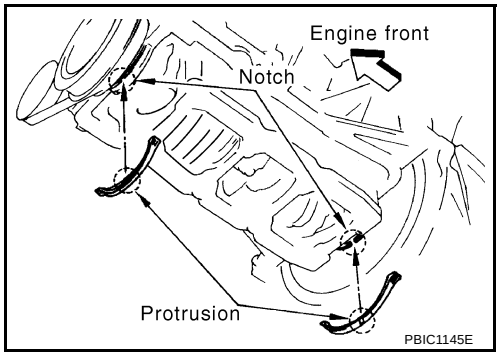


b. Install new oil pan gaskets.

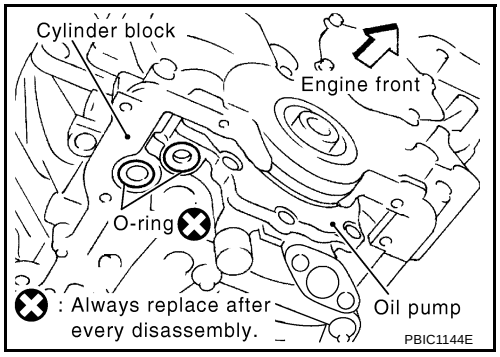
- Apply liquid gasket to oil pan gaskets as shown in the figure. **Use Genuine RTV Silicone Sealant or equivalent. Refer to** **GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS"** **.**



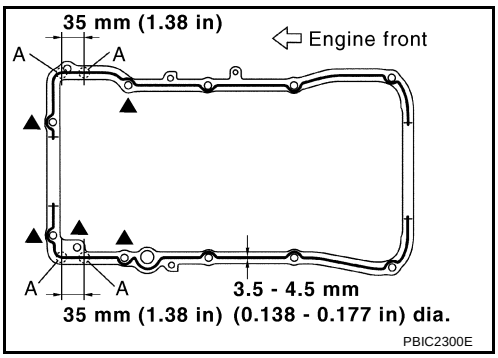
- To install, align protrusion of oil pan gasket with notches of front timing chain case and rear oil seal retainer.
- Install oil pan gasket with smaller arc to front timing chain case side.



c. Install new O-rings on the bottom of cylinder block and oil pump.



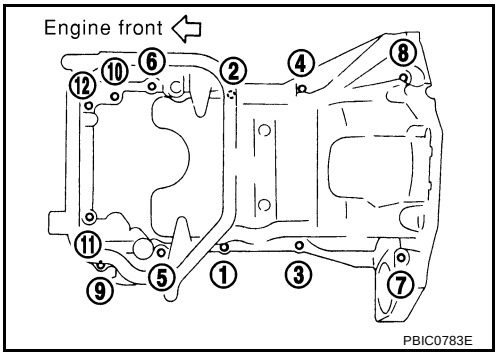
d. Apply a continuous bead of liquid gasket with tube presser [SST: WS39930000 (—)] to the cylinder block mating surface of oil pan (upper) to a limited portion as shown in the figure.
Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .



CAUTION:
- **For bolt holes with ▲ marks (5 locations), apply liquid gasket outside the holes.**
- **Apply a bead of 4.5 to 5.5 mm (0.177 to 0.217 in) in diameter to area "A".**
- **Attaching should be done within 5 minutes after coating.**

e. Install oil pan (upper).
- Tighten mounting bolts in numerical order as shown in the figure.
- There are two types of mounting bolts. Refer to the following for locating bolts.

M8 × 100 mm (3.97 in) : 5, 7, 8, 11
M8 × 25 mm (0.98 in) : Except the above

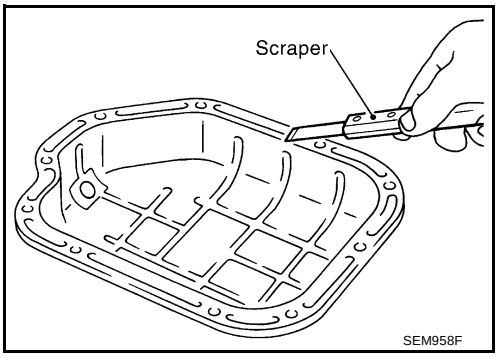


f. Tighten transmission joint bolts. Refer to MT-19, "TRANSMISSION ASSEMBLY" (M/T models) or AT-263, "TRANSMISSION ASSEMBLY" (A/T models).

2. Install oil strainer to oil pump.

3. Install oil pan (lower) as follows:

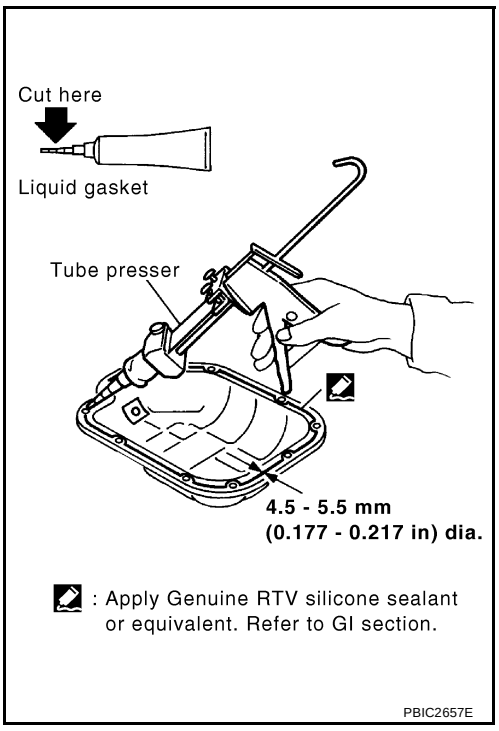
a. Use scraper to remove old liquid gasket from mating surfaces.
- Also remove old liquid gasket from mating surface of oil pan (upper).
- Remove old liquid gasket from the bolt holes and thread.



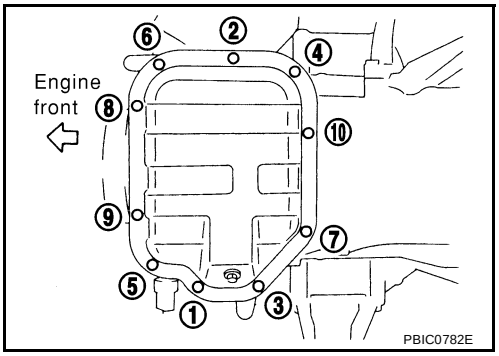
CAUTION:
Do not scratch or damage the mating surfaces when cleaning off old liquid gasket.

b. Apply a continuous bead of liquid gasket with tube presser [SST: WS39930000 (—)] to the oil pan (lower) as shown in the figure.
Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

CAUTION:
Attaching should be done within 5 minutes after coating.



c. Install oil pan (lower).
- Tighten mounting bolts in numerical order as shown in the figure.



4. Install oil pan drain plug.
- Refer to the figure of components of former page for installation direction of drain plug washer. Refer to EM-27, "Removal and Installation" .

5. Install in the reverse order of removal after this step.

NOTE:
At least 30 minutes after oil pan is installed, pour engine oil.

INSPECTION AFTER INSTALLATION

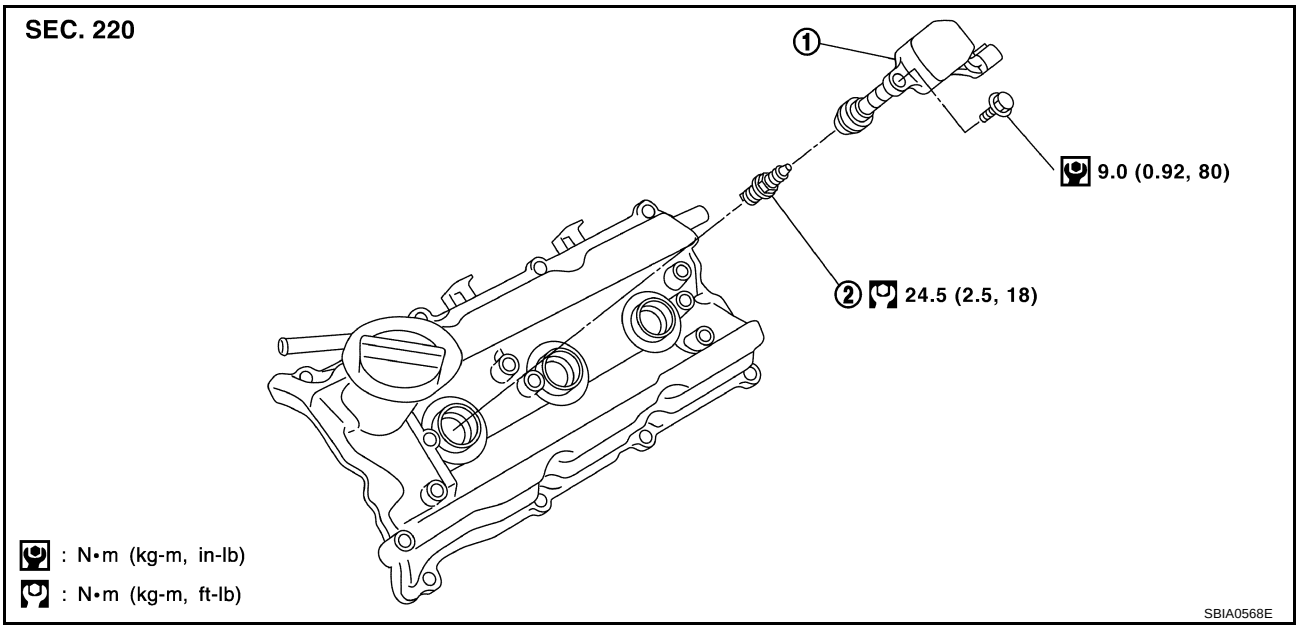
1. Check engine oil level and add engine oil. Refer to LU-6, "ENGINE OIL" .
2. Start engine, and check there is no leak of engine oil.
3. Stop engine and wait for 10 minutes.
4. Check engine oil level again. Refer to LU-6, "ENGINE OIL" .

IGNITION COIL

PFP:22448

Removal and Installation

ABS009YL



1. Ignition coil
2. Spark plug

REMOVAL

1. Remove engine cover with power tool. Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .
2. Remove air cleaner case and air duct. (At the left bank side, remove ignition coil) Refer to EM-14, "AIR CLEANER AND AIR DUCT" .
3. Move aside harness, harness bracket, and hoses located above ignition coil.
4. Disconnect harness connector from ignition coil.
5. Remove ignition coil.

CAUTION:
Do not shock it.

INSTALLATION

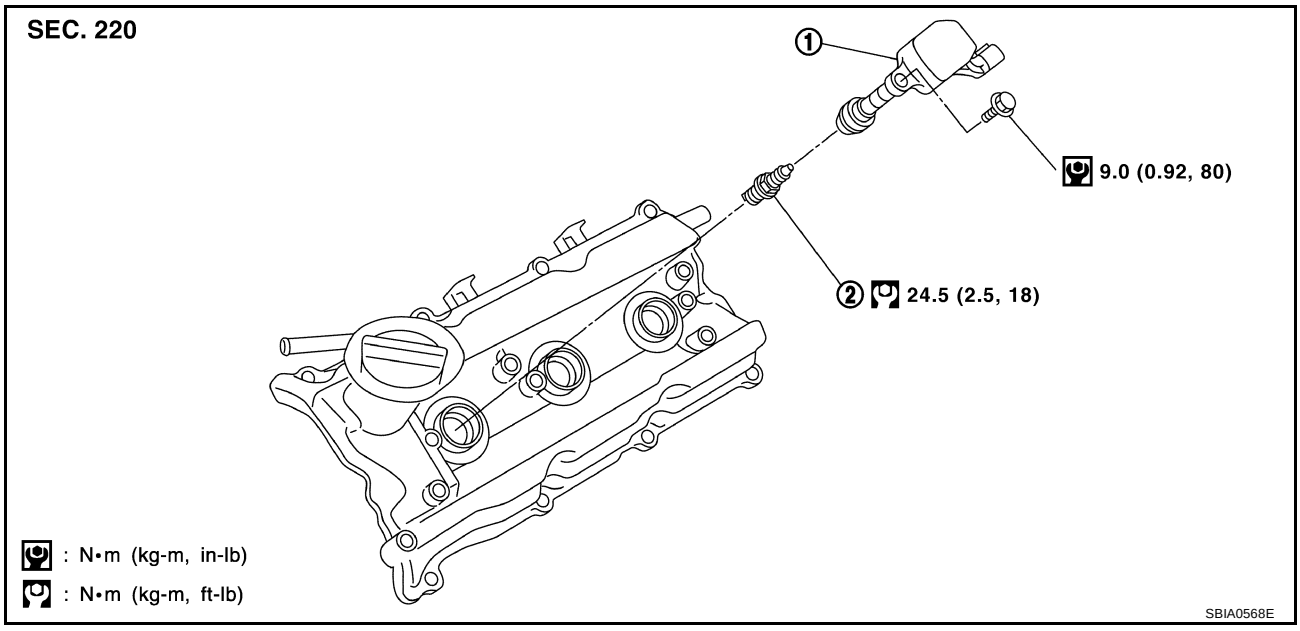
Install in the reverse order of removal.

SPARK PLUG (PLATINUM-TIPPED TYPE)

PFP:22401

Removal and Installation

ABS009YM

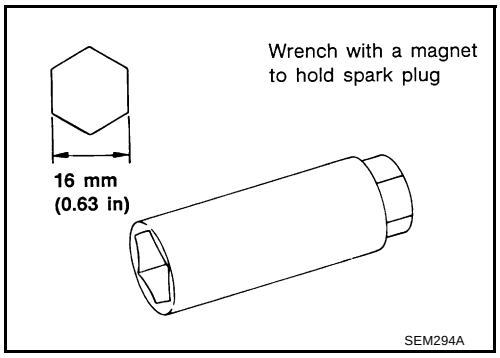


1. Ignition coil
2. Spark plug

REMOVAL

1. Remove engine cover with power tool. Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .
2. Remove ignition coil. Refer to EM-33, "IGNITION COIL" .
3. Remove spark plug using spark plug wrench (commercial service tool).

CAUTION:
Do not drop or shock it.



INSPECTION AFTER REMOVAL

Use standard type spark plug for normal condition.

Hot type spark plug is suitable when fouling occurs with standard type spark plug under conditions such as:

- Frequent engine starts
- Low ambient temperatures

Cold type spark plug is suitable when spark plug knock occurs with standard type spark plug under conditions such as:

- Extended highway driving
- Frequent high engine revolution

Make	NGK
Standard type	PLFR5A-11
Hot type	PLFR4A-11
Cold type	PLFR6A-11

Gap (Nominal) : 1.1 mm (0.043 in)

CAUTION:

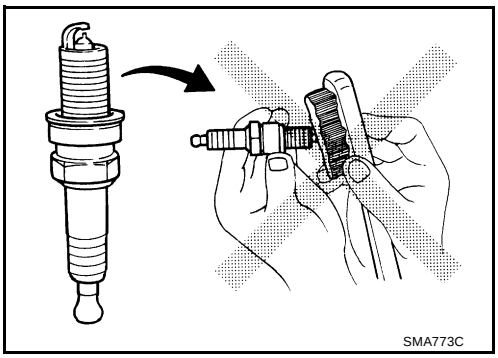
- **Do not drop or shock spark plug.**
- **Do not use wire brush for cleaning.**
- **If plug tip is covered with carbon, spark plug cleaner may be used.**

  Cleaner air pressure:

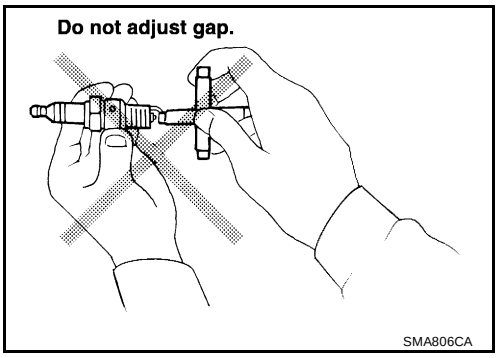
  Less than 588 kPa (6 kg/cm^2 , 85 psi)

  Cleaning time:

  Less than 20 seconds



- **Checking and adjusting plug gap is not required between change intervals.**



INSTALLATION

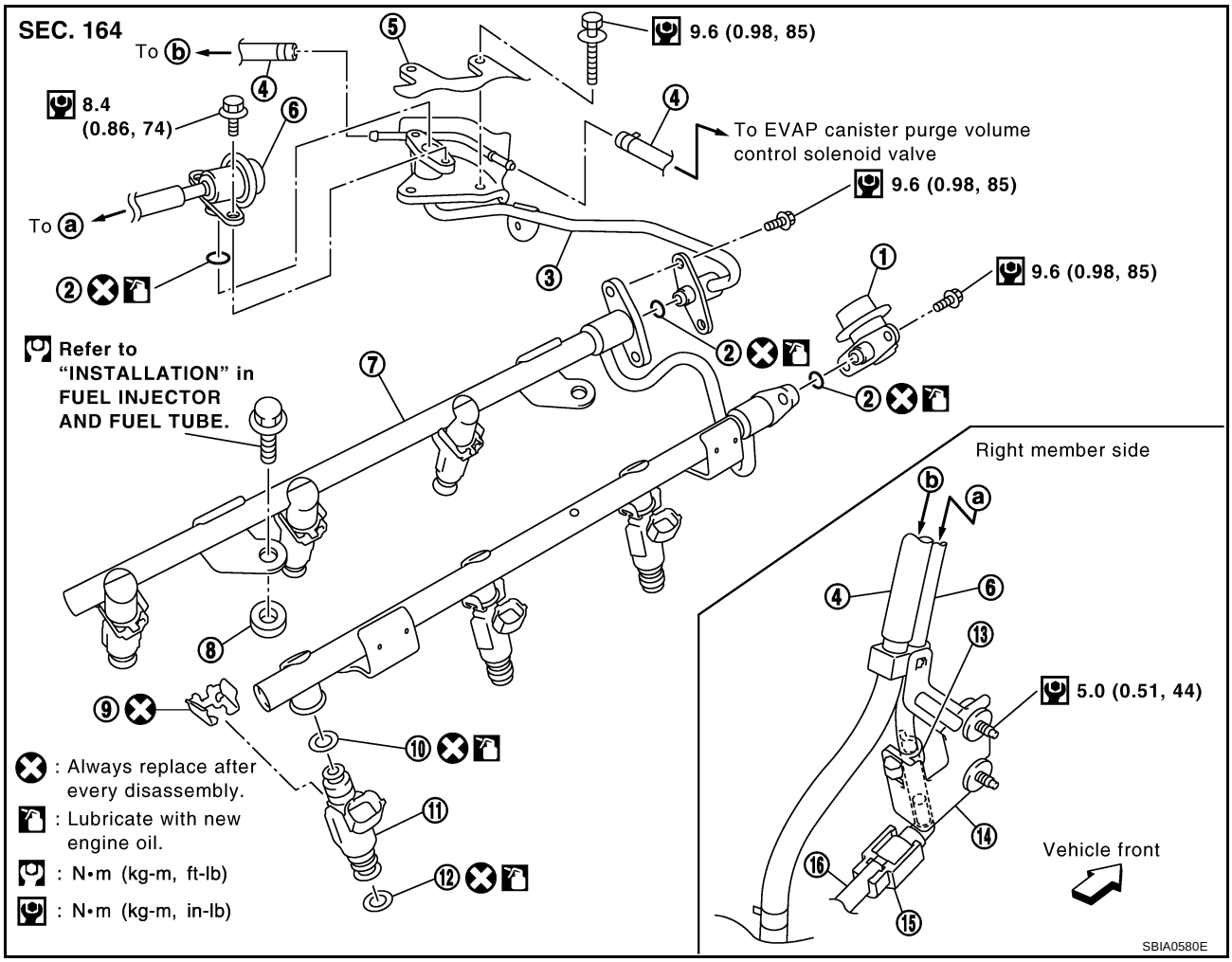
Install in the reverse order of removal.

FUEL INJECTOR AND FUEL TUBE

PFP:16600

Removal and Installation

ABS009YN



1. Fuel damper
2. O-ring
3. Fuel sub-tube
4. EVAP hose
5. Intake manifold collector (lower) rear right side
6. Fuel feed hose (with damper)
7. Fuel tube
8. Spacer
9. Clip
10. O-ring (blue)
11. Fuel injector
12. O-ring (brown)
13. Hose clamp
14. Bracket
15. Quick connector cap
16. Centralized under-floor piping

CAUTION:

Do not remove or disassemble parts unless instructed as shown in the figure.

REMOVAL

WARNING:

- **Put a "CAUTION INFLAMMABLE" sign in the workshop.**
- **Be sure to work in a well ventilated area and furnish workshop with a CO_2 fire extinguisher.**
- **Do not smoke while servicing fuel system. Keep open flames and sparks away from the work area.**
- **To avoid the danger of being scalded, do not drain engine coolant when engine is hot.**

1. Remove engine cover with power tool. Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .
2. Release fuel pressure. Refer to EC-45, "FUEL PRESSURE RELEASE" .
3. Drain engine coolant, or when water hoses are disconnected, attach plug to prevent engine coolant leakage. Refer to CO-9, "Changing Engine Coolant" and EM-16, "INTAKE MANIFOLD COLLECTOR" .

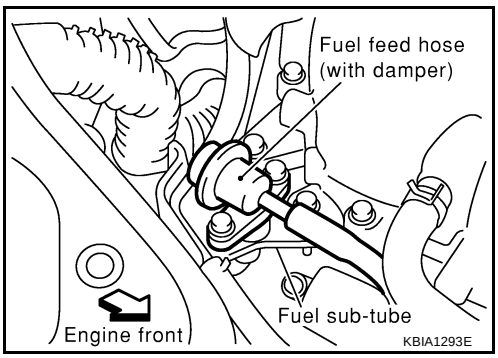
   CAUTION:

   Perform this step when engine is cold.

4. Remove fuel feed hose (with damper) from fuel sub-tube.

NOTE:
There is no fuel return route.

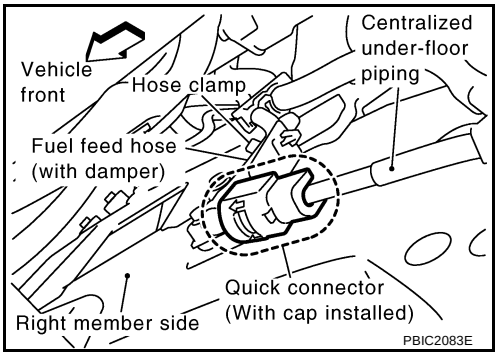
CAUTION:
- **While hoses are disconnected, plug them to prevent fuel from draining.**
- **Do not separate fuel damper and fuel feed hose.**



5. When separating fuel feed hose (with damper) and centralized under-floor piping connection, disconnect quick connector as follows:

a. Remove quick connector cap from quick connector connection on right member side.

b. Disconnect fuel feed hose (with damper) from bracket hose clamp.



c. Disconnect quick connector from centralized under-floor piping as follows:

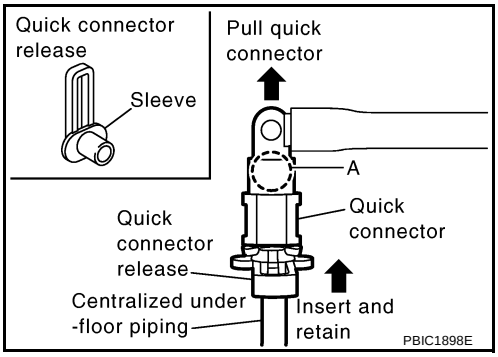
CAUTION:
Disconnect quick connector by using quick connector release [SST: J-45488], not by picking out retainer tabs.

i. With the sleeve side of quick connector release facing quick connector, install quick connector release onto centralized under-floor piping.

ii. Insert quick connector release into quick connector until sleeve contacts and goes no further. Hold quick connector release on that position.

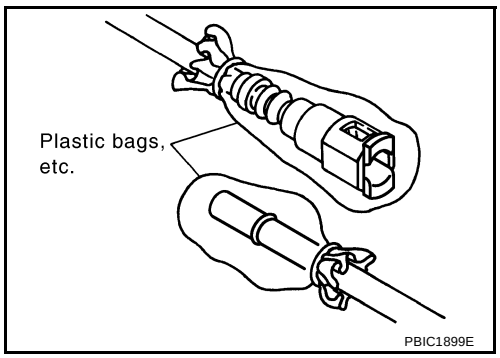
CAUTION:
Inserting quick connector release hard will not disconnect quick connector. Hold quick connector release where it contacts and goes no further.

iii. Draw and pull out quick connector straight from centralized under-floor piping.



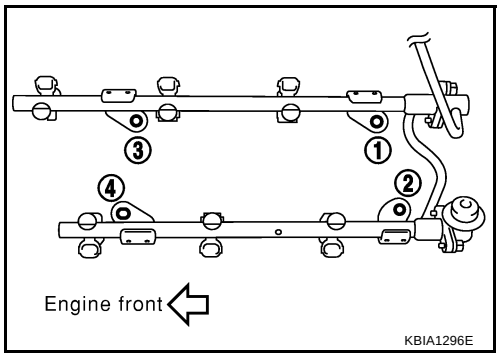
CAUTION:
- **Pull quick connector holding “A” position as shown in the figure.**
- **Do not pull with lateral force applied. O-ring inside quick connector may be damaged.**
- **Prepare container and cloth beforehand as fuel will leak out.**
- **Avoid fire and sparks.**
- **Keep parts away from heat source. Especially, be careful when welding is performed around them.**
- **Do not expose parts to battery electrolyte or other acids.**
- **Do not bend or twist connection between quick connector and fuel feed hose (with damper) during installation/removal.**

- **To keep clean the connecting portion and to avoid damage and foreign materials, cover them completely with plastic bags or something similar.**



6. Remove intake manifold collectors (upper and lower). Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .
7. Disconnect harness connector from fuel injector.
8. Loosen mounting bolts in reverse order as shown in the figure, and remove fuel tube and fuel injector assembly.

   CAUTION:
   Do not tilt it, or remaining fuel in pipes may flow out from pipes.

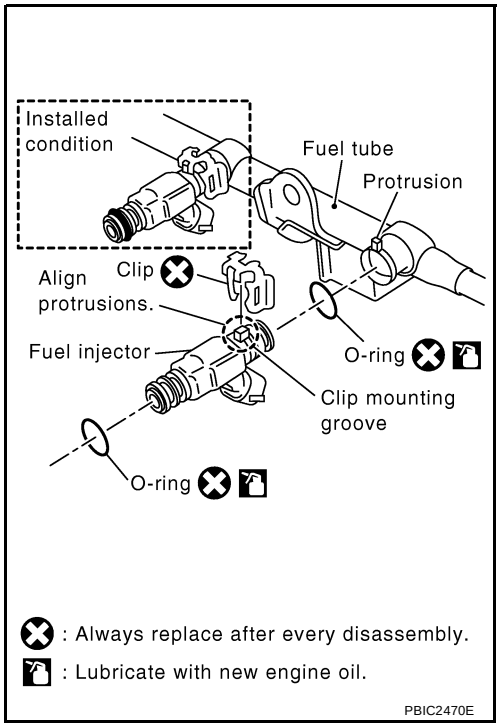


9. Remove spacers on intake manifold.
10. Remove fuel injector from fuel tube as follows:

a. Open and remove clip.

b. Remove fuel injector from fuel tube by pulling straight.

   CAUTION:
   - **Be careful with remaining fuel that may go out from fuel tube.**
   - **Be careful not to damage injector nozzles during removal.**
   - **Do not bump or drop fuel injector.**
   - **Do not disassemble fuel injector.**



11. Remove fuel sub-tube and fuel damper.

INSTALLATION

1. Install fuel damper and fuel sub-tube.
   - When handling new O-rings, be careful of the following caution:

     CAUTION:
     - **Handle O-ring with bare hands. Do not wear gloves.**

- **Lubricate O-ring with new engine oil.**
- **Do not clean O-ring with solvent.**
- **Make sure that O-ring and its mating part are free of foreign material.**
- **When installing O-ring, be careful not to scratch it with tool or fingernails. Also be careful not to twist or stretch O-ring. If O-ring was stretched while it was being attached, do not insert it quickly into fuel tube.**
- **Insert O-ring straight into fuel tube. Do not decenter or twist it.**
- Insert fuel damper and fuel sub-tube straight into fuel tube.
- Tighten mounting bolts evenly in turn.
- After tightening mounting bolts, make sure that there is no gap between flange and fuel tube.

2. Install O-rings to fuel injector, paying attention to the following.

CAUTION:

- **Upper and lower O-ring are different. Be careful not to confuse them.**

Fuel tube side : Blue
Nozzle side : Brown

- **Handle O-ring with bare hands. Do not wear gloves.**
- **Lubricate O-ring with new engine oil.**
- **Do not clean O-ring with solvent.**
- **Make sure that O-ring and its mating part are free of foreign material.**
- **When installing O-ring, be careful not to scratch it with tool or fingernails. Also be careful not to twist or stretch O-ring. If O-ring was stretched while it was being attached, do not insert it quickly into fuel tube.**
- **Insert O-ring straight into fuel injector. Do not decenter or twist it.**

3. Install fuel injector to fuel tube as follows:

a. Insert clip into clip mounting groove on fuel injector.

- Insert clip so that protrusion “A” of fuel injector matches cutout “A” of clip.

CAUTION:

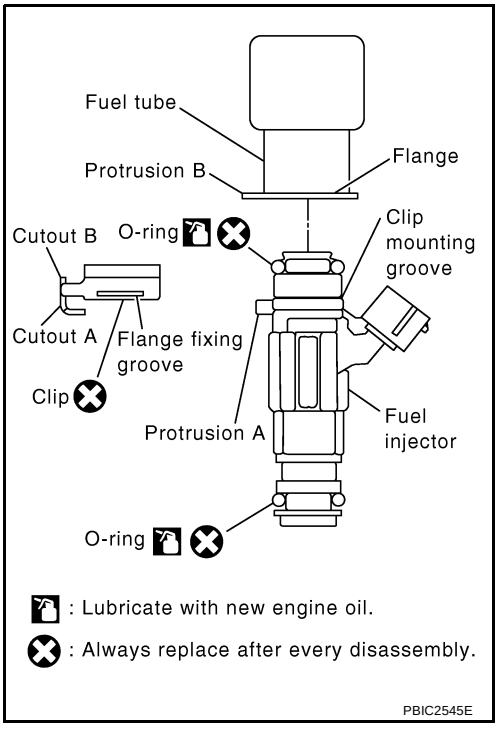
- **Do not reuse clip. Replace it with a new one.**
- **Be careful to keep clip from interfering with O-ring. If interference occurs, replace O-ring.**

b. Insert fuel injector into fuel tube with clip attached.

- Insert it while matching it to the axial center.
- Insert fuel injector so that protrusion “B” of fuel tube matches cutout “B” of clip.
- Make sure that fuel tube flange is securely fixed in flange fixing groove on clip.

c. Make sure that installation is complete by checking that fuel injector does not rotate or come off.

- Make sure that protrusions of fuel injectors are aligned with cutouts of clips after installation.



4. Install spacers on intake manifold.
5. Install fuel tube and fuel injector assembly to intake manifold.

CAUTION:

Be careful not to let tip of injector nozzle come in contact with other parts.

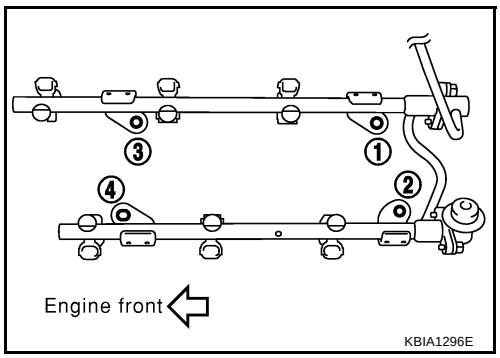
- Tighten mounting bolts in two steps in numerical order as shown in the figure.

1st step

: 9.3 - 10.8 N·m (0.95 - 1.1 kg-m, 6.9 - 7.9 ft-lb)

2nd step

: 20.6 - 26.5 N·m (2.1 - 2.7 kg-m, 16 - 19 ft-lb)



6. Connect fuel injector harness connector.
7. Install intake manifold collectors (upper and lower). Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .
8. Install fuel sub-tube on rear end of intake manifold collector (lower).
9. Connect fuel feed hose (with damper).
   - Handling procedure of O-ring is the same as that of fuel damper and fuel sub-tube.
   - Insert fuel damper straight into fuel sub-tube.
   - Tighten mounting bolts evenly in turn.
   - After tightening mounting bolts, make sure that there is no gap between flange and fuel sub-tube.
10. Connect quick connector between fuel feed hose (with damper) and centralized under-floor piping connection as follows:

a. Make sure no foreign substances are deposited in and around centralized under-floor piping and quick connector, and no damage on them.

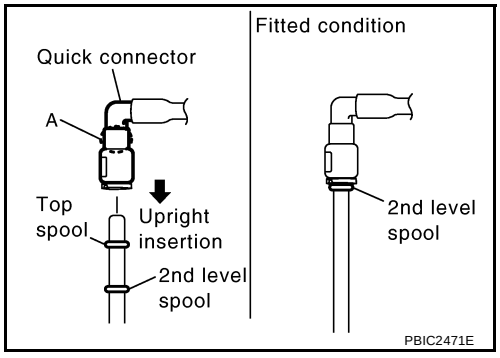
b. Thinly apply new engine oil around centralized under-floor piping from tip end to spool end.

c. Align center to insert quick connector straightly into centralized under-floor piping.

- Insert quick connector to centralized under-floor piping until top spool is completely inside quick connector, and 2nd level spool exposes right below quick connector.

CAUTION:

- **Hold “A” position as shown in the figure when inserting centralized under-floor piping into quick connector.**
- **Carefully align center to avoid inclined insertion to prevent damage to O-ring inside quick connector.**
- **Insert until you hear a “click” sound and actually feel the engagement.**
- **To avoid misidentification of engagement with a similar sound, be sure to perform the next step.**



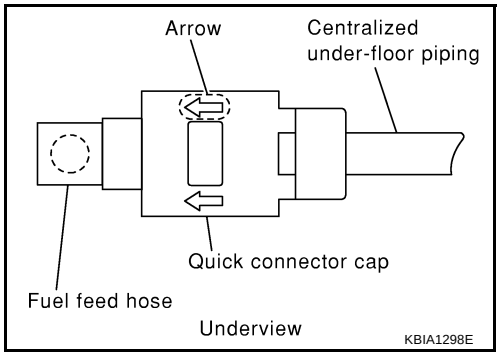
d. Pull quick connector by hand holding “A” position. Make sure it is completely engaged (connected) so that it does not come out from centralized under-floor piping.

e. Install quick connector cap to quick connector connection.

- Install quick connector cap with arrow on surface facing in direction of quick connector (fuel feed hose side).

CAUTION:

If cap cannot be installed smoothly, quick connector may have not been installed correctly. Check connection again.



11. Install in the reverse order of removal after this step.

INSPECTION AFTER INSTALLATION

Check on Fuel Leakage

1. Turn ignition switch “ON” (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.

   NOTE:
   Use mirrors for checking at points out of clear sight.

2. Start engine. With engine speed increased, check again for fuel leakage at connection points.

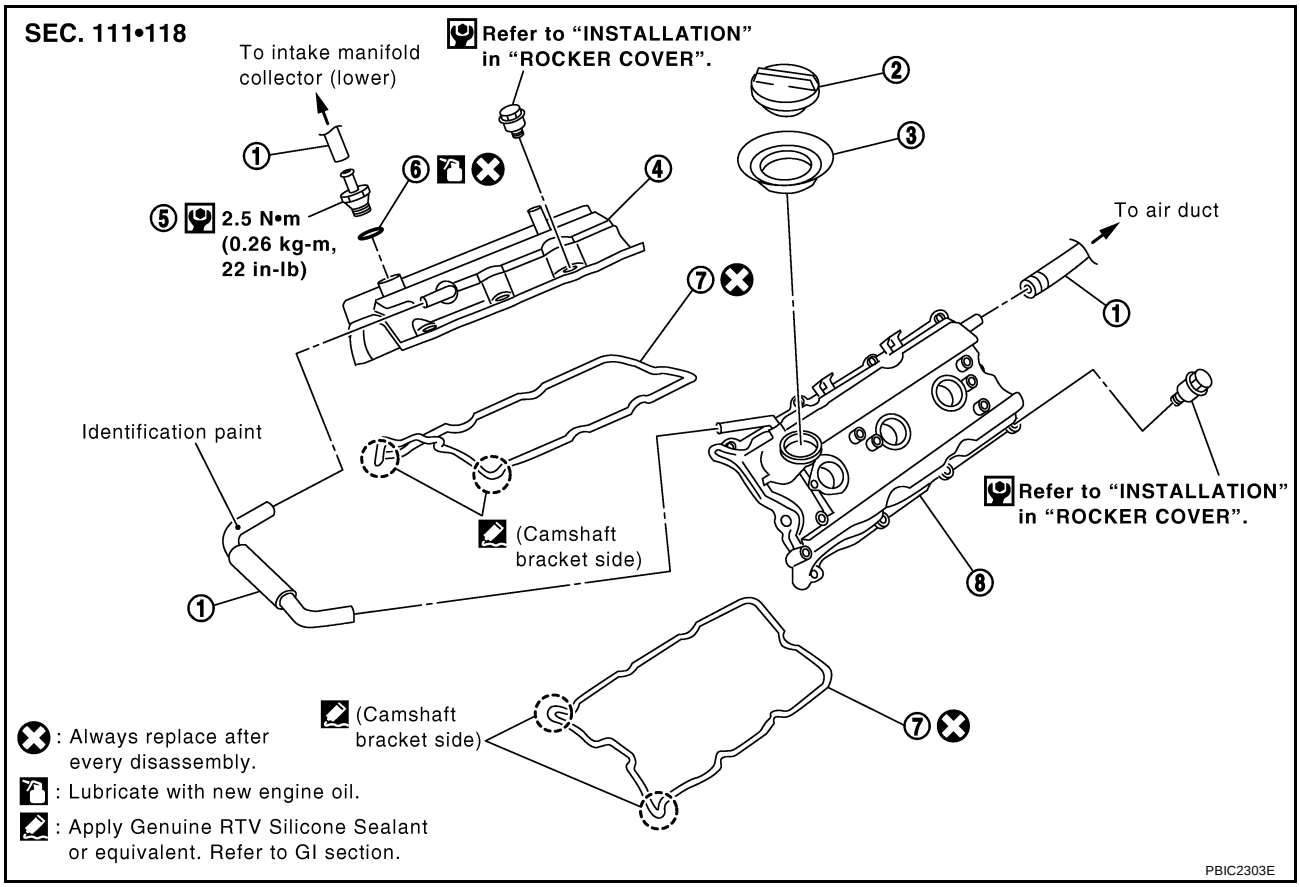
   CAUTION:
   Do not touch engine immediately after stopped, as engine becomes extremely hot.

ROCKER COVER

PFP:13264

Removal and Installation

ABS009YO



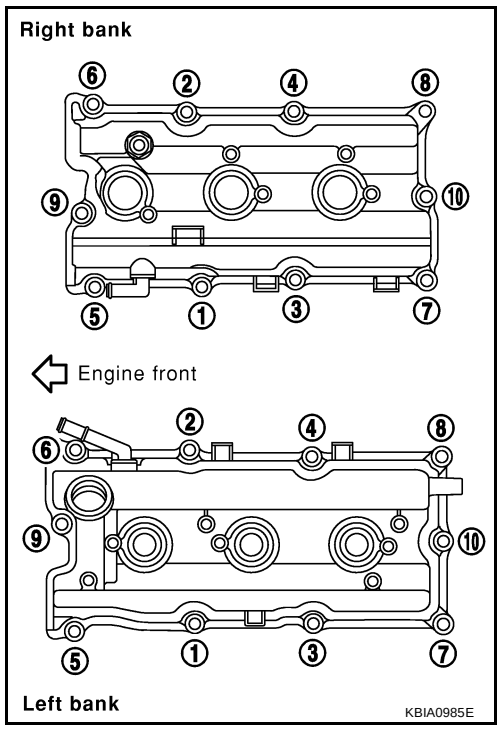
1. PCV hose
2. Oil filler cap
3. Oil catcher
4. Rocker cover (right bank)
5. PCV valve
6. O-ring
7. Rocker cover gasket
8. Rocker cover (left bank)

REMOVAL

1. Remove engine cover. Refer to EM-16, "INTAKE MANIFOLD COLLECTOR"
2. Release the fuel pressure. Refer to EC-45, "FUEL PRESSURE RELEASE" .
3. Drain engine coolant, or when water hoses are disconnected, attach plug to prevent engine coolant leakage. Refer to CO-9, "Changing Engine Coolant" and EM-16, "INTAKE MANIFOLD COLLECTOR" .

   CAUTION:
   Perform this step when engine is cold.
4. Remove intake manifold collectors (upper and lower). Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .
5. Separate engine harness removing their brackets from rocker covers.
6. Remove ignition coil. Refer to EM-33, "IGNITION COIL" .
7. Remove PCV hoses from rocker covers.
8. Remove PCV valve and O-ring from rocker cover (right bank), if necessary.
9. Remove oil filler cap from rocker cover (left bank), if necessary.

10. Loosen mounting bolts with power tool in reverse order as shown in the figure.



11. Remove rocker cover gaskets from rocker covers.
12. Use scraper to remove all trances of liquid gasket from cylinder head and camshaft bracket (No. 1).

CAUTION:
Do not scratch or damage the mating surface when cleaning off old liquid gasket.

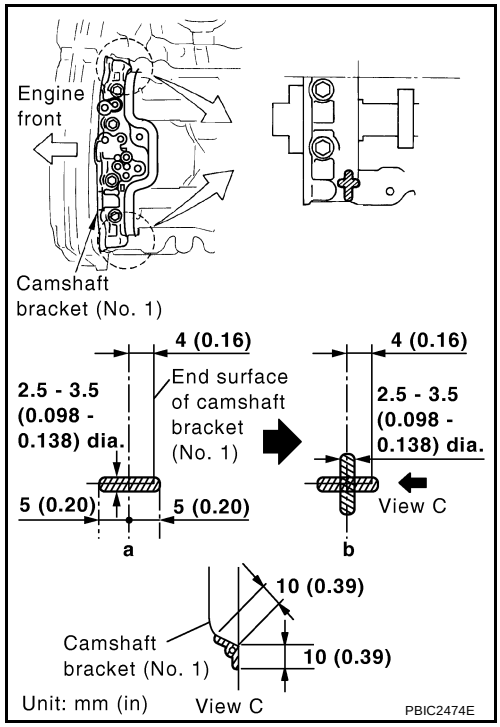
INSTALLATION

1. Apply liquid gasket with tube presser [SST: WS39930000 (—)] to joint part among rocker cover, cylinder head and camshaft bracket (No. 1) as follows:
   Use Genuine RTV Silicone Sealant or equivalent. Refer to **GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS"** **.**

   NOTE:
   The figure shows an example of left bank side [zoomed in shows camshaft bracket (No. 1)].

a. Refer to the figure “a” to apply liquid gasket to joint part of camshaft bracket (No. 1) and cylinder head.

b. Refer to the figure “b” to apply liquid gasket to the figure “a” squarely.



2. Install new rocker cover gasket to rocker cover.
3. Install rocker cover.
   - Check if rocker cover gasket is not dropped from installation groove of rocker cover.

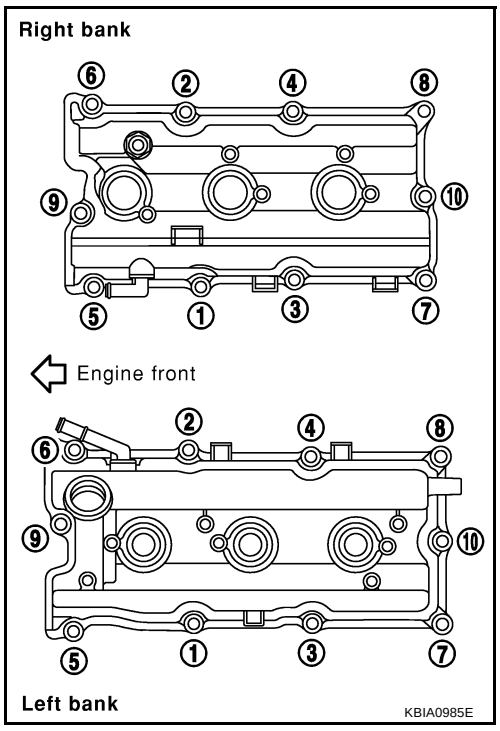
4. Tighten bolts in two steps separately in numerical order as shown in the figure.

   1st step

   : 0.96 - 2.96 N·m (0.10 - 0.30 kg-m, 9 - 26 in-lb)

   2nd step

   : 7.33 - 9.33 N·m (0.75 - 0.95 kg-m, 65 - 82 in-lb)



5. Install oil filer cap to rocker cover (left bank), if removed.
6. Install new O-ring and PCV valve to rocker cover (right bank), if removed.
7. Install PCV hose.
   - Insert PCV hose by 25 to 30 mm (0.98 to 1.18 in) from connector end.
   - When installing, be careful not to twist or come in contact with other parts.
   - Install PCV hose between right and left rocker covers with its identification paint facing upward (right rocker cover side). Refer to component figure in EM-42, "Removal and Installation" .
8. Install in the reverse order of removal after this step.

FRONT TIMING CHAIN CASE

PFP:13599

Removal and Installation

ABS009YP

NOTE:

- This section describes removal/installation procedure of front timing chain case and timing chain related parts without removing oil pan (upper) on vehicle.
- When oil pan (upper) needs to be removed or installed, or when rear timing chain case is removed or installed, remove oil pans (upper and lower) first. Then remove front timing chain case, timing chain related parts, and rear timing chain case in this order, and install in the reverse order of removal. Refer to EM-55, "TIMING CHAIN" .
- Refer to EM-55, "TIMING CHAIN" for component parts location.

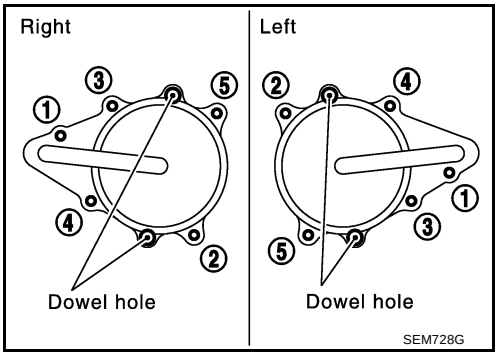
REMOVAL

1. Remove engine cover with power tool. Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .
2. Remove undercover with power tool.
3. Release the fuel pressure. Refer to EC-45, "FUEL PRESSURE RELEASE" .
4. Drain engine oil. Refer to LU-8, "Changing Engine Oil" .

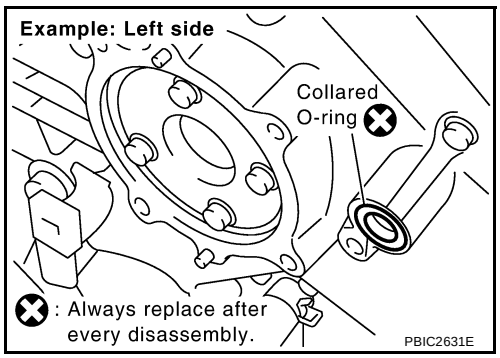
   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine oil on drive belts.**
5. Drain engine coolant from radiator. Refer to CO-9, "Changing Engine Coolant" .

   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine coolant on drive belts.**
6. Remove radiator cooling fan assembly. Refer to CO-19, "COOLING FAN" .
7. Separate engine harnesses removing their brackets from front timing chain case.
8. Remove drive belts. Refer to EM-12, "DRIVE BELTS" .
9. Remove power steering oil pump from bracket with piping connected, and temporarily secure it to aside. Refer to PS-29, "POWER STEERING OIL PUMP" .
10. Remove power steering oil pump bracket. Refer to PS-29, "POWER STEERING OIL PUMP" .
11. Remove alternator. Refer to SC-21, "CHARGING SYSTEM" .
12. Remove water bypass hose, water hose clamp and idler pulley bracket from front timing chain case.
13. Remove right and left intake valve timing control covers.
    - Loosen mounting bolts in reverse order as shown in the figure.
    - Use seal cutter [SST: KV10111100 (J37228)] to cut liquid gasket for removal.

    CAUTION:
    Shaft is internally jointed with camshaft sprocket (INT) center hole. When removing, keep it horizontal until it is completely disconnected.



14. Remove collared O-ring from front timing chain case (left and right side).



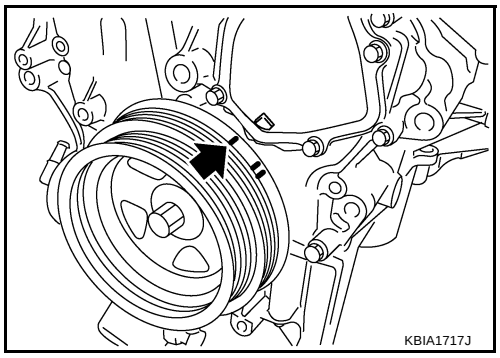
15. Remove rocker covers (right and left banks). Refer to EM-42, "ROCKER COVER" .

NOTE:
When only timing chain (primary) is removed, rocker cover does not need to be removed.

16. Obtain No. 1 cylinder at TDC of its compression stroke as follows:

NOTE:
When timing chain is not removed/installed, this step is not required.

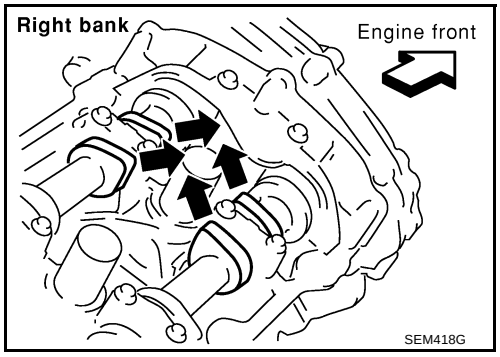
a. Rotate crankshaft pulley clockwise to align timing mark (grooved line without color) with timing indicator.



b. Make sure that intake and exhaust cam noses on No. 1 cylinder (engine front side of right bank) are located as shown in the figure.

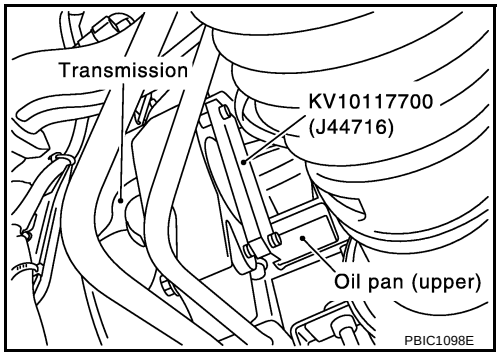
- If not, turn crankshaft one revolution (360 degrees) and align as shown in the figure.

NOTE:
When only timing chain (primary) is removed, rocker cover does not need to be removed. To make sure that No. 1 cylinder is at its compression TDC, remove front timing chain case first. Then check mating marks on camshaft sprockets. Refer to EM-64, "INSTALLATION" .



17. Remove crankshaft pulley as follows:

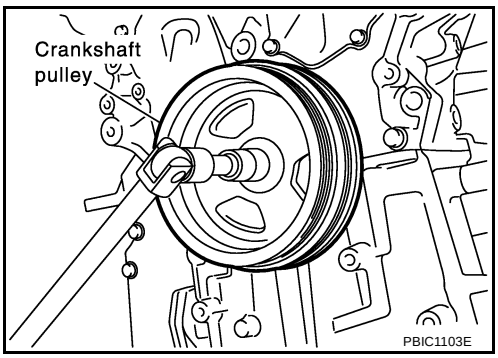
a. Remove starter motor and set ring gear stopper [SST] as shown in the figure. Refer to SC-10, "STARTING SYSTEM" .



b. Loosen crankshaft pulley bolt and locate bolt seating surface as 10 mm (0.39 in) from its original position.

CAUTION:

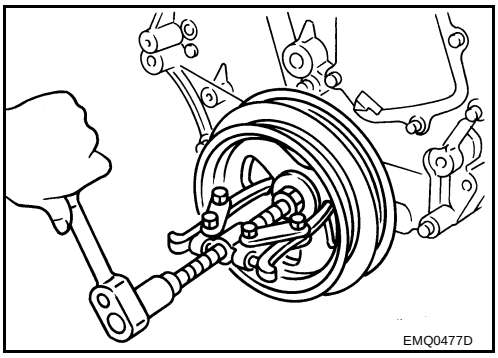
Do not remove crankshaft pulley bolt as it will be used as a supporting point for suitable puller.



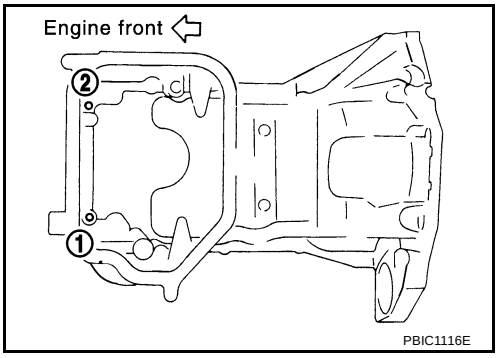
c. Place suitable puller tab on holes of crankshaft pulley, and pull crankshaft pulley through.

CAUTION:

Do not put suitable puller tab on crankshaft pulley periphery, as this will damage internal damper.

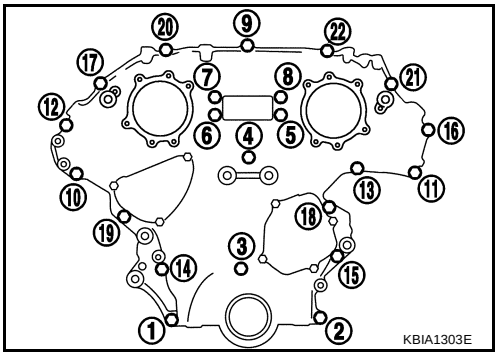


18. Remove oil pan (lower). Refer to EM-27, "OIL PAN AND OIL STRAINER" .
19. Loosen two mounting bolts in front of oil pan (upper) in reverse order as shown in the figure.



20. Remove front timing chain case as follows:

a. Loosen mounting bolts in reverse order as shown in the figure.



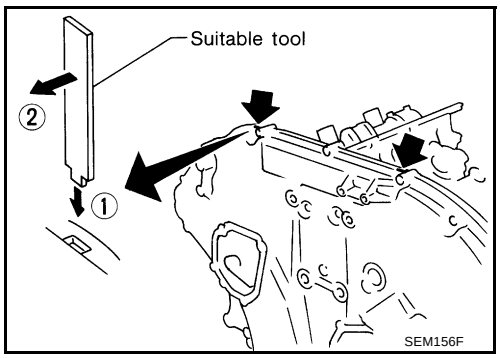
b. Insert suitable tool into the notch at the top of the front timing chain case as shown (1).

c. Pry off case by moving tool as shown (2).

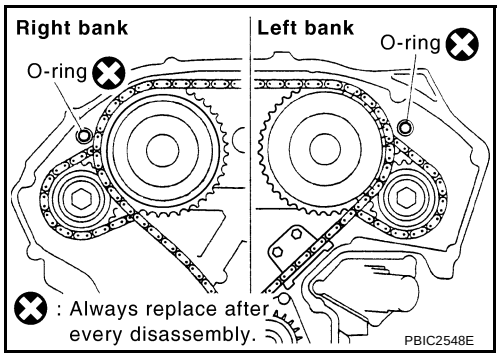
- Use seal cutter [SST: KV10111100 (J37228)] to cut liquid gasket for removal.

CAUTION:

- **Do not use flat-blade screwdriver or something similar.**
- **After removal, handle front timing chain case carefully so it does not tilt, cant, or warp under a load.**



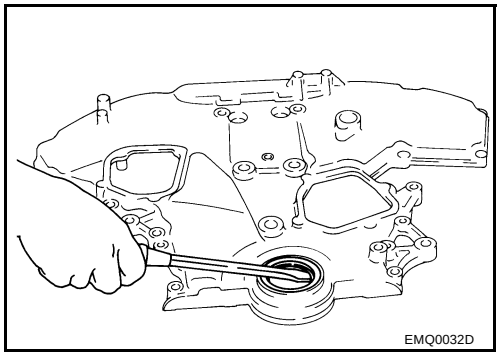
21. Remove O-rings from rear timing chain case.



22. Remove oil pan gasket. Refer to EM-27, "OIL PAN AND OIL STRAINER" .
23. Remove water pump cover and chain tensioner cover from front timing chain case.
    - Use seal cutter [SST: KV10111100 (J37228)] or equivalent tool to cut liquid gasket for removal.
24. Remove front oil seal from front timing chain case using suitable tool.
    - Use screwdriver for removal.

CAUTION:

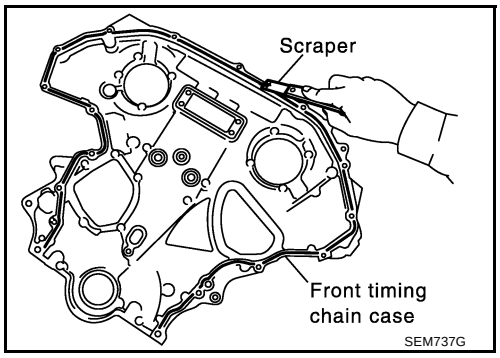
Be careful not to damage front timing chain case.



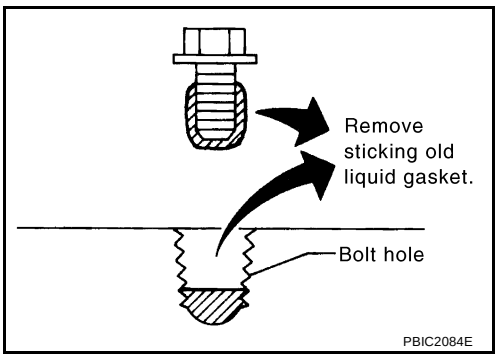
25. Remove timing chain and related parts. Refer to EM-55, "TIMING CHAIN" .
26. Use scraper to remove all traces of old liquid gasket from front and rear timing chain cases and oil pan (upper), and liquid gasket mating surfaces.

CAUTION:

Be careful not to allow gasket fragments to enter oil pan.

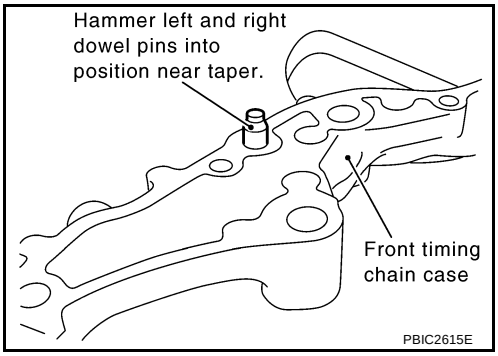


- Remove old liquid gasket from bolt hole and thread.

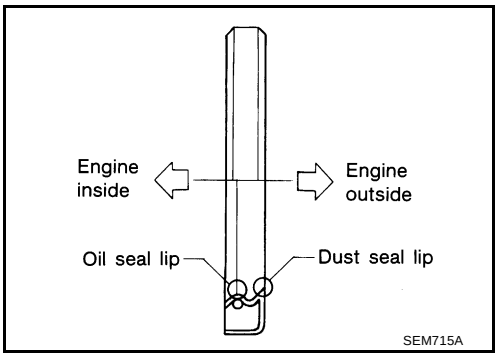


INSTALLATION

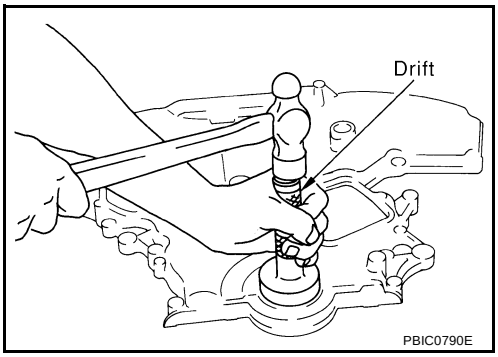
1. Install timing chain and related parts. Refer to EM-55, "TIMING CHAIN" .
2. Hammer dowel pins (right and left) into front timing chain case up to a point close to taper in order to shorten protrusion length.



3. Install new front oil seal on the front timing chain case.
   - Apply new engine oil to both oil seal lip and dust seal lip.
   - Install it so that each seal lip is oriented as shown in the figure.

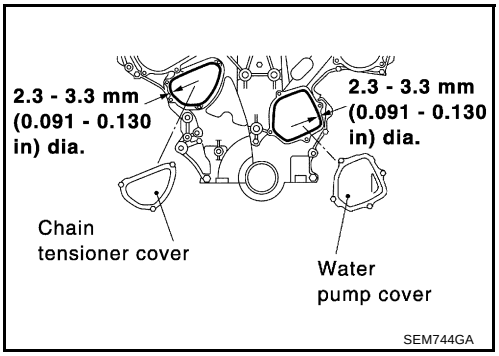


   - Using suitable drift [outer diameter: 60 mm (2.36 in)], press-fit oil seal until it becomes flush with front timing chain case end face.
   - Make sure the garter spring is in position and seal lip is not inverted.



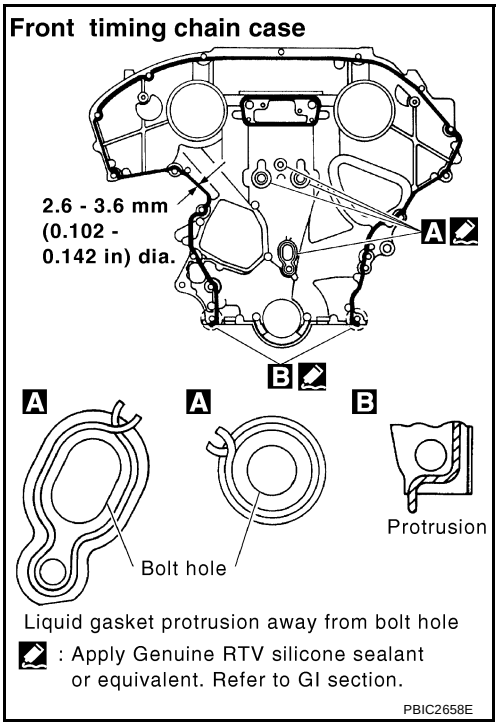
4. Install water pump cover and chain tensioner cover to front timing chain case.

- Apply a continuous bead of liquid gasket with tube presser [SST: WS39930000 (—)] to front timing chain case as shown in the figure.
  Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .



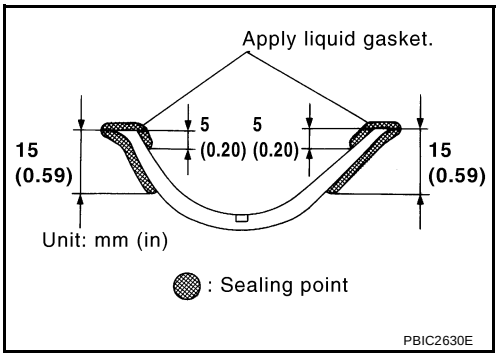
5. Install front timing chain case as follows:

a. Apply a continuous bead of liquid gasket with tube presser [SST: WS39930000 (—)] to front timing chain case back side as shown in the figure.
Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

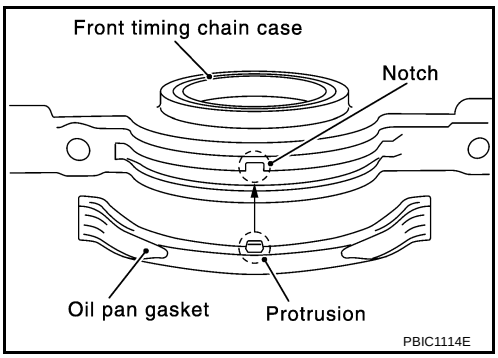


b. Install new oil pan gasket.

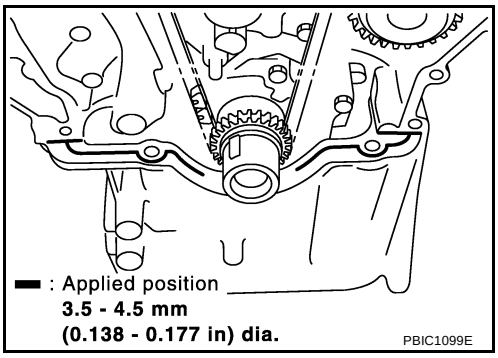
- Apply liquid gasket to oil pan gasket as shown in the figure.
  Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .



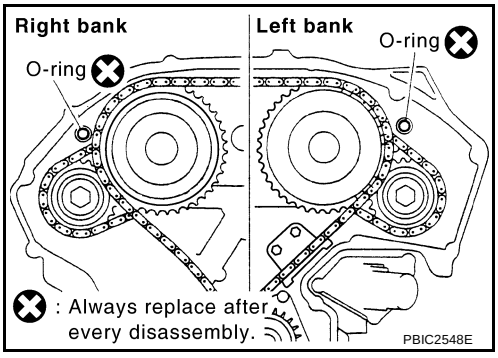
- Align notch of front timing chain case with protrusion of oil pan gasket.



- Apply liquid gasket with tube presser [SST: WS39930000 (—)] to top surface of oil pan (upper) as shown in the figure.
  Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .



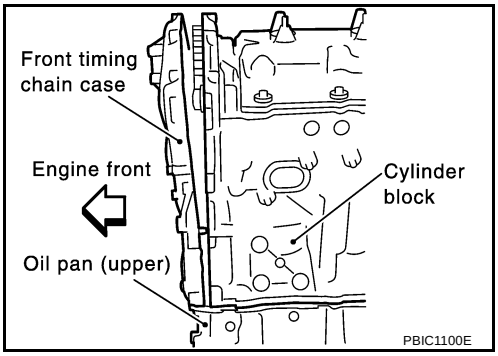
c. Install new O-rings on rear timing chain case.



d. Assemble front timing chain case as follows:

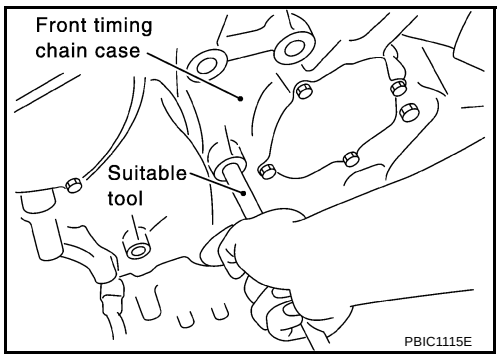
i. Fit lower end of front timing chain case tightly onto top face of oil pan (upper). From the fitting point, make entire front timing chain case contact rear timing chain case completely.

CAUTION:
Be careful that oil pan gasket is in place.



ii. Since front timing chain case is offset for difference of bolt holes, tight bolts temporarily with holding front timing chain case from front and top as shown in the figure.

iii. Same as the step ii, insert dowel pin with holding front timing chain case from front and top completely.



e. Tighten mounting bolts to the specified torque in numerical order as shown in the figure.

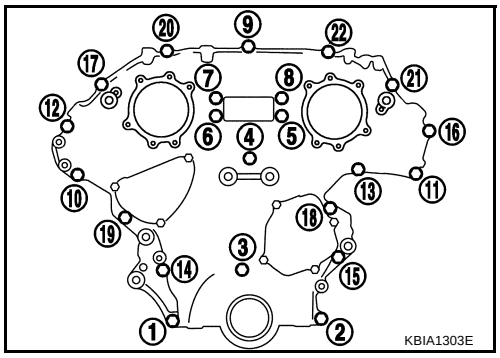
- There are two type of mounting bolts. Refer to the following for locating bolts.

M8 bolts : 1, 2

: 25.5 - 31.3 N·m (2.6 - 3.2 kg-m, 19 - 23 ft-lb)

M6 bolts : Except the above

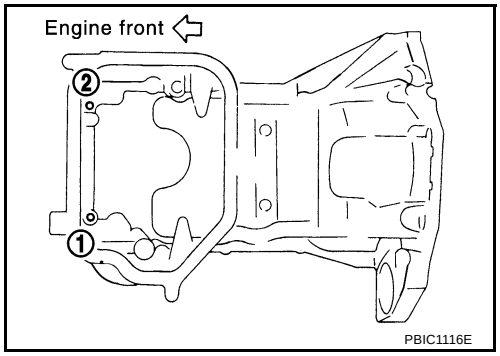
: 11.7 - 13.7 N·m (1.2 - 1.4 kg-m, 9 - 10 ft-lb)



f. After all bolts tightened, retighten them to the specified torque in numerical order as shown in the figure.

6. Install two mounting bolts in front of oil pan (upper) in numerical order as shown in the figure.

: 15.7 - 18.6 N·m (1.6 - 1.9 kg-m, 12 - 13 ft-lb)

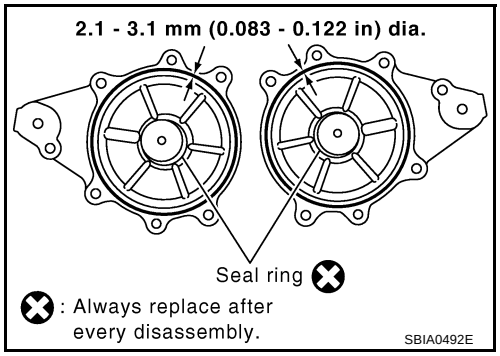


7. Install oil pan (lower). Refer to EM-27, "OIL PAN AND OIL STRAINER" .

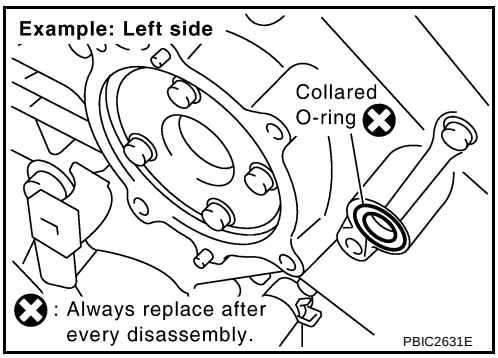
8. Install right and left intake valve timing control covers as follows:

a. Install new seal rings in shaft grooves.

b. Apply a continuous bead of liquid gasket with tube presser [SST: WS39930000 (—)] to intake valve timing control covers as shown in the figure.
Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

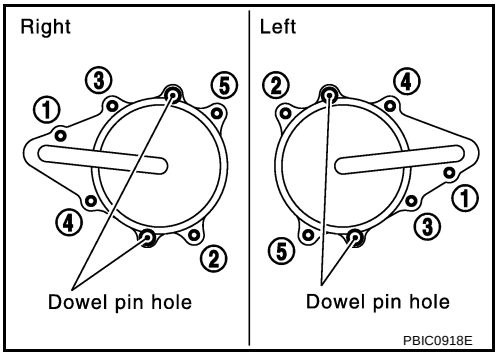


c. Install new collared O-rings in front timing chain case oil hole (left and right sides).



d. Being careful not to move seal ring from the installation groove, align dowel pins on front timing chain case with the holes to install intake valve timing control covers.

e. Tighten mounting bolts in numerical order as shown in the figure.



9. Install crankshaft pulley as follows:

a. Fix crankshaft using ring gear stopper [SST: KV10117700 (J44716)].

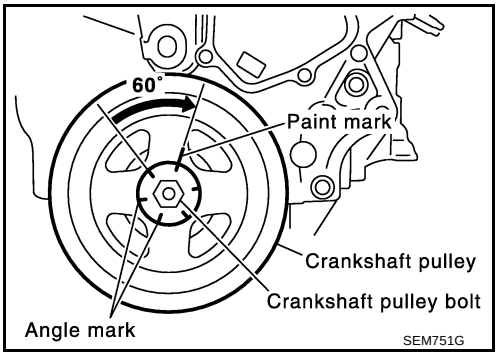
b. Install crankshaft pulley, taking care not to damage front oil seal.

- When press-fitting crankshaft pulley with plastic hammer, tap on its center portion (not circumference).

c. Tighten crankshaft pulley bolt.

: 39.2 - 49.0 N·m (4.0 - 5.0 kg-m, 29 - 36 ft-lb)

d. Put a paint mark on crankshaft pulley aligning with angle mark on crankshaft pulley bolt. Then, further retighten bolt by 60 to 65 degrees [Target: 60 degrees (equivalent to one graduation)].



10. Rotate crankshaft pulley in normal direction (clockwise when viewed from front) to confirm it turns smoothly.

11. Install in the reverse order of removal after this step.

NOTE:
If hydraulic pressure inside timing chain tensioner drops after removal/installation, slack in the guide may generate a pounding noise during and just after engine start. However, this is normal. Noise will stop after hydraulic pressure rises.

INSPECTION AFTER INSTALLATION

- Before starting engine, check the levels of engine coolant, lubrications and working fluid. If less than required quantity, fill to the specified level.
- Run engine to check for unusual noise and vibration.

- Warm up engine thoroughly to make sure there is no leakage of engine coolant, engine oil and working fluid, fuel and exhaust gas.
- Bleed air from passages in pipes and tubes of applicable lines, such as in cooling system.
- After cooling down engine, again check levels of engine coolant, engine oil and working fluid. Refill to the specified level, if necessary.

Summary of the inspection items:

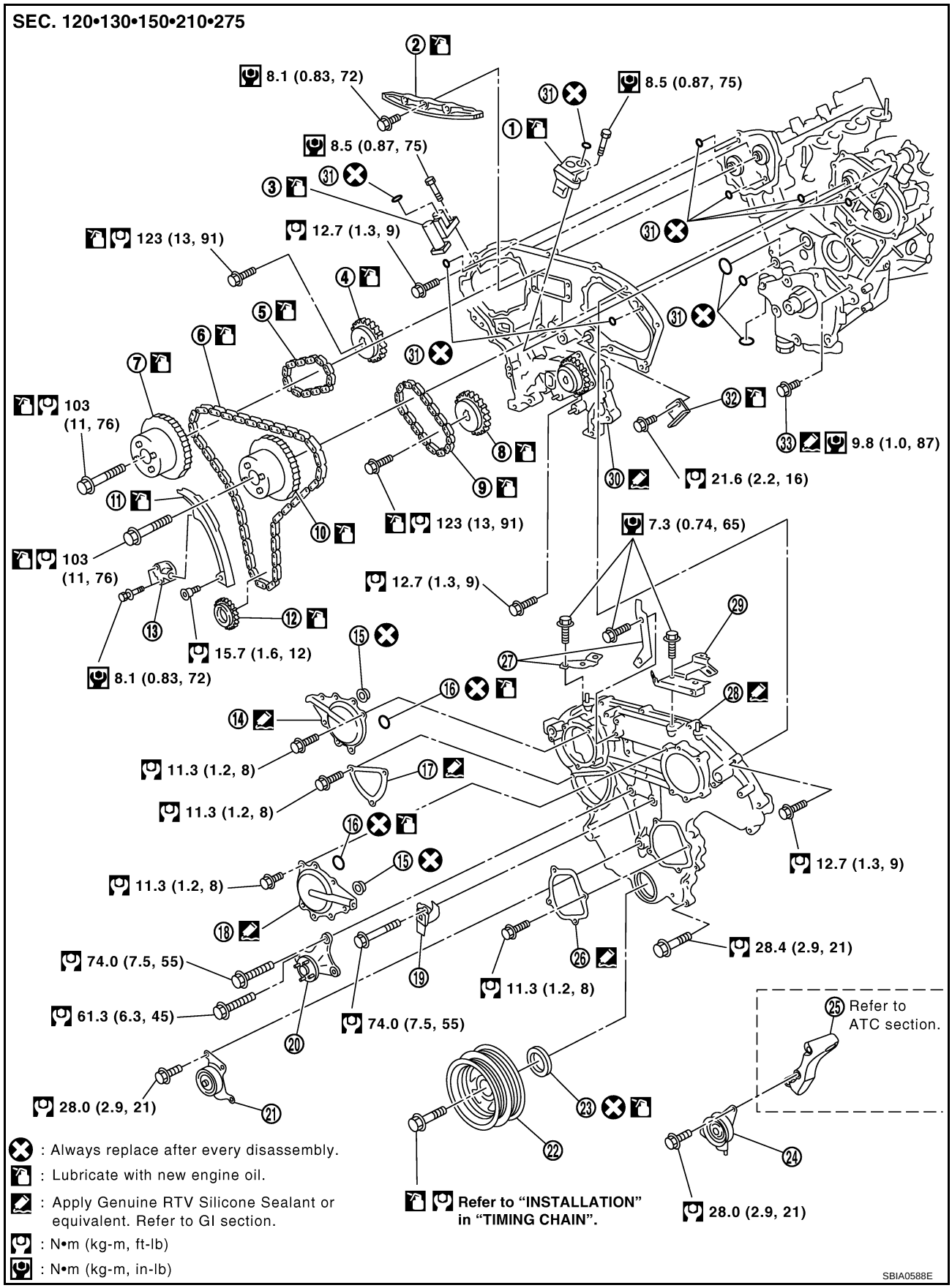
Item	Before starting engine	Engine running	After engine stopped
Engine coolant	Level	Leakage	Level
Engine oil	Level	Leakage	Level
Working fluid	Level	Leakage	Level

TIMING CHAIN

PFP:13028

Removal and Installation

ABS009YQ



1. Timing chain tensioner (secondary)
2. Internal chain guide
3. Timing chain tensioner (secondary)
4. Camshaft sprocket (EXH)
5. Timing chain (secondary)
6. Timing chain (primary)
7. Camshaft sprocket (INT)
8. Camshaft sprocket (EXH)
9. Timing chain (secondary)
10. Camshaft sprocket (INT)
11. Slack guide
12. Crankshaft sprocket
13. Timing chain tensioner (primary)
14. Intake valve timing control cover
15. Collared O-ring
16. O-ring
17. Chain tensioner cover
18. Intake valve timing control cover
19. Water hose clamp
20. Idler pulley bracket
21. Idler pulley
22. Crankshaft pulley
23. Front oil seal
24. Idler pulley
25. A/C compressor bracket
26. Water pump cover
27. Bracket
28. Front timing chain case
29. Bracket
30. Rear timing chain case
31. O-ring
32. Tension guide
33. Water drain plug (Front)

NOTE:

- This section describes procedures for removing/installing front timing chain case and timing chain related parts, and rear timing chain case, when oil pan (upper) needs to be removed/installed for engine overhaul, etc.
- To remove/install front timing chain case, timing chain, and its related parts without removing oil pan (upper), refer to EM-45, "FRONT TIMING CHAIN CASE" .

REMOVAL

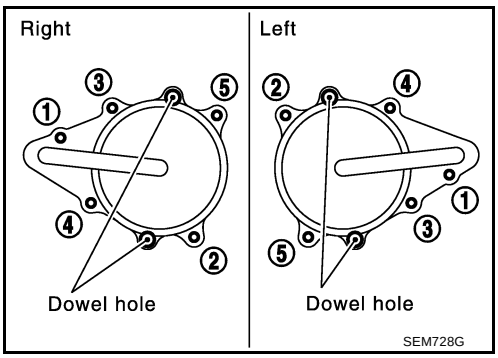
1. Remove engine cover with power tool. Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .
2. Remove air cleaner case assembly. Refer to EM-14, "AIR CLEANER AND AIR DUCT" .
3. Remove undercover with power tool.
4. Drain engine coolant from radiator. Refer to CO-9, "Changing Engine Coolant" .

   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine coolant on drive belts.**
5. Drain engine oil. Refer to LU-8, "Changing Engine Oil" .

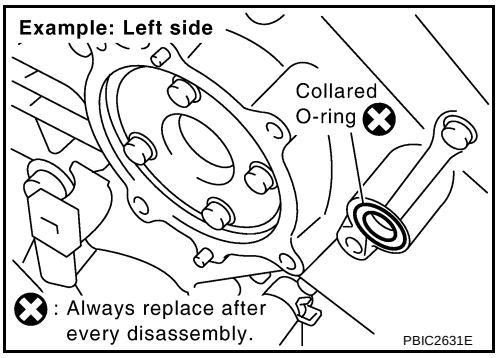
   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine oil on drive belts.**
6. Separate engine harnesses removing their brackets from front timing chain case.
7. Remove intake manifold collectors (upper and lower). Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .
8. Remove radiator cooling fan assembly. Refer to CO-19, "COOLING FAN" .
9. Remove drive belts. Refer to EM-12, "DRIVE BELTS" .
10. Remove A/C compressor from bracket with piping connected, and temporarily secure it aside. Refer to ATC-131, "Components" .
11. Remove power steering oil pump from bracket with piping connected, and temporarily secure it aside. Refer to PS-29, "POWER STEERING OIL PUMP" .
12. Remove power steering oil pump bracket. Refer to PS-29, "POWER STEERING OIL PUMP" .
13. Remove alternator. Refer to SC-21, "CHARGING SYSTEM" .
14. Remove water bypass hose, water hose clamp and idler pulley bracket from front timing chain case.
15. Remove right and left intake valve timing control covers.

- Loosen mounting bolts in reverse order as shown in the figure.
- Use seal cutter [SST: KV10111100 (J37228)] to cut liquid gasket for removal.

CAUTION:
Shaft is internally jointed with camshaft sprocket (INT) center hole. When removing, keep it horizontal until it is completely disconnected.

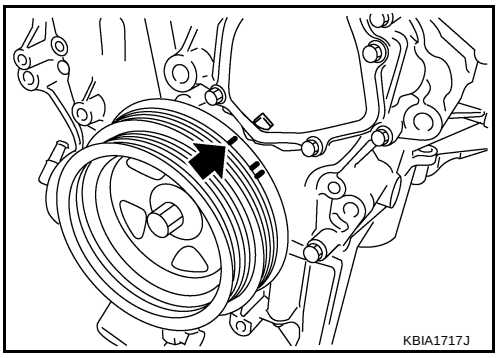


16. Remove collared O-ring from front timing chain case (left and right side).

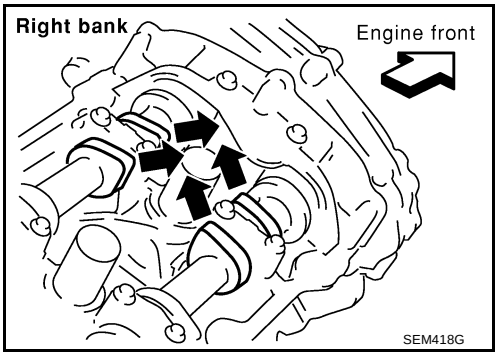


17. Remove rocker covers (right and left banks). Refer to EM-42, "ROCKER COVER" .
18. Obtain No. 1 cylinder at TDC of its compression stroke as follows:

a. Rotate crankshaft pulley clockwise to align timing mark (grooved line without color) with timing indicator.

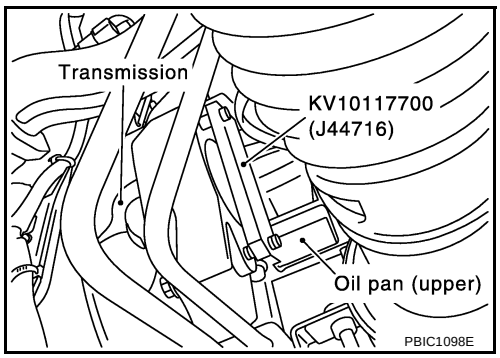


b. Make sure that intake and exhaust cam noses on No. 1 cylinder (engine front side of right bank) are located as shown in the figure.
   - If not, turn crankshaft one revolution (360 degrees) and align as shown in the figure.



19. Remove crankshaft pulley as follows:

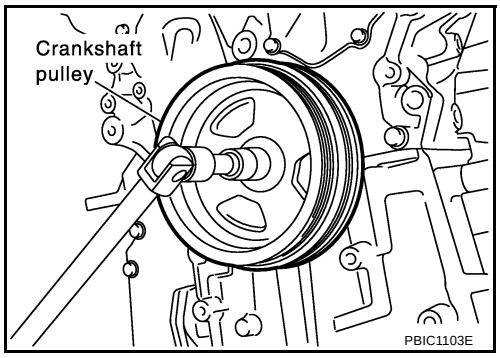
a. Remove starter motor and set ring gear stopper [SST] as shown in the figure. Refer to SC-10, "STARTING SYSTEM" .



b. Loosen crankshaft pulley bolt and rotate bolt seating surface at 10 mm (0.39 in) from its original position.

CAUTION:

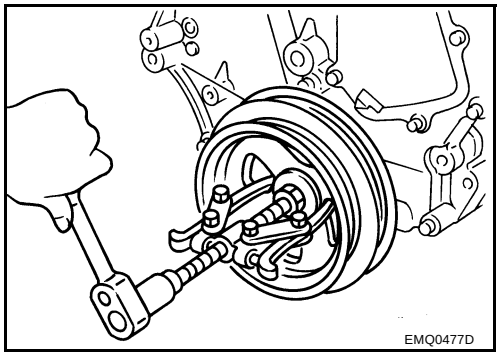
Do not remove crankshaft pulley bolt as it will be used as a supporting point for suitable puller.



c. Place suitable puller tab on holes of crankshaft pulley, and pull crankshaft pulley through.

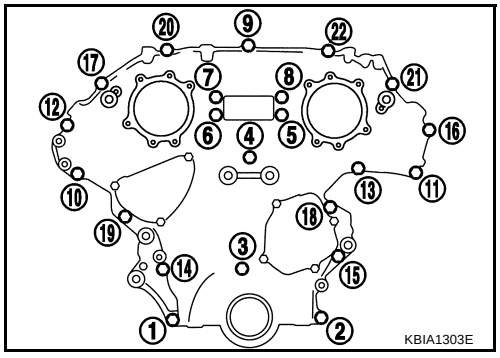
CAUTION:

Do not put suitable puller tab on crankshaft pulley periphery, as this will damage internal damper.



20. Remove oil pans (upper and lower). Refer to EM-27, "OIL PAN AND OIL STRAINER" .
21. Remove front timing chain case as follows:

a. Loosen mounting bolts in reverse order as shown in the figure.



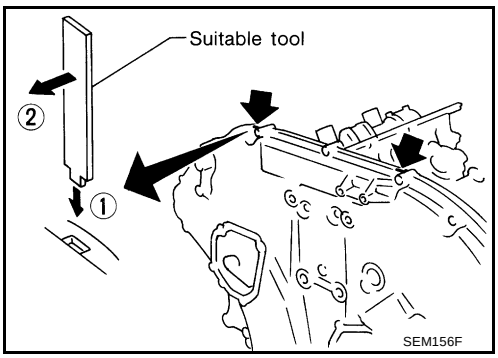
b. Insert suitable tool into the notch at the top of the front timing chain case as shown (1).

c. Pry off case by moving the tool as shown (2).

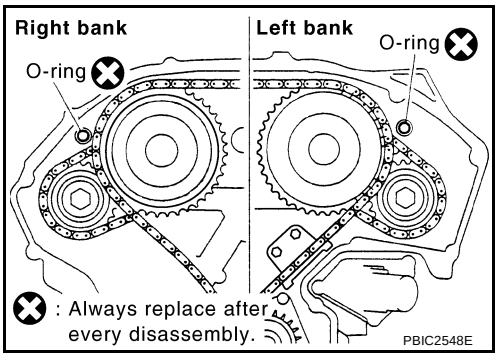
- Use seal cutter [SST: KV10111100 (J37228)] to cut liquid gasket for removal.

CAUTION:

- **Do not use flat-blade screwdriver or something similar.**
- **After removal, handle front timing chain case carefully so it does not tilt, cant, or warp under a load.**



22. Remove O-rings from rear timing chain case.



23. Remove water pump cover and chain tensioner cover from front timing chain case.

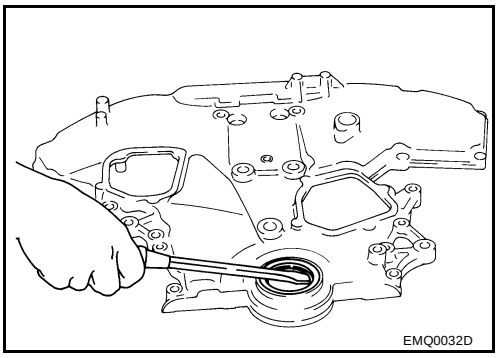
- Use seal cutter [SST: KV10111100 (J37228)] to cut liquid gasket for removal.

24. Remove front oil seal from front timing chain case using suitable tool.

- Use screwdriver for removal.

CAUTION:

Be careful not to damage front timing chain case.



25. Remove timing chain tensioner (primary) as follows:

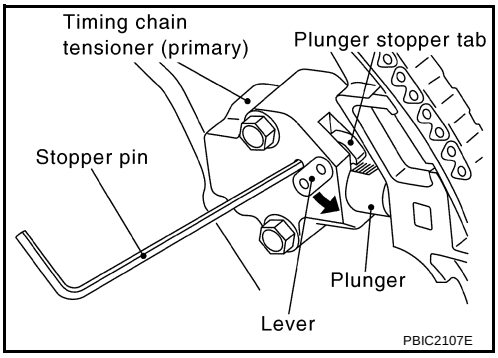
a. Pull lever down and release plunger stopper tab.

- Plunger stopper tab can be pushed up to release (coaxial structure with lever).

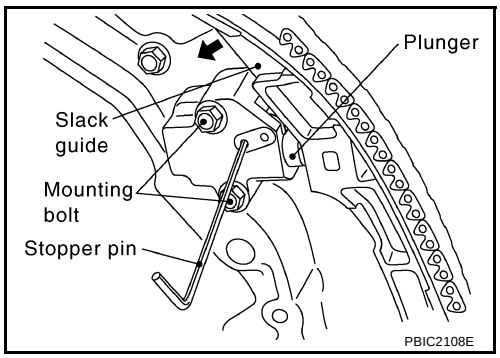
b. Insert stopper pin into tensioner body hole to hold lever, and keep tab released.

NOTE:

Allen wrench [2.5 mm (0.098 in)] is used for a stopper pin as an example.

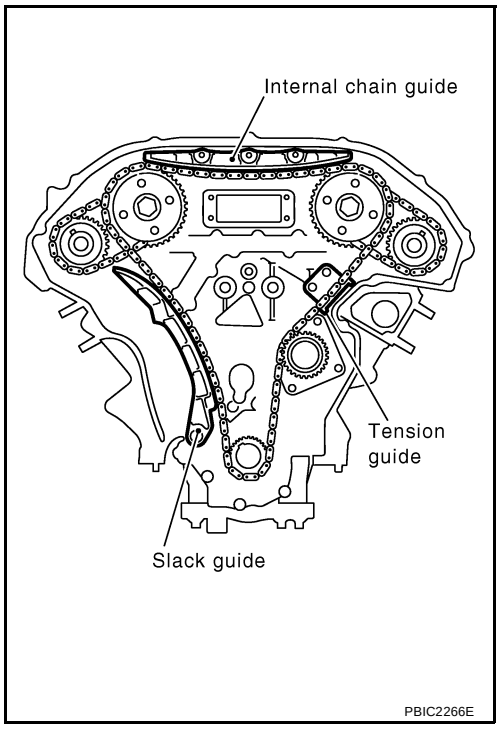


c. Insert plunger into tensioner body by pressing slack guide.
d. Keep slack guide pressed and hold it by pushing stopper pin through the lever hole and body hole.
e. Remove mounting bolts and remove timing chain tensioner (primary).



26. Remove internal chain guide, tension guide and slack guide.

NOTE:
Tension guide can be removed after removing timing chain (primary).



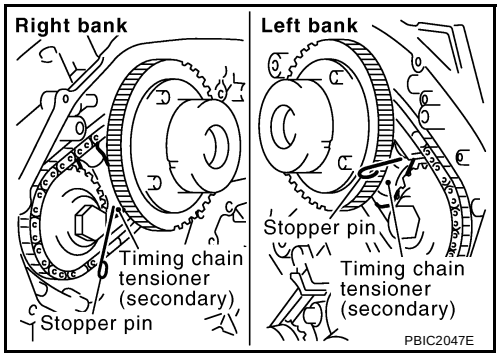
27. Remove timing chain (primary) and crankshaft sprocket.

CAUTION:
After removing timing chain (primary), do not turn crankshaft and camshaft separately, or valves will strike the piston heads.

28. Remove timing chain (secondary) and camshaft sprockets as follows:

a. Attach suitable stopper pin to the right and left timing chain tensioners (secondary).

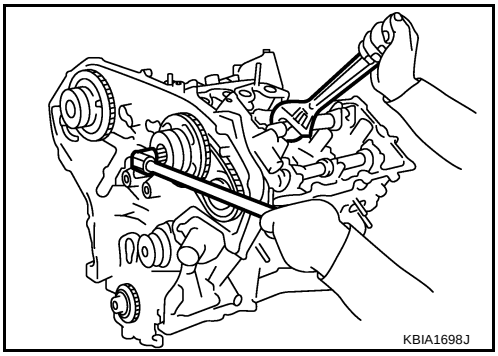
NOTE:
- Use approximately 0.5 mm (0.02 in) dia. hard metal pin as a stopper pin.
- For removal of timing chain tensioner (secondary), refer to EM-76, "CAMSHAFT" . [Removing camshaft bracket (No. 1) is required.]



b. Remove intake and exhaust camshaft sprocket bolts.

- Secure the hexagonal portion of camshaft using wrench to loosen mounting bolts.

CAUTION:
Do not loosen mounting bolts with securing anything other than the camshaft hexagonal portion or with tensioning the timing chain.

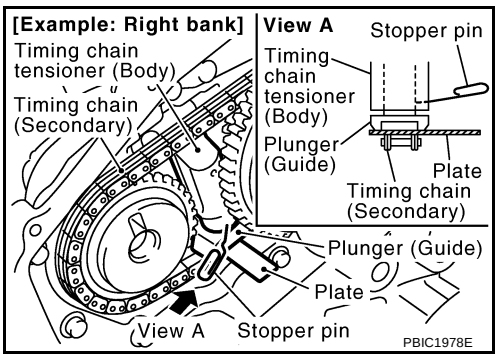


c. Remove timing chain (secondary) together with camshaft sprockets.

- Turn camshaft slightly to secure slackness of timing chain on timing chain tensioner (secondary) side.
- Insert 0.5 mm (0.020 in)-thick metal or resin plate between timing chain and timing chain tensioner plunger (guide). Remove timing chain (secondary) together with camshaft sprockets with timing chain loose from guide groove.

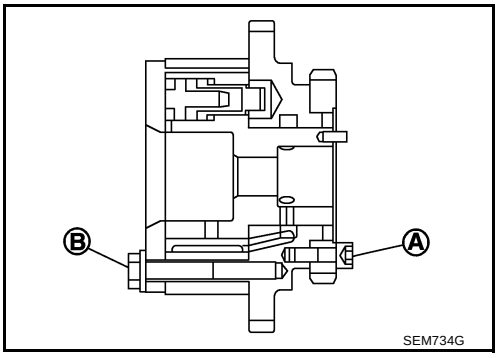
CAUTION:
Be careful of plunger coming-off when removing timing chain (secondary). This is because plunger of timing chain tensioner (secondary) moves during operation, leading to coming-off of fixed stopper pin.

NOTE:
Camshaft sprocket (INT) is two-for-one structure of primary and secondary sprockets.



- When handling camshaft sprocket (INT), be careful of the following caution:

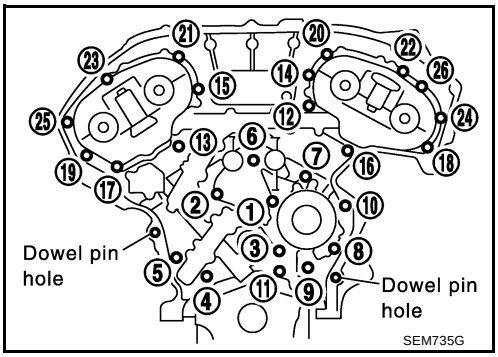
CAUTION:
- **Handle carefully to avoid any shock to camshaft sprocket.**
- **Do not disassemble. (Do not loosen bolts "A" and "B" as shown in the figure).**



29. Remove water pump. Refer to CO-21, "WATER PUMP" .
30. Remove rear timing chain case as follows:

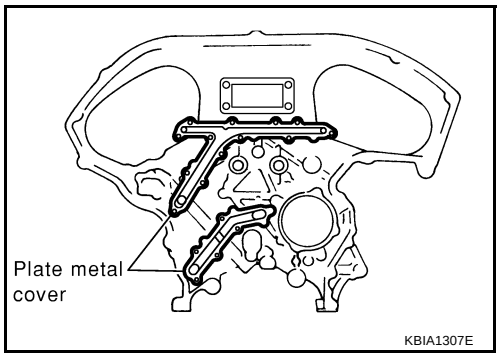
a. Loosen and remove mounting bolts in reverse order as shown in the figure.

b. Cut liquid gasket using seal cutter [SST: KV10111100 (J37228)] and remove rear timing chain case.

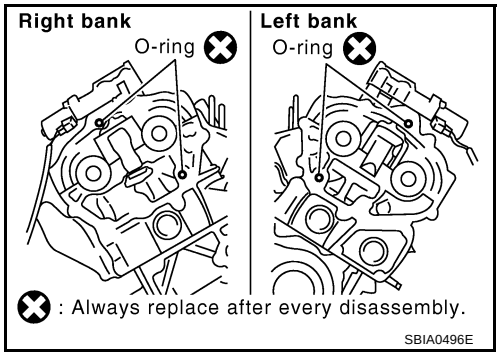


CAUTION:

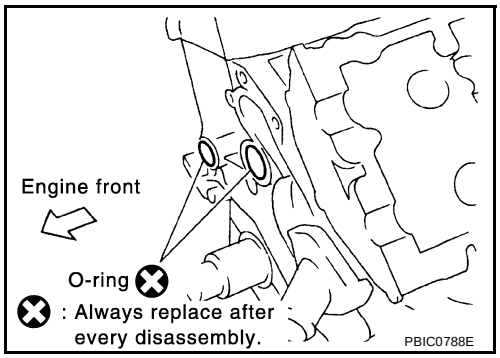
- **Do not remove plate metal cover of oil passage.**
- **After removal, handle rear timing chain case carefully so it does not tilt, cant, or warp under a load.**



31. Remove O-rings from cylinder head.



32. Remove O-rings from cylinder block.

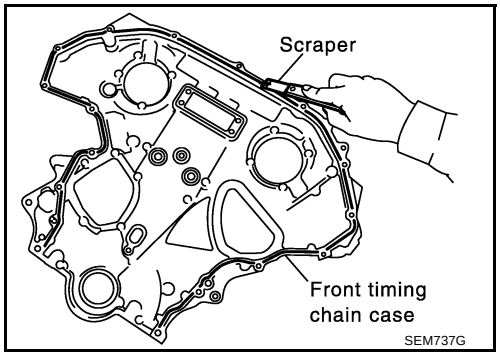


33. Remove timing chain tensioners (secondary) from cylinder head as follows, if necessary.

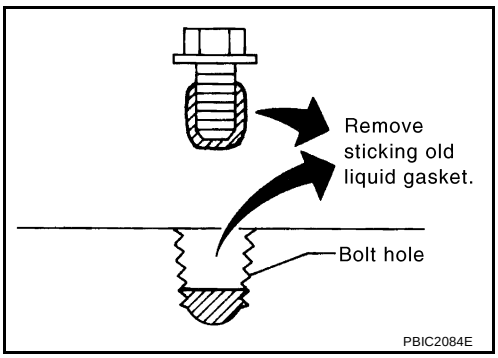
a. Remove camshaft brackets (No. 1). Refer to EM-77, "REMOVAL" .

b. Remove timing chain tensioners (secondary) with stopper pin attached.

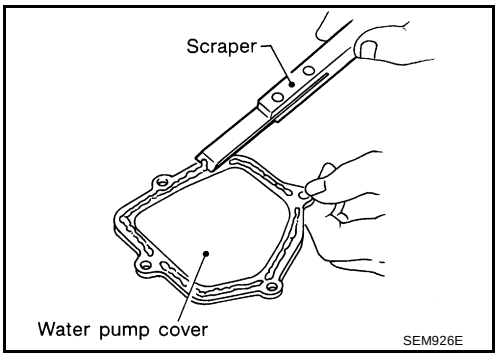
34. Use scraper to remove all traces of old liquid gasket from front and rear timing chain cases, and opposite mating surfaces.



- Remove old liquid gasket from bolt hole and thread.



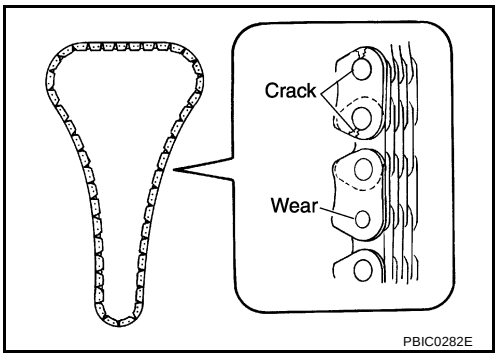
35. Use scraper to remove all traces of liquid gasket from water pump cover, chain tensioner cover and intake valve timing control covers.



INSPECTION AFTER REMOVAL

Timing Chain

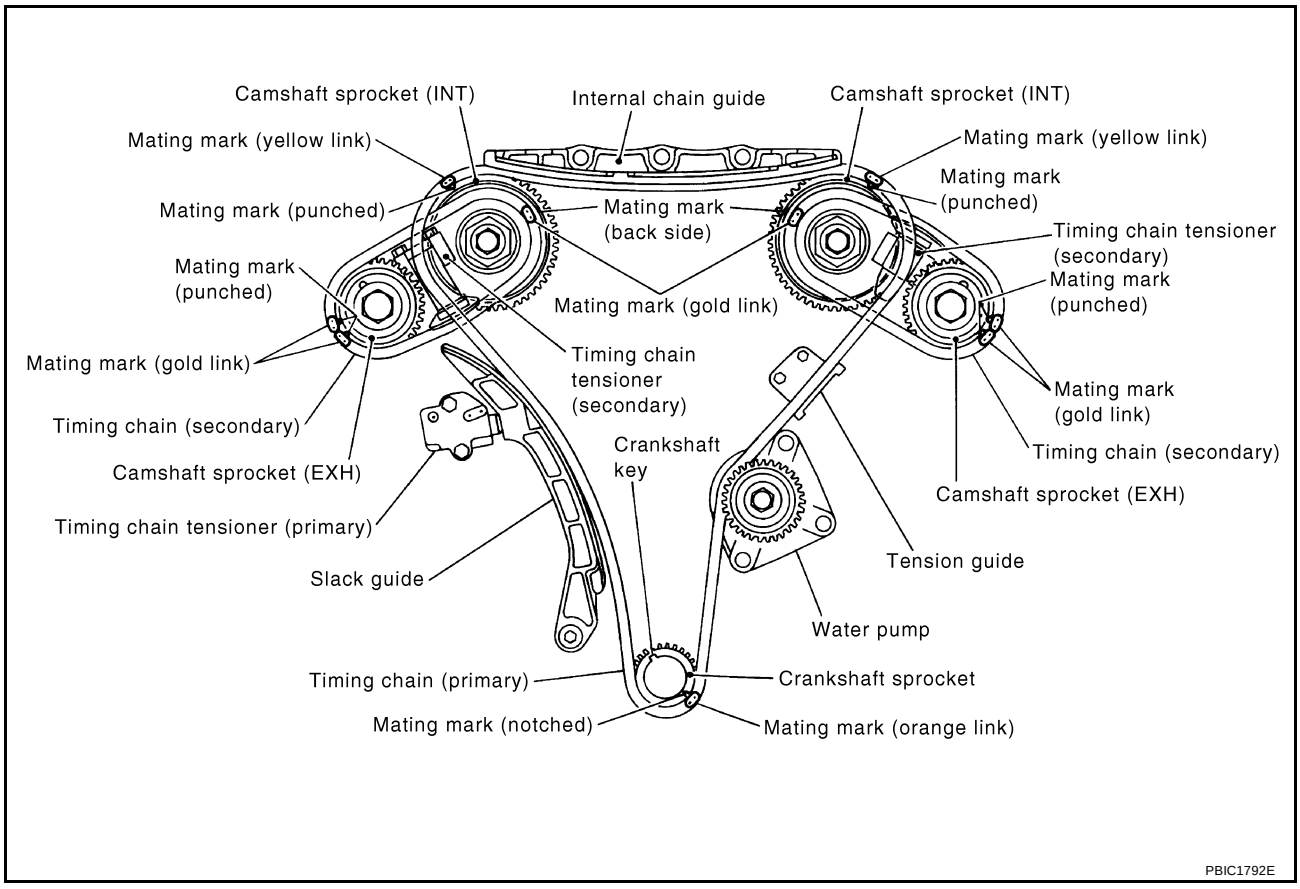
Check for cracks and any excessive wear at link plates and roller links of timing chain. Replace timing chain as necessary.



INSTALLATION

NOTE:

The below figure shows the relationship between the mating mark on each timing chain and that on the corresponding sprocket, with the components installed.



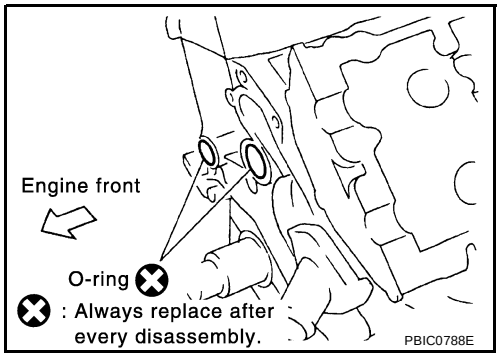
1. Install timing chain tensioners (secondary) to cylinder head as follows if removed. Refer to EM-81, "INSTALLATION" .

a. Install timing chain tensioners (secondary) with stopper pin attached and new O-ring.

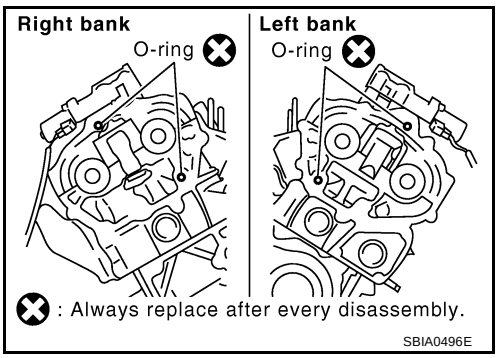
b. Install camshaft brackets (No. 1). Refer to EM-81, "INSTALLATION" .

2. Install rear timing chain case as follows:

a. Install new O-rings onto cylinder block.



b. Install new O-rings to cylinder head.



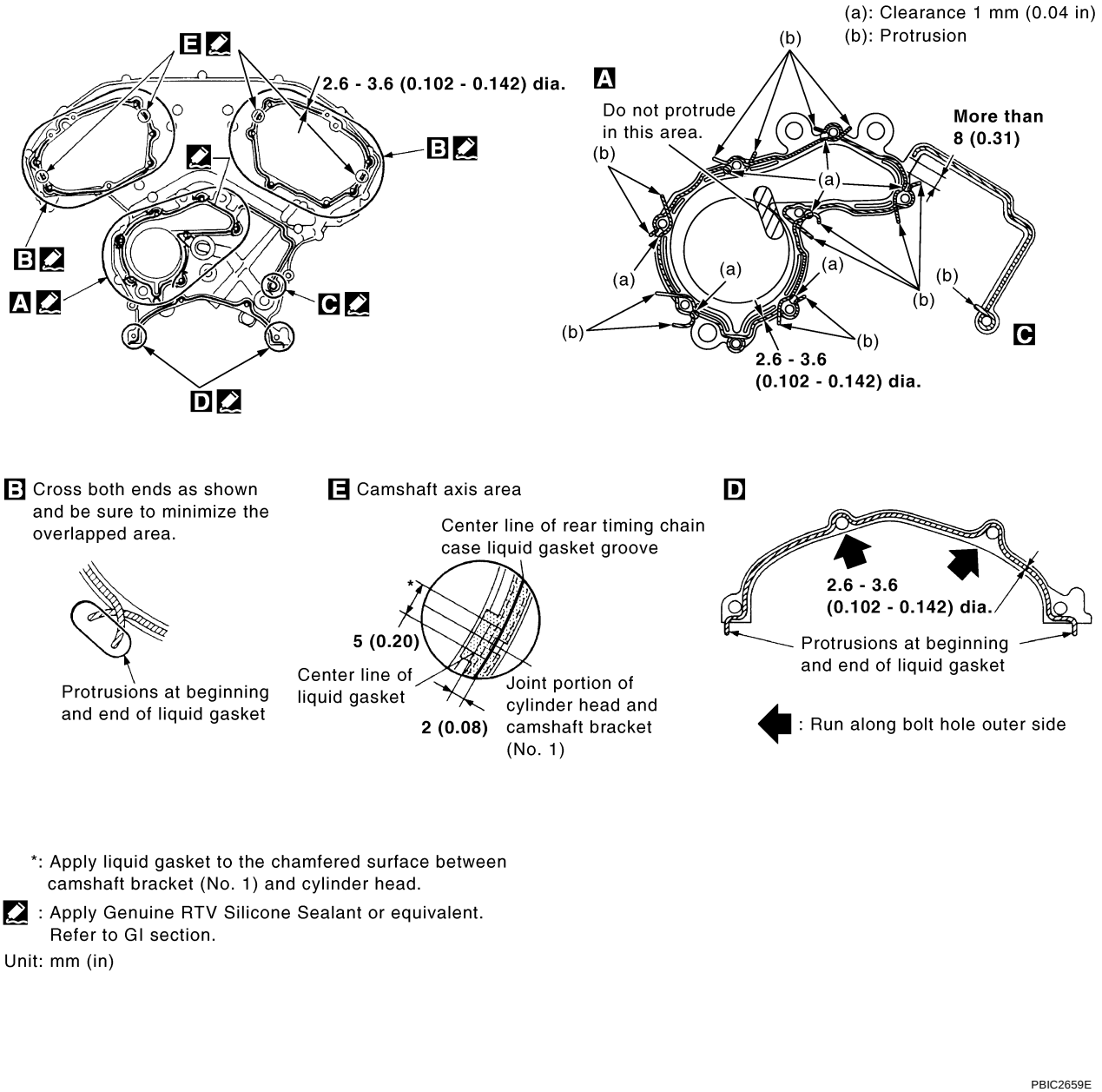
c. Apply liquid gasket with tube presser [SST: WS39930000 (—)] to rear timing chain case back side as shown in the figure.
Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

CAUTION:

- **For “A” in the figure, completely wipe out liquid gasket extended on a portion touching at engine coolant.**

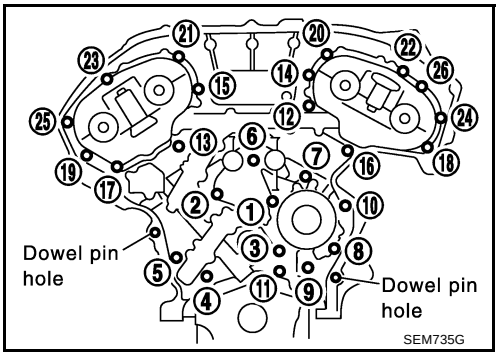
- **Apply liquid gasket on installation position of water pump and cylinder head very completely.**

Rear timing chain case: Back side



d. Align rear timing chain case and water pump assembly with dowel pins (right and left) on cylinder block and install rear timing chain case.
   - Make sure O-rings stay in place during installation to cylinder block and cylinder head.

e. Tighten mounting bolts in numerical order as shown in the figure.
   - There are two type mounting bolts. Refer to the following for locating bolts.



Bolt length:	Bolt position
20 mm (0.79 in)	: 1, 2, 3, 6, 7, 8, 9, 10
16 mm (0.63 in)	: Except the above

: 11.7 - 13.7 N·m (1.2 - 1.4 kg-m, 9 - 10 ft-lb)

f. After all bolts are tightened, retighten them to the specified in numerical order shown in the figure.
- If liquid gasket protrudes, wipe it off immediately.

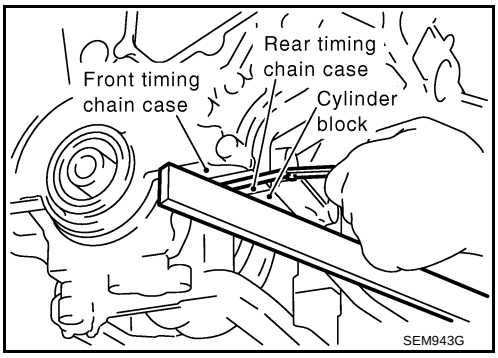
g. After installing rear timing chain case, check the surface height difference between following parts on oil pan (upper) mounting surface.

Standard

Rear timing chain case to cylinder block:

–0.24 to 0.14 mm (–0.0094 to 0.0055 in)

- If not within standard, repeat the installation procedure.



3. Install water pump with new O-rings. Refer to CO-21, "WATER PUMP" .

4. Make sure that dowel pin hole, dowel pin and crankshaft key are located as shown in the figure. (No. 1 cylinder at compression TDC)
- **NOTE:**
  Though camshaft does not stop at the position as shown in the figure, for the placement of cam nose, it is generally accepted camshaft is placed for the same direction of the figure.

Camshaft dowel pin hole (intake side)

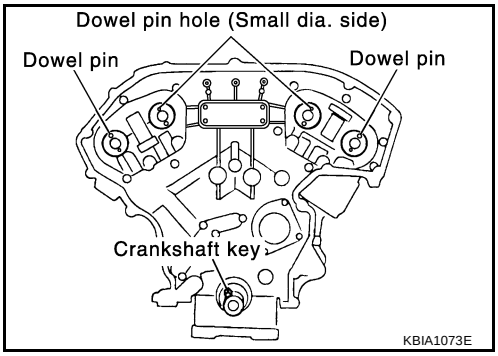
: At cylinder head upper face side in each bank.

Camshaft dowel pin (exhaust side)

: At cylinder head upper face side in each bank.

Crankshaft key

: At cylinder head side of right bank.



CAUTION:

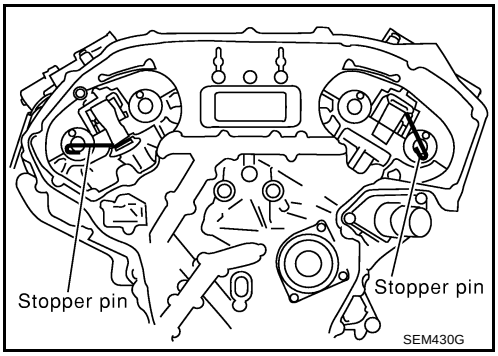
Hole on small dia. side must be used for intake side dowel pin hole. Do not misidentify (ignore big dia. side).

5. Install timing chains (secondary) and camshaft sprockets as follows:

CAUTION:

Mating marks between timing chain and sprockets slip easily. Confirm all mating mark positions repeatedly during the installation process.

a. Push plunger of timing chain tensioner (secondary) and keep it pressed in with stopper pin.

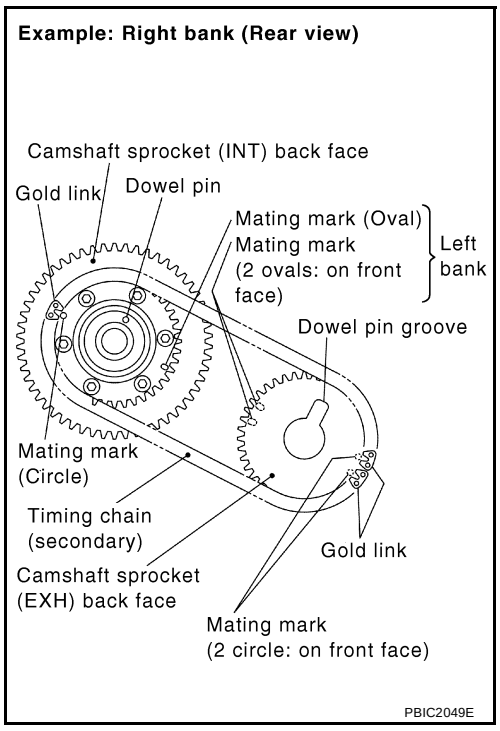


b. Install timing chains (secondary) and camshaft sprockets.

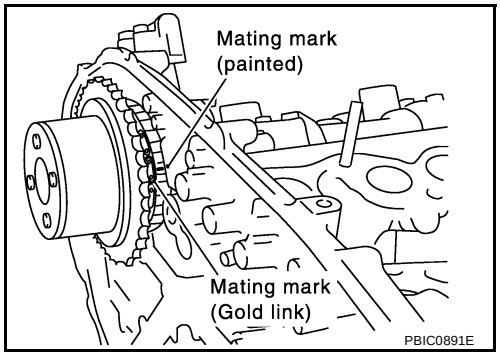
- Align the mating marks on timing chain (secondary) (gold link) with the ones on intake and exhaust camshaft sprockets (punched), and install them.

  NOTE:
  - Mating marks for intake camshaft sprocket are on the back side of camshaft sprocket (secondary).
  - There are two types of mating marks, circle and oval types. They should be used for the right and left banks, respectively.

  Right bank : Use circle type.
  Left bank : Use oval type.

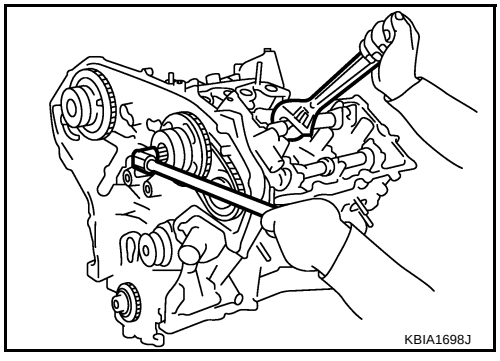


- Align dowel pin and pin hole on camshafts with the groove and dowel pin on sprockets, and install them.
- On the intake side, align pin hole on the small diameter side of the camshaft front end with dowel pin on the back side of camshaft sprocket, and install them.
- On the exhaust side, align dowel pin on camshaft front end with pin groove on camshaft sprocket, and install them.
- In case that positions of each mating mark and each dowel pin are not fit on mating parts, make fine adjustment to the position holding the hexagonal portion on camshaft with wrench or equivalent.
- Mounting bolts for camshaft sprockets must be tightened in the next step. Tightening them by hand is enough to prevent the dislocation of dowel pins.
- It may be difficult to visually check the dislocation of mating marks during and after installation. To make the matching easier, make a mating mark on the top of sprocket teeth and its extended line in advance with paint.

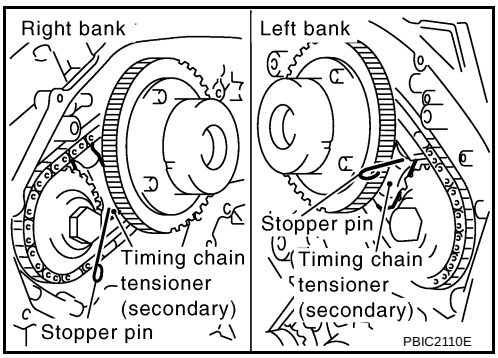


c. After confirming the mating marks are aligned, tighten camshaft sprocket mounting bolts.

- Secure camshaft using wrench at the hexagonal portion to tighten mounting bolts.

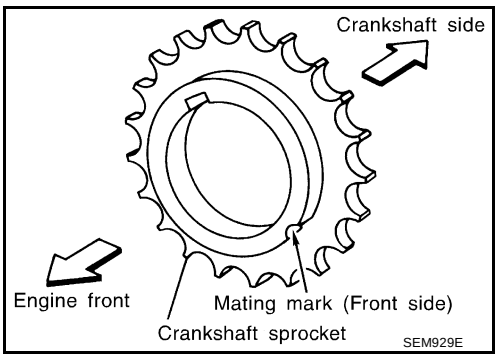


d. Pull stopper pins out from timing chain tensioners (secondary).

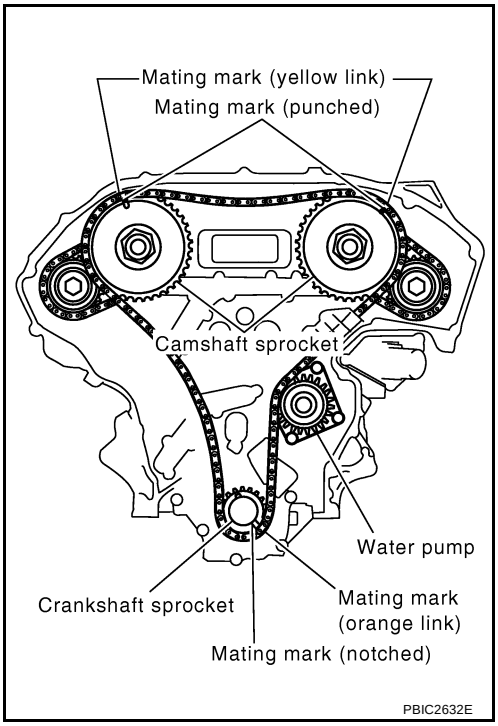


6. Install tension guide.
7. Install timing chain (primary) as follows:

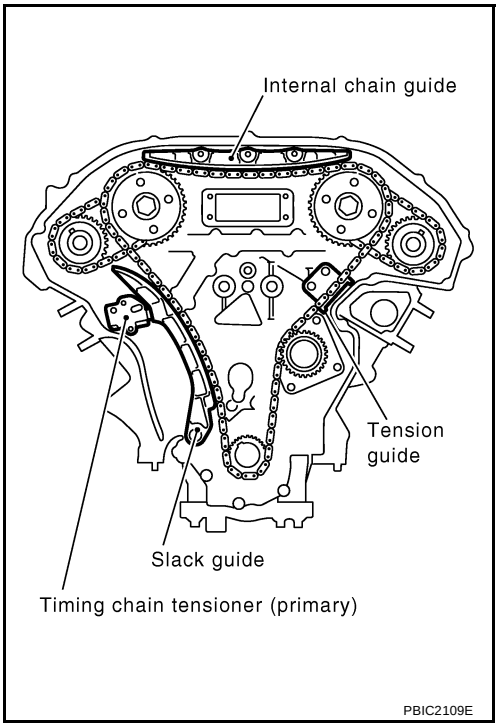
a. Install crankshaft sprocket.
   - Make sure the mating marks on crankshaft sprocket face the front of engine.



b. Install timing chain (primary).
   - Install timing chain (primary) so the mating mark (punched) on camshaft sprocket is aligned with the yellow link on timing chain, while the mating mark (notched) on crankshaft sprocket is aligned with the orange one on timing chain, as shown in the figure.
   - When it is difficult to align mating marks of timing chain (primary) with each sprocket, gradually turn camshaft using wrench on the hexagonal portion to align it with the mating marks.
   - During alignment, be careful to prevent dislocation of mating mark alignments of timing chains (secondary).

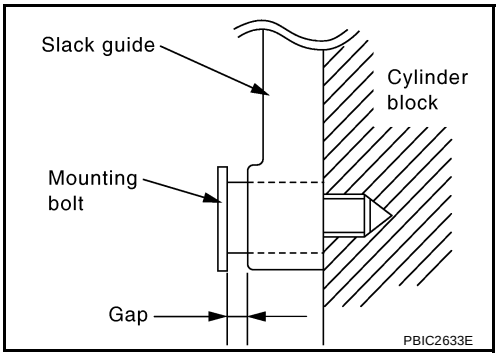


8. Install internal chain guide, slack guide and timing chain tensioner (primary).

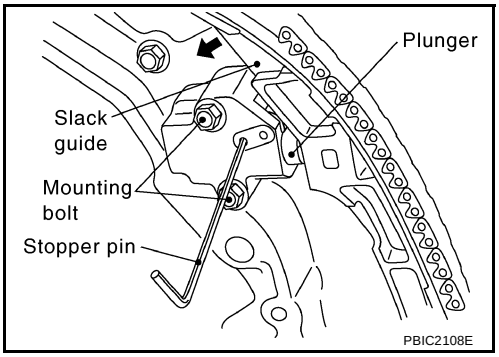


CAUTION:

Do not overtighten slack guide mounting bolts. It is normal for a gap to exist under the bolt seats when mounting bolts are tightened to specification.

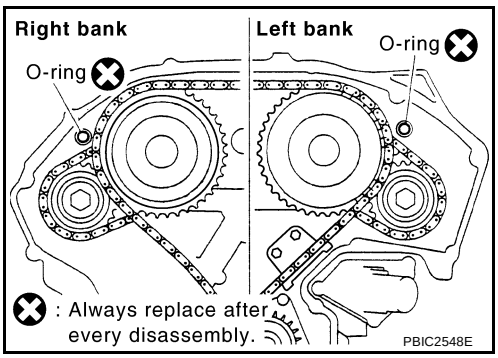


- When installing timing chain tensioner (primary), push in plunger and keep it pressed in with stopper pin.
- Remove any dirt and foreign materials completely from the back and the mounting surfaces of timing chain tensioner (primary).
- After installation, pull out stopper pin by pressing slack guide.

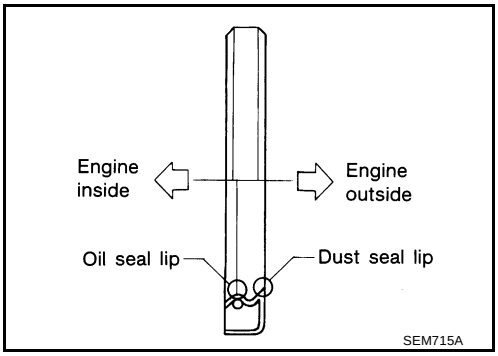


9. Make sure again that the mating marks on sprockets and timing chain have not slipped out of alignment.

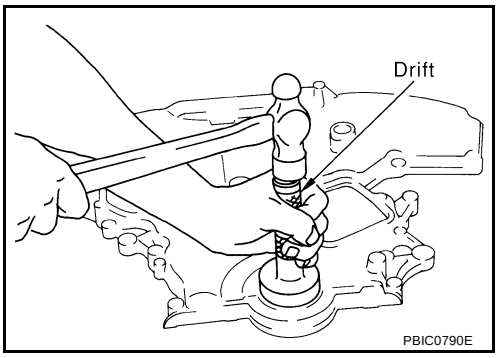
10. Install new O-rings on rear timing chain case.



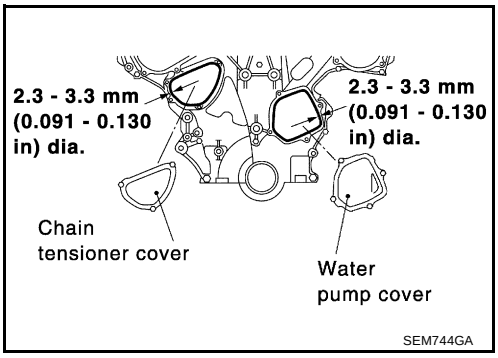
11. Install new front oil seal on front timing chain case.
    - Apply new engine oil to both oil seal lip and dust seal lip.
    - Install it so that each seal lip is oriented as shown in the figure.



    - Using suitable drift, press-fit oil seal until it becomes flush with front timing chain case end face.
    - Make sure the garter spring is in position and seal lip is not inverted.

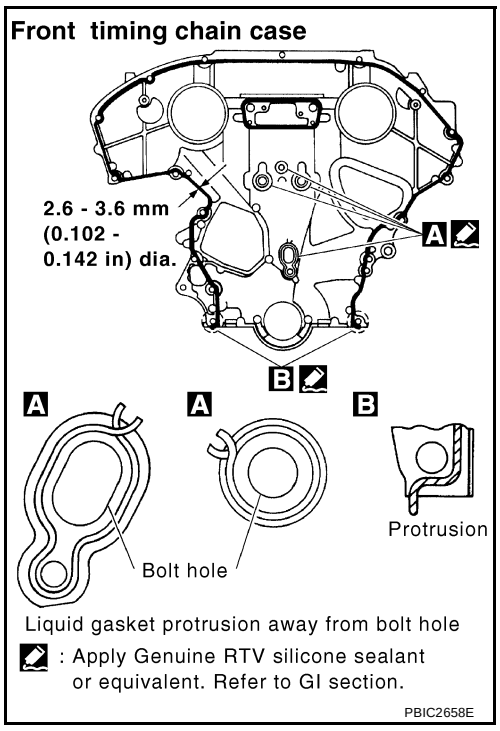


12. Install water pump cover and chain tensioner cover to front timing chain case.
    - Apply a continuous bead of liquid gasket with tube presser [SST: WS39930000 (—)] to front timing chain case as shown in the figure.
      Use Genuine RTV Silicone Sealant or equivalent. Refer to **GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS"** **.**



13. Install front timing chain case as follows:

a. Apply a continuous bead of liquid gasket with tube presser [SST: WS39930000 (—)] to front timing chain case back side as shown in the figure.
Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .



b. Install front timing chain case as to fit its dowel pin hole together dowel pin on rear timing chain case.

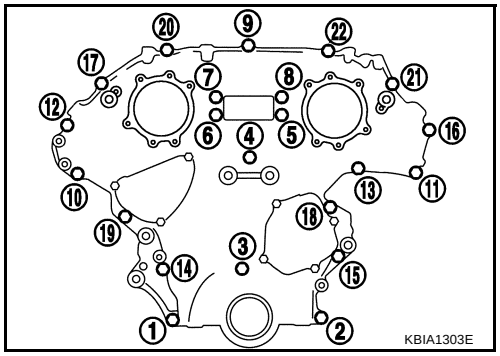
c. Tighten mounting bolts to the specified torque in numerical order as shown in the figure.
- There are two type of mounting bolts. Refer to the following for locating bolts.

M8 bolts : 1, 2

: 25.5 - 31.3 N·m (2.6 - 3.2 kg-m, 19 - 23 ft-lb)

M6 bolts : Except the above

: 11.7 - 13.7 N·m (1.2 - 1.4 kg-m, 9 - 10 ft-lb)



d. After all bolts are tightened, retighten them to the specified torque in numerical order shown in the figure.

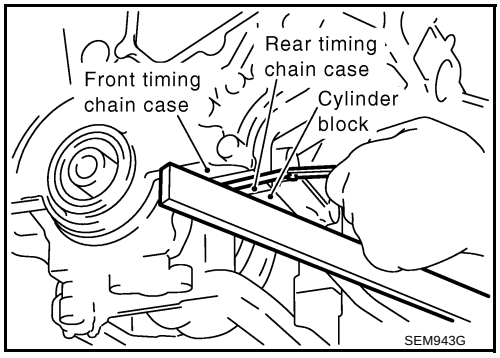
CAUTION:
Be sure to wipe off any excessive liquid gasket leaking on surface mating with oil pan (upper).

e. After installing front timing chain case, check the surface height difference between the following parts on the oil pan (upper) mounting surface.

Standard

Front timing chain case to rear timing chain case:
–0.14 to 0.14 mm (–0.005 to 0.0055 in)

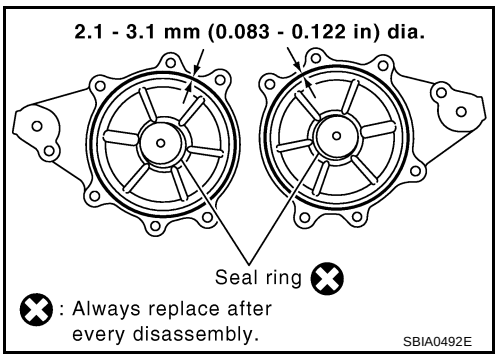
- If not within standard, repeat the installation procedure.



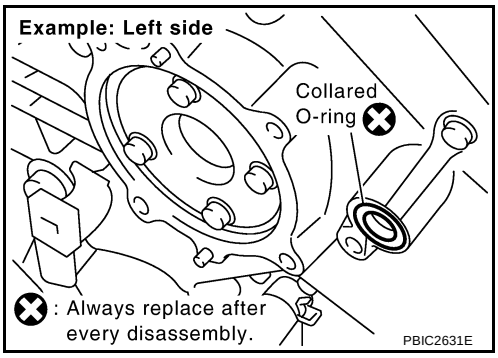
14. Install right and left intake valve timing control covers as follows:

a. Install new seal rings in shaft grooves.

b. Apply a continuous bead of liquid gasket with tube presser [SST: WS39930000 (—)] to intake valve timing control covers as shown in the figure.
Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

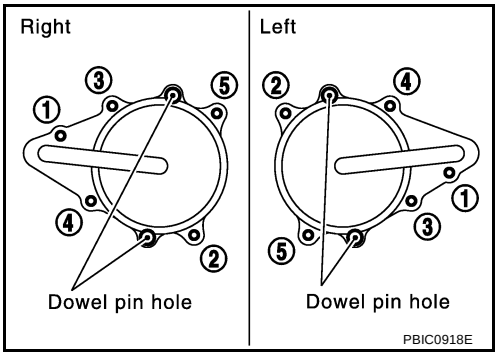


c. Install new collared O-rings in front timing chain case oil hole (left and right sides).



d. Being careful not to move seal ring from the installation groove, align dowel pins on front timing chain case with holes to install intake valve timing control covers.

e. Tighten mounting bolts in numerical order as shown in the figure.



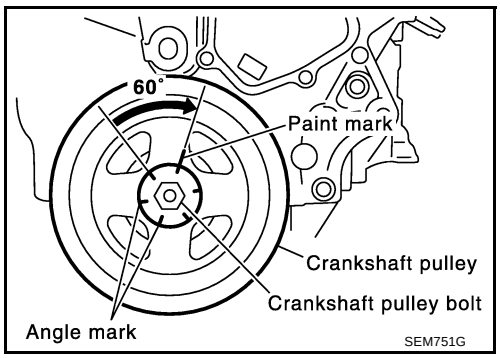
15. Install oil pans (upper and lower). Refer to EM-27, "OIL PAN AND OIL STRAINER" .
16. Install rocker covers (right and left banks). Refer to EM-42, "ROCKER COVER" .
17. Install crankshaft pulley as follows:

a. Fix crankshaft using ring gear stopper [SST: KV10117700 (J44716)].
b. Install crankshaft pulley, taking care not to damage front oil seal.
- When press-fitting crankshaft pulley with plastic hammer, tap on its center portion (not circumference).

c. Tighten crankshaft pulley bolt.

: 39.2 - 49.0 N·m (4.0 - 5.0 kg-m, 29 - 36 ft-lb)

d. Put a paint mark on crankshaft pulley aligning with angle mark on crankshaft pulley bolt. Then, further retighten bolt by 60 to 65 degrees [Target: 60 degrees (equivalent to one graduation)].



18. Rotate crankshaft pulley in normal direction (clockwise when viewed from engine front) to confirm it turns smoothly.
19. Install in the reverse order of removal after this step.

NOTE:
If hydraulic pressure inside timing chain tensioner drops after removal/installation, slack in guide may generate a pounding noise during and just after engine start. However, this is normal. Noise will stop after hydraulic pressure rises.

INSPECTION AFTER INSTALLATION

- Before starting engine, check the levels of engine coolant, lubrications and working fluid. If less than required quantity, fill to the specified level.
- Use procedure below to check for fuel leakage.
  - Turn ignition switch “ON” (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.
  - Start engine. With engine speed increased, check again for fuel leakage at connection points.
- Run engine to check for unusual noise and vibration.
- Warm up engine thoroughly to make sure there is no leakage of engine coolant, engine oil and working fluid, fuel and exhaust gas.
- Bleed air from passages in pipes and tubes of applicable lines, such as in cooling system.
- After cooling down engine, again check levels of engine coolant, engine oil and working fluid. Refill to the specified level, if necessary.

Summary of the inspection items:

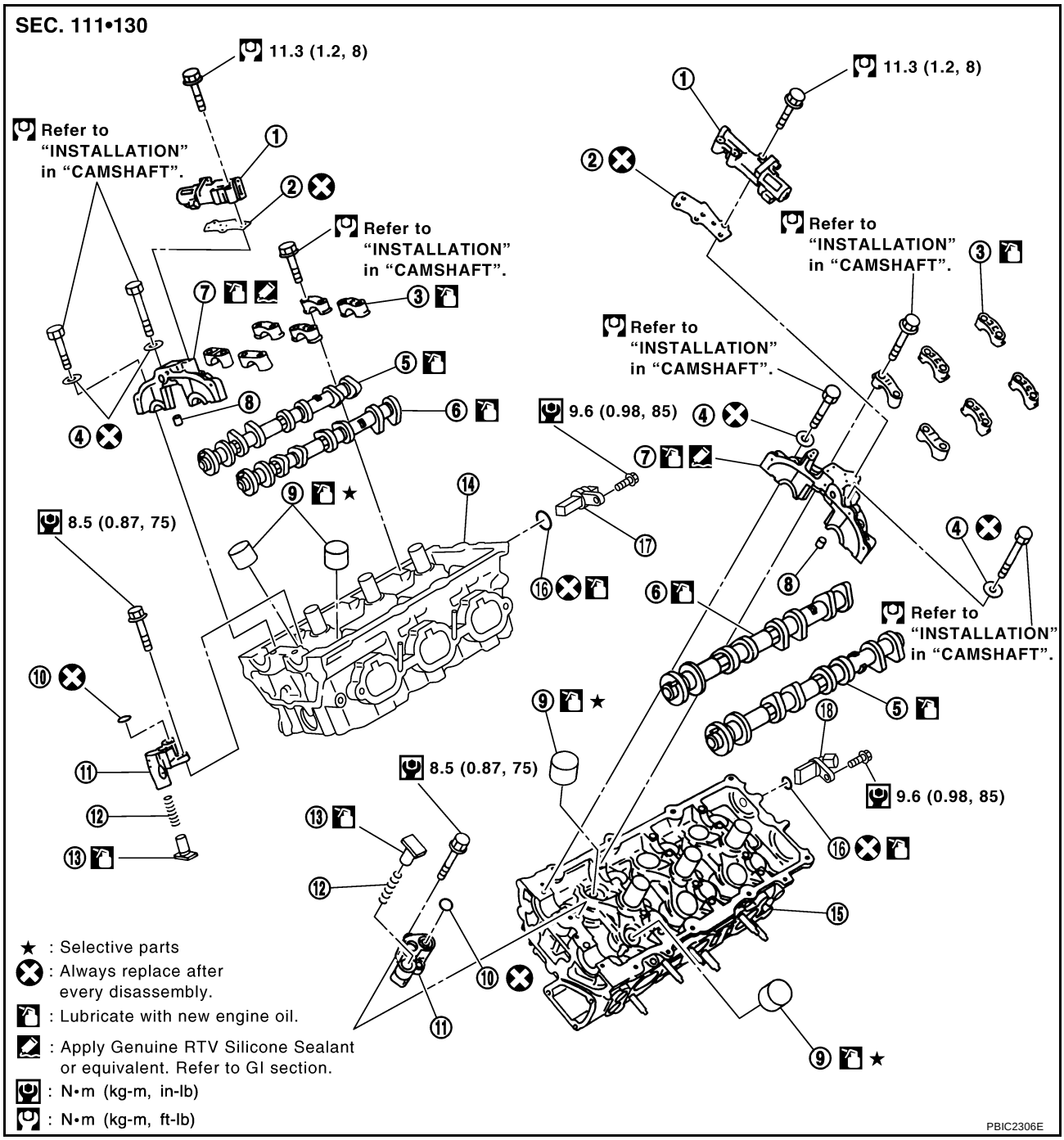
Item	Before starting engine	Engine running	After engine stopped
Engine coolant	Level	Leakage	Level
Engine oil	Level	Leakage	Level
Working fluid	Level	Leakage	Level

CAMSHAFT

PFP:13001

Removal and Installation

ABS009YR

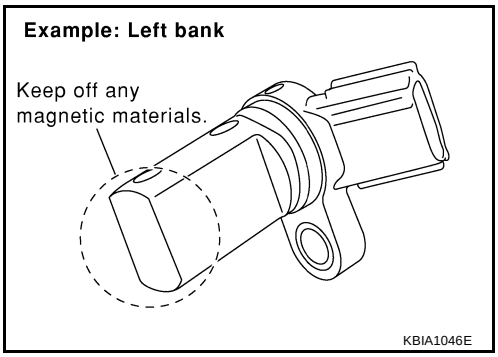


1.	Intake valve timing control solenoid valve	2.	Gasket	3.	Camshaft bracket (No. 2 to No. 4)
4.	Seal washer	5.	Camshaft (EXH)	6.	Camshaft (INT)
7.	Camshaft bracket (No. 1)	8.	Dowel pin	9.	Valve lifter
10.	O-ring	11.	Timing chain tensioner (Secondary)	12.	Spring
13.	Plunger	14.	Cylinder head (right bank)	15.	Cylinder head (left bank)
16.	O-ring	17.	Camshaft position sensor (PHASE) (right bank)	18.	Camshaft position sensor (PHASE) (left bank)

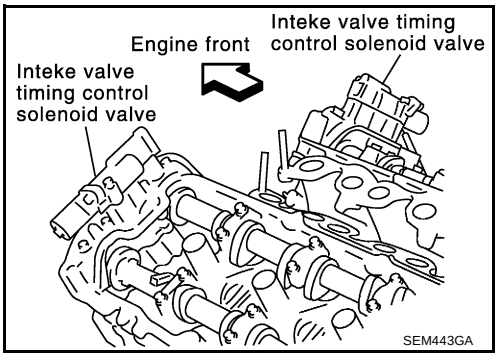
REMOVAL

1. Remove front timing chain case, camshaft sprocket, timing chain and rear timing chain case. Refer to EM-55, "TIMING CHAIN" .
2. Remove camshaft position sensor (PHASE) (right and left banks) from cylinder head back side.

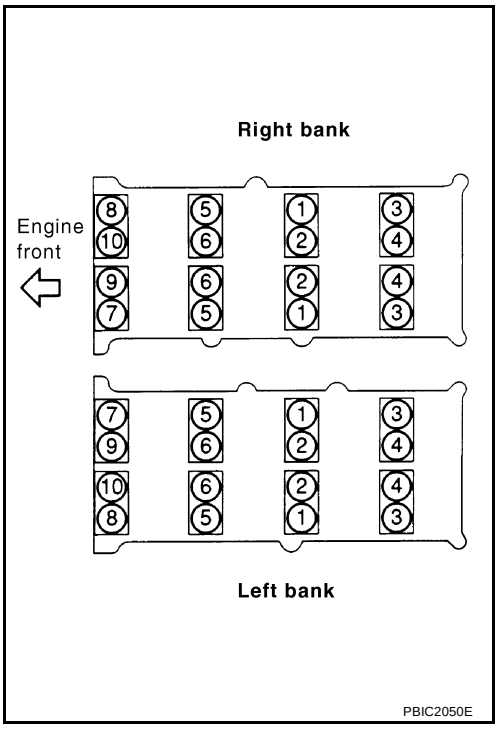
   CAUTION:
   - **Handle carefully to avoid dropping and shocks.**
   - **Do not disassemble.**
   - **Do not allow metal powder to adhere to magnetic part at sensor tip.**
   - **Do not place sensors in a location where they are exposed to magnetism.**



3. Remove intake valve timing control solenoid valves.
   - Discard intake valve timing control solenoid valve gaskets and use new gaskets for installation.



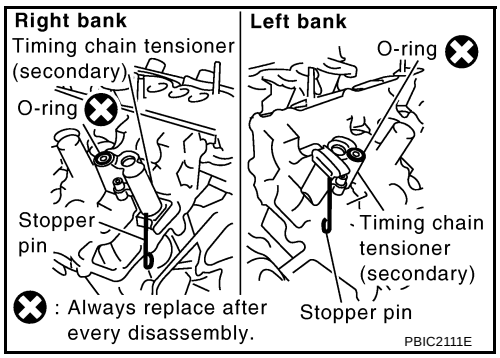
4. Remove intake and exhaust camshaft brackets.
   - Mark camshafts, camshaft brackets and bolts so they are placed in the same position and direction for installation.
   - Equally loosen camshaft bracket bolts in several steps in reverse order as shown in the figure.



5. Remove camshaft.
6. Remove valve lifter.
   - Identify installation positions, and store them without mixing them up.

7. Remove timing chain tensioner (secondary) from cylinder head.
   - Remove timing chain tensioner (secondary) with its stopper pin attached.

   NOTE:
   Stopper pin was attached when timing chain (secondary) was removed.



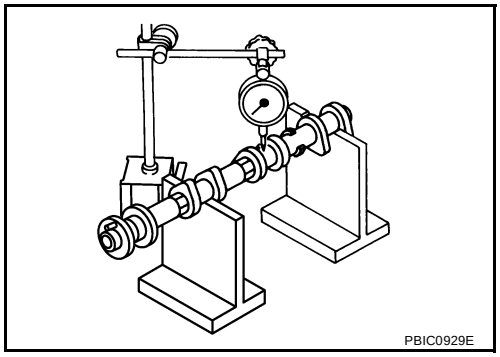
INSPECTION AFTER REMOVAL

Camshaft Runout

1. Put V-block on precise flat table, and support No. 2 and 4 journal of camshaft.

   CAUTION:
   Do not support journal No. 1 (on the side of camshaft sprocket) because it has a different diameter from the other three locations.
2. Set dial indicator vertically to No. 3 journal.
3. Turn camshaft to one direction with hands, and measure the camshaft runout on dial indicator. (Total indicator reading)

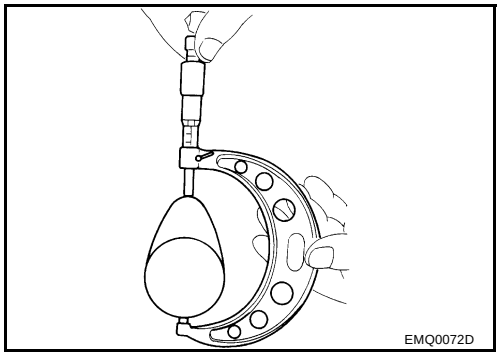
   Standard : Less than 0.02 mm (0.0020 in)
   Limit : 0.05 mm (0.0020 in)
4. If it exceeds the limit, replace camshaft.



Camshaft Cam Height

1. Measure the camshaft cam height with micrometer.

   Standard cam height (intake and exhaust)
   : 44.865 - 45.055 mm (1.7663 - 1.7738 in)
   Cam wear limit
   : 0.2 mm (0.008 in)
2. If wear is beyond the limit, replace camshaft.

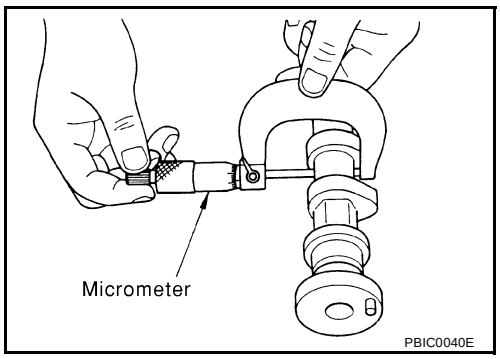


Camshaft Journal Oil Clearance

CAMSHAFT JOURNAL DIAMETER

- Measure the outer diameter of camshaft journal with micrometer.

  Standard:
  No. 1 : 25.935 - 25.955 mm (1.0211 - 1.0218 in)
  No. 2, 3, 4 : 23.445 - 23.465 mm (0.9230 - 0.9238 in)



CAMSHAFT BRACKET INNER DIAMETER

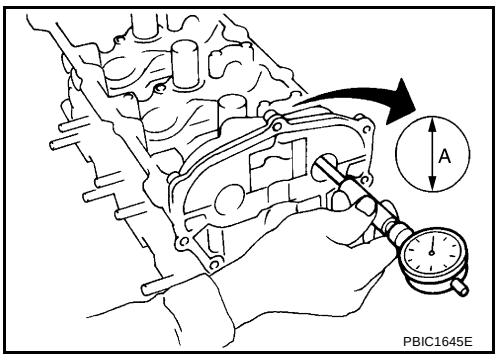
- Tighten camshaft bracket bolt with the specified torque. Refer to EM-81, "INSTALLATION" for the tightening procedure.

- Measure the inner diameter “A” of camshaft bracket with bore gauge.

Standard:

No. 1 : 26.000 - 26.021 mm (1.0236 - 1.0244 in)

No. 2, 3, 4 : 23.500 - 23.521 mm (0.9252 - 0.9260 in)



CAMSHAFT JOURNAL OIL CLEARANCE

- (Oil clearance) = (Camshaft bracket inner diameter) – (Camshaft journal diameter).

Standard:

No. 1 : 0.045 - 0.086 mm (0.0018 - 0.0034 in)

No. 2, 3, 4 : 0.035 - 0.076 mm (0.0014 - 0.0030 in)

Limit : 0.15 mm (0.0059 in)

- If it exceeds the limit, replace either or both camshaft and cylinder head.

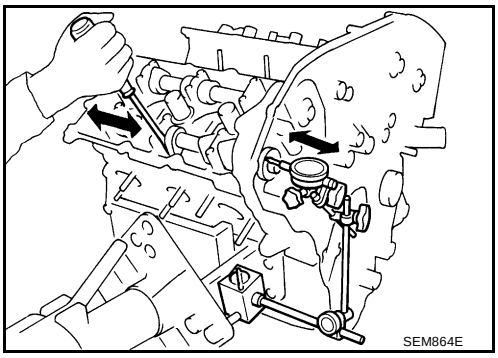
NOTE:
Camshaft bracket cannot be replaced as a single part, because it is machined together with cylinder head. Replace whole cylinder head assembly.

Camshaft End Play

- Install dial indicator in thrust direction on front end of camshaft. Measure the end play of dial indicator when camshaft is moved forward/backward (in direction to axis).

Standard : 0.115 - 0.188 mm (0.0045 - 0.0074 in)

Limit : 0.24 mm (0.0094 in)



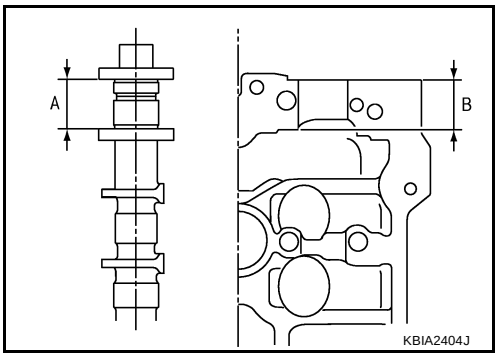
- Measure the following parts if out of the limit.
  - Dimension “A” for camshaft No. 1 journal

Standard : 27.500 - 27.548 mm (1.0827 - 1.0846 in)

  - Dimension “B” for cylinder head No. 1 journal bearing

Standard : 27.360 - 27.385 mm (1.0772 - 1.0781 in)

- Refer to the standards above, and then replace camshaft and/or cylinder head.



Camshaft Sprocket Runout

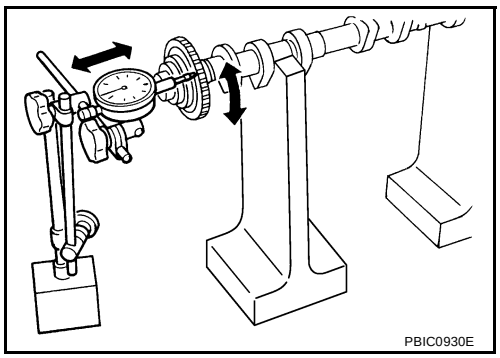
1. Put V-block on precise flat table, and support No. 2 and 4 journal of camshaft.

CAUTION:
Do not support journal No. 1 (on the side of camshaft sprocket) because it has a different diameter from the other three locations.

2. Measure the camshaft sprocket runout with dial indicator. (Total indicator reading)

Limit : 0.15 mm (0.0059 in)

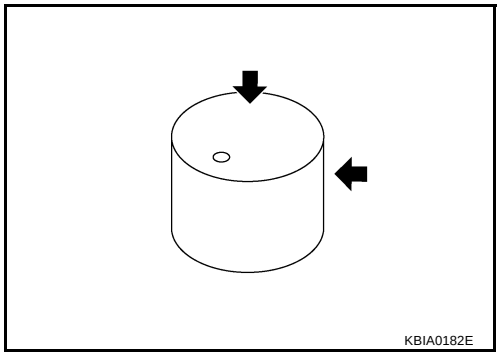
- If it exceeds the limit, replace camshaft sprocket.



Valve Lifter

Check if surface of valve lifter has any wear or cracks.

- If anything above is found, replace valve lifter. Refer to EM-144, "Available Valve Lifter" .



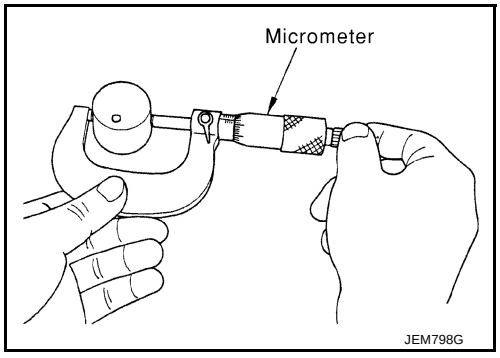
Valve Lifter Clearance

VALVE LIFTER OUTER DIAMETER

- Measure the outer diameter at 1/2 height of valve lifter with micrometer since valve lifter is in barrel shape.

Standard (Intake and exhaust)

: 33.977 - 33.987 mm (1.3377 - 1.3381 in)

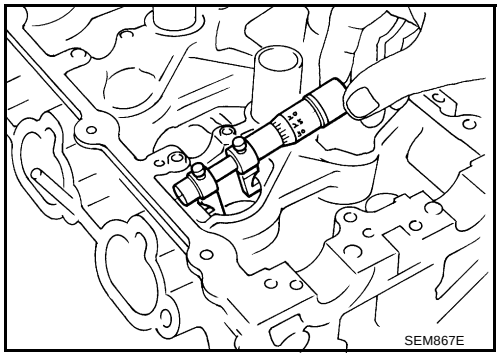


VALVE LIFTER HOLE DIAMETER

- Measure the inner diameter of valve lifter hole of cylinder head with inside micrometer.

Standard (Intake and exhaust)

: 34.000 - 34.016 mm (1.3386 - 1.3392 in)



VALVE LIFTER CLEARANCE

- (Valve lifter clearance) = (Valve lifter hole diameter) – (Valve lifter outer diameter)

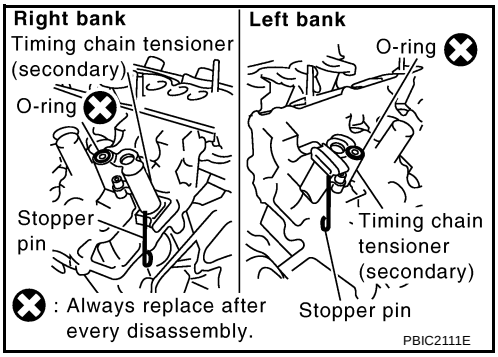
Standard (Intake and exhaust)

: 0.013 - 0.039 mm (0.0005 - 0.0015 in)

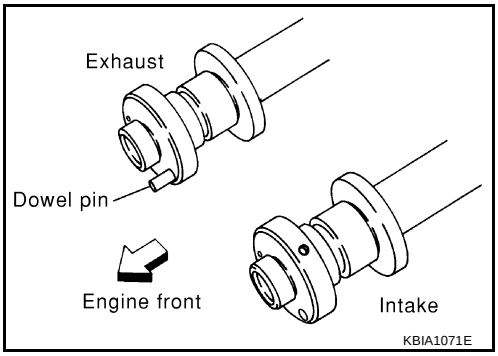
- If the calculated value is out of the standard, referring to each standard of valve lifter outer diameter and valve lifter hole diameter, replace either or both valve lifter and cylinder head.

INSTALLATION

1. Install timing chain tensioners (secondary) on both sides of cylinder head.
   - Install timing chain tensioner with its stopper pin attached.
   - Install timing chain tensioner with sliding part facing downward on right-side cylinder head, and with sliding part facing upward on left-side cylinder head.
   - Install new O-ring as shown in the figure.

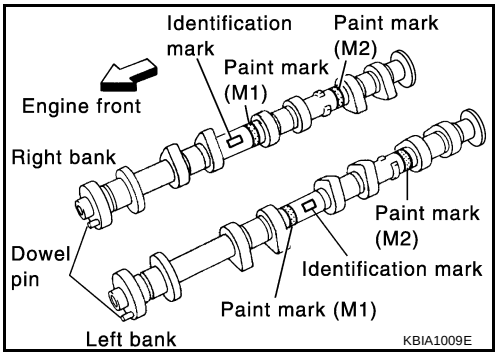


2. Install valve lifter.
   - Install it in the original position.
3. Install camshafts.
   - Install camshaft with dowel pin attached to its front end face on the exhaust side.



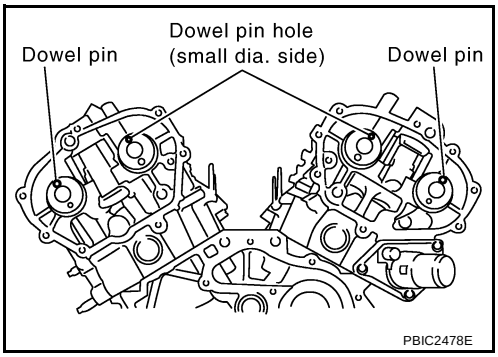
   - Follow your identification marks made during removal, or follow the identification marks that are present on new camshafts for proper placement and direction.

Bank	INT/EXH	Dowel pin	Paint marks		Identification mark
			M1	M2	
RH	INT	No	Pink	No	RE
	EXH	Yes	No	Orange	RE
LH	INT	No	Pink	No	LH
	EXH	Yes	No	Orange	LH

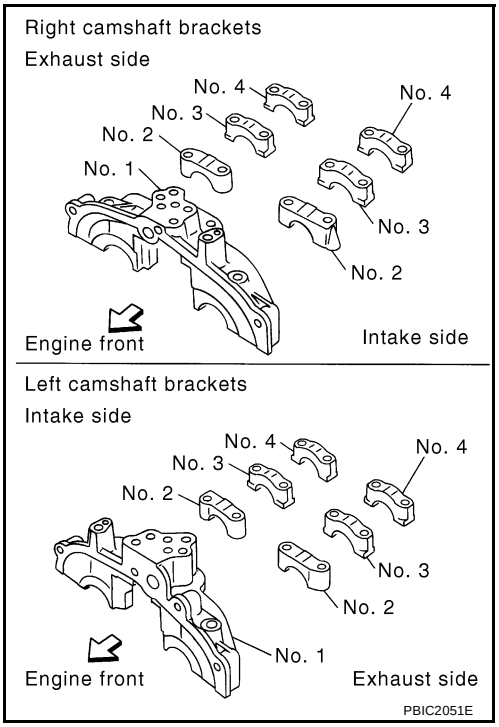


   - Install camshaft so that dowel pin hole and dowel pin on front end face are positioned as shown in the figure. (No. 1 cylinder TDC on its compression stroke)

     NOTE:
     - Large and small pin holes are located on front end face of camshaft (INT), at intervals of 180 degrees. Face small dia. side pin hole upward (in cylinder head upper face direction).
     - Though camshaft does not stop at the portion as shown in the figure, for the placement of cam nose, it is generally accepted camshaft is placed for the same direction of the figure.

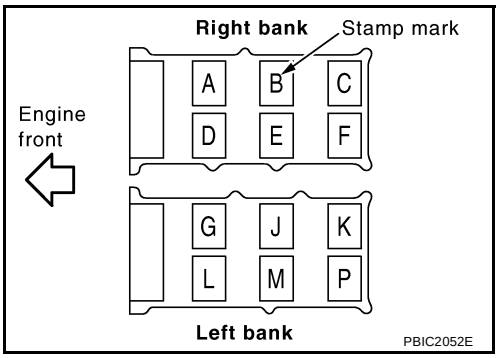


4. Install camshaft brackets.
   - Remove foreign material completely from camshaft bracket backside and from cylinder head installation face.
   - Install camshaft bracket in original position and direction as shown in the figure.

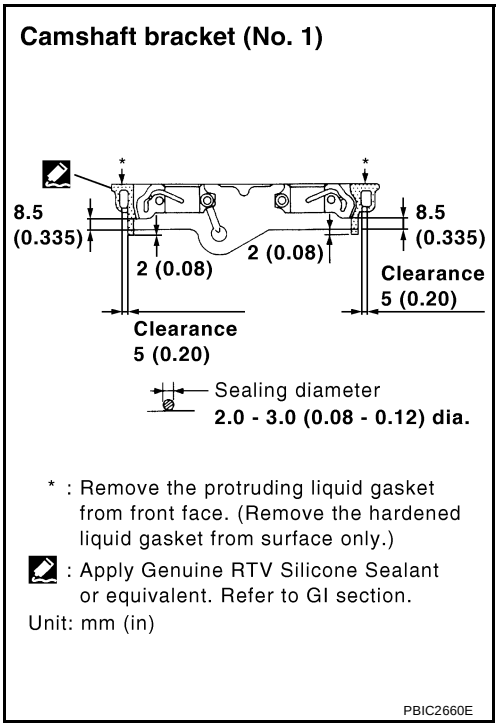


   - Install camshaft brackets (No. 2 to 4) aligning the stamp marks as shown in the figure.

     NOTE:
     There are no identification marks indicating left and right for camshaft bracket (No. 1).



   - Apply liquid gasket to mating surface of camshaft bracket (No. 1) as shown on right and left banks.
     Use Genuine RTV Silicone Sealant or equivalent. Refer to **GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS"** **.**



5. Tighten camshaft bracket bolts in the following steps, in numerical order as shown in the figure.

a. Tighten No. 7 to 10 in order as shown.

: 1.96 N·m (0.2 kg-m, 17 in-lb)

b. Tighten No. 1 to 6 in order as shown.

: 1.96 N·m (0.2 kg-m, 17 in-lb)

c. Tighten No. 1 to 10 in numerical order as shown.

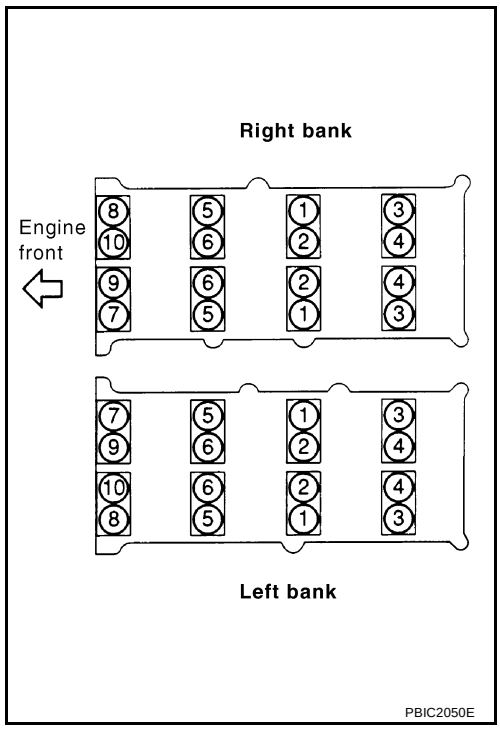
: 5.88 N·m (0.6 kg-m, 52 in-lb)

d. Tighten No. 1 to 6 in numerical order as shown.

: 9.02 - 11.8 N·m (0.92 - 1.20 kg-m, 80 - 104 in-lb)

e. Tighten No. 7 to 10 in numerical order as shown.

: 8.3 - 10.3 N·m (0.85 - 1.0 kg-m, 74 - 91 in-lb)



CAUTION:

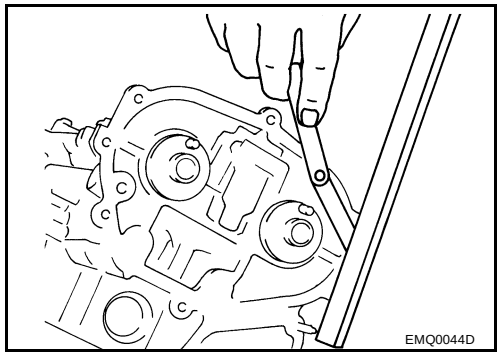
After tightening mounting bolts of camshaft brackets (No. 1), be sure to wipe off excessive liquid gasket from the parts list below.

- **Mating surface of rocker cover**
- **Mating surface of rear timing chain case**

6. Measure difference in levels between front end faces of camshaft bracket (No. 1) and cylinder head.

Standard : –0.14 to 0.14 mm (–0.0055 to 0.0055 in)

- Measure two positions (both intake and exhaust side) for a single bank.
- If measured value is out of the standard, re-install camshaft bracket (No. 1).



7. Check and adjust the valve clearance. Refer to EM-84, "Valve Clearance" .
8. Install in the reverse order of removal after this step.

INSPECTION AFTER INSTALLATION

- Before starting engine, check the levels of engine coolant, engine oil and working fluid. If less than required quantity, fill to the specified level.
- Use procedure below to check for fuel leakage.
  - Turn ignition switch “ON” (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.
  - Start engine. With engine speed increased, check again for fuel leakage at connection points.
- Run engine to check for unusual noise and vibration.
- Warm up engine thoroughly to make sure there is no leakage of engine coolant, engine oil, working fluid, fuel and exhaust gas.
- Bleed air from passages in pipes and tubes of applicable lines, such as in cooling system.
- After cooling down engine, again check levels of engine coolant, engine oil and working fluid. Refill to the specified level, if necessary.

Summary of the inspection items:

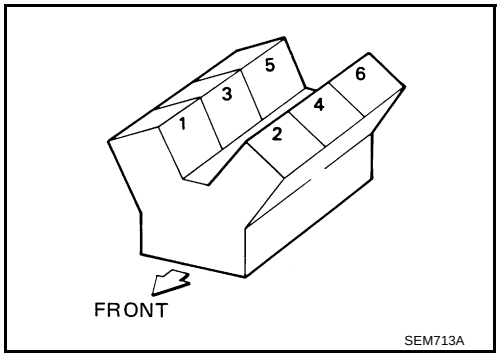
Item	Before starting engine	Engine running	After engine stopped
Engine coolant	Level	Leakage	Level
Engine oil	Level	Leakage	Level
Working fluid	Level	Leakage	Level
Fuel	—	Leakage	—
Exhaust gases	—	Leakage	—

Valve Clearance

ABS009YS

INSPECTION

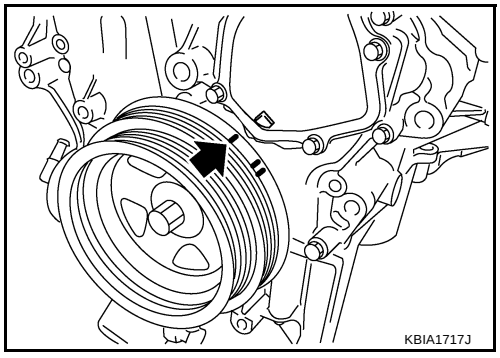
In cases of removing/installing or replacing camshaft and valve-related parts, or of unusual engine conditions due to changes in valve clearance (found malfunctions during stating, idling or causing noise), perform inspection as follows:



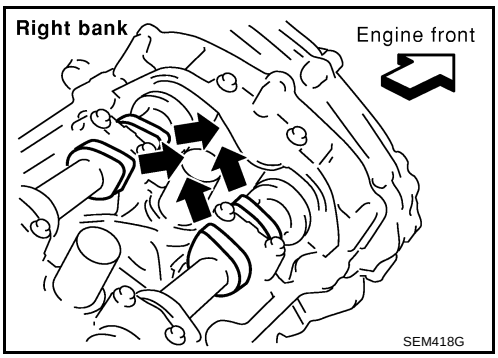
1. Remove rocker covers (right and left bank). Refer to EM-42, "ROCKER COVER" .
2. Measure the valve clearance as follows:

a. Set No. 1 cylinder at TDC of its compression stroke.

- Rotate crankshaft pulley clockwise to align timing mark (grooved line without color) with timing indicator.



- Make sure that intake and exhaust cam nose on No. 1 cylinder (engine front side of right bank) are located as shown in the figure.
- If not, turn crankshaft one revolution (360 degrees) and align as shown in the figure.

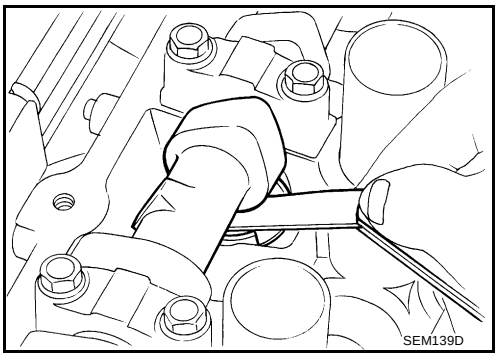


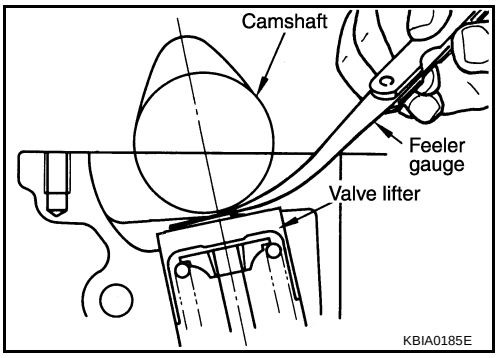
b. Use feeler gauge, measure the clearance between valve lifter and camshaft.

Valve clearance standard:

Cold	**Intake**	**: 0.26 - 0.34 mm (0.010 - 0.013 in)**
	Exhaust	**: 0.29 - 0.37 mm (0.011 - 0.015 in)**
Hot*	**Intake**	**: 0.304 - 0.416 mm (0.012 - 0.016 in)**
	Exhaust	**: 0.308 - 0.432 mm (0.012 - 0.017 in)**

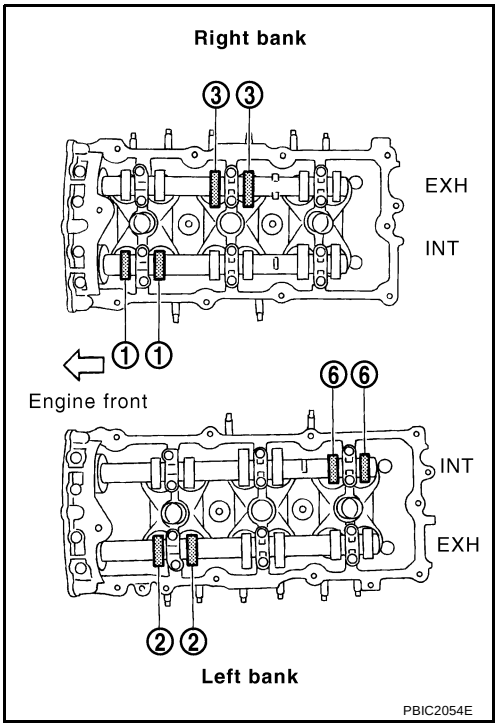
***: Approximately 80°C (176°F) (Reference data)**





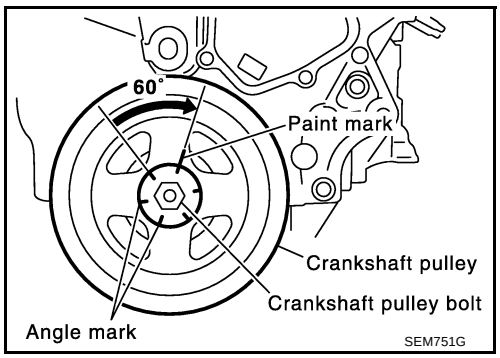
- By referring to the figure, measure the valve clearances at locations marked "×" as shown in the table below (locations indicated in the figure) with feeler gauge.
- No. 1 cylinder at compression TDC

Measuring position (right bank)		No. 1 CYL.	No. 3 CYL.	No. 5 CYL.
No. 1 cylinder at compression TDC	EXH		×	
	INT	×		
Measuring position (left bank)		**No. 2 CYL.**	**No. 4 CYL.**	**No. 6 CYL.**
No. 1 cylinder at compression TDC	INT			×
	EXH	×		



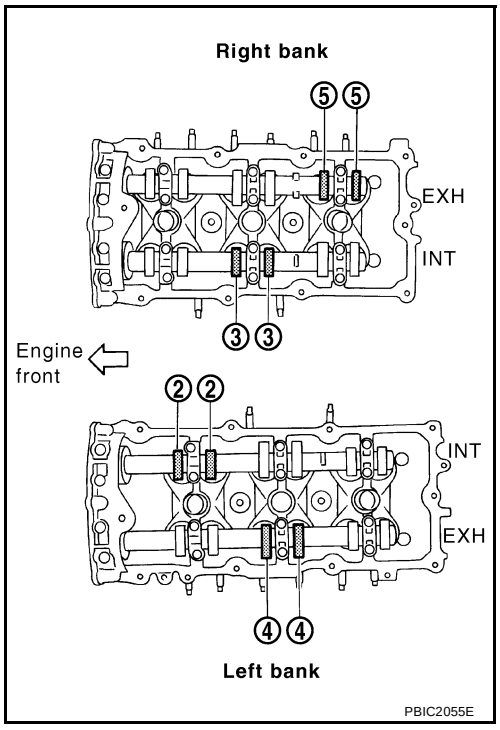
c. Rotate crankshaft by 240 degrees clockwise (when viewed from engine front) to align No. 3 cylinder at TDC of its compression stroke.

NOTE:
Crankshaft pulley mounting bolt flange has a stamped line every 60 degrees. They can be used as a guide to rotation angle.

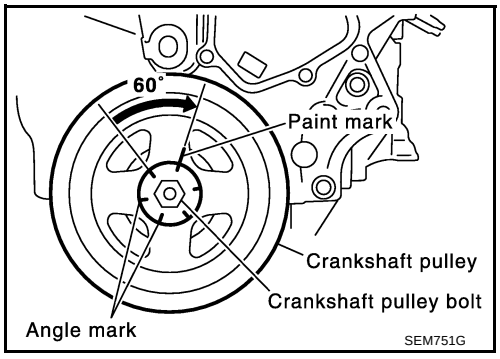


- By referring to the figure, measure the valve clearances at locations marked "×" as shown in the table below (locations indicated in the figure) with feeler gauge.
- No. 3 cylinder at compression TDC

Measuring position (right bank)		No. 1 CYL.	No. 3 CYL.	No. 5 CYL.
No. 3 cylinder at compression TDC	EXH			×
	INT		×	
Measuring position (left bank)		No. 2 CYL.	No. 4 CYL.	No. 6 CYL.
No. 3 cylinder at compression TDC	INT	×		
	EXH		×	

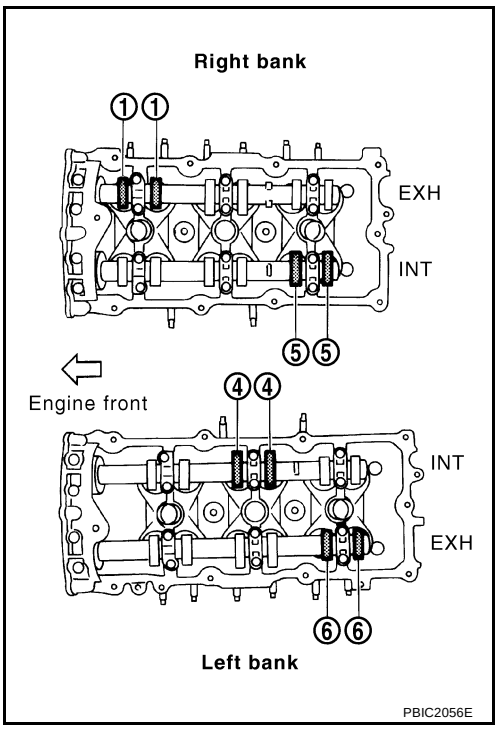


d. Rotate crankshaft by 240 degrees clockwise (when viewed from engine front) to align No. 5 cylinder at TDC of compression stroke.



- By referring to the figure, measure the valve clearances at locations marked "×" as shown in the table below (locations indicated in the figure) with feeler gauge.
- No. 5 cylinder at compression TDC

Measuring position (right bank)		No. 1 CYL.	No. 3 CYL.	No. 5 CYL.
No. 5 cylinder at compression TDC	EXH	×		
	INT			×
Measuring position (left bank)		No. 2 CYL.	No. 4 CYL.	No. 6 CYL.
No. 5 cylinder at compression TDC	INT		×	
	EXH			×

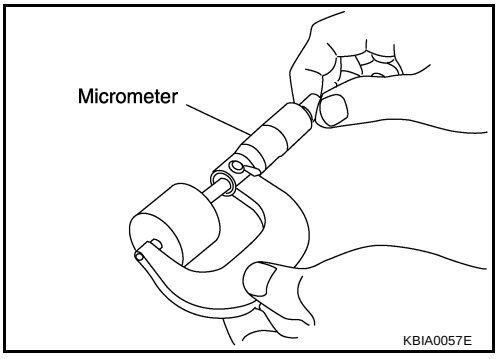


3. For measured value are out of the standard, perform adjustment. Refer to EM-87, "ADJUSTMENT" .

ADJUSTMENT

- Perform adjustment depending on selected head thickness of valve lifter.

1. Remove camshaft. Refer to EM-77, "REMOVAL" .
2. Remove valve lifters at the locations that are out of the standard.
3. Measure the center thickness of removed valve lifters with micrometer.



4. Use the equation below to calculate valve lifter thickness for replacement.

Valve lifter thickness calculation: $t = t_1 + (C_1 - C_2)$

t = Valve lifter thickness to be replaced

t_1 = Removed valve lifter thickness

C_1 = Measured valve clearance

C_2 = Standard valve clearance:

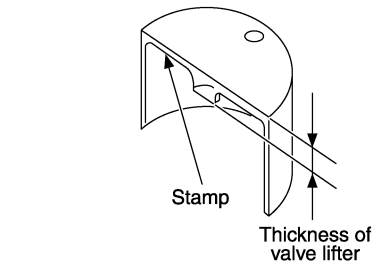
Intake : 0.30 mm (0.012 in)*

Exhaust : 0.33 mm (0.013 in)*

***: Approximately 20°C (68°F)**

- Thickness of new valve lifter can be identified by stamp marks on the reverse side (inside the cylinder).
  Stamp mark 788U or 788R indicates 7.88 mm (0.3102 in) in thickness.

  NOTE:
  Two types of stamp marks are used for parallel setting and for manufacturer identification.



KBIA0119E

Available thickness of valve lifter: 27 sizes with range 7.88 to 8.40 mm (0.3102 to 0.3307 in) in steps of 0.02 mm (0.0008 in) (when manufactured at factory). Refer to EM-144, "Available Valve Lifter" .

5. Install selected valve lifter.
6. Install camshaft. Refer to EM-81, "INSTALLATION" .
7. Manually turn crankshaft pulley a few turns.
8. Make sure that valve clearances for cold engine are within the specifications by referring to the specified values.

Valve clearance:

Unit: mm (in)

	Cold	Hot * (reference data)
Intake	0.26 - 0.34 (0.010 - 0.013)	0.304 - 0.416 (0.012 - 0.016)
Exhaust	0.29 - 0.37 (0.011 - 0.015)	0.308 - 0.432 (0.012 - 0.017)

*: Approximately 80°C (176°F)

OIL SEAL

PFP:00100

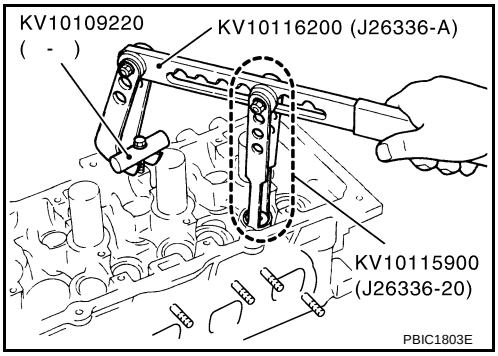
Removal and Installation of Valve Oil Seal

ABS009YT

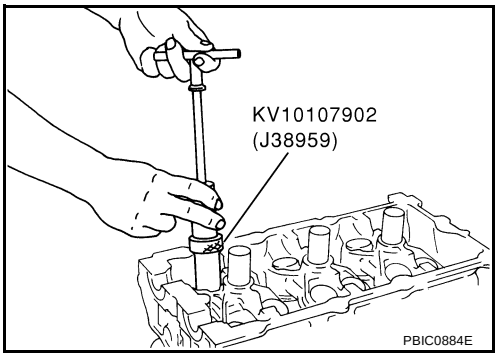
REMOVAL

1. Remove camshaft relating to valve oil seal to be removed. Refer to EM-76, "CAMSHAFT" .
2. Remove valve lifters. Refer to EM-76, "CAMSHAFT" .
3. Turn crankshaft until the cylinder requiring new oil seals is at TDC. This will prevent valve from dropping into cylinder.
4. Remove valve collet.
   - Compress valve spring with valve spring compressor, attachment, adapter [SST]. Remove valve collet with magnet hand.

   CAUTION:
   When working, take care not to damage valve lifter holes.



5. Remove valve spring retainer, valve spring and valve spring seat.
6. Remove valve oil seal using valve oil seal puller [SST].

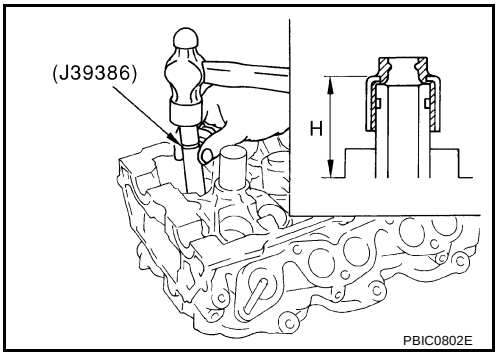


INSTALLATION

1. Apply engine oil on new valve oil seal joint and seal lip.
2. Using valve oil seal drift [SST], press fit valve seal to height “H” shown in the figure.

   NOTE:
   Dimension “H”: Height measured before valve spring seat installation

   Intake and exhaust : 14.3 - 14.9 mm (0.563 - 0.587 in)



3. Install in the reverse order of removal after this step.

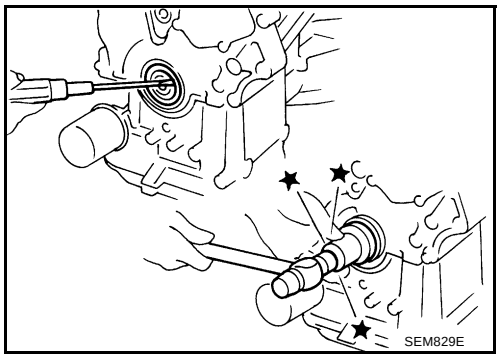
Removal and Installation of Front Oil Seal

ABS009YU

REMOVAL

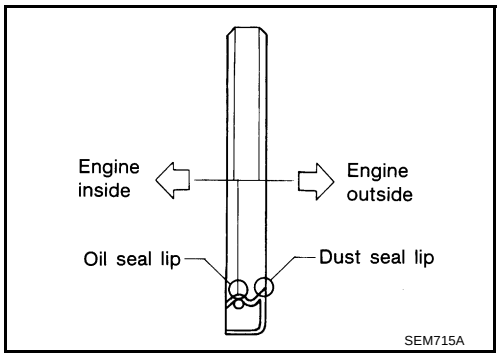
1. Remove the following parts:
   - Undercover
   - Drive belts; Refer to EM-12, "DRIVE BELTS" .
   - Radiator cooling fan assembly; Refer to CO-19, "COOLING FAN" .
   - Starter motor; Refer to SC-10, "STARTING SYSTEM" .
   - Crankshaft pulley; Refer to EM-55, "TIMING CHAIN" .
2. Remove front oil seal using suitable tool.

CAUTION:
Be careful not to damage front timing chain case and crankshaft.



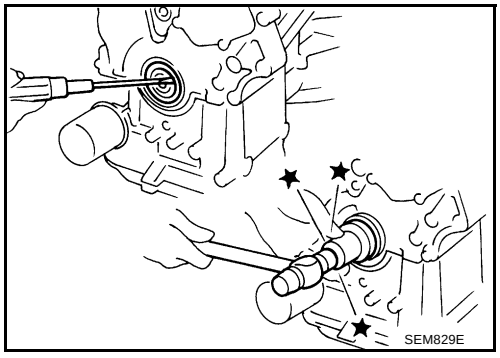
INSTALLATION

1. Apply engine oil to both oil seal lip and dust seal lip of new front oil seal.
2. Install front oil seal.
   - Install front oil seal so that each seal lip is oriented as shown in the figure.



   - Using suitable drift, press-fit until the height of front oil seal is level with the mounting surface.
     - Suitable drift: outer diameter 60 mm (2.36 in), inner diameter 50 mm (1.97 in).

CAUTION:
- **Be careful not to damage front timing chain case and crankshaft.**
- **Press-fit straight and avoid causing burrs or tilting oil seal.**



3. Install in the reverse order of removal after this step.

Removal and Installation of Rear Oil Seal

ABS009YV

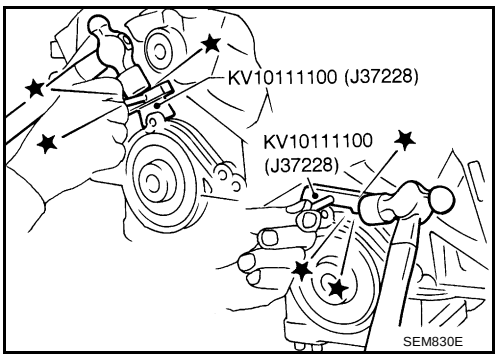
REMOVAL

1. Remove oil pan (upper). Refer to EM-27, "OIL PAN AND OIL STRAINER" .
2. Remove transmission assembly. Refer to MT-19, "TRANSMISSION ASSEMBLY" (M/T models) or AT-263, "TRANSMISSION ASSEMBLY" (A/T models).
3. Remove clutch cover and clutch disk (M/T models). Refer to CL-15, "CLUTCH DISC, CLUTCH COVER" .
4. Remove flywheel (M/T models) or drive plate (A/T models). Refer to EM-111, "CYLINDER BLOCK" .

5. Use seal cutter [SST] to cut away liquid gasket and remove rear oil seal retainer.

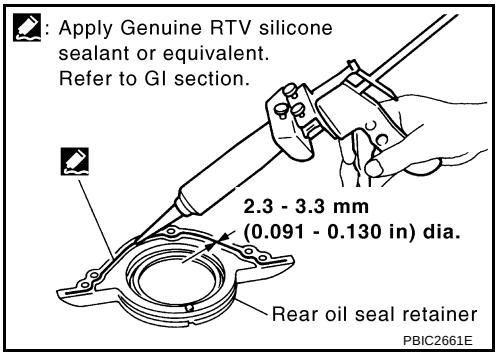
CAUTION:
Be careful not to damage mating surfaces.

NOTE:
Regard both rear oil seal and retainer as an assembly.



INSTALLATION

1. Remove old liquid gasket on mating surface of cylinder block and oil pan using scraper.
2. Apply new engine oil to both oil seal lip and dust seal lip of new rear oil seal retainer.
3. Apply a continuous bead of liquid gasket with tube presser [SST: WS39930000 (—)] to rear oil seal retainer as shown in the figure.
   Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .
   - Assembly should be done within 5 minutes after coating.



4. Install rear oil seal retainer to cylinder block. Refer to EM-111, "CYLINDER BLOCK" .
5. Install in the reverse order of removal after this step.

CYLINDER HEAD

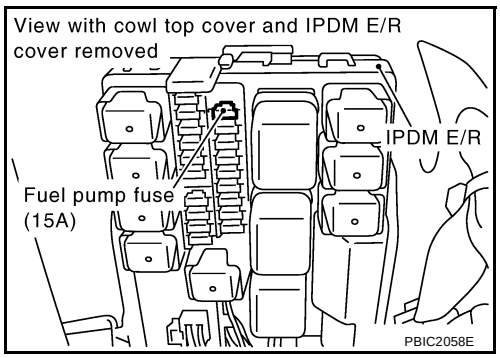
PFP:11041

On-Vehicle Service

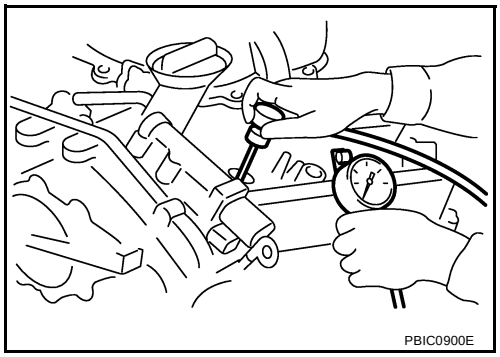
ABS009YW

CHECKING COMPRESSION PRESSURE

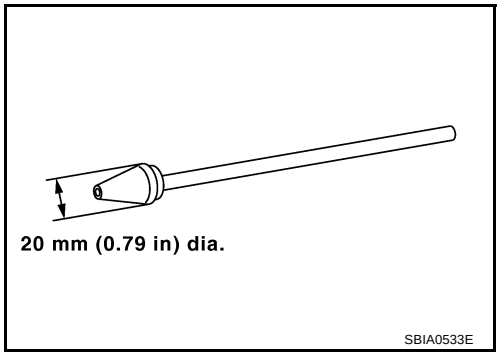
1. Warm up engine thoroughly. Then, stop it.
2. Release fuel pressure. Refer to EC-45, "FUEL PRESSURE RELEASE" .
3. Disconnect fuel pump fuse to avoid fuel injection during measurement.



4. Remove engine cover. Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .
5. Remove ignition coil and spark plug from each cylinder. Refer to EM-33, "IGNITION COIL" and EM-34, "SPARK PLUG (PLATINUM-TIPPED TYPE)" .
6. Connect engine tachometer (not required in use of CONSULT-ll).
7. Install compression tester with adapter onto spark plug hole.



- Use compression gauge whose picking up end inserted to spark plug hole is smaller than 20 mm (0.79 in) in diameter. Otherwise, it may be caught by cylinder head during removal.



8. With accelerator pedal fully depressed, turn ignition switch to “START” for cranking. When the gauge pointer stabilizes, read the compression pressure and engine rpm. Perform these steps to check each cylinder.

Compression pressure:

Unit: kPa (kg/cm^2 , psi) /rpm

Standard	Minimum	Differential limit between cylinders
1,275 (13.0, 185) / 300	981 (10.0, 142) / 300	98 (1.0, 14) / 300

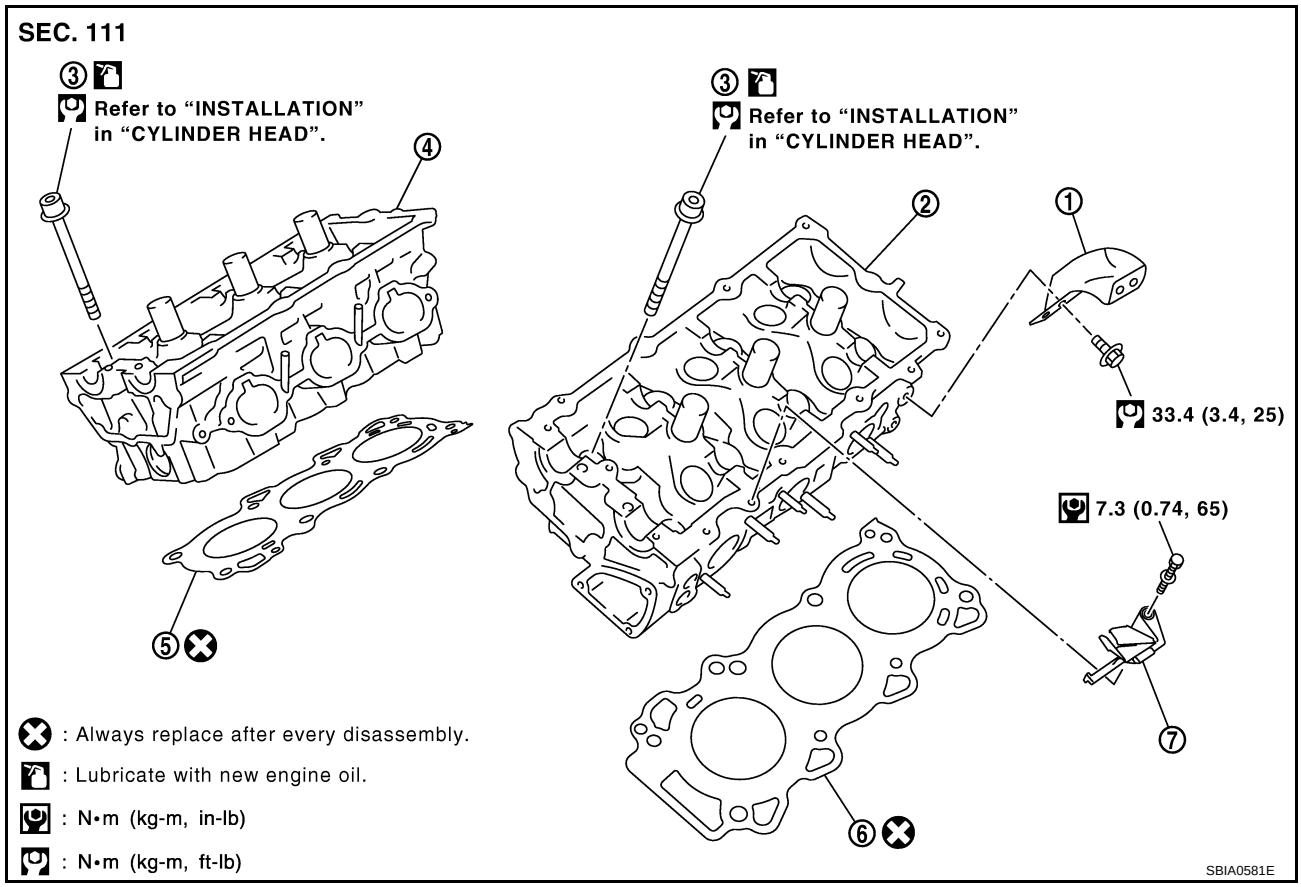
CAUTION:
Always use a fully changed battery to obtain specified engine speed.

- If the engine speed is out of specified range, check battery liquid for proper gravity. Check engine speed again with normal battery gravity.
- If compression pressure is below minimum value, check valve clearances and parts associated with combustion chamber (valve, valve seat, piston, piston ring, cylinder bore, cylinder head, cylinder head gasket). After the checking, measure compression pressure again.
- If some cylinders have low compression pressure, pour small amount of engine oil into the spark plug hole of the cylinder to re-check it for compression.
  - If the added engine oil improves the compression, piston rings may be worn out or damaged. Check the piston rings and replace if necessary.
  - If the compression pressure remains at low level despite the addition of engine oil, valves may be malfunctioning. Check valves for damage. Replace valve or valve seat accordingly.
- If two adjacent cylinders have respectively low compression pressure and their compression remains low even after the addition of engine oil, cylinder head gaskets are leaking. In such a case, replace cylinder head gaskets.

9. After inspection is completed, install removed parts.
10. Start engine, and make sure that engine runs smoothly.
11. Perform trouble diagnosis. If DTC appears, erase it. Refer to EC-72, "TROUBLE DIAGNOSIS" .

Removal and Installation

ABS009YX



1. Engine rear lower slinger
2. Cylinder head (left bank)
3. Cylinder head bolt
4. Cylinder head (right bank)
5. Cylinder head gasket (right bank)
6. Cylinder head gasket (left bank)
7. Oil level gauge guide

REMOVAL

1. Remove camshaft. Refer to EM-76, "CAMSHAFT" .

   NOTE:
   It is also possible to perform the following steps 2 and 3 just before removing the camshaft.
2. Temporarily fit front suspension member to support engine. Refer to FSU-19, "FRONT SUSPENSION MEMBER" .

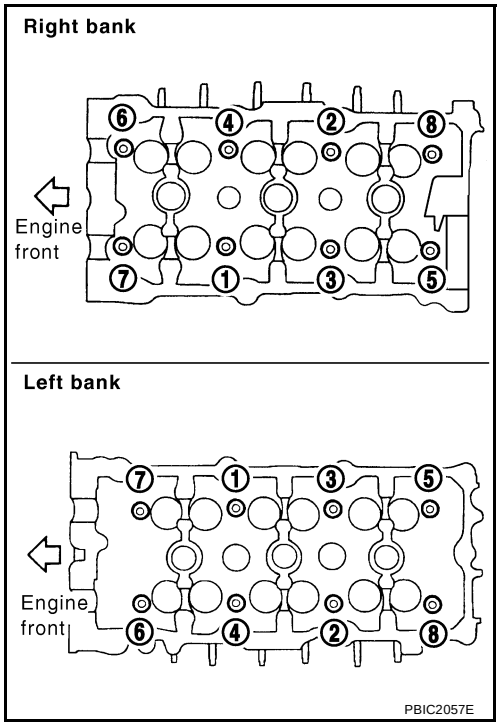
CAUTION:

Temporary fitting means the status that engine is adequately stable though the hoist is released from hanging.

NOTE:

At the time of the start of this procedure front suspension member is removed, and cylinder head is hanged by the hoist with engine slinger installed.

3. Release the hoist from hanging, then remove the engine slinger.
4. Remove the following parts:
   - Fuel tube and fuel injector assembly; Refer to EM-36, "FUEL INJECTOR AND FUEL TUBE" .
   - Intake manifold; Refer to EM-21, "INTAKE MANIFOLD" .
   - Exhaust manifold; Refer to EM-23, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .
   - Water inlet and thermostat assembly; Refer to CO-25, "WATER INLET AND THERMOSTAT ASSEMBLY" .
   - Water outlet and water pipe; Refer to CO-27, "WATER OUTLET AND WATER PIPING" .
5. Remove cylinder head bolts in reverse order as shown in the figure with cylinder head bolt wrench (commercial service tool).



6. Remove cylinder head gaskets.

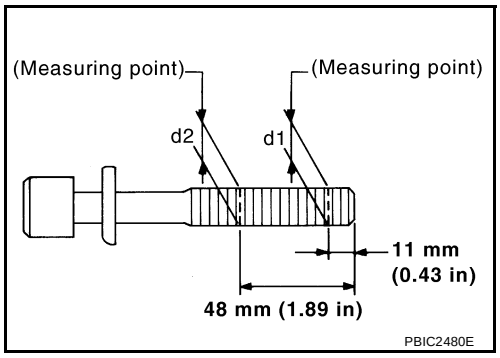
INSPECTION AFTER REMOVAL

Cylinder Head Bolts Outer Diameter

- Cylinder head bolts are tightened by plastic zone tightening method. Whenever the size difference between “d1” and “d2” exceeds the limit, replace them with new one.

  Limit (“d1” – “d2”) : 0.11 mm (0.0043 in)

- If reduction of outer diameter appears in a position other than “d2”, use it as “d2” point.



Cylinder Head Distortion

NOTE:

When performing this inspection, cylinder block distortion should be also checking. Refer to EM-133, "CYLINDER BLOCK DISTORTION" .

1. Using scraper, wipe off oil, scale, gasket, sealant and carbon deposits from surface of cylinder head.

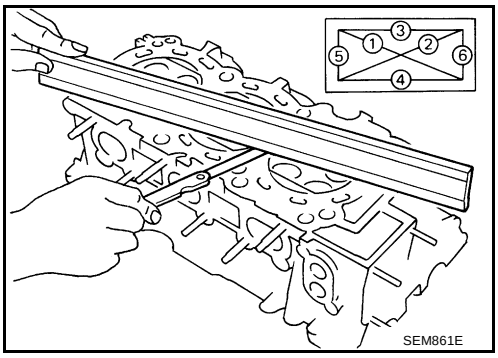
   CAUTION:

   Do not allow gasket fragments to enter engine oil or engine coolant passages.

2. At each of several locations on bottom surface of cylinder head, measure the distortion in six directions.

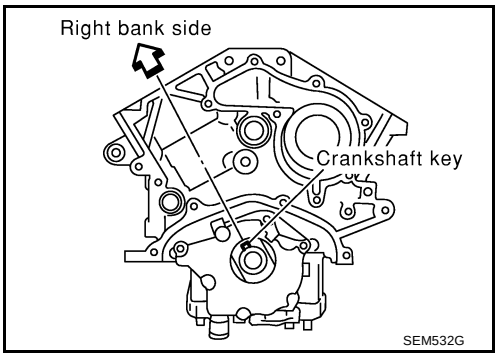
   Limit : 0.1 mm (0.004 in)

   - If it exceeds the limit, replace cylinder head.



INSTALLATION

1. Install new cylinder head gaskets.
2. Turn crankshaft until No. 1 piston is set at TDC.
   - Crankshaft key should line up with the right bank cylinder center line as shown in the figure.



3. Install cylinder head follow the steps below to tighten cylinder head bolts in numerical order as shown in the figure.

   CAUTION:

   If cylinder head bolts re-used, check their outer diameters before installation. Refer to EM-94, "Cylinder Head Bolts Outer Diameter" .

a. Apply new engine oil to threads and seat surfaces of cylinder head bolts.

b. Tighten all cylinder head bolts.

   : 98.1 N·m (10 kg-m, 72 ft-lb)

c. Completely loosen all cylinder head bolts.

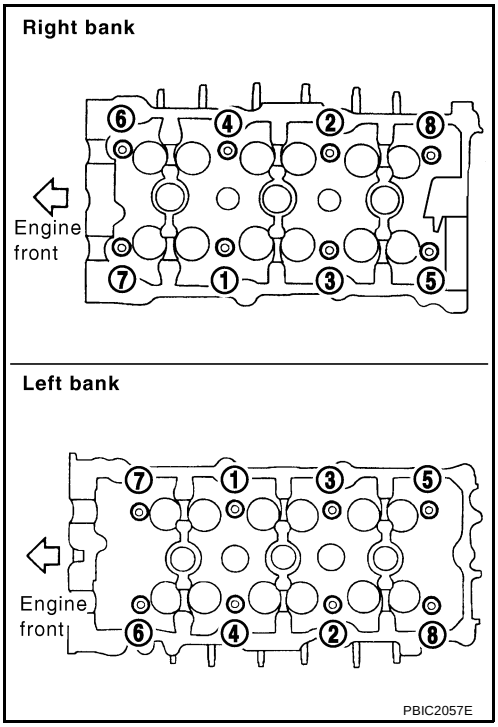
   : 0 N·m (0 kg-m, 0 ft-lb)

   CAUTION:

   In step “c”, loosen bolts in reverse order of that indicated in the figure.

d. Tighten all cylinder head bolts.

   : 34.3 - 44.1 N·m (3.5 - 4.4 kg-m, 26 - 32 ft-lb)



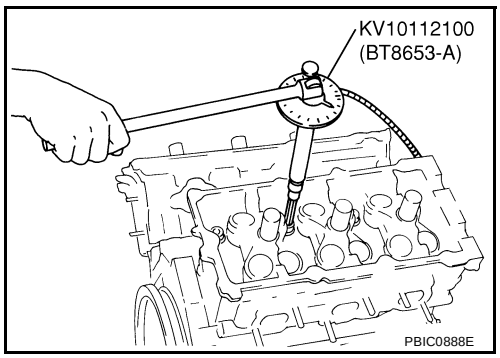
e. Turn all bolts 90 to 95 degrees clockwise [target: 90 degrees (angle tightening)].

CAUTION:

Check the tightening angle by using angle wrench [SST]. Avoid judgment by visual inspection without tool.

- Check tightening angle indicated on angle wrench [SST] indicator plate.

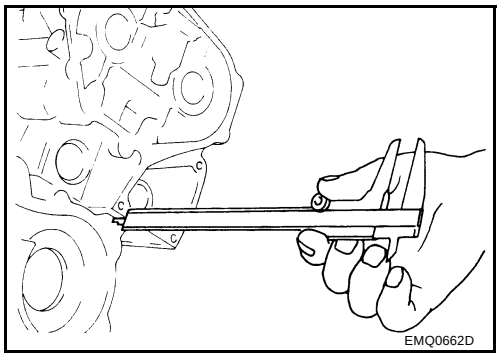
f. Turn all bolts 90 to 95 degrees clockwise again [target: 90 degrees (angle tightening)].



4. After installing cylinder head, measure distance between front end faces of cylinder block and cylinder head (left and right banks).

Standard : 14.1 - 14.9 mm (0.555 - 0.587 in)

- If the measured value is out of the standard, re-install cylinder head.



5. Install in the reverse order of removal after this step.

INSPECTION AFTER INSTALLATION

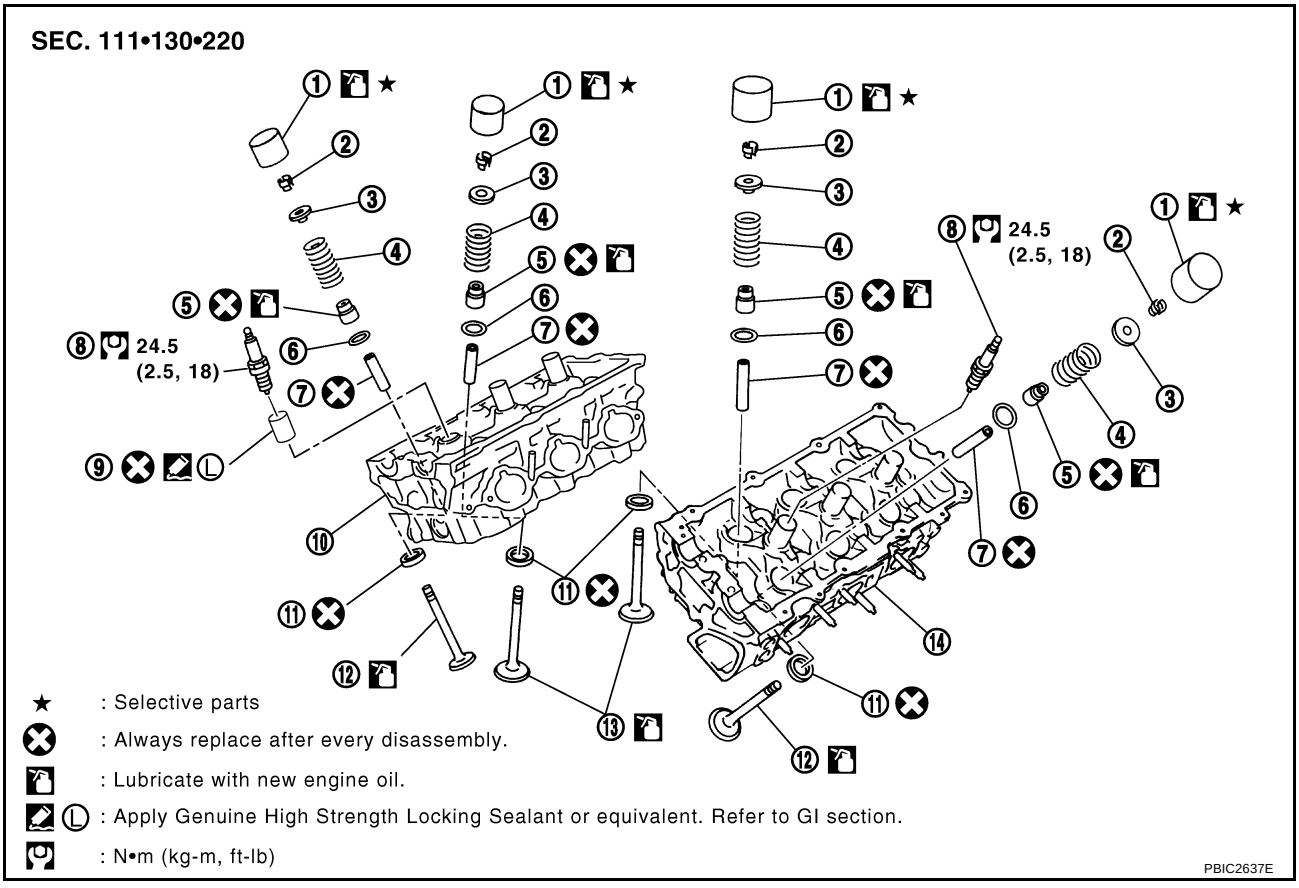
- Before starting engine, check the levels of engine coolant, engine oil and working fluid. If less than required quantity, fill to the specified level.
- Use procedure below to check for fuel leakage.
  - Turn ignition switch “ON” (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.
  - Start engine. With engine speed increased, check again for fuel leakage at connection points.
- Run engine to check for unusual noise and vibration.
- Warm up engine thoroughly to make sure there is no leakage of engine coolant, engine oil, working fluid, fuel and exhaust gas.
- Bleed air from passages in pipes and tubes of applicable lines, such as in cooling system.
- After cooling down engine, again check levels of engine coolant, engine oil and working fluid. Refill to the specified level, if necessary.

Summary of the inspection items:

Item	Before starting engine	Engine running	After engine stopped
Engine coolant	Level	Leakage	Level
Engine oil	Level	Leakage	Level
Working fluid	Level	Leakage	Level
Fuel	—	Leakage	—
Exhaust gases	—	Leakage	—

Disassembly and Assembly

ABS009YY



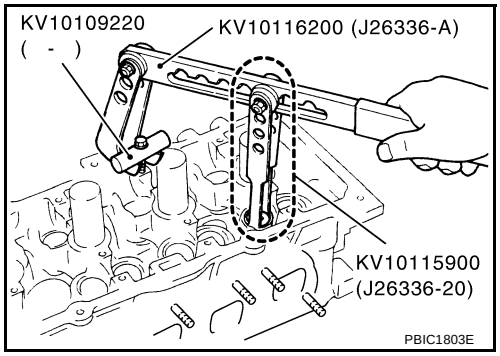
1. Valve lifter
2. Valve collet
3. Valve spring retainer
4. Valve spring
5. Valve oil seal
6. Valve spring seat
7. Valve guide
8. Spark plug
9. Spark plug tube

10. Cylinder head (right bank)
11. Valve seat
12. Valve (EXH)
13. Valve (INT)
14. Cylinder head (left bank)

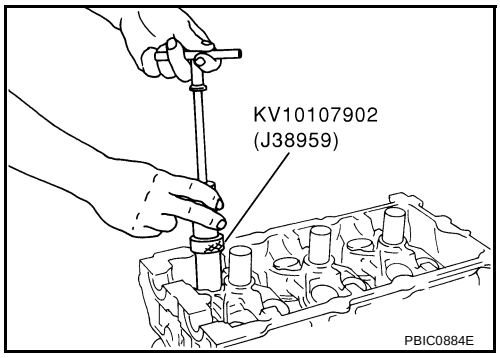
DISASSEMBLY

1. Remove spark plug with spark plug wrench (commercial service tool).
2. Remove valve lifter.
   - Identify installation positions, and store them without mixing them up.
3. Remove valve collet.
   - Compress valve spring with valve spring compressor, attachment and adapter [SST]. Remove valve collet with magnet hand.

   CAUTION:
   When working, take care not to damage valve lifter holes.



4. Remove valve spring retainer, valve spring and valve spring retainer.
5. Push valve stem to combustion chamber side, and remove valve.
   - Identify installation positions, and store them without mixing them up.
6. Remove valve oil seals using valve oil seal puller [SST].



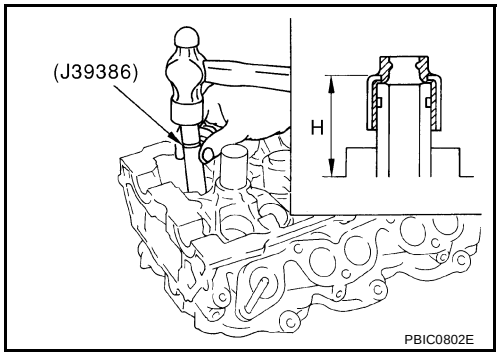
7. If valve seat must be replaced, refer to EM-102, "VALVE SEAT REPLACEMENT" .
8. If valve guide must be replaced, refer to EM-100, "VALVE GUIDE REPLACEMENT" .
9. Remove spark plug tube, as necessary.
   - Using pair of pliers, pull spark plug tube out of cylinder head.

   CAUTION:
   - **Take care not to damage cylinder head.**
   - **Once removed, spark plug tube will be deformed and cannot be reused. Do not remove it unless absolutely necessary.**

ASSEMBLY

1. When valve guide is removed, install it. Refer to EM-100, "VALVE GUIDE REPLACEMENT" .
2. When valve seat is removed, install it. Refer to EM-102, "VALVE SEAT REPLACEMENT" .
3. Install valve oil seals.
   - Install with valve oil seal drift [SST] to match dimension in the figure.

   Height “H” (Without valve spring seat installed)
   Intake and exhaust : 14.3 - 14.9 mm (0.563 - 0.587 in)



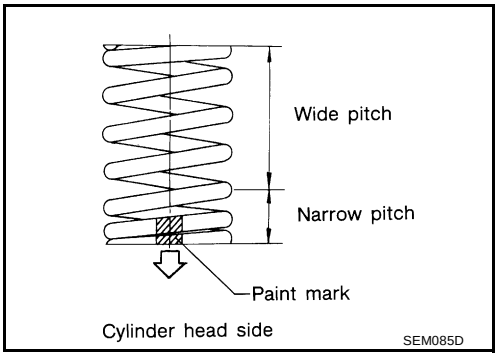
4. Install valve spring seat.
5. Install valves.
   - Larger diameter valves are for intake side.

   NOTE:
   Larger diameter valves are for intake side.
6. Install valve spring (uneven pitch type).
   - Install narrow pitch end (paint mark) to cylinder head side (valve spring seat side).
   - Intake side and exhaust side valve springs are different. Install them referring to the following paint mark collar.

   Paint mark collar

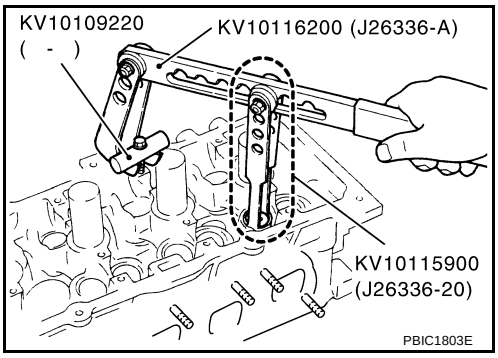
   Intake : White

   Exhaust : Blue



7. Install valve spring retainer.
8. Install valve collet.
   - Compress valve spring with valve spring compressor, attachment and adapter [SST]. Install valve collet with magnet hand.

     CAUTION:
     When working, take care not to damage valve lifter holes.
   - Tap valve stem edge lightly with plastic hammer after installation to check its installed condition.



9. Install valve lifter.
   - Install it in the original position.
10. Install spark plug tube.
    - Press-fit spark plug tube as follows:

a. Remove old liquid gasket adhering to cylinder head mounting hole.

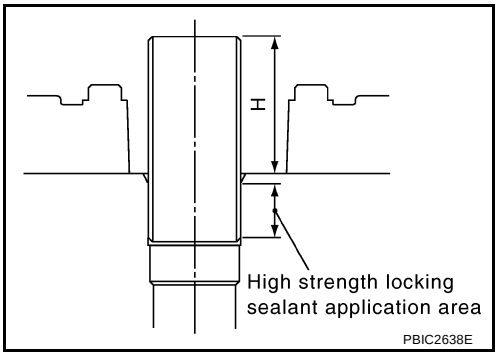
b. Apply liquid gasket to area within approximately 12 mm (0.47 in) from edge of spark plug tube press-fit side.
Use Genuine High Strength Locking Sealant or equivalent. Refer to GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

c. Using drift, press-fit spark plug tube so that its height “H” is as specified in the figure.

Standard press-fit height “H” :

: 38.55 - 38.65 mm (1.5177 - 1.5217 in)

CAUTION:
- **When press-fitting, take care not to deform spark plug tube.**
- **After press-fitting, wipe off liquid gasket protruding onto cylinder-head upper face.**



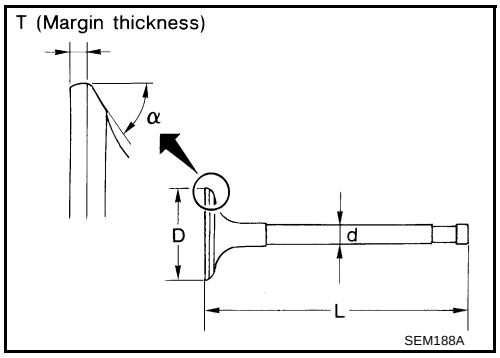
11. Install spark plug with spark plug wrench (commercial service tool).

Inspection After Disassembly

ABS009YZ

VALVE DIMENSIONS

- Check dimensions of each valve. For dimensions, refer to EM-145, "Valve Dimensions" .
- If dimensions are out of the standard, replace valve.



VALVE GUIDE CLEARANCE

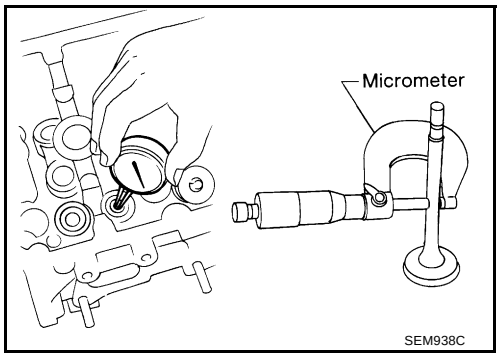
Valve Stem Diameter

Measure diameter of valve stem with micrometer.

Standard

Intake : 5.965 - 5.980 mm (0.2348 - 0.2354 in)

Exhaust : 5.955 - 5.970 mm (0.2344 - 0.2350 in)



Valve Guide Inner Diameter

Measure inner diameter of valve guide with inside micrometer.

Standard

Intake and Exhaust : 6.000 - 6.018 mm (0.2362 - 0.2369 in)

Valve Guide Clearance

(Valve guide clearance) = (Valve guide inner diameter) – (Valve stem diameter).

Valve guide clearance:

Standard

Intake : 0.020 - 0.053 mm (0.0008 - 0.0021 in)

Exhaust : 0.030 - 0.063 mm (0.0012 - 0.0025 in)

Limit

Intake : 0.08 mm (0.003 in)

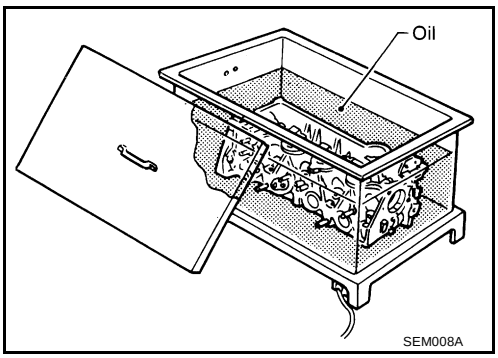
Exhaust : 0.09 mm (0.004 in)

- If it exceeds the limit, replace valve and/or valve guide. When valve guide must be replaced, refer to EM-100, "VALVE GUIDE REPLACEMENT" .

VALVE GUIDE REPLACEMENT

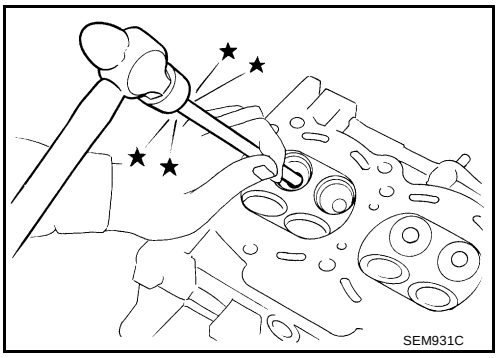
When valve guide is removed, replace with oversized [0.2 mm (0.008 in)] valve guide.

1. To remove valve guide, heat cylinder head to 110 to 130°C (230 to 266°F) by soaking in heated oil.



2. Drive out valve guide with a press [under a 20 kN (2 ton, 2.2 US ton, 2.0 lmp ton) pressure] or hammer and suitable tool.

CAUTION:
Cylinder head contains heat. When working, wear protective equipment to avoid getting burned.

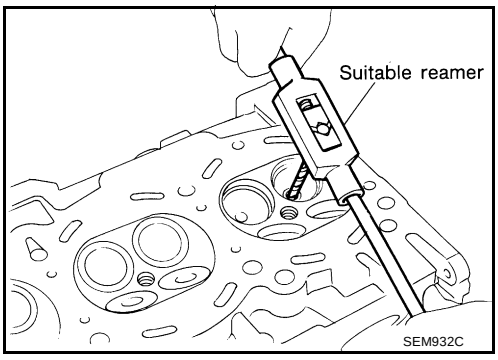


3. Using valve guide reamer (commercial service tool), ream cylinder head valve guide hole.

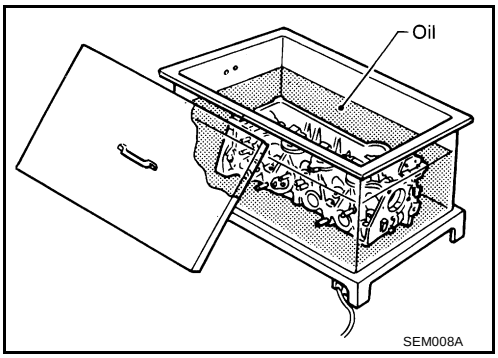
Valve guide hole diameter (for service parts):

Intake and exhaust

: 10.175 - 10.196 mm (0.4006 - 0.4014 in)



4. Heat cylinder head to 110 to 130°C (230 to 266°F) by soaking in heated oil.



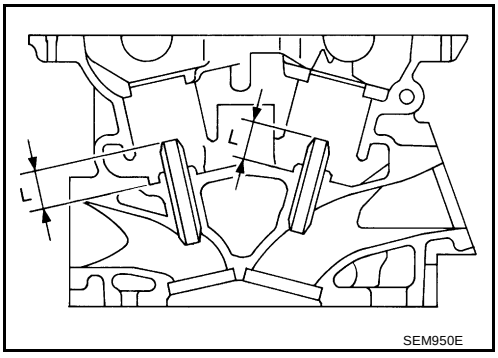
5. Using valve guide drift (commercial service tool), press valve guide from camshaft side to the dimensions as in the figure.

Projection "L"

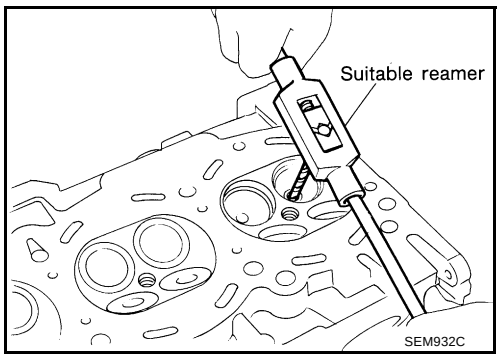
Intake and exhaust

: 12.6 - 12.8 mm (0.496 - 0.504 in)

CAUTION:
Cylinder head contains heat. When working, wear protective equipment to avoid getting burned.



6. Using valve guide reamer (commercial service tool), apply reamer finish to valve guide.



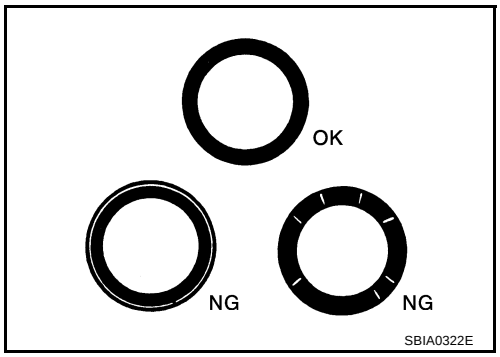
Standard:

Intake and exhaust

: 6.000 - 6.018 mm (0.2362 - 0.2369 in)

VALVE SEAT CONTACT

- After confirming that the dimensions of valve guides and valves are within the specifications, perform this procedure.
- Apply prussian blue (or white lead) onto contacting surface of valve seat to check the condition of the valve contact on the surface.
- Check if the contact area band is continuous all around the circumference.
- If not, grind to adjust valve fitting and check again. If the contacting surface still has “NG” conditions even after the re-check, replace valve seat. Refer to EM-102, "VALVE SEAT REPLACEMENT" .



VALVE SEAT REPLACEMENT

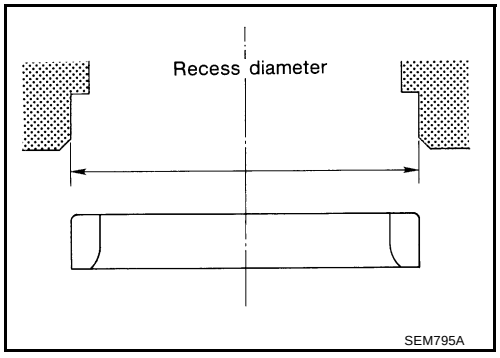
When valve seat is removed, replace with oversized [0.5 mm (0.020 in)] valve seat.

1. Bore out old seat until it collapses. Boring should not continue beyond the bottom face of the seat recess in cylinder head. Set the machine depth stop to ensure this.

CAUTION:

Prevent to scratch cylinder head by excessive boring.

2. Ream cylinder head recess diameter for service valve seat.



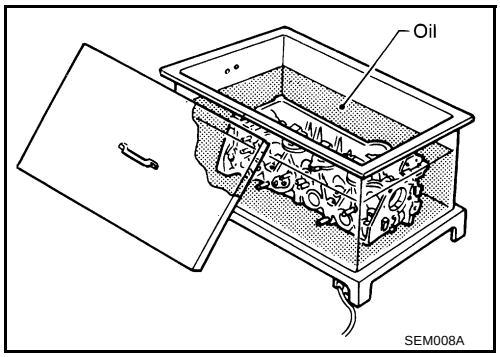
Oversize [0.5 mm (0.020 in)]

Intake : 38.500 - 38.516 mm (1.5157 - 1.5164 in)

Exhaust : 32.700 - 32.716 mm (1.2874 - 1.2880 in)

- Be sure to ream in circles concentric to valve guide center. This will enable valve to fit correctly.

3. Heat cylinder head to 110 to 130°C (230 to 266°F) by soaking in heated oil.



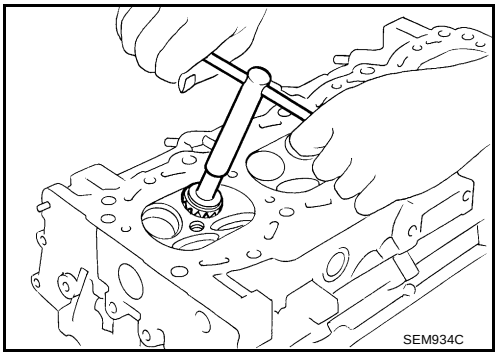
4. Provide valve seats cooled well with dry ice. Force fit valve seat into cylinder head.

CAUTION:

- **Avoid directly touching cold valve seats.**

- **Cylinder head contains heat. When working, wear protective equipment to avoid getting burned.**

5. Using valve seat cutter set (commercial service tool) or valve seat grinder, finish seat to the specified dimensions. Refer to EM-147, "Valve Seat" .



CAUTION:
When using valve seat cutter, firmly grip cutter handle with both hands. Then, press on the contacting surface all around the circumference to cut in a single drive. Improper pressure on with cutter or cutting many different times may result in stage valve seat.

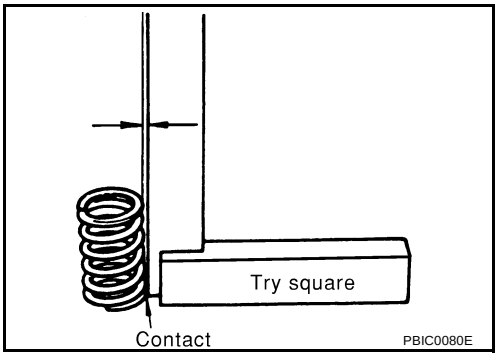
6. Using compound, grind to adjust valve fitting.
7. Check again for normal contact. Refer to EM-102, "VALVE SEAT CONTACT" .

VALVE SPRING SQUARENESS

- Set try square along the side of valve spring and rotate spring. Measure the maximum clearance between the top face of spring and try square.

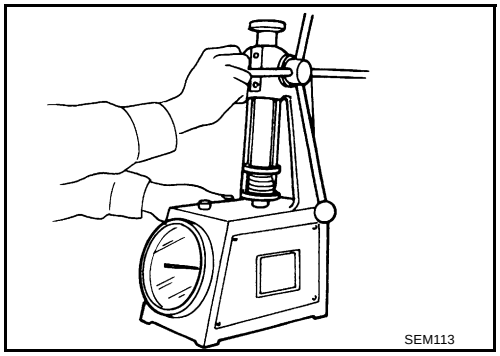
  Limit : 2.1 mm (0.083 in)

- If it exceeds the limit, replace valve spring.



VALVE SPRING DIMENSIONS AND VALVE SPRING PRESSURE LOAD

- Check valve spring pressure at specified spring height.



Standard:

Intake and exhaust

Free height

: 47.07 mm (1.8531 in)

Installation height

: 37.00 mm (1.4567 in)

Installation load

: 166 - 188 N (16.9 - 19.2 kg, 37 - 42 lb)

Height during valve open

: 27.2 mm (1.0709 in)

Load with valve open

: 373 - 421 N (38.0 - 42.9 kg, 84 - 95 lb)

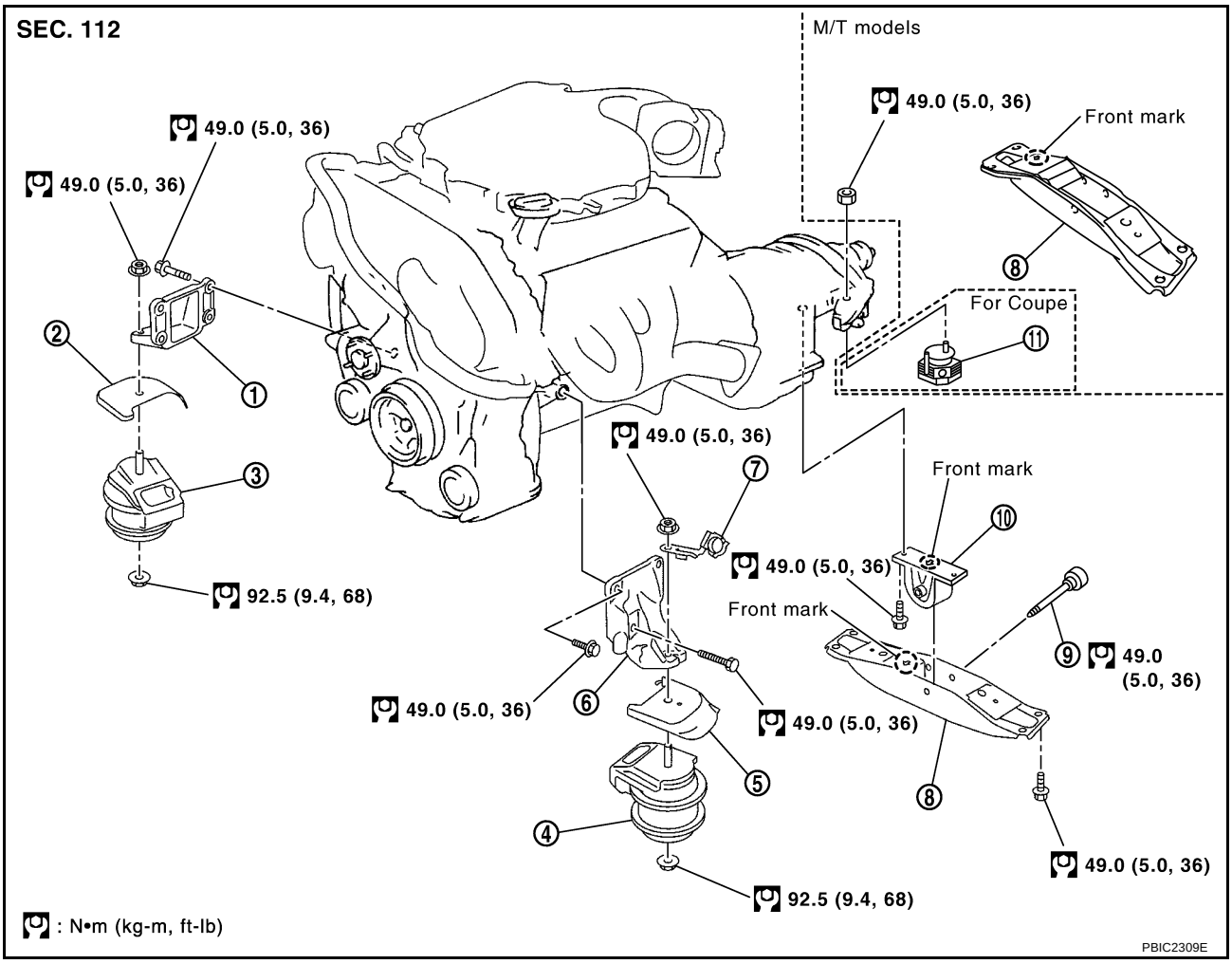
- If the installation load or load with valve open is out of the standard, replace valve spring.

ENGINE ASSEMBLY

PFP:10001

Removal and Installation

ABS009Z0



1. Engine mounting bracket (RH)
2. Heat insulator (RH)
3. Engine mounting Insulator (RH)
4. Engine mounting insulator (LH)
5. Heat insulator (LH)
6. Engine mounting bracket (LH)
7. Harness bracket
8. Rear engine mounting member
9. Mass damper
10. Engine mounting insulator (rear)
11. Dynamic damper

WARNING:

- **Situate vehicle on a flat and solid surface.**
- **Place chocks at front and back of rear wheels.**
- **For engines not equipped with engine slingers, attach proper slingers and bolts described in PARTS CATALOG.**

CAUTION:

- **Always be careful to work safely, avoid forceful or uninstructed operations.**
- **Do not start working until exhaust system and engine coolant are cool enough.**
- **If items or work required are not covered by the engine section, refer to the applicable sections.**
- **Always use the support point specified for lifting.**
- **Use either 2-pole lift type or separate type lift as best you can. If board-on type is used for unavoidable reasons, support at the rear axle jacking point with transmission jack or similar tool before starting work, in preparation for the backward shift of center of gravity.**
- **For supporting points for lifting and jacking point at rear axle, refer to GI-41, "Garage Jack and Safety Stand" .**

REMOVAL

Outline

At first, remove engine and transmission assembly with front suspension member from vehicle downward. Then separate engine from transmission.

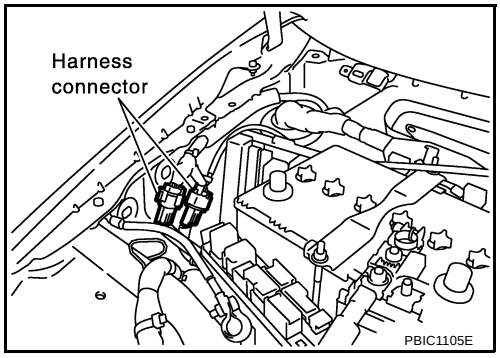
Preparation

1. Release fuel pressure. Refer to EC-45, "FUEL PRESSURE RELEASE" .
2. Drain engine coolant from radiator. Refer to CO-9, "Changing Engine Coolant" .

   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine coolant on drive belts.**
3. Disconnect both battery terminal. Refer to SC-4, "BATTERY" .
4. Remove the following parts:
   - Hood assembly; Refer to BL-13, "HOOD" .
   - Tower bar; Refer to FSU-20, "TOWER BAR" .
   - Engine cover; Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .
   - Front wiper arm and cowl top cover; Refer to EI-20, "COWL TOP" .
   - Undercover
   - Drive belts; Refer to EM-12, "DRIVE BELTS" .
   - Front road wheels and tires
5. Drain engine coolant from radiator. Refer to CO-9, "Changing Engine Coolant" .
6. Remove air cleaner case and air duct. Refer to EM-14, "AIR CLEANER AND AIR DUCT" .
7. Discharge refrigerant from A/C circuit. Refer to ATC-129, "REFRIGERANT LINES" .
8. Remove radiator cooling fan assembly, reservoir tank and hoses. Refer to CO-19, "COOLING FAN" and CO-12, "RADIATOR" .

Engine Room

1. Disconnect heater hose at engine-side, and fit a plug onto hose end to prevent engine coolant leak.
2. Disconnect ground cable (between vehicle to left cylinder head).
3. Disconnect battery positive cable harness at vehicle side and temporarily fasten it on engine.
4. Disconnect A/C piping from A/C compressor, and temporarily fasten it on vehicle with a rope.
5. Remove engine room harness connectors as shown in the figure.



6. Disconnect two body ground cables.
7. Disconnect brake booster vacuum hose.
8. Disconnect fuel feed hose (with damper) and EVAP hose. Refer to EM-36, "FUEL INJECTOR AND FUEL TUBE" .

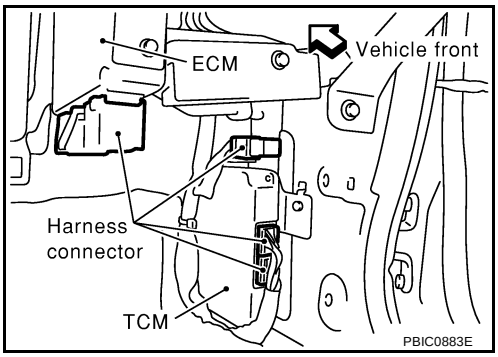
   CAUTION:
   Fit plugs onto disconnected hoses to prevent fuel leak.
9. Remove reservoir tank of power steering oil pump, and piping from vehicle, and temporarily secure them on engine.

   CAUTION:
   When temporarily securing, keep the reservoir tank upright to avoid a fluid leak.

Passenger Room Side

Follow procedure below to disconnect engine room harness connectors at passenger room side, and temporarily secure them on engine.

1. Remove passenger-side kicking plate inner, dash side finisher, and instrument passenger panel lower. Refer to EI-35, "BODY SIDE TRIM" and IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Disconnect engine room harness connectors at unit sides TCM (A/T models), ECM and other.



3. Disengage intermediate fixing point. Pull out engine room harnesses to engine room side, and temporarily secure them on engine.

CAUTION:

- **When pulling out harnesses, take care not to damage harnesses and connectors.**
- **After temporarily securing, cover connectors with vinyl or similar material to protect against foreign material adhesion.**

Vehicle Underbody

1. Remove exhaust front tube. Refer to EX-3, "EXHAUST SYSTEM" .
2. Disconnect steering lower joint at power steering gear assembly side, and release steering lower shaft. Refer to PS-10, "STEERING COLUMN" .
3. Remove propeller shaft. Refer to PR-5, "REAR PROPELLER SHAFT" .

CAUTION:

Do not impact or damage propeller shaft tube.

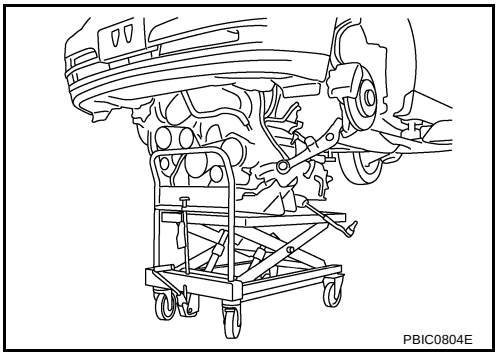
4. Disengage shift lever and clutch operating cylinder (M/T models). Refer to MT-19, "TRANSMISSION ASSEMBLY" and CL-11, "OPERATING CYLINDER" .
5. Disengage A/T control rod at control device assembly side. Then, temporarily secure it on transmission, so that it does not sag (A/T models). Refer to AT-227, "SHIFT CONTROL SYSTEM" .
6. Remove rear plate from oil pan (upper). Then remove bolts fixing drive plate to torque converter (A/T models). Refer toEM-27, "OIL PAN AND OIL STRAINER" and AT-263, "TRANSMISSION ASSEMBLY" .
7. Remove bolts fixing transmission to lower rear side of oil pan (upper). Refer to MT-19, "TRANSMISSION ASSEMBLY" (M/T models) or AT-263, "TRANSMISSION ASSEMBLY" (A/T models).
8. Remove front stabilizer. Refer to FSU-18, "STABILIZER BAR" .
9. Remove outer sockets from steering knuckle. Refer to PS-17, "POWER STEERING GEAR AND LINKAGE" .
10. Remove transverse links from suspension member. Refer to FSU-13, "TRANSVERSE LINK" .

Removal Work

1. Use a manual lift table caddy (commercial service tool) or equivalently rigid tool such as transmission jack. Securely support bottom of suspension member and transmission.

CAUTION:

Put a piece of wood or something similar as the supporting surface, secure a completely stable condition.



2. Remove rear engine mounting member bolts.
3. Remove suspension member mounting bolts and nuts. Refer to FSU-5, "FRONT SUSPENSION ASSEMBLY" .
4. Carefully lower jack, or raise lift to remove engine, transmission and suspension member assembly. When performing work, observe the following caution:

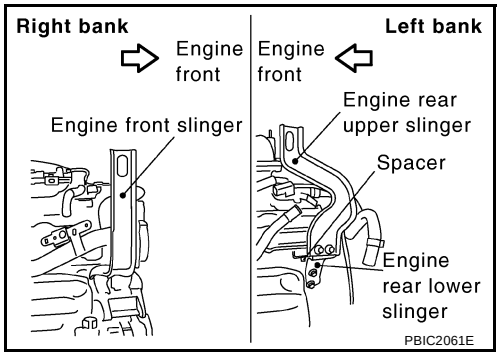
   CAUTION:
   - **Confirm there is no interference with vehicle.**
   - **Make sure that all connection points have been disconnected.**
   - **Keep in mind the center of vehicle gravity changes. If necessary, use jack(s) to support vehicle at rear jacking point(s) to prevent it from falling it off the lift.**

Separation Work

1. Install engine slingers into front of right bank cylinder head and rear of left bank cylinder head.

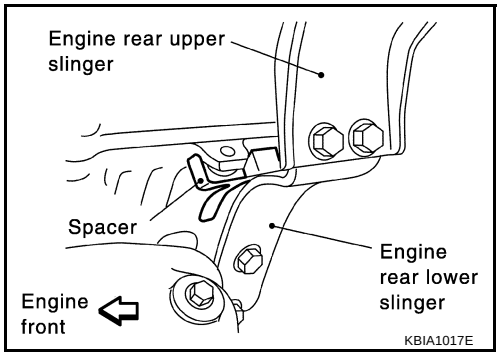
   Slinger bolts:

   : 24.5 - 31.4 N·m (2.5 - 3.2 kg-m, 18 - 23 ft-lb)



   - To protect rocker cover against damage caused by tilting of engine slinger, insert spacer between cylinder head and engine rear lower slinger, in direction shown in the figure.

     NOTE:
     Spacer is a component part of engine rear upper slinger assembly.



2. Remove power steering oil pump from engine side. Refer to PS-29, "POWER STEERING OIL PUMP" .
3. Remove engine mounting insulators (RH and LH) under side nut.
4. Lift with hoist and separate engine and transmission assembly from suspension member.

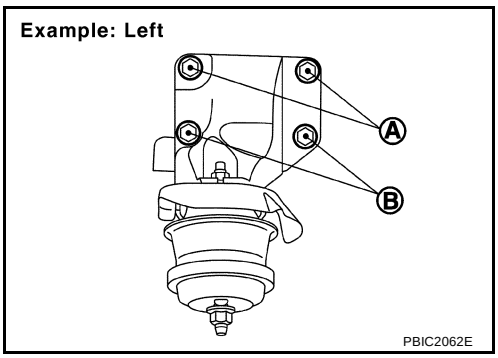
   CAUTION:
   - **Before and during this lifting, always make sure that any harnesses are left connected.**
   - **Avoid damage to and oil/grease smearing or spills onto engine mounting insulator.**
5. Remove alternator. Refer to SC-21, "CHARGING SYSTEM" .
6. Remove starter motor. Refer to SC-10, "STARTING SYSTEM" .
7. Separate engine from transmission. Refer to MT-19, "TRANSMISSION ASSEMBLY" (M/T models) or AT-263, "TRANSMISSION ASSEMBLY" (A/T models).
8. Remove engine mounting insulators (RH and LH) and brackets (RH and LH) from engine.
9. Remove rear engine mounting member and engine mounting insulator (rear) from transmission.

INSTALLATION

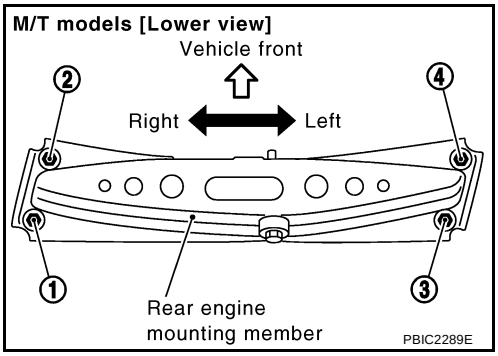
Note the following, and install in the reverse order of removal.

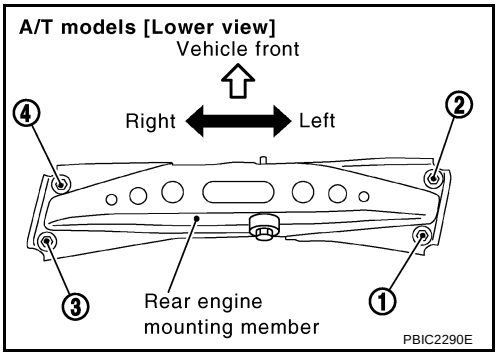
- Do not allow engine mounting insulator to be damage and careful no engine oil gets on it.

- For a location with a positioning pin, insert it securely into hole of mating part.
- For a part with a specified installation orientation, refer to component figure in EM-105, "Removal and Installation" .
- When installing engine mounting brackets (RH and LH) on cylinder block, tighten two upper bolts (shown as “A” in the figure) first. Then tighten two lower bolts (shown as “B” in the figure).



- Make sure all engine mounting insulators are seated properly, then tighten mounting nuts.
- Tighten rear engine mounting member bolts in numerical order as shown in the figure.





INSPECTION AFTER INSTALLATION

- Before starting engine, check the levels of engine coolant, engine oil and working fluid. If less than required quantity, fill to the specified level.
- Use procedure below to check for fuel leakage.
  - Turn ignition switch “ON” (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.
  - Start engine. With engine speed increased, check again for fuel leakage at connection points.
- Run engine to check for unusual noise and vibration.
- Warm up engine thoroughly to make sure there is no leakage of engine coolant, engine oil, working fluid, fuel and exhaust gas.
- Bleed air from passages in pipes and tubes of applicable lines, such as in cooling system.
- After cooling down engine, again check levels of engine coolant, engine oil and working fluid. Refill to the specified level, if necessary.

Summary of the inspection items:

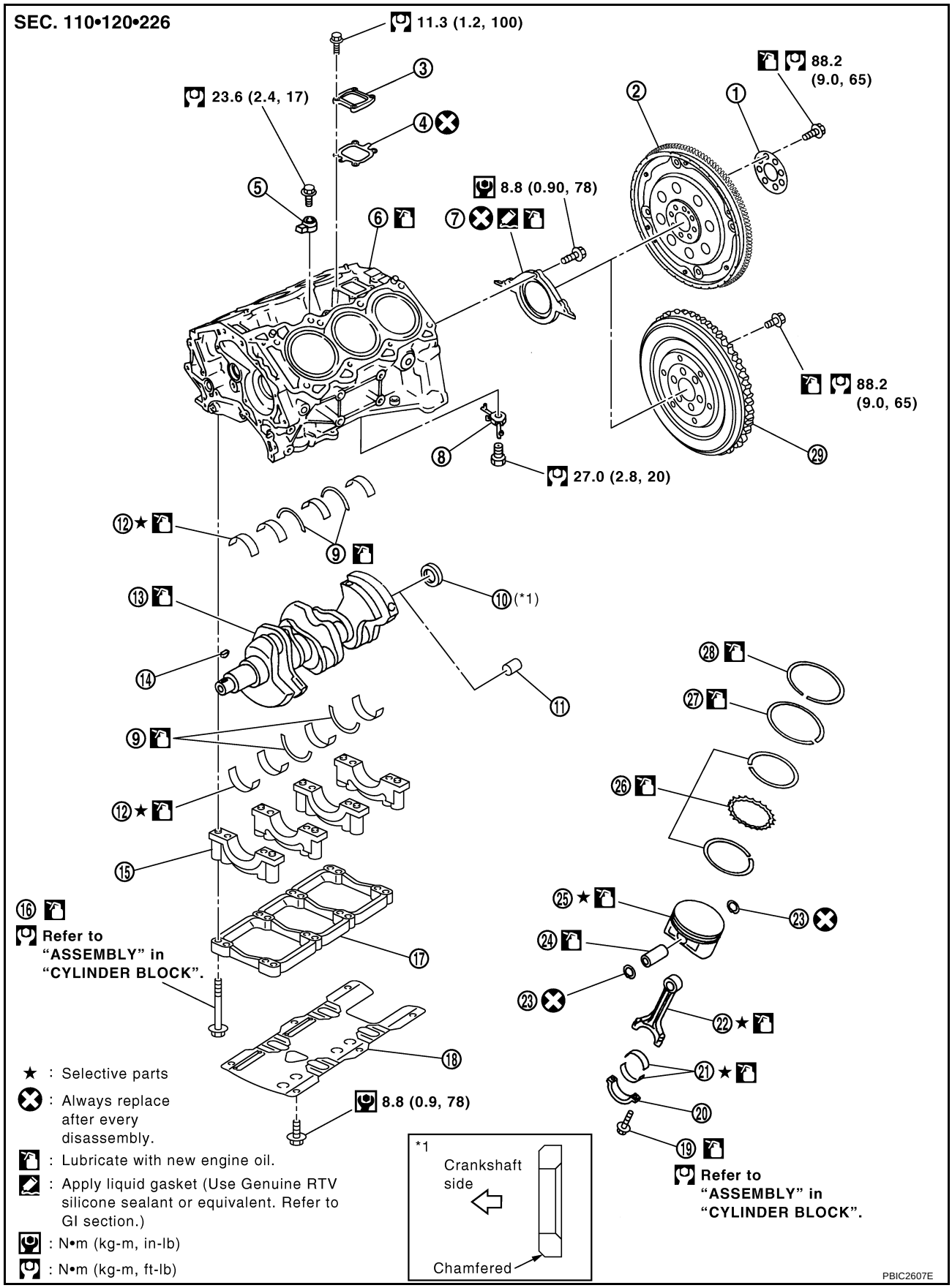
Item	Before starting engine	Engine running	After engine stopped
Engine coolant	Level	Leakage	Level
Engine oil	Level	Leakage	Level
Working fluid	Level	Leakage	Level
Fuel	—	Leakage	—
Exhaust gas	—	Leakage	—

CYLINDER BLOCK

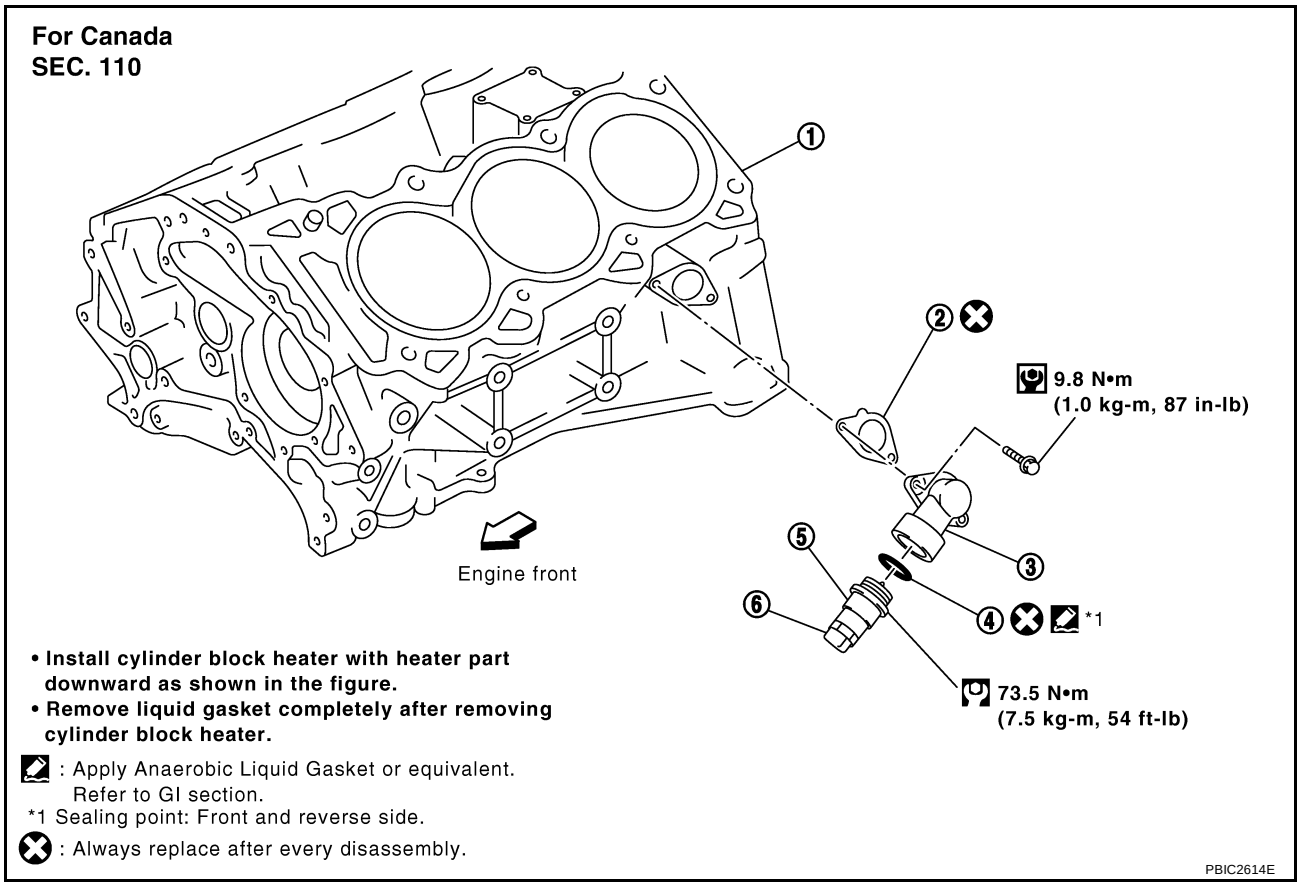
PFP:11010

Disassembly and Assembly

ABS009Z1



1. Reinforcement plate
2. Drive plate (A/T models)
3. Cover
4. Gasket
5. Knock sensor
6. Cylinder block
7. Rear oil seal retainer
8. Oil jet
9. Thrust bearing
10. Pilot converter (A/T models)
11. Pilot bushing (M/T models)
12. Main bearing
13. Crankshaft
14. Crankshaft Key
15. Main bearing cap
16. Main bearing cap bolt
17. Main bearing beam
18. Baffle plate
19. Connecting rod bolt
20. Connecting rod bearing cap
21. Connecting rod bearing
22. Connecting rod
23. Snap ring
24. Piston pin
25. Piston
26. Oil ring
27. Second ring
28. Top ring
29. Flywheel (M/T models)

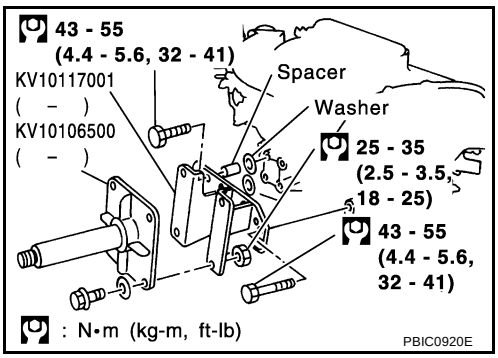


1. Cylinder block
2. Gasket
3. Water connector
4. Gasket
5. Cylinder block heater
6. Connector protector cap

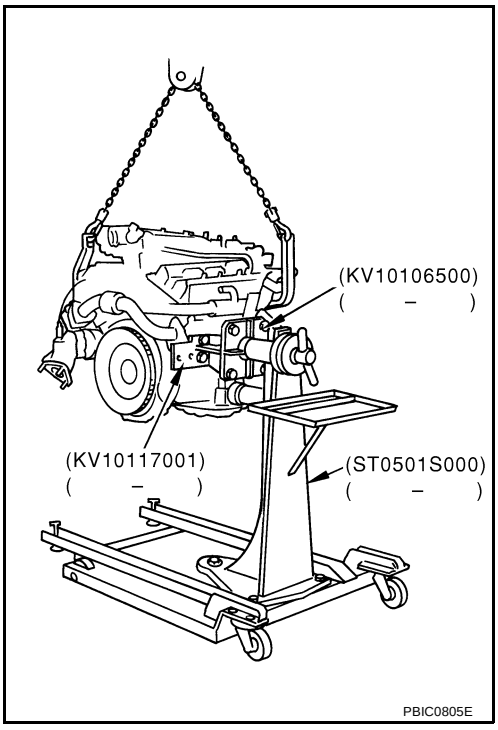
DISASSEMBLY

1. Remove engine assembly from vehicle, and separate front suspension member and transmission from engine. Refer to EM-105, "ENGINE ASSEMBLY" .
2. Remove engine mounting brackets (RH and LH). Refer to EM-105, "ENGINE ASSEMBLY" .
3. Remove exhaust manifold (right bank). Refer to EM-23, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

4. Install engine sub-attachment with engine stand shaft [SST] to right side of cylinder block.
   - Use spacer to engine rear side.



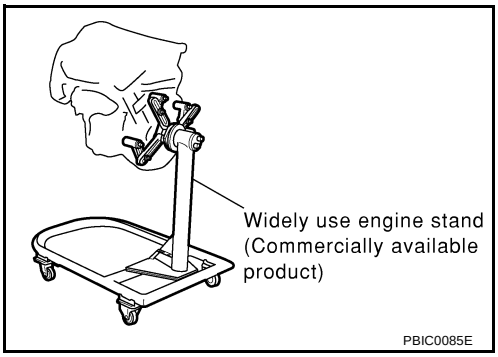
5. Lift engine, and mount it onto engine stand [SST].



   - A widely use engine stand can be used.

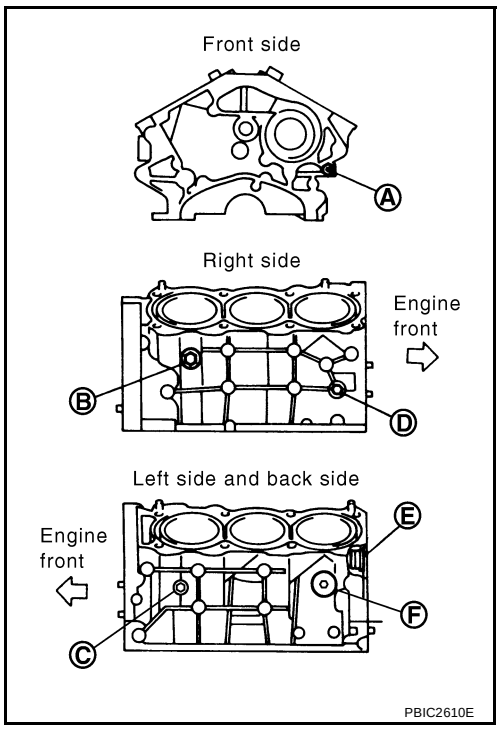
     CAUTION:
     Use engine stand that has a load capacity [approximately 220 kg (441 lb) or more] large enough for supporting the engine weight.

     NOTE:
     This example is engine stand for holding at transmission mounting side with flywheel (M/T models) or drive plate (A/T models) removed.

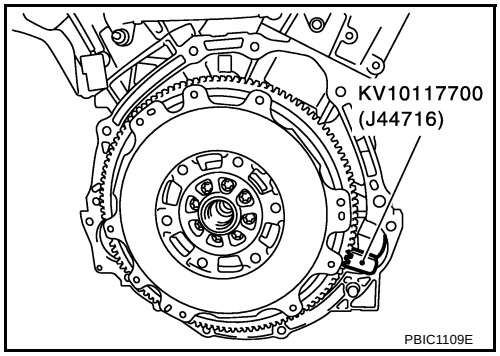


6. Drain engine oil. Refer to LU-8, "Changing Engine Oil" .

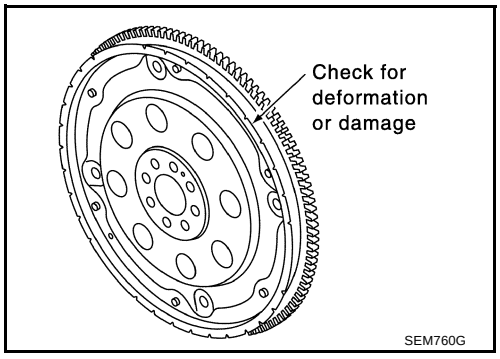
7. Drain engine coolant by removing water drain plugs from cylinder block both sides at “B” and “C” and cylinder block front side at “A” as shown in the figure.



8. Remove clutch cover and clutch disc (M/T models). Refer to CL-15, "CLUTCH DISC, CLUTCH COVER" .
9. Remove flywheel (M/T models) or drive plate (A/T models). Fix crankshaft with ring gear stopper [SST], and remove mounting bolts.
   - Loosen mounting bolts in diagonal order.
   - Use TORX socket for flywheel mounting bolts (size: T55, commercial service tool)



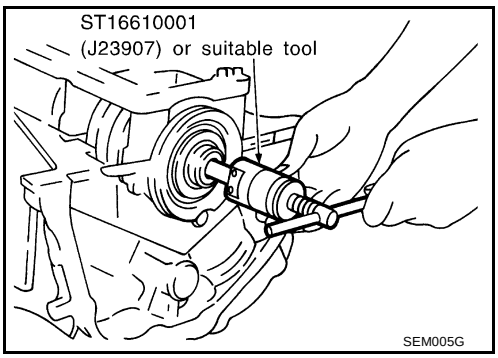
CAUTION:
- **Do not disassemble flywheel (M/T models) and drive plate (A/T models).**
- **Do not place drive plate (A/T models) with signal plate facing down.**
- **When handling signal plate, take care not to damage or scratch it.**
- **Handle signal plate in a manner that prevents it from becoming magnetized.**



10. Remove cylinder head. Refer to EM-92, "CYLINDER HEAD" .
11. Remove knock sensor.

CAUTION:
Carefully handle sensor avoiding shocks.

12. Remove pilot bushing (M/T models) or pilot converter (A/T models) using pilot bushing puller [SST] or suitable tool as necessary.



13. Remove rear oil seal retainer.
    - Remove by inserting screwdriver between main bearing cap and rear oil seal retainer.

    CAUTION:
    If rear oil seal retainer is removed, replace it with new one.

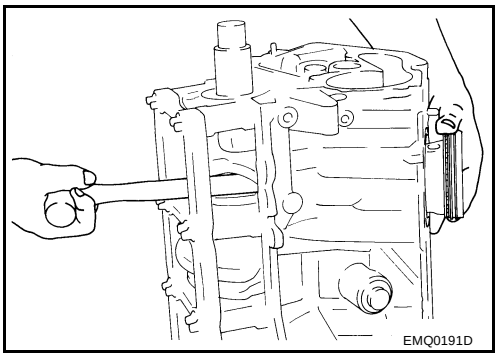
    NOTE:
    Regard both rear oil seal and retainer as an assembly.
14. Remove baffle plate from main bearing beam.
15. Remove piston and connecting rod assembly as follows:
    - Before removing piston and connecting rod assembly, check the connecting rod side clearance. Refer to EM-130, "CONNECTING ROD SIDE CLEARANCE" .

a. Position crankshaft pin corresponding to connecting rod to be removed onto the bottom dead center.

b. Remove connecting rod bearing cap.

c. Using hammer handle or similar tool, push piston and connecting rod assembly out to the cylinder head side.

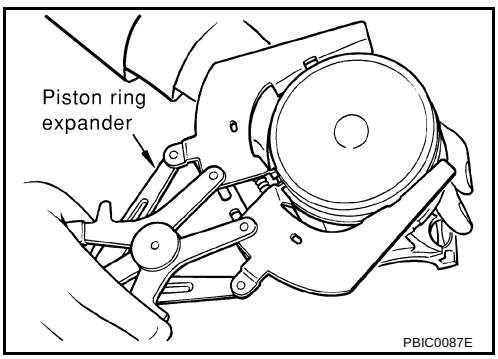
    CAUTION:
    Be careful not to damage the cylinder wall and crankshaft pin, resulting from an interference of the connecting rod big end.



16. Remove connecting rod bearings from connecting rod and connecting rod bearing cap.

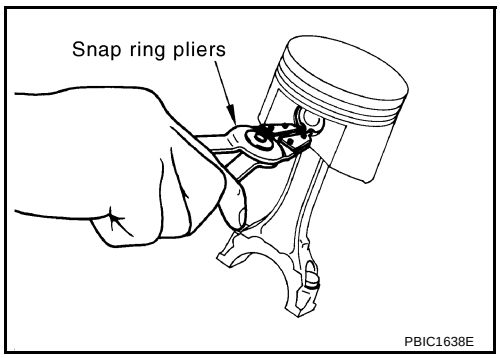
    CAUTION:
    Identify installation position, and store them without mixing them up.
17. Remove piston rings form piston.
    - Before removing piston rings, check the piston ring side clearance. Refer to EM-131, "PISTON RING SIDE CLEARANCE" .
    - Use piston ring expander (commercial service tool).

    CAUTION:
    - **When removing piston rings, be careful not to damage piston.**
    - **Be careful not to damage piston rings by expanding them excessively.**

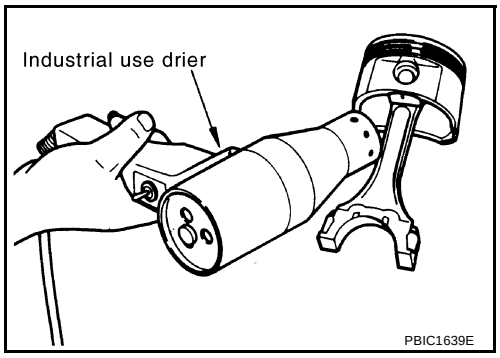


18. Remove piston from connecting rod as follows:

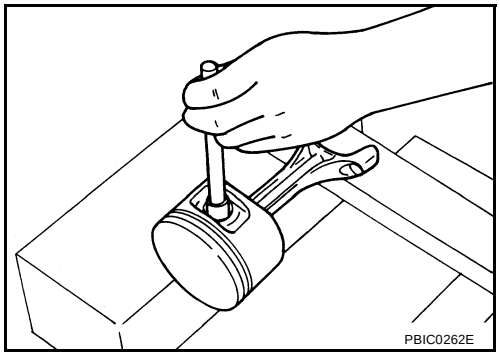
a. Using snap ring pliers, remove snap ring.



b. Heat piston to 60 to 70°C (140 to 158°F) with industrial use drier or equivalent.



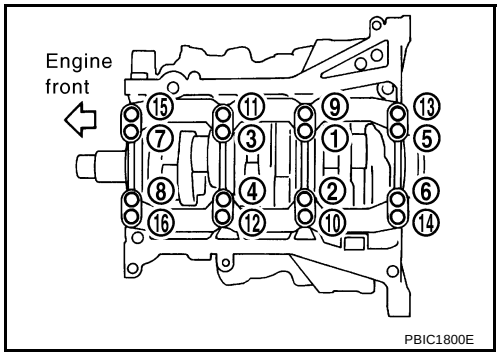
c. Push out piston pin with stick of outer diameter approximately 20 mm (0.79 in).



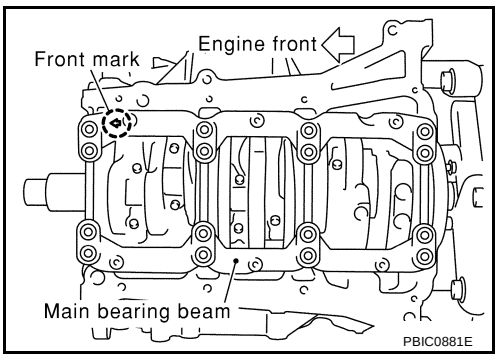
19. Remove main bearing cap bolts.

NOTE:
Use TORX socket (size E14).

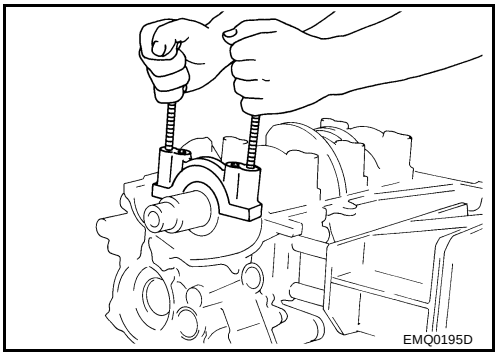
- Before loosening main bearing cap bolts, measure the crankshaft end play. Refer to EM-130, "CRANKSHAFT END PLAY" .
- Loosen main bearing cap bolts in reverse order shown in the figure in several different steps.



20. Remove main bearing beam.



21. Remove main bearing caps.
    - Using main bearing cap bolts, remove main bearing cap while shaking it back-and-forth.



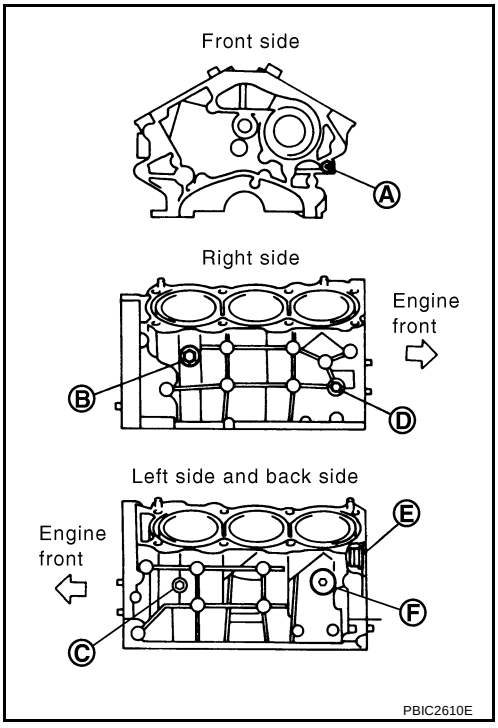
22. Remove crankshaft.
23. Remove main bearings and thrust bearings from cylinder block and main bearing caps.

    CAUTION:
    Identify installation positions, and store them without mixing them up.
24. Remove oil jet.

ASSEMBLY

1. Fully air-blow engine coolant and engine oil passages in cylinder block, cylinder bore and crankcase to remove any foreign material.

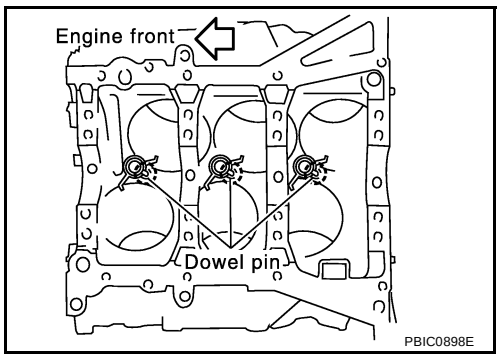
   CAUTION:
   Use a goggles to protect your eye.
2. Install each plug to cylinder block as shown in the figure.
   - Apply sealant to the thread of water drain plugs “A”, “B” and “C”.
     Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .
   - Apply sealant to the thread of plugs “D” and “E”.
     Use Genuine High Strength Thread Locking Sealant or equivalent. Refer to GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .
   - Apply sealant to the thread of plug “F”.
     Use Anaerobic Liquid Gasket or equivalent. Refer to GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .
   - Replace washers with new one.



- Tighten each plug as specified below.

Part	Washer	Tightening torque
A	No	9.8 N·m (1.0 kg-m, 87 in-lb)
B	No	19.6 N·m (2.0 kg-m, 14 ft-lb)
C	No	19.6 N·m (2.0 kg-m, 14 ft-lb)
D	Yes	12.3 N·m (1.3 kg-m, 9 ft-lb)
E	Yes	62 N·m (6.3 kg-m, 46 ft-lb)
F	Yes	62 N·m (6.3 kg-m, 46 ft-lb)

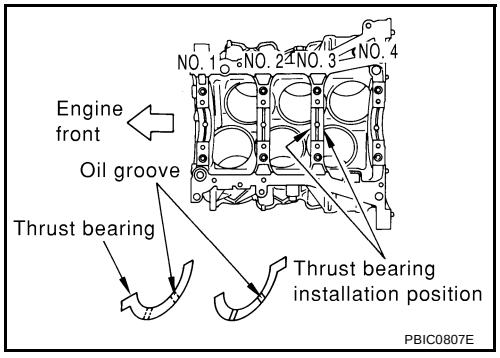
3. Install oil jet.
   - Insert oil jet dowel pin into cylinder block dowel pin hole, and tighten mounting bolts.



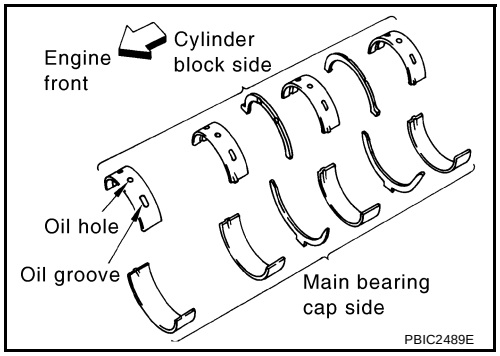
4. Install main bearings and thrust bearings as follows:

a. Remove dust, dirt, and engine oil on bearing mating surfaces of cylinder block and main bearing caps.

b. Install thrust bearings to the both sides of the No. 3 journal housing on cylinder block and main bearing cap.
   - Install thrust bearings with the oil groove facing crankshaft arm (outside).
   - Install thrust bearing with a protrusion on one end on cylinder block, and thrust bearing with a protrusion at center on cap. Align each protrusion with mating notch.



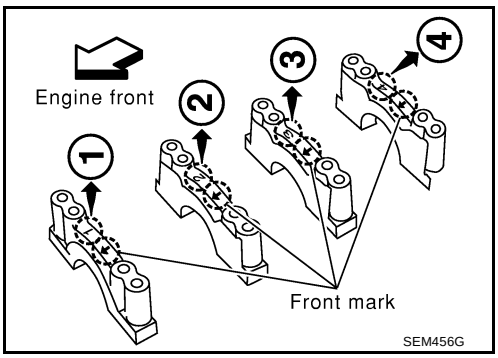
c. Install main bearings paying attention to the direction.
   - Main bearing with oil hole and groove goes on cylinder block. The one without them goes on main bearing cap.
   - Before installing main bearings, apply engine oil to the bearing surface (inside). Do not apply engine oil to the back surface, but thoroughly clean it.
   - When installing, align main bearing stopper protrusion to cut-out of cylinder block and main bearing caps.
   - Ensure the oil holes on cylinder block and those on the corresponding bearing are aligned.



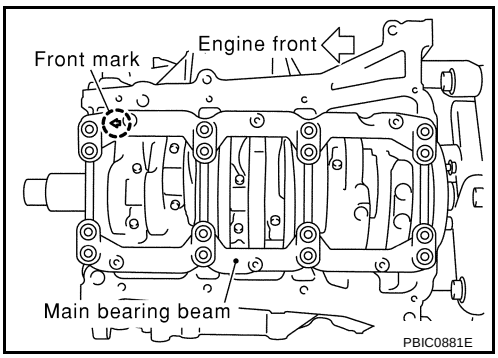
5. Install crankshaft to cylinder block.
   - While turning crankshaft by hand, check that it turns smoothly.
6. Install main bearing cap.

- Main bearing caps are identified by identification mark cast on them. For installation, face front mark to front side.

NOTE:
Main bearing cap cannot be replaced as a single part, because it is machined together with cylinder block.



7. Install main bearing beam.
   - Install main bearing beam with front mark facing downward (oil pan side).
   - Install main bearing beam with front mark facing front of engine.

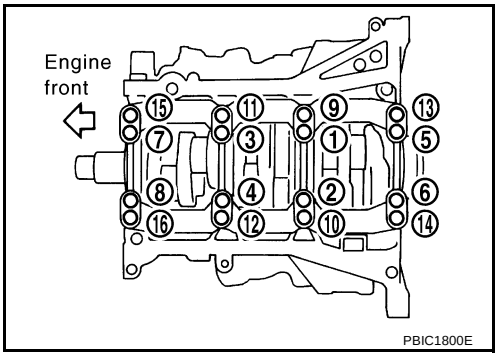


8. Inspect the outer diameter of main bearing cap bolt. Refer to EM-138, "MAIN BEARING CAP BOLT OUTER DIAMETER" .
9. Install main bearing cap bolts in numerical order as shown in the figure as follows:

a. Apply new engine oil to threads and seat surfaces of main bearing cap bolts.

b. Tighten main bearing cap bolts in several different steps.

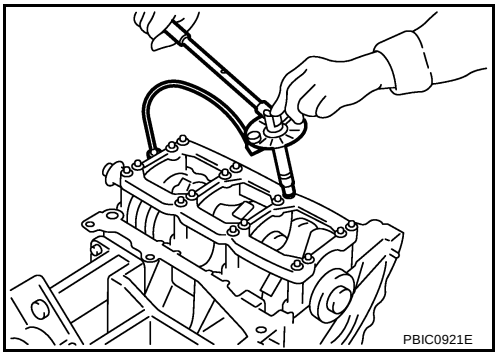
: 32.3 - 38.3 N·m (3.3 - 3.9 kg-m, 24 - 28 ft-lb)



c. Turn all bolts another 90 to 95 degrees clockwise [Target: 90 degrees (Angle tightening)].

CAUTION:
Use angle wrench [SST: KV10112100 (BT8653-A)] to check tightening angle. Do not make judgment by visual inspection.

- After installing main bearing cap bolts, make sure that crankshaft can be rotated smoothly by hand.
- Check the crankshaft end play. Refer to EM-130, "CRANKSHAFT END PLAY" .

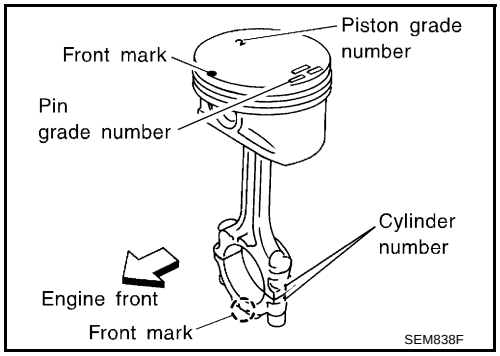


10. Inspect the outer diameter of connecting rod bolt. Refer to EM-139, "CONNECTING ROD BOLT OUTER DIAMETER" .
11. Install piston to connecting rod as follows:

a. Using snap ring pliers, install new snap ring to the groove of piston rear side.
   - Insert it fully into groove to install.

b. Install piston to connecting rod.

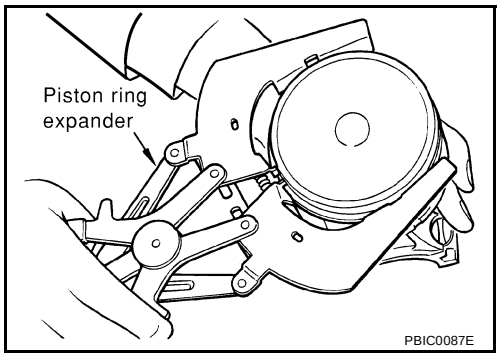
- Using industrial use drier or similar tool, heat piston until piston pin can be pushed in by hand without excess force [approx. 60 to 70°C (140 to 158°F)]. From the front to the rear, insert piston pin into piston and connecting rod.
- Assemble so that the front mark on the piston head and the cylinder number on connecting rod are positioned as shown in the figure.



c. Install new snap ring to the groove of the piston front side.
- Insert it fully into groove to install.
- After installing, make sure that connecting rod moves smoothly.

12. Using piston ring expander (commercial service tool), install piston rings.

CAUTION:
- **When installing piston rings, be careful not to damage piston.**
- **Be careful not to damage piston rings by expending them excessively.**

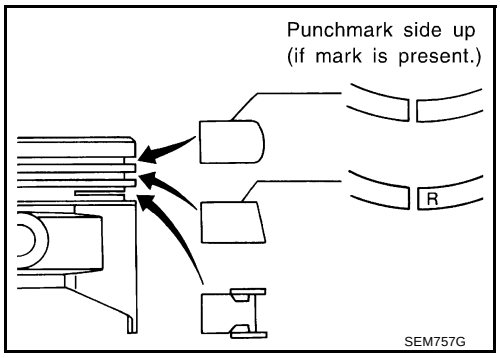


- If there is stamped mark on ring, mount it with marked side up.

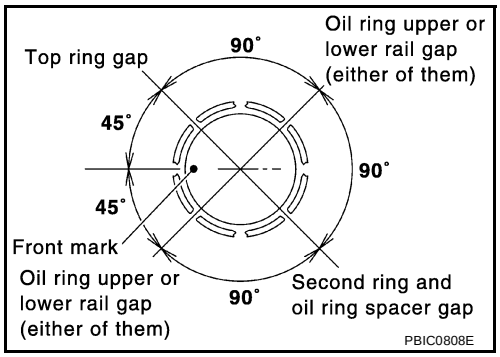
NOTE:
If there is no stamp on ring, no specific orientation is required for installation.

Stamped mark:

Top ring : —
Second ring : R



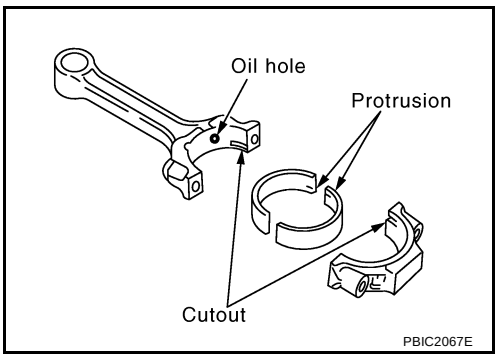
- Position each ring with the gap as shown in the figure referring to the piston front mark.



- Check the piston ring side clearance. Refer to EM-131, "PISTON RING SIDE CLEARANCE" .

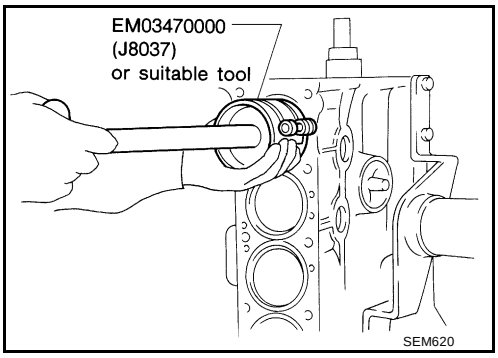
13. Install connecting rod bearings to connecting rod and connecting rod bearing cap.
- Before installing connecting rod bearings, apply engine oil to the bearing surface (inside). Do not apply engine oil to the back surface, but thoroughly clean it.

- When installing, align connecting rod bearing stopper protrusion with cutout of connecting rods and connecting rod bearing caps to install.
- Ensure the oil hole on connecting rod and that on the corresponding bearing are aligned.

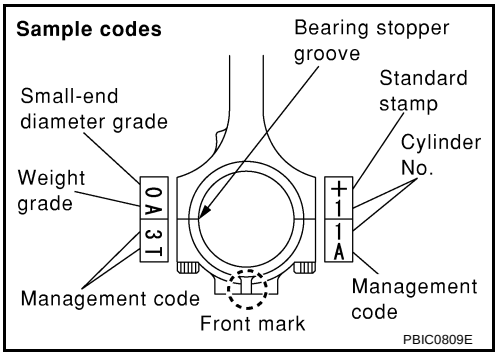


14. Install piston and connecting rod assembly to crankshaft.
    - Position crankshaft pin corresponding to connecting rod to be installed onto the bottom dead center.
    - Apply engine oil sufficiently to the cylinder bore, piston and crankshaft pin journal.
    - Match the cylinder position with the cylinder number on connecting rod to install.
    - Be sure that front mark on piston head is facing front of engine.
    - Using piston ring compressor [SST] or suitable tool, install piston with the front mark on the piston head facing the front of engine.

    CAUTION:
    Be careful not to damage the cylinder wall and crankshaft pin, resulting from an interference of the connecting rod big end.



15. Install connecting rod bearing cap.
    - Match the stamped cylinder number marks on connecting rod with those on connecting rod bearing cap to install.
    - Be sure that front mark on connecting rod bearing cap is facing front of engine.



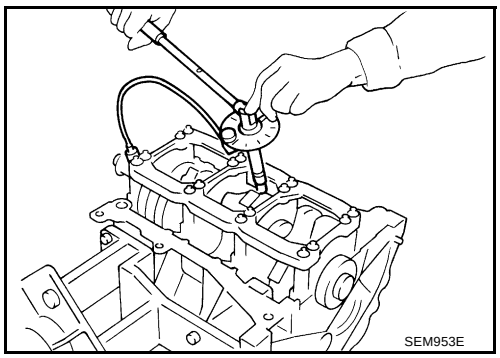
16. Tighten connecting rod bolts as follows:

a. Apply engine oil to the threads and seats of connecting rod bolts.

b. Tighten connecting rod bolts.

: 18.6 - 20.6 N·m (1.9 - 2.1 kg-m, 14 - 15 ft-lb)

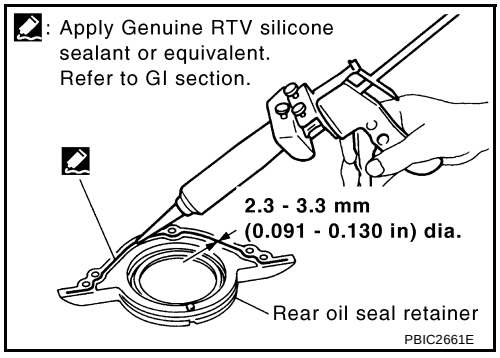
c. Then tighten all bolts 90 to 95 degrees clockwise [target: 90 degrees (Angle tightening)].



CAUTION:
Use angle wrench [SST: KV10112100 (BT8653-A)] to check tightening angle. Do not make judgment by visual inspection.

- After tightening connecting rod bolts, make sure that crankshaft rotates smoothly.
- Check the connecting rod side clearance. Refer to EM-130, "CONNECTING ROD SIDE CLEARANCE" .

17. Install baffle plate to main bearing beam.
18. Install new rear oil seal retainer to cylinder block.
    - Apply new engine oil to both oil seal lip and dust seal lip.
    - Apply a continuous bead of liquid gasket with tube presser [SST: WS39930000 (—)] to rear oil seal retainer as shown in the figure.
      Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

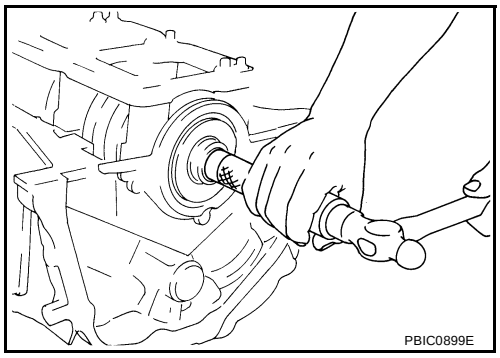


CAUTION:
Replace with a new parts.

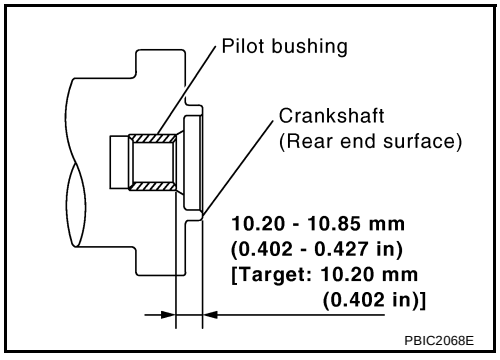
NOTE:
Regard both rear oil seal and retainer as an assembly.

19. Install pilot bushing (M/T models) or pilot converter (A/T models).
    - With drift of the following outer diameter, press-fit as far as it will go.

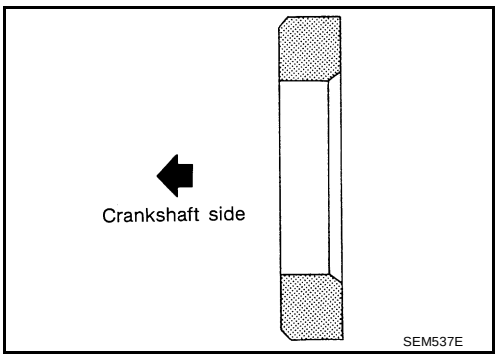
      Pilot bushing : Approx. 17 mm (0.67 in)
      Pilot converter : Approx. 33 mm (1.30 in)



    - Press-fit pilot bushing as the dimension in the figure. (M/T models)



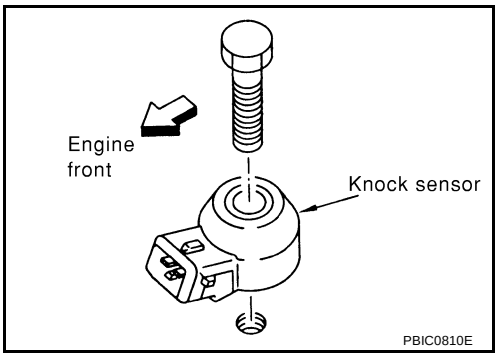
- Press-fit pilot converter with its chamfer facing crankshaft as shown in the figure. (A/T models)



20. Install knock sensor.
    - Install knock sensor so that connector faces front of engine.
    - After installing knock sensor, connect harness connector, and lay it out to rear of engine.

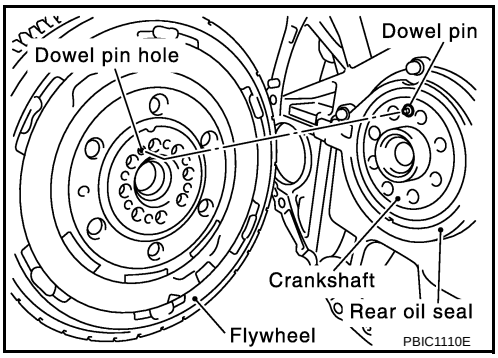
    CAUTION:
    - **Do not tighten mounting bolts while holding connector.**
    - **If any impact by dropping is applied to knock sensor, replace it with new one.**

    NOTE:
    - Make sure that there is no foreign material on the cylinder block mating surface and the back surface of knock sensor.
    - Make sure that knock sensor does not interfere with other parts.

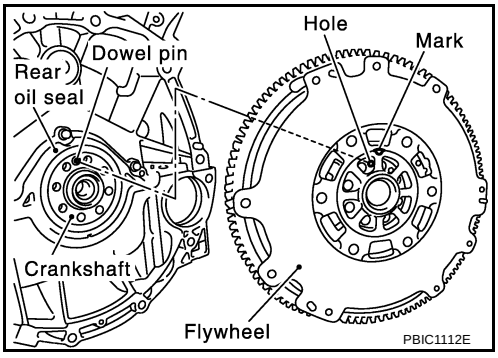


21. Note the following, assemble in the reverse order of disassembly after this step.

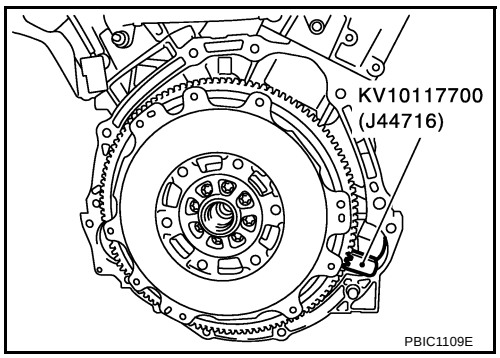
    Flywheel (M/T models)
    - When installing flywheel to crankshaft, be sure to correctly align crankshaft side dowel pin and flywheel side dowel pin hole.



    - There is a mating mark on the clutch cover side of flywheel. Refer it during installation.

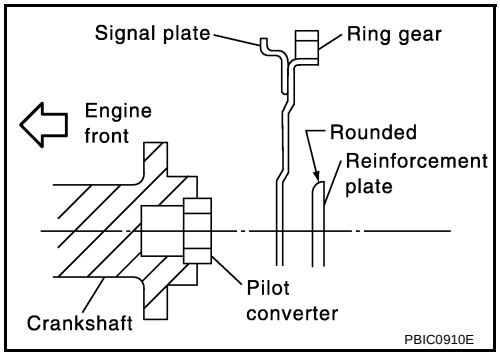


- Holding ring gear with ring gear stopper [SST], tighten securing bolts with TORX socket (size: T55, commercial service tool).
- Tighten the mounting bolts crosswise over several times.



Drive plate (A/T models)

- Install drive plate and reinforcement plate as shown in the figure.
- Holding ring gear with ring gear stopper [SST: KV10117700 (J44716)].
- Tighten the mounting bolts crosswise over several times.



How to Select Piston and Bearing

ABS009Z2

DESCRIPTION

Selection points	Selection parts	Selection items	Selection methods
Between cylinder block to crankshaft	Main bearing	Main bearing grade (bearing thickness)	Determined by match of cylinder block bearing housing grade (inner diameter of housing) and crankshaft journal grade (outer diameter of journal)
Between crankshaft to connecting rod	Connecting rod bearing	Connecting rod bearing grade (bearing thickness)	Combining service grades for connecting rod big end diameter and crankshaft pin outer diameter determine connecting rod bearing selection.
Between cylinder block to piston	Piston and piston pin assembly (Piston is available together with piston pin as assembly.)	Piston grade (piston skirt diameter)	Piston grade = cylinder bore grade (inner diameter of bore)
Between piston to connecting rod*	—	—	—

*: For the service parts, the grade for fitting cannot be selected between piston pin and connecting rod. (Only “0” grade is available.) The information at the shipment from the plant is described as a reference.

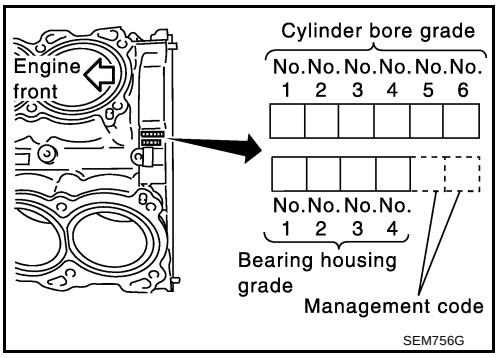
- The identification grade stamped on each part is the grade for the dimension measured in new condition. This grade cannot apply to reused parts.
- For reused or repaired parts, measure the dimension accurately. Determine the grade by comparing the measurement with the values of each selection table.
- For details of the measurement method of each part, the reuse standards and the selection method of the selective fitting parts, refer to the text.

HOW TO SELECT PISTON

When New Cylinder Block is Used

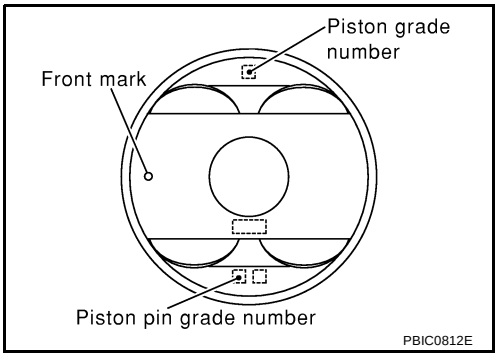
Check the cylinder bore grade (“1”, “2” or “3”) on rear side of cylinder block, and select piston of the same grade.

NOTE:
Piston is available with piston pin as a set for the service part. (Only “0” grade piston pin is available.)



When Cylinder Block is Reused

1. Measure the cylinder bore inner diameter. Refer to EM-134, "Cylinder Bore Inner Diameter" .
2. Determine the bore grade by comparing the measurement with the values under the cylinder bore inner diameter of the “Piston Selection Table”.



3. Select piston of the same grade.

Piston Selection Table

Unit: mm (in)

Grade	1	2 (or no mark)	3
Cylinder bore inner diameter	95.500 - 95.510 (3.7598 - 3.7602)	95.510 - 95.520 (3.7602- 3.7606)	95.520 - 95.530 (3.7606 - 3.7610)
Piston skirt diameter	95.480 - 95.490 (3.7590 - 3.7594)	95.490 - 95.500 (3.7594 - 3.7598)	95.500 - 95.510 (3.7598 - 3.7602)

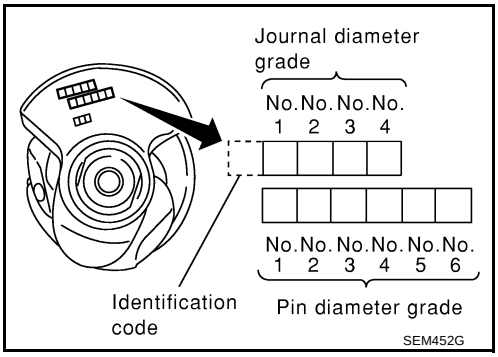
NOTE:
- Piston is available together with piston pin as assembly.
- Piston pin (piston pin hole) grade is provided only for the parts installed at the plant. For service parts, no piston pin grades can be selected. (Only “0” grade is available.)
- No second grade mark is available on piston.

HOW TO SELECT CONNECTING ROD BEARING

When New Connecting Rod and Crankshaft are Used

Check pin diameter grade (“0”, “1” or “2”) on front of crankshaft, and select connecting rod bearing of the same grade.

NOTE:
There is no grading for connecting rod big end diameter.



When Crankshaft and Connecting Rod are Reused

1. Measure the connecting rod big end diameter. Refer to EM-132, "CONNECTING ROD BIG END DIAMETER" .
2. Make sure that the connecting rod big end diameter is within the standard value.
3. Measure the crankshaft pin journal diameter. Refer to EM-136, "CRANKSHAFT PIN JOURNAL DIAMETER" .
4. Determine the grade of crankshaft pin diameter grade by corresponding to the measured dimension in “Crankshaft pin journal diameter” column of “Connecting Rod Bearing Selection Table”.
5. Select connecting rod bearing of the same grade.

Connecting Rod Bearing Selection Table

Unit: mm (in)

Connecting rod big end diameter	55.000 - 55.013 (2.1654 - 2.1659)

Unit: mm (in)

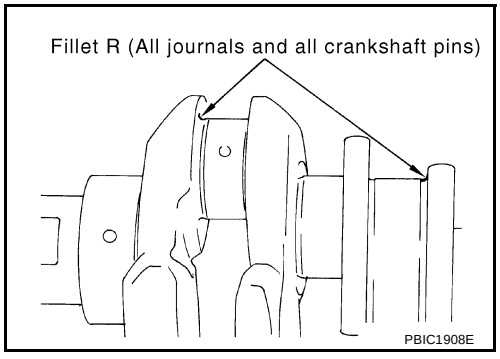
Crankshaft		Connecting rod bearing		
Crankshaft pin journal diameter	Grade (Mark)	Dimension (Bearing thickness range)	Bearing grade No.	Color
51.968 - 51.974 (2.0460 - 2.0462)	0	1.500 - 1.503 (0.0591 - 0.0592)	STD 0	Black
51.962 - 51.968 (2.0457 - 2.0460)	1	1.503 - 1.506 (0.0592 - 0.0593)	STD 1	Brown
51.956 - 51.962 (2.0455 - 2.0457)	2	1.506 - 1.509 (0.0593 - 0.0594)	STD 2	Green

Undersize Bearings Usage Guide

- When the specified connecting rod bearing oil clearance is not obtained with standard size connecting rod bearings, use undersize (US) bearings.
- When using undersize (US) bearing, measure the connecting rod bearing inner diameter with bearing installed, and grind crankshaft pin so that the connecting rod bearing oil clearance satisfies the standard.

CAUTION:

In grinding crankshaft pin to use undersize bearings, keep the fillet R [1.5 mm (0.059 in)].



Bearing undersize table

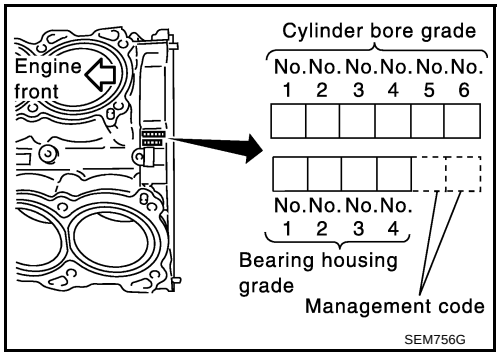
Unit: mm (in)

Size	Thickness
US 0.25 (0.0098)	1.626 - 1.634 (0.0640 - 0.0643)

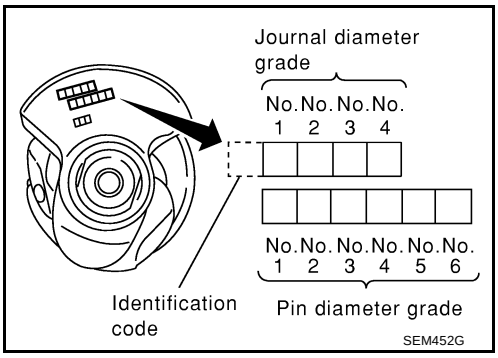
HOW TO SELECT MAIN BEARING

When New Cylinder Block and Crankshaft are Used

1. “Main Bearing Selection Table” rows correspond to bearing housing grade on rear left side of cylinder block.



2. “Main Bearing Selection Table” columns correspond to journal diameter grade on front side of crankshaft.



3. Select main bearing grade at the point where selected row and column meet in “Main Bearing Selection Table”.

When Cylinder Block and Crankshaft are Reused

1. Measure cylinder block main bearing housing inner diameter and crankshaft main journal diameter. Refer to EM-134, "MAIN BEARING HOUSING INNER DIAMETER" and EM-135, "CRANKSHAFT MAIN JOURNAL DIAMETER" .
2. Correspond the measured dimension in “Cylinder block main bearing housing inner diameter” row of “Main Bearing Selection Table”.
3. Correspond the measured dimension in “Crankshaft main journal diameter” column of “Main Bearing Selection Table”.
4. Select main bearing grade at the point where selected row and column meet in following selection table.

Main Bearing Selection Table

Mark	Axle diameter	Hole diameter	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	X	Y	4	7
	Cylinder block main bearing housing inner diameter Unit: mm (in) / Crankshaft main journal diameter Unit: mm (in)	Mark	63.993 - 63.994 (2.5194 - 2.5194)	63.994 - 63.995 (2.5194 - 2.5195)	63.995 - 63.996 (2.5195 - 2.5195)	63.996 - 63.997 (2.5195 - 2.5196)	63.997 - 63.998 (2.5196 - 2.5196)	63.998 - 63.999 (2.5196 - 2.5196)	63.999 - 64.000 (2.5196 - 2.5197)	64.000 - 64.001 (2.5197 - 2.5197)	64.001 - 64.002 (2.5197 - 2.5198)	64.002 - 64.003 (2.5198 - 2.5198)	64.003 - 64.004 (2.5198 - 2.5198)	64.004 - 64.005 (2.5198 - 2.5199)	64.005 - 64.006 (2.5199 - 2.5199)	64.006 - 64.007 (2.5199 - 2.5200)	64.007 - 64.008 (2.5200 - 2.5200)	64.008 - 64.009 (2.5200 - 2.5200)	64.009 - 64.010 (2.5200 - 2.5201)	64.010 - 64.011 (2.5201 - 2.5201)	64.011 - 64.012 (2.5201 - 2.5202)	64.012 - 64.013 (2.5202 - 2.5202)	64.013 - 64.014 (2.5202 - 2.5202)	64.014 - 64.015 (2.5202 - 2.5203)	64.015 - 64.016 (2.5203 - 2.5203)	64.016 - 64.017 (2.5203 - 2.5203)
A	59.975 - 59.974 (2.3612 - 2.3612)		0	0	0	01	01	01	1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34
B	59.974 - 59.973 (2.3612 - 2.3611)		0	0	01	01	01	1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4
C	59.973 - 59.972 (2.3611 - 2.3611)		0	01	01	01	1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4
D	59.972 - 59.971 (2.3611 - 2.3611)		01	01	01	1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4
E	59.971 - 59.970 (2.3611 - 2.3610)		01	01	1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45
F	59.970 - 59.969 (2.3610 - 2.3610)		01	1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45
G	59.969 - 59.968 (2.3610 - 2.3609)		1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45
H	59.968 - 59.967 (2.3609 - 2.3609)		1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5
J	59.967 - 59.966 (2.3609 - 2.3609)		1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5
K	59.966 - 59.965 (2.3909 - 2.3608)		12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5
L	59.965 - 59.964 (2.3608 - 2.3608)		12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56
M	59.964 - 59.963 (2.3608 - 2.3607)		12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56
N	59.963 - 59.962 (2.3607 - 2.3607)		2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56
P	59.962 - 59.961 (2.3607 - 2.3607)		2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6
R	59.961 - 59.960 (2.3607 - 2.3606)		2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6
S	59.960 - 59.959 (2.3606 - 2.3606)		23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6
T	59.959 - 59.958 (2.3606 - 2.3605)		23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67
U	59.958 - 59.957 (2.3605 - 2.3605)		23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67
V	59.957 - 59.956 (2.3605 - 2.3605)		3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67	67
W	59.956 - 59.955 (2.3605 - 2.3604)		3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67	67	7
X	59.955 - 59.954 (2.3604 - 2.3604)		3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67	67	7	7
Y	59.954 - 59.953 (2.3604 - 2.3603)		34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67	67	7	7	7
4	59.953 - 59.952 (2.3603 - 2.3603)		34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67	67	7	7	7	7
7	59.952 - 59.951 (2.3603 - 2.3603)		34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67	67	7	7	7	7	7

PBIC1981E

Main Bearing Grade Table (All Journals)

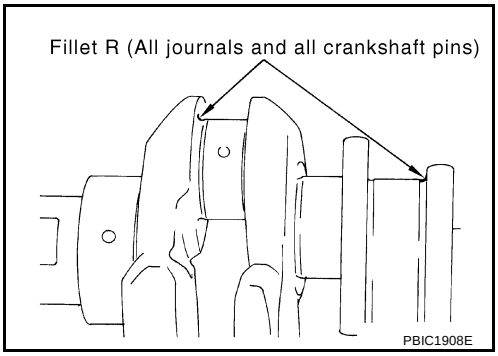
Grade number		Thickness Unit: mm (in)	Width Unit: mm (in)	Identification color	Remarks
0		2.000 - 2.003 (0.0787 - 0.0789)	19.9 - 20.1 (0.783 - 0.791)	Black	Grade and color are the same for upper and lower bearings.
1		2.003 - 2.006 (0.0789 - 0.0790)		Brown	
2		2.006 - 2.009 (0.0790 - 0.0791)		Green	
3		2.009 - 2.012 (0.0791 - 0.0792)		Yellow	
4		2.012 - 2.015 (0.0792 - 0.0793)		Blue	
5		2.015 - 2.018 (0.0793 - 0.0794)		Pink	
6		2.018 - 2.021 (0.0794 - 0.0796)		Purple	
7		2.021 - 2.024 (0.0796 - 0.0797)		White	
01	UPP	2.003 - 2.006 (0.0789 - 0.0790)		Brown	Grade and color are different for upper and lower bearings.
	LWR	2.000 - 2.003 (0.0787 - 0.0789)		Black	
12	UPR	2.006 - 2.009 (0.0790 - 0.0791)		Green	
	LWR	2.003 - 2.006 (0.0789 - 0.0790)		Brown	
23	UPR	2.009 - 2.012 (0.0791 - 0.0792)		Yellow	
	LWR	2.006 - 2.009 (0.0790 - 0.0791)		Green	
34	UPR	2.012 - 2.015 (0.0792 - 0.0793)		Blue	
	LWR	2.009 - 2.012 (0.0791 - 0.0792)		Yellow	
45	UPR	2.015 - 2.018 (0.0793 - 0.0794)		Pink	
	LWR	2.012 - 2.015 (0.0792 - 0.0793)		Blue	
56	UPR	2.018 - 2.021 (0.0794 - 0.0796)		Purple	
	LWR	2.015 - 2.018 (0.0793 - 0.0794)		Pink	
67	UPR	2.021 - 2.024 (0.0796 - 0.0797)		White	
	LWR	2.018 - 2.021 (0.0794 - 0.0796)		Purple	

Undersize Bearing Usage Guide

- When the specified main bearing oil clearance is not obtained with standard size main bearings, use underside (US) bearing.
- When using undersize (US) bearing, measure the main bearing inner diameter with bearing installed, and grind main journal so that the main bearing oil clearance satisfies the standard.

CAUTION:

In grinding crankshaft main journal to use undersize bearings, keep the fillet R [1.5 mm (0.059 in)].



Bearing undersize table

Unit: mm (in)

Size	Thickness
US 0.25 (0.0098)	2.132 - 2.140 (0.0839 - 0.0843)

Inspection After Disassembly

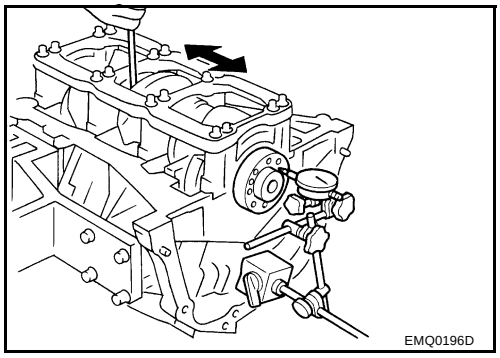
ABS009Z3

CRANKSHAFT END PLAY

- Measure the clearance between thrust bearings and crankshaft arm when crankshaft is moved fully forward or backward with dial indicator.

  Standard : 0.10 - 0.25 mm (0.0039 - 0.0098 in)

  Limit : 0.30 mm (0.0118 in)



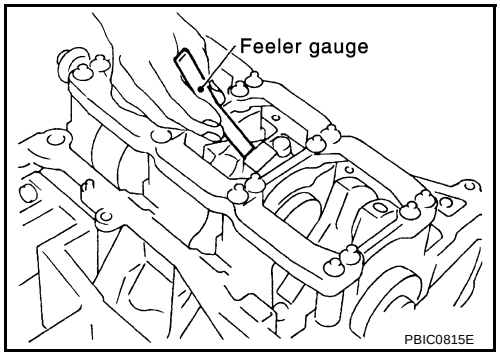
- If the measured value exceeds the limit, replace thrust bearings, and measure again. If it still exceeds the limit, replace crankshaft also.

CONNECTING ROD SIDE CLEARANCE

- Measure the side clearance between connecting rod and crankshaft arm with feeler gauge.

  Standard : 0.20 - 0.35 mm (0.0079 - 0.0138 in)

  Limit : 0.40 mm (0.0157 in)



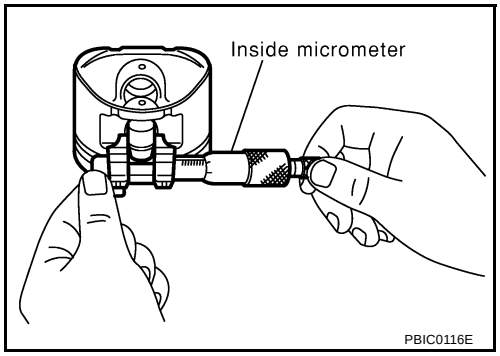
- If the measured value exceeds the limit, replace connecting rod, and measure again. If it still exceeds the limit, replace crankshaft also.

PISTON TO PISTON PIN OIL CLEARANCE

Piston Pin Hole Diameter

Measure the inner diameter of piston pin hole with inside micrometer.

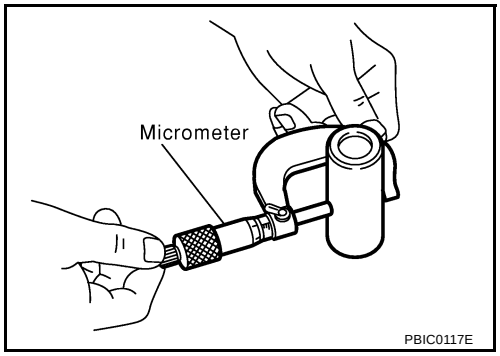
Standard : 21.993 - 22.005 mm (0.8659 - 0.8663 in)



Piston Pin Outer Diameter

Measure the outer diameter of piston pin with micrometer.

Standard : 21.989 - 22.001 mm (0.8657 - 0.8662 in)



Piston to Piston Pin Oil Clearance

(Piston to piston pin oil clearance) = (Piston pin hole diameter) – (Piston pin outer diameter)

Standard : 0.002 - 0.006 mm (0.0001 - 0.0002 in)

- If the calculated value is out of the standard, replace piston and piston pin assembly.

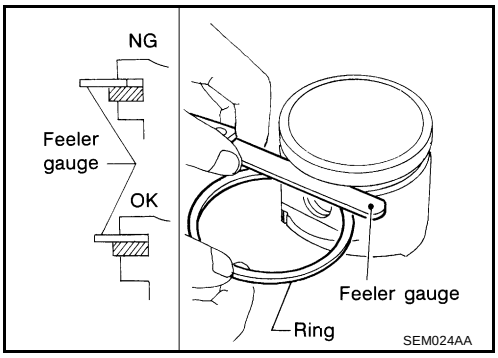
- When replacing piston and piston pin assembly, refer to EM-125, "HOW TO SELECT PISTON" .

NOTE:

- Piston is available together with piston pin as assembly.
- Piston pin (piston pin hole) grade is provided only for the parts installed at the plant. For service parts, no piston pin grades can be selected. (Only “0” grade is available.)

PISTON RING SIDE CLEARANCE

- Measure the side clearance of piston ring and piston ring groove with feeler gauge.



Standard:

Top ring	: 0.045 - 0.080 mm (0.0018 - 0.0031 in)
2nd ring	: 0.030 - 0.070 mm (0.0012 - 0.0028 in)
Oil ring	: 0.065 - 0.135 mm (0.0026 - 0.0053 in)

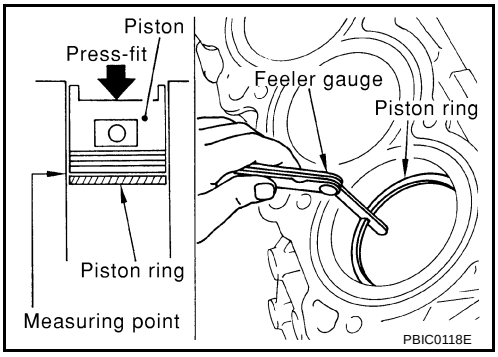
Limit:

Top ring	: 0.11 mm (0.0043 in)
2nd ring	: 0.10 mm (0.0039 in)

- If the measured value exceeds the limit, replace piston ring, and measure again. If it still exceeds the limit, replace piston also.

PISTON RING END GAP

- Make sure that cylinder bore inner diameter is within the specification. Refer to EM-134, "Cylinder Bore Inner Diameter" .
- Lubricate with new engine oil to piston and piston ring, and then insert piston ring until middle of cylinder with piston, and measure the piston ring end gap with feeler gauge.



Standard:

Top ring	: 0.23 - 0.33 mm (0.0091 - 0.0130 in)
2nd ring	: 0.33 - 0.48 mm (0.0130 - 0.0189 in)
Oil ring	: 0.20 - 0.50 mm (0.0079 - 0.0197 in)

Limit:

Top ring	: 0.54 mm (0.0213 in)
2nd ring	: 0.80 mm (0.0315 in)
Oil ring	: 0.95 mm (0.0374 in)

- If the measured value exceeds the limit, replace piston ring, and measure again. If it still exceeds the limit, re-bore cylinder and use oversize piston and piston rings.

CONNECTING ROD BEND AND TORSION

- Check with connecting rod aligner.

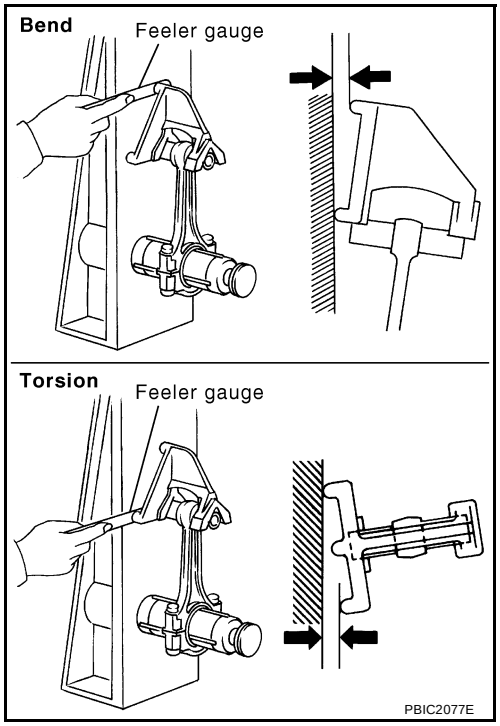
Bend:

Limit : 0.15 mm (0.0059 in) per 100 mm (3.94 in) length

Torsion:

Limit : 0.30 mm (0.0118 in) per 100 mm (3.94 in) length

- If it exceeds the limit, replace connecting rod assembly.

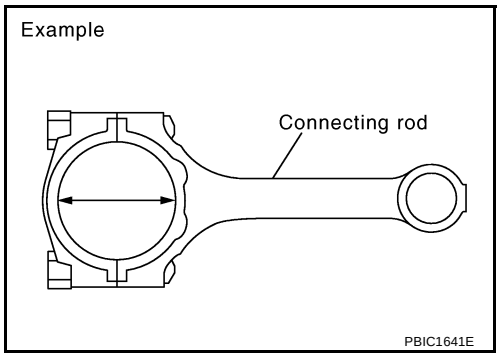


CONNECTING ROD BIG END DIAMETER

- Install connecting rod bearing cap without installing connecting rod bearing, and tightening connecting rod bolts to the specified torque. Refer to EM-117, "ASSEMBLY" for the tightening procedure.
- Measure the inner diameter of connecting rod big end with inside micrometer.

Standard : 55.000 - 55.013 mm (2.1654 - 2.1659 in)

- If out of the standard, replace connecting rod assembly.

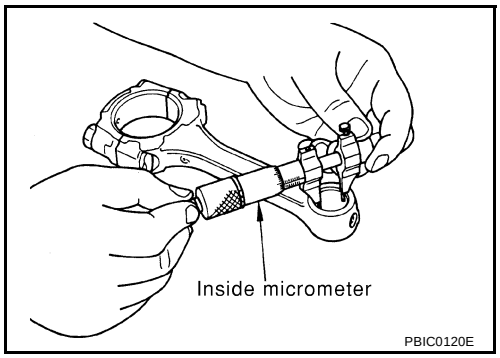


CONNECTING ROD BUSHING OIL CLEARANCE

Connecting Rod Bushing Inner Diameter

Measure the inner diameter of connecting rod bushing with inside micrometer.

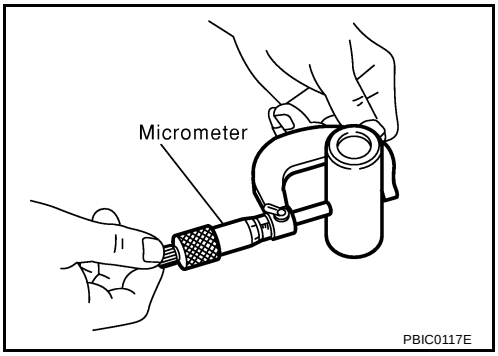
Standard : 22.000 - 22.012 mm (0.8661 - 0.8666 in)



Piston Pin Outer Diameter

Measure the outer diameter of piston pin with micrometer.

Standard : 21.989 - 22.001 mm (0.8657 - 0.8662 in)



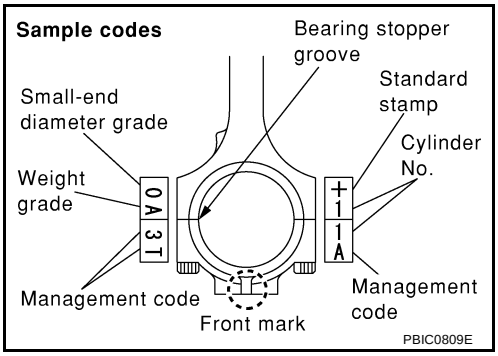
Connecting Rod Bushing Oil Clearance

(Connecting rod bushing oil clearance) = (Connecting rod bushing inner diameter) – (Piston pin outer diameter)

Standard : 0.005 - 0.017 mm (0.0002 - 0.0007 in)

Limit : 0.030 mm (0.0012 in)

- If the measured value exceeds the limit, replace connecting rod assembly and/or piston and piston pin assembly.
- If replacing piston and piston pin assembly, refer to EM-125, "HOW TO SELECT PISTON" .
- If replacing connecting rod assembly, refer to EM-136, "CONNECTING ROD BEARING OIL CLEARANCE" to select the connecting rod bearing.



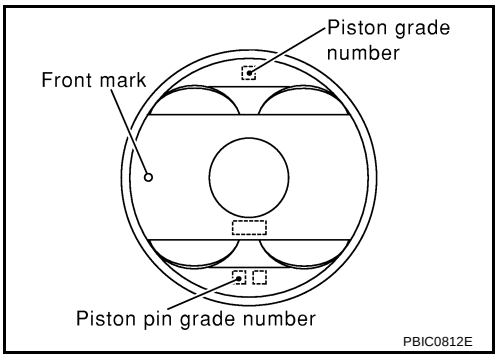
Factory installed parts grading:

- Service parts apply only to grade “0”.

Unit: mm (in)

Grade	0	1
Connecting rod bushing inner diameter *	22.000 - 22.006 (0.8661 - 0.8664)	22.006 - 22.012 (0.8664 - 0.8666)
Piston pin hole diameter	21.993 - 21.999 (0.8659 - 0.8661)	21.999 - 22. 005 (0.8661 - 0.8663)
Piston pin outer diameter	21.989 - 21.995 (0.8657- 0.8659)	21.995 - 22.001 (0.8659 - 0.8662)

*: After installing in connecting rod



CYLINDER BLOCK DISTORTION

- Using scraper, remove gasket on the cylinder block surface, and also remove engine oil, scale, carbon, or other contamination.

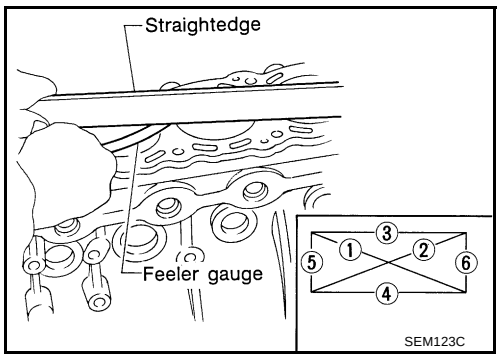
CAUTION:

Be careful not to allow gasket flakes to enter engine oil or engine coolant passages.

- Measure the distortion on the cylinder block upper face at some different points in six directions with straightedge and feeler gauge.

  Limit : 0.1 mm (0.004 in)

- If it exceeds the limit, replace cylinder block.



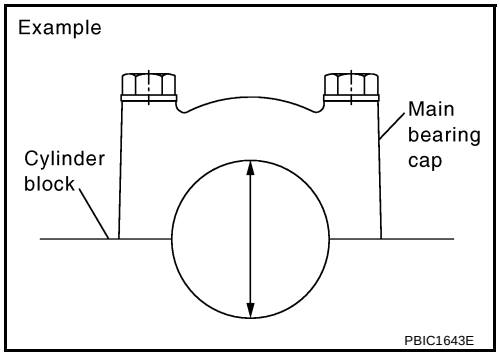
MAIN BEARING HOUSING INNER DIAMETER

- Install main bearing caps and main bearing beam without installing main bearings, and tighten main bearing cap bolts to the specified torque. Refer to EM-117, "ASSEMBLY" for the tightening procedure.
- Measure the inner diameter of main bearing housing with bore gauge.

  Standard : 63.993 - 64.017 mm (2.5194 - 2.5203 in)

- If out of the standard, replace cylinder block and main bearing caps as assembly.

  NOTE:
  Cylinder block cannot be replaced as a single part, because it is machined together with main bearing caps.

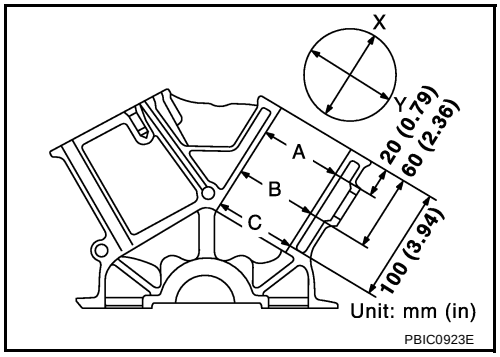


PISTON TO CYLINDER BORE CLEARANCE

Cylinder Bore Inner Diameter

- Using bore gauge, measure cylinder bore for wear, out-of-round and taper at six different points on each cylinder. (“X” and “Y” directions at “A”, “B” and “C”) (“Y” is in longitudinal direction of engine)

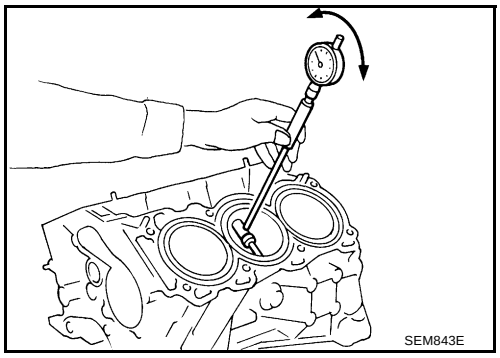
  Standard inner diameter:
  95.500 - 95.530 mm (3.7598 - 3.7610 in)
  Wear limit:
  0.2 mm (0.008 in)
  Out-of-round (Difference between “X” and “Y”):
  0.015 mm (0.0006 in)
  Taper limit (Difference between “A” and “C”):
  0.01 mm (0.0004 in)



- If the measured value exceeds the limit, or if there are scratches and/or seizure on the cylinder inner wall, hone or re-bore the inner wall.
- Oversize piston is provided. When using oversize piston, re-bore cylinder so that the clearance of the piston-to-cylinder bore satisfies the standard.

  CAUTION:
  When using oversize piston, use over size pistons for all cylinders with oversize piston rings.

  Oversize (OS) : 0.2 mm (0.008 in)



Piston Skirt Diameter

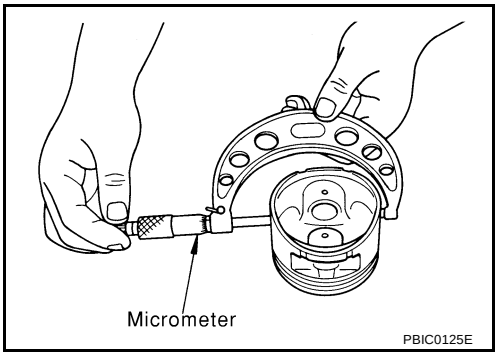
Measure the outer diameter of piston skirt with micrometer.

Measure point

: Distance from the top 41.0 mm (1.614 in)

Standard

: 95.480 - 95.510 mm (3.7590 - 3.7602 in)



Piston to Cylinder Bore Clearance

Calculate by piston skirt diameter and cylinder bore inner diameter (direction “Y”, position “B”).
(Clearance) = (Cylinder bore inner diameter) – (Piston skirt diameter).

Standard **: 0.010 - 0.030 mm (0.0004 - 0.0012 in)**

Limit **: 0.08 mm (0.0031 in)**

- If calculated value exceeds the limit, replace piston and piston pin assembly. Refer to EM-125, "HOW TO SELECT PISTON" .

Re-boring Cylinder Bore

1. Cylinder bore size is determined by adding piston to cylinder bore clearance to piston skirt diameter.

   Re-bored size calculation: D = A + B – C

   where,

   D: Bored diameter

   A: Piston skirt diameter as measured

   B: Piston to cylinder bore clearance (standard value)

   C: Honing allowance 0.02 mm (0.0008 in)

2. Install main bearing caps and main bearing beam, and tighten to the specified torque. Otherwise, cylinder bores may be distorted in final assembly.
3. Cut cylinder bores.

   NOTE:
   - When any cylinder needs boring, all other cylinders must also be bored.
   - Do not cut too much out of cylinder bore at a time. Cut only 0.05 mm (0.0020 in) or so in diameter at a time.
4. Hone cylinders to obtain the specified piston to cylinder bore clearance.
5. Measure finished cylinder bore for the out-of-round and taper.

   NOTE:
   Measurement should be done after cylinder bore cools down.

CRANKSHAFT MAIN JOURNAL DIAMETER

- Measure the outer diameter of crankshaft main journals with micrometer.

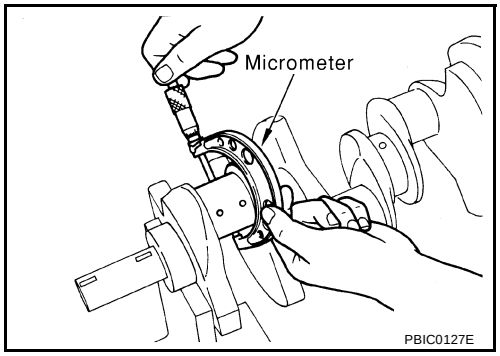
  Standard **: 59.951 - 59.975 mm (2.3603 - 2.3612 in) dia.**

- If out of the standard, measure the main bearing oil clearance. Then use undersize bearing. Refer to EM-137, "MAIN BEARING OIL CLEARANCE" .

CRANKSHAFT PIN JOURNAL DIAMETER

- Measure the outer diameter of crankshaft pin journal with micrometer.

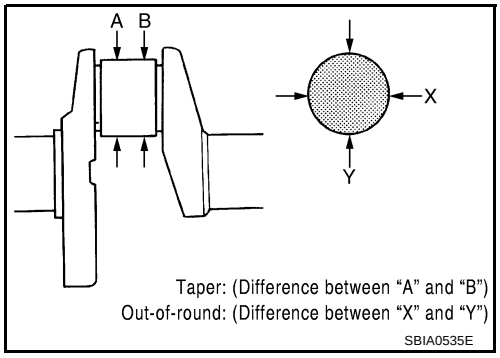
Standard : 51.956 - 51.974 mm (2.0455 - 2.0462 in) dia.



- If out of the standard, measure the connecting rod bearing oil clearance. Then use undersize bearing. Refer to EM-136, "CONNECTING ROD BEARING OIL CLEARANCE" .

CRANKSHAFT OUT-OF-ROUND AND TAPER

- Measure the dimensions at four different points as shown in the figure on each main journal and pin journal with micrometer.
- Out-of-round is indicated by the difference in the dimensions between “X” and “Y” at “A” and “B”.
- Taper is indicated by the difference in the dimensions between “A” and “B” at “X” and “Y”.



Limit:

Out-of-round (Difference between “X” and “Y”)

: 0.002 mm (0.0001 in)

Taper (Difference between “A” and “B”)

: 0.002 mm (0.0001 in)

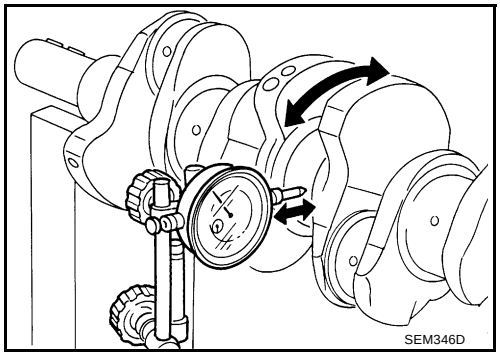
- If the measured value exceeds the limit, correct or replace crankshaft.
- If corrected, measure the bearing oil clearance of the corrected main journal and/or pin journal. Then select the main bearing and/or connecting rod bearing. Refer to EM-137, "MAIN BEARING OIL CLEARANCE" and/or EM-136, "CONNECTING ROD BEARING OIL CLEARANCE" .

CRANKSHAFT RUNOUT

- Place V-block on precise flat table, and support the journals on the both end of crankshaft.
- Place dial indicator straight up on the No. 3 journal.
- While rotating crankshaft, read the movement of the pointer on dial indicator. (Total indicator reading)

Standard : Less than 0.05 mm (0.002 in)

Limit : 0.10 mm (0.0039 in)



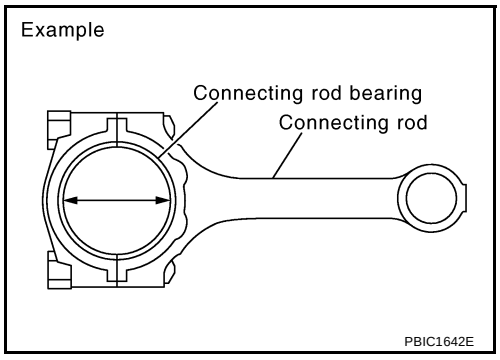
- If it exceeds the limit, replace crankshaft.

CONNECTING ROD BEARING OIL CLEARANCE

Method by Calculation

- Install connecting rod bearings to connecting rod and cap, and tighten connecting rod bolts to the specified torque. Refer to EM-117, "ASSEMBLY" for the tightening procedure.
- Measure the inner diameter of connecting rod bearing with inside micrometer.

(Bearing oil clearance) = (Connecting rod bearing inner diameter) – (Crankshaft pin journal diameter)



Standard : 0.034 - 0.059 mm (0.0013 - 0.0023 in) (actual clearance)

Limit : 0.070 mm (0.0028 in)

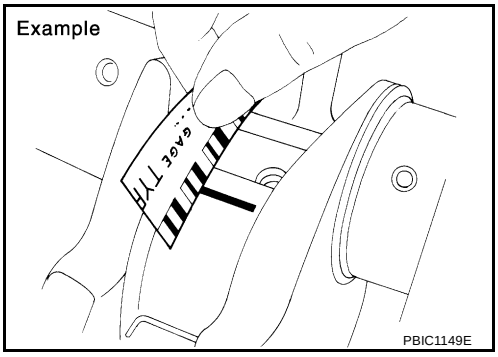
- If the calculated value exceeds the limit, select proper connecting rod bearing according to connecting rod big end diameter and crankshaft pin journal diameter to obtain the specified bearing oil clearance. Refer to EM-125, "HOW TO SELECT CONNECTING ROD BEARING" .

Method of Using Plastigage

- Remove oil and dust on crankshaft pin journal and the surfaces of each bearing completely.
- Cut plastigage slightly shorter than the bearing width, and place it in crankshaft axial direction, avoiding oil holes.
- Install connecting rod bearings to connecting rod and cap, and tighten connecting rod bolts to the specified torque. Refer to EM-117, "ASSEMBLY" for the tightening procedure.

  CAUTION:
  Do not rotate crankshaft.
- Remove connecting rod bearing cap and bearing, and using scale on plastigage bag, measure the plastigage width.

  NOTE:
  The procedure when the measured value exceeds the limit is same as that described in the “Method by Calculation”.



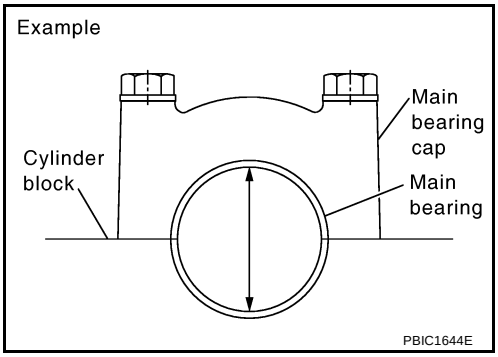
MAIN BEARING OIL CLEARANCE

Method by Calculation

- Install main bearings to cylinder block and main bearing caps, and tighten main bearing cap bolts with main bearing beam to the specified torque. Refer to EM-117, "ASSEMBLY" for the tightening procedure.
- Measure the inner diameter of main bearing with bore gauge.

(Bearing clearance) = (Main bearing inner diameter) – (Crankshaft main journal diameter)

Standard	:	**0.035 - 0.045 mm (0.0014 - 0.0018 in) (actual clearance)**
Limit	:	**0.065 mm (0.0026 in)**



- If the clearance exceeds the limit, select proper main bearing according to main bearing inner diameter and crankshaft main journal diameter to obtain the specified bearing oil clearance. Refer to EM-126, "HOW TO SELECT MAIN BEARING" .

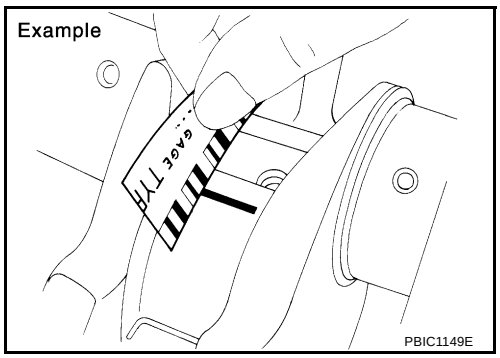
Method of Using Plastigage

- Remove oil and dust on crankshaft main journal and the surfaces of each bearing completely.
- Cut plastigage slightly shorter than the bearing width, and place it in crankshaft axial direction, avoiding oil holes.
- Install main bearings to cylinder block and main bearing caps, and tighten main bearing bolts with main bearing beam to the specified torque. Refer to EM-117, "ASSEMBLY" for the tightening procedure.

  CAUTION:
  Do not rotate crankshaft.

- Remove main bearing caps and bearings, and using scale on plastigage bag, measure the plastigage width.

  NOTE:
  The procedure when the measured value exceeds the limit is same as that described in the “Method by Calculation”.

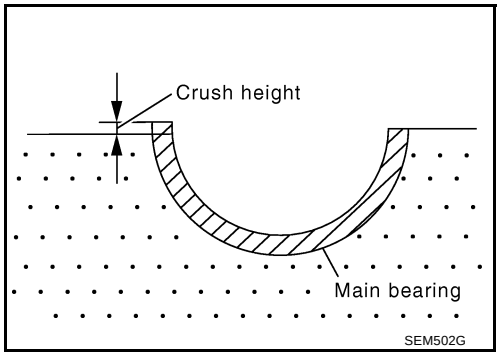


CRUSH HEIGHT OF MAIN BEARING

- When main bearing cap is removed after being tightened to the specified torque with main bearings installed, the tip end of bearing must protrude. Refer to EM-117, "ASSEMBLY" for the tightening procedure.

  Standard : There must be crush height.

- If the standard is not met, replace main bearings.

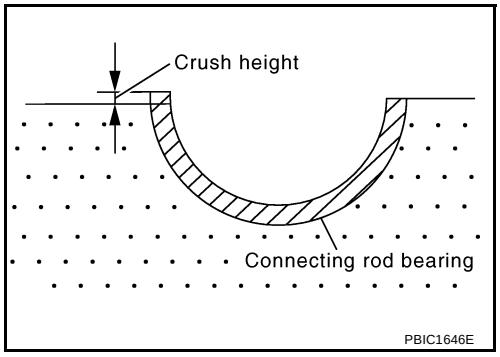


CRUSH HEIGHT OF CONNECTING ROD BEARING

- When connecting rod bearing cap is removed after being tightened to the specified torque with connecting rod bearings installed, the tip end of bearing must protrude. Refer to EM-117, "ASSEMBLY" for the tightening procedure.

  Standard : There must be crush height.

- If the standard is not met, replace connecting rod bearings.

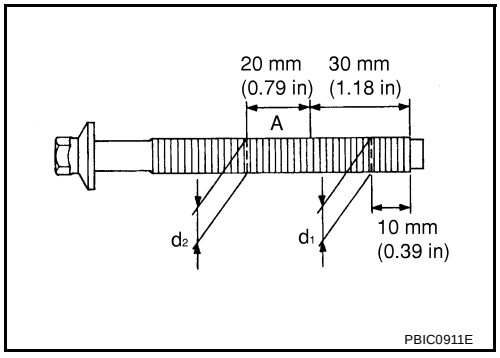


MAIN BEARING CAP BOLT OUTER DIAMETER

- Measure the outer diameters (“d_1 ”, “d_2 ”) at two positions as shown in the figure.
- If reduction appears in “A” range, regard it as “d_2 ”.

  Limit (“d_1 ” – “d_2 ”) : 0.11 mm (0.0051 in)

- If it exceeds the limit (large difference in dimensions), replace main bearing cap bolt with new one.

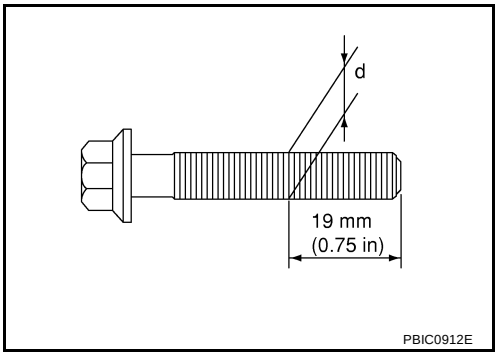


CONNECTING ROD BOLT OUTER DIAMETER

- Measure the outer diameter “d” at position shown in the figure.
- If the reduction appears in a position other than “d”, regard it as “d”.

Standard : 7.90 - 8.00 mm (0.3110 - 0.3150 in)
Limit : 7.75 mm (0.3051 in)

- When “d” exceeds the limit (when it becomes thinner), replace bolt with new one.

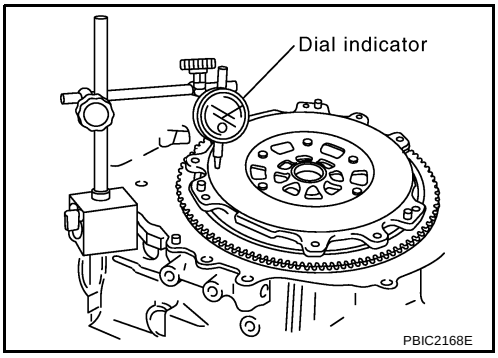


FLYWHEEL DEFLECTION (M/T MODELS)

- Measure the deflection of flywheel contact surface to clutch with dial indicator.
- Measure the deflection at 210 mm (8.27 in) dia.

Standard : 0.45 mm (0.0177 in) or less

- If the measured value is out of the standard, replace flywheel.



MOVEMENT AMOUNT OF FLYWHEEL (M/T MODELS)

CAUTION:
Do not disassemble double mass flywheel.

Movement Amount of Thrust (Fore-and-Aft) Direction

- Measure the movement amount of thrust (fore-and-aft) direction when 100 N (10.2 kg, 22 lb) force is added at the portion of 125 mm (4.92 in) radius from the center of flywheel.

Standard : 1.3 mm (0.051 in) or less

- If measured value is out of the standard, replace flywheel.

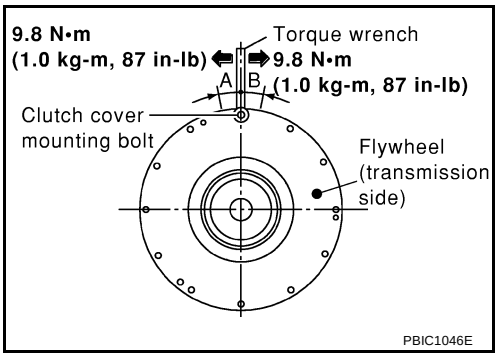
Movement Amount of Radial (Rotation) Direction

Check the movement amount of radial (rotation) direction as follows:

1. Install bolt to clutch cover mounting hole, and place a torque wrench on the extended line of the flywheel center line.
   - Tighten bolt at a force of 9.8 N·m (1.0 kg-m, 87 in-lb) to keep it from loosening.
2. Put a mating mark on circumferences of the two flywheel masses without applying any load (Measurement standard points).
3. Apply a force of 9.8 N·m (1.0 kg-m, 87 in-lb) in each direction, and mark the movement amount on the mass on the transmission side.
4. Measure dimensions of movement amounts “A” and “B” on circumference of flywheel on the transmission side.

Standard : 24 mm (0.94 in) or less

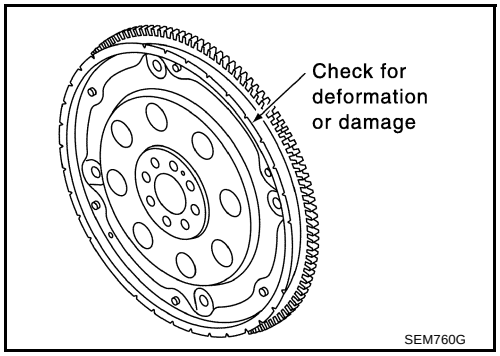
- If the measured value is out of the standard, replace flywheel.



DRIVE PLATE (A/T MODELS)

- Check drive plate and signal plate for deformation or cracks.

  CAUTION:
  - **Do not disassemble drive plate.**
  - **Do not place drive plate with signal plate facing down.**
  - **When handling signal plate, take care not to damage or scratch it.**
  - **Handle signal plate in a manner that prevents it from becoming magnetized.**
- If anything is found, replace drive plate.

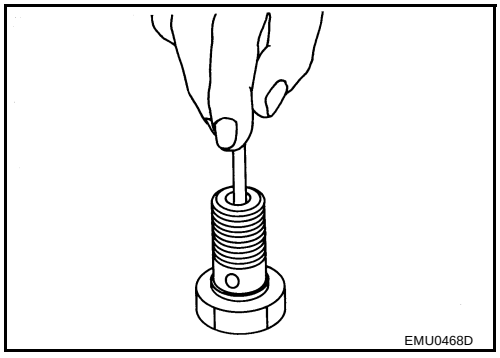


OIL JET

- Check nozzle for deformation and damage.
- Blow compressed air from nozzle, and check for clogs.
- If it is not satisfied, clean or replace oil jet.

OIL JET RELIEF VALVE

- Using clean plastic stick, press check valve in oil jet relief valve. Make sure that valve moves smoothly with proper reaction force.
- If it is not satisfied, replace oil jet relief valve.



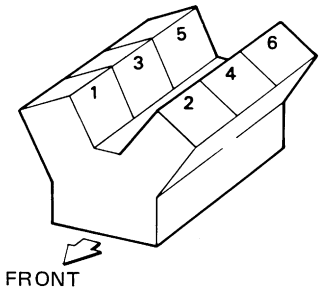
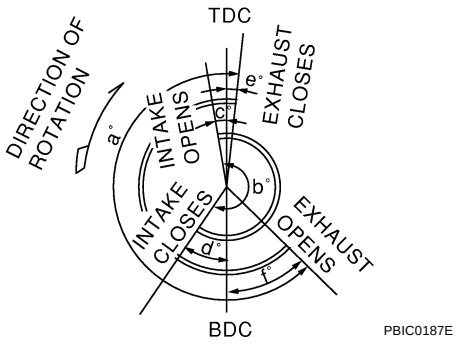
SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00100

Standard and Limit

ABS009Z4

GENERAL SPECIFICATIONS

Cylinder arrangement		V-6
Displacement cm^3 (cu in)		3,498 (213.45)
Bore and stroke mm (in)		95.5 x 81.4 (3.76 x 3.205)
Valve arrangement		DOHC
Firing order		1-2-3-4-5-6
Number of piston rings	Compression	2
	Oil	1
Number of main bearings		4
Compression ratio		10.3
Compression pressure kPa (kg/cm^2 , psi)/300 rpm	Standard	1,275 (13.0, 185)
	Minimum	981 (10.0, 142)
	Differential limit between cylinders	98 (1.0, 14)
Cylinder number	 SEM713A	
Valve timing (Intake valve timing control - “OFF”)	 PBIC0187E	

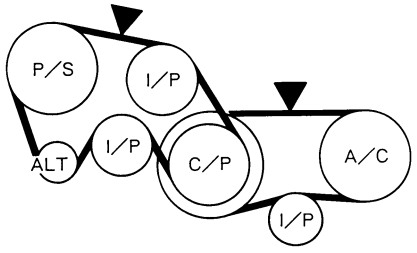
Unit: degree

a	b	c	d	e	f
240	238	- 6	64	8	52

DRIVE BELT

	Deflection adjustment		Unit: mm (in)	Tension adjustment*		Unit: N (kg, lb)
	Used belt		New belt	Used belt		New belt
	Limit	After adjustment		Limit	After adjustment	
Alternator and power steering oil pump belt	7 (0.28)	4 - 5 (0.16 - 0.20)	3.5 - 4.5 (0.138 - 0.177)	294 (30, 66)	730 - 818 (74.5 - 83.5, 164 - 184)	838 - 926 (85.5 - 94.5, 188 - 208)
A/C compressor belt	12 (0.47)	9 - 10 (0.35 - 0.39)	8 - 9 (0.31 - 0.35)	196 (20, 44)	348 - 436 (35.5 - 44.5, 78 - 98)	470 - 559 (48 - 57, 106 - 126)
Applied pushing force	98 N (10 kg, 22 lb)			—		

SEC.117



KBIA1731J

INTAKE MANIFOLD COLLECTOR, INTAKE MANIFOLD AND EXHAUST MANIFOLD

Unit: mm (in)

Items		Limit
Surface distortion	Intake manifold collector (upper)	0.1 (0.004)
	Intake manifold collector (lower)	0.1 (0.004)
	Intake manifold	0.1 (0.004)
	Exhaust manifold	0.3 (0.012)

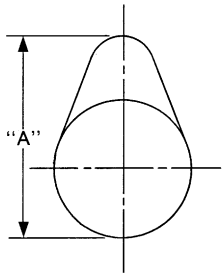
SPARK PLUG

Make	NGK
Standard type	PLFR5A-11
Hot type	PLFR4A-11
Cold type	PLFR6A-11
Gap (nominal)	1.1 mm (0.043 in)

CAMSHAFT AND CAMSHAFT BEARING

Unit: mm (in)

Items		Standard	Limit
Camshaft journal oil clearance	No. 1	0.045 - 0.086 (0.0018 - 0.0034)	0.15 (0.0059)
	No. 2, 3, 4	0.035 - 0.076 (0.0014 - 0.0030)	
Camshaft bracket inner diameter	No. 1	26.000 - 26.021 (1.0236 - 1.0244)	—
	No. 2, 3, 4	23.500 - 23.521 (0.9252 - 0.9260)	—
Camshaft journal diameter	No. 1	25.935 - 25.955 (1.0211 - 1.0218)	—
	No. 2, 3, 4	23.445 - 23.465 (0.9230 - 0.9238)	—
Camshaft end play		0.115 - 0.188 (0.0045 - 0.0074)	0.24 (0.0094)
Camshaft cam height “A”	Intake and exhaust	44.865 - 45.055 (1.7663 - 1.7738)	0.2 (0.008)*1
Camshaft runout [TIR*2]		Less than 0.02 (0.0010)	0.05 (0.0020)
Camshaft sprocket runout [TIR*2]		—	0.15 (0.0059)



SEM671

*1 : Cam wear limit

*2 : Total indicator reading

Valve Lifter

Unit: mm (in)

Items	Standard
Valve lifter outer diameter	33.977 - 33.987 (1.3377 - 1.3381)
Valve lifter hole diameter	34.000 - 34.016 (1.3386 - 1.3392)
Valve lifter clearance	0.013 - 0.039 (0.0005 - 0.0015)

Valve Clearance

Unit: mm (in)

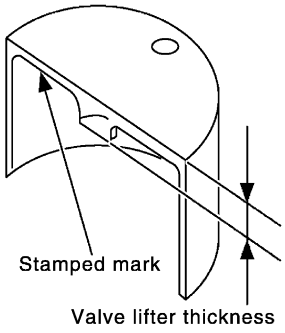
Items	Cold	Hot* (reference data)
Intake	0.26 - 0.34 (0.010 - 0.013)	0.304 - 0.416 (0.012 - 0.016)
Exhaust	0.29 - 0.37 (0.011 - 0.015)	0.308 - 0.432 (0.012 - 0.017)

*: Approximately 80°C (176°F)

Available Valve Lifter

Unit: mm (in)

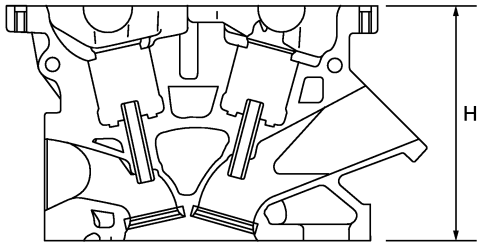
Identification (stamped) mark	Thickness
788U or 788R	7.88 (0.3102)
790U or 790R	7.90 (0.3110)
792U or 792R	7.92 (0.3118)
794U or 794R	7.94 (0.3126)
796U or 796R	7.96 (0.3134)
798U or 798R	7.98 (0.3142)
800U or 800R	8.00 (0.3150)
802U or 802R	8.02 (03.157)
804U or 804R	8.04 (0.3165)
806U or 806R	8.06 (0.3173)
808U or 808R	8.08 (0.3181)
810U or 810R	8.10 (0.3189)
812U or 812R	8.12 (0.3197)
814U or 814R	8.14 (0.3205)
816U or 816R	8.16 (0.3213)
818U or 818R	8.18 (0.3220)
820U or 820R	8.20 (0.3228)
822U or 822R	8.22 (0.3236)
824U or 824R	8.24 (0.3244)
826U or 826R	8.26 (0.3252)
828U or 828R	8.28 (0.3260)
830U or 830R	8.30 (0.3268)
832U or 832R	8.32 (0.3276)
834U or 834R	8.34 (0.3283)
836U or 836R	8.36 (0.3291)
838U or 838R	8.38 (0.3299)
840U or 840R	8.40 (0.3307)



CYLINDER HEAD

Unit: mm (in)

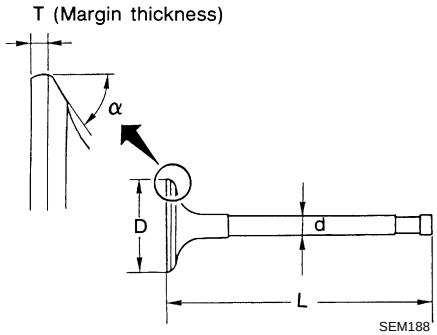
Items	Standard	Limit
Head surface distortion	Less than 0.03 (0.0012)	0.1 (0.004)
Normal cylinder head height “H”	126.3 - 126.5 (4.972 - 4.980)	—



PBIC0924E

Valve Dimensions

Unit: mm (in)

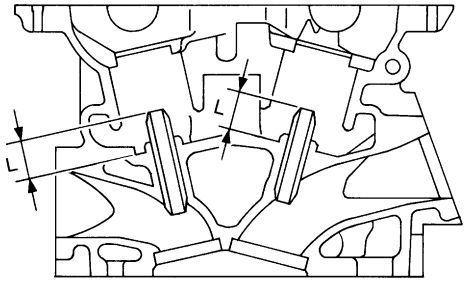


SEM188

Valve head diameter “D”	Intake	37.0 - 37.3 (1.4567 - 1.4685)
	Exhaust	31.2 - 31.5 (1.228 - 1.240)
Valve length “L”	Intake	96.37 (3.794)
	Exhaust	93.99 (3.700)
Valve stem diameter “d”	Intake	5.965 - 5.980 (0.2348 - 0.2354)
	Exhaust	5.955 - 5.970 (0.2344 - 0.2350)
Valve seat angle “α”	Intake	45°15′ - 45°45′
	Exhaust	
Valve margin “T”	Intake	1.1 (0.043)
	Exhaust	1.3 (0.051)
Valve margin “T” limit		0.5 (0.020)
Valve stem end surface grinding limit		0.2 (0.008)

Valve Guide

Unit: mm (in)



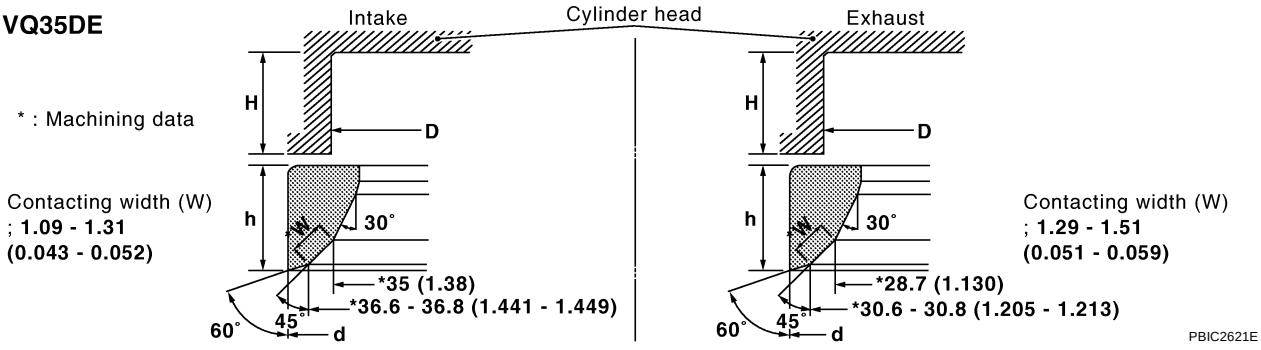
SEM950E

Items		Standard	0.2 (0.008) oversize (Service)
Valve guide	Outer diameter	10.023 - 10.034 (0.3946 - 0.3950)	10.223 - 10.234 (0.4025 - 0.4029)
	Inner diameter (Finished size)	6.000 - 6.018 (0.2362 - 0.2369)	
Cylinder head valve guide hole diameter		9.975 - 9.996 (0.3927 - 0.3935)	10.175 - 10.196 (0.4006 - 0.4014)
Interference fit of valve guide		0.027 - 0.059 (0.0011 - 0.0023)	
Items		Standard	Limit
Valve guide clearance	Intake	0.020 - 0.053 (0.0008 - 0.0021)	0.08 (0.003)
	Exhaust	0.030 - 0.063 (0.0012 - 0.0025)	0.09 (0.004)
Projection length “L”		12.6 - 12.8 (0.496 - 0.504)	

Valve Seat

Unit: mm (in)

VQ35DE



Items		Standard	Oversize [0.5 (0.020)] (Service)
Cylinder head seat recess diameter “D”	Intake	38.000 - 38.016 (1.4961 - 1.4967)	38.500 - 38.516 (1.5157 - 1.5164)
	Exhaust	32.200 - 32.216 (1.2677 - 1.2683)	32.700 - 32.716 (1.2874 - 1.2880)
Valve seat outer diameter “d”	Intake	38.097 - 38.113 (1.4999 - 1.5005)	38.597 - 38.613 (1.5196 - 1.5202)
	Exhaust	32.280 - 32.296 (1.2709 - 1.2715)	32.780 - 32.796 (1.2905 - 1.2912)
Valve seat interference fit	Intake	0.081 - 0.113 (0.0032 - 0.0044)	
	Exhaust	0.064 - 0.096 (0.0025 - 0.0038)	

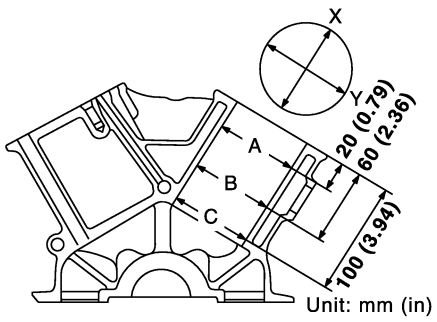
Items		Standard	Service
Height “h”	Intake	5.9 - 6.0 (0.232 - 0.236)	5.05 - 5.15 (0.1988 - 0.2028)
	Exhaust	5.9 - 6.0 (0.232 - 0.236)	4.95 - 5.05 (0.1949 - 0.1988)
Depth “H”		6.0 (0.246)	

Valve Spring

Free height mm (in)		47.07 (1.8531)
Pressure N (kg, lb) at height mm (in)	Installation	166 - 188 (16.9 - 19.2, 37 - 42) at 37.00 (1.4567)
	Valve open	373 - 421 (38.0 - 42.9, 84 - 95) at 27.2 (1.0709)
squareness mm (in)	Limit	2.1 (0.083)

CYLINDER BLOCK

Unit: mm (in)



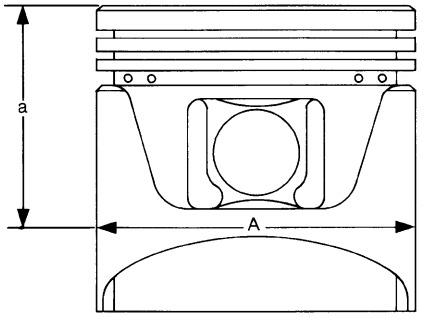
PBIC0923E

Surface distortion		Standard		Less than 0.03 (0.0012)
		Limit		0.1 (0.004)
Main bearing housing inner diameter		Standard		63.993 - 64.017 (2.5194 - 2.5203)
Cylinder bore	Inner diameter	Standard	Grade No. 1	95.500 - 95.510 (3.7598 - 3.7602)
			Grade No. 2	95.510 - 95.520 (3.7602 - 3.7606)
			Grade No. 3	95.520 - 95.530 (3.7606 - 3.7610)
		Wear limit		0.2 (0.008)
Out-of-round (Difference between “X” and “Y”)		Limit		0.015 (0.0006)
Taper (Difference between “A” and “C”)				0.01 (0.0004)
Main bearing housing inner diameter (Without bearing)			Grade No. A	63.993 - 63.994 (2.5194 - 2.5194)
			Grade No. B	63.994 - 63.995 (2.5194 - 2.5195)
			Grade No. C	63.995 - 63.996 (2.5195 - 2.5195)
			Grade No. D	63.996 - 63.997 (2.5195 - 2.5196)
			Grade No. E	63.997 - 63.998 (2.5196 - 2.5196)
			Grade No. F	63.998 - 63.999 (2.5196 - 2.5196)
			Grade No. G	63.999 - 64.000 (2.5196 - 2.5197)
			Grade No. H	64.000 - 64.001 (2.5197 - 2.5197)
			Grade No. J	64.001 - 64.002 (2.5197 - 2.5198)
			Grade No. K	64.002 - 64.003 (2.5198 - 2.5198)
			Grade No. L	64.003 - 64.004 (2.5198 - 2.5198)
			Grade No. M	64.004 - 64.005 (2.5198 - 2.5199)
			Grade No. N	64.005 - 64.006 (2.5199 - 2.5199)
			Grade No. P	64.006 - 64.007 (2.5199 - 2.5200)
			Grade No. R	64.007 - 64.008 (2.5200 - 2.5200)
			Grade No. S	64.008 - 64.009 (2.5200 - 2.5200)
			Grade No. T	64.009 - 64.010 (2.5200 - 2.5201)
			Grade No. U	64.010 - 64.011 (2.5201 - 2.5201)
			Grade No. V	64.011 - 64.012 (2.5201 - 2.5202)
			Grade No. W	64.012 - 64.013 (2.5202 - 2.5202)
			Grade No. X	64.013 - 64.014 (2.5202 - 2.5202)
			Grade No. Y	64.014 - 64.015 (2.5202 - 2.5203)
			Grade No. 4	64.015 - 64.016 (2.5203 - 2.5203)
			Grade No. 7	64.016 - 64.017 (2.5203 - 2.5203)
Difference in inner diameter between cylinders		Standard		Less than 0.03 (0.0012)

PISTON, PISTON RING AND PISTON PIN

Available Piston

Unit: mm (in)



SEM882E

Items		Standard	0.20 (0.0079) oversize
Piston skirt diameter “A”	Grade No. 1	95.480 - 95.490 (3.7590 - 3.7594)	—
	Grade No. 2	95.490 - 95.500 (3.7594 - 3.7598)	—
	Grade No. 3	95.500 - 95.510 (3.7598 - 3.7602)	—
	Service	—	95.680 - 95.710 (3.7669 - 3.7681)
Items		Standard	Limit
“a” dimension		41.0 (1.614)	—
Piston pin hole diameter	Grade No. 0	21.993 - 21.999 (0.8659 - 0.8661)	—
	Grade No. 1	21.999 - 22.005 (0.8661 - 0.8663)	—
Piston to cylinder bore clearance		0.010 - 0.030 (0.0004 - 0.0012)	0.08 (0.0031)

Piston Ring

Unit: mm (in)

Items		Standard	Limit
Side clearance	Top	0.045 - 0.080 (0.0018 - 0.0031)	0.11 (0.0043)
	2nd	0.030 - 0.070 (0.0012 - 0.0028)	0.10 (0.0039)
	Oil ring	0.065 - 0.135 (0.0026 - 0.0053)	—
End gap	Top	0.23 - 0.33 (0.0091 - 0.0130)	0.54 (0.0213)
	2nd	0.33 - 0.48 (0.0130 - 0.0189)	0.80 (0.0315)
	Oil (rail ring)	0.20 - 0.50 (0.0079 - 0.0197)	0.95 (0.0374)

Piston Pin

Unit: mm (in)

Items		Standard	Limit
Piston pin outer diameter	Grade No. 0	21.989 - 21.995 (0.8657 - 0.8659)	—
	Grade No. 1	21.995 - 22.001 (0.8659 - 0.8662)	—
Piston to piston pin oil clearance		0.002 - 0.006 (0.0001 - 0.0002)	—
Connecting rod bushing oil clearance		0.005 - 0.017 (0.0002 - 0.0007)	0.030 (0.0012)

CONNECTING ROD

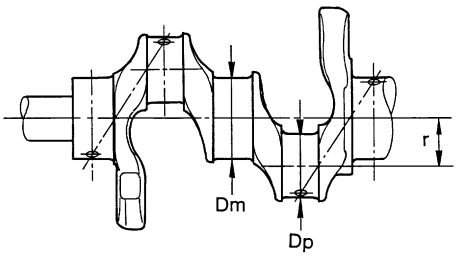
Unit: mm (in)

Items		Standard	Limit
Center distance		144.15 - 144.25 (5.6752 - 5.6791)	—
Bend [per 100 (3.94)]		—	0.15 (0.0059)
Torsion [per 100 (3.94)]		—	0.30 (0.0118)
Connecting rod bushing inner diameter*	Grade No. 0	22.000 - 22.006 (0.8661 - 0.8664)	—
	Grade No. 1	22.006 - 22.012 (0.8664 - 0.8666)	—
Connecting rod big end diameter (Without bearing)		55.000 - 55.013 (2.1654 - 2.1659)	—
Side clearance		0.20 - 0.35 (0.0079 - 0.0138)	0.40 (0.0157)

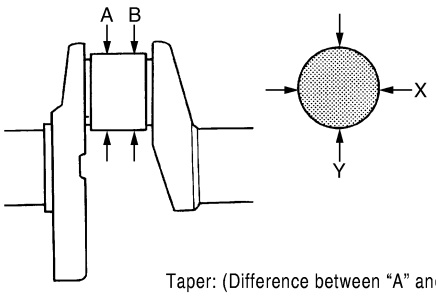
*: After installing in connecting rod

CRANKSHAFT

Unit: mm (in)



SEM645



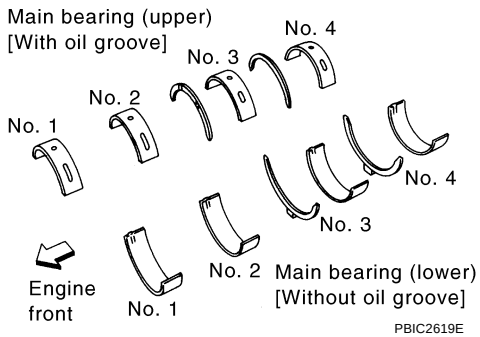
Taper: (Difference between “A” and “B”)
Out-of-round: (Difference between “X” and “Y”)

SBIA0535E

Main journal diameter. “Dm”	Standard	Grade No. A	59.974 - 59.975 (2.3612 - 2.3612)
		Grade No. B	59.973 - 59.974 (2.3611 - 2.3612)
		Grade No. C	59.972 - 59.973 (2.3611 - 2.3611)
		Grade No. D	59.971 - 59.972 (2.3611 - 2.3611)
		Grade No. E	59.970 - 59.971 (2.3610 - 2.3611)
		Grade No. F	59.969 - 59.970 (2.3610 - 2.3610)
		Grade No. G	59.968 - 59.969 (2.3609 - 2.3610)
		Grade No. H	59.967 - 59.968 (2.3609 - 2.3609)
		Grade No. J	59.966 - 59.967 (2.3609 - 2.3609)
		Grade No. K	59.965 - 59.966 (2.3608 - 2.3609)
		Grade No. L	59.964 - 59.965 (2.3608 - 2.3608)
		Grade No. M	59.963 - 59.964 (2.3607 - 2.3608)
		Grade No. N	59.962 - 59.963 (2.3607 - 2.3607)
		Grade No. P	59.961 - 59.962 (2.3607 - 2.3607)
		Grade No. R	59.960 - 59.961 (2.3606 - 2.3607)
		Grade No. S	59.959 - 59.960 (2.3606 - 2.3606)
		Grade No. T	59.958 - 59.959 (2.3605 - 2.3606)
		Grade No. U	59.957 - 59.958 (2.3605 - 2.3605)
		Grade No. V	59.956 - 59.957 (2.3605 - 2.3605)
		Grade No. W	59.955 - 59.956 (2.3604 - 2.3605)
		Grade No. X	59.954 - 59.955 (2.3604 - 2.3604)
		Grade No. Y	59.953 - 59.954 (2.3603 - 2.3604)
		Grade No. 4	59.952 - 59.953 (2.3603 - 2.3603)
		Grade No. 7	59.951 - 59.952 (2.3603 - 2.3603)
Pin journal diameter. “Dp”	Standard	Grade No. 0	51.968 - 51.974 (2.0460 - 2.0462)
		Grade No. 1	51.962 - 51.968 (2.0457 - 2.0460)
		Grade No. 2	51.956 - 51.962 (2.0455 - 2.0457)
Center distance “r”			40.66 - 40.74 (1.6008 - 1.6039)
Out-of-round (Difference between “X” and “Y”)	Limit		0.002 (0.0001)
Taper (Difference between “A” and “B”)			0.002 (0.0001)
Crankshaft runout [TIR*]	Standard		Less than 0.05 (0.002)
	Limit		0.10 (0.0039)
Crankshaft end play	Standard		0.10 - 0.25 (0.0039 - 0.0098)
	Limit		0.30 (0.0118)

*: Total indicator reading

MAIN BEARING



Grade number	UPR/LWR	Thickness "T" mm (in)	Width "W" mm (in)	Identification color	Remarks
0	—	2.000 - 2.003 (0.0787 - 0.0789)	19.9 - 20.1 (0.783 - 0.791)	Black	Grade is the same for upper and lower bearings.
1	—	2.003 - 2.006 (0.0789 - 0.0790)		Brown	
2	—	2.006 - 2.009 (0.0790 - 0.0791)		Green	
3	—	2.009 - 2.012 (0.0791 - 0.0792)		Yellow	
4	—	2.012 - 2.015 (0.0792 - 0.0793)		Blue	
5	—	2.015 - 2.018 (0.0793 - 0.0794)		Pink	
6	—	2.018 - 2.021 (0.0794 - 0.0796)		Purple	
7	—	2.021 - 2.024 (0.0796 - 0.0797)		White	
01	UPP	2.003 - 2.006 (0.0789 - 0.0790)		Brown	Grade is different for upper and lower bearings.
	LWR	2.000 - 2.003 (0.0787 - 0.0789)		Black	
12	UPR	2.006 - 2.009 (0.0790 - 0.0791)		Green	
	LWR	2.003 - 2.006 (0.0789 - 0.0790)		Brown	
23	UPR	2.009 - 2.012 (0.0791 - 0.0792)		Yellow	
	LWR	2.006 - 2.009 (0.0790 - 0.0791)		Green	
34	UPR	2.012 - 2.015 (0.0792 - 0.0793)		Blue	
	LWR	2.009 - 2.012 (0.0791 - 0.0792)		Yellow	
45	UPR	2.015 - 2.018 (0.0793 - 0.0794)		Pink	
	LWR	2.012 - 2.015 (0.0792 - 0.0793)		Blue	
56	UPR	2.018 - 2.021 (0.0794 - 0.0796)		Purple	
	LWR	2.015 - 2.018 (0.0793 - 0.0794)		Pink	
67	UPR	2.021 - 2.024 (0.0796 - 0.0797)		White	
	LWR	2.018 - 2.021 (0.0794 - 0.0796)		Purple	

Undersize

Unit: mm (in)

Items	Thickness	Main journal diameter
0.25 (0.0098)	2.132 - 2.140 (0.0839 - 0.0843)	Grind so that bearing clearance is the specified value.

Main Bearing Oil Clearance

Unit: mm (in)

Items	Standard	Limit
Main bearing oil clearance	0.035 - 0.045 (0.0014 - 0.0018)*	0.065 (0.0026)

*: Actual clearance

CONNECTING ROD BEARING

Grade number	Thickness "T" mm (in)	Identification color (mark)
0	1.500 - 1.503 (0.0591 - 0.0592)	Black
1	1.503 - 1.506 (0.0592 - 0.0593)	Brown
2	1.506 - 1.509 (0.0593 - 0.0594)	Green

Undersize

Unit: mm (in)

Items	Thickness	Crank pin journal diameter
0.25 (0.0098)	1.626 - 1.634 (0.0640 - 0.0643)	Grind so that bearing clearance is the specified value.

Connecting Rod Bearing Oil Clearance

Unit: mm (in)

Items	Standard	Limit
Connecting rod bearing oil clearance	0.034 - 0.059 (0.0013 - 0.0023)*	0.070 (0.0028)

*: Actual clearance

Tightening Torque

ABS009Z5

*1: Parts to be tightened in particular orders.
1)-: Order of tightening when tightening two or more times separately.

Unit: N·m (kg-m, ft-lb)
Unit: N·m (kg-m, in-lb)*2

	Air cleaner and air duct		5.5 (0.56, 49)*2
	Mass air flow sensor		5.5 (0.56, 49)*2
	Engine cover		5.0 - 6.5 (0.51 - 0.66, 45 - 57)*2
*1	Intake manifold collector (upper)		11.8 - 13.7 (1.2 - 1.3, 9 - 10)
*1	Intake manifold collector (lower)		11.8 - 13.7 (1.2 - 1.3, 9 - 10)
*1	Electric throttle control actuator		7.2 - 9.7 (0.74 - 0.98, 64 - 85)*2
	EVAP canister purge volume control solenoid valve		5.0 - 6.5 (0.51 - 0.66, 45 - 57)*2
*1	Intake manifold	1)	4.9 - 9.8 (0.5 - 1.0, 4 - 7)
		2)	26.5 - 31.4 (2.7 - 3.2, 20 - 23)
	Exhaust manifold cover		5.8 (0.59, 51)*2
	Exhaust manifold stud		14.7 (1.5, 11)
*1	Exhaust manifold		30.5 (3.1, 22)
	Tree way catalyst		63.0 (6.4, 46)
	Air fuel ratio sensor 1		50.0 (5.1, 37)
	Heated oxygen sensor 2		45.0 (4.6, 33)
*1	Oil pan (lower)		7.0 (0.71, 62)*2
*1	Oil pan (upper)		17.2 (18, 13)
	Oil strainer		21.6 (2.2, 16)
	Oil pan drain plug		34.3 (3.5, 25)
	Rear plate		7.0 (0.71, 62)*2
	Crankshaft position sensor (POS)		9.0 (0.92, 80)*2
	Ignition coil		9.0 (0.92, 80)*2
	Spark plug		24.5 (2.5, 18)
	Fuel hose clamp bracket (right member side)		5.0 (0.51, 44)*2
	Fuel feed hose (with damper)		8.4 (0.86, 74)*2

	Fuel sub-tube			9.6 (0.98, 85)*2
	Fuel damper			9.6 (0.98, 85)*2
*1	Fuel tube		1)	9.3 - 10.8 (0.95 - 1.1, 6.9 - 7.9)
			2)	20.6 - 26.5 (2.1 - 2.7, 16 - 19)
*1	Rocker cover		1)	0.96 - 2.96 (0.10 - 0.30, 9 - 26)*2
			2)	7.33 - 9.33 (0.75 - 0.95, 65 - 82)*2
	PCV valve			2.5 (0.26, 22)*2
*1	Intake valve timing control cover			11.3 (1.2, 8)
	Camshaft sprocket (INT)			103 (11, 76)
	Camshaft sprocket (EXH)			123 (13, 91)
	Timing chain tensioner (primary)			8.1 (0.83, 72)*2
	Timing chain tensioner (secondary)			8.5 (0.87, 75)*2
	Internal chain guide			8.1 (0.83, 72)*2
	Tension guide			21.6 (2.2, 16)
	Slack guide			15.7 (1.6, 12)
	Crankshaft pulley		1)	39.2 - 49.0 (4.0 - 5.0, 29 - 36)
			2)	60° - 65° (angle tightening)
	Chain tensioner cover			11.3 (1.2, 8)
	Water pump cover			11.3 (1.2, 8)
	Water hose clamp mounting bolt			74.0 (7.5, 55)
*1	Front timing chain case	M6 bolt		12.7 (13, 9)
		M8 bolt		28.4 (2.9, 21)
*1	Rear timing chain case			12.7 (13, 9)
*1	Camshaft bracket		1)	1.96 (0.2, 17)*2
			2)	1.96 (0.2, 17)*2
			3)	5.88 (0.6, 52)*2
			4)	9.02 - 11.8 (0.92 - 1.20, 80 - 104)*2
			5)	8.3 - 10.3 (0.85 - 1.0, 74 - 91)*2
	Camshaft position sensor (PHASE)			9.6 (0.98, 85)*2
	Intake valve timing control solenoid valve			11.3 (1.2, 8)
*1	Cylinder head		1)	98.1 (10, 72)
			2)	0 (0, 0)
			3)	34.3 - 44.1 (3.5 - 4.4, 26 - 32)
			4)	90° - 95° (angle tightening)
			5)	90° - 95° (angle tightening)
*1	Engine mounting bracket (RH and LH)			49.0 (5.0, 36)
	Engine mounting insulator (RH and LH)			92.5 (9.4, 68)
*1	Rear engine mounting member			49.0 (5.0, 36)
	Engine mounting insulator (rear)			49.0 (5.0, 36)
	Mass damper			49.0 (5.0, 36)
	Dynamic damper [M/T models (For Coupe)]			49.0 (5.0, 36)
*1	Main bearing cap		1)	32.3 - 38.3 (3.3 - 3.9, 24 - 28)
			2)	90° - 95° (angle tightening)

Connecting rod	1)	18.6 - 20.6 (1.9 - 2.1, 14 - 15)
	2)	90° - 95° (angle tightening)
Oil jet		27.0 (2.8, 20)
Knock sensor		23.6 (2.4, 1.7)
Flywheel (M/T models)		88.2 (9.0, 65)
Drive plate (A/T models)		88.2 (9.0, 65)
Rear oil seal retainer		8.8 (0.9, 65)*2

SECTION LU

ENGINE LUBRICATION SYSTEM

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PRECAUTIONS

PFP:00001

Precautions for Battery Service

ABS00B4O

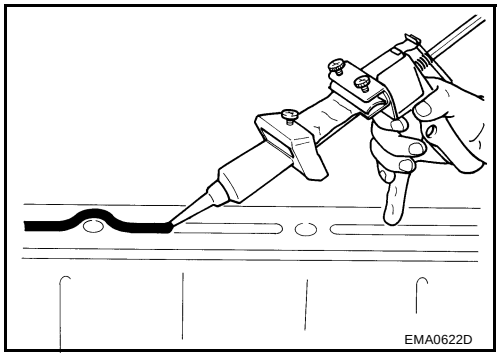
Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Liquid Gasket

ABS009Z7

LIQUID GASKET APPLICATION PROCEDURE

1. Remove old liquid gasket adhering to the liquid gasket application surface and the mating surface.
   - Remove liquid gasket completely from the liquid gasket application surface, mounting bolts, and bolt holes.
2. Wipe the liquid gasket application surface and the mating surface with white gasoline (lighting and heating use) to remove adhering moisture, grease and foreign materials.
3. Attach liquid gasket tube to tube presser [SST: WS39930000 (—)].
   Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .
   - Within five minutes of liquid gasket application, install the mating component.
   - If liquid gasket protrudes, wipe it off immediately.
   - Do not retighten mounting bolts or nuts after the installation.
   - After 30 minutes or more have passed from the installation, fill engine oil and engine coolant.



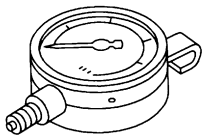
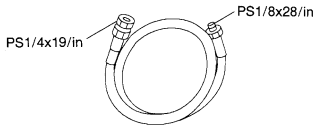
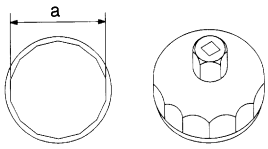
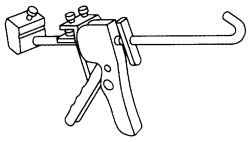
PREPARATION

PFP:00002

Special Service Tools

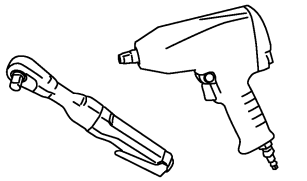
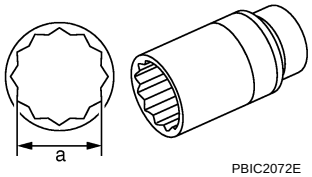
ABS009Z8

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
ST25051001 (J25695-1) Oil pressure gauge  NT050	Measuring oil pressure **Maximum measuring range: 2,452 kPa (25 kg/cm^2 , 356 psi)**
ST25052000 (J25695-2) Hose  S-NT559	Adapting oil pressure gauge to oil pan (upper)
KV10115801 (J38956) Oil filter wrench  S-NT375	Removing oil filter **a: 64.3 mm (2.531 in)**
WS39930000 (—) Tube presser  NT052	Pressing the tube of liquid gasket

Commercial Service Tools

ABS009Z9

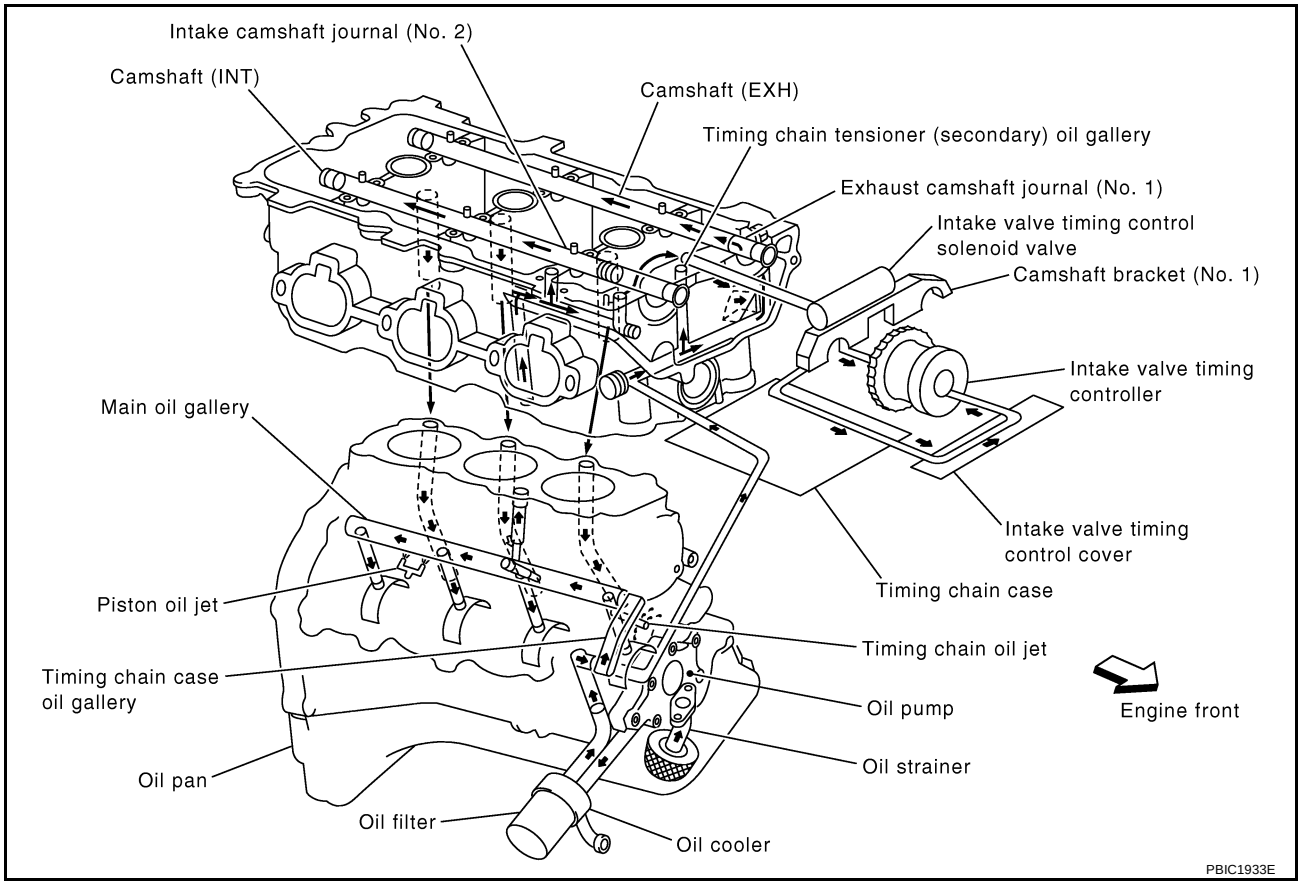
Tool name	Description
Power tool  PBIC0190E	Loosening nuts and bolts
Deep socket  PBIC2072E	Removing and installing oil pressure sensor **a: 24 mm (0.94 in)**

LUBRICATION SYSTEM

PFP:15010

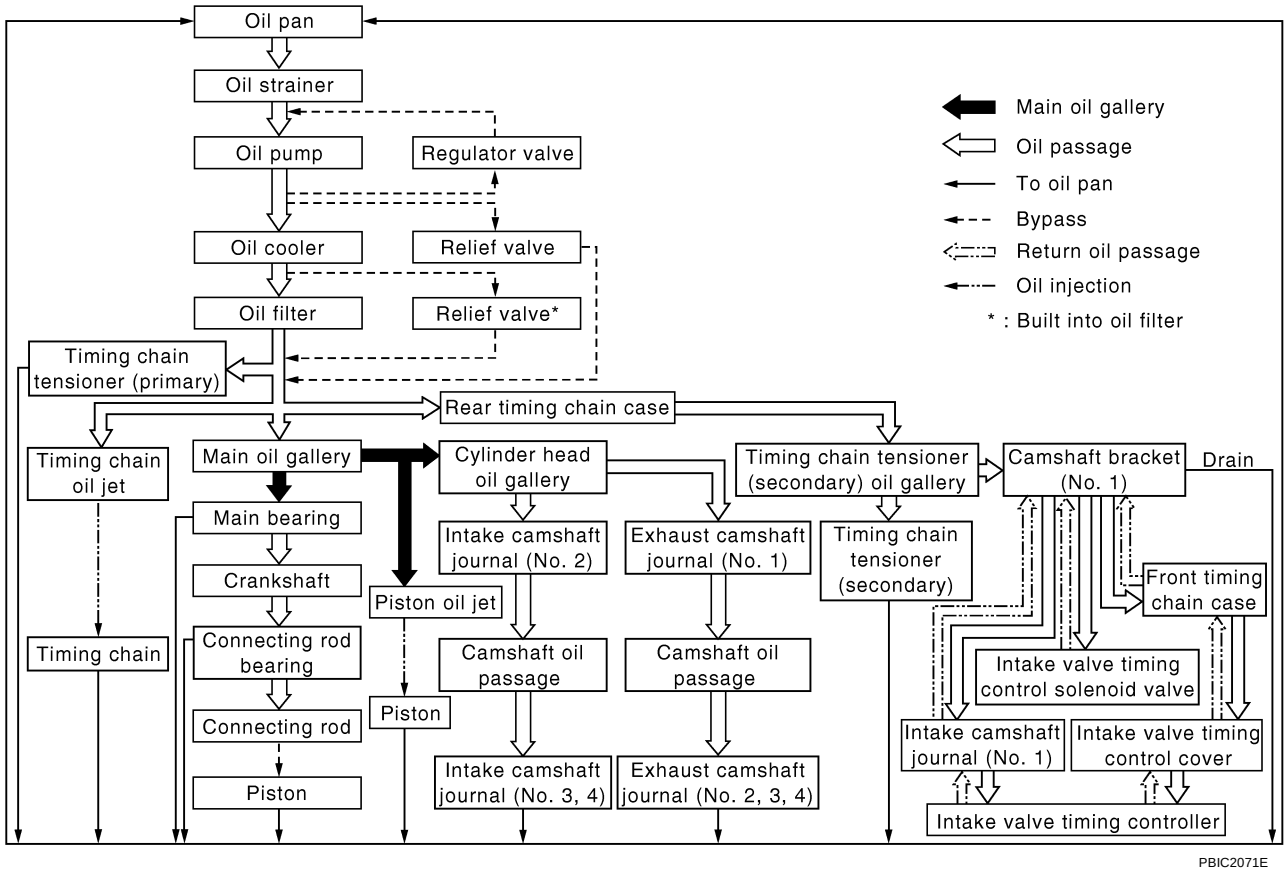
Lubrication Circuit

ABS009ZA



System Chart

ABS009ZB



PBIC2071E

ENGINE OIL

PFP:KLA92

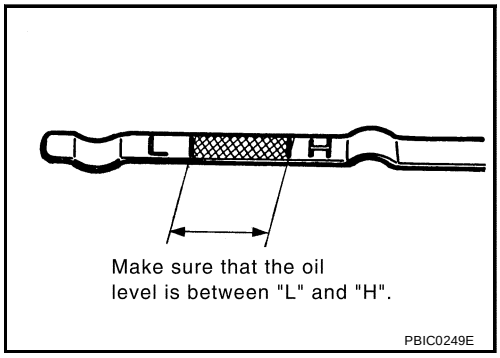
Inspection

ABS009ZC

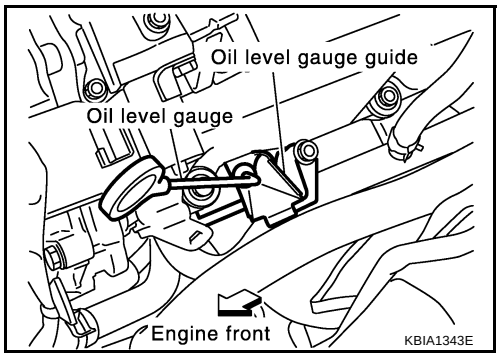
ENGINE OIL LEVEL

NOTE:
Before starting engine, put vehicle horizontally and check the engine oil level. If engine is already started, stop it and allow 10 minutes before checking.

1. Pull out oil level gauge and wipe it clean.
2. Insert oil level gauge and make sure the engine oil level is within the range shown in the figure.
3. If it is out of range, adjust it.



NOTE:
When checking oil level, insert oil level gauge with its tip aligned with oil level gauge guide on cylinder head. (In the figure, air cleaner case and air duct are removed.)



ENGINE OIL APPEARANCE

- Check engine oil for white turbidity or heavy contamination.
- If engine oil becomes turbid and white, it is highly probable that it is contaminated with engine coolant. Repair or replace damaged parts.

ENGINE OIL LEAKAGE

Check for oil leakage around the following areas:

- Oil pans (lower and upper)
- Oil pan drain plug
- Oil pressure sensor
- Oil filter
- Oil cooler
- Water pump cover
- Chain tensioner cover
- Intake valve timing control cover and intake valve timing control solenoid valve
- Mating surface between cylinder block and cylinder head
- Mating surface between cylinder head and rocker cover
- Mating surface between front timing chain case and rear timing chain case
- Mating surface between rear timing chain case and cylinder block
- Crankshaft oil seals (front and rear)

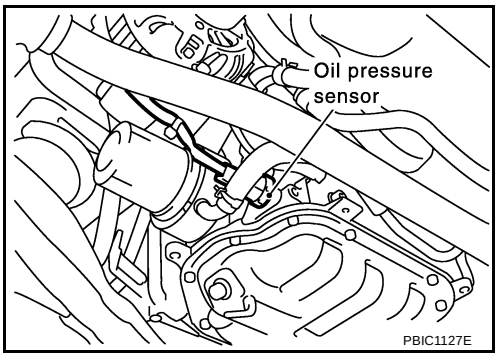
OIL PRESSURE CHECK

WARNING:

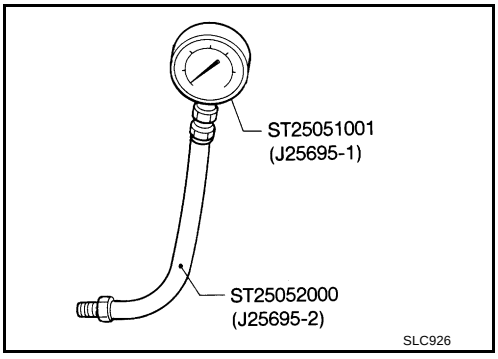
- **Be careful not to burn yourself, as engine oil may be hot.**
- **Oil pressure check should be done in “Neutral position” (M/T models) or “Parking position” (A/T models).**

1. Check engine oil level. Refer to LU-6, "ENGINE OIL LEVEL" .
2. Remove undercover with power tool.
3. Disconnect harness connector at oil pressure sensor, and remove oil pressure sensor using deep socket (commercial service tool).

   CAUTION:
   Do not drop or shock oil pressure sensor.



4. Install oil pressure gauge and hose [SST].



5. Start engine and warm it up to normal operating temperature.
6. Check oil pressure with engine running under no-load.

   NOTE:
   When engine oil temperature is low, engine oil pressure becomes high.

Engine oil pressure [Engine oil temperature at 80°C (176°F)]

Engine speed rpm	Approximate discharge pressure kPa (kg/cm^2 , psi)
Idle speed	More than 98 (1.0, 14)
2,000	More than 294 (3.0, 43)

If difference is extreme, check oil passage and oil pump for oil leaks.

7. After the inspections, install oil pressure sensor as follows:

a. Remove old liquid gasket adhering to oil presser sensor and engine.

b. Apply liquid gasket and tighten oil pressure sensor to specification.
   Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

   : 12.3 - 17.2 N·m (1.25 - 1.75 kg-m, 9 - 12 ft-lb)

c. After warming up engine, make sure there is no leakage of engine oil with running engine.

Changing Engine Oil

ABS009ZD

WARNING:

- **Be careful not to burn yourself, as engine oil may be hot.**
- **Prolonged and repeated contact with used engine oil may cause skin cancer; try to avoid direct skin contact with used engine oil. If skin contact is made, wash thoroughly with soap or hand cleaner as soon as possible.**

1. Warm up engine, put vehicle horizontally and check for oil leakage from engine components. Refer to LU-6, "ENGINE OIL LEAKAGE" .
2. Stop engine and wait for 10 minutes.
3. Loosen oil filler cap and then remove drain plug.
4. Drain engine oil.
5. Install drain plug with new washer. Refer to EM-27, "OIL PAN AND OIL STRAINER" .

   CAUTION:
   Be sure to clean drain plug and install with new washer.

   Oil pan drain plug:

   : 29.4 - 39.2 N·m (3.0 - 4.0 kg-m, 22 - 28 ft-lb)
6. Refill with new engine oil.
   Engine oil specification and viscosity:
   Refer to MA-12, "RECOMMENDED FLUIDS AND LUBRICANTS" .

   Engine oil capacity (Approximate):

Unit: ℓ (US qt, Imp qt)

Drain and refill	With oil filter change	4.7 (5, 4-1/8)
	Without oil filter change	4.4 (4-5/8, 3-7/8)
Dry engine (Overhaul)		5.4 (5-3/4, 4-3/4)

CAUTION:

- **When filling engine oil, do not pull out oil level gauge.**
- **The refill capacity depends on the engine oil temperature and drain time. Use these specifications for reference only.**
- **Always use oil level gauge to determine the proper amount of engine oil in the engine.**

7. Warm up engine and check area around drain plug and oil filter for oil leakage.
8. Stop engine and wait for 10 minutes.
9. Check the engine oil level. Refer to LU-6, "ENGINE OIL LEVEL" .

OIL FILTER

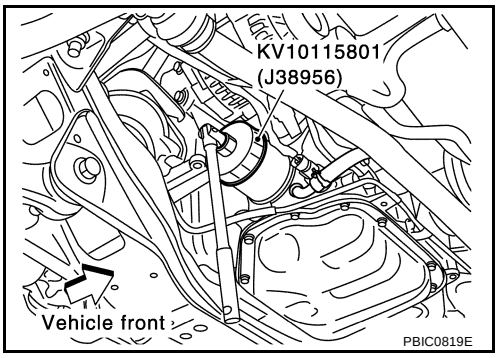
PFP:15208

Removal and Installation

ABS009ZE

REMOVAL

1. Remove undercover with power tool.
2. Using oil filter wrench [SST], remove oil filter.

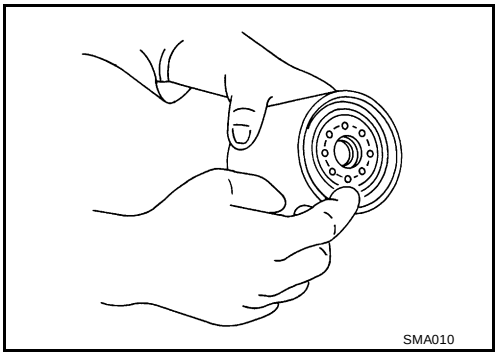


CAUTION:

- **Oil filter is provided with relief valve. Use Genuine Nissan Oil Filter or equivalent.**
- **Be careful not to get burned when engine and engine oil may be hot.**
- **When removing, prepare a shop cloth to absorb any engine oil leakage or spillage.**
- **Do not allow engine oil to adhere to drive belts.**
- **Completely wipe off any engine oil that adheres to engine and vehicle.**

INSTALLATION

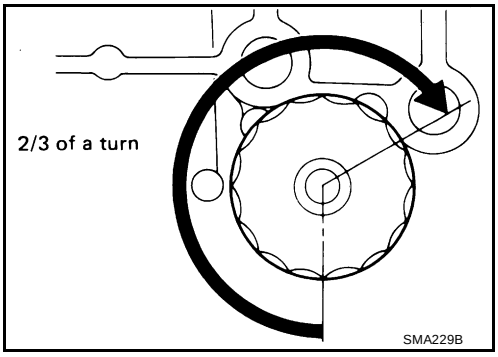
1. Remove foreign materials adhering to oil filter installation surface.
2. Apply engine oil to the oil seal contact surface of new oil filter.



3. Screw oil filter manually until it touches the installation surface, then tighten it by 2/3 turn. Or tighten to specification.

Oil filter:

: 14.7 - 20.5 N·m (1.5 - 2.0 kg-m, 11 - 15 ft-lb)



INSPECTION AFTER INSTALLATION

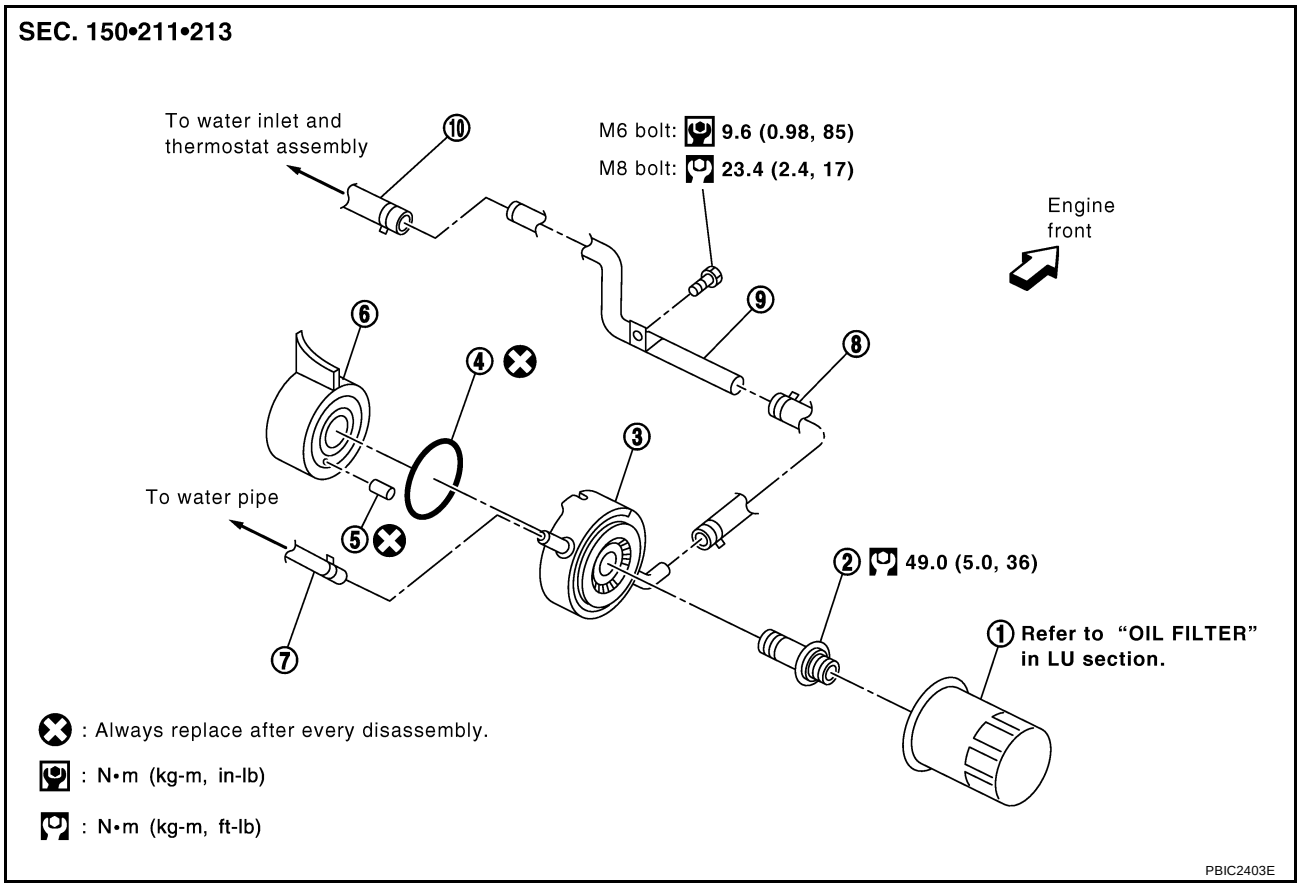
1. Check the engine oil level. Refer to LU-6, "ENGINE OIL" .
2. Start engine, and check there is no leaks of engine oil.
3. Stop engine and wait for 10 minutes.
4. Check the engine oil level and add engine oil. Refer to LU-6, "ENGINE OIL" .

OIL COOLER

PFP:21305

Removal and Installation

ABS009ZF



1. Oil filter
2. Connector bolt
3. Oil cooler
4. O-ring
5. Relief valve
6. Oil pan (Upper) right side
7. Water hose
8. Water hose
9. Water pipe
10. Water hose

WARNING:

Be careful not to get burn yourself, as engine oil and engine coolant are hot.

REMOVAL

NOTE:

When removing oil cooler only, step 2 is unnecessary.

1. Remove undercover with power tool.
2. Drain engine coolant from radiator and cylinder block. Refer to CO-9, "Changing Engine Coolant" and EM-112, "DISASSEMBLY" .

   NOTE:

   Perform this step when removing water pipes.
3. Remove oil filter. Refer to LU-9, "OIL FILTER" .

   CAUTION:

   Do not spill engine oil on drive belts.
4. Disconnect water hoses from oil cooler.
   - When removing oil cooler only, pinching water hoses near oil cooler to prevent engine coolant spilling.

   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine coolant on drive belts.**
5. Remove connector bolt, and remove oil cooler.

CAUTION:
Do not spill engine oil to rubber parts such as drive belts and engine mounting insulator.

6. Remove water pipes, as necessary.

INSPECTION AFTER REMOVAL

Oil Cooler

Check oil cooler for cracks. Check oil cooler for clogging by blowing through engine coolant inlet. If necessary, replace oil cooler.

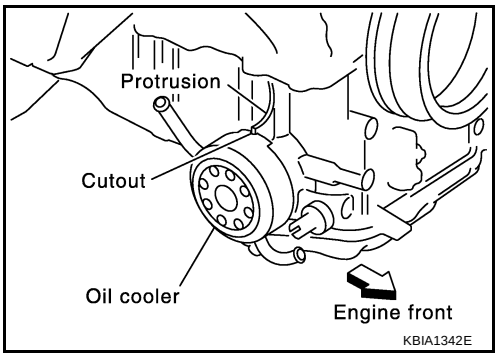
Relief Valve

Check relief valve for movement, cracks and breaks by pushing the ball. If replacement is necessary, remove relief valve by prying it out with suitable tool. Install a new relief valve in place by tapping it.

INSTALLATION

Note the following, and install in the reverse order of removal.

- Make sure that no foreign objects are adhering to the installation planes of oil cooler and oil pan (upper).
- Align cutout on oil cooler with protrusion on oil pan (upper) side, and tighten connector bolt.



INSPECTION AFTER INSTALLATION

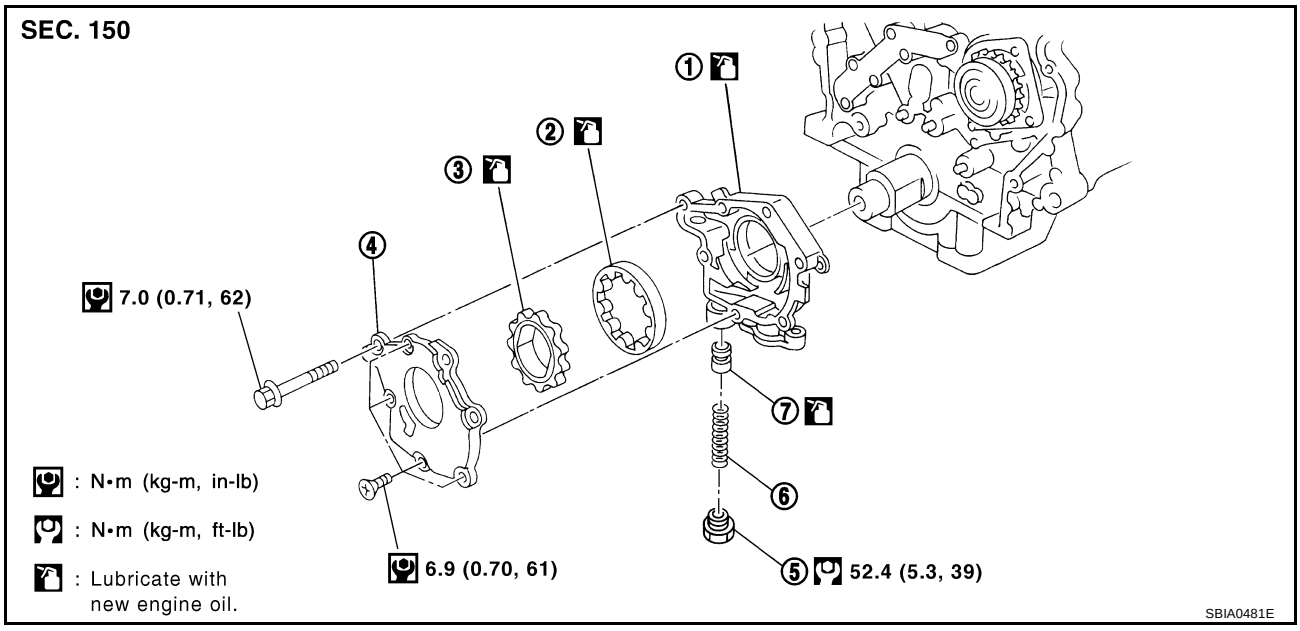
1. Check the engine oil level and the engine coolant level, and add engine oil and engine coolant. Refer to LU-6, "ENGINE OIL" and CO-9, "ENGINE COOLANT" .
2. Start engine, and make sure that there is no leaks of engine oil or engine coolant.
3. Stop engine and wait for 10 minutes.
4. Check the engine oil level and the engine coolant level again. Refer to LU-6, "ENGINE OIL" and CO-9, "ENGINE COOLANT" .

OIL PUMP

PFP:15010

Removal and Installation

ABS009ZG



1. Oil pump body
2. Oil pump outer rotor
3. Oil pump inner rotor
4. Oil pump cover
5. Regulator valve plug
6. Regulator valve spring
7. Regulator valve

REMOVAL

1. Remove oil pans (lower and upper) and oil strainer. Refer to EM-27, "OIL PAN AND OIL STRAINER" .
2. Remove front timing chain case and timing chain (primary). Refer to EM-55, "TIMING CHAIN" .
3. Remove oil pump assembly.

INSTALLATION

Note the following, and install in the reverse order of removal.

- When installing, align crankshaft flat faces with inner rotor flat faces.

INSPECTION AFTER INSTALLATION

1. Check the engine oil level. Refer to LU-6, "ENGINE OIL" .
2. Start engine, and check there is no leaks of engine oil.
3. Stop engine and wait for 10 minutes.
4. Check the engine oil level and add engine oil. Refer to LU-6, "ENGINE OIL" .

Disassembly and Assembly

ABS009ZH

DISASSEMBLY

1. Remove oil pump cover.
2. Remove oil pump inner rotor and oil pump outer rotor from oil pump body.
3. After removing regulator valve plug, remove regulator valve spring and regulator valve.

INSPECTION AFTER DISASSEMBLY

Oil Pump Clearance

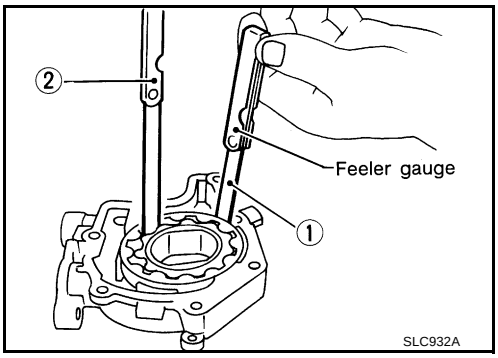
- Measure the clearance with feeler gauge.

– Clearance between oil pump outer rotor and oil pump body (Position “1”)

Standard : 0.114 - 0.260 mm (0.0045 - 0.0102 in)

– Tip clearance between oil pump inner rotor and oil pump outer rotor (Position “2”)

Standard : Below 0.180 mm (0.0071 in)



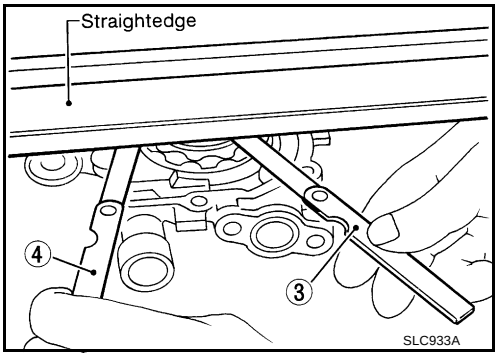
- Measure the clearance with feeler gauge and straightedge.

– Side clearance between oil pump inner rotor and oil pump body (Position “3”)

Standard : 0.030 - 0.070 mm (0.0012 - 0.0028 in)

– Side clearance between oil pump outer rotor and oil pump body (Position “4”)

Standard : 0.050 - 0.110 mm (0.0020 - 0.0043 in)



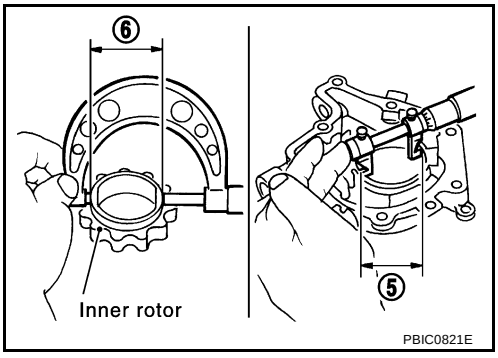
- Calculate the clearance between oil pump inner rotor and oil pump body as follows:

OIL PUMP BODY INNER DIAMETER

– Measure the inner diameter of oil pump body with inside micrometer. (Position “5”)

OIL PUMP INNER ROTOR OUTER DIAMETER

– Measure the outer diameter of protruded portion of oil pump inner rotor with micrometer. (Position “6”)



OIL PUMP INNER ROTOR TO OIL PUMP BODY CLEARANCE

– (Clearance) = (Oil pump body inner diameter) – (Oil pump inner rotor outer diameter)

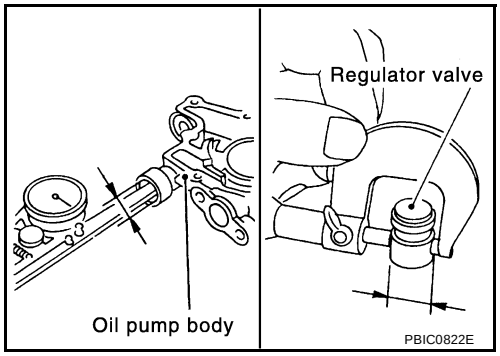
Standard : 0.045 - 0.091 mm (0.0018 - 0.0036 in)

- If measured/calculated values are out of the standard, replace oil pump assembly.

Regulator Valve Clearance

(Clearance) = (Valve hole diameter) – (Regulator valve outer diameter)

Standard : 0.040 - 0.097 mm (0.0016 - 0.0038 in)



- If the calculated value is out of the standard, replace oil pump assembly.

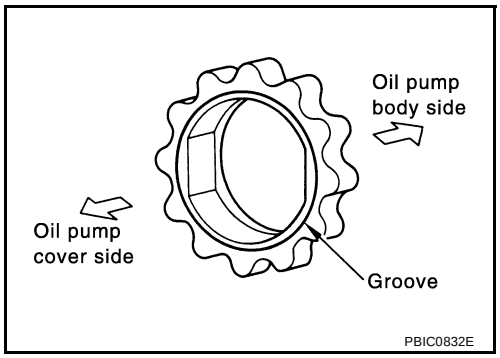
CAUTION:

- **Coat regulator valve with engine oil.**
- **Make sure that it falls smoothly into valve hole by its own weight.**

ASSEMBLY

Note the following, and assemble in the reverse order of disassembly.

- Install oil pump inner rotor with the groove faced to oil pump cover side.



SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Standard and Limit

ABS009ZI

OIL PRESSURE

Engine speed rpm	Approximate discharge pressure* kPa (kg/cm^2 , psi)
Idle speed	More than 98 (1.0, 14)
2,000	More than 294 (3.0, 43)

*: Engine oil temperature at 80°C (176°F)

OIL CAPACITY (APPROXIMATE)

Unit: ℓ (US qt, Imp qt)

Drain and refill	With oil filter change	4.7 (5, 4-1/8)
	Without oil filter change	4.4 (4-5/8, 3-7/8)
Dry engine (Overhaul)		5.4 (5-3/4, 4-3/4)

OIL PUMP

Unit: mm (in)

Oil pump body to oil pump outer rotor radial clearance	0.114 - 0.260 (0.0045 - 0.0102)
Oil pump inner rotor to oil pump outer rotor tip clearance	Below 0.180 (0.0071)
Oil pump body to oil pump inner rotor side clearance	0.030 - 0.070 (0.0012 - 0.0028)
Oil pump body to oil pump outer rotor side clearance	0.050 - 0.110 (0.0020 - 0.0043)
Oil pump inner rotor to oil pump body clearance	0.045 - 0.091 (0.0018 - 0.0036)

REGULATOR VALVE

Unit: mm (in)

Regulator valve to oil pump body clearance	0.040 - 0.097 (0.0016 - 0.0038)

Tightening Torque

ABS009ZJ

Unit: N·m (kg-m, ft-lb)
Unit: N·m (kg-m, in-lb)*

Oil pressure sensor		12.3 - 17.2 (1.25 - 1.75, 9 - 12)
Oil pan drain plug		29.4 - 39.2 (3.0 - 4.0, 22 - 28)
Oil cooler connector bolt		49.0 (5.0, 36)
Water pipe	M6 bolt	9.6 (0.98, 85)*
	M8 bolt	23.4 (2.4, 17)
Oil pump body		6.9 (0.70, 61)*
Oil pump cover		7.0 (0.71, 62)*
Regulator valve plug		52.4 (5.3, 39)

SECTION CO
ENGINE COOLING SYSTEM

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

ABS00A3A

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

ABS00B4P

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Liquid Gasket

ABS009ZM

REMOVAL OF LIQUID GASKET SEALING

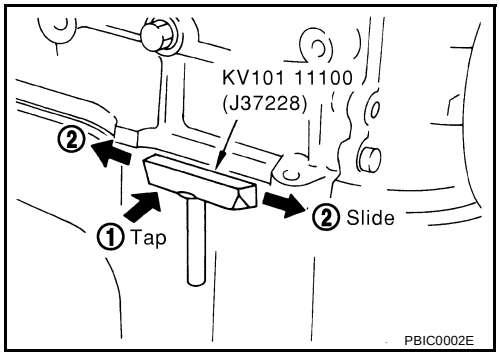
- After removing mounting bolts and nuts, separate the mating surface using seal cutter [SST] and remove old liquid gasket sealing.

  CAUTION:

  Be careful not to damage the mating surfaces.
- Tap seal cutter to insert it, and then slide it by tapping on the side as shown in the figure.
- In areas where seal cutter [SST] is difficult to use, use plastic hammer to lightly tap the parts, to remove it.

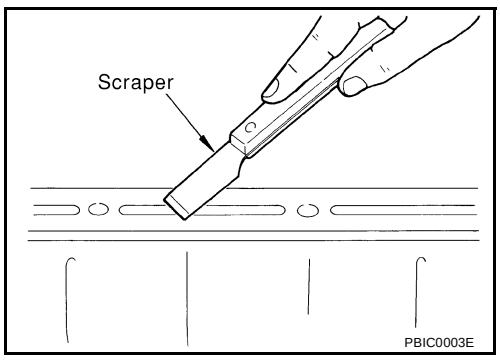
  CAUTION:

  If for some unavoidable reason tool such as screwdriver is used, be careful not to damage the mating surfaces.

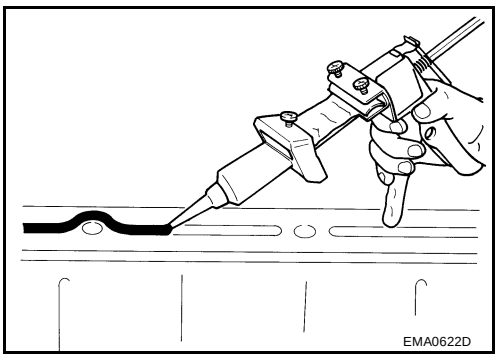


LIQUID GASKET APPLICATION PROCEDURE

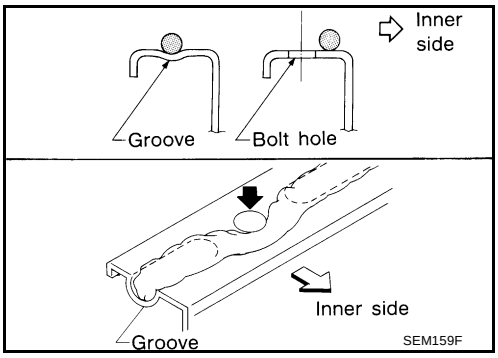
1. Using scraper, remove old liquid gasket adhering to the liquid gasket application surface and the mating surface.
   - Remove liquid gasket completely from the groove of the liquid gasket application surface, mounting bolts, and bolt holes.
2. Wipe the liquid gasket application surface and the mating surface with white gasoline (lighting and heating use) to remove adhering moisture, grease and foreign materials.



3. Attach liquid gasket tube to tube presser [SST: WS39930000 (—)].
   Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .
4. Apply liquid gasket without breaks to the specified location with the specified dimensions.
   - If there is a groove for the liquid gasket application, apply liquid gasket to the groove.



   - As for the bolt holes, normally apply liquid gasket inside the holes. Occasionally, it should be applied outside the holes. Make sure to read the text of service manual.
   - Within five minutes of liquid gasket application, install the mating component.
   - If liquid gasket protrudes, wipe it off immediately.
   - Do not retighten mounting bolts or nuts after the installation.
   - After 30 minutes or more have passed from the installation, fill engine oil and engine coolant.



CAUTION:
If there are specific instructions in this manual, observe them.

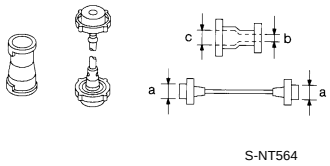
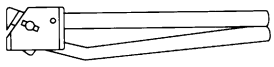
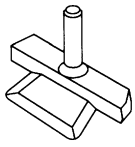
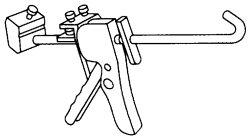
PREPARATION

PFP:00002

Special Service Tools

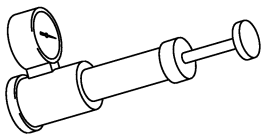
ABS009ZN

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
EG17650301 (J33984-A) Radiator cap tester adapter  S-NT564	Adapting radiator cap tester to radiator cap and radiator filler neck **a: 28 (1.10) dia.** **b: 31.4 (1.236) dia.** **c: 41.3 (1.626) dia.** Unit: mm (in)
KV99103510 (—) Radiator plate pliers A S-NT224	Installing radiator upper and lower tanks
KV99103520 (—) Radiator plate pliers B  S-NT225	Removing radiator upper and lower tanks
KV10111100 (J37228) Seal cutter  NT046	Removing chain tensioner cover and water pump cover
WS39930000 (—) Tube presser  S-NT052	Pressing the tube of liquid gasket

Commercial Service Tools

ABS009ZO

Tool name	Description
Radiator cap tester  PBIC1982E	Checking radiator and radiator cap

OVERHEATING CAUSE ANALYSIS

PFP:00012

Troubleshooting Chart

ABS009ZP

	Symptom		Check items	
Cooling system parts malfunction	Poor heat transfer	Water pump malfunction	Worn or loose drive belt	—
		Thermostat stuck closed	—	
		Damaged fins	Dust contamination or paper clogging	
			Physical damage	
		Clogged radiator cooling tube	Excess foreign material (rust, dirt, sand, etc.)	
	Reduced air flow	Cooling fan does not operate	Fan assembly	—
		High resistance to fan rotation		
		Damaged fan blades		
	Damaged radiator shroud	—	—	—
	Improper engine coolant mixture ratio	—	—	—
	Poor engine coolant quality	—	Engine coolant viscosity	—
	Insufficient engine coolant	Engine coolant leaks	Cooling hose	Loose clamp
				Cracked hose
			Water pump	Poor sealing
			Radiator cap	Loose
				Poor sealing
			Radiator	O-ring for damage, deterioration or improper fitting
				Cracked radiator tank
				Cracked radiator core
			Reservoir tank	Cracked reservoir tank
		Overflowing reservoir tank	Exhaust gas leaks into cooling system	Cylinder head deterioration
				Cylinder head gasket deterioration

OVERHEATING CAUSE ANALYSIS

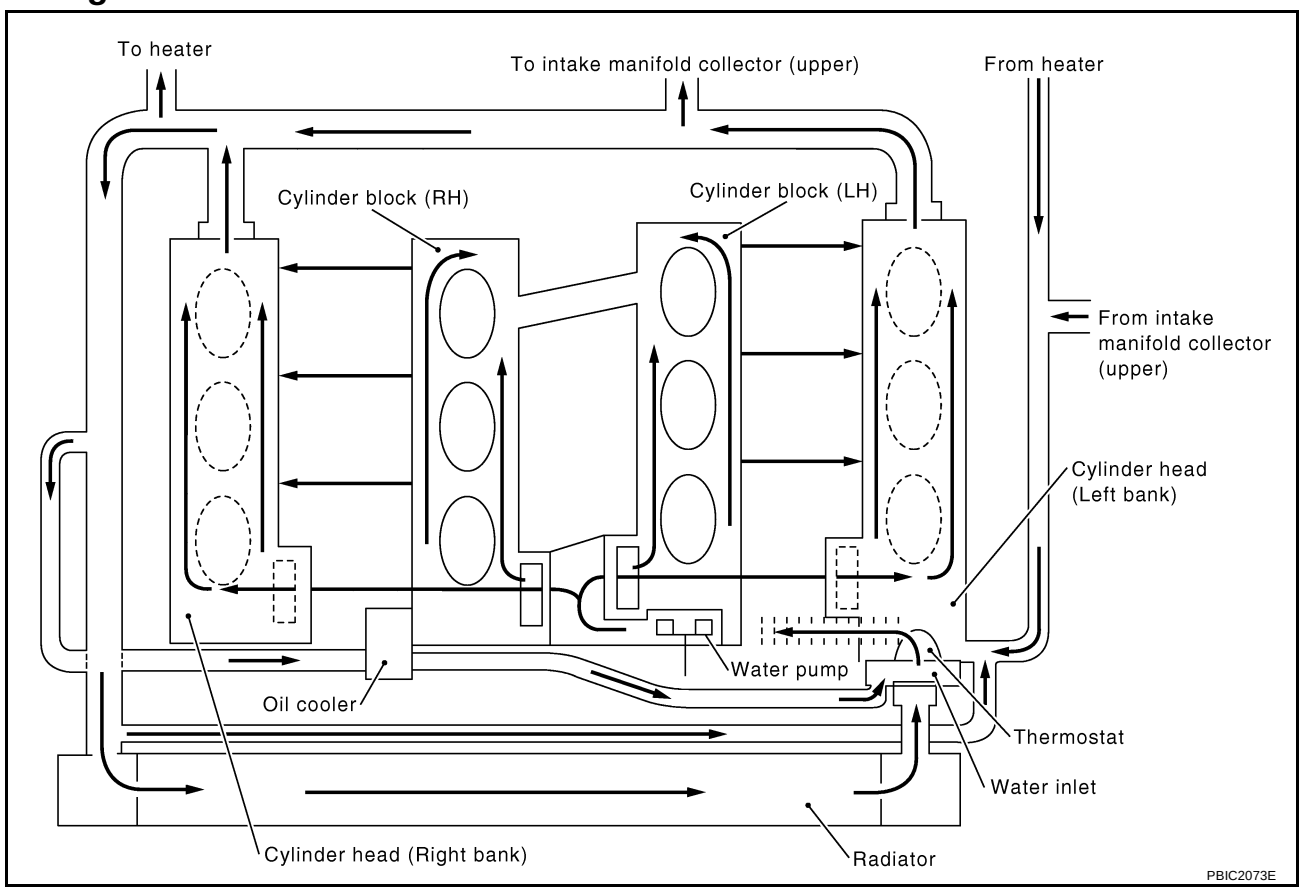
	Symptom		Check items	
Except cooling system parts malfunction	—	Overload on engine	Abusive driving	High engine rpm under no load
				Driving in low gear for extended time
				Driving at extremely high speed
			Powertrain system malfunction	—
			Installed improper size wheels and tires	
			Dragging brakes	
			Improper ignition timing	
	Blocked or restricted air flow	Blocked bumper	—	—
		Blocked radiator grille	Installed car brassiere	
			Mud contamination or paper clogging	
		Blocked radiator	—	
		Blocked condenser	Blocked air flow	
		Installed large fog lamp		

COOLING SYSTEM

PFP:21020

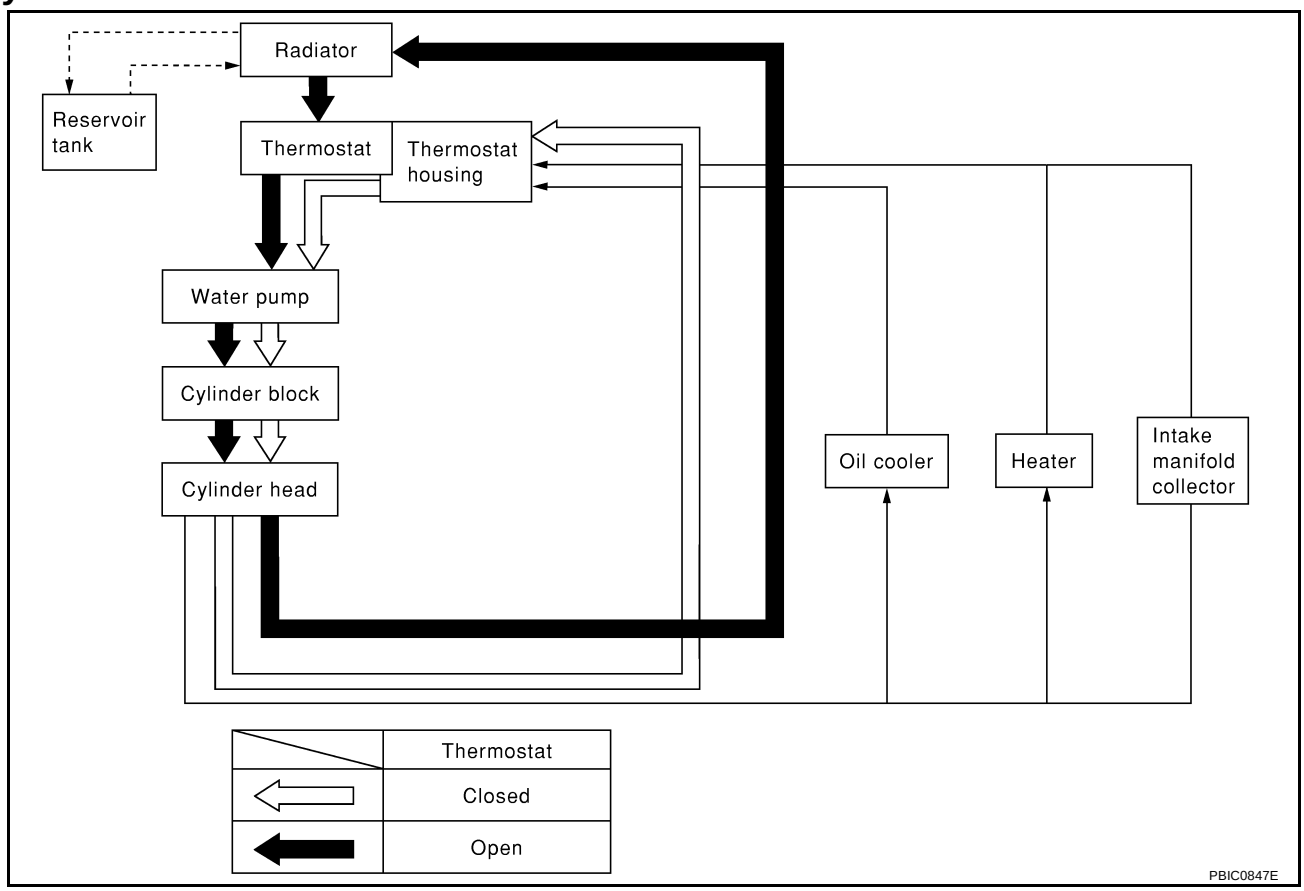
Cooling Circuit

ABS009ZQ



System Chart

ABS009ZR



ENGINE COOLANT

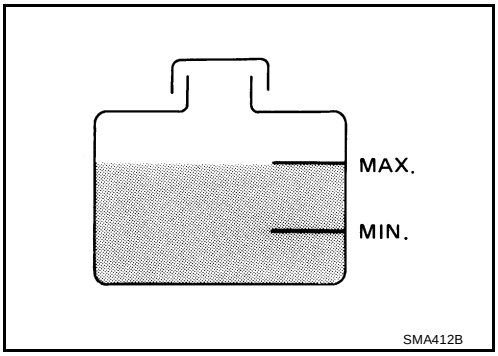
PFP:KQ100

Inspection

ABS009ZS

LEVEL CHECK

- Check if the reservoir tank engine coolant level is within the “MIN” to “MAX” range when engine is cool.
- Adjust the engine coolant level as necessary.



LEAK CHECK

- To check for leaks, apply pressure to the cooling system with radiator cap tester (commercial service tool) and radiator cap tester adapter [SST].

  Testing pressure

  : 157 kPa (1.6 kg/cm^2 , 23 psi)

  WARNING:

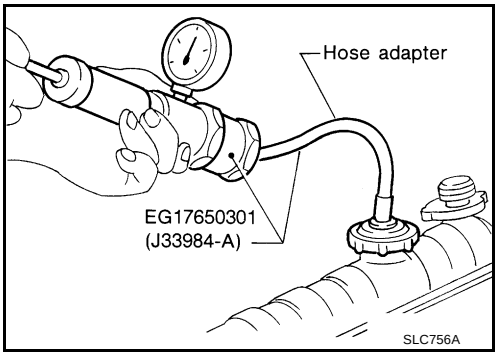
  Do not remove radiator cap when engine is hot. Serious burns could occur from high-pressure engine coolant escaping from radiator.

  CAUTION:

  Higher test pressure than specified may cause radiator damage.

  NOTE:

  In a case engine coolant decreases, replenish radiator with engine coolant.



- If anything is found, repair or replace damaged parts.

Changing Engine Coolant

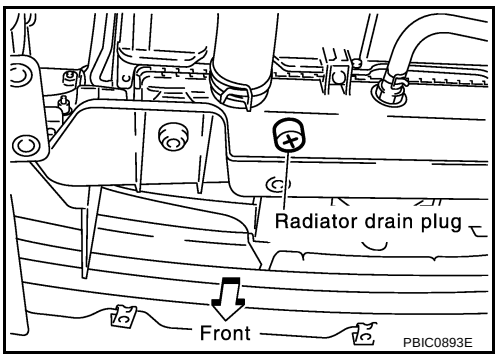
ABS009ZT

WARNING:

- **To avoid being scalded, do not change engine coolant when engine is hot.**
- **Wrap a thick cloth around cap and carefully remove cap. First, turn cap a quarter of a turn to release built-up pressure. Then turn cap all the way.**
- **Be careful not to allow engine coolant to contact drive belts.**

DRAINING ENGINE COOLANT

1. Remove undercover with power tool.
2. Open radiator drain plug at the bottom of radiator, and then remove radiator cap.



When drain all of engine coolant in the system, open water drain plugs on engine cylinder block. Refer to EM-112, "DISASSEMBLY" .

3. Remove reservoir tank as necessary, and drain engine coolant and clean reservoir tank before installing.

4. Check drained engine coolant for contaminants such as rust, corrosion or discoloration.
   If contaminated, flush the engine cooling system. Refer to CO-11, "FLUSHING COOLING SYSTEM" .

REFILLING ENGINE COOLANT

1. Install reservoir tank, and radiator drain plug.

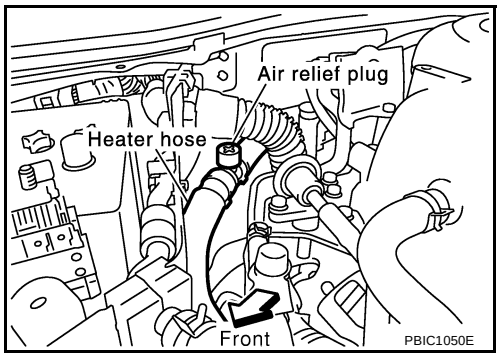
   CAUTION:
   Be sure to clean drain plug and install with new O-ring.

   Radiator drain plug:

   : 0.78 - 1.6 N·m (0.08 - 0.16 kg-m, 7 - 14 in-lb)

   If water drain plugs on cylinder block are removed, close and tighten them. Refer to EM-117, "ASSEMBLY" .

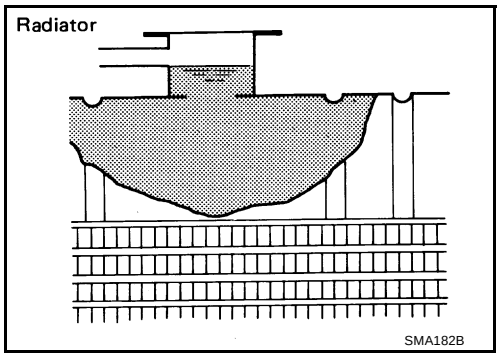
2. Make sure that each hose clamp has been firmly tightened.
3. Remove air relief plug on heater hose.



4. Fill radiator and reservoir tank to specified level.
   - **Pour engine coolant through engine coolant filler neck slowly of less than 2 ℓ (2-1/8 US qt, 1-3/4 Imp qt) a minute to allow air in system to escape.**
   - **Use Genuine Nissan Long Life Antifreeze/Coolant or equivalent mixed with water (distilled or demineralized). Refer to MA-12, "RECOMMENDED FLUIDS AND LUBRICANTS".**

   Engine coolant capacity
   (with reservoir tank at "MAX" level)

   : Approx. 8.7 ℓ (9-1/4 US qt, 7-5/8 Imp qt)



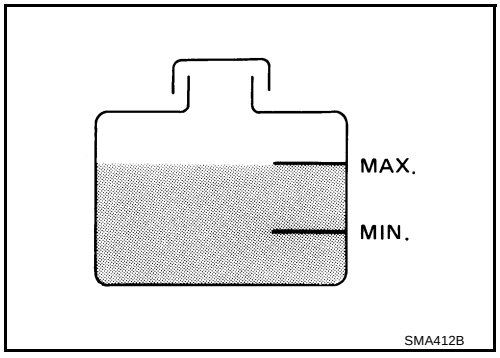
   Reservoir tank capacity (at "MAX" level)

   : 0.8 ℓ (7/8 US qt, 3/4 Imp qt)

   - When engine coolant overflows air relief hole on heater hose, install air relief plug with new O-ring.

   Air relief plug:

   : 0.78 - 1.6 N·m (0.08 - 0.16 kg-m, 7 - 14 in-lb)



5. Install radiator cap.
6. Warm up until opening thermostat. Standard for warming-up time is approximately 10 minutes at 3,000 rpm.
   - Make sure thermostat opening condition by touching radiator hose (lower) to see a flow of warm water.

   CAUTION:
   Watch water temperature gauge so as not to overheat engine.
7. Stop engine and cool down to less than approximately 50°C (122°F).
   - Cool down using fan to reduce the time.

- If necessary, refill radiator up to filler neck with engine coolant.

8. Refill reservoir tank to “MAX” level line with engine coolant.
9. Repeat steps 4 through 7 two or more times with radiator cap installed until engine coolant level no longer drops.
10. Check cooling system for leaks with engine running.
11. Warm up engine, and check for sound of engine coolant flow while running engine from idle up to 3,000 rpm with heater temperature controller set at several position between “COOL” and “WARM”.
    - Sound may be noticeable at heater unit.
12. Repeat step 11 three times.
13. If sound is heard, bleed air from cooling system by repeating step 4 through 7 until engine coolant level no longer drops.
    - **Clean excess engine coolant from engine.**

FLUSHING COOLING SYSTEM

1. Install reservoir tank, and radiator drain plug.

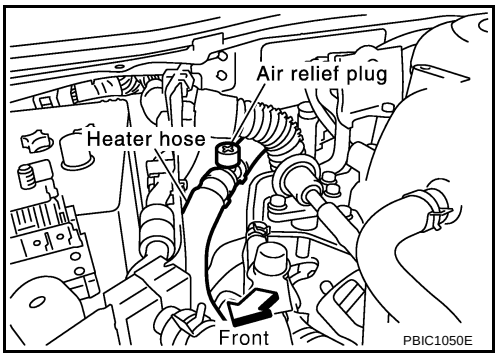
   CAUTION:
   Be sure to clean drain plug and install with new O-ring.

   Radiator drain plug:

   : 0.78 - 1.6 N·m (0.08 - 0.16 kg-m, 7 - 14 in-lb)

   If water drain plugs on cylinder block are removed, close and tighten them. Refer to EM-117, "ASSEMBLY" .

2. Remove air relief plug on heater hose.



3. Fill radiator with water until water spills from the air relief hole, then close air relief plug. Fill radiator and reservoir tank with water and reinstall radiator cap.

   Air relief plug:

   : 0.78 - 1.6 N·m (0.08 - 0.16 kg-m, 7 - 14 in-lb)

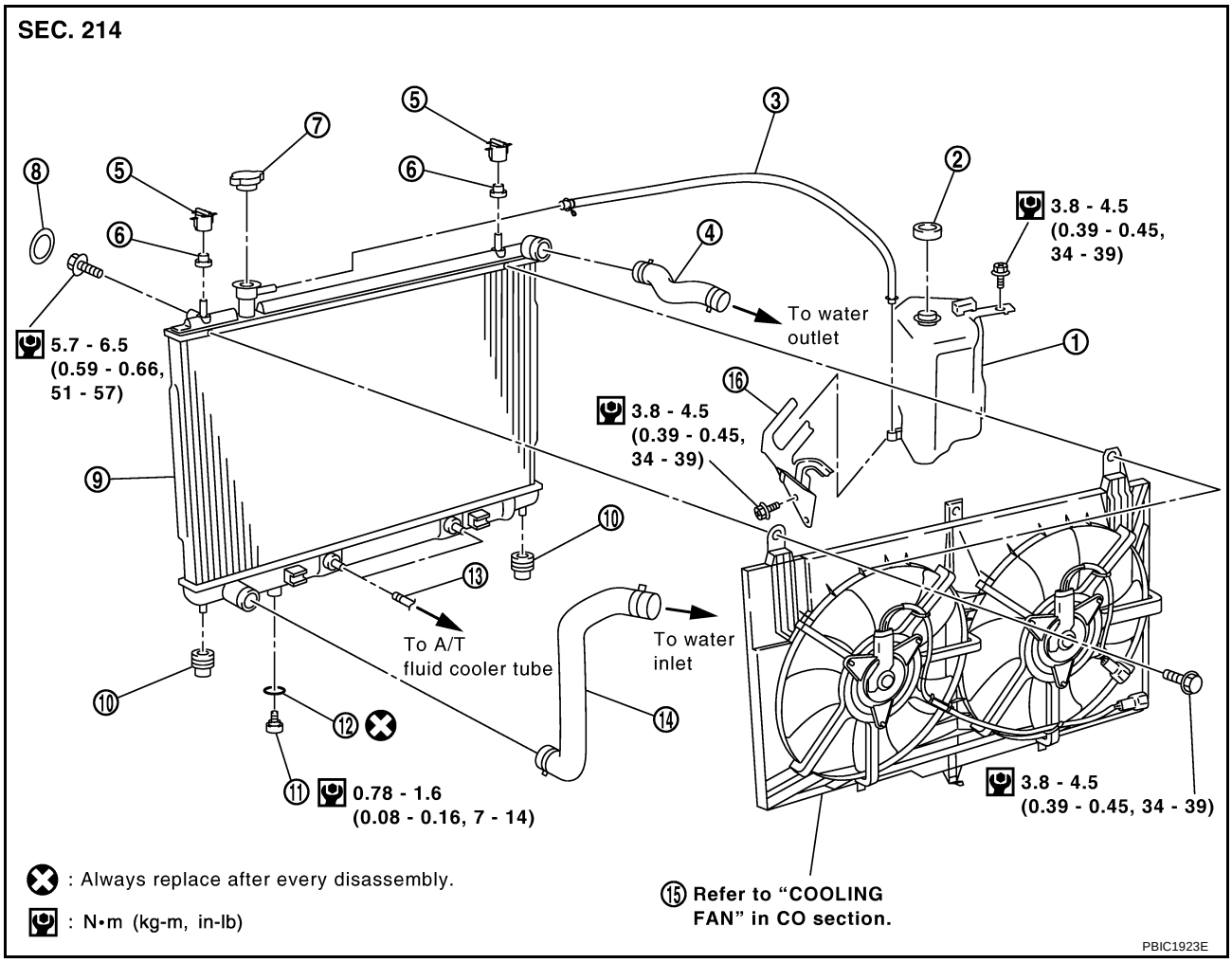
4. Run engine and warm it up to normal operating temperature.
5. Rev engine two or three times under no-load.
6. Stop engine and wait until it cools down.
7. Drain water from the system. Refer to CO-9, "DRAINING ENGINE COOLANT" .
8. Repeat steps 1 through 7 until clear water begins to drain from radiator.

RADIATOR

PFP:21400

Removal and Installation

ABS009ZU



1. Reservoir tank
2. Reservoir tank cap
3. Reservoir tank hose
4. Radiator hose (upper)
5. Upper mount bracket
6. Mounting rubber (upper)
7. Radiator cap
8. Cover
9. Radiator
10. Mounting rubber (lower)
11. Radiator drain plug
12. O-ring
13. A/T fluid cooler hose
14. Radiator hose (lower)
15. Radiator cooling fan assembly
16. Bracket

WARNING:

Do not remove radiator cap when engine is hot. Serious burns could occur from high-pressure engine coolant escaping from radiator. Wrap a thick cloth around the cap. Slowly turn it a quarter of a turn to release built-up pressure. Carefully remove radiator cap by turning it all the way.

REMOVAL

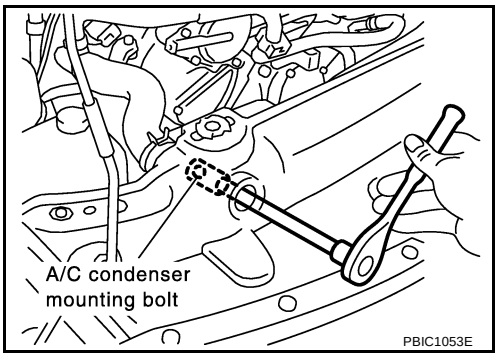
1. Remove engine cover with power tool. Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .
2. Remove undercover with power tool.
3. Drain engine coolant from radiator. Refer to CO-9, "Changing Engine Coolant" .

   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine coolant on drive belts.**
4. Remove air duct and air cleaner case assembly. Refer toEM-14, "AIR CLEANER AND AIR DUCT" .
5. Remove bracket mounting bolt for anchoring A/C piping from vehicle left side, so that A/C piping can be moved.
6. Remove reservoir tank and bracket.

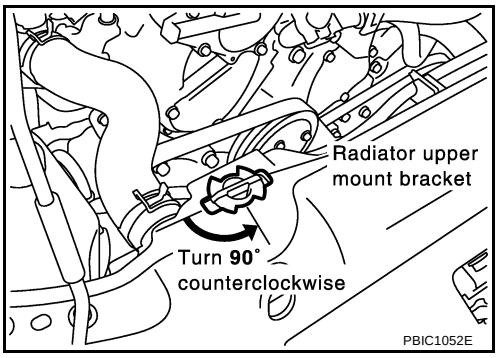
7. Removal radiator hoses (upper and lower) and reservoir tank hose.

CAUTION:
Be careful not to allow engine coolant to contact drive belts.

8. Remove radiator cooling fan assembly. Refer to CO-19, "COOLING FAN" .
9. Disconnect A/T fluid cooler hoses. (A/T models)
   - Install blind plug to avoid leakage of A/T fluid.
10. Remove cover, and then two A/C condenser mounting bolts located in upper part of radiator.



11. Rotate two radiator upper mount brackets 90 degrees in the direction as shown in the figure, and remove them.

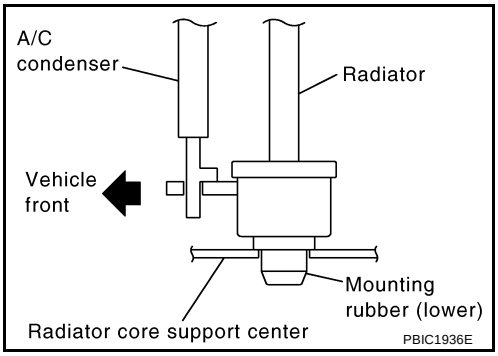


12. Remove radiator as follows:

CAUTION:
Do not damage or scratch A/C condenser and radiator core when removing.

a. With lifting and pulling radiator in a rear direction, disassemble lower mount from radiator core support center.

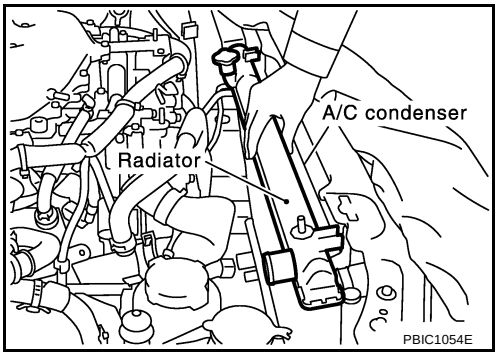
CAUTION:
Because A/C condenser is onto the front-lower portion of radiator, moving to rear direction should be at minimum.



b. Lift A/C condenser up and remove radiator after disengaging the fitting as front-bottom surface.

CAUTION:
Lifting A/C condenser should be minimum to prevent a load to A/C piping.

c. After removing radiator, put A/C condenser on radiator core support center to prevent a load to A/C piping, and temporarily fix it with rope or similar means.



INSTALLATION

Install in the reverse order of removal.

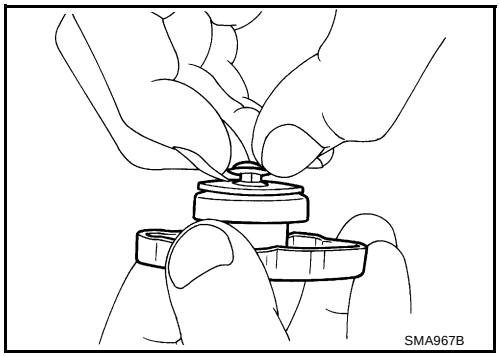
INSPECTION AFTER INSTALLATION

- Check for leaks of engine coolant using radiator cap tester adapter [SST: EG17650301 (J33984-A)] and radiator cap tester (commercial service tool). Refer to CO-9, "LEAK CHECK" .
- Start and warm up engine. Visually make sure that there is no leaks of engine coolant and A/T fluid.

Checking Radiator Cap

ABS009ZV

1. Pull negative-pressure valve to open it and make sure that it closes completely when released.
   - Make sure that there is no dirt or damage on the valve seat of radiator cap negative-pressure valve.
   - Make sure that there are no unusualness in the opening and closing conditions of negative-pressure valve.



2. Check radiator cap relief pressure.

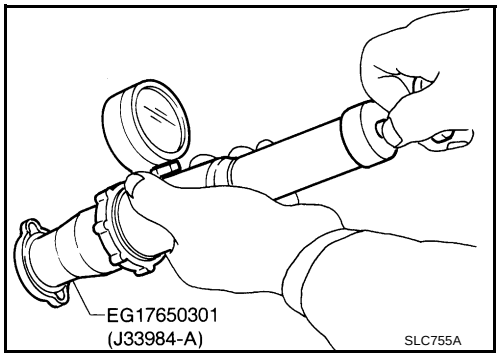
   Standard:

   78 - 98 kPa (0.8 - 1.0 kg/cm^2 , 11 - 14 psi)

   Limit:

   59 kPa (0.6 kg/cm^2 , 9 psi)

   - When connecting radiator cap to radiator cap tester (commercial service tool) and radiator cap tester adapter [SST], apply engine coolant to the cap seal surface.
   - Replace radiator cap if there is an unusualness in negative-pressure valve, or if the relief pressure falls below the limit.



Checking Radiator

ABS009ZW

Check radiator for mud or clogging. If necessary, clean radiator as follows.

- Be careful not to bend or damage the radiator fins.
- When radiator is cleaned without removal, remove all surrounding parts such as cooling fan, radiator shroud and horns. Then tape harness and electrical connectors to prevent water from entering.

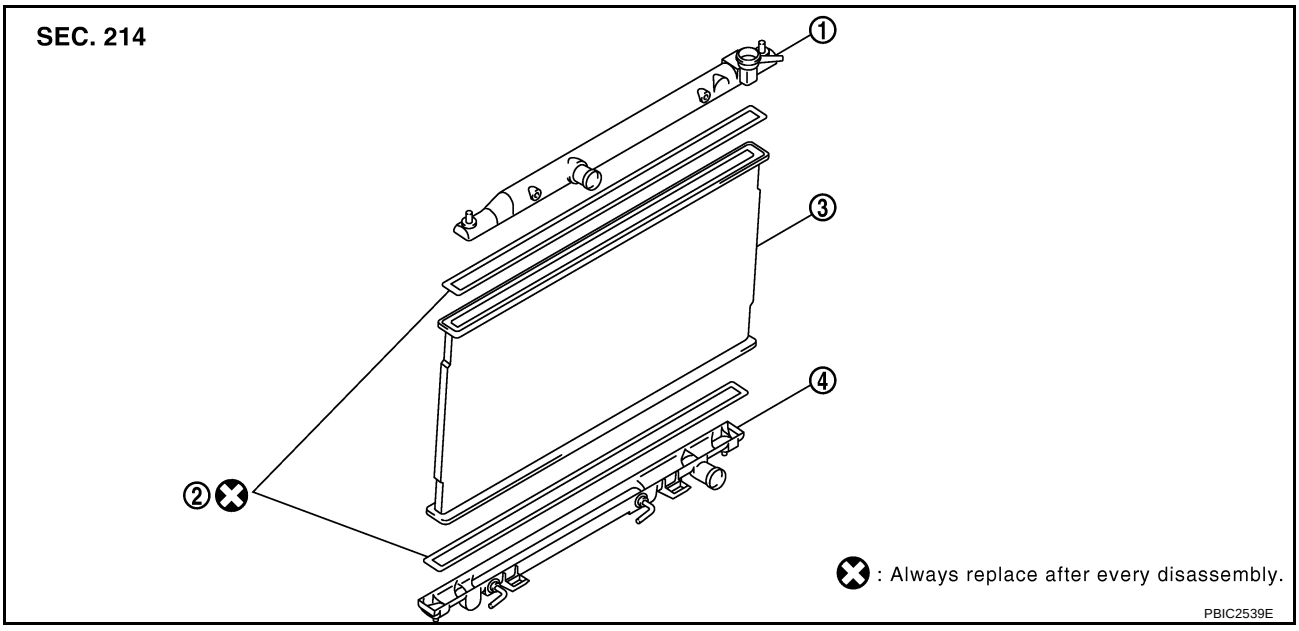
1. Apply water by hose to the back side of radiator core vertically downward.
2. Apply water again to all radiator core surface once per minute.
3. Stop washing if any stains no longer flow out from radiator.
4. Blow air into the back side of radiator core vertically downward.
   - Use compressed air lower than 490 kPa (5 kg/cm^2 , 71 psi) and keep distance more than 30 cm (11.8 in).
5. Blow air again into all the radiator core surfaces once per minute until no water sprays out.

RADIATOR (ALUMINUM TYPE)

PFP:21460

Disassembly and Assembly

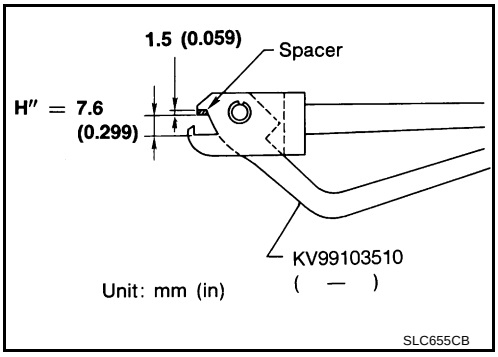
ABS009ZX



1. Upper tank
2. Sealing rubber
3. Core
4. Lower tank (with A/T fluid cooler)

PREPARATION

1. Attach spacer to tip of radiator plate pliers A [SST].
   Spacer specification: 18 mm (0.71 in) wide × 8.5 mm (0.335 in) long × 1.5 mm (0.059 in) thick.



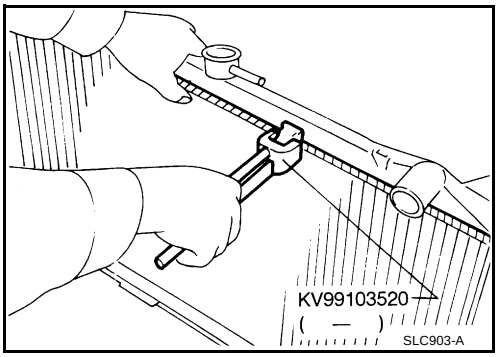
2. Make sure that when radiator plate pliers A [SST: KV99103510 (—)] are closed dimension H″ is approx. 7.6 mm (0.299 in).
3. Adjust dimension H″ with spacer, if necessary.

DISASSEMBLY

1. Remove upper and lower tanks with radiator plate pliers B [SST].

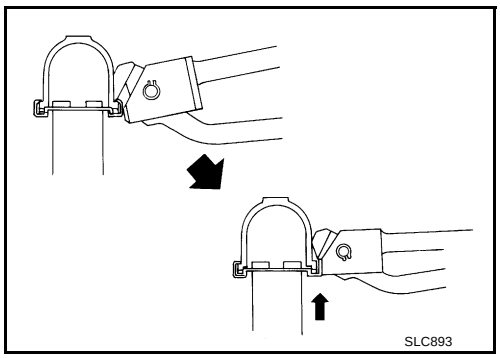
   CAUTION:
   Do not disassemble lower tank and A/T fluid cooler.

   NOTE:
   Regard lower tank and A/T fluid cooler as an assembly.



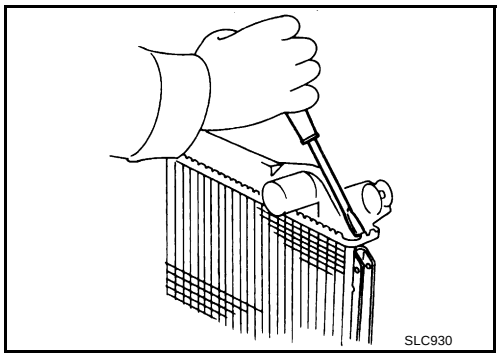
- Grip the crimped edge and bend it upwards so that radiator plate pliers B slips off.

  CAUTION:
  Do not bend excessively.

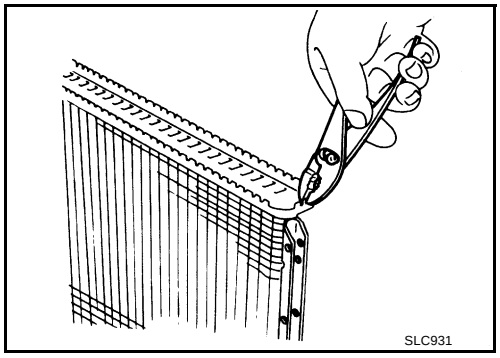


- In areas where radiator plate pliers B cannot be used, use flat-blade screwdriver to bend the edge up.

  CAUTION:
  Be careful not to damage tank.

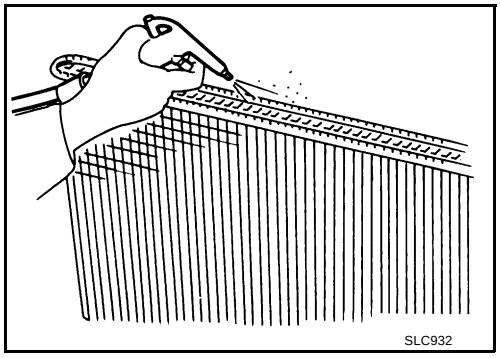


2. Remove sealing rubber.
3. Make sure the edge stands straight up.



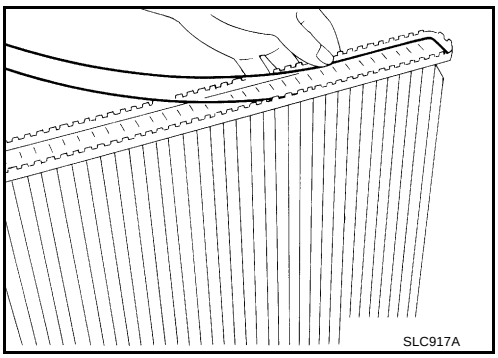
ASSEMBLY

1. Clean contact portion of tank.

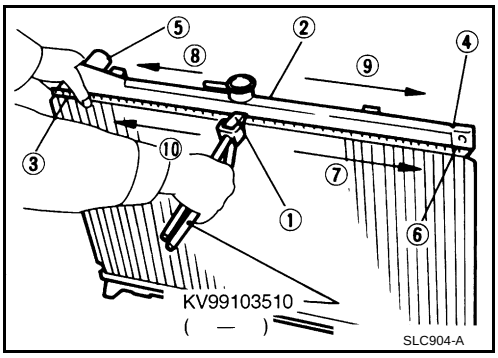


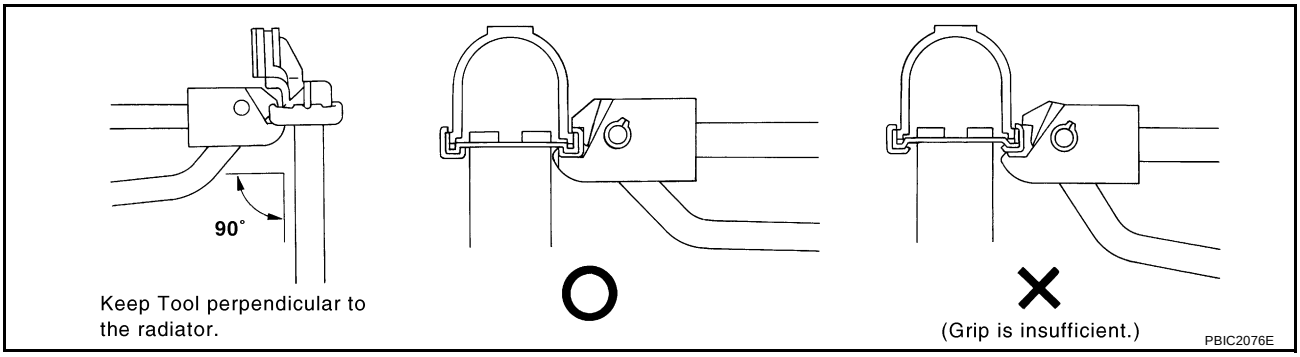
2. Install sealing rubber while pushing it with fingers.

CAUTION:
Be careful not to twist sealing rubber.

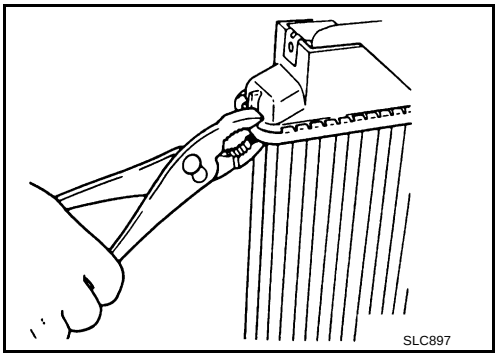


3. Caulk tank in numerical order as shown in the figure with radiator plate pliers A [SST].



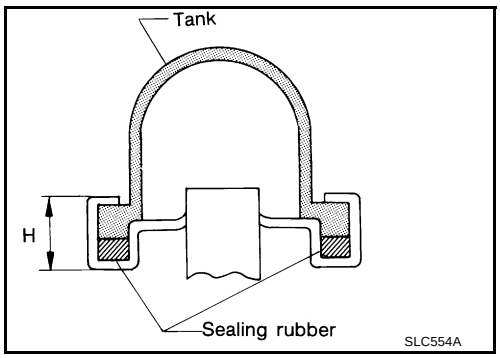


- Use pliers in the locations where radiator plate pliers A cannot be used.



4. Make sure that the rim is completely crimped down.

Standard height "H" : 8.0 - 8.4 mm (0.315 - 0.331 in)



5. Make sure that there is no leakage.
Refer to CO-18, "INSPECTION" .

INSPECTION

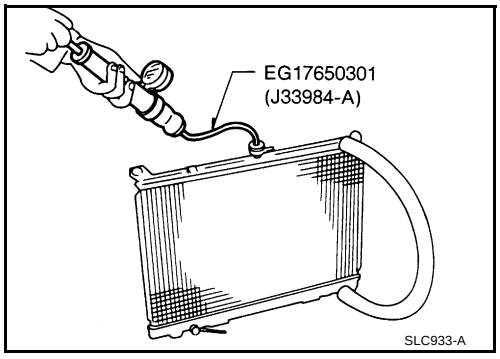
1. Apply pressure with radiator cap tester adapter [SST] and radiator cap tester (commercial service tool).

Testing pressure

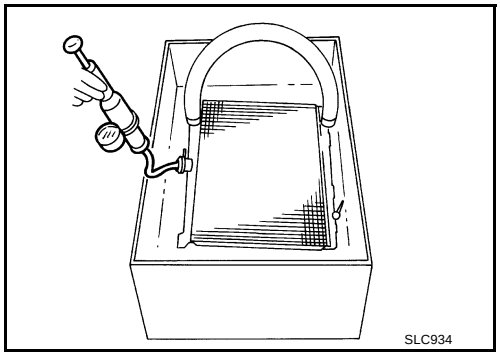
: 157 kPa (1.6 kg/cm^2 , 23 psi)

WARNING:
To prevent the risk of hose coming undone while under pressure, securely fasten it down with hose clamp.

CAUTION:
Attach hose to A/T fluid cooler to seal its inlet and outlet. (A/T models)



2. Check for leakage by soaking radiator in water container with the testing pressure applied.

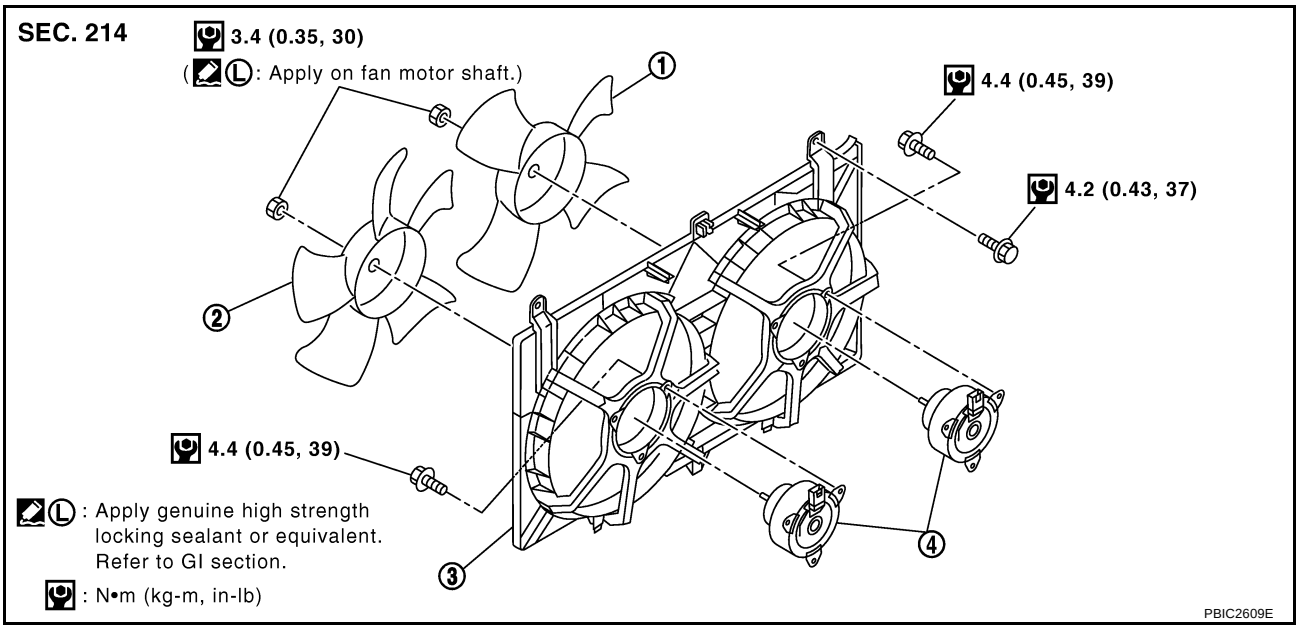


COOLING FAN

PFP:21140

Removal and Installation

ABS009ZY

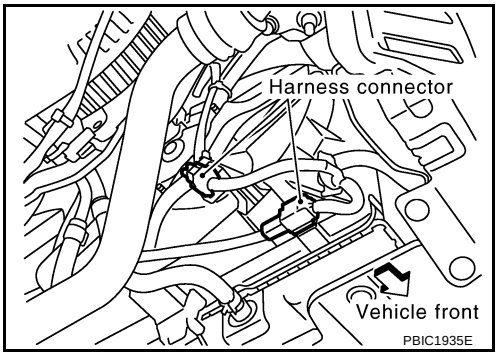


1. Cooling fan (RH)
2. Cooling fan (LH)
3. Fan shroud
4. Fan motor

REMOVAL

1. Remove engine cover with power tool. Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .
2. Drain engine coolant from radiator. Refer to CO-9, "Changing Engine Coolant" .

   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine coolant on drive belts.**
3. Remove air cleaner case assembly. Refer to EM-14, "AIR CLEANER AND AIR DUCT" .
4. Disconnect radiator hose (upper) at radiator side. Refer to CO-12, "RADIATOR" .
5. Disconnect fan motor harness connectors at the right-lower portion of fan shroud.



6. Remove mounting bolts to lift up and radiator cooling fan assembly.

   CAUTION:
   Be careful not to damage or scratch on radiator core.

INSTALLATION

Install in the reverse order of removal.

- Cooling fans are controlled by ECM. For details, refer to EC-440, "DTC P1217 ENGINE OVER TEMPERATURE" .

Disassembly and Assembly

ABS009ZZ

DISASSEMBLY

1. Remove cooling fans (RH and LH) from fan motors.
2. Remove fan motors from fan shroud.

INSPECTION AFTER DISASSEMBLY

Cooling Fan

Inspect cooling fan for crack or unusual bend.

- If anything is found, replace cooling fan.

ASSEMBLY

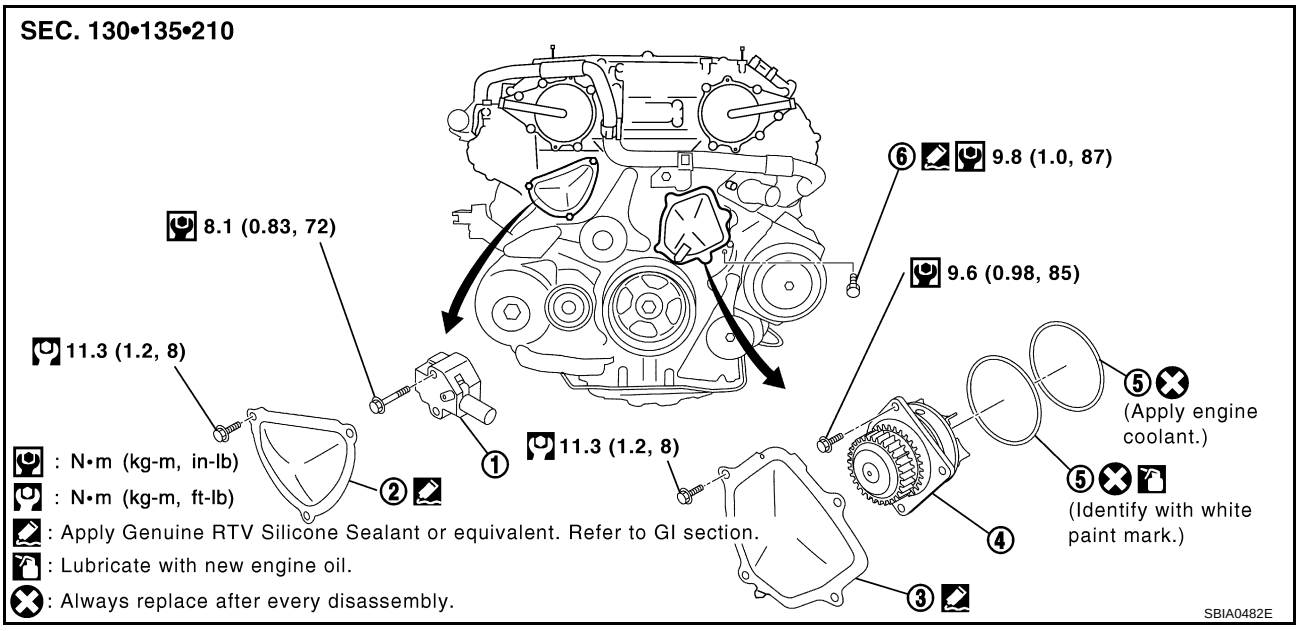
Assemble in the reverse order of disassembly.

WATER PUMP

PFP:21020

Removal and Installation

ABS00A00



1. Timing chain tensioner (primary)
2. Chain tensioner cover
3. Water pump cover
4. Water pump
5. O- ring
6. Water drain plug (front)

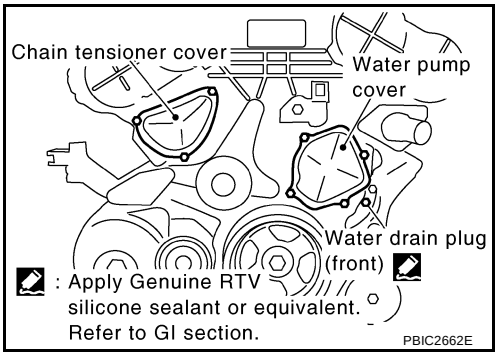
CAUTION:

- **When removing water pump assembly, be careful not to get engine coolant on drive belt.**
- **Water pump cannot be disassembled and should be replaced as a unit.**
- **After installing water pump, connect hose and clamp securely, then check for leaks using radiator cap tester (commercial service tool) and radiator cap tester adapter [SST: EG17650301 (J33984-A)].**

REMOVAL

1. Remove undercover with power tool.
2. Remove drive belts. Refer to EM-12, "DRIVE BELTS" .
3. Drain engine coolant from radiator. Refer to CO-9, "Changing Engine Coolant" .

   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine coolant on drive belts.**
4. Remove radiator hoses (upper and lower) and cooling fan assembly. Refer to CO-19, "COOLING FAN" .
5. Remove water drain plug (front) on water pump side of cylinder block to drain engine coolant from engine inside.



6. Remove chain tensioner cover and water pump cover from front timing chain case.
   - Use seal cutter [SST: KV10111100 (J37228)] to cut liquid gasket for removal.
7. Remove timing chain tensioner (primary) as follows:

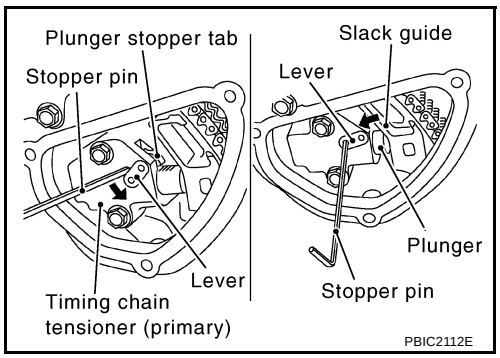
a. Pull lever down and release plunger stopper tab.
   - Plunger stopper tab can be pushed up to release (coaxial structure with lever).

b. Insert stopper pin into tensioner body hole to hold lever, and keep tab released.

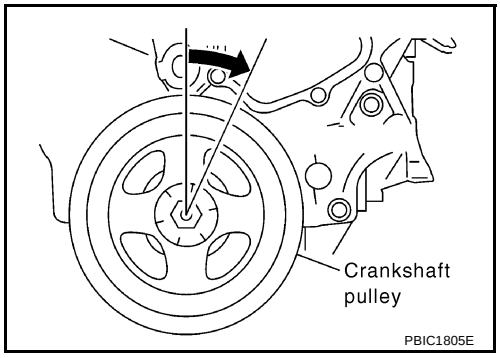
   NOTE:
   Allen wrench [2.5 mm (0.098 in)] is used for stopper pin as an example.

c. Insert plunger into tensioner body by pressing slack guide.

d. Keep slack guide pressed and hold plunger in by pushing stopper pin through the lever hole and tensioner body hole.

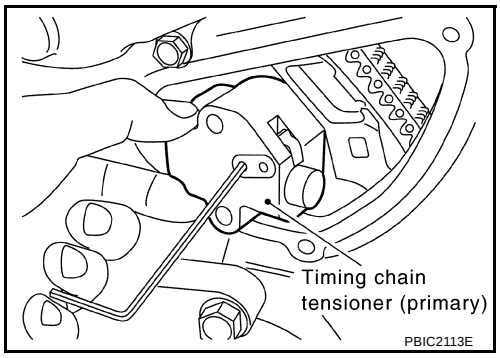


e. Turn crankshaft pulley clockwise so that timing chain on the timing chain tensioner (primary) side is loose.



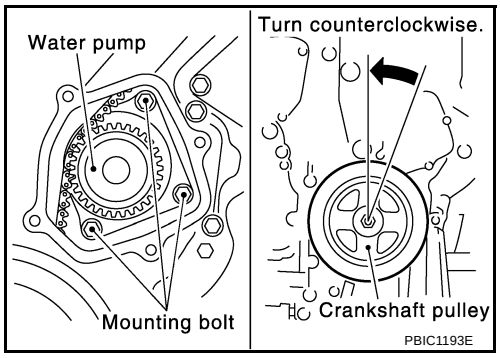
f. Remove mounting bolts and remove timing chain tensioner (primary).

   CAUTION:
   Be careful not to drop mounting bolts inside timing chain case.



8. Remove water pump as follows:

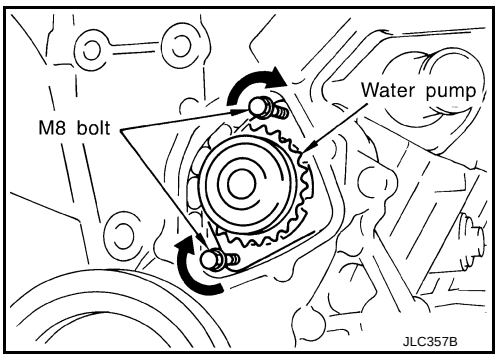
a. Remove three water pump mounting bolts. Secure a gap between water pump gear and timing chain, by turning crankshaft pulley counterclockwise until timing chain looseness on water pump sprocket becomes maximum.



b. Screw M8 bolts [pitch: 1.25 mm (0.049 in) length: approx. 50 mm (1.97 in)] into water pumps upper and lower mounting bolt holes until they reach timing chain case. Then, alternately tighten each bolt for a half turn, and pull out water pump.

CAUTION:

- **Pull straight out while preventing vane from contacting socket in installation area.**
- **Remove water pump without causing sprocket to contact timing chain.**



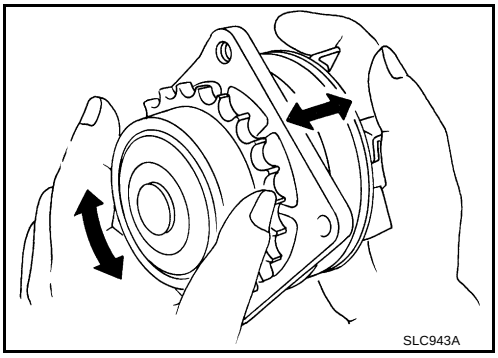
c. Remove M8 bolts and O-rings from water pump.

CAUTION:

Do not disassemble water pump.

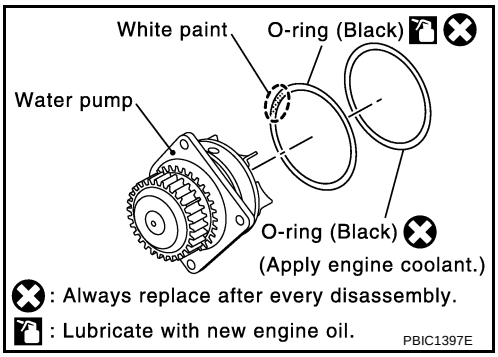
INSPECTION AFTER REMOVAL

- Check for badly rusted or corroded water pump body assembly.
- Check for rough operation due to excessive end play.
- Replace water pump, if necessary.



INSTALLATION

1. Install new O-rings to water pump.
   - Apply engine oil and engine coolant to O-rings as shown in the figure.
   - Locate O-ring with white paint mark to engine front side.

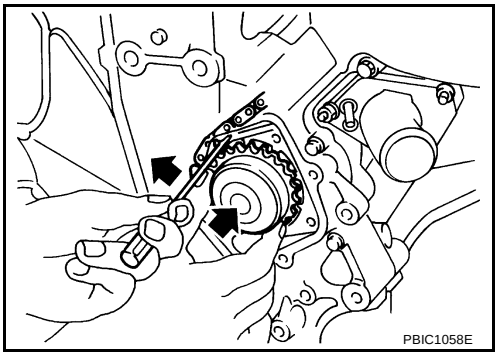


2. Install water pump.

CAUTION:

Do not allow cylinder block to nip O-rings when install water pump.

- Make sure that timing chain and water pump sprocket are engaged.
- Insert water pump by tightening mounting bolts alternately and evenly.



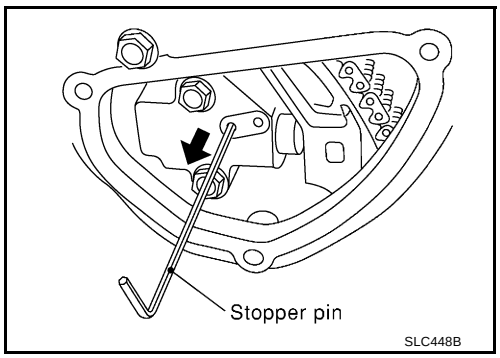
3. Install timing chain tensioner (primary) as follows:

a. Remove dust and foreign material completely from backside of timing chain tensioner (primary) and from installation area of rear timing chain case.

b. Turn crankshaft pulley clockwise so that timing chain on the timing chain tensioner (primary) side is loose.

c. Install timing chain tensioner (primary).

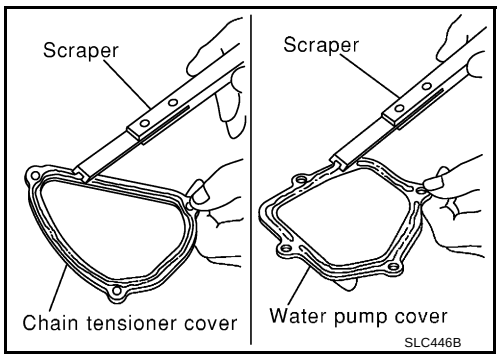
d. Remove stopper pin.



e. Make sure again that timing chain and water pump sprocket are engaged.

4. Install chain tensioner cover and water pump cover as follows:

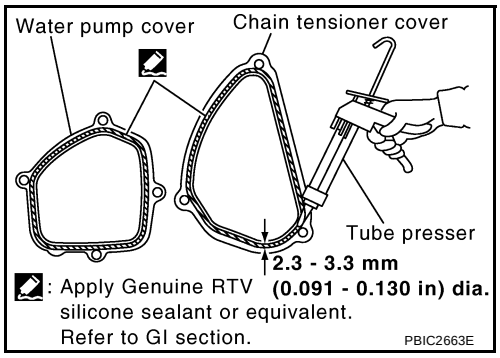
a. Before installing, remove all traces of old liquid gasket from mating surface of water pump cover and chain tensioner cover using scraper. Also remove traces of old liquid gasket from the mating surface of front timing chain case.



b. Apply a continuous bead of liquid gasket with tube presser [SST: WS39930000 (—)] to mating surface of chain tensioner cover and water pump cover.
Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

CAUTION:
Attaching should be done within 5 minutes after coating.

c. Tighten mounting bolts.



5. Install water drain plug (front) on water pump side of cylinder block.

6. Install in the reverse order of removal after this step.

- **After starting engine, let idle for three minutes, then rev engine up to 3,000 rpm under no load to purge air from the high-pressure chamber of chain tensioner. Engine may produce a rattling noise. This indicates that air still remains in the chamber and is not a matter of concern.**

INSPECTION AFTER INSTALLATION

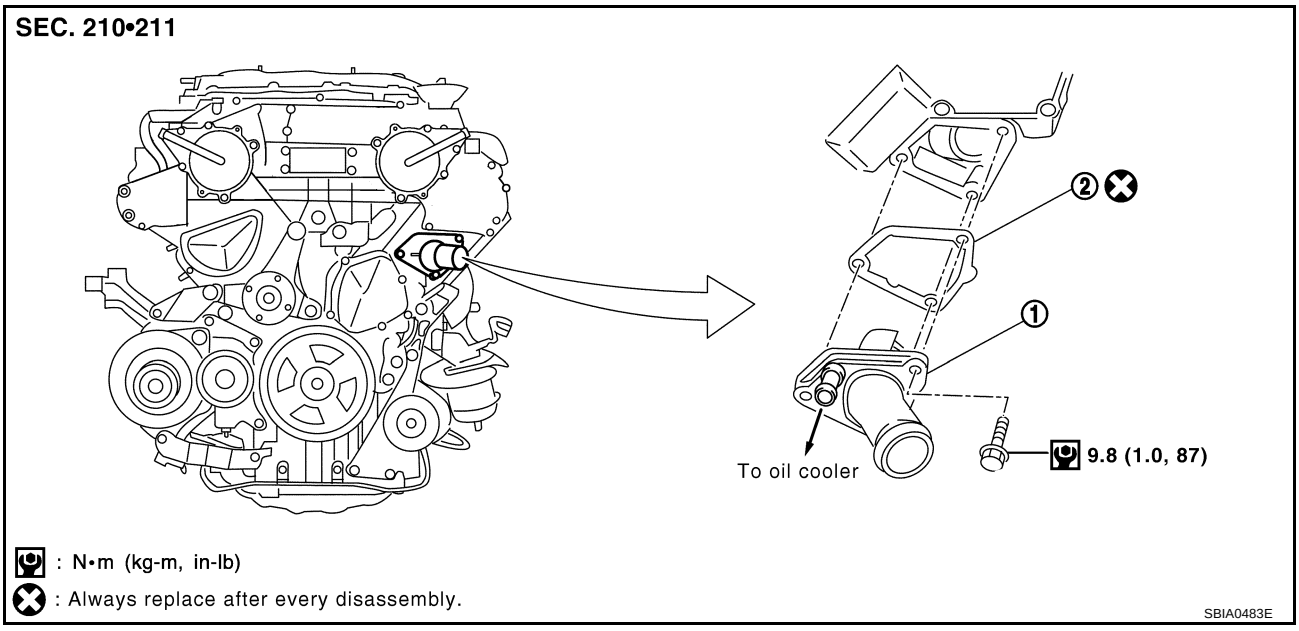
- Check for leaks of engine coolant using radiator cap tester adapter [SST: EG17650301 (J33984-A)] and radiator cap tester (commercial service tool). Refer to CO-9, "LEAK CHECK" .
- Start and warm up engine. Visually make sure that there is no leaks of engine coolant.

WATER INLET AND THERMOSTAT ASSEMBLY

PFP:21200

Removal and Installation

ABS00A01



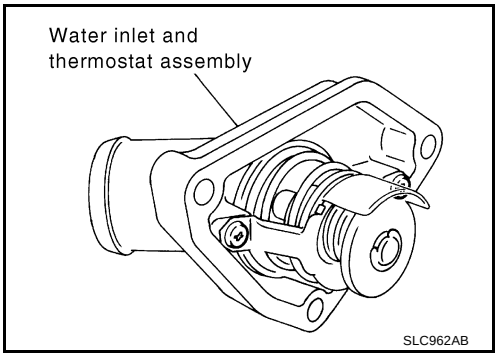
1. Water inlet and thermostat assembly 2. Gasket

REMOVAL

1. Remove undercover with power tool.
2. Drain engine coolant from radiator drain plug at the bottom of radiator, and from water drain plug at the front of cylinder block. Refer to CO-9, "Changing Engine Coolant" and CO-21, "WATER PUMP" .

   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine coolant on drive belts.**
3. Remove air duct and air cleaner case. Refer to EM-14, "AIR CLEANER AND AIR DUCT" .
4. Remove water drain plug on water pump side of cylinder block.
5. Disconnect radiator hose (lower) and oil cooler hose from water inlet and thermostat assembly.
6. Remove water inlet and thermostat assembly.

   CAUTION:
   Do not disassemble water inlet and thermostat assembly. Replace them as a unit, if necessary.



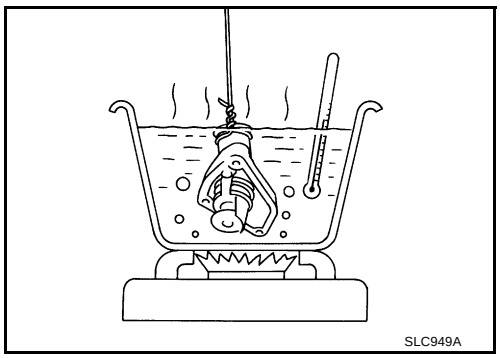
INSPECTION AFTER REMOVAL

1. Check valve seating condition at ordinary room temperatures. It should seat tightly.

2. Check valve operation.

Thermostat	Standard
Valve opening temperature	76 - 79°C (169 - 174°F)
Maximum valve lift	8.6 mm / 90°C (0.339 in / 194°F)
Valve closing temperature	71°C (160°F)

- If the malfunctioning condition, when valve seating at ordinary room temperature, or measured values are out of the standard, replace water inlet and thermostat assembly.



INSTALLATION

Note the following, and install in the reverse order of removal.

- **Be careful not to spill engine coolant over engine room. Use rag to absorb engine coolant.**

INSPECTION AFTER INSTALLATION

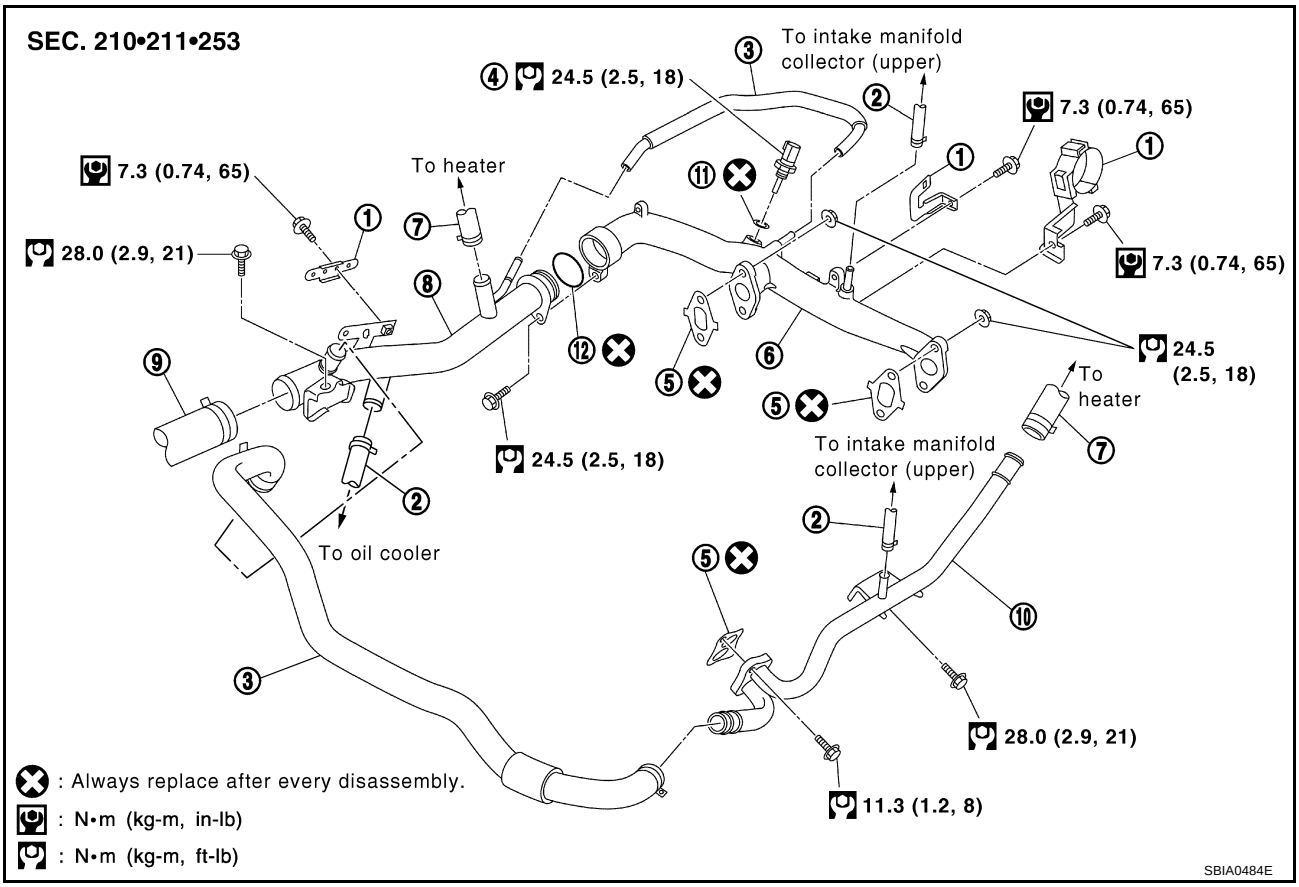
- Check for leaks of engine coolant using radiator cap tester adapter [SST: EG17650301 (J33984-A)] and radiator cap tester (commercial service tool). Refer to CO-9, "LEAK CHECK" .
- Start and warm up engine. Visually make sure that there is no leaks of engine coolant.

WATER OUTLET AND WATER PIPING

PFP:11060

Removal and Installation

ABS00A02



1.	Harness bracket	2.	Water hose	3.	Water bypass hose
4.	Engine coolant temperature sensor	5.	Gasket	6.	Water outlet
7.	Heater hose	8.	Water pipe	9.	Radiator hose (upper)
10.	Heater pipe	11.	Washer	12.	O-ring

REMOVAL

1. Remove undercover with power tool.
2. Drain engine coolant from radiator drain plug at the bottom of radiator, and from water drain plug at the front of cylinder block. Refer to CO-9, "Changing Engine Coolant" and CO-21, "WATER PUMP" .

   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine coolant on drive belts.**
3. Remove engine cover with power tool Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .
4. Remove air duct and air cleaner case. Refer to EM-14, "AIR CLEANER AND AIR DUCT" .
5. Remove radiator hose (upper), heater hoses and water hoses.
6. Remove the following parts, when remove water outlet.
   - A/T fluid charging pipe (A/T models); Refer to AT-263, "TRANSMISSION ASSEMBLY" .
   - Intake manifold collectors (upper and lower). Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .
   - Rocker cover (right bank). Refer to EM-42, "ROCKER COVER" .
7. Remove engine coolant temperature sensor as necessary.

   CAUTION:
   Be careful not to damage engine coolant temperature sensor.
8. Remove water outlet, heater pipe, water bypass hoses and water pipe.

INSTALLATION

Note the following, and install in the reverse order of removal.

- Securely insert each hose, and install clamp at a position where it does not interfere with the pipe bulge.
- When inserting water pipe into water outlet, apply neutral detergent to O-ring.

INSPECTION AFTER INSTALLATION

- Check for leaks of engine coolant using radiator cap tester adapter [SST: EG17650301 (J33984-A)] and radiator cap tester (commercial service tool). Refer to CO-9, "LEAK CHECK" .
- Start and warm up engine. Visually make sure that there is no leaks of engine coolant.

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00100

Standard and Limit

ABS00A03

ENGINE COOLANT CAPACITY (APPROXIMATE)

Unit: ℓ (US qt, Imp qt)

Engine coolant capacity (With reservoir tank at “MAX” level)	8.7 (9-1/4, 7- 5/8)
Reservoir tank engine coolant capacity (At “MAX” level)	0.8 (7/8, 3/4)

RADIATOR

Unit: kPa (kg/cm^2 , psi)

Cap relief pressure	Standard	78 - 98 (0.8 - 1.0, 11 - 14)
	Limit	59 (0.6, 9)
Leakage test pressure		157 (1.6, 23)

THERMOSTAT

Valve opening temperature	76 - 79°C (169 - 174°F)
Maximum valve lift	8.6 mm / 90°C (0.339 in / 194°F)
Water closing temperature	71°C (160°F)

Tightening Torque

ABS00A04

Unit: N·m (kg-m, ft-lb)
Unit: N·m (kg-m, in-lb)*

Air relief plug	0.78 - 1.6 (0.08 - 0.16, 7 - 14)*
Radiator drain plug	0.78 - 1.6 (0.08 - 0.16, 7 - 14)*
Radiator cooling fan assembly	3.8 - 4.5 (0.39 - 0.5, 34 - 39)*
Cooling fan	3.4 (0.35, 30)*
Fan motor	4.4 (0.45, 39)*
Cylinder block drain plug (Front side)	9.8 (1.0, 87)*
Water pump cover	11.3 (1.2, 8)
Water pump	9.6 (0.98, 85)*
Chain tensioner cover	11.3 (1.2, 8)
Chain tensioner	8.1 (0.83, 72)*
Water inlet and thermostat assembly	9.8 (1.0, 87)*
Water outlet	24.5 (2.5, 18)
Engine coolant temperature sensor	24.5 (2.5, 18)

SECTION EC
ENGINE CONTROL SYSTEM

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Crankshaft Position Sensor (POS) 689
Camshaft Position Sensor (PHASE) 690
Throttle Control Motor 690
Injector 690
Fuel Pump 690

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NOTE:
If DTC U1000 or U1001 is displayed with other DTC, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-138, "DTC U1000, U1001 CAN COMMUNICATION LINE" .

×:Applicable —: Not applicable

Items (CONSULT-II screen terms)	DTC*1		Trip	MIL lighting up	Reference page
	CONSULT-II GST*2	ECM*3			
A/F SEN1 (B1)	P1271	1271	2	×	EC-462
A/F SEN1 (B1)	P1272	1272	2	×	EC-470
A/F SEN1 (B1)	P1273	1273	2	×	EC-478
A/F SEN1 (B1)	P1274	1274	2	×	EC-487
A/F SEN1 (B1)	P1276	1276	2	×	EC-496
A/F SEN1 (B1)	P1278	1278	2	×	EC-505
A/F SEN1 (B1)	P1279	1279	2	×	EC-517
A/F SEN1 (B2)	P1281	1281	2	×	EC-462
A/F SEN1 (B2)	P1282	1282	2	×	EC-470
A/F SEN1 (B2)	P1283	1283	2	×	EC-478
A/F SEN1 (B2)	P1284	1284	2	×	EC-487
A/F SEN1 (B2)	P1286	1286	2	×	EC-496
A/F SEN1 (B2)	P1288	1288	2	×	EC-505
A/F SEN1 (B2)	P1289	1289	2	×	EC-517
A/F SEN1 HTR (B1)	P1031	1031	2	×	EC-378
A/F SEN1 HTR (B1)	P1032	1032	2	×	EC-378
A/F SEN1 HTR (B2)	P1051	1051	2	×	EC-378
A/F SEN1 HTR (B2)	P1052	1052	2	×	EC-378
A/T INTERLOCK	P1730	1730	1	×	AT-139
A/T TCC S/V FNCTN	P0744	0744	2	×	AT-121
APP SEN 1/CIRC	P2122	2122	1	×	EC-587
APP SEN 1/CIRC	P2123	2123	1	×	EC-587
APP SEN 2/CIRC	P2127	2127	1	×	EC-595
APP SEN 2/CIRC	P2128	2128	1	×	EC-595
APP SENSOR	P2138	2138	1	×	EC-611
ASCD BRAKE SW	P1572	1572	1	—	EC-554
ASCD SW	P1564	1564	1	—	EC-546
ASCD VHL SPD SEN	P1574	1574	1	—	EC-571
ATF TEMP SEN/CIRC	P0710	0710	2	×	AT-130
BRAKE SW/CIRCUIT	P1805	1805	2	—	EC-581
CAN COMM CIRCUIT	U1000	1000*4	1 (A/T) 2 (M/T)	× —	EC-138
CAN COMM CIRCUIT	U1001	1001*4	2	—	EC-138
CKP SEN/CIRCUIT	P0335	0335	2	×	EC-267
CLOSED LOOP-B1	P1148	1148	1	×	EC-437
CLOSED LOOP-B2	P1168	1168	1	×	EC-437
CMP SEN/CIRC-B1	P0340	0340	2	×	EC-274

Items (CONSULT-II screen terms)	DTC*1		Trip	MIL lighting up	Reference page
	CONSULT-II GST*2	ECM*3			
CMP SEN/CIRC-B2	P0345	0345	2	×	EC-274
CTP LEARNING	P1225	1225	2	—	EC-453
CTP LEARNING	P1226	1226	2	—	EC-455
CYL 1 MISFIRE	P0301	0301	2	×	EC-255
CYL 2 MISFIRE	P0302	0302	2	×	EC-255
CYL 3 MISFIRE	P0303	0303	2	×	EC-255
CYL 4 MISFIRE	P0304	0304	2	×	EC-255
CYL 5 MISFIRE	P0305	0305	2	×	EC-255
CYL 6 MISFIRE	P0306	0306	2	×	EC-255
D/C SOLENOID/CIRC	P1762	1762	1	×	AT-152
D/C SOLENOID FNCTN	P1764	1764	1	×	AT-154
ECM	P0605	0605	1 or 2	× or —	EC-375
ECM BACK UP/CIRCUIT	P1065	1065	2	×	EC-385
ECT SEN/CIRCUIT	P0117	0117	1	×	EC-176
ECT SEN/CIRCUIT	P0118	0118	1	×	EC-176
ECT SENSOR	P0125	0125	1	×	EC-190
ENG OVER TEMP	P1217	1217	1	×	EC-440
ENGINE SPEED SIG	P0725	0725	2	×	AT-117
ETC ACTR	P1121	1121	1	×	EC-396
ETC FUNCTION/CIRC	P1122	1122	1	×	EC-398
ETC MOT	P1128	1128	1	×	EC-410
ETC MOT PWR	P1124	1124	1	×	EC-405
ETC MOT PWR	P1126	1126	1	×	EC-405
EVAP GROSS LEAK	P0455	0455	2	×	EC-339
EVAP PURG FLOW/MON	P0441	0441	2	×	EC-287
EVAP SMALL LEAK	P0442	0442	2	×	EC-292
EVAP SYS PRES SEN	P0451	0451	2	×	EC-317
EVAP SYS PRES SEN	P0452	0452	2	×	EC-320
EVAP SYS PRES SEN	P0453	0453	2	×	EC-329
EVAP VERY SML LEAK	P0456	0456	2	×	EC-347
FR/B SOLENOID/CIRC	P1757	1757	1	×	AT-148
FR/B SOLENOID FNCT	P1759	1759	1	×	AT-150
FTT SEN/CIRCUIT	P0182	0182	2	×	EC-242
FTT SEN/CIRCUIT	P0183	0183	2	×	EC-242
FTT SENSOR	P0181	0181	2	×	EC-236
FUEL LEV SEN SLOSH	P0460	0460	2	×	EC-357
FUEL LEVEL SENSOR	P0461	0461	2	×	EC-359
FUEL LEVL SEN/CIRC	P0462	0462	2	×	EC-361
FUEL LEVL SEN/CIRC	P0463	0463	2	×	EC-361
FUEL SYS-LEAN-B1	P0171	0171	2	×	EC-219
FUEL SYS-LEAN-B2	P0174	0174	2	×	EC-219
FUEL SYS-RICH-B1	P0172	0172	2	×	EC-228

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Items (CONSULT-II screen terms)	DTC*1		Trip	MIL lighting up	Reference page
	CONSULT-II GST*2	ECM*3			
FUEL SYS-RICH-B2	P0175	0175	2	×	EC-228
HLR/C SOL FNCTN	P1769	1769	1	×	AT-158
HLR/C SOL/CIRC	P1767	1767	1	×	AT-156
HO2S2 (B1)	P0138	0138	2	×	EC-199
HO2S2 (B1)	P0139	0139	2	×	EC-208
HO2S2 (B1)	P1146	1146	2	×	EC-415
HO2S2 (B1)	P1147	1147	2	×	EC-426
HO2S2 (B2)	P0158	0158	2	×	EC-199
HO2S2 (B2)	P0159	0159	2	×	EC-208
HO2S2 (B2)	P1166	1166	2	×	EC-415
HO2S2 (B2)	P1167	1167	2	×	EC-426
HO2S2 HTR (B1)	P0037	0037	2	×	EC-144
HO2S2 HTR (B1)	P0038	0038	2	×	EC-144
HO2S2 HTR (B2)	P0057	0057	2	×	EC-144
HO2S2 HTR (B2)	P0058	0058	2	×	EC-144
I/C SOLENOID/CIRC	P1752	1752	1	×	AT-144
I/C SOLENOID FNCTN	P1754	1754	1	×	AT-146
IAT SEN/CIRCUIT	P0112	0112	2	×	EC-170
IAT SEN/CIRCUIT	P0113	0113	2	×	EC-170
IAT SENSOR	P0127	0127	2	×	EC-194
INT/V TIM CONT-B1	P0011	0011	2	×	EC-141
INT/V TIM CONT-B2	P0021	0021	2	×	EC-141
INT/V TIM V/CIR-B1	P1111	1111	2	×	EC-389
INT/V TIM V/CIR-B2	P1136	1136	2	×	EC-389
ISC SYSTEM	P0506	0506	2	×	EC-365
ISC SYSTEM	P0507	0507	2	×	EC-367
KNOCK SEN/CIRC-B1	P0327	0327	2	—	EC-262
KNOCK SEN/CIRC-B1	P0328	0328	2	—	EC-262
L/PRESS SOL/CIRC	P0745	0745	2	×	AT-123
LC/B SOLENOID FNCT	P1774	1774	1	×	AT-162
LC/B SOLENOID/CIRC	P1772	1772	1	×	AT-160
MAF SEN/CIRCUIT	P0101	0101	1	×	EC-153
MAF SEN/CIRCUIT	P0102	0102	1	×	EC-162
MAF SEN/CIRCUIT	P0103	0103	1	×	EC-162
MULTI CYL MISFIRE	P0300	0300	2	×	EC-255
NATS MALFUNCTION	P1610 - P1615	1610 - 1615	2	—	EC-63
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	No DTC	Flashing	—	Flashing	EC-64
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	**P0000**	**0000**	—	—	**—**
P-N POS SW/CIRCUIT	P1706	1706	2	×	EC-573
PNP SW/CIRC	P0705	0705	2	×	AT-108

INDEX FOR DTC

Items (CONSULT-II screen terms)	DTC*1		Trip	MIL lighting up	Reference page
	CONSULT-II GST*2	ECM*3			
PURG VOLUME CONT/V	P0444	0444	2	×	EC-301
PURG VOLUME CONT/V	P0445	0445	2	×	EC-301
PURG VOLUME CONT/V	P1444	1444	2	×	EC-529
PW ST P SEN/CIRC	P0550	0550	2	—	EC-369
SENSOR POWER/CIRC	P1229	1229	1	×	EC-457
TCC SOLENOID/CIRC	P0740	0740	2	×	AT-119
TCM	P0700	0700	1	×	AT-107
TCS C/U FUNCTN	P1211	1211	2	—	EC-438
TCS/CIRC	P1212	1212	2	—	EC-439
THERMSTAT FNCTN	P0128	0128	2	×	EC-197
TP SEN 1/CIRC	P0222	0222	1	×	EC-247
TP SEN 1/CIRC	P0223	0223	1	×	EC-247
TP SEN 2/CIRC	P0122	0122	1	×	EC-182
TP SEN 2/CIRC	P0123	0123	1	×	EC-182
TP SEN/CIRC A/T	P1705	1705	1	×	AT-127
TP SENSOR	P2135	2135	1	×	EC-603
TURBINE REV S/CIRC	P1716	1716	2	×	AT-135
TW CATALYST SYS-B1	P0420	0420	2	×	EC-283
TW CATALYST SYS-B2	P0430	0430	2	×	EC-283
VEH SPD SEN/CIR AT*5	P0720	0720	2	×	AT-112
VEH SPEED SEN/CIRC*5	P0500	0500	2	×	EC-363
VENT CONTROL VALVE	P0447	0447	2	×	EC-308
VENT CONTROL VALVE	P1446	1446	2	×	EC-537

*1: 1st trip DTC No. is the same as DTC No.
*2: This number is prescribed by SAE J2012.
*3: In Diagnostic Test Mode II (Self-diagnostic results), this number is controlled by NISSAN.
*4: The troubleshooting for this DTC needs CONSULT-II.
*5: When the fail-safe operations for both self-diagnoses occur, the MIL illuminates.

DTC No. Index

ABS009AA

NOTE:
If DTC U1000 or U1001 is displayed with other DTC, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-138, "DTC U1000, U1001 CAN COMMUNICATION LINE" .

×:Applicable —: Not applicable

DTC*1		Items (CONSULT-II screen terms)	Trip	MIL lighting up	Reference page
CONSULT-II GST*2	ECM*3				
No DTC	Flashing	NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	—	Flashing	EC-64
U1000	1000*4	CAN COMM CIRCUIT	1 (A/T) 2 (M/T)	× —	EC-138
U1001	1001*4	CAN COMM CIRCUIT	2	—	EC-138
P0000	**0000**	**NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.**	—	—	**—**
P0011	0011	INT/V TIM CONT-B1	2	×	EC-141
P0021	0021	INT/V TIM CONT-B2	2	×	EC-141
P0037	0037	HO2S2 HTR (B1)	2	×	EC-144
P0038	0038	HO2S2 HTR (B1)	2	×	EC-144
P0057	0057	HO2S2 HTR (B2)	2	×	EC-144
P0058	0058	HO2S2 HTR (B2)	2	×	EC-144
P0101	0101	MAF SEN/CIRCUIT	1	×	EC-153
P0102	0102	MAF SEN/CIRCUIT	1	×	EC-162
P0103	0103	MAF SEN/CIRCUIT	1	×	EC-162
P0112	0112	IAT SEN/CIRCUIT	2	×	EC-170
P0113	0113	IAT SEN/CIRCUIT	2	×	EC-170
P0117	0117	ECT SEN/CIRCUIT	1	×	EC-176
P0118	0118	ECT SEN/CIRCUIT	1	×	EC-176
P0122	0122	TP SEN 2/CIRC	1	×	EC-182
P0123	0123	TP SEN 2/CIRC	1	×	EC-182
P0125	0125	ECT SENSOR	1	×	EC-190
P0127	0127	IAT SENSOR	2	×	EC-194
P0128	0128	THERMSTAT FNCTN	2	×	EC-197
P0138	0138	HO2S2 (B1)	2	×	EC-199
P0139	0139	HO2S2 (B1)	2	×	EC-208
P0158	0158	HO2S2 (B2)	2	×	EC-199
P0159	0159	HO2S2 (B2)	2	×	EC-208
P0171	0171	FUEL SYS-LEAN-B1	2	×	EC-219
P0172	0172	FUEL SYS-RICH-B1	2	×	EC-228
P0174	0174	FUEL SYS-LEAN-B2	2	×	EC-219
P0175	0175	FUEL SYS-RICH-B2	2	×	EC-228
P0181	0181	FTT SENSOR	2	×	EC-236
P0182	0182	FTT SEN/CIRCUIT	2	×	EC-242
P0183	0183	FTT SEN/CIRCUIT	2	×	EC-242
P0222	0222	TP SEN 1/CIRC	1	×	EC-247
P0223	0223	TP SEN 1/CIRC	1	×	EC-247

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DTC*1		Items (CONSULT-II screen terms)	Trip	MIL lighting up	Reference page
CONSULT-II GST*2	ECM*3				
P0300	0300	MULTI CYL MISFIRE	2	×	EC-255
P0301	0301	CYL 1 MISFIRE	2	×	EC-255
P0302	0302	CYL 2 MISFIRE	2	×	EC-255
P0303	0303	CYL 3 MISFIRE	2	×	EC-255
P0304	0304	CYL 4 MISFIRE	2	×	EC-255
P0305	0305	CYL 5 MISFIRE	2	×	EC-255
P0306	0306	CYL 6 MISFIRE	2	×	EC-255
P0327	0327	KNOCK SEN/CIRC-B1	2	—	EC-262
P0328	0328	KNOCK SEN/CIRC-B1	2	—	EC-262
P0335	0335	CKP SEN/CIRCUIT	2	×	EC-267
P0340	0340	CMP SEN/CIRC-B1	2	×	EC-274
P0345	0345	CMP SEN/CIRC-B2	2	×	EC-274
P0420	0420	TW CATALYST SYS-B1	2	×	EC-283
P0430	0430	TW CATALYST SYS-B2	2	×	EC-283
P0441	0441	EVAP PURG FLOW/MON	2	×	EC-287
P0442	0442	EVAP SMALL LEAK	2	×	EC-292
P0444	0444	PURG VOLUME CONT/V	2	×	EC-301
P0445	0445	PURG VOLUME CONT/V	2	×	EC-301
P0447	0447	VENT CONTROL VALVE	2	×	EC-308
P0451	0451	EVAP SYS PRES SEN	2	×	EC-317
P0452	0452	EVAP SYS PRES SEN	2	×	EC-320
P0453	0453	EVAP SYS PRES SEN	2	×	EC-329
P0455	0455	EVAP GROSS LEAK	2	×	EC-339
P0456	0456	EVAP VERY SML LEAK	2	×	EC-347
P0460	0460	FUEL LEV SEN SLOSH	2	×	EC-357
P0461	0461	FUEL LEVEL SENSOR	2	×	EC-359
P0462	0462	FUEL LEVL SEN/CIRC	2	×	EC-361
P0463	0463	FUEL LEVL SEN/CIRC	2	×	EC-361
P0500	0500	VEH SPEED SEN/CIRC*5	2	×	EC-363
P0506	0506	ISC SYSTEM	2	×	EC-365
P0507	0507	ISC SYSTEM	2	×	EC-367
P0550	0550	PW ST P SEN/CIRC	2	—	EC-369
P0605	0605	ECM	1 or 2	× or —	EC-375
P0700	0700	TCM	1	×	AT-107
P0705	0705	PNP SW/CIRC	2	×	AT-108
P0710	0710	ATF TEMP SEN/CIRC	2	×	AT-130
P0720	0720	VEH SPD SEN/CIR AT*5	2	×	AT-112
P0725	0725	ENGINE SPEED SIG	2	×	AT-117
P0740	0740	TCC SOLENOID/CIRC	2	×	AT-119
P0744	0744	A/T TCC S/V FNCTN	2	×	AT-121
P0745	0745	L/PRESS SOL/CIRC	2	×	AT-123
P1031	1031	A/F SEN1 HTR (B1)	2	×	EC-378

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DTC*1		Items (CONSULT-II screen terms)	Trip	MIL lighting up	Reference page
CONSULT-II GST*2	ECM*3				
P1032	1032	A/F SEN1 HTR (B1)	2	×	EC-378
P1051	1051	A/F SEN1 HTR (B2)	2	×	EC-378
P1052	1052	A/F SEN1 HTR (B2)	2	×	EC-378
P1065	1065	ECM BACK UP/CIRCUIT	2	×	EC-385
P1111	1111	INT/V TIM V/CIR-B1	2	×	EC-389
P1121	1121	ETC ACTR	1	×	EC-396
P1122	1122	ETC FUNCTION/CIRC	1	×	EC-398
P1124	1124	ETC MOT PWR	1	×	EC-405
P1126	1126	ETC MOT PWR	1	×	EC-405
P1128	1128	ETC MOT	1	×	EC-410
P1136	1136	INT/V TIM V/CIR-B2	2	×	EC-389
P1146	1146	HO2S2 (B1)	2	×	EC-415
P1147	1147	HO2S2 (B1)	2	×	EC-426
P1148	1148	CLOSED LOOP-B1	1	×	EC-437
P1166	1166	HO2S2 (B2)	2	×	EC-415
P1167	1167	HO2S2 (B2)	2	×	EC-426
P1168	1168	CLOSED LOOP-B2	1	×	EC-437
P1211	1211	TCS C/U FUNCTN	2	—	EC-438
P1212	1212	TCS/CIRC	2	—	EC-439
P1217	1217	ENG OVER TEMP	1	×	EC-440
P1225	1225	CTP LEARNING	2	—	EC-453
P1226	1226	CTP LEARNING	2	—	EC-455
P1229	1229	SENSOR POWER/CIRC	1	×	EC-457
P1271	1271	A/F SENSOR (B1)	2	×	EC-462
P1272	1272	A/F SENSOR (B1)	2	×	EC-470
P1273	1273	A/F SENSOR (B1)	2	×	EC-478
P1274	1274	A/F SENSOR (B1)	2	×	EC-487
P1276	1276	A/F SENSOR (B1)	2	×	EC-496
P1278	1278	A/F SENSOR (B1)	2	×	EC-505
P1279	1279	A/F SENSOR (B1)	2	×	EC-517
P1281	1281	A/F SENSOR (B2)	2	×	EC-462
P1282	1282	A/F SENSOR (B2)	2	×	EC-470
P1283	1283	A/F SENSOR (B2)	2	×	EC-478
P1284	1284	A/F SENSOR (B2)	2	×	EC-487
P1286	1286	A/F SENSOR (B2)	2	×	EC-496
P1288	1288	A/F SENSOR (B2)	2	×	EC-505
P1289	1289	A/F SENSOR (B2)	2	×	EC-517
P1444	1444	PURG VOLUME CONT/V	2	×	EC-529
P1446	1446	VENT CONTROL VALVE	2	×	EC-537
P1564	1564	ASCD SW	1	—	EC-546
P1572	1572	ASCD BRAKE SW	1	—	EC-554
P1574	1574	ASCD VHL SPD SEN	1	—	EC-571

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DTC*1		Items (CONSULT-II screen terms)	Trip	MIL lighting up	Reference page
CONSULT-II GST*2	ECM*3				
P1610 - P1615	1610 - 1615	NATS MALFUNCTION	2	—	EC-63
P1705	1705	TP SEN/CIRC A/T	1	×	AT-127
P1706	1706	P-N POS SW/CIRCUIT	2	×	EC-573
P1716	1716	TURBINE REV S/CIRC	2	×	AT-135
P1730	1730	A/T INTERLOCK	1	×	AT-139
P1752	1752	I/C SOLENOID/CIRC	1	×	AT-144
P1754	1754	I/C SOLENOID FNCTN	1	×	AT-146
P1757	1757	FR/B SOLENOID/CIRC	1	×	AT-148
P1759	1759	FR/B SOLENOID FNCT	1	×	AT-150
P1762	1762	D/C SOLENOID/CIRC	1	×	AT-152
P1764	1764	D/C SOLENOID FNCTN	1	×	AT-154
P1767	1767	HLR/C SOL/CIRC	1	×	AT-156
P1769	1769	HLR/C SOL FNCTN	1	×	AT-158
P1772	1772	LC/B SOLENOID/CIRC	1	×	AT-160
P1774	1774	LC/B SOLENOID FNCT	1	×	AT-162
P1805	1805	BRAKE SW/CIRCUIT	2	—	EC-581
P2122	2122	APP SEN 1/CIRC	1	×	EC-587
P2123	2123	APP SEN 1/CIRC	1	×	EC-587
P2127	2127	APP SEN 2/CIRC	1	×	EC-595
P2128	2128	APP SEN 2/CIRC	1	×	EC-595
P2135	2135	TP SENSOR	1	×	EC-603
P2138	2138	APP SENSOR	1	×	EC-611

*1: 1st trip DTC No. is the same as DTC No.
*2: This number is prescribed by SAE J2012.
*3: In Diagnostic Test Mode II (Self-diagnostic results), this number is controlled by NISSAN.
*4: The troubleshooting for this DTC needs CONSULT-II.
*5: When the fail-safe operations for both self-diagnoses occur, the MIL illuminates.

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

ABS009AB

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

ABS009AC

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

On Board Diagnostic (OBD) System of Engine and A/T

ABS009AD

The ECM has an on board diagnostic system. It will light up the malfunction indicator lamp (MIL) to warn the driver of a malfunction causing emission deterioration.

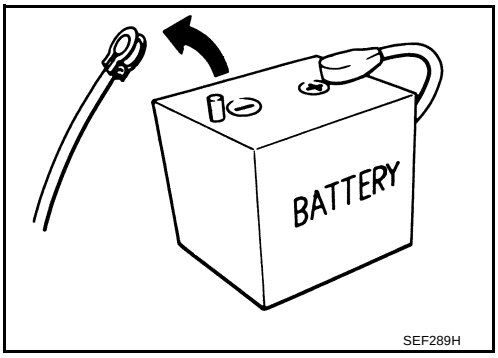
CAUTION:

- **Be sure to turn the ignition switch OFF and disconnect the negative battery cable before any repair or inspection work. The open/short circuit of related switches, sensors, solenoid valves, etc. will cause the MIL to light up.**
- **Be sure to connect and lock the connectors securely after work. A loose (unlocked) connector will cause the MIL to light up due to the open circuit. (Be sure the connector is free from water, grease, dirt, bent terminals, etc.)**
- **Certain systems and components, especially those related to OBD, may use a new style slide-locking type harness connector. For description and how to disconnect, refer to PG-80, "HARNESS CONNECTOR" .**
- **Be sure to route and secure the harnesses properly after work. The interference of the harness with a bracket, etc. may cause the MIL to light up due to the short circuit.**
- **Be sure to connect rubber tubes properly after work. A misconnected or disconnected rubber tube may cause the MIL to light up due to the malfunction of the EVAP system or fuel injection system, etc.**
- **Be sure to erase the unnecessary malfunction information (repairs completed) from the ECM and TCM (Transmission control module) before returning the vehicle to the customer.**

Precaution

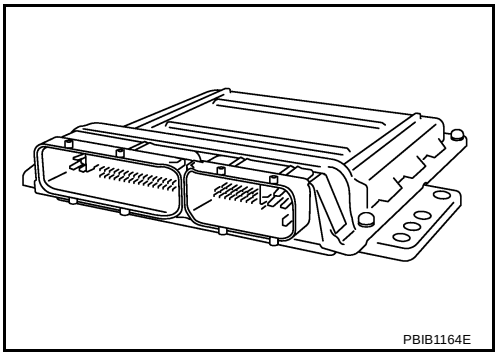
ABS009AE

- **Always use a 12 volt battery as power source.**
- **Do not attempt to disconnect battery cables while engine is running.**
- **Before connecting or disconnecting the ECM harness connector, turn ignition switch OFF and disconnect battery ground cable. Failure to do so may damage the ECM because battery voltage is applied to ECM even if ignition switch is turned OFF.**
- **Before removing parts, turn ignition switch OFF and then disconnect battery ground cable.**

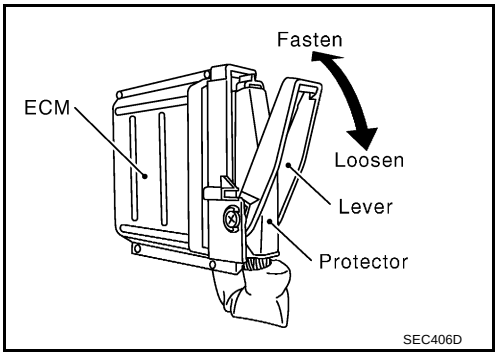


SEF289H

- **Do not disassemble ECM.**
- **If a battery cable is disconnected, the memory will return to the ECM value.**
  The ECM will now start to self-control at its initial value. Engine operation can vary slightly when the terminal is disconnected. However, this is not an indication of a malfunction. Do not replace parts because of a slight variation.

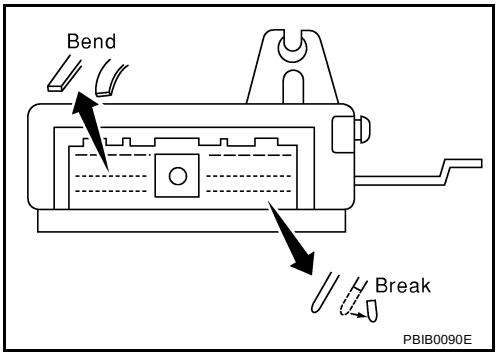

PBIB1164E

- **When connecting ECM harness connector, fasten it securely with a lever as far as it will go as shown in the figure.**



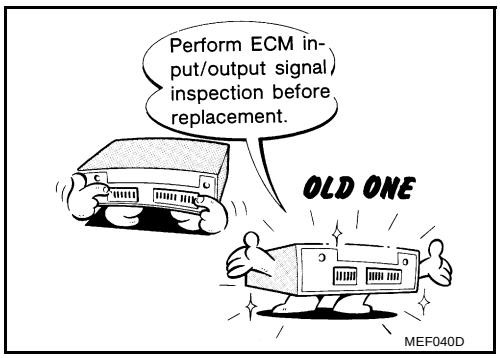
SEC406D

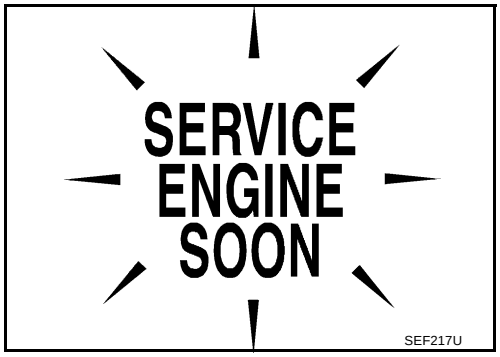
- **When connecting or disconnecting pin connectors into or from ECM, take care not to damage pin terminals (bend or break).**
  Make sure that there are not any bends or breaks on ECM pin terminal, when connecting pin connectors.
- **Securely connect ECM harness connectors.**
  A poor connection can cause an extremely high (surge) voltage to develop in coil and condenser, thus resulting in damage to ICs.
- **Keep engine control system harness at least 10 cm (4 in) away from adjacent harness, to prevent engine control system malfunctions due to receiving external noise, degraded operation of ICs, etc.**
- **Keep engine control system parts and harness dry.**



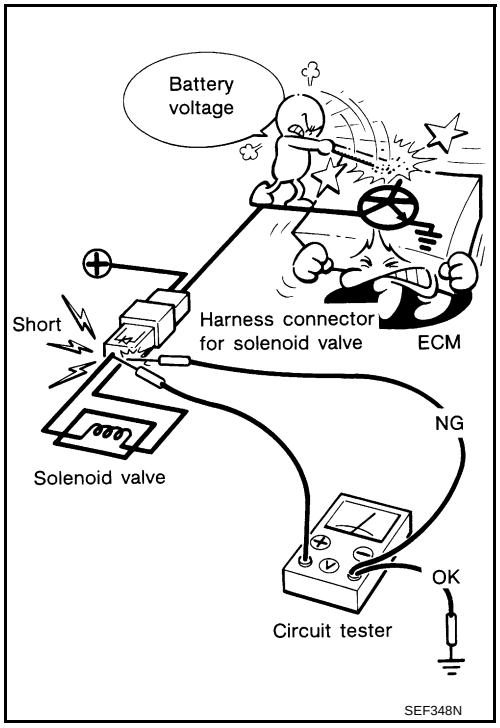
PBIB0090E

- **Before replacing ECM, perform ECM Terminals and Reference Value inspection and make sure ECM functions properly. Refer to EC-95 .**
- **Handle mass air flow sensor carefully to avoid damage.**
- **Do not disassemble mass air flow sensor.**
- **Do not clean mass air flow sensor with any type of detergent.**
- **Do not disassemble electric throttle control actuator.**
- **Even a slight leak in the air intake system can cause serious incidents.**
- **Do not shock or jar the camshaft position sensor (PHASE), crankshaft position sensor (POS).**
- **After performing each TROUBLE DIAGNOSIS, perform DTC Confirmation Procedure or Overall Function Check.**
  The DTC should not be displayed in the DTC Confirmation Procedure if the repair is completed. The Overall Function Check should be a good result if the repair is completed.

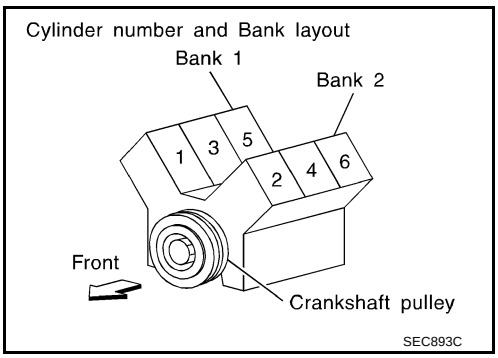




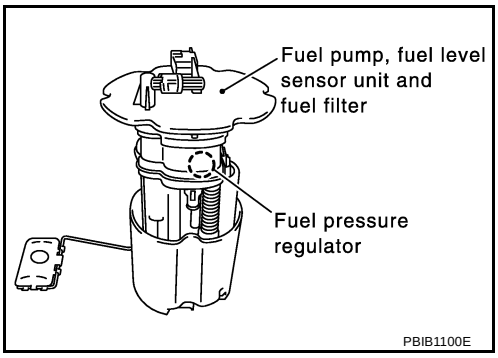
- **When measuring ECM signals with a circuit tester, never allow the two tester probes to contact.**
  Accidental contact of probes will cause a short circuit and damage the ECM power transistor.
- **Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.**



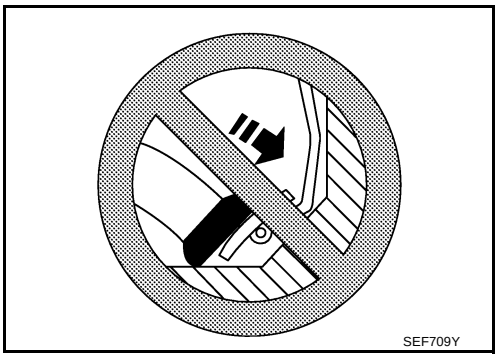
- **B1 indicates the bank 1, B2 indicates the bank 2 as shown in the figure.**



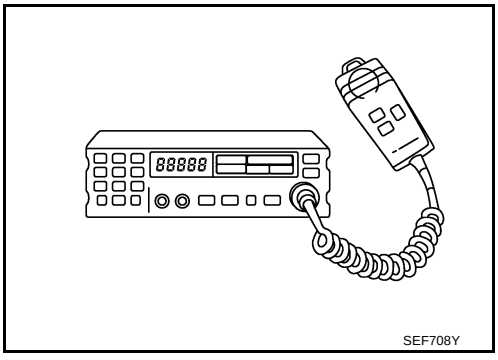
- **Do not operate fuel pump when there is no fuel in lines.**
- **Tighten fuel hose clamps to the specified torque.**



- **Do not depress accelerator pedal when starting.**
- **Immediately after starting, do not rev up engine unnecessarily.**
- **Do not rev up engine just prior to shutdown.**



- **When installing C.B. ham radio or a mobile phone, be sure to observe the following as it may adversely affect electronic control systems depending on installation location.**
  - **Keep the antenna as far as possible from the electronic control units.**
  - **Keep the antenna feeder line more than 20 cm (8 in) away from the harness of electronic controls.**
    Do not let them run parallel for a long distance.
  - **Adjust the antenna and feeder line so that the standing-wave radio can be kept smaller.**
  - **Be sure to ground the radio to vehicle body.**



Wiring Diagrams and Trouble Diagnosis

ABS009AF

When you read wiring diagrams, refer to the following:

- GI-15, "How to Read Wiring Diagrams"
- PG-4, "POWER SUPPLY ROUTING CIRCUIT" for power distribution circuit

When you perform trouble diagnosis, refer to the following:

- GI-11, "HOW TO FOLLOW TEST GROUPS IN TROUBLE DIAGNOSES"
- GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident"

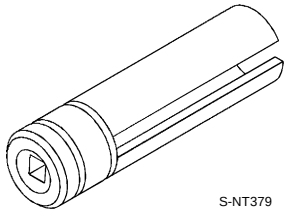
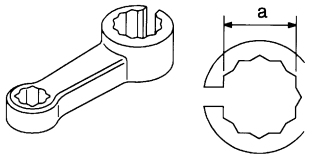
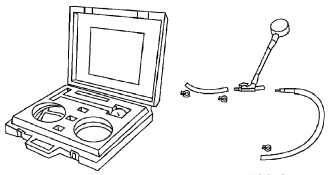
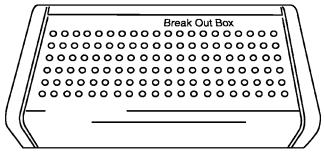
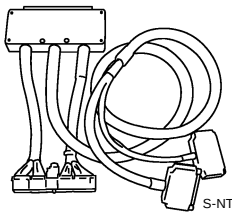
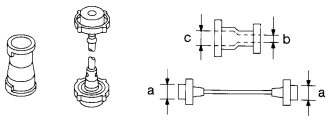
PREPARATION

PFP:00002

Special Service Tools

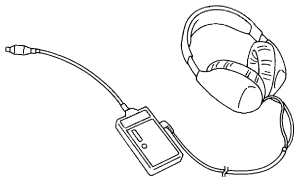
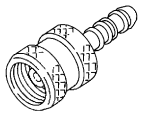
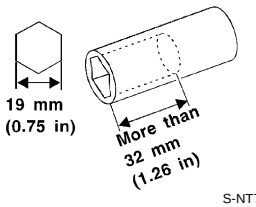
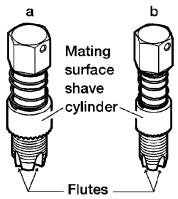
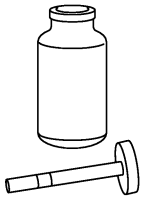
ABS009AG

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
KV10117100 (J-36471-A) Heated oxygen sensor wrench  S-NT379	Loosening or tightening heated oxygen sensor with 22 mm (0.87 in) hexagon nut
KV10114400 (J-38365) Heated oxygen sensor wrench  S-NT636	Loosening or tightening heated oxygen sensor **a: 22 mm (0.87 in)**
(J-44321) Fuel pressure gauge kit  LEC642	Checking fuel pressure
KV109E0010 (J-46209) Break-out box  S-NT825	Measuring the ECM signals with a circuit tester
KV109E0080 (J-45819) Y-cable adapter  S-NT826	Measuring the ECM signals with a circuit tester
EG17650301 (J-33984-A) Radiator cap tester adapter  S-NT564	Adapting radiator cap tester to radiator cap and radiator filler neck **a: 28 (1.10) dia.** **b: 31.4 (1.236) dia.** **c: 41.3 (1.626) dia.** Unit: mm (in)

Commercial Service Tools

ABS009AH

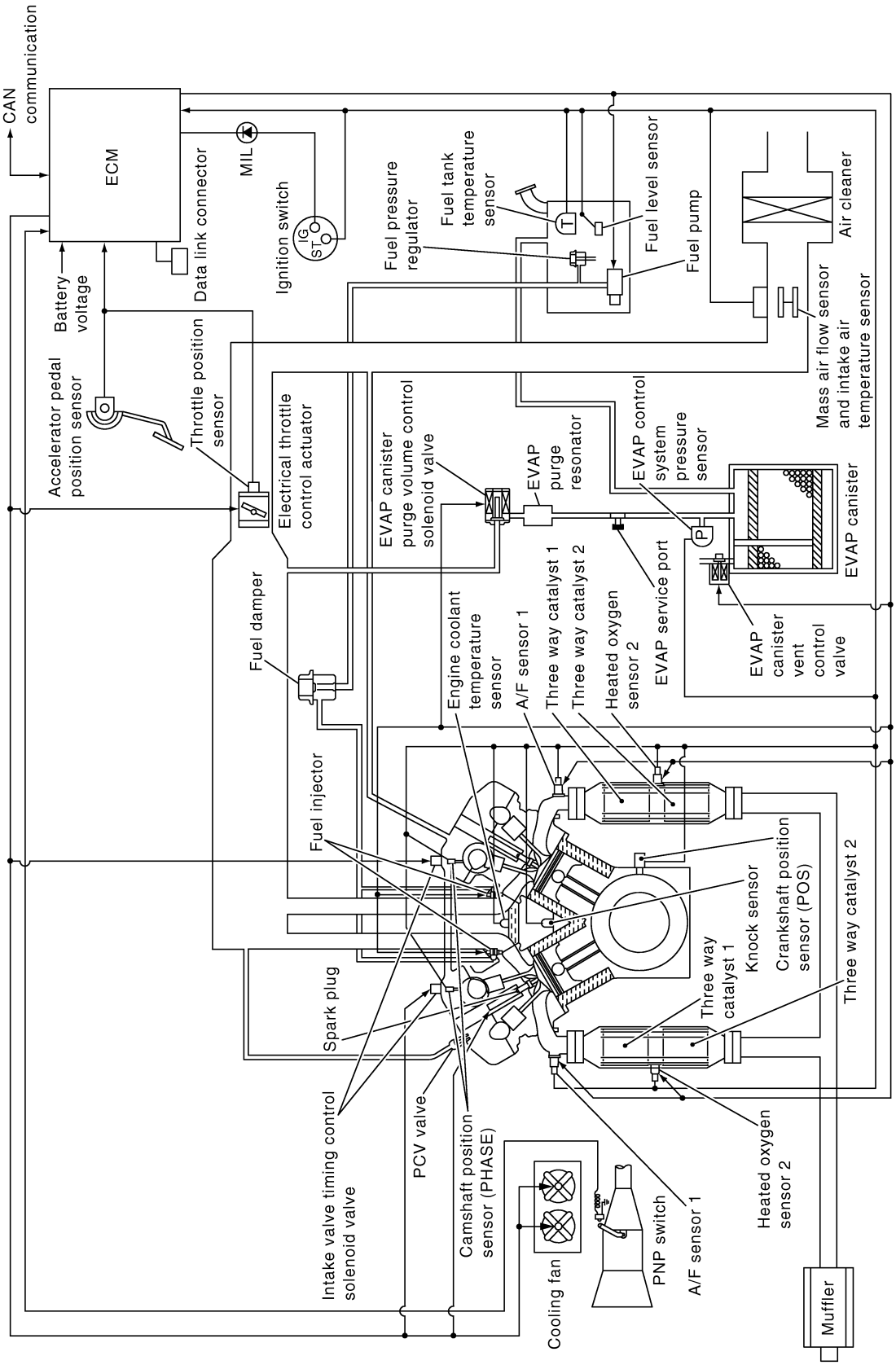
Tool name (Kent-Moore No.)		Description
Leak detector i.e.: (J-41416)	 S-NT703	Locating the EVAP leak
EVAP service port adapter i.e.: (J-41413-OBD)	 S-NT704	Applying positive pressure through EVAP service port
Fuel filler cap adapter i.e.: (MLR-8382)	 S-NT815	Checking fuel tank vacuum relief valve opening pressure
Socket wrench	 S-NT705	Removing and installing engine coolant temperature sensor
Oxygen sensor thread cleaner i.e.: (J-43897-18) (J-43897-12)	 AEM488	Reconditioning the exhaust system threads before installing a new oxygen sensor. Use with anti-seize lubricant shown below. **a: 18 mm diameter with pitch 1.5 mm for Zirconia Oxygen Sensor** **b: 12 mm diameter with pitch 1.25 mm for Titania Oxygen Sensor**
Anti-seize lubricant i.e.: (Permatex™ 133AR or equivalent meeting MIL specification MIL-A-907)	 S-NT779	Lubricating oxygen sensor thread cleaning tool when reconditioning exhaust system threads.

ENGINE CONTROL SYSTEM

PFP:23710

System Diagram

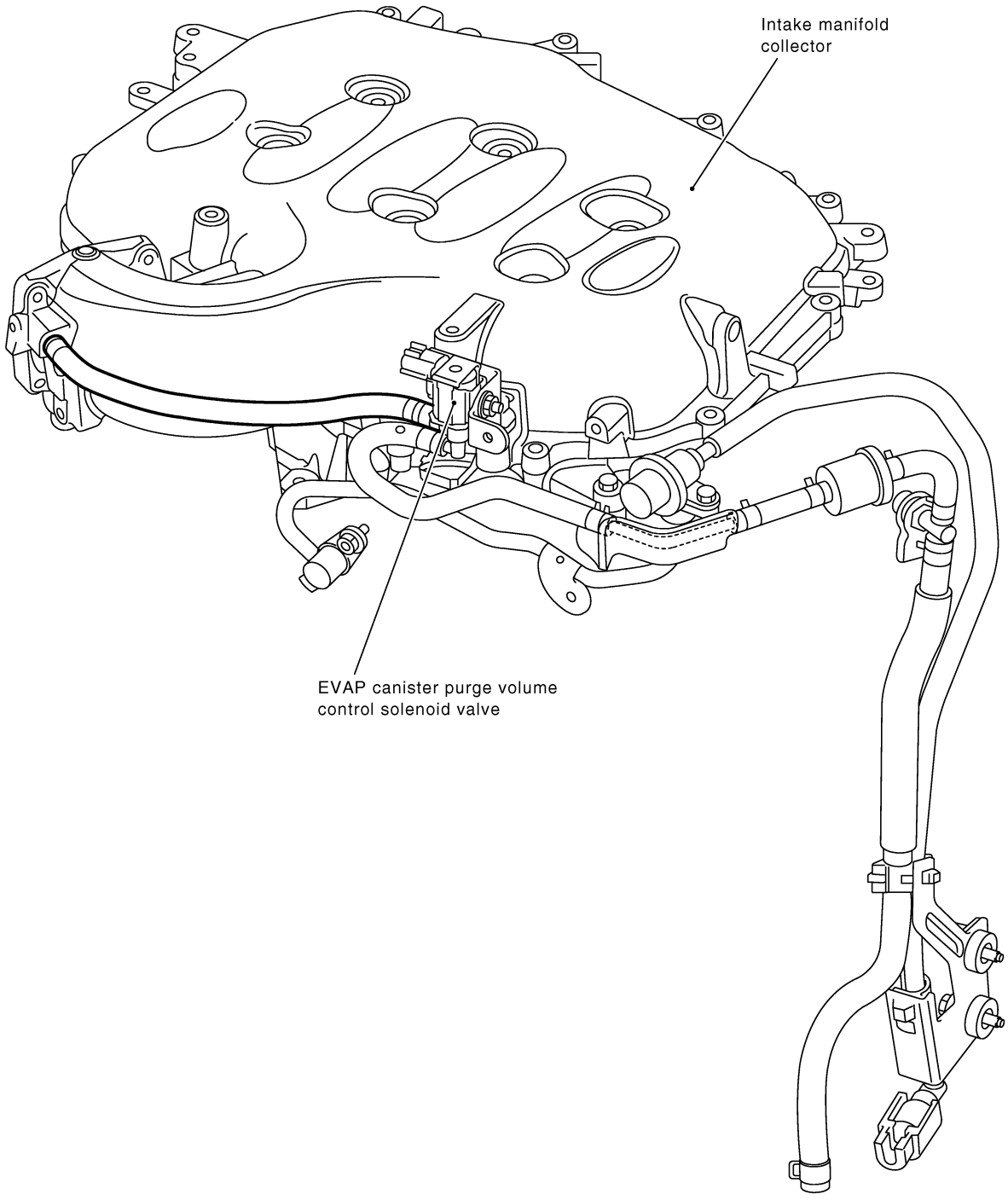
ABS009AI



PBIB2283E

Vacuum Hose Drawing

ABS009AJ



NOTE: Do not use soapy water or any type of solvent while installing vacuum hose or purge hoses.

PBIB2095E

Refer to EC-22, "System Diagram" for Vacuum Control System.

System Chart

ABS009AK

Input (Sensor)	ECM Function	Output (Actuator)
● Camshaft position sensor (PHASE) ● Crankshaft position sensor (POS) ● Mass air flow sensor ● Engine coolant temperature sensor ● Air fuel ratio (A/F) sensor 1 ● Throttle position sensor ● Accelerator pedal position sensor ● Park/neutral position (PNP) switch ● Intake air temperature sensor ● Power steering pressure sensor ● Ignition switch ● Battery voltage ● Knock sensor ● Refrigerant pressure sensor ● Stop lamp switch ● ASCD steering switch ● ASCD brake switch ● ASCD clutch switch ● Fuel level sensor*1 *3 ● EVAP control system pressure sensor ● Fuel tank temperature sensor*1 ● Heated oxygen sensor 2*2 ● TCM (Transmission control module)*3 ● Air conditioner switch*3 ● Wheel sensor*3 ● Electrical load signal*3	Fuel injection & mixture ratio control	Fuel injector
	Electronic ignition system	Power transistor
	Fuel pump control	Fuel pump relay
	ASCD vehicle speed control	Electric throttle control actuator
	On board diagnostic system	MIL (On the instrument panel)*4
	Air fuel ratio (A/F) sensor 1 heater control	Air fuel ratio (A/F) sensor 1 heater
	Heated oxygen sensor 2 heater control	Heated oxygen sensor 2 heater
	EVAP canister purge flow control	EVAP canister purge volume control solenoid valve
	Air conditioning cut control	Air conditioner relay*4
	Cooling fan control	Cooling fan relay*4
	ON BOARD DIAGNOSIS for EVAP system	EVAP canister vent control valve

*1: This sensor is not used to control the engine system. This is used only for the on board diagnosis.
*2: This sensor is not used to control the engine system under normal conditions.
*3: This input signal is sent to the ECM through CAN communication line.
*4: This output signal is sent from the ECM through CAN communication line.

Multiport Fuel Injection (MFI) System

ABS009AL

INPUT/OUTPUT SIGNAL CHART

Sensor	Input Signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS)	Engine speed*3 Piston position	Fuel injection & mixture ratio control	Fuel injector
Camshaft position sensor (PHASE)			
Mass air flow sensor	Amount of intake air		
Engine coolant temperature sensor	Engine coolant temperature		
Air fuel ratio (A/F) sensor 1	Density of oxygen in exhaust gas		
Throttle position sensor	Throttle position		
Accelerator pedal position sensor	Accelerator pedal position		
Park/neutral position (PNP) switch	Gear position		
Knock sensor	Engine knocking condition		
Battery	Battery voltage*3		
Power steering pressure sensor	Power steering operation		
Heated oxygen sensor 2*1	Density of oxygen in exhaust gas		
Air conditioner switch*2	Air conditioner operation		
Wheel sensor*2	Vehicle speed		

*1: This sensor is not used to control the engine system under normal conditions.
*2: This signal is sent to the ECM through CAN communication line.
*3: ECM determines the start signal status by the signals of engine speed and battery voltage.

SYSTEM DESCRIPTION

The amount of fuel injected from the fuel injector is determined by the ECM. The ECM controls the length of time the valve remains open (injection pulse duration). The amount of fuel injected is a program value in the ECM memory. The program value is preset by engine operating conditions. These conditions are determined by input signals (for engine speed and intake air) from both the crankshaft position sensor and the mass air flow sensor.

VARIOUS FUEL INJECTION INCREASE/DECREASE COMPENSATION

In addition, the amount of fuel injected is compensated to improve engine performance under various operating conditions as listed below.

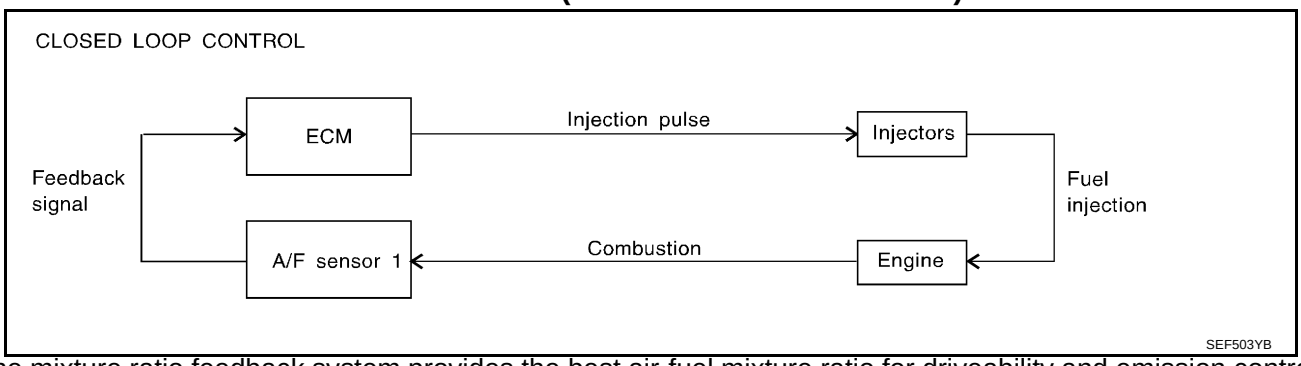
<Fuel increase>

- During warm-up
- When starting the engine
- During acceleration
- Hot-engine operation
- When selector lever is changed from N to D (A/T models)
- High-load, high-speed operation

<Fuel decrease>

- During deceleration
- During high engine speed operation

MIXTURE RATIO FEEDBACK CONTROL (CLOSED LOOP CONTROL)



The mixture ratio feedback system provides the best air-fuel mixture ratio for driveability and emission control. The three way catalyst 1 can then better reduce CO, HC and NOx emissions. This system uses air fuel ratio (A/F) sensor 1 in the exhaust manifold to monitor whether the engine operation is rich or lean. The ECM adjusts the injection pulse width according to the sensor voltage signal. For more information about air fuel ratio (A/F) sensor 1, refer to EC-462 . This maintains the mixture ratio within the range of stoichiometric (ideal air-fuel mixture).
This stage is referred to as the closed loop control condition.
Heated oxygen sensor 2 is located downstream of the three way catalyst 1. Even if the switching characteristics of air fuel ratio (A/F) sensor 1 shift, the air-fuel ratio is controlled to stoichiometric by the signal from heated oxygen sensor 2.

Open Loop Control

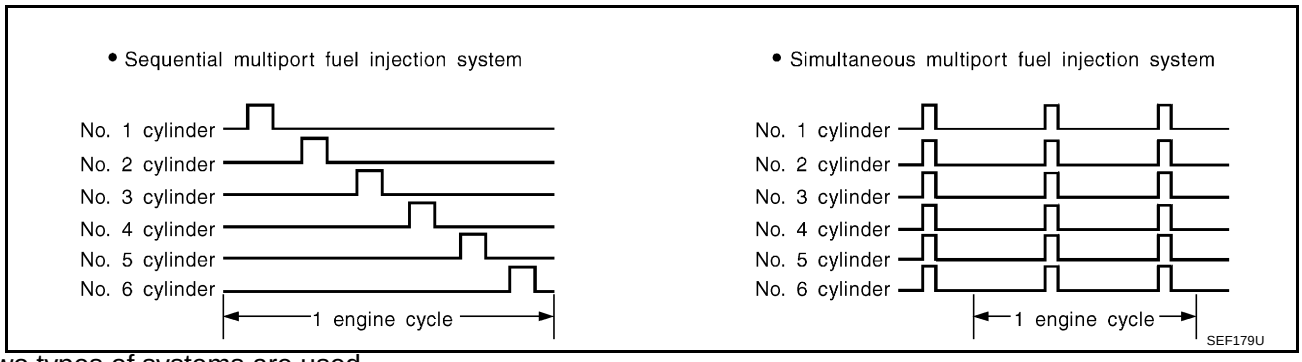
The open loop system condition refers to when the ECM detects any of the following conditions. Feedback control stops in order to maintain stabilized fuel combustion.

- Deceleration and acceleration
- High-load, high-speed operation
- Malfunction of air fuel ratio (A/F) sensor 1 or its circuit
- Insufficient activation of air fuel ratio (A/F) sensor 1 at low engine coolant temperature
- High engine coolant temperature
- During warm-up
- After shifting from N to D (A/T models)
- When starting the engine

MIXTURE RATIO SELF-LEARNING CONTROL

The mixture ratio feedback control system monitors the mixture ratio signal transmitted from air fuel ratio (A/F) sensor 1. This feedback signal is then sent to the ECM. The ECM controls the basic mixture ratio as close to the theoretical mixture ratio as possible. However, the basic mixture ratio is not necessarily controlled as originally designed. Both manufacturing differences (i.e., mass air flow sensor hot wire) and characteristic changes during operation (i.e., injector clogging) directly affect mixture ratio.
Accordingly, the difference between the basic and theoretical mixture ratios is monitored in this system. This is then computed in terms of “injection pulse duration” to automatically compensate for the difference between the two ratios.
“Fuel trim” refers to the feedback compensation value compared against the basic injection duration. Fuel trim includes short term fuel trim and long term fuel trim.
“Short term fuel trim” is the short-term fuel compensation used to maintain the mixture ratio at its theoretical value. The signal from air fuel ratio (A/F) sensor 1 indicates whether the mixture ratio is RICH or LEAN compared to the theoretical value. The signal then triggers a reduction in fuel volume if the mixture ratio is rich, and an increase in fuel volume if it is lean.
“Long term fuel trim” is overall fuel compensation carried out long-term to compensate for continual deviation of the short term fuel trim from the central value. Such deviation will occur due to individual engine differences, wear over time and changes in the usage environment.

FUEL INJECTION TIMING



Two types of systems are used.

Sequential Multiport Fuel Injection System

Fuel is injected into each cylinder during each engine cycle according to the firing order. This system is used when the engine is running.

Simultaneous Multiport Fuel Injection System

Fuel is injected simultaneously into all six cylinders twice each engine cycle. In other words, pulse signals of the same width are simultaneously transmitted from the ECM.
The six injectors will then receive the signals two times for each engine cycle.
This system is used when the engine is being started and/or if the fail-safe system (CPU) is operating.

FUEL SHUT-OFF

Fuel to each cylinder is cut off during deceleration or operation of the engine at excessively high speeds.

Electronic Ignition (EI) System

ABS009AM

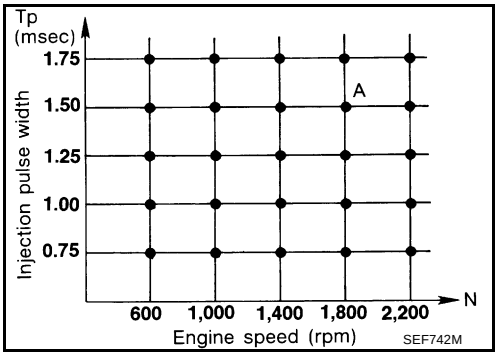
INPUT/OUTPUT SIGNAL CHART

Sensor	Input Signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS)	Engine speed*2 Piston position	Ignition timing control	Power transistor
Camshaft position sensor (PHASE)			
Mass air flow sensor	Amount of intake air		
Engine coolant temperature sensor	Engine coolant temperature		
Throttle position sensor	Throttle position		
Accelerator pedal position sensor	Accelerator pedal position		
Knock sensor	Engine knocking		
Park/neutral position (PNP) switch	Gear position		
Battery	Battery voltage*2		
Wheel sensor*1	Vehicle speed		

*1: This signal is sent to the ECM through CAN communication line.
*2: ECM determines the start signal status by the signals of engine speed and battery voltage.

SYSTEM DESCRIPTION

The ignition timing is controlled by the ECM to maintain the best air-fuel ratio for every running condition of the engine. The ignition timing data is stored in the ECM. This data forms the map shown.
The ECM receives information such as the injection pulse width and camshaft position sensor signal. Computing this information, ignition signals are transmitted to the power transistor.
e.g., N: 1,800 rpm, Tp: 1.50 msec
A °BTDC
During the following conditions, the ignition timing is revised by the ECM according to the other data stored in the ECM.



- At starting
- During warm-up

- At idle
- At low battery voltage
- During acceleration

The knock sensor retard system is designed only for emergencies. The basic ignition timing is programmed within the anti-knocking zone, if recommended fuel is used under dry conditions. The retard system does not operate under normal driving conditions. If engine knocking occurs, the knock sensor monitors the condition. The signal is transmitted to the ECM. The ECM retards the ignition timing to eliminate the knocking condition.

Air Conditioning Cut Control

ABS009AN

INPUT/OUTPUT SIGNAL CHART

Sensor	Input Signal to ECM	ECM function	Actuator
Air conditioner switch*1	Air conditioner ON signal	Air conditioner cut control	Air conditioner relay
Throttle position sensor	Throttle position		
Accelerator pedal position sensor	Accelerator pedal position		
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed*2		
Engine coolant temperature sensor	Engine coolant temperature		
Battery	Battery voltage*2		
Refrigerant pressure sensor	Refrigerant pressure		
Power steering pressure sensor	Power steering operation		
Wheel sensor*1	Vehicle speed		

*1: This signal is sent to the ECM through CAN communication line.
*2: ECM determines the start signal status by the signals of engine speed and battery voltage.

SYSTEM DESCRIPTION

This system improves engine operation when the air conditioner is used.
Under the following conditions, the air conditioner is turned OFF.

- When the accelerator pedal is fully depressed.
- When cranking the engine.
- At high engine speeds.
- When the engine coolant temperature becomes excessively high.
- When operating power steering during low engine speed or low vehicle speed.
- When engine speed is excessively low.
- When refrigerant pressure is excessively low or high.

Fuel Cut Control (at No Load and High Engine Speed)

ABS009AO

INPUT/OUTPUT SIGNAL CHART

Sensor	Input Signal to ECM	ECM function	Actuator
Park/neutral position (PNP) switch	Neutral position	Fuel cut control	Fuel injector
Accelerator pedal position sensor	Accelerator pedal position		
Engine coolant temperature sensor	Engine coolant temperature		
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed		
Wheel sensor*	Vehicle speed		

*: This signal is sent to the ECM through CAN communication line.

SYSTEM DESCRIPTION

If the engine speed is above 1,800 rpm under no load (for example, the shift position is neutral and engine speed is over 1,800 rpm) fuel will be cut off after some time. The exact time when the fuel is cut off varies based on engine speed.
Fuel cut will be operated until the engine speed reaches 1,500 rpm, then fuel cut will be cancelled.

NOTE:
This function is different from deceleration control listed under Multiport Fuel Injection (MFI) System, EC-25 .

CAN communication

ABS009AP

SYSTEM DESCRIPTION

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.
Refer to LAN-5, "CAN Communication Unit" , about CAN communication for detail.

BASIC SERVICE PROCEDURE

PFP:00018

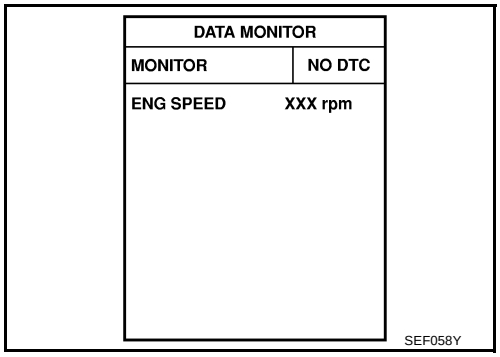
Idle Speed and Ignition Timing Check

ABS009AQ

IDLE SPEED

With CONSULT-II

Check idle speed in “DATA MONITOR” mode with CONSULT-II.



With GST

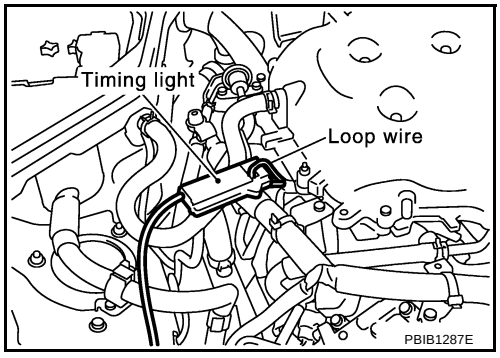
Check idle speed with GST.

IGNITION TIMING

Any of following two methods may be used.

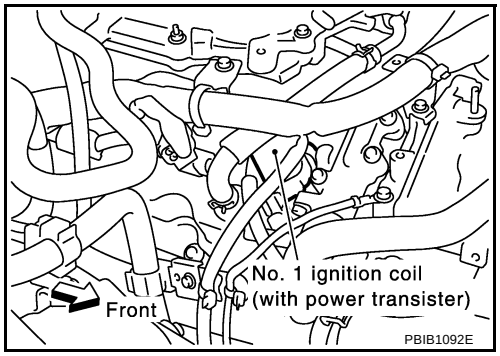
Method A

1. Attach timing light to loop wire as shown.
2. Check ignition timing.

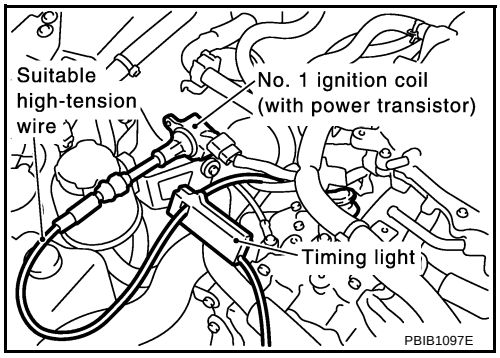


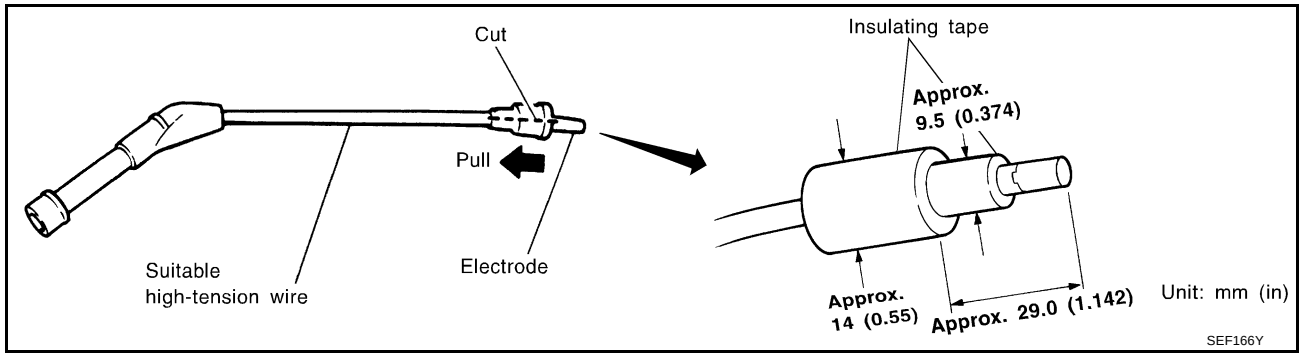
Method B

1. Remove No. 1 ignition coil.

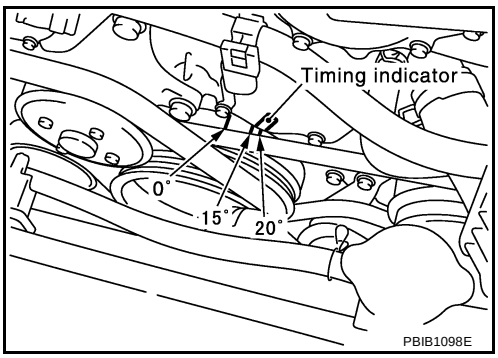


2. Connect No. 1 ignition coil and No. 1 spark plug with suitable high-tension wire as shown, and attach timing light clamp to this wire.





3. Check ignition timing.



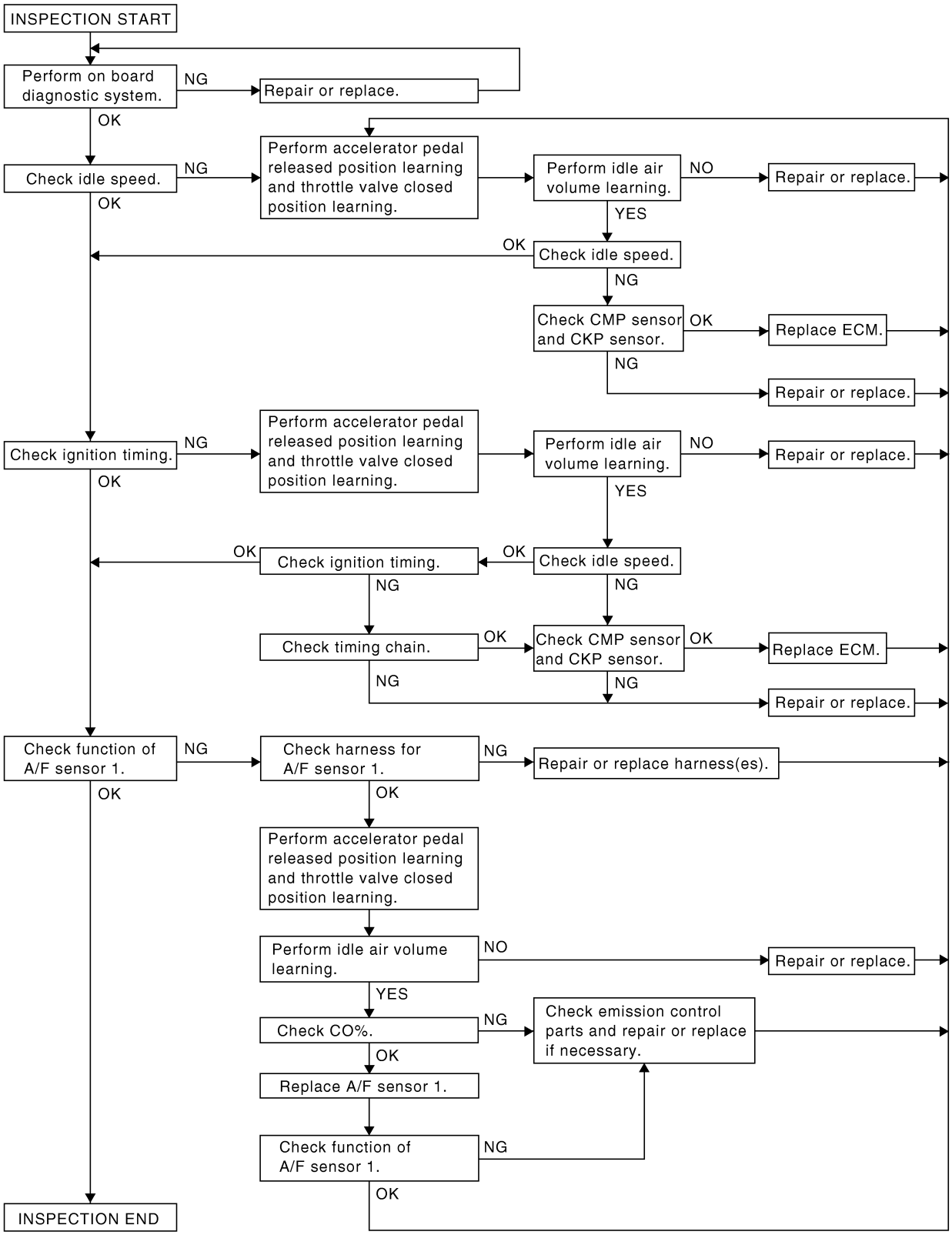
Idle Speed/Ignition Timing/Idle Mixture Ratio Adjustment

ABS009AR

PREPARATION

1. Make sure that the following parts are in good order.
   - Battery
   - Ignition system
   - Engine oil and coolant levels
   - Fuses
   - ECM harness connector
   - Vacuum hoses
   - Air intake system
     (Oil filler cap, oil level gauge, etc.)
   - Fuel pressure
   - Engine compression
   - Throttle valve
   - Evaporative emission system
2. On air conditioner equipped models, checks should be carried out while the air conditioner is OFF.
3. On automatic transmission equipped models, when checking idle rpm, ignition timing and mixture ratio, checks should be carried out while shift lever is in N position.
4. When measuring CO percentage, insert probe more than 40 cm (15.7 in) into tail pipe.
5. Turn OFF headlamp, heater blower, rear window defogger.
6. Keep front wheels pointed straight ahead.

OVERALL INSPECTION SEQUENCE



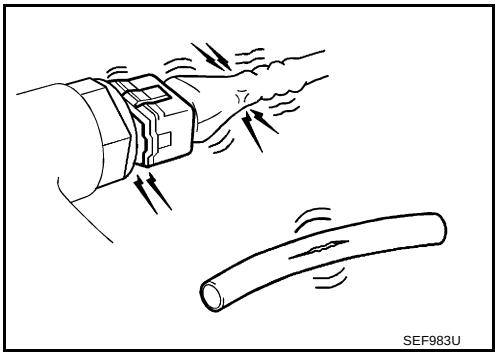
NOTE:
If a vehicle contains a part which is operating outside of design specifications with no MIL illumination, the part shall not be replaced prior to emission testing unless it is determined that the part has been tampered with or abused in such a way that the diagnostic system cannot reasonably be expected to detect the resulting malfunction.

PBIB2086E

INSPECTION PROCEDURE

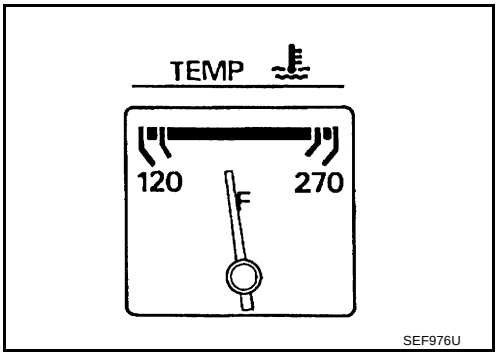
1. INSPECTION START

1. Check service records for any recent repairs that may indicate a related malfunction, or a current need for scheduled maintenance.
2. Open engine hood and check the following:
- Harness connectors for improper connections
- Wiring harness for improper connections, pinches and cut
- Vacuum hoses for splits, kinks and improper connections
- Hoses and ducts for leaks
- Air cleaner clogging
- Gasket



3. Confirm that electrical or mechanical loads are not applied.
- Head lamp switch is OFF.
- Air conditioner switch is OFF.
- Rear window defogger switch is OFF.
- Steering wheel is in the straight-ahead position, etc.

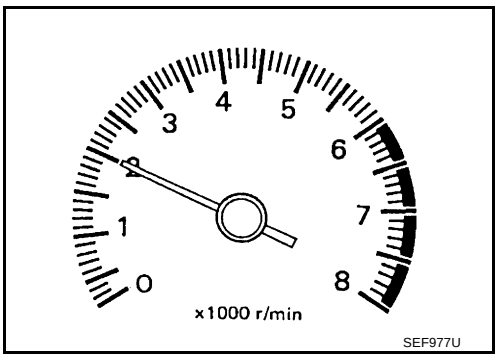
4. Start engine and warm it up until engine coolant temperature indicator points the middle of gauge.
Ensure engine stays below 1,000 rpm.



5. Run engine at about 2,000 rpm for about 2 minutes under no-load.
6. Make sure that no DTC is displayed with CONSULT-II or GST.

OK or NG

OK >> GO TO 3.
NG >> GO TO 2.



2. REPAIR OR REPLACE

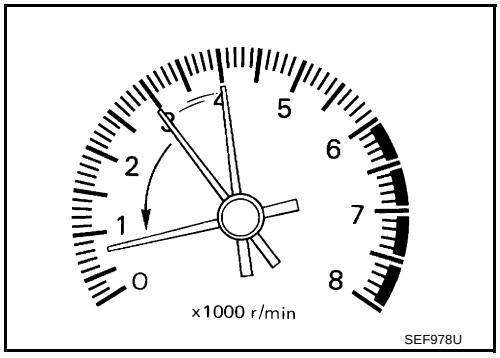
Repair or replace components as necessary according to corresponding Diagnostic Procedure.

>> GO TO 3.

3. CHECK TARGET IDLE SPEED

With CONSULT-II

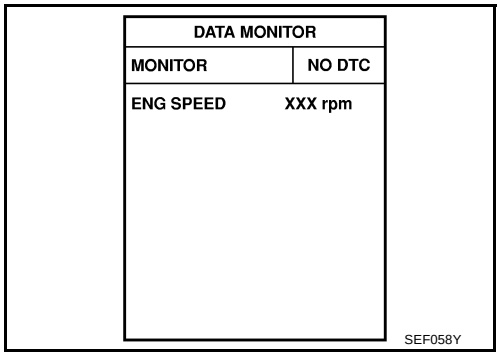
1. Run engine at about 2,000 rpm for about 2 minutes under no-load.
2. Rev engine (2,000 to 3,000 rpm) two or three times under no-load, then run engine at idle speed for about 1 minute.



3. Read idle speed in “DATA MONITOR” mode with CONSULT-II.

   A/T: 650 ± 50 rpm (in P or N position)

   M/T: 650 ± 50 rpm



Without CONSULT-II

1. Run engine at about 2,000 rpm for about 2 minutes under no-load.
2. Rev engine (2,000 to 3,000 rpm) two or three times under no-load, then run engine at idle speed for about 1 minute.
3. Check idle speed.

   A/T: 650 ± 50 rpm (in P or N position)

   M/T: 650 ± 50 rpm

OK or NG

OK >> GO TO 10.
NG >> GO TO 4.

4. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

1. Stop engine.
2. Perform EC-42, "Accelerator Pedal Released Position Learning" .

>> GO TO 5.

5. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform EC-42, "Throttle Valve Closed Position Learning" .

>> GO TO 6.

6. PERFORM IDLE AIR VOLUME LEARNING

Perform EC-43, "Idle Air Volume Learning" .
Is Idle Air Volume Learning carried out successfully?

Yes or No

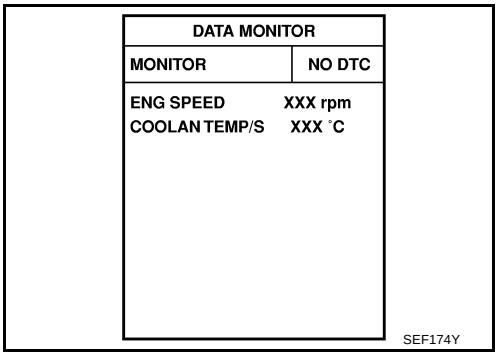
Yes >> GO TO 7.
No >> 1. Follow the instruction of Idle Air Volume Learning.
2. GO TO 4.

7. CHECK TARGET IDLE SPEED AGAIN

With CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Read idle speed in “DATA MONITOR” mode with CONSULT-II.

A/T: 650 ± 50 rpm (in P or N position)
M/T: 650 ± 50 rpm



Without CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Check idle speed.

A/T: 650 ± 50 rpm (in P or N position)
M/T: 650 ± 50 rpm

OK or NG

OK >> GO TO 10.
NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Check camshaft position sensor (PHASE) and circuit. Refer to EC-274 .
- Check crankshaft position sensor (POS) and circuit. Refer to EC-267 .

OK or NG

OK >> GO TO 9.
NG >> 1. Repair or replace.
2. GO TO 4.

9. CHECK ECM FUNCTION

1. Substitute another known-good ECM to check ECM function. (ECM may be the cause of an incident, but this is a rare case.)
2. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs. Refer to BL-160, "ECM Re-communicating Function" .

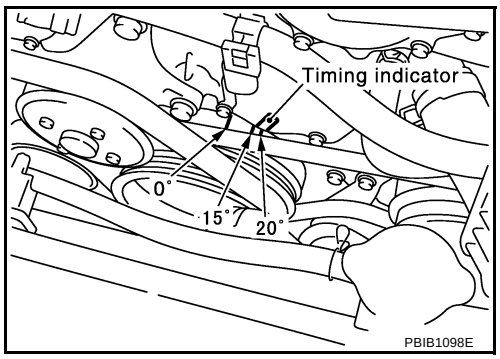
>> GO TO 4.

10. CHECK IGNITION TIMING

1. Run engine at idle.
2. Check ignition timing with a timing light.

A/T: 15 ± 5° BTDC (in P or N position)

M/T: 15 ± 5° BTDC



OK or NG

OK (With CONSULT-II)>>GO TO 19.
OK (Without CONSULT-II)>>GO TO 20.
NG >> GO TO 11.

11. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

1. Stop engine.
2. Perform EC-42, "Accelerator Pedal Released Position Learning" .

>> GO TO 12.

12. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform EC-42, "Throttle Valve Closed Position Learning" .

>> GO TO 13.

13. PERFORM IDLE AIR VOLUME LEARNING

Perform EC-43, "Idle Air Volume Learning" .

Is Idle Air Volume Learning carried out successfully?

Yes or No

Yes >> GO TO 14.
No >> 1. Follow the instruction of Idle Air Volume Learning.
2. GO TO 4.

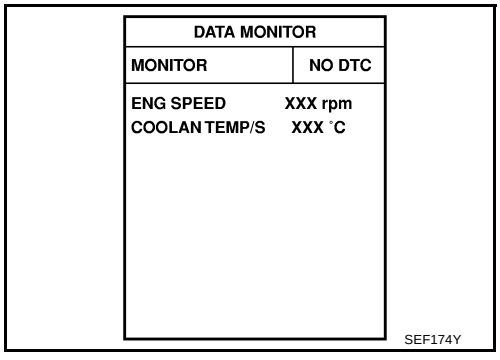
14. CHECK TARGET IDLE SPEED AGAIN

With CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Read idle speed in “DATA MONITOR” mode with CONSULT-II.

A/T: 650 ± 50 rpm (in P or N position)

M/T: 650 ± 50 rpm



Without CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Check idle speed.

A/T: 650 ± 50 rpm (in P or N position)

M/T: 650 ± 50 rpm

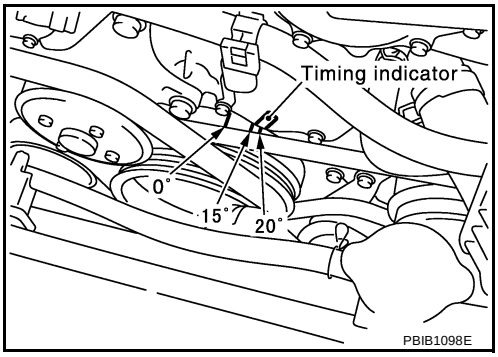
OK or NG

OK >> GO TO 15.
NG >> GO TO 17.

15. CHECK IGNITION TIMING AGAIN

1. Run engine at idle.
2. Check ignition timing with a timing light.

A/T: 15 ± 5° BTDC (in P or N position)
M/T: 15 ± 5° BTDC



OK or NG

OK (With CONSULT-II)>>GO TO 19.
OK (Without CONSULT-II)>>GO TO 20.
NG >> GO TO 16.

16. CHECK TIMING CHAIN INSTALLATION

Check timing chain installation. Refer to EM-55, "TIMING CHAIN" .

OK or NG

OK >> GO TO 17.
NG >> 1. Repair the timing chain installation.
2. GO TO 4.

17. DETECT MALFUNCTIONING PART

Check the following.

- Check camshaft position sensor (PHASE) and circuit. Refer to EC-274 .
- Check crankshaft position sensor (POS) and circuit. Refer to EC-267 .

OK or NG

OK >> GO TO 18.
NG >> 1. Repair or replace.
2. GO TO 4.

18. CHECK ECM FUNCTION

1. Substitute another known-good ECM to check ECM function. (ECM may be the cause of an incident, but this is a rare case.)
2. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs. Refer to BL-160, "ECM Re-communicating Function" .

>> GO TO 4.

19. CHECK AIR FUEL RATIO (A/F) SENSOR 1 FUNCTION

With CONSULT-II

1. Turn ignition switch OFF and wait at a least 10 seconds.
2. Start engine and warm it up to normal operating temperature.
3. Drive the vehicle at a speed of 80 km/h (50 MPH) for a few minutes in D position with “OD” OFF (A/T models) or 5th position (M/T models).

   NOTE:
   Keep the accelerator pedal as steady as possible during the cruising.
4. Set “OD” ON, then release the accelerator pedal fully until the vehicle speed decreases to 50 km/h (30 MPH).

   NOTE:
   Never apply brake during releasing the accelerator pedal.
5. Repeat steps 3 to 4 for five times.
6. Stop the vehicle and connect CONSULT-II to the vehicle.
7. Make sure that no (1st trip) DTC is displayed in “SELF-DIAG RESULTS” mode.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 21.

20. CHECK AIR FUEL RATIO (A/F) SENSOR 1 FUNCTION

Without CONSULT-II

1. Turn ignition switch OFF and wait at a least 10 seconds.
2. Start engine and warm it up to normal operating temperature.
3. Drive the vehicle at a speed of 80 km/h (50 MPH) for a few minutes in D position with “OD” OFF (A/T models) or 5th position (M/T models).

   NOTE:
   Keep the accelerator pedal as steady as possible during the cruising.
4. Set “OD” ON, then release the accelerator pedal fully until the vehicle speed decreases to 50 km/h (30 MPH).

   NOTE:
   Never apply brake during releasing the accelerator pedal.
5. Repeat steps 3 to 4 for five times.
6. Stop the vehicle and connect GST to the vehicle.
7. Make sure that no (1st trip) DTC is displayed.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 21.

21. CHECK AIR FUEL RATIO (A/F) SENSOR 1 HARNESS

1. Turn ignition switch OFF and disconnect battery ground cable.
2. Disconnect ECM harness connector.
3. Disconnect A/F sensor 1 harness connector.
4. Check harness continuity between the following terminals. Refer to EC-464, "Wiring Diagram" .

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	16	1	76
2	75	2	77
4	2	4	24
5	35	5	57
6	56	6	58

Continuity should exist.

5. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 22.
NG >> 1. Repair open circuit or short to ground or short to power in harness or connectors between ECM and A/F sensor 1.
2. GO TO 4.

22. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

1. Reconnect ECM harness connector.
2. Perform EC-42, "Accelerator Pedal Released Position Learning" .

>> GO TO 23.

23. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform EC-42, "Throttle Valve Closed Position Learning" .

>> GO TO 24.

24. PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-43, "Idle Air Volume Learning" .
Is Idle Air Volume Learning carried out successfully?

Yes or No

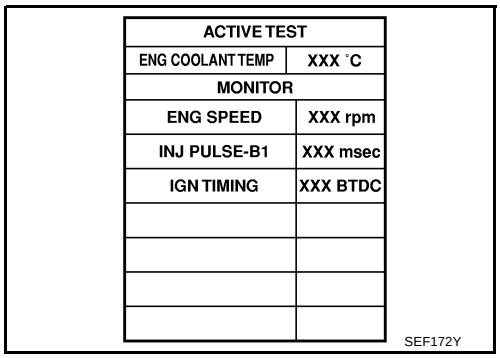
Yes (With CONSULT-II)>>GO TO 25.
Yes (Without CONSULT-II)>>GO TO 26.
No >> 1. Follow the instruction of Idle Air Volume Learning.
2. GO TO 4.

25. CHECK CO%

With CONSULT-II

1. Start engine and warm it up until engine coolant temperature indicator points the middle of gauge.
2. Turn ignition switch OFF, wait at least 10 seconds and then turn ON.
3. Select “ENG COOLANT TEMP” in “ACTIVE TEST” mode.
4. Set “ENG COOLANT TEMP” to 5°C (41°F) by touching “DOWN” and “Qd”.
5. Start engine and rev it (2,000 to 3,000 rpm) two or three times under no-load, then run engine at idle speed.
6. Check CO%.

Idle CO: 0.7 – 9.9% and engine runs smoothly.



OK or NG

OK >> GO TO 28.
NG >> GO TO 27.

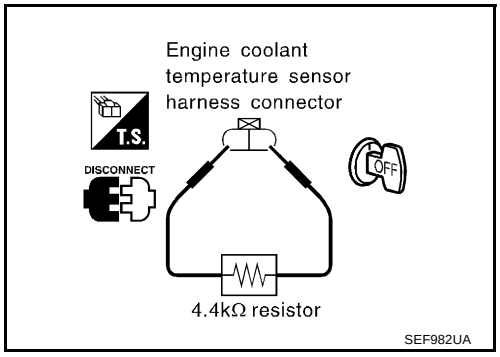
26. CHECK CO%

Without CONSULT-II

1. Start engine and warm it up until engine coolant temperature indicator points to the middle of gauge.
2. Turn ignition switch OFF.
3. Disconnect engine coolant temperature sensor harness connector.
4. Connect a resistor (4.4 kΩ) between terminals of engine coolant temperature sensor harness connector.
5. Start engine and rev it (2,000 to 3,000 rpm) two or three times under no-load, then run engine at idle speed.
6. Check CO%.

Idle CO: 0.7 – 9.9% and engine runs smoothly.

7. After checking CO%, turn ignition switch OFF, disconnect the resistor from the terminals of engine coolant temperature sensor harness connector, and then connect engine coolant temperature sensor harness connector to engine coolant temperature sensor.



OK or NG

OK >> GO TO 28.
NG >> GO TO 27.

27. RECONNECT AIR FUEL RATIO (A/F) SENSOR 1 HARNESS CONNECTOR

1. Turn ignition switch OFF.
2. Reconnect A/F sensor 1 harness connector.

>> GO TO 31.

28. REPLACE AIR FUEL RATIO (A/F) SENSOR 1

1. Stop engine.
2. Replace A/F sensor 1 on the malfunctioning bank.

With CONSULT-II>>GO TO 29.
Without CONSULT-II>>GO TO 30.

29. CHECK AIR FUEL RATIO (A/F) SENSOR 1 FUNCTION

With CONSULT-II

1. Turn ignition switch OFF and wait at a least 10 seconds.
2. Start engine and warm it up to normal operating temperature.
3. Drive the vehicle at a speed of 80 km/h (50 MPH) for a few minutes in D position with “OD” OFF (A/T models) or 5th position (M/T models).

   NOTE:
   Keep the accelerator pedal as steady as possible during the cruising.
4. Set “OD” ON, then release the accelerator pedal fully until the vehicle speed decreases to 50 km/h (30 MPH).

   NOTE:
   Never apply brake during releasing the accelerator pedal.
5. Repeat steps 3 to 4 for five times.
6. Stop the vehicle and connect CONSULT-II to the vehicle.
7. Make sure that no (1st trip) DTC is displayed in “SELF-DIAG RESULTS” mode.

OK or NG

OK >> GO TO 4.
NG >> GO TO 31.

30. CHECK AIR FUEL RATIO (A/F) SENSOR 1 FUNCTION

Without CONSULT-II

1. Turn ignition switch OFF and wait at a least 10 seconds.
2. Start engine and warm it up to normal operating temperature.
3. Drive the vehicle at a speed of 80 km/h (50 MPH) for a few minutes in D position with “OD” OFF (A/T models) or 5th position (M/T models).

   NOTE:
   Keep the accelerator pedal as steady as possible during the cruising.
4. Set “OD” ON, then release the accelerator pedal fully until the vehicle speed decreases to 50 km/h (30 MPH).

   NOTE:
   Never apply brake during releasing the accelerator pedal.
5. Repeat steps 3 to 4 for five times.
6. Stop the vehicle and connect GST to the vehicle.
7. Make sure that no (1st trip) DTC is displayed.

OK or NG

OK >> GO TO 4.
NG >> GO TO 31.

31. DETECT MALFUNCTIONING PART

Check the following.

- Check fuel pressure regulator and repair or replace if necessary. Refer to EC-45, "Fuel Pressure Check" .
- Check mass air flow sensor and its circuit, and repair or replace if necessary. Refer to EC-153 and EC-162 .
- Check injector and its circuit, and repair or replace if necessary. Refer to EC-632 .
- Check engine coolant temperature sensor and its circuit, and repair or replace if necessary. Refer to EC-176 and EC-190 .

OK or NG

OK >> GO TO 33.
NG >> 1. Repair or replace.
2. GO TO 32.

32. ERASE UNNECESSARY DTC

After this inspection, unnecessary DTC might be displayed.
Erase the stored memory in ECM and TCM. Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" and AT-38, "HOW TO ERASE DTC" .

>> GO TO 4.

33. CHECK ECM FUNCTION

1. Substitute another known-good ECM to check ECM function. (ECM may be the cause of an incident, but this is a rare case.)
2. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs. Refer to BL-160, "ECM Re-communicating Function" .

>> GO TO 4.

VIN Registration

ABS00B4Q

DESCRIPTION

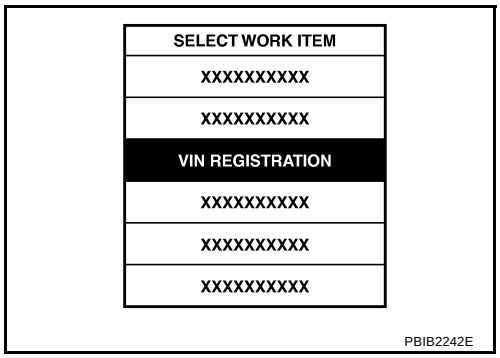
VIN Registration is an operation to registering VIN in ECM. It must be performed each time ECM is replaced.

NOTE:
Accurate VIN which is registered in ECM may be required for Inspection & Maintenance (I/M).

OPERATION PROCEDURE

With CONSULT-II

1. Check the VIN of the vehicle and note it. Refer to GI-48, "IDENTIFICATION INFORMATION" .
2. Turn ignition switch ON and engine stopped.
3. Select “VIN REGISTRATION” in “WORK SUPPORT” mode.
4. Follow the instruction of CONSULT-II display.



Accelerator Pedal Released Position Learning

ABS009AS

DESCRIPTION

Accelerator Pedal Released Position Learning is an operation to learn the fully released position of the accelerator pedal by monitoring the accelerator pedal position sensor output signal. It must be performed each time harness connector of accelerator pedal position sensor or ECM is disconnected.

OPERATION PROCEDURE

1. Make sure that accelerator pedal is fully released.
2. Turn ignition switch ON and wait at least 2 seconds.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Turn ignition switch ON and wait at least 2 seconds.
5. Turn ignition switch OFF and wait at least 10 seconds.

Throttle Valve Closed Position Learning

ABS009AT

DESCRIPTION

Throttle Valve Closed Position Learning is an operation to learn the fully closed position of the throttle valve by monitoring the throttle position sensor output signal. It must be performed each time harness connector of electric throttle control actuator or ECM is disconnected.

OPERATION PROCEDURE

1. Make sure that accelerator pedal is fully released.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.
   Make sure that throttle valve moves during above 10 seconds by confirming the operating sound.

Idle Air Volume Learning

ABS009AU

DESCRIPTION

Idle Air Volume Learning is an operation to learn the idle air volume that keeps each engine within the specific range. It must be performed under any of the following conditions:

- Each time electric throttle control actuator or ECM is replaced.
- Idle speed or ignition timing is out of specification.

PREPARATION

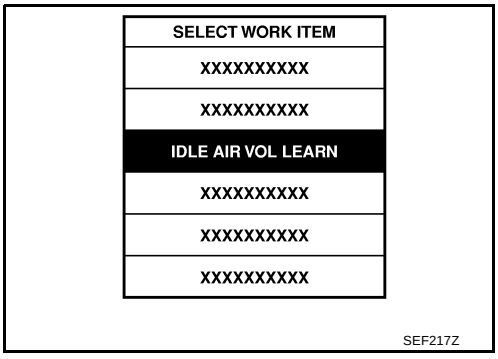
Before performing Idle Air Volume Learning, make sure that all of the following conditions are satisfied. Learning will be cancelled if any of the following conditions are missed for even a moment.

- Battery voltage: More than 12.9V (At idle)
- Engine coolant temperature: 70 - 100°C (158 - 212°F)
- PNP switch: ON
- Electric load switch: OFF
  (Air conditioner, headlamp, rear window defogger)
  On vehicles equipped with daytime light systems, if the parking brake is applied before the engine is started, the headlamp will not be illuminated.
- Steering wheel: Neutral (Straight-ahead position)
- Vehicle speed: Stopped
- Transmission: Warmed-up
  For A/T models with CONSULT-II, drive vehicle until “ATF TEMP SE 1” in “DATA MONITOR” mode of “A/T” system indicates less than 0.9V.
  For A/T models without CONSULT-II and M/T models, drive vehicle for 10 minutes.

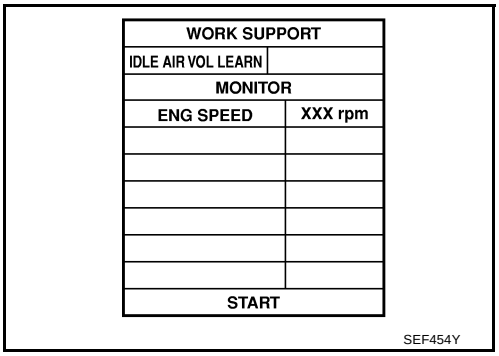
OPERATION PROCEDURE

With CONSULT-II

1. Perform EC-42, "Accelerator Pedal Released Position Learning" .
2. Perform EC-42, "Throttle Valve Closed Position Learning" .
3. Start engine and warm it up to normal operating temperature.
4. Check that all items listed under the topic PREPARATION (previously mentioned) are in good order.
5. Select “IDLE AIR VOL LEARN” in “WORK SUPPORT” mode.

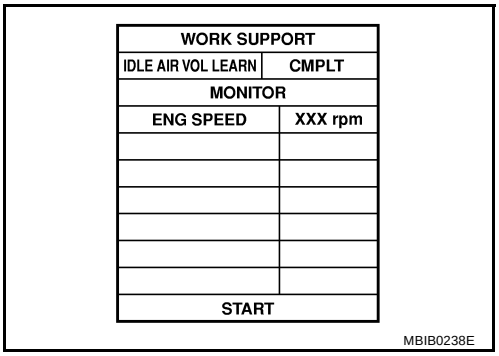


6. Touch “START” and wait 20 seconds.



7. Make sure that “CMPLT” is displayed on CONSULT-II screen. If “CMPLT” is not displayed, Idle Air Volume Learning will not be carried out successfully. In this case, find the cause of the incident by referring to the DIAGNOSIS PROCEDURE below.
8. Rev up the engine two or three times and make sure that idle speed and ignition timing are within the specifications.

ITEM	SPECIFICATION
Idle speed	A/T: 650±50 rpm (in P or N position) M/T: 650±50 rpm
Ignition timing	A/T: 15±5° BTDC (in P or N position) M/T: 15±5° BTDC



Without CONSULT-II

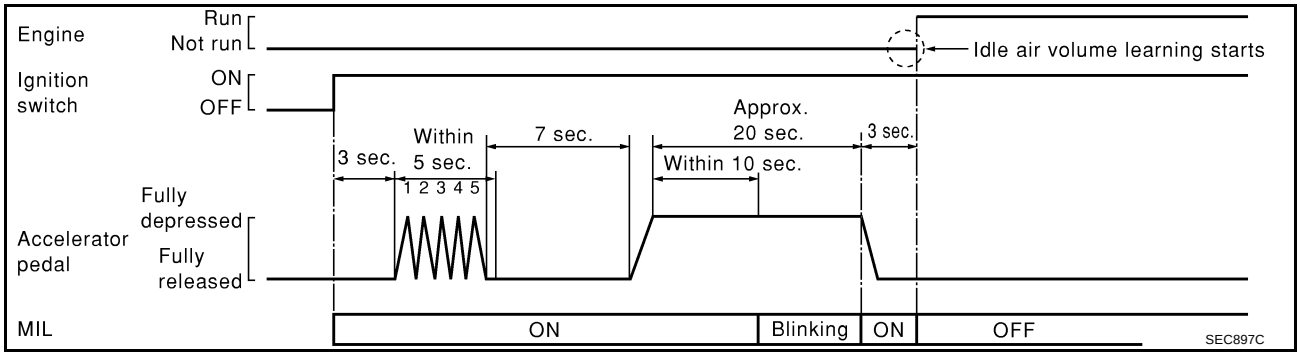
NOTE:

- **It is better to count the time accurately with a clock.**
- **It is impossible to switch the diagnostic mode when an accelerator pedal position sensor circuit has a malfunction.**

1. Perform EC-42, "Accelerator Pedal Released Position Learning" .
2. Perform EC-42, "Throttle Valve Closed Position Learning" .
3. Start engine and warm it up to normal operating temperature.
4. Check that all items listed under the topic PREPARATION (previously mentioned) are in good order.
5. Turn ignition switch OFF and wait at least 10 seconds.
6. Confirm that accelerator pedal is fully released, turn ignition switch ON and wait 3 seconds.
7. Repeat the following procedure quickly five times within 5 seconds.

a. Fully depress the accelerator pedal.
b. Fully release the accelerator pedal.

8. Wait 7 seconds, fully depress the accelerator pedal and keep it for approx. 20 seconds until the MIL stops blinking and turned ON.
9. Fully release the accelerator pedal within 3 seconds after the MIL turned ON.
10. Start engine and let it idle.
11. Wait 20 seconds.



12. Rev up the engine two or three times and make sure that idle speed and ignition timing are within the specifications.

ITEM	SPECIFICATION
Idle speed	A/T: 650±50 rpm (in P or N position) M/T: 650±50 rpm
Ignition timing	A/T: 15±5° BTDC (in P or N position) M/T: 15±5° BTDC

13. If idle speed and ignition timing are not within the specification, Idle Air Volume Learning will not be carried out successfully. In this case, find the cause of the incident by referring to the DIAGNOSTIC PROCEDURE below.

DIAGNOSTIC PROCEDURE

If idle air volume learning cannot be performed successfully, proceed as follows:

1. **Check that throttle valve is fully closed.**
2. **Check PCV valve operation.**
3. **Check that downstream of throttle valve is free from air leakage.**
4. **When the above three items check out OK, engine component parts and their installation condition are questionable. Check and eliminate the cause of the incident.**
   It is useful to perform EC-124, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .
5. **If any of the following conditions occur after the engine has started, eliminate the cause of the incident and perform Idle Air Volume Learning all over again:**
   - **Engine stalls.**
   - **Erroneous idle.**

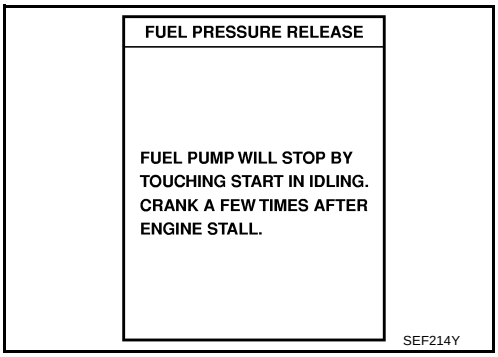
Fuel Pressure Check

ABS009AV

FUEL PRESSURE RELEASE

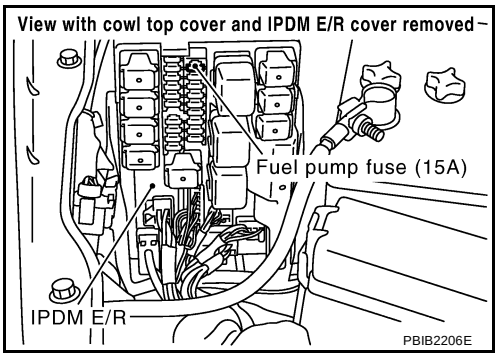
With CONSULT-II

1. Turn ignition switch ON.
2. Perform “FUEL PRESSURE RELEASE” in “WORK SUPPORT” mode with CONSULT-II.
3. Start engine.
4. After engine stalls, crank it two or three times to release all fuel pressure.
5. Turn ignition switch OFF.



Without CONSULT-II

1. Remove fuel pump fuse located in IPDM E/R.
2. Start engine.
3. After engine stalls, crank it two or three times to release all fuel pressure.
4. Turn ignition switch OFF.
5. Reinstall fuel pump fuse after servicing fuel system.

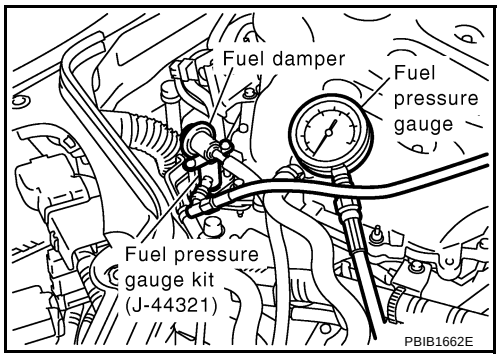


FUEL PRESSURE CHECK

Before disconnecting fuel line, release fuel pressure from fuel line to eliminate danger.

NOTE:
Prepare pans or saucers under the disconnected fuel line because the fuel may spill out. The fuel pressure cannot be completely released because Z33 models do not have fuel return system.
Use Fuel Pressure Gauge Kit (J-44321) to check fuel pressure.

1. Release fuel pressure to zero. Refer to EC-45, "FUEL PRESSURE RELEASE" .
2. Install the inline fuel quick disconnected fitting between fuel damper and injector tube.
3. Connect the fuel pressure test gauge (quick connector adapter hose) to the inline fuel quick disconnected fitting.
4. Turn ignition switch ON and check for fuel leakage.
5. Start engine and check for fuel leakage.
6. Read the indication of fuel pressure gauge.



At idling: Approximately 350 kPa (3.57 kg/cm^2 , 51 psi)

7. If result is unsatisfactory, go to next step.
8. Check the following.
   - Fuel hoses and fuel tubes for clogging
   - Fuel filter for clogging
   - Fuel pump
   - Fuel pressure regulator for clogging

   If OK, replace fuel pressure regulator.
   If NG, repair or replace.

ON BOARD DIAGNOSTIC (OBD) SYSTEM

PFP:00028

Introduction

ABS009AW

The ECM has an on board diagnostic system, which detects malfunctions related to engine sensors or actuators. The ECM also records various emission-related diagnostic information including:

Emission-related diagnostic information	SAE Mode
Diagnostic Trouble Code (DTC)	Mode 3 of SAE J1979
Freeze Frame data	Mode 2 of SAE J1979
System Readiness Test (SRT) code	Mode 1 of SAE J1979
1st Trip Diagnostic Trouble Code (1st Trip DTC)	Mode 7 of SAE J1979
1st Trip Freeze Frame data	
Test values and Test limits	Mode 6 of SAE J1979
Calibration ID	Mode 9 of SAE J1979

The above information can be checked using procedures listed in the table below.

×: Applicable —: Not applicable

	DTC	1st trip DTC	Freeze Frame data	1st trip Freeze Frame data	SRT code	Test value
CONSULT-II	×	×	×	×	×	—
GST	×	×	×	—	×	×
ECM	×	×	—	—	—	—

*: When DTC and 1st trip DTC simultaneously appear on the display, they cannot be clearly distinguished from each other.

The malfunction indicator lamp (MIL) on the instrument panel lights up when the same malfunction is detected in two consecutive trips (Two trip detection logic), or when the ECM enters fail-safe mode. (Refer to EC-77 .)

Two Trip Detection Logic

ABS009AX

When a malfunction is detected for the first time, 1st trip DTC and 1st trip Freeze Frame data are stored in the ECM memory. The MIL will not light up at this stage. <1st trip>
If the same malfunction is detected again during the next drive, the DTC and Freeze Frame data are stored in the ECM memory, and the MIL lights up. The MIL lights up at the same time when the DTC is stored. <2nd trip> The “trip” in the “Two Trip Detection Logic” means a driving mode in which self-diagnosis is performed during vehicle operation. Specific on board diagnostic items will cause the ECM to light up or blink the MIL, and store DTC and Freeze Frame data, even in the 1st trip, as shown below.

×: Applicable —: Not applicable

Items	MIL				DTC		1st trip DTC	
	1st trip		2nd trip		1st trip displaying	2nd trip displaying	1st trip displaying	2nd trip displaying
	Blinking	Lighting up	Blinking	Lighting up				
Misfire (Possible three way catalyst damage) — DTC: P0300 - P0306 is being detected	×	—	—	—	—	—	×	—
Misfire (Possible three way catalyst damage) — DTC: P0300 - P0306 is being detected	—	—	×	—	—	×	—	—
One trip detection diagnoses (Refer to EC-8 .)	—	×	—	—	×	—	—	—
Except above	—	—	—	×	—	×	×	—

When there is an open circuit on MIL circuit, the ECM cannot warn the driver by lighting up MIL when there is malfunction on engine control system.
Therefore, when electrical controlled throttle and part of ECM related diagnoses are continuously detected as NG for 5 trips, ECM warns the driver that engine control system malfunctions and MIL circuit is open by means of operating fail-safe function.

The fail-safe function also operates when above diagnoses except MIL circuit are detected and demands the driver to repair the malfunction.

Engine operating condition in fail-safe mode	Engine speed will not rise more than 2,500 rpm due to the fuel cut

Emission-related Diagnostic Information

ABS009AY

EMISSION-RELATED DIAGNOSTIC INFORMATION ITEMS

Items (CONSULT-II screen terms)	DTC*1		SRT code	Test value/ Test limit (GST only)	1st trip DTC	Reference page
	CONSULT-II GST*2	ECM*3				
CAN COMM CIRCUIT	U1000	1000*5	—	—	— (A/T) × (M/T)	EC-138
CAN COMM CIRCUIT	U1001	1001*5	—	—	×	EC-138
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	**P0000**	**0000**	—	—	—	—
INT/V TIM CONT-B1	P0011	0011	—	—	×	EC-141
INT/V TIM CONT-B2	P0021	0021	—	—	×	EC-141
HO2S2 HTR (B1)	P0037	0037	×	×	×	EC-144
HO2S2 HTR (B1)	P0038	0038	×	×	×	EC-144
HO2S2 HTR (B2)	P0057	0057	×	×	×	EC-144
HO2S2 HTR (B2)	P0058	0058	×	×	×	EC-144
MAF SEN/CIRCUIT	P0101	0101	—	—	—	EC-153
MAF SEN/CIRCUIT	P0102	0102	—	—	—	EC-162
MAF SEN/CIRCUIT	P0103	0103	—	—	—	EC-162
IAT SEN/CIRCUIT	P0112	0112	—	—	×	EC-170
IAT SEN/CIRCUIT	P0113	0113	—	—	×	EC-170
ECT SEN/CIRCUIT	P0117	0117	—	—	—	EC-176
ECT SEN/CIRCUIT	P0118	0118	—	—	—	EC-176
TP SEN 2/CIRC	P0122	0122	—	—	—	EC-182
TP SEN 2/CIRC	P0123	0123	—	—	—	EC-182
ECT SENSOR	P0125	0125	—	—	—	EC-190
IAT SENSOR	P0127	0127	—	—	×	EC-194
THERMSTAT FNCTN	P0128	0128	—	—	×	EC-197
HO2S2 (B1)	P0138	0138	—	×	×	EC-199
HO2S2 (B1)	P0139	0139	×	×	×	EC-208
HO2S2 (B2)	P0158	0158	—	×	×	EC-199
HO2S2 (B2)	P0159	0159	×	×	×	EC-208
FUEL SYS-LEAN-B1	P0171	0171	—	—	×	EC-219
FUEL SYS-RICH-B1	P0172	0172	—	—	×	EC-228
FUEL SYS-LEAN-B2	P0174	0174	—	—	×	EC-219
FUEL SYS-RICH-B2	P0175	0175	—	—	×	EC-228
FTT SENSOR	P0181	0181	—	—	×	EC-236
FTT SEN/CIRCUIT	P0182	0182	—	—	×	EC-242
FTT SEN/CIRCUIT	P0183	0183	—	—	×	EC-242
TP SEN 1/CIRC	P0222	0222	—	—	—	EC-247
TP SEN 1/CIRC	P0223	0223	—	—	—	EC-247
MULTI CYL MISFIRE	P0300	0300	—	—	×	EC-255

Items (CONSULT-II screen terms)	DTC*1		SRT code	Test value/ Test limit (GST only)	1st trip DTC	Reference page
	CONSULT-II GST*2	ECM*3				
CYL 1 MISFIRE	P0301	0301	—	—	×	EC-255
CYL 2 MISFIRE	P0302	0302	—	—	×	EC-255
CYL 3 MISFIRE	P0303	0303	—	—	×	EC-255
CYL 4 MISFIRE	P0304	0304	—	—	×	EC-255
CYL 5 MISFIRE	P0305	0305	—	—	×	EC-255
CYL 6 MISFIRE	P0306	0306	—	—	×	EC-255
KNOCK SEN/CIRC-B1	P0327	0327	—	—	×	EC-262
KNOCK SEN/CIRC-B1	P0328	0328	—	—	×	EC-262
CKP SEN/CIRCUIT	P0335	0335	—	—	×	EC-267
CMP SEN/CIRC-B1	P0340	0340	—	—	×	EC-274
CMP SEN/CIRC-B2	P0345	0345	—	—	×	EC-274
TW CATALYST SYS-B1	P0420	0420	×	×	×	EC-283
TW CATALYST SYS-B2	P0430	0430	×	×	×	EC-283
EVAP PURG FLOW/MON	P0441	0441	×	×	×	EC-287
EVAP SMALL LEAK	P0442	0442	×	×	×	EC-292
PURG VOLUME CONT/V	P0444	0444	—	—	×	EC-301
PURG VOLUME CONT/V	P0445	0445	—	—	×	EC-301
VENT CONTROL VALVE	P0447	0447	—	—	×	EC-308
EVAP SYS PRES SEN	P0451	0451	—	—	×	EC-317
EVAP SYS PRES SEN	P0452	0452	—	—	×	EC-320
EVAP SYS PRES SEN	P0453	0453	—	—	×	EC-329
EVAP GROSS LEAK	P0455	0455	—	—	×	EC-339
EVAP VERY SML LEAK	P0456	0456	×*4	×	×	EC-347
FUEL LEV SEN SLOSH	P0460	0460	—	—	×	EC-357
FUEL LEVEL SENSOR	P0461	0461	—	—	×	EC-359
FUEL LEVL SEN/CIRC	P0462	0462	—	—	×	EC-361
FUEL LEVL SEN/CIRC	P0463	0463	—	—	×	EC-361
VEH SPEED SEN/CIRC*6	P0500	0500	—	—	×	EC-363
ISC SYSTEM	P0506	0506	—	—	×	EC-365
ISC SYSTEM	P0507	0507	—	—	×	EC-367
PW ST P SEN/CIRC	P0550	0550	—	—	×	EC-369
ECM	P0605	0605	—	—	× or —	EC-375
TCM	P0700	0700	—	—	—	AT-107
PNP SW/CIRC	P0705	0705	—	—	×	AT-108
ATF TEMP SEN/CIRC	P0710	0710	—	—	×	AT-130
VEH SPD SEN/CIR AT*6	P0720	0720	—	—	×	AT-112
ENGINE SPEED SIG	P0725	0725	—	—	×	AT-117
TCC SOLENOID/CIRC	P0740	0740	—	—	×	AT-119
A/T TCC S/V FNCTN	P0744	0744	—	—	×	AT-121
L/PRESS SOL/CIRC	P0745	0745	—	—	×	AT-123
A/F SEN1 HTR (B1)	P1031	1031	×	×	×	EC-378
A/F SEN1 HTR (B1)	P1032	1032	×	×	×	EC-378

Items (CONSULT-II screen terms)	DTC*1		SRT code	Test value/ Test limit (GST only)	1st trip DTC	Reference page
	CONSULT-II GST*2	ECM*3				
A/F SEN1 HTR (B2)	P1051	1051	×	×	×	EC-378
A/F SEN1 HTR (B2)	P1052	1052	×	×	×	EC-378
ECM BACK UP/CIRC	P1065	1065	—	—	×	EC-385
INT/V TIM V/CIR-B1	P1111	1111	—	—	×	EC-389
ETC ACTR	P1121	1121	—	—	—	EC-396
ETC FUNCTION/CIRC	P1122	1122	—	—	—	EC-398
ETC MOT PWR	P1124	1124	—	—	—	EC-405
ETC MOT PWR	P1126	1126	—	—	—	EC-405
ETC MOT	P1128	1128	—	—	—	EC-410
INT/V TIM V/CIR-B2	P1136	1136	—	—	×	EC-389
HO2S2 (B1)	P1146	1146	×	×	×	EC-415
HO2S2 (B1)	P1147	1147	×	×	×	EC-426
CLOSED LOOP-B1	P1148	1148	—	—	—	EC-437
HO2S2 (B2)	P1166	1166	×	×	×	EC-415
HO2S2 (B2)	P1167	1167	×	×	×	EC-426
CLOSED LOOP-B2	P1168	1168	—	—	—	EC-437
TCS C/U FUNCTN	P1211	1211	—	—	×	EC-438
TCS/CIRC	P1212	1212	—	—	×	EC-439
ENG OVER TEMP	P1217	1217	—	—	—	EC-440
CTP LEARNING	P1225	1225	—	—	×	EC-453
CTP LEARNING	P1226	1226	—	—	×	EC-455
SENSOR POWER/CIRC	P1229	1229	—	—	—	EC-457
A/F SENSOR1 (B1)	P1271	1271	—	—	×	EC-462
A/F SENSOR1 (B1)	P1272	1272	—	—	×	EC-470
A/F SENSOR1 (B1)	P1273	1273	—	—	×	EC-478
A/F SENSOR1 (B1)	P1274	1274	—	—	×	EC-487
A/F SENSOR1 (B1)	P1276	1276	—	—	×	EC-496
A/F SENSOR1 (B1)	P1278	1278	×	×	×	EC-505
A/F SENSOR1 (B1)	P1279	1279	×	×	×	EC-517
A/F SENSOR1 (B2)	P1281	1281	—	—	×	EC-462
A/F SENSOR1 (B2)	P1282	1282	—	—	×	EC-470
A/F SENSOR1 (B2)	P1283	1283	—	—	×	EC-478
A/F SENSOR1 (B2)	P1284	1284	—	—	×	EC-487
A/F SENSOR1 (B2)	P1286	1286	—	—	×	EC-496
A/F SENSOR1 (B2)	P1288	1288	×	×	×	EC-505
A/F SENSOR1 (B2)	P1289	1289	×	×	×	EC-517
PURG VOLUME CONT/V	P1444	1444	—	—	×	EC-529
VENT CONTROL VALVE	P1446	1446	—	—	×	EC-537
ASCD SW	P1564	1564	—	—	—	EC-546
ASCD BRAKE SW	P1572	1572	—	—	—	EC-554
ASCD VHL SPD SEN	P1574	1574	—	—	—	EC-571
NATS MALFUNCTION	P1610 - P1615	1610 - 1615	—	—	×	EC-63

Items (CONSULT-II screen terms)	DTC*1		SRT code	Test value/ Test limit (GST only)	1st trip DTC	Reference page
	CONSULT-II GST*2	ECM*3				
TPV SEN/CIRC A/T	P1705	1705	—	—	—	AT-127
P-N POS SW/CIRCUIT	P1706	1706	—	—	×	EC-573
TURBINE REV S/CIRC	P1716	1716	—	—	×	AT-135
A/T INTERLOCK	P1730	1730	—	—	—	AT-139
I/C SOLENOID/CIRC	P1752	1752	—	—	—	AT-144
I/C SOLENOID FNCTN	P1754	1754	—	—	—	AT-146
FR/B SOLENOID/CIRC	P1757	1757	—	—	—	AT-148
FR/B SOLENOID/CIRC	P1759	1759	—	—	—	AT-150
D/C SOLENOID/CIRC	P1762	1762	—	—	—	AT-152
D/C SOLENOID FNCTN	P1764	1764	—	—	—	AT-154
HLR/C SOL/CIRC	P1767	1767	—	—	—	AT-156
HLR/C SOL FNCTN	P1769	1769	—	—	—	AT-158
LC/B SOLENOID/CIRC	P1772	1772	—	—	—	AT-160
LC/B SOLENOID FNCT	P1774	1774	—	—	—	AT-162
BRAKE SW/CIRCUIT	P1805	1805	—	—	×	EC-581
APP SEN 1/CIRC	P2122	2122	—	—	—	EC-587
APP SEN 1/CIRC	P2123	2123	—	—	—	EC-587
APP SEN 2/CIRC	P2127	2127	—	—	—	EC-595
APP SEN 2/CIRC	P2128	2128	—	—	—	EC-595
TP SENSOR	P2135	2135	—	—	—	EC-603
APP SENSOR	P2138	2138	—	—	—	EC-611

*1: 1st trip DTC No. is the same as DTC No.
*2: This number is prescribed by SAE J2012.
*3: In Diagnostic Test Mode II (Self-diagnostic results), this number is controlled by NISSAN.
*4: SRT code will not be set if the self-diagnostic result is NG.
*5: The troubleshooting for this DTC needs CONSULT-II.
*6: When the fail-safe operations for both self-diagnoses occur at the same time, the MIL illuminates.

DTC AND 1ST TRIP DTC

The 1st trip DTC (whose number is the same as the DTC number) is displayed for the latest self-diagnostic result obtained. If the ECM memory was cleared previously, and the 1st trip DTC did not reoccur, the 1st trip DTC will not be displayed.
If a malfunction is detected during the 1st trip, the 1st trip DTC is stored in the ECM memory. The MIL will not light up (two trip detection logic). If the same malfunction is not detected in the 2nd trip (meeting the required driving pattern), the 1st trip DTC is cleared from the ECM memory. If the same malfunction is detected in the 2nd trip, both the 1st trip DTC and DTC are stored in the ECM memory and the MIL lights up. In other words, the DTC is stored in the ECM memory and the MIL lights up when the same malfunction occurs in two consecutive trips. If a 1st trip DTC is stored and a non-diagnostic operation is performed between the 1st and 2nd trips, only the 1st trip DTC will continue to be stored. For malfunctions that blink or light up the MIL during the 1st trip, the DTC and 1st trip DTC are stored in the ECM memory.
Procedures for clearing the DTC and the 1st trip DTC from the ECM memory are described in EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .
For malfunctions in which 1st trip DTCs are displayed, refer to EC-48, "EMISSION-RELATED DIAGNOSTIC INFORMATION ITEMS" . These items are required by legal regulations to continuously monitor the system/component. In addition, the items monitored non-continuously are also displayed on CONSULT-II.
1st trip DTC is specified in Mode 7 of SAE J1979. 1st trip DTC detection occurs without lighting up the MIL and therefore does not warn the driver of a malfunction. However, 1st trip DTC detection will not prevent the vehicle from being tested, for example during Inspection/Maintenance (I/M) tests.
When a 1st trip DTC is detected, check, print out or write down and erase (1st trip) DTC and Freeze Frame data as specified in Work Flow procedure Step II, refer to EC-73, "WORK FLOW" . Then perform DTC Confir-

mation Procedure or Overall Function Check to try to duplicate the malfunction. If the malfunction is duplicated, the item requires repair.

How to Read DTC and 1st Trip DTC

DTC and 1st trip DTC can be read by the following methods.

With CONSULT-II

With GST

CONSULT-II or GST (Generic Scan Tool) Examples: P0340, P1148, P1706, etc.
These DTCs are prescribed by SAE J2012.
(CONSULT-II also displays the malfunctioning component or system.)

No Tools

The number of blinks of the MIL in the Diagnostic Test Mode II (Self-Diagnostic Results) indicates the DTC. Example: 0340, 1148, 1706, etc.
These DTCs are controlled by NISSAN.

- **1st trip DTC No. is the same as DTC No.**
- **Output of a DTC indicates a malfunction. However, GST or the Diagnostic Test Mode II do not indicate whether the malfunction is still occurring or has occurred in the past and has returned to normal. CONSULT-II can identify malfunction status as shown below. Therefore, using CONSULT-II (if available) is recommended.**

A sample of CONSULT-II display for DTC and 1st trip DTC is shown below. DTC or 1st trip DTC of a malfunction is displayed in “SELF-DIAGNOSTIC RESULTS” mode of CONSULT-II. Time data indicates how many times the vehicle was driven after the last detection of a DTC.
If the DTC is being detected currently, the time data will be [0].
If a 1st trip DTC is stored in the ECM, the time data will be [1t].

DTC display

SELF DIAG RESULTS	
DTC RESULTS	TIME
CKP SEN/CIRCUIT [P0335]	0

1st trip DTC display

SELF DIAG RESULTS	
DTC RESULTS	TIME
CKP SEN/CIRCUIT [P0335]	1t

PBIB0911E

FREEZE FRAME DATA AND 1ST TRIP FREEZE FRAME DATA

The ECM records the driving conditions such as fuel system status, calculated load value, engine coolant temperature, short term fuel trim, long term fuel trim, engine speed, vehicle speed, base fuel schedule and intake air temperature at the moment a malfunction is detected.
Data which are stored in the ECM memory, along with the 1st trip DTC, are called 1st trip freeze frame data. The data, stored together with the DTC data, are called freeze frame data and displayed on CONSULT-II or GST. The 1st trip freeze frame data can only be displayed on the CONSULT-II screen, not on the GST. For details, see EC-108, "Freeze Frame Data and 1st Trip Freeze Frame Data" .
Only one set of freeze frame data (either 1st trip freeze frame data or freeze frame data) can be stored in the ECM. 1st trip freeze frame data is stored in the ECM memory along with the 1st trip DTC. There is no priority for 1st trip freeze frame data and it is updated each time a different 1st trip DTC is detected. However, once freeze frame data (2nd trip detection/MIL on) is stored in the ECM memory, 1st trip freeze frame data is no longer stored. Remember, only one set of freeze frame data can be stored in the ECM. The ECM has the following priorities to update the data.

Priority	Items	
1	Freeze frame data	Misfire — DTC: P0300 - P0306 Fuel Injection System Function — DTC: P0171, P0172, P0174, P0175
2		Except the above items (Includes A/T related items)
3	1st trip freeze frame data	

For example, the EGR malfunction (Priority: 2) was detected and the freeze frame data was stored in the 2nd trip. After that when the misfire (Priority: 1) is detected in another trip, the freeze frame data will be updated from the EGR malfunction to the misfire. The 1st trip freeze frame data is updated each time a different mal-

function is detected. There is no priority for 1st trip freeze frame data. However, once freeze frame data is stored in the ECM memory, 1st trip freeze data is no longer stored (because only one freeze frame data or 1st trip freeze frame data can be stored in the ECM). If freeze frame data is stored in the ECM memory and freeze frame data with the same priority occurs later, the first (original) freeze frame data remains unchanged in the ECM memory.
Both 1st trip freeze frame data and freeze frame data (along with the DTCs) are cleared when the ECM memory is erased. Procedures for clearing the ECM memory are described in EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .

SYSTEM READINESS TEST (SRT) CODE

System Readiness Test (SRT) code is specified in Mode 1 of SAE J1979.
As part of an enhanced emissions test for Inspection & Maintenance (I/M), certain states require the status of SRT be used to indicate whether the ECM has completed self-diagnosis of major emission systems and components. Completion must be verified in order for the emissions inspection to proceed.
If a vehicle is rejected for a State emissions inspection due to one or more SRT items indicating “INCMP”, use the information in this Service Manual to set the SRT to “CMPLT”.
In most cases the ECM will automatically complete its self-diagnosis cycle during normal usage, and the SRT status will indicate “CMPLT” for each application system. Once set as “CMPLT”, the SRT status remains “CMPLT” until the self-diagnosis memory is erased.
Occasionally, certain portions of the self-diagnostic test may not be completed as a result of the customer's normal driving pattern; the SRT will indicate “INCMP” for these items.

NOTE:
The SRT will also indicate “INCMP” if the self-diagnosis memory is erased for any reason or if the ECM memory power supply is interrupted for several hours.
If, during the state emissions inspection, the SRT indicates “CMPLT” for all test items, the inspector will continue with the emissions test. However, if the SRT indicates “INCMP” for one or more of the SRT items the vehicle is returned to the customer untested.

NOTE:
If MIL is ON during the state emissions inspection, the vehicle is also returned to the customer untested even though the SRT indicates “CMPLT” for all test items. Therefore, it is important to check SRT (“CMPLT”) and DTC (No DTCs) before the inspection.

SRT Item

The table below shows required self-diagnostic items to set the SRT to “CMPLT”.

SRT item (CONSULT-II indication)	Performance Priority*	Required self-diagnostic items to set the SRT to “CMPLT”	Corresponding DTC No.
CATALYST	2	Three way catalyst function	P0420, P0430
EVAPORATIVE SYSTEM	1	EVAP control system	P0442
	2	EVAP control system	P0456
	2	EVAP control system purge flow monitoring	P0441
HO2S	2	Air fuel ratio (A/F) sensor 1	P1278, P1279
		Air fuel ratio (A/f) sensor 1	P1288, P1289
		Heated oxygen sensor 2	P0139, P0159
		Heated oxygen sensor 2	P1146, P1166
		Heated oxygen sensor 2	P1147, P1167
HO2S HTR	2	Air fuel ratio (A/F) sensor 1 heater	P1031, P1032, P1051, P1052
		Heated oxygen sensor 2 heater	P0037, P0038, P0057, P0058

*: If completion of several SRTs is required, perform driving patterns (DTC confirmation procedure), one by one based on the priority for models with CONSULT-II.

SRT Set Timing

SRT is set as “CMPLT” after self-diagnosis has been performed one or more times. Completion of SRT is done regardless of whether the result is OK or NG. The set timing is different between OK and NG results and is shown in the table below.

Self-diagnosis result		Example				
		Diagnosis	Ignition cycle ← ON →	OFF ← ON →	OFF ← ON →	OFF ← ON →
All OK	Case 1	P0400	OK (1)	— (1)	OK (2)	— (2)
		P0402	OK (1)	— (1)	— (1)	OK (2)
		P1402	OK (1)	OK (2)	— (2)	— (2)
		SRT of EGR	“CMPLT”	“CMPLT”	“CMPLT”	“CMPLT”
	Case 2	P0400	OK (1)	— (1)	— (1)	— (1)
		P0402	— (0)	— (0)	OK (1)	— (1)
		P1402	OK (1)	OK (2)	— (2)	— (2)
		SRT of EGR	“INCMP”	“INCMP”	“CMPLT”	“CMPLT”
NG exists	Case 3	P0400	OK	OK	—	—
		P0402	—	—	—	—
		P1402	NG	—	NG	NG (Consecutive NG)
		(1st trip) DTC	1st trip DTC	—	1st trip DTC	DTC (= MIL “ON”)
		SRT of EGR	“INCMP”	“INCMP”	“INCMP”	“CMPLT”

OK: Self-diagnosis is carried out and the result is OK.
NG: Self-diagnosis is carried out and the result is NG.
—: Self-diagnosis is not carried out.

When all SRT related self-diagnoses showed OK results in a single cycle (Ignition OFF-ON-OFF), the SRT will indicate “CMPLT”. → Case 1 above
When all SRT related self-diagnoses showed OK results through several different cycles, the SRT will indicate “CMPLT” at the time the respective self-diagnoses have at least one OK result. → Case 2 above

If one or more SRT related self-diagnoses showed NG results in 2 consecutive cycles, the SRT will also indicate “CMPLT”. → Case 3 above

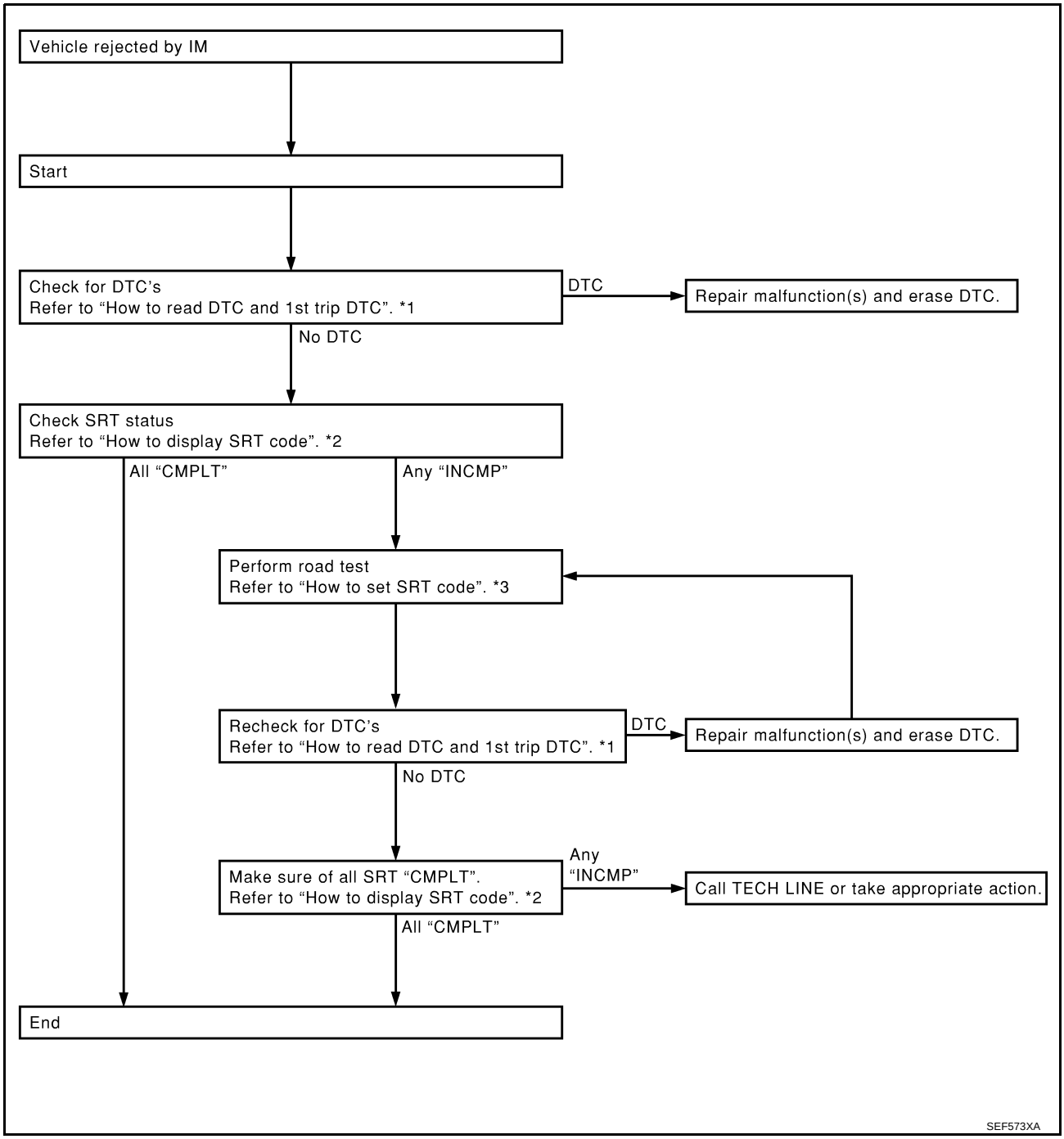
The table above shows that the minimum number of cycles for setting SRT as “INCMP” is one (1) for each self-diagnosis (Case 1 & 2) or two (2) for one of self-diagnoses (Case 3). However, in preparation for the state emissions inspection, it is unnecessary for each self-diagnosis to be executed twice (Case 3) for the following reasons:

- The SRT will indicate “CMPLT” at the time the respective self-diagnoses have one (1) OK result.
- The emissions inspection requires “CMPLT” of the SRT only with OK self-diagnosis results.
- When, during SRT driving pattern, 1st trip DTC (NG) is detected prior to “CMPLT” of SRT, the self-diagnosis memory must be erased from ECM after repair.
- If the 1st trip DTC is erased, all the SRT will indicate “INCMP”.

NOTE:
SRT can be set as “CMPLT” together with the DTC(s). Therefore, DTC check must always be carried out prior to the state emission inspection even though the SRT indicates “CMPLT”.

SRT Service Procedure

If a vehicle has failed the state emissions inspection due to one or more SRT items indicating “INCMP”, review the flowchart diagnostic sequence on the next page.



*1 EC-52 *2 EC-56 *3 EC-57

How to Display SRT Code

WITH CONSULT-II

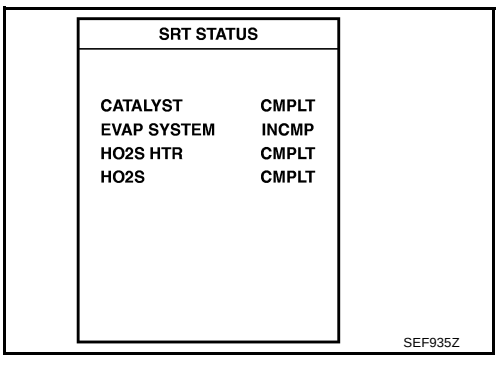
Selecting "SRT STATUS" in "DTC CONFIRMATION" mode with CONSULT-II.

For items whose SRT codes are set, a "CMPLT" is displayed on the CONSULT-II screen; for items whose SRT codes are not set, "INCMP" is displayed.

A sample of CONSULT-II display for SRT code is shown at right.

"INCMP" means the self-diagnosis is incomplete and SRT is not set.

"CMPLT" means the self-diagnosis is complete and SRT is set.



WITH GST

Selecting Mode 1 with GST (Generic Scan Tool)

How to Set SRT Code

To set all SRT codes, self-diagnosis for the items indicated above must be performed one or more times. Each diagnosis may require a long period of actual driving under various conditions.

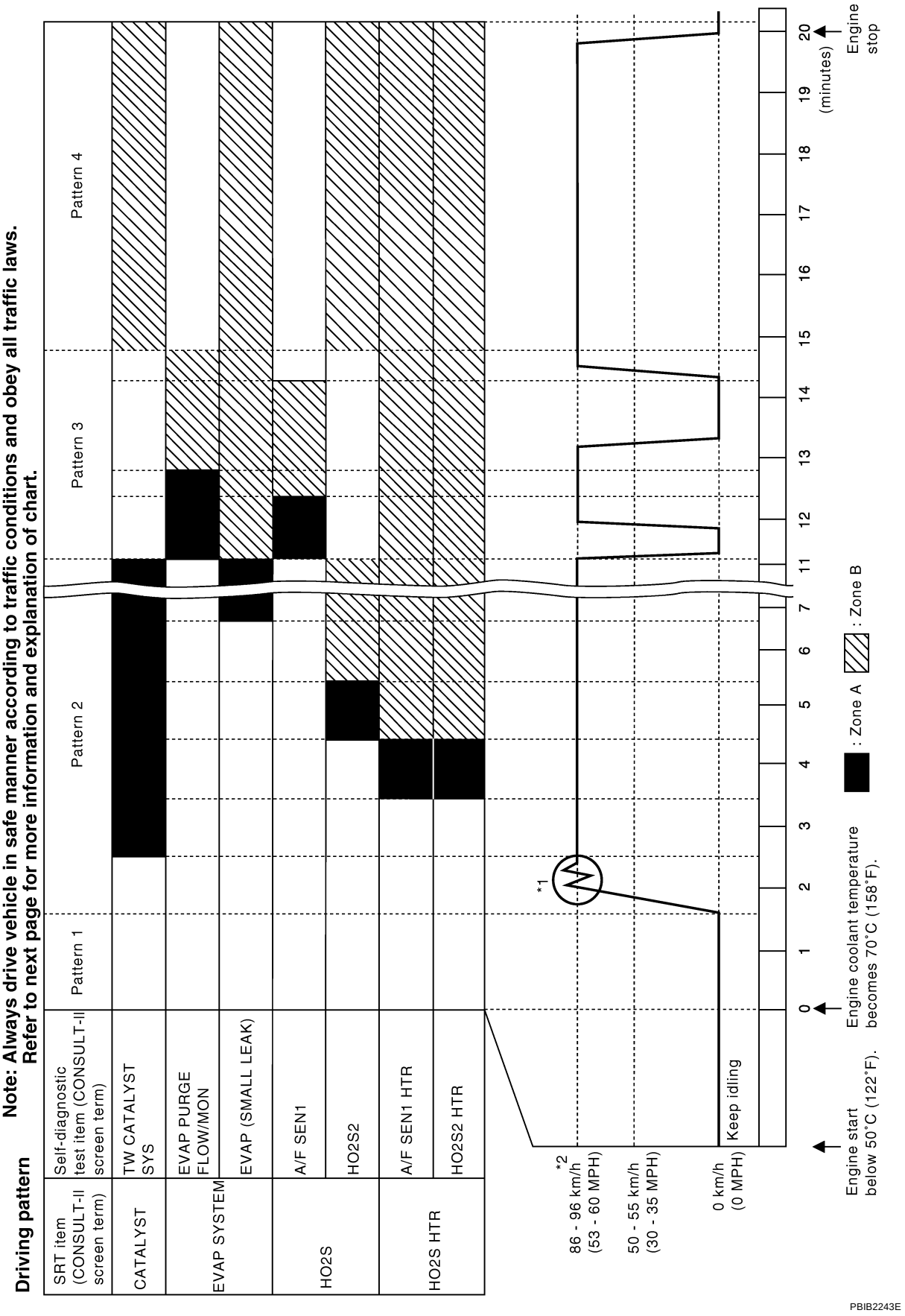
WITH CONSULT-II

Perform corresponding DTC Confirmation Procedure one by one based on Performance Priority in the table on EC-54, "SRT Item" .

WITHOUT CONSULT-II

The most efficient driving pattern in which SRT codes can be properly set is explained on the next page. The driving pattern should be performed one or more times to set all SRT codes.

Driving Pattern



- The time required for each diagnosis varies with road surface conditions, weather, altitude, individual driving habits, etc.
  Zone A refers to the range where the time, required for the diagnosis under normal conditions*, is the shortest.
  Zone B refers to the range where the diagnosis can still be performed if the diagnosis is not completed within zone A.

*: Normal conditions refer to the following:

- Sea level
- Flat road
- Ambient air temperature: 20 - 30°C (68 - 86°F)
- Diagnosis is performed as quickly as possible under normal conditions.
  Under different conditions [For example: ambient air temperature other than 20 - 30°C (68 - 86°F)], diagnosis may also be performed.

Pattern 1:

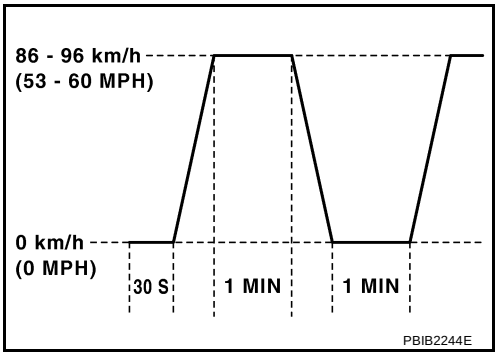
- **The engine is started at the engine coolant temperature of −10 to 35°C (14 to 95°F) (where the voltage between the ECM terminal 73 and ground is 3.0 - 4.3V).**
- **The engine must be operated at idle speed until the engine coolant temperature is greater than 70°C (158°F) (where the voltage between the ECM terminal 73 and ground is lower than 1.4V).**
- **The engine is started at the fuel tank temperature of warmer than 0°C (32°F) (where the voltage between the ECM terminal 107 and ground is less than 4.1V).**

Pattern 2:

- When steady-state driving is performed again even after it is interrupted, each diagnosis can be conducted. In this case, the time required for diagnosis may be extended.

Pattern 3:

- Operate vehicle following the driving pattern shown in the figure.
- Release the accelerator pedal during decelerating vehicle speed from 90 km/h (56 MPH) to 0 km/h (0 MPH).



Pattern 4:

- The accelerator pedal must be held very steady during steady-state driving.
- If the accelerator pedal is moved, the test must be conducted all over again.

*1: Depress the accelerator pedal until vehicle speed is 90 km/h (56 MPH), then release the accelerator pedal and keep it released for more than 10 seconds. Depress the accelerator pedal until vehicle speed is 90 km/h (56 MPH) again.
*2: Checking the vehicle speed with GST is advised.

Suggested Transmission Gear Position
Set the selector lever in the D position.
Suggested Upshift Speeds for M/T Models
Shown below are suggested vehicle speeds for shifting into a higher gear. These suggestions relate to fuel economy and vehicle performance. Actual upshift speeds will vary according to road conditions, the weather and individual driving habits.

	For normal acceleration in low altitude areas [less than 1,219 m (4,000 ft)]:		For quick acceleration in low altitude areas and high altitude areas [over 1,219 m (4,000 ft)]:
Gear change	ACCEL shift point km/h (MPH)	CRUISE shift point km/h (MPH)	km/h (MPH)
1st to 2nd	21 (13)	13 (8)	24 (15)
2nd to 3rd	37 (23)	26 (16)	40 (25)
3rd to 4th	48 (30)	40 (25)	64 (40)
4th to 5th	60 (37)	45 (28)	72 (45)
6th	68 (42)	53 (33)	80 (50)

Suggested Maximum Speed in Each Gear

Downshift to a lower gear if the engine is not running smoothly, or if you need to accelerate.
Do not exceed the maximum suggested speed (shown below) in any gear. For level road driving, use the highest gear suggested for that speed. Always observe posted speed limits and drive according to the road conditions to ensure sage operation. Do not over-rev the engine when shifting to a lower gear as it may cause engine damage or loss of vehicle control.

Gear	km/h (MPH)
1st	56 (35)
2nd	96 (60)
3rd	136 (85)
4th	—
5th	—
6th	—

TEST VALUE AND TEST LIMIT (GST ONLY — NOT APPLICABLE TO CONSULT-II)

The following is the information specified in Mode 6 of SAE J1979.
The test value is a parameter used to determine whether a system/circuit diagnostic test is OK or NG while being monitored by the ECM during self-diagnosis. The test limit is a reference value which is specified as the maximum or minimum value and is compared with the test value being monitored.
These data (test value and test limit) are specified by Test ID (TID) and Component ID (CID) and can be displayed on the GST screen.

Item	Self-diagnostic test item	DTC	Test value (GST display)		Test limit	Conversion
			TID	CID		
CATALYST	Three way catalyst function (Bank 1)	P0420	01H	01H	Max.	1/128
		P0420	02H	81H	Min.	1
	Three way catalyst function (Bank 2)	P0430	03H	02H	Max.	1/128
		P0430	04H	82H	Min.	1
EVAP SYSTEM	EVAP control system (Small leak)	P0442	05H	03H	Max.	1/128 mm^2
	EVAP control system purge flow monitoring	P0441	06H	83H	Min.	20 mV
	EVAP control system (Very small leak)	P0456	07H	03H	Max.	1/128 mm^2

Item	Self-diagnostic test item	DTC	Test value (GST display)		Test limit	Conversion
			TID	CID		
HO2S	A/F sensor 1 (Bank 1)	P1271	41H	8EH	Min.	5mV
		P1272	42H	0EH	Max.	5mV
		P1273	43H	0EH	Max.	0.002
		P1274	44H	8EH	Min.	0.002
		P1278	45H	8EH	Min.	0.004
		P1276	46H	0EH	Max.	5mV
		P1276	47H	8EH	Min.	5mV
		P1279	48H	8EH	Min.	0.004
	A/F sensor 1 (Bank 2)	P1281	4CH	8FH	Min.	5mV
		P1282	4DH	0FH	Max	5mV
		P1283	4EH	0FH	Max.	0.002
		P1284	4FH	8FH	Min	0.002
		P1288	50H	8FH	Min.	0.004
		P1286	51H	0FH	Max.	5mV
		P1286	52H	8FH	Min	5mV
		P1289	53H	8FH	Min.	0.004
	Heated oxygen sensor 2 (Bank 1)	P0138	1CH	06H	Max.	10mV
		P0139	19H	86H	Min.	10mV/500 ms
		P1147	1AH	86H	Min.	10 mV
		P1146	1BH	06H	Max.	10 mV
	Heated oxygen sensor 2 (Bank 2)	P0158	24H	07H	Max	10mV
		P0159	21H	87H	Min.	10 mV/500 ms
		P1167	22H	87H	Min.	10 mV
		P1166	23H	07H	Max.	10 mV
HO2S HEATER	A/F sensor 1 heater (Bank 1)	P1032	57H	10H	Max.	5 mV
		P1031	58H	90H	Max.	5 mV
	A/F sensor 1 heater (Bank 2)	P1052	59H	11H	Max.	5 mV
		P1051	5AH	91H	Max.	5 mV
	Heated oxygen sensor 2 heater (Bank 1)	P0038	2DH	0AH	Max.	20 mV
		P0037	2EH	8AH	Min.	20 mV
	Heated oxygen sensor 2 heater (Bank 2)	P0058	2FH	0BH	Max.	20 mV
		P0057	30H	8BH	Min.	20 mV

HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION

How to Erase DTC

WITH CONSULT-II

The emission related diagnostic information in the ECM can be erased by selecting “ERASE” in the “SELF-DIAG RESULTS” mode with CONSULT-II.

If DTCs are displayed for both ECM and TCM (Transmission control module), they need to be erased individually from the ECM and TCM (Transmission control module).

NOTE:

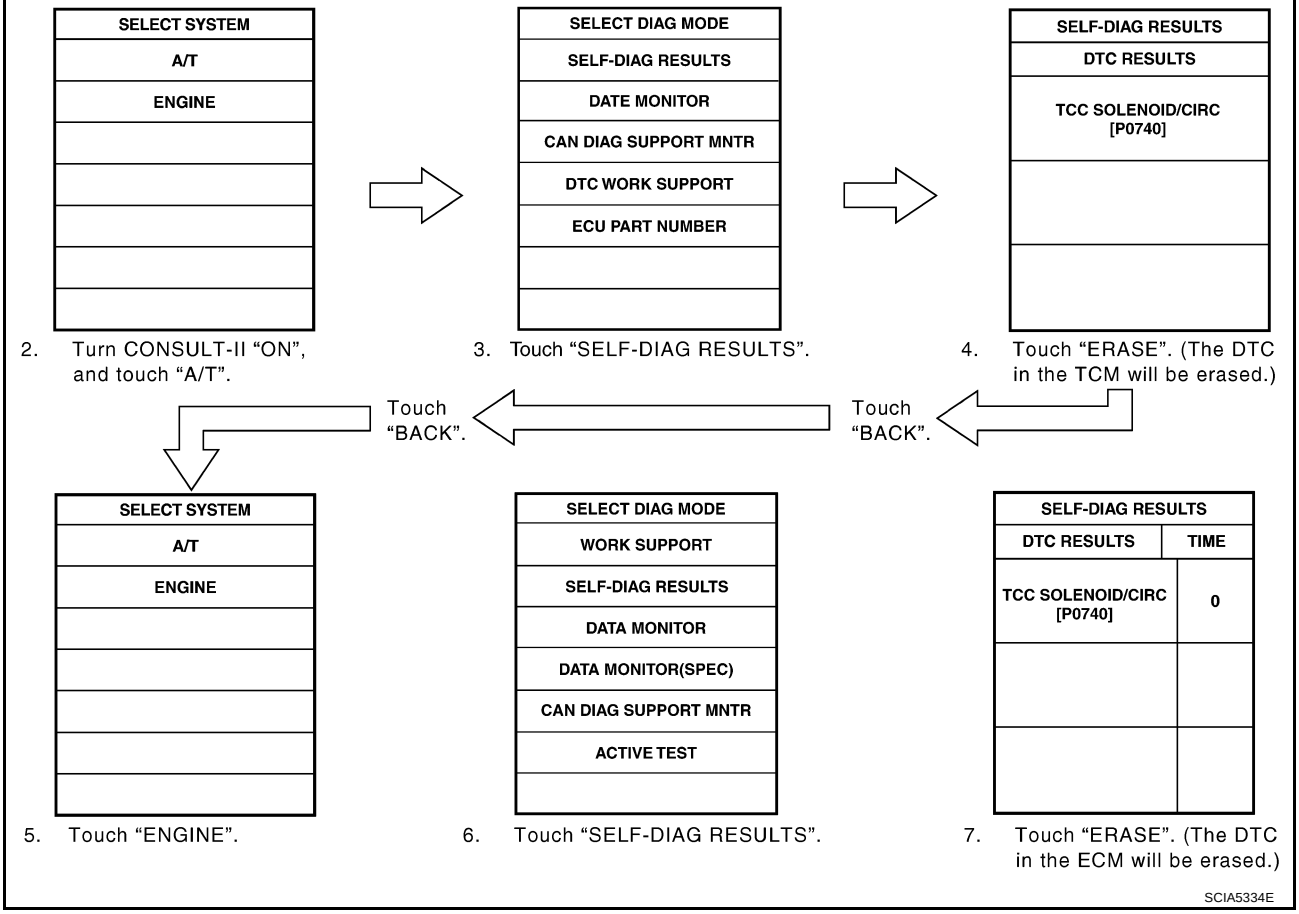
If the DTC is not for A/T related items (see EC-8), skip steps 2 through 4.

1. If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
2. Turn CONSULT-II ON and touch “A/T”.
3. Touch “SELF-DIAG RESULTS”.

4. Touch “ERASE”. [The DTC in the TCM (Transmission control module) will be erased.] Then touch “BACK” twice.
5. Touch “ENGINE”.
6. Touch “SELF-DIAG RESULTS”.
7. Touch “ERASE”. (The DTC in the ECM will be erased.)

How to erase DTC (With CONSULT-II)

1. If the ignition switch stays “ON” after repair work, be sure to turn ignition switch “OFF” once. Wait at least 10 seconds and then turn it “ON” (engine stopped) again.



WITH GST

The emission related diagnostic information in the ECM can be erased by selecting Mode 4 with GST.

NOTE:
If the DTC is not for A/T related items (see EC-8), skip step 2.

1. If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
2. Perform AT-39, "HOW TO ERASE DTC (WITH GST)" . (The DTC in the TCM will be erased.)
3. Select Mode 4 with GST (Generic Scan Tool).

NO TOOLS

NOTE:
If the DTC is not for A/T related items (see EC-8), skip step 2.

1. If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
2. Perform AT-40, "HOW TO ERASE DTC (NO TOOLS)" . (The DTC in the TCM will be erased.)
3. Change the diagnostic test mode from Mode II to Mode I by depressing the accelerator pedal. Refer to EC-64, "HOW TO SWITCH DIAGNOSTIC TEST MODE" .

- **If the battery is disconnected, the emission-related diagnostic information will be lost within 24 hours.**
- **The following data are cleared when the ECM memory is erased.**

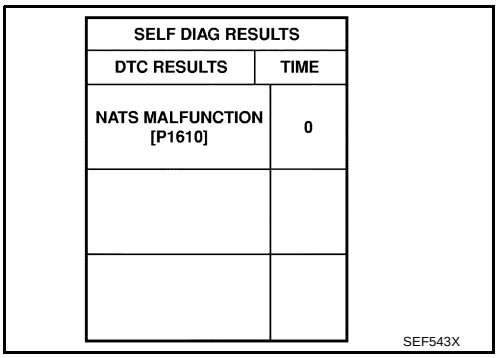
- Diagnostic trouble codes
- 1st trip diagnostic trouble codes
- Freeze frame data
- 1st trip freeze frame data
- System readiness test (SRT) codes
- Test values
- Others

Actual work procedures are explained using a DTC as an example. Be careful so that not only the DTC, but all of the data listed above, are cleared from the ECM memory during work procedures.

NVIS (Nissan Vehicle Immobilizer System — NATS)

ABS009AZ

- **If the security indicator lights up with the ignition switch in the ON position or "NATS MALFUNCTION" is displayed on "SELF-DIAG RESULTS" screen, perform self-diagnostic results mode with CONSULT-II using NATS program card. Refer to BL-158, "NVIS (NISSAN VEHICLE IMMOBILIZER SYSTEM-NATS)" .**
- **Confirm no self-diagnostic results of NVIS (NATS) is displayed before touching "ERASE" in "SELF-DIAG RESULTS" mode with CONSULT-II.**
- **When replacing ECM, initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs must be carried out with CONSULT-II using NATS program card. Therefore, be sure to receive all keys from vehicle owner. Regarding the procedures of NVIS (NATS) initialization and all NVIS (NATS) ignition key ID registration, refer to CONSULT-II Operation Manual, IVIS/NVIS.**



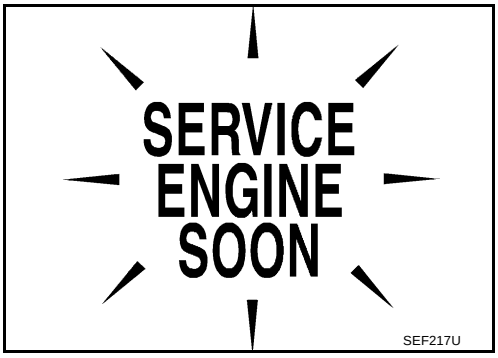
Malfunction Indicator Lamp (MIL)

ABS009B0

DESCRIPTION

The MIL is located on the instrument panel.

1. The MIL will light up when the ignition switch is turned ON without the engine running. This is a bulb check.
   If the MIL does not light up, refer to DI-62, "WARNING LAMPS" , or see EC-671 .
2. When the engine is started, the MIL should go off.
   If the MIL remains on, the on board diagnostic system has detected an engine system malfunction.



ON BOARD DIAGNOSTIC SYSTEM FUNCTION

The on board diagnostic system has the following three functions.

Diagnostic Test Mode	KEY and ENG. Status	Function	Explanation of Function
Mode I	Ignition switch in ON position Engine stopped	BULB CHECK	This function checks the MIL bulb for damage (blown, open circuit, etc.). If the MIL does not come on, check MIL circuit.
	Engine running	MALFUNCTION WARNING	This is a usual driving condition. When a malfunction is detected twice in two consecutive driving cycles (two trip detection logic), the MIL will light up to inform the driver that a malfunction has been detected. The following malfunctions will light up or blink the MIL in the 1st trip. ● Misfire (Possible three way catalyst damage) ● One trip detection diagnoses
Mode II	Ignition switch in ON position Engine stopped	SELF-DIAGNOSTIC RESULTS	This function allows DTCs and 1st trip DTCs to be read.

When there is an open circuit on MIL circuit, the ECM cannot warn the driver by lighting up MIL when there is malfunction on engine control system.
Therefore, when electrical controlled throttle and part of ECM related diagnoses are continuously detected as NG for 5 trips, ECM warns the driver that engine control system malfunctions and MIL circuit is open by means of operating fail-safe function.
The fail-safe function also operates when above diagnoses except MIL circuit are detected and demands the driver to repair the malfunction.

Engine operating condition in fail-safe mode	Engine speed will not rise more than 2,500 rpm due to the fuel cut

MIL Flashing Without DTC

If the ECM is in Diagnostic Test Mode II, MIL may flash when engine is running. In this case, check ECM diagnostic test mode. EC-64, "HOW TO SWITCH DIAGNOSTIC TEST MODE" .
How to switch the diagnostic test (function) modes, and details of the above functions are described later. EC-64, "HOW TO SWITCH DIAGNOSTIC TEST MODE" .
The following emission-related diagnostic information is cleared when the ECM memory is erased.

- Diagnostic trouble codes
- 1st trip diagnostic trouble codes
- Freeze frame data
- 1st trip freeze frame data
- System readiness test (SRT) codes
- Test values
- Others

HOW TO SWITCH DIAGNOSTIC TEST MODE

NOTE:

- **It is better to count the time accurately with a clock.**

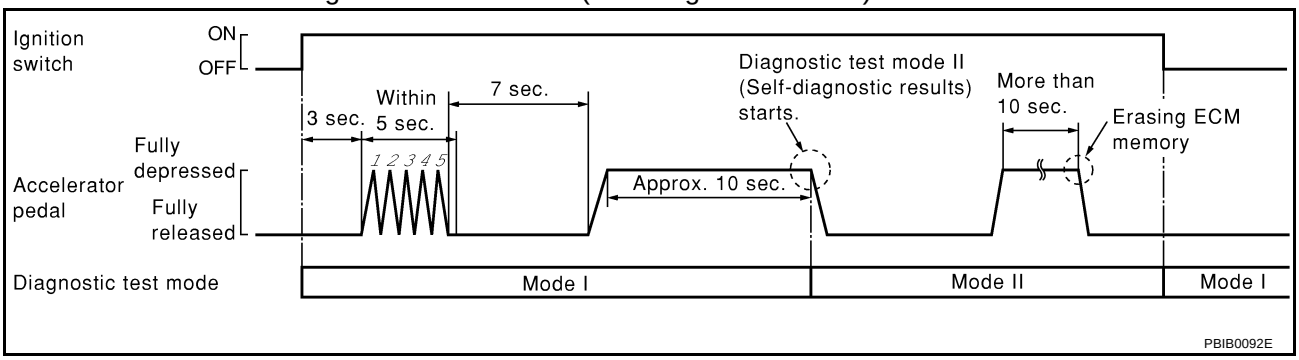
- **It is impossible to switch the diagnostic mode when an accelerator pedal position sensor circuit has a malfunction.**
- **Always ECM returns to Diagnostic Test Mode I after ignition switch is turned OFF.**

How to Set Diagnostic Test Mode II (Self-diagnostic Results)

1. Confirm that accelerator pedal is fully released, turn ignition switch ON and wait 3 seconds.
2. Repeat the following procedure quickly five times within 5 seconds.

a. Fully depress the accelerator pedal.
b. Fully release the accelerator pedal.

3. Wait 7 seconds, fully depress the accelerator pedal and keep it for approx. 10 seconds until the MIL starts blinking.
4. Fully release the accelerator pedal.
   ECM has entered to Diagnostic Test Mode II (Self-diagnostic results).



How to Erase Diagnostic Test Mode II (Self-diagnostic Results)

1. Set ECM in Diagnostic Test Mode II (Self-diagnostic results). Refer to EC-65, "How to Set Diagnostic Test Mode II (Self-diagnostic Results)" .
2. Fully depress the accelerator pedal and keep it for more than 10 seconds.
   The emission-related diagnostic information has been erased from the backup memory in the ECM.
3. Fully release the accelerator pedal, and confirm the DTC 0000 is displayed.

DIAGNOSTIC TEST MODE I — BULB CHECK

In this mode, the MIL on the instrument panel should stay ON. If it remains OFF, check the bulb. Refer to DI-62, "WARNING LAMPS" or see EC-671 .

DIAGNOSTIC TEST MODE I — MALFUNCTION WARNING

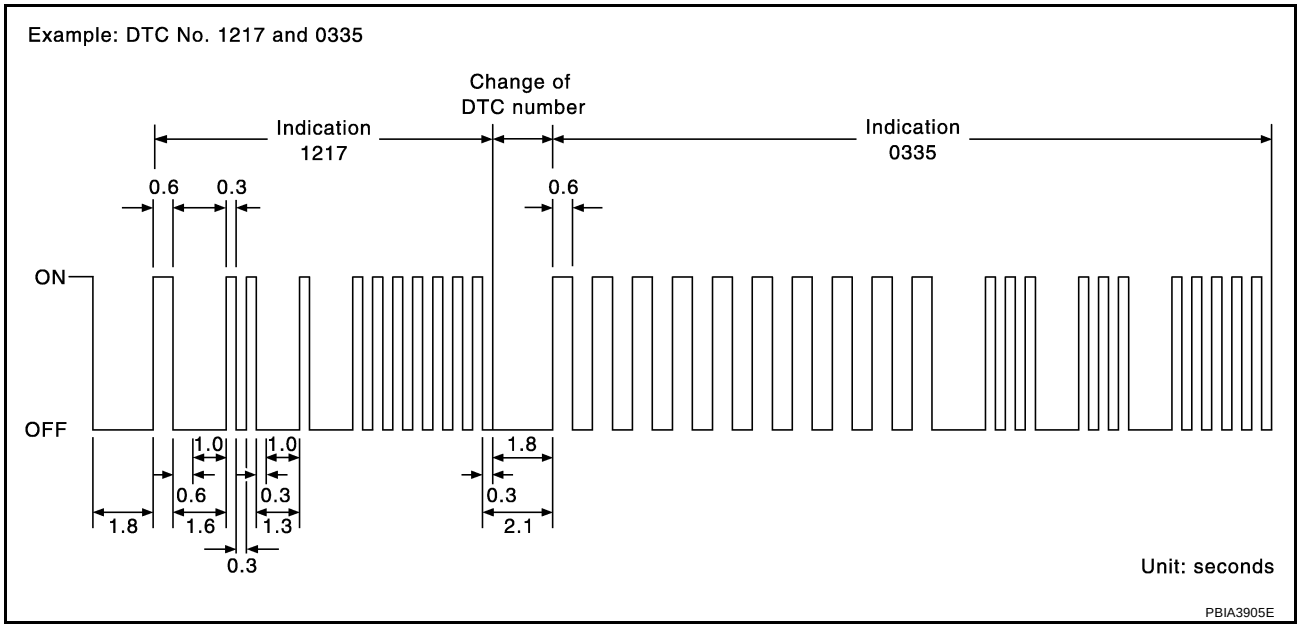
MIL	Condition
ON	When the malfunction is detected.
OFF	No malfunction.

These DTC numbers are clarified in Diagnostic Test Mode II (SELF-DIAGNOSTIC RESULTS)

DIAGNOSTIC TEST MODE II — SELF-DIAGNOSTIC RESULTS

In this mode, the DTC and 1st trip DTC are indicated by the number of blinks of the MIL as shown below. The DTC and 1st trip DTC are displayed at the same time. If the MIL does not illuminate in diagnostic test mode I (Malfunction warning), all displayed items are 1st trip DTCs. If only one code is displayed when the MIL illuminates in diagnostic test mode II (SELF-DIAGNOSTIC RESULTS), it is a DTC; if two or more codes are displayed, they may be either DTCs or 1st trip DTCs. DTC No. is same as that of 1st trip DTC. These uniden-

tified codes can be identified by using the CONSULT-II or GST. A DTC will be used as an example for how to read a code.



A particular trouble code can be identified by the number of four-digit numeral flashes. The “zero” is indicated by the number of ten flashes. The length of time the 1,000th-digit numeral flashes on and off is 1.2 seconds consisting of an ON (0.6-second) - OFF (0.6-second) cycle.
The 100th-digit numeral and lower digit numerals consist of a 0.3-second ON and 0.3-second OFF cycle.
A change from one digit numeral to another occurs at an interval of 1.0-second OFF. In other words, the later numeral appears on the display 1.3 seconds after the former numeral has disappeared.
A change from one trouble code to another occurs at an interval of 1.8-second OFF.
In this way, all the detected malfunctions are classified by their DTC numbers. The DTC 0000 refers to no malfunction. (See EC-8, "INDEX FOR DTC")

How to Erase Diagnostic Test Mode II (Self-diagnostic Results)

The DTC can be erased from the back up memory in the ECM by depressing accelerator pedal. Refer to EC-65, "How to Erase Diagnostic Test Mode II (Self-diagnostic Results)" .

- **If the battery is disconnected, the DTC will be lost from the backup memory within 24 hours.**
- **Be careful not to erase the stored memory before starting trouble diagnoses.**

OBD System Operation Chart

ABS009B1

RELATIONSHIP BETWEEN MIL, 1ST TRIP DTC, DTC, AND DETECTABLE ITEMS

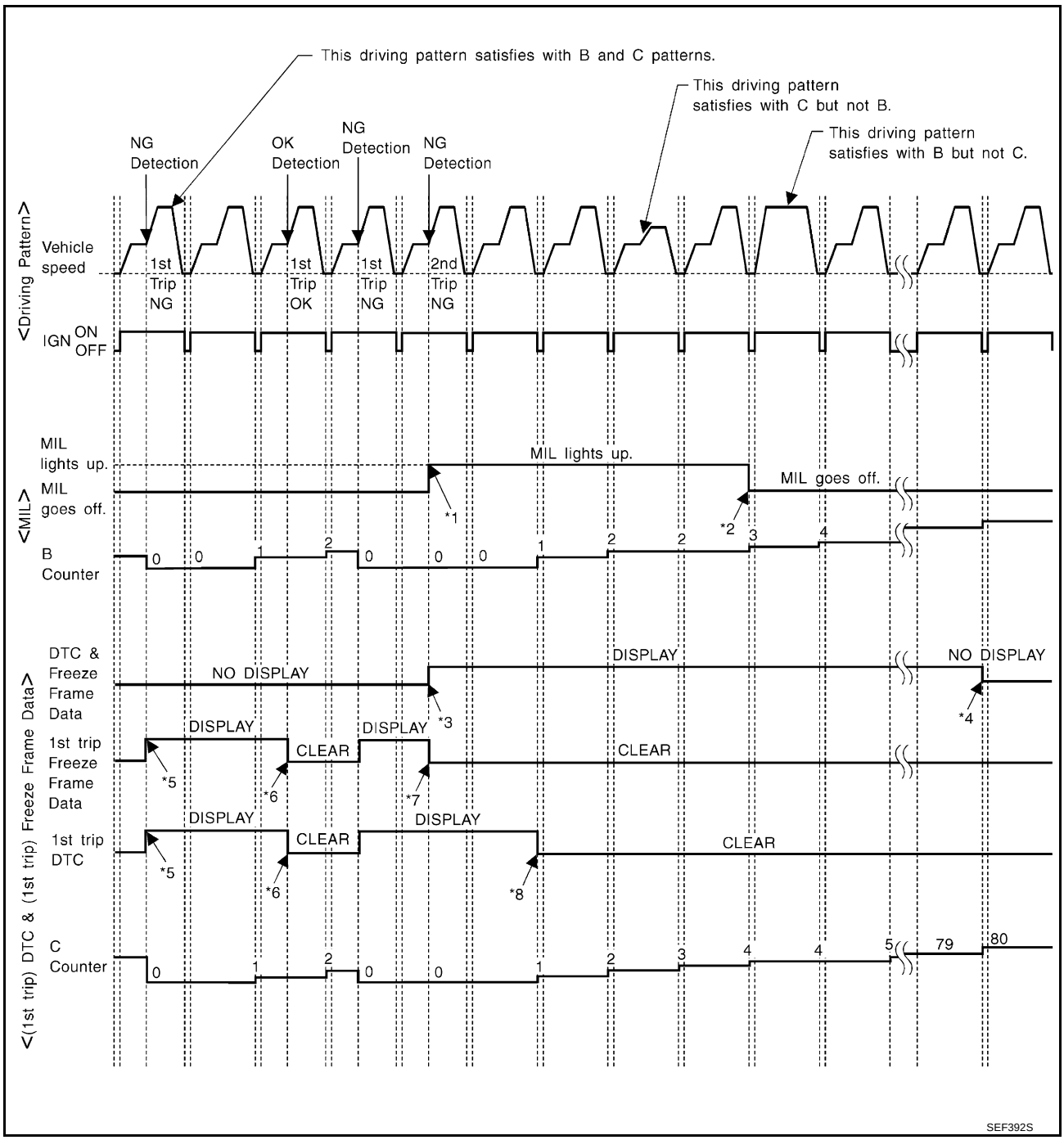
- When a malfunction is detected for the first time, the 1st trip DTC and the 1st trip freeze frame data are stored in the ECM memory.
- When the same malfunction is detected in two consecutive trips, the DTC and the freeze frame data are stored in the ECM memory, and the MIL will come on. For details, refer to EC-47, "Two Trip Detection Logic" .
- The MIL will go off after the vehicle is driven 3 times with no malfunction. The drive is counted only when the recorded driving pattern is met (as stored in the ECM). If another malfunction occurs while counting, the counter will reset.
- The DTC and the freeze frame data will be stored until the vehicle is driven 40 times (driving pattern A) without the same malfunction recurring (except for Misfire and Fuel Injection System). For Misfire and Fuel Injection System, the DTC and freeze frame data will be stored until the vehicle is driven 80 times (driving pattern C) without the same malfunction recurring. The “TIME” in “SELF-DIAGNOSTIC RESULTS” mode of CONSULT-II will count the number of times the vehicle is driven.
- The 1st trip DTC is not displayed when the self-diagnosis results in OK for the 2nd trip.

SUMMARY CHART

Items	Fuel Injection System	Misfire	Other
MIL (goes off)	3 (pattern B)	3 (pattern B)	3 (pattern B)
DTC, Freeze Frame Data (no display)	80 (pattern C)	80 (pattern C)	40 (pattern A)
1st Trip DTC (clear)	1 (pattern C), *1	1 (pattern C), *1	1 (pattern B)
1st Trip Freeze Frame Data (clear)	*1, *2	*1, *2	1 (pattern B)

For details about patterns B and C under “Fuel Injection System” and “Misfire”, see EC-69 .
For details about patterns A and B under “Other”, see EC-71
*1: Clear timing is at the moment OK is detected.
*2: Clear timing is when the same malfunction is detected in the 2nd trip.

RELATIONSHIP BETWEEN MIL, DTC, 1ST TRIP DTC AND DRIVING PATTERNS FOR “MISFIRE ” <EXHAUST QUALITY DETERIORATION>, “FUEL INJECTION SYSTEM”



*1: When the same malfunction is detected in two consecutive trips, MIL will light up.

*2: MIL will go off after vehicle is driven 3 times (pattern B) without any malfunctions.

*3: When the same malfunction is detected in two consecutive trips, the DTC and the freeze frame data will be stored in ECM.

*4: The DTC and the freeze frame data will not be displayed any longer after vehicle is driven 80 times (pattern C) without the same malfunction. (The DTC and the freeze frame data still remain in ECM.)

*5: When a malfunction is detected for the first time, the 1st trip DTC and the 1st trip freeze frame data will be stored in ECM.

*6: The 1st trip DTC and the 1st trip freeze frame data will be cleared at the moment OK is detected.

*7: When the same malfunction is detected in the 2nd trip, the 1st trip freeze frame data will be cleared.

*8: 1st trip DTC will be cleared when vehicle is driven once (pattern C) without the same malfunction after DTC is stored in ECM.

EXPLANATION FOR DRIVING PATTERNS FOR “MISFIRE <EXHAUST QUALITY DETERIORATION>”, “FUEL INJECTION SYSTEM”

<Driving Pattern B>

Driving pattern B means the vehicle operation as follows:
All components and systems should be monitored at least once by the OBD system.

- The B counter will be cleared when the malfunction is detected once regardless of the driving pattern.
- The B counter will be counted up when driving pattern B is satisfied without any malfunction.
- The MIL will go off when the B counter reaches 3. (*2 in OBD SYSTEM OPERATION CHART)

<Driving Pattern C>

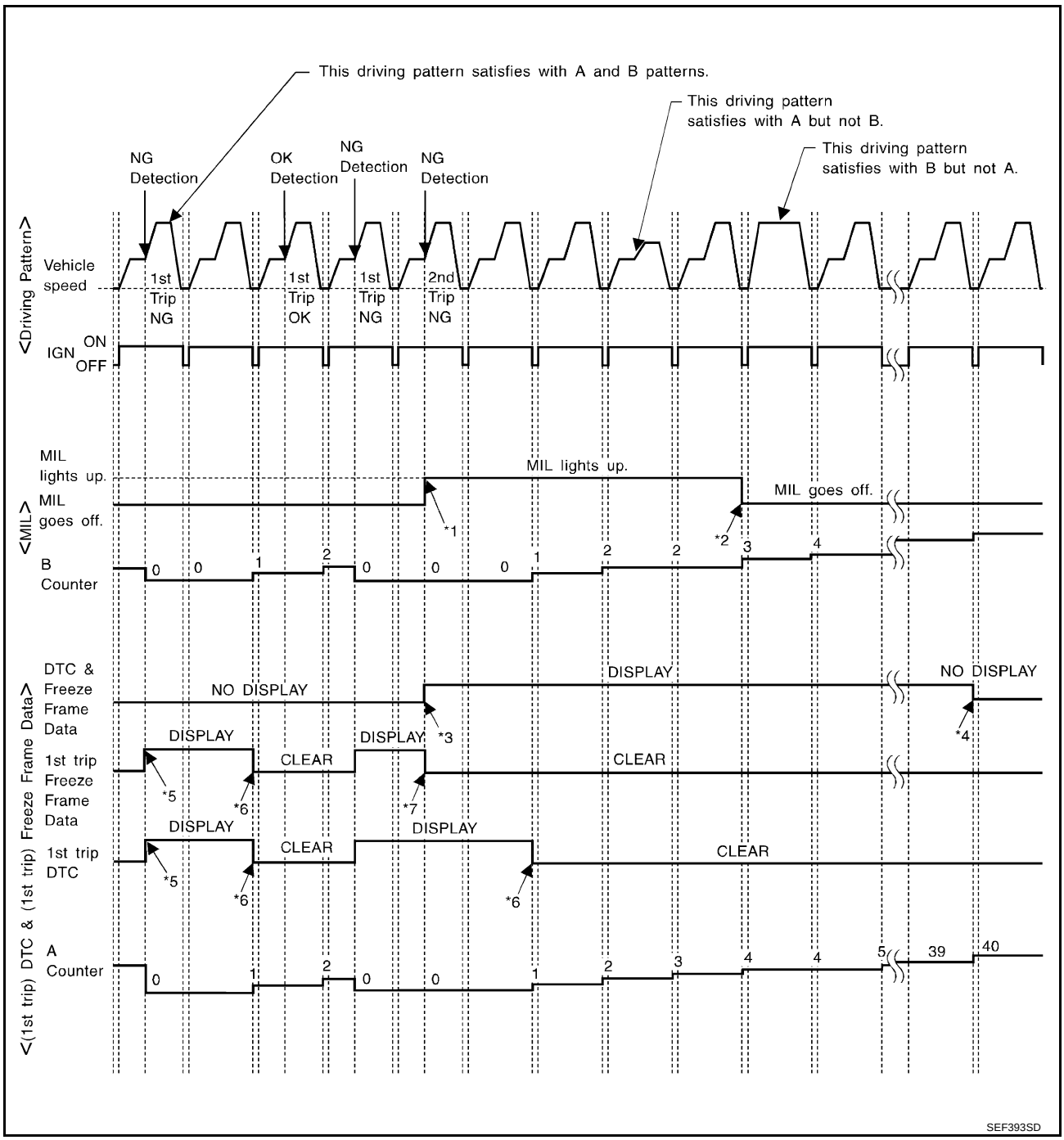
Driving pattern C means the vehicle operation as follows:
The following conditions should be satisfied at the same time:
Engine speed: (Engine speed in the freeze frame data) ±375 rpm
Calculated load value: (Calculated load value in the freeze frame data) x (1±0.1) [%]
Engine coolant temperature (T) condition:

- When the freeze frame data shows lower than 70°C (158°F), T should be lower than 70°C (158°F).
- When the freeze frame data shows higher than or equal to 70°C (158°F), T should be higher than or equal to 70°C (158°F).

Example:
If the stored freeze frame data is as follows:
Engine speed: 850 rpm, Calculated load value: 30%, Engine coolant temperature: 80°C (176°F)
To be satisfied with driving pattern C, the vehicle should run under the following conditions:
Engine speed: 475 - 1,225 rpm, Calculated load value: 27 - 33%, Engine coolant temperature: more than 70°C (158°F)

- The C counter will be cleared when the malfunction is detected regardless of vehicle conditions above.
- The C counter will be counted up when vehicle conditions above is satisfied without the same malfunction.
- The DTC will not be displayed after C counter reaches 80.
- The 1st trip DTC will be cleared when C counter is counted once without the same malfunction after DTC is stored in ECM.

RELATIONSHIP BETWEEN MIL, DTC, 1ST TRIP DTC AND DRIVING PATTERNS EXCEPT FOR "MISFIRE <EXHAUST QUALITY DETERIORATION>", "FUEL INJECTION SYSTEM"



*1: When the same malfunction is detected in two consecutive trips, MIL will light up.

*2: MIL will go off after vehicle is driven 3 times (pattern B) without any malfunctions.

*3: When the same malfunction is detected in two consecutive trips, the DTC and the freeze frame data will be stored in ECM.

*4: The DTC and the freeze frame data will not be displayed any longer after vehicle is driven 40 times (pattern A) without the same malfunction. (The DTC and the freeze frame data still remain in ECM.)

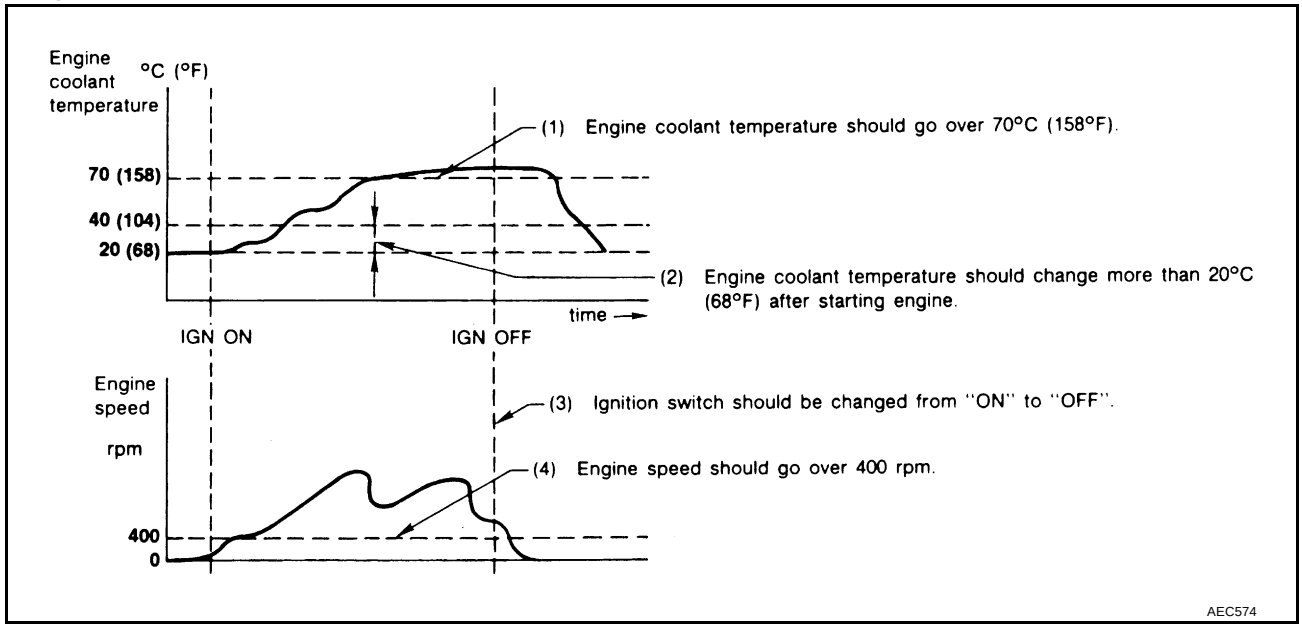
*5: When a malfunction is detected for the first time, the 1st trip DTC and the 1st trip freeze frame data will be stored in ECM.

*6: 1st trip DTC will be cleared after vehicle is driven once (pattern B) without the same malfunction.

*7: When the same malfunction is detected in the 2nd trip, the 1st trip freeze frame data will be cleared.

EXPLANATION FOR DRIVING PATTERNS EXCEPT FOR "MISFIRE <EXHAUST QUALITY DETERIORATION>", "FUEL INJECTION SYSTEM"

<Driving Pattern A>



- The A counter will be cleared when the malfunction is detected regardless of (1) - (4).
- The A counter will be counted up when (1) - (4) are satisfied without the same malfunction.
- The DTC will not be displayed after the A counter reaches 40.

<Driving Pattern B>

Driving pattern B means the vehicle operation as follows:
All components and systems should be monitored at least once by the OBD system.

- The B counter will be cleared when the malfunction is detected once regardless of the driving pattern.
- The B counter will be counted up when driving pattern B is satisfied without any malfunctions.
- The MIL will go off when the B counter reaches 3 (*2 in OBD SYSTEM OPERATION CHART).

TROUBLE DIAGNOSIS

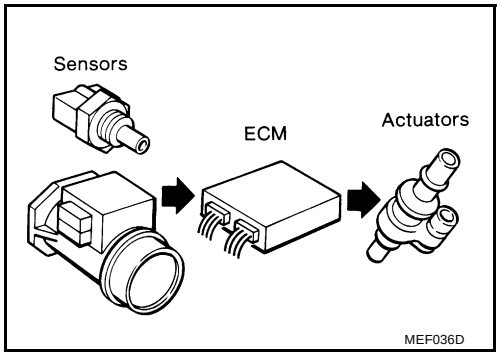
PFP:00004

Trouble Diagnosis Introduction

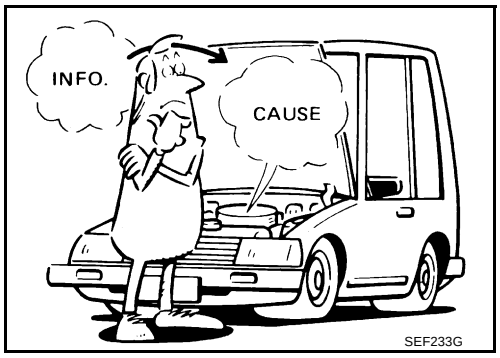
ABS009B2

INTRODUCTION

The engine has an ECM to control major systems such as fuel control, ignition control, idle air control system, etc. The ECM accepts input signals from sensors and instantly drives actuators. It is essential that both input and output signals are proper and stable. At the same time, it is important that there are no malfunctions such as vacuum leaks, fouled spark plugs, or other malfunctions with the engine.



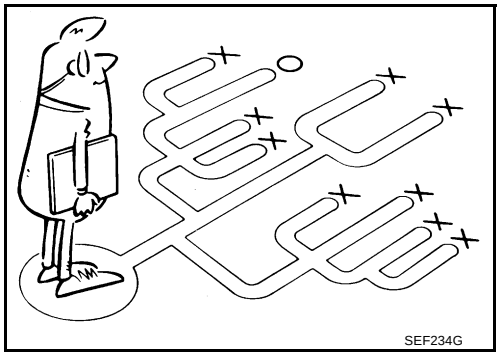
It is much more difficult to diagnose an incident that occurs intermittently rather than continuously. Most intermittent incidents are caused by poor electric connections or improper wiring. In this case, careful checking of suspected circuits may help prevent the replacement of good parts.



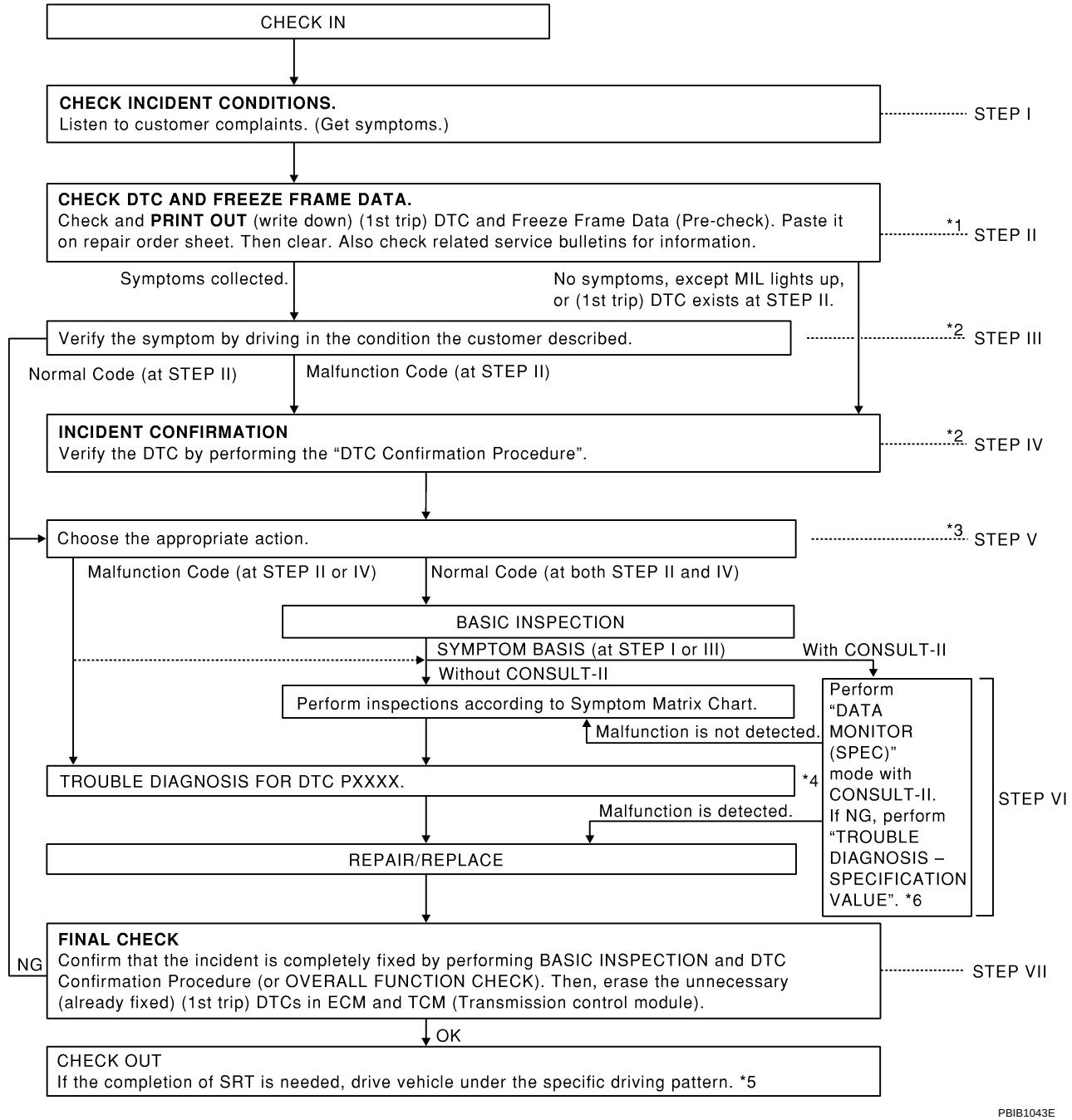
A visual check only may not find the cause of the incidents. A road test with CONSULT-II (or GST) or a circuit tester connected should be performed. Follow the Work Flow on EC-73 .

Before undertaking actual checks, take a few minutes to talk with a customer who approaches with a driveability complaint. The customer can supply good information about such incidents, especially intermittent ones. Find out what symptoms are present and under what conditions they occur. A Diagnostic Worksheet like the example on EC-75 should be used.

Start your diagnosis by looking for conventional malfunctions first. This will help troubleshoot driveability malfunctions on an electronically controlled engine vehicle.



WORK FLOW
Flow Chart



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*1 If time data of “SELF-DIAG RESULTS” is other than [0] or [1t], perform EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

*2 If the incident cannot be verified, perform EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

*3 If the on board diagnostic system cannot be performed, check main power supply and ground circuit. Refer to EC-129, "POWER SUPPLY AND GROUND CIRCUIT" .

*4 If malfunctioning part cannot be detected, perform EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

*5 EC-58

*6 EC-124

Description for Work Flow

STEP	DESCRIPTION
STEP I	Get detailed information about the conditions and the environment when the incident/symptom occurred using the DIAGNOSTIC WORK SHEET, EC-74 .
STEP II	Before confirming the concern, check and write down (print out using CONSULT-II or GST) the (1st trip) DTC and the (1st trip) freeze frame data, then erase the DTC and the data. (Refer to EC-61 .) The (1st trip) DTC and the (1st trip) freeze frame data can be used when duplicating the incident at STEP III & IV. If the incident cannot be verified, perform EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" . Study the relationship between the cause, specified by (1st trip) DTC, and the symptom described by the customer. (The Symptom Matrix Chart will be useful. See EC-83 .) Also check related service bulletins for information.
STEP III	Try to confirm the symptom and under what conditions the incident occurs. The DIAGNOSTIC WORK SHEET and the freeze frame data are useful to verify the incident. Connect CONSULT-II to the vehicle in DATA MONITOR (AUTO TRIG) mode and check real time diagnosis results. If the incident cannot be verified, perform EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" . If the malfunction code is detected, skip STEP IV and perform STEP V.
STEP IV	Try to detect the (1st trip) DTC by driving in (or performing) the DTC Confirmation Procedure. Check and read the (1st trip) DTC and (1st trip) freeze frame data by using CONSULT-II or GST. During the (1st trip) DTC verification, be sure to connect CONSULT-II to the vehicle in DATA MONITOR (AUTO TRIG) mode and check real time diagnosis results. If the incident cannot be verified, perform EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" . In case the DTC Confirmation Procedure is not available, perform the Overall Function Check instead. The (1st trip) DTC cannot be displayed by this check, however, this simplified check is an effective alternative. The NG result of the Overall Function Check is the same as the (1st trip) DTC detection.
STEP V	Take the appropriate action based on the results of STEP I through IV. If the malfunction code is indicated, proceed to TROUBLE DIAGNOSIS FOR DTC PXXXX. If the normal code is indicated, proceed to the BASIC INSPECTION. (Refer to EC-78 .) Then perform inspections according to the Symptom Matrix Chart. (Refer to EC-83 .)
STEP VI	Identify where to begin diagnosis based on the relationship study between symptom and possible causes. Inspect the system for mechanical binding, loose connectors or wiring damage using (tracing) Harness Layouts. Gently shake the related connectors, components or wiring harness with CONSULT-II set in “DATA MONITOR (AUTO TRIG)” mode. Check the voltage of the related ECM terminals or monitor the output data from the related sensors with CONSULT-II. Refer to EC-95 , EC-118 . The Diagnostic Procedure in EC section contains a description based on open circuit inspection. A short circuit inspection is also required for the circuit check in the Diagnostic Procedure. For details, refer to Circuit Inspection in GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident" . Repair or replace the malfunction parts. If malfunctioning part cannot be detected, perform EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .
STEP VII	Once you have repaired the circuit or replaced a component, you need to run the engine in the same conditions and circumstances which resulted in the customer's initial complaint. Perform the DTC Confirmation Procedure and confirm the normal code [DTC No. P0000] is detected. If the incident is still detected in the final check, perform STEP VI by using a method different from the previous one. Before returning the vehicle to the customer, be sure to erase the unnecessary (already fixed) (1st trip) DTC in ECM and TCM (Transmission control module). (Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" and AT-38, "HOW TO ERASE DTC" .)

DIAGNOSTIC WORKSHEET

Description

There are many operating conditions that lead to the malfunction of engine components. A good grasp of such conditions can make troubleshooting faster and more accurate.
In general, each customer feels differently about a incident. It is important to fully understand the symptoms or conditions for a customer complaint.
Utilize a diagnostic worksheet like the one on the next page in order to organize all the information for troubleshooting.
Some conditions may cause the MIL to come on steady or blink and DTC to be detected. Examples:

- Vehicle ran out of fuel, which caused the engine to misfire.

KEY POINTS

WHAT ..... Vehicle & engine model
WHEN ..... Date, Frequencies
WHERE..... Road conditions
HOW ..... Operating conditions, Weather conditions, Symptoms

SEF907L

- Fuel filler cap was left off or incorrectly screwed on, allowing fuel to evaporate into the atmosphere.

Worksheet Sample

Customer name MR/MS		Model & Year	VIN
Engine #		Trans.	Mileage
Incident Date		Manuf. Date	In Service Date
Fuel and fuel filler cap		☐ Vehicle ran out of fuel causing misfire ☐ Fuel filler cap was left off or incorrectly screwed on.	
Symptoms	☐ Startability	☐ Impossible to start ☐ No combustion ☐ Partial combustion ☐ Partial combustion affected by throttle position ☐ Partial combustion NOT affected by throttle position ☐ Possible but hard to start ☐ Others [ ]	
	☐ Idling	☐ No fast idle ☐ Unstable ☐ High idle ☐ Low idle ☐ Others [ ]	
	☐ Driveability	☐ Stumble ☐ Surge ☐ Knock ☐ Lack of power ☐ Intake backfire ☐ Exhaust backfire ☐ Others [ ]	
	☐ Engine stall	☐ At the time of start ☐ While idling ☐ While accelerating ☐ While decelerating ☐ Just after stopping ☐ While loading	
Incident occurrence		☐ Just after delivery ☐ Recently ☐ In the morning ☐ At night ☐ In the daytime	
Frequency		☐ All the time ☐ Under certain conditions ☐ Sometimes	
Weather conditions		☐ Not affected	
	Weather	☐ Fine ☐ Raining ☐ Snowing ☐ Others [ ]	
	Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold ☐ Humid ˚F	
Engine conditions		☐ Cold ☐ During warm-up ☐ After warm-up Engine speed 0 2,000 4,000 6,000 8,000 rpm	
Road conditions		☐ In town ☐ In suburbs ☐ Highway ☐ Off road (up/down)	
Driving conditions		☐ Not affected ☐ At starting ☐ While idling ☐ At racing ☐ While accelerating ☐ While cruising ☐ While decelerating ☐ While turning (RH/LH) Vehicle speed 0 10 20 30 40 50 60 MPH	
Malfunction indicator lamp		☐ Turned on ☐ Not turned on	

MTBL0017

DTC Inspection Priority Chart

ABS009B3

If some DTCs are displayed at the same time, perform inspections one by one based on the following priority chart.

NOTE:
If DTC U1000 and/or U1001 is displayed with other DTC, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-138 .

Priority	Detected items (DTC)
1	● U1000 U1001 CAN communication line ● P0101 P0102 P0103 Mass air flow sensor ● P0112 P0113 P0127 Intake air temperature sensor ● P0117 P0118 P0125 Engine coolant temperature sensor ● P0128 Thermostat function ● P0122 P0123 P0222 P0223 P1225 P1226 P2135 Throttle position sensor ● P0181 P0182 P0183 Fuel tank temperature sensor ● P0327 P0328 Knock sensor ● P0335 Crankshaft position sensor (POS) ● P0340 P0345 Camshaft position sensor (PHASE) ● P0460 P0461 P0462 P0463 Fuel level sensor ● P0500 Vehicle speed sensor ● P0605 ECM ● P0700 TCM ● P0705 Park/Neutral position (PNP) switch ● P1229 Sensor power supply ● P1610 - P1615 NATS ● P1706 Park/Neutral position (PNP) switch ● P2122 P2123 P2127 P2128 P2138 Accelerator pedal position sensor
2	● P0037 P0038 P0057 P0058 Heated oxygen sensor 2 heater ● P0138 P0139 P0158 P0159 P1146 P1147 P1166 P1167 Heated oxygen sensor 2 ● P0441 EVAP control system purge flow monitoring ● P0444 P0445 P1444 EVAP canister purge volume control solenoid valve ● P0447 P1446 EVAP canister vent control valve ● P0451 P0452 P0453 EVAP control system pressure sensor ● P0550 Power steering pressure sensor ● P0710 P0720 P0725 P0740 P0744 P0745 P1705 P1716 P1730 P1752 P1754 P1757 P1759 P1762 P1764 P1767 P1769 P1772 P1774 A/T related sensors, solenoid valves and switches ● P1031 P1032 P1051 P1052 A/F sensor 1 heater ● P1065 ECM power supply ● P1111 P1136 Intake valve timing control solenoid valve ● P1122 Electric throttle control function ● P1124 P1126 P1128 Electric throttle control actuator ● P1217 Engine over temperature (OVERHEAT) ● P1271 P1272 P1273 P1274 P1276 P1278 P1279 P1281 P1282 P1283 P1284 P1286 P1288 P1289 A/F sensor 1 ● P1805 Brake switch
3	● P0011 P0021 Intake valve timing control ● P0171 P0172 P0174 P0175 Fuel injection system function ● P0300 - P0306 Misfire ● P0420 P0430 Three way catalyst function ● P0442 P0455 P0456 EVAP control system ● P0506 P0507 Idle speed control system ● P1121 Electric throttle control actuator ● P1148 P1168 Closed loop control ● P1211 TCS control unit ● P1212 TCS communication line ● P1564 ASCD steering switch ● P1572 ASCD brake switch ● P1574 ASCD vehicle speed sensor

Fail-safe Chart

ABS009B4

When the DTC listed below is detected, the ECM enters fail-safe mode and the MIL lights up.

DTC No.	Detected items	Engine operating condition in fail-safe mode
P0102 P0103	Mass air flow sensor circuit	Engine speed will not rise more than 2,400 rpm due to the fuel cut.
P0117 P0118	Engine coolant temperature sensor circuit	Engine coolant temperature will be determined by ECM based on the time after turning ignition switch ON or START. CONSULT-II displays the engine coolant temperature decided by ECM.
		Condition: Just as ignition switch is turned ON or START — Engine coolant temperature decided (CONSULT-II display): 40°C (104°F)
		Condition: More than approx. 4 minutes after ignition ON or START — Engine coolant temperature decided (CONSULT-II display): 80°C (176°F)
		Condition: Except as shown above — Engine coolant temperature decided (CONSULT-II display): 40 - 80°C (104 - 176°F) (Depends on the time)
		When the fail-safe system for engine coolant temperature sensor is activated, the cooling fan operates while engine is running.
P0122 P0123 P0222 P0223 P2135	Throttle position sensor	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.
P1121	Electric throttle control actuator	(When electric throttle control actuator does not function properly due to the return spring malfunction:) ECM controls the electric throttle actuator by regulating the throttle opening around the idle position. The engine speed will not rise more than 2,000 rpm.
		(When throttle valve opening angle in fail-safe mode is not in specified range:) ECM controls the electric throttle control actuator by regulating the throttle opening to 20 degrees or less.
		(When ECM detects the throttle valve is stuck open:) While the vehicle is driving, it slows down gradually by fuel cut. After the vehicle stops, the engine stalls. The engine can restart in N or P position, and engine speed will not exceed 1,000 rpm or more.
P1122	Electric throttle control function	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.
P1124 P1126	Throttle control motor relay	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.
P1128	Throttle control motor	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.
P1229	Sensor power supply	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.
P2122 P2123 P2127 P2128 P2138	Accelerator pedal position sensor	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

- When there is an open circuit on MIL circuit, the ECM cannot warn the driver by lighting up MIL when there is malfunction on engine control system.
  Therefore, when electrical controlled throttle and part of ECM related diagnoses are continuously detected as NG for 5 trips, ECM warns the driver that engine control system malfunctions and MIL circuit is open by means of operating fail-safe function.
  The fail-safe function also operates when above diagnoses except MIL circuit are detected and demands the driver to repair the malfunction.

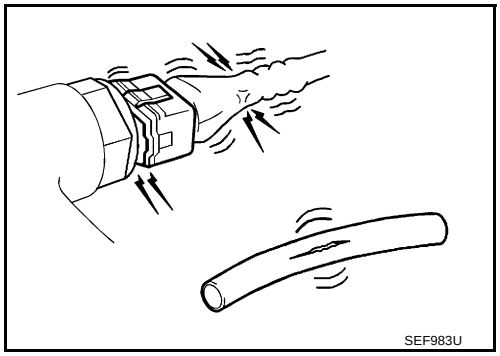
Engine operating condition in fail-safe mode	Engine speed will not rise more than 2,500 rpm due to the fuel cut

Basic Inspection

ABS009B5

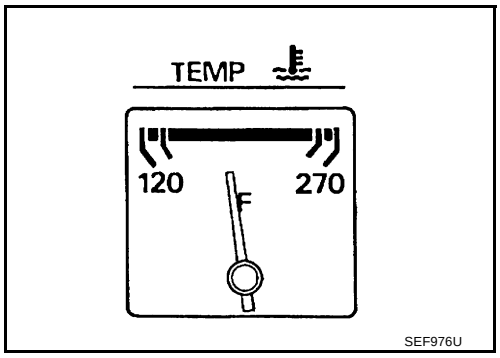
1. INSPECTION START

1. Check service records for any recent repairs that may indicate a related malfunction, or a current need for scheduled maintenance.
2. Open engine hood and check the following:
- Harness connectors for improper connections
- Wiring harness for improper connections, pinches and cut
- Vacuum hoses for splits, kinks and improper connections
- Hoses and ducts for leaks
- Air cleaner clogging
- Gasket


SEF983U

3. Confirm that electrical or mechanical loads are not applied.
- Headlamp switch is OFF.
- Air conditioner switch is OFF.
- Rear window defogger switch is OFF.
- Steering wheel is in the straight-ahead position, etc.

4. Start engine and warm it up until engine coolant temperature indicator points the middle of gauge.
Ensure engine stays below 1,000 rpm.

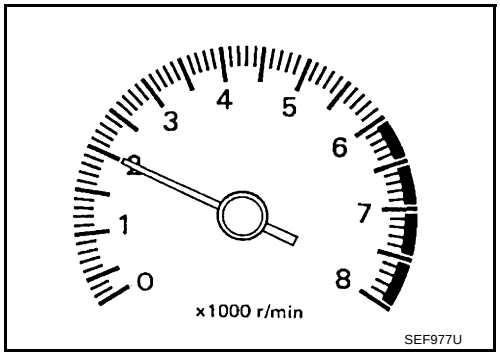


SEF976U

5. Run engine at about 2,000 rpm for about 2 minutes under no-load.
6. Make sure that no DTC is displayed with CONSULT-II or GST.

OK or NG

OK >> GO TO 3.
NG >> GO TO 2.



SEF977U

2. REPAIR OR REPLACE

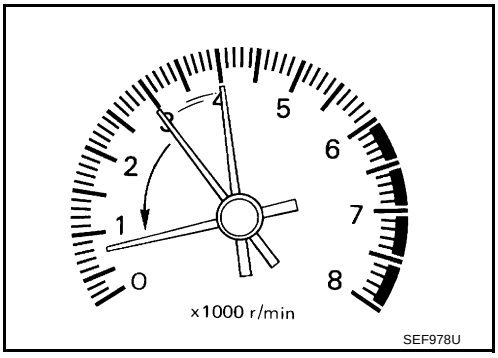
Repair or replace components as necessary according to corresponding Diagnostic Procedure.

>> GO TO 3.

3. CHECK TARGET IDLE SPEED

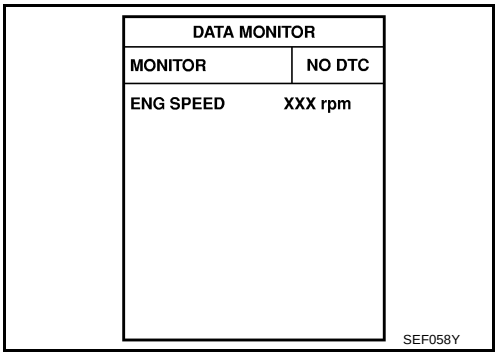
With CONSULT-II

1. Run engine at about 2,000 rpm for about 2 minutes under no-load.
2. Rev engine (2,000 to 3,000 rpm) two or three times under no-load, then run engine at idle speed for about 1 minute.



3. Read idle speed in “DATA MONITOR” mode with CONSULT-II.

A/T: 650 ± 50 rpm (in P or N position)
M/T: 650 ± 50 rpm



Without CONSULT-II

1. Run engine at about 2,000 rpm for about 2 minutes under no-load.
2. Rev engine (2,000 to 3,000 rpm) two or three times under no-load, then run engine at idle speed for about 1 minute.
3. Check idle speed.

A/T: 650 ± 50 rpm (in P or N position)
M/T: 650 ± 50 rpm

OK or NG

OK >> GO TO 10.
NG >> GO TO 4.

4. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

1. Stop engine.
2. Perform EC-42, "Accelerator Pedal Released Position Learning" .

>> GO TO 5.

5. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform EC-42, "Throttle Valve Closed Position Learning" .

>> GO TO 6.

6. PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-43, "Idle Air Volume Learning" .
Is Idle Air Volume Learning carried out successfully?

Yes or No

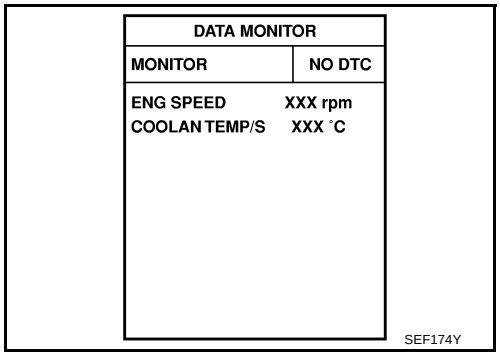
Yes >> GO TO 7.
No >> 1. Follow the instruction of Idle Air Volume Learning.
2. GO TO 4.

7. CHECK TARGET IDLE SPEED AGAIN

With CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Read idle speed in “DATA MONITOR” mode with CONSULT-II.

A/T: 650 ± 50 rpm (in P or N position)
M/T: 650 ± 50 rpm



Without CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Check idle speed.

A/T: 650 ± 50 rpm (in P or N position)
M/T: 650 ± 50 rpm

OK or NG

OK >> GO TO 10.
NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Check camshaft position sensor (PHASE) and circuit. Refer to EC-274 .
- Check crankshaft position sensor (POS) and circuit. Refer to EC-267 .

OK or NG

OK >> GO TO 9.
NG >> 1. Repair or replace.
2. GO TO 4.

9. CHECK ECM FUNCTION

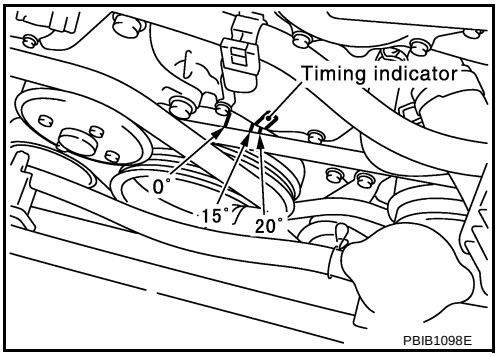
1. Substitute another known-good ECM to check ECM function. (ECM may be the cause of an incident, but this is a rare case.)
2. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs. Refer to EC-63, "NVIS (Nissan Vehicle Immobilizer System — NATS)" .

>> GO TO 4.

10. CHECK IGNITION TIMING

1. Run engine at idle.
2. Check ignition timing with a timing light.

A/T: 15 ± 5° BTDC (in P or N position)
M/T: 15 ± 5° BTDC



OK or NG

OK >> **INSPECTION END**
NG >> GO TO 11.

11. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

1. Stop engine.
2. Perform EC-42, "Accelerator Pedal Released Position Learning" .

>> GO TO 12.

12. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform EC-42, "Throttle Valve Closed Position Learning" .

>> GO TO 13.

13. PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-43, "Idle Air Volume Learning" .
Is Idle Air Volume Learning carried out successfully?

Yes or No

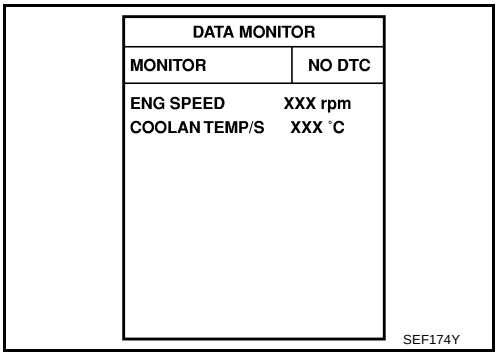
Yes >> GO TO 14.
No >> 1. Follow the instruction of Idle Air Volume Learning.
2. GO TO 4.

14. CHECK TARGET IDLE SPEED AGAIN

With CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Read idle speed in “DATA MONITOR” mode with CONSULT-II.

A/T: 650 ± 50 rpm (in P or N position)
M/T: 650 ± 50 rpm



Without CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Check idle speed.

A/T: 650 ± 50 rpm (in P or N position)
M/T: 650 ± 50 rpm

OK or NG

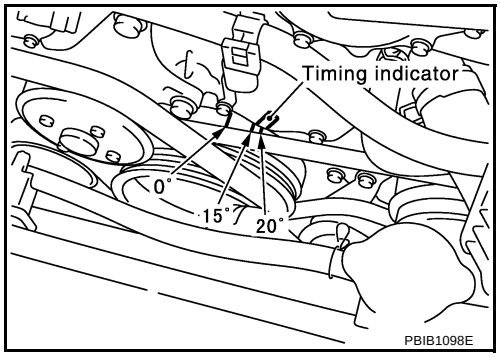
OK >> GO TO 15.
NG >> GO TO 17.

15. CHECK IGNITION TIMING AGAIN

1. Run engine at idle.
2. Check ignition timing with a timing light.

A/T: 15 ± 5° BTDC (in P or N position)

M/T: 15 ± 5° BTDC



OK or NG

OK >> **INSPECTION END**
NG >> GO TO 16.

16. CHECK TIMING CHAIN INSTALLATION

Check timing chain installation. Refer to EM-55, "TIMING CHAIN" .

OK or NG

OK >> GO TO 17.
NG >> 1. Repair the timing chain installation.
2. GO TO 4.

17. DETECT MALFUNCTIONING PART

Check the following.

- Check camshaft position sensor (PHASE) and circuit. Refer to EC-274 .
- Check crankshaft position sensor (POS) and circuit. Refer to EC-267 .

OK or NG

OK >> GO TO 18.
NG >> 1. Repair or replace.
2. GO TO 4.

18. CHECK ECM FUNCTION

1. Substitute another known-good ECM to check ECM function. (ECM may be the cause of an incident, but this is a rare case.)
2. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs. Refer to EC-63, "NVIS (Nissan Vehicle Immobilizer System — NATS)" .

>> GO TO 4.

Symptom Matrix Chart
SYSTEM — BASIC ENGINE CONTROL SYSTEM

ABS009B6

		SYMPTOM													Reference page
		HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	
Warranty symptom code		AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	HA	
Fuel	Fuel pump circuit	1	1	2	3	2		2	2			3		2	EC-638
	Fuel pressure regulator system	3	3	4	4	4	4	4	4	4		4			EC-45
	Injector circuit	1	1	2	3	2		2	2			2			EC-632
	Evaporative emission system	3	3	4	4	4	4	4	4	4		4			EC-673
Air	Positive crankcase ventilation system	3	3	4	4	4	4	4	4	4		4	1		EC-685
	Incorrect idle speed adjustment						1	1	1	1		1			EC-31
	Electric throttle control actuator	1	1	2	3	3	2	2	2	2		2		2	EC-396, EC-398
Ignition	Incorrect ignition timing adjustment	3	3	1	1	1		1	1			1			EC-31
	Ignition circuit	1	1	2	2	2		2	2			2			EC-620
Main power supply and ground circuit		2	2	3	3	3		3	3		2	3			EC-129
Mass air flow sensor circuit		1	1	2	2	2		2	2			2			EC-153, EC-162
Engine coolant temperature sensor circuit					3		3			3					EC-176, EC-190
A/F sensor 1 circuit															EC-378, EC-462, EC-470, EC-478, EC-487, EC-496, EC-505, EC-517
Throttle position sensor circuit							2			2					EC-182, EC-247, EC-453, EC-455, EC-603
Accelerator pedal position sensor circuit				3	2	1									EC-457, EC-587, EC-595, EC-611
Knock sensor circuit				2								3			EC-262
Crankshaft position sensor (POS) circuit		2	2												EC-267
Camshaft position sensor (PHASE) circuit		3	2												EC-274

	SYMPTOM													Reference page
	HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	
Warranty symptom code	AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	HA	
Vehicle speed signal circuit		2	3		3						3			EC-363
Power steering pressure sensor circuit		2					3	3						EC-369
ECM	2	2	3	3	3	3	3	3	3	3	3			EC-375, EC-385
Intake valve timing control solenoid valve circuit		3	2		1	3	2	2	3		3			EC-389
PNP switch circuit			3		3		3	3			3			EC-573
Refrigerant pressure sensor circuit		2				3			3		4			EC-645
Electrical load signal circuit							3							EC-651
Air conditioner circuit	2	2	3	3	3	3	3	3	3		3		2	ATC-36
VDC/TCS/ABS control unit ABS actuator and electric unit (control unit)			4											BRC-94, BRC-46

1 - 6: The numbers refer to the order of inspection.

(continued on next page)

SYSTEM — ENGINE MECHANICAL & OTHER

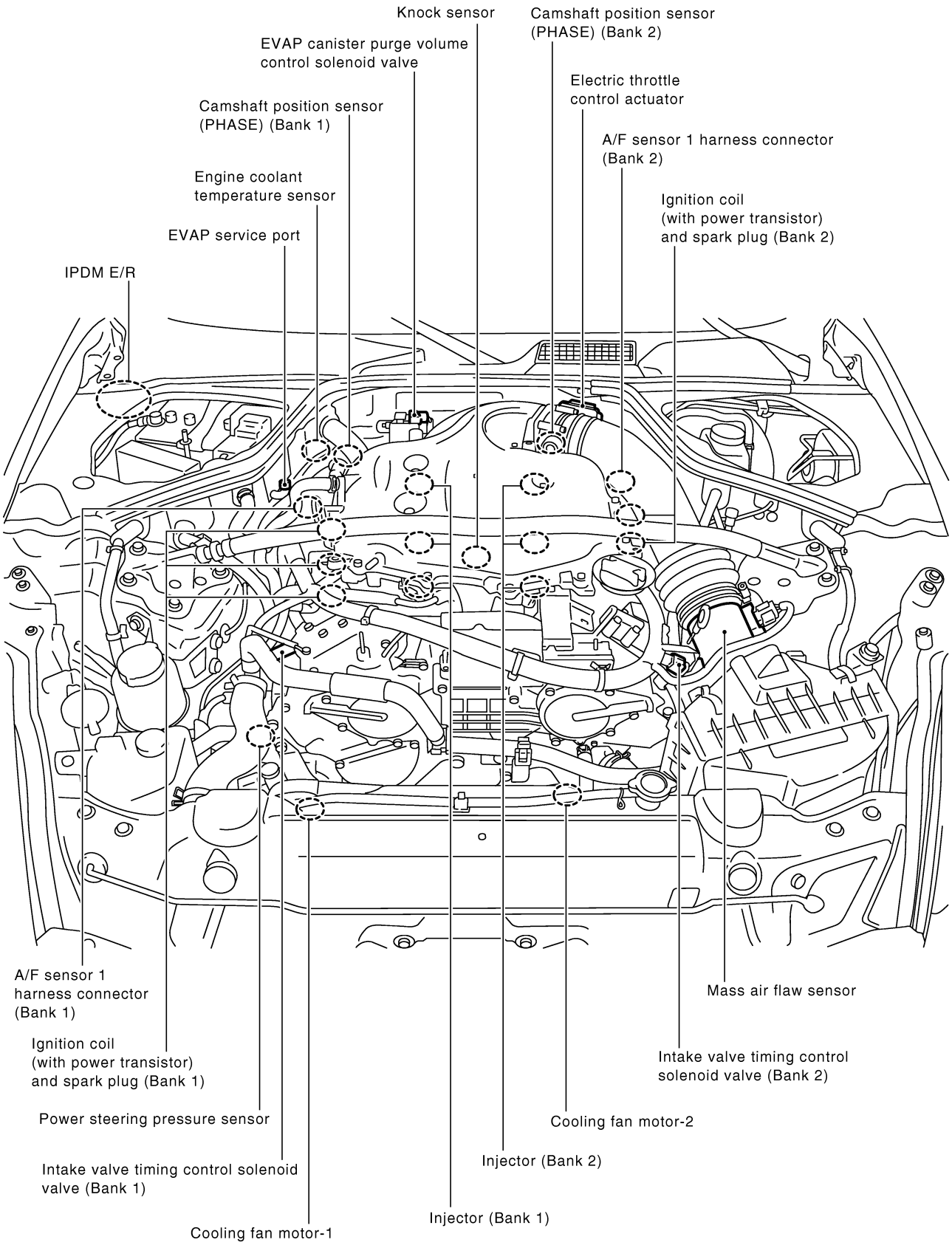
		SYMPTOM													Reference page
		HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	
Warranty symptom code		AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	HA	
Fuel	Fuel tank	5	5												FL-10
	Fuel piping			5	5	5		5	5			5			EM-36
	Vapor lock														—
	Valve deposit	5		5	5	5		5	5			5			—
	Poor fuel (Heavy weight gasoline, Low octane)														—
Air	Air duct	5	5	5	5	5	5	5	5	5		5			EM-14
	Air cleaner														EM-14
	Air leakage from air duct (Mass air flow sensor — electric throttle control actuator)														EM-14
	Electric throttle control actuator														EM-16
	Air leakage from intake manifold/ Collector/Gasket														EM-16, EM-21
Cranking	Battery	1	1	1		1		1	1			1		1	SC-4
	Generator circuit														SC-21
	Starter circuit	3													SC-10
	Signal plate	6													EM-111
	PNP switch	4													MT-12 or AT-108
Engine	Cylinder head	5	5	5	5	5		5	5			5			EM-92
	Cylinder head gasket										4		3		
	Cylinder block	6	6	6	6	6		6	6			6	4		EM-111
	Piston														
	Piston ring														
	Connecting rod														
	Bearing														
	Crankshaft														

		SYMPTOM													Reference page
		HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	
Warranty symptom code		AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	HA	
Valve mechanism	Timing chain	5	5	5	5	5		5	5			5			EM-55
	Camshaft														EM-76
	Intake valve timing control														EM-55
	Intake valve												3		EM-92
	Exhaust valve														
Exhaust	Exhaust manifold/Tube/Muffler/Gasket	5	5	5	5	5		5	5			5			EM-23, EX-3
	Three way catalyst														
Lubrication	Oil pan/Oil strainer/Oil pump/Oil filter/Oil gallery/Oil cooler	5	5	5	5	5		5	5			5			EM-27, LU-12 , LU-9 , LU-10
	Oil level (Low)/Filthy oil														LU-6
Cooling	Radiator/Hose/Radiator filler cap	5	5	5	5	5		5	5		4	5			CO-12, CO-15
	Thermostat									5					CO-25
	Water pump														CO-21
	Water gallery														CO-27
	Cooling fan									5					CO-19
	Coolant level (Low)/Contaminated coolant														CO-9
NVIS (NISSAN Vehicle Immobilizer System — NATS)		1	1												EC-63 or BL-158

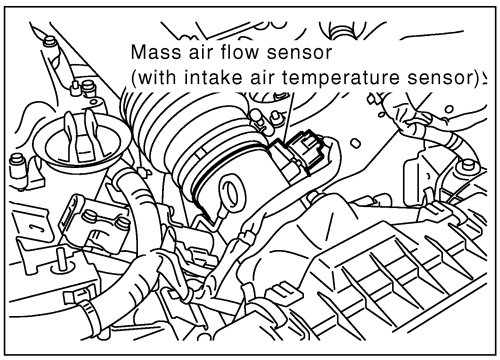
1 - 6: The numbers refer to the order of inspection.

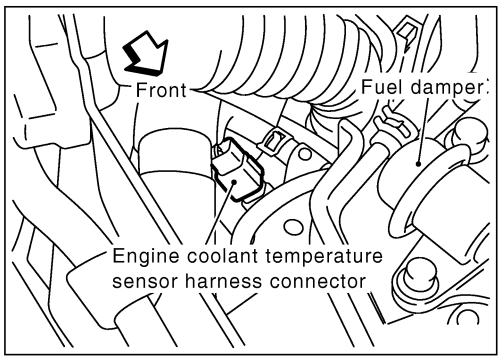
Engine Control Component Parts Location

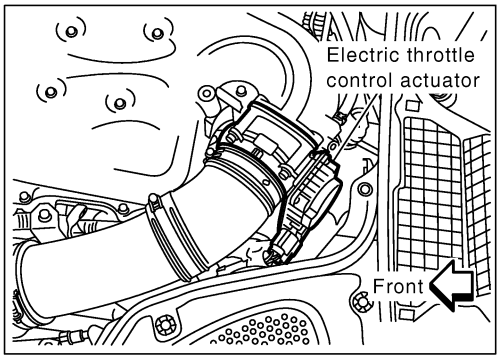
ABS009B7

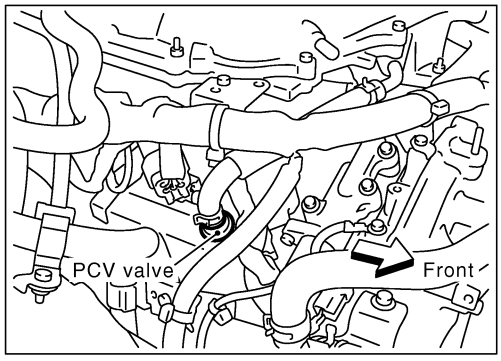


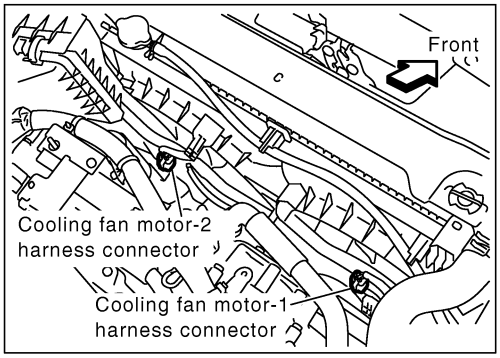
PBIB2205E

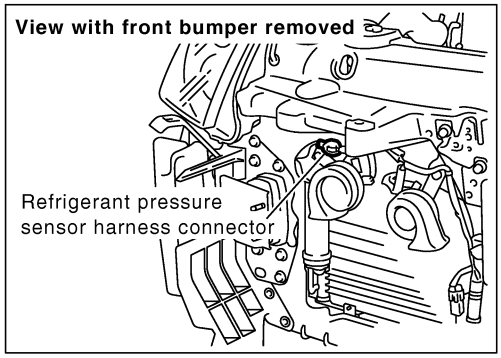

Mass air flow sensor
(with intake air temperature sensor)

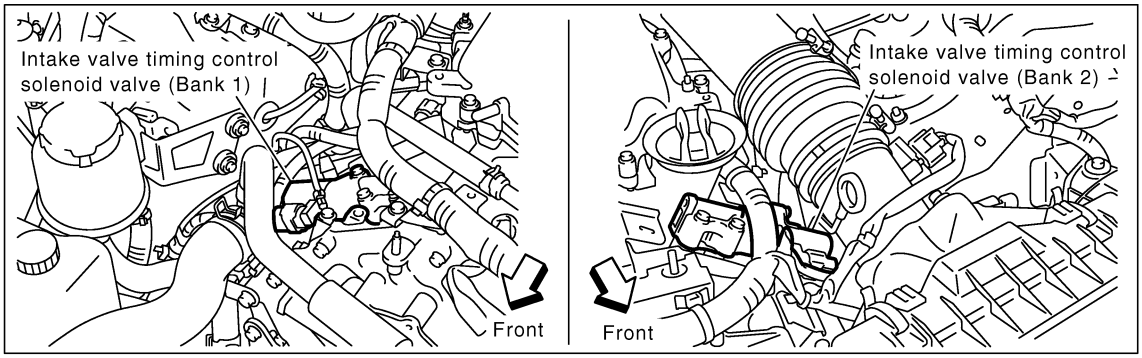

Front
Fuel damper
Engine coolant temperature
sensor harness connector


Electric throttle
control actuator
Front

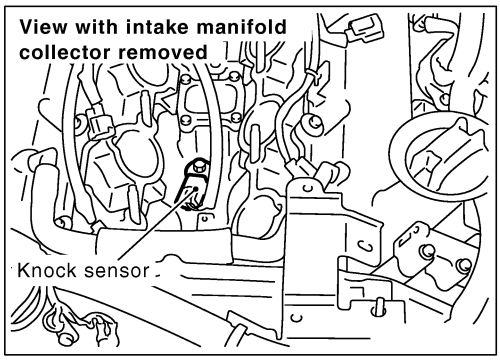

PCV valve
Front

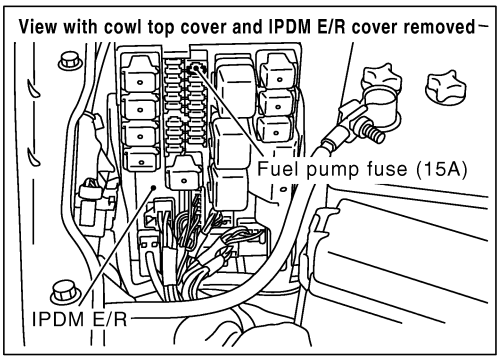

Front
Cooling fan motor-2
harness connector
Cooling fan motor-1
harness connector

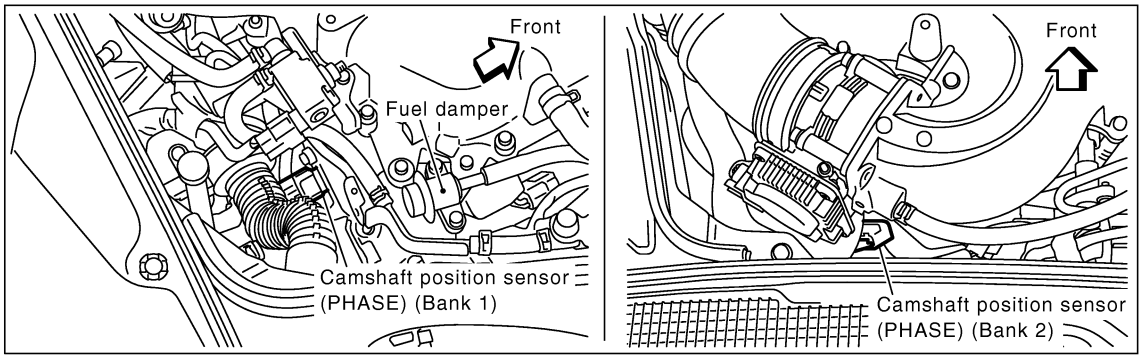

View with front bumper removed
Refrigerant pressure
sensor harness connector

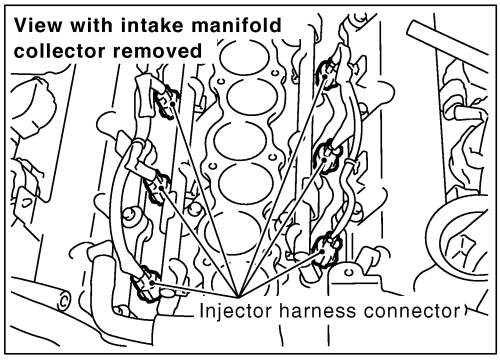

Intake valve timing control
solenoid valve (Bank 1)
Front
Intake valve timing control
solenoid valve (Bank 2)
Front

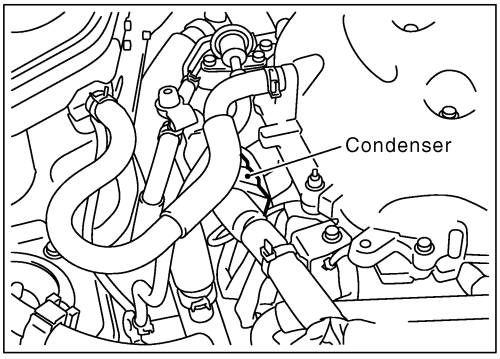
PBIB2211E

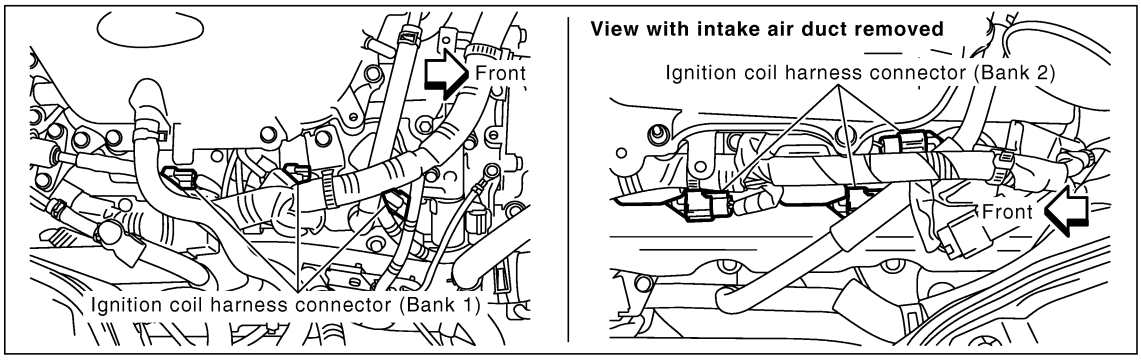

View with intake manifold collector removed
Knock sensor


View with cowl top cover and IPDM E/R cover removed
Fuel pump fuse (15A)
IPDM E/R

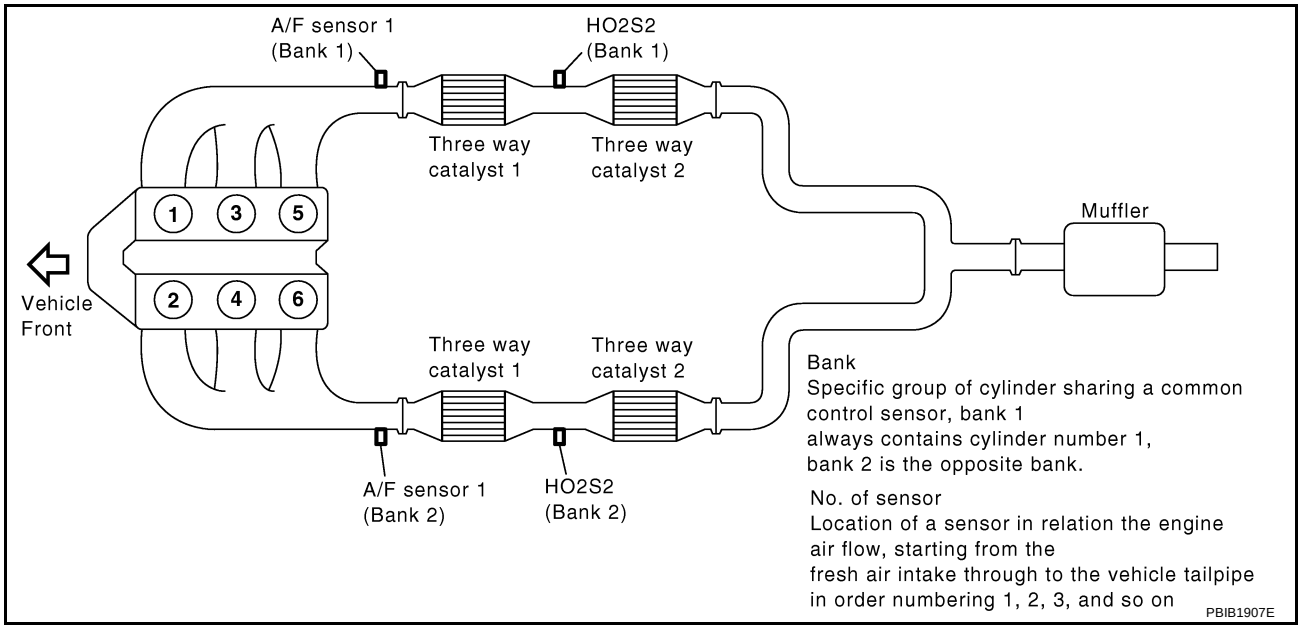

Front
Fuel damper
Camshaft position sensor (PHASE) (Bank 1)
Front
Camshaft position sensor (PHASE) (Bank 2)

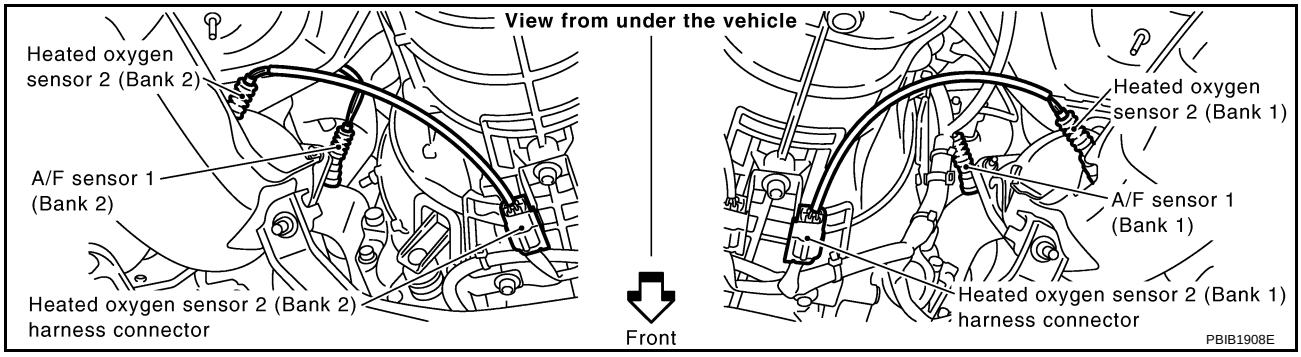

View with intake manifold collector removed
Injector harness connector

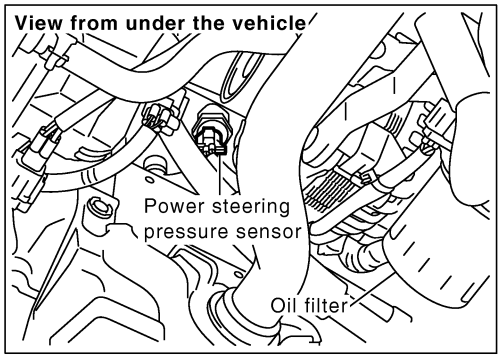

Condenser

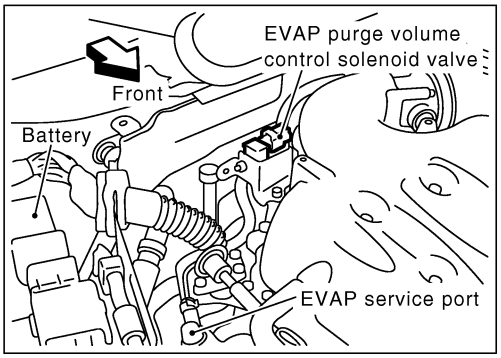

Front
Ignition coil harness connector (Bank 1)
View with intake air duct removed
Ignition coil harness connector (Bank 2)
Front

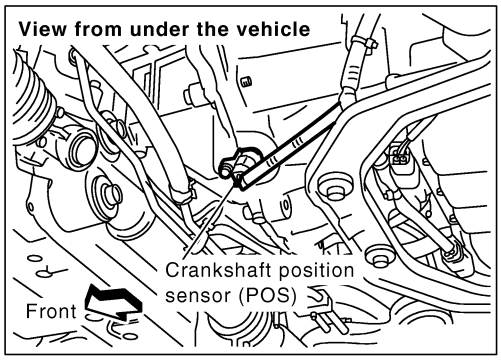
PBIB2212E

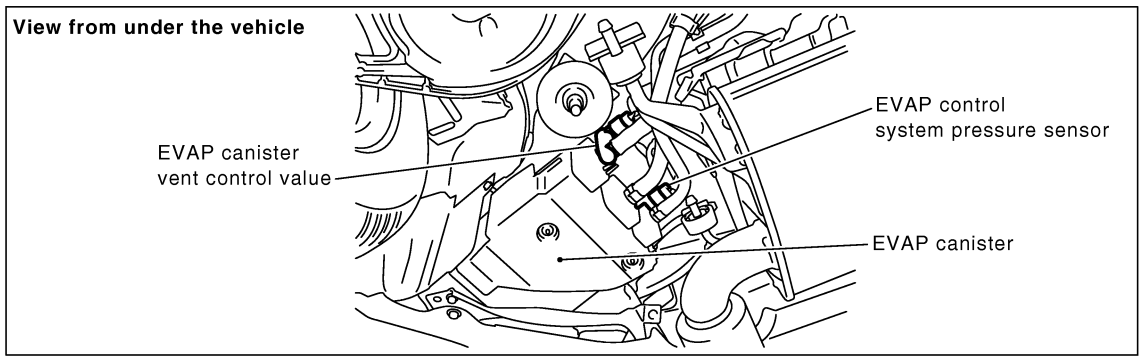

A/F sensor 1
(Bank 1)
HO2S2
(Bank 1)
Three way
catalyst 1
Three way
catalyst 2
Muffler
1
3
5
2
4
6
Vehicle
Front
Three way
catalyst 1
Three way
catalyst 2
A/F sensor 1
(Bank 2)
HO2S2
(Bank 2)
Bank
Specific group of cylinder sharing a common control sensor, bank 1
always contains cylinder number 1,
bank 2 is the opposite bank.
No. of sensor
Location of a sensor in relation the engine air flow, starting from the
fresh air intake through to the vehicle tailpipe in order numbering 1, 2, 3, and so on
PBIB1907E


View from under the vehicle
Heated oxygen
sensor 2 (Bank 2)
A/F sensor 1
(Bank 2)
Heated oxygen sensor 2 (Bank 2)
harness connector
Front
Heated oxygen
sensor 2 (Bank 1)
A/F sensor 1
(Bank 1)
Heated oxygen sensor 2 (Bank 1)
harness connector
PBIB1908E

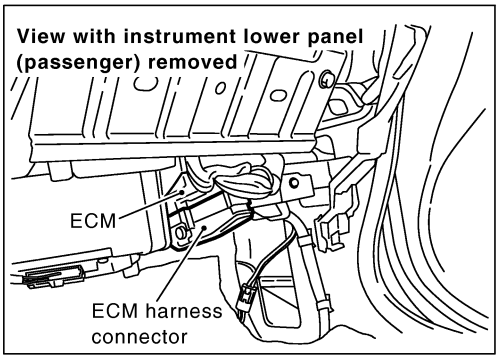

View from under the vehicle
Power steering
pressure sensor
Oil filter

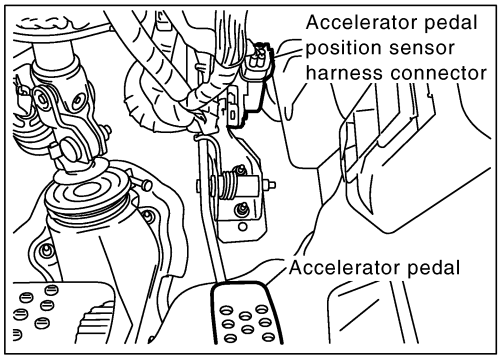

EVAP purge volume
control solenoid valve
Front
Battery
EVAP service port

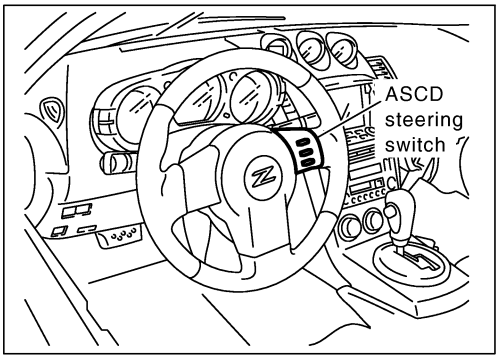

View from under the vehicle
Crankshaft position
sensor (POS)
Front

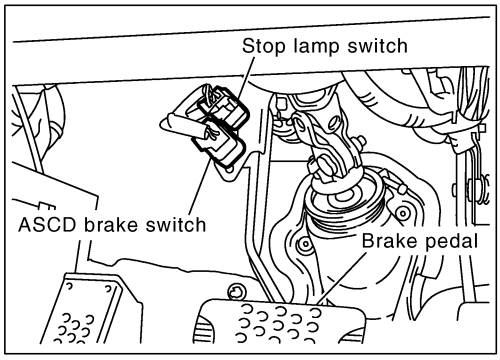

View from under the vehicle
EVAP control
system pressure sensor
EVAP canister
vent control value
EVAP canister

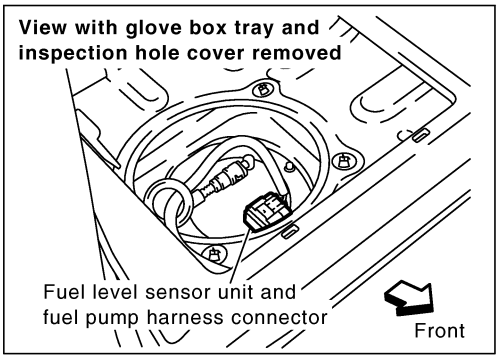
PBIB2213E

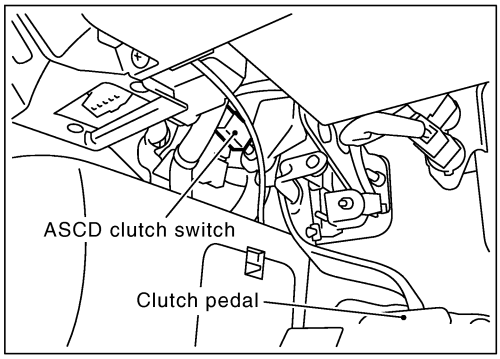

View with instrument lower panel (passenger) removed
ECM
ECM harness connector

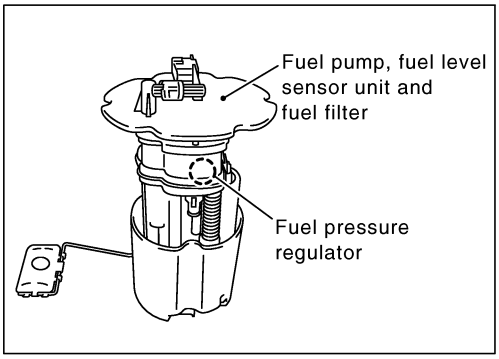

Accelerator pedal position sensor harness connector
Accelerator pedal


ASCD steering switch


Stop lamp switch
ASCD brake switch
Brake pedal


View with glove box tray and inspection hole cover removed
Fuel level sensor unit and fuel pump harness connector
Front

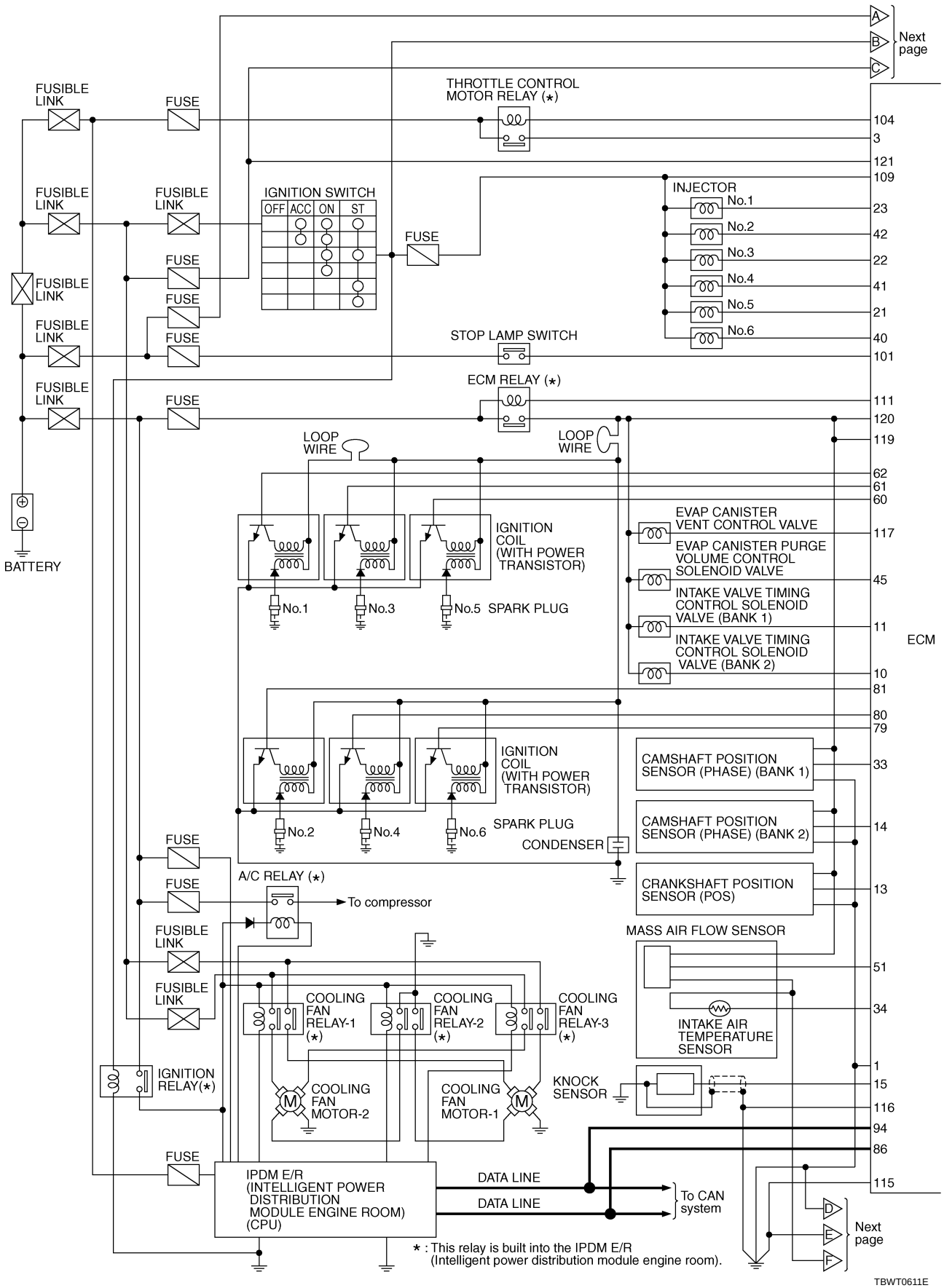

ASCD clutch switch
Clutch pedal

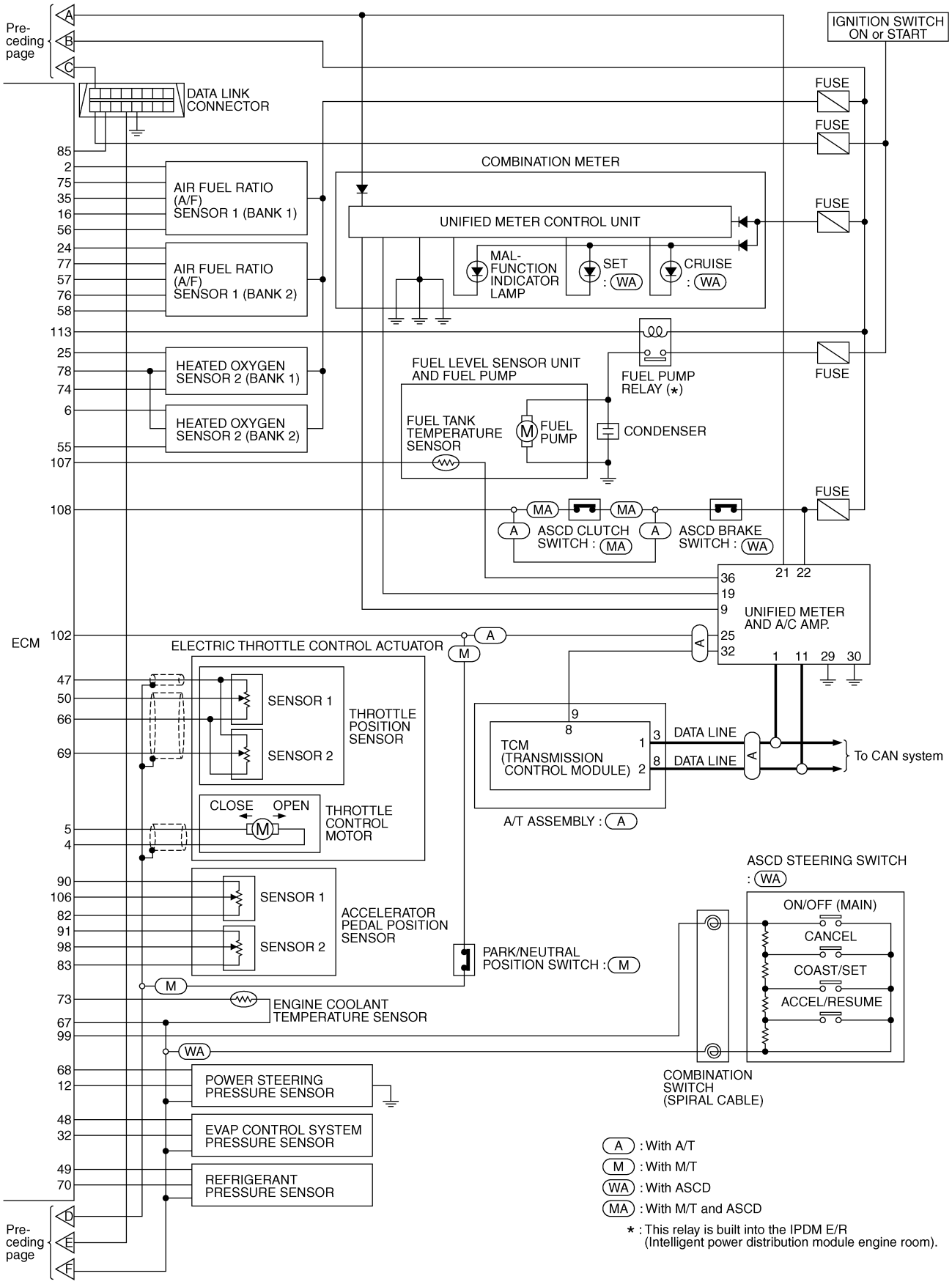

Fuel pump, fuel level sensor unit and fuel filter
Fuel pressure regulator

PBIB1664E

Circuit Diagram

ABS009B8

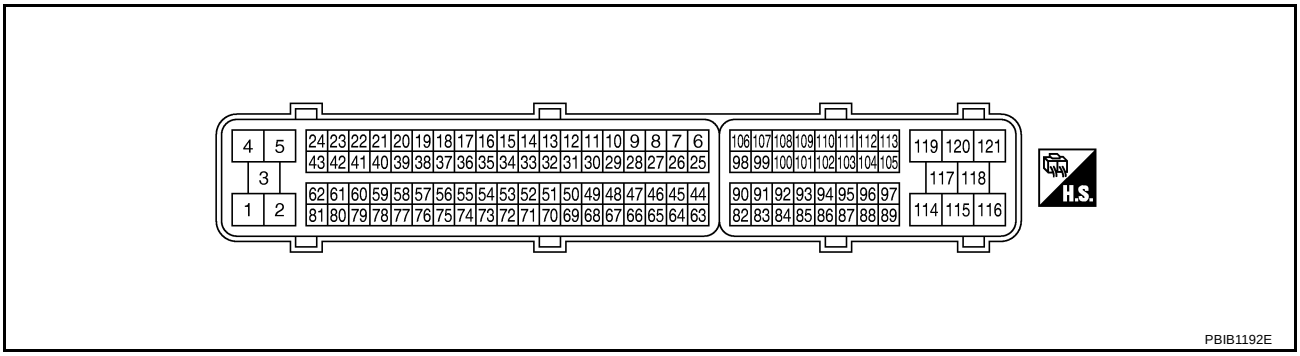



Pre-ceding page
A
B
C
IGNITION SWITCH ON or START
DATA LINK CONNECTOR
FUSE
FUSE
FUSE
FUSE
FUSE
85
2
75
35
16
56
24
77
57
76
58
113
25
78
74
6
55
107
108
AIR FUEL RATIO (A/F) SENSOR 1 (BANK 1)
AIR FUEL RATIO (A/F) SENSOR 1 (BANK 2)
HEATED OXYGEN SENSOR 2 (BANK 1)
HEATED OXYGEN SENSOR 2 (BANK 2)
COMBINATION METER
UNIFIED METER CONTROL UNIT
MAL-FUNCTION INDICATOR LAMP
SET : WA
CRUISE : WA
FUEL LEVEL SENSOR UNIT AND FUEL PUMP
FUEL PUMP RELAY (*)
FUEL TANK TEMPERATURE SENSOR
FUEL PUMP
CONDENSER
MA
MA
A
ASCD CLUTCH SWITCH : MA
A
ASCD BRAKE SWITCH : WA
21 22
36
19
9
UNIFIED METER AND A/C AMP.
ECM
102
ELECTRIC THROTTLE CONTROL ACTUATOR
A
M
A
25
32
1 11 29 30
47
50
66
69
SENSOR 1
SENSOR 2
THROTTLE POSITION SENSOR
9
8
TCM (TRANSMISSION CONTROL MODULE)
1
2
3
8
DATA LINE
DATA LINE
A
To CAN system
CLOSE
OPEN
M
5
4
THROTTLE CONTROL MOTOR
A/T ASSEMBLY : A
ASCD STEERING SWITCH : WA
90
106
82
91
98
83
SENSOR 1
SENSOR 2
ACCELERATOR PEDAL POSITION SENSOR
PARK/NEUTRAL POSITION SWITCH : M
ON/OFF (MAIN)
CANCEL
COAST/SET
ACCEL/RESUME
M
73
ENGINE COOLANT TEMPERATURE SENSOR
67
99
WA
COMBINATION SWITCH (SPIRAL CABLE)
68
12
48
32
49
70
POWER STEERING PRESSURE SENSOR
EVAP CONTROL SYSTEM PRESSURE SENSOR
REFRIGERANT PRESSURE SENSOR
Pre-ceding page
D
E
F
A : With A/T
M : With M/T
WA : With ASCD
MA : With M/T and ASCD
* : This relay is built into the IPDM E/R (Intelligent power distribution module engine room).

TBWM0595E

ECM Harness Connector Terminal Layout

ABS009B9

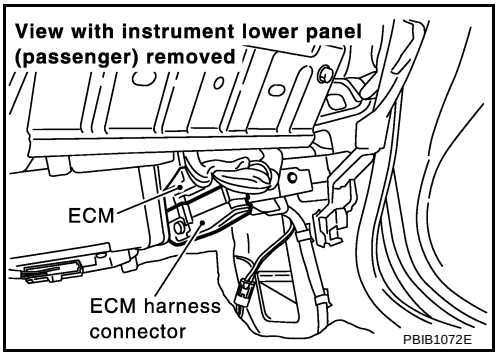


ECM Terminals and Reference Value

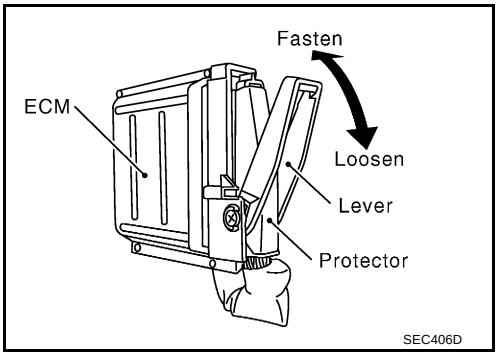
ABS009BA

PREPARATION

1. ECM is located behind the passenger side instrument lower panel. For this inspection, remove passenger side instrument lower panel.
2. Remove ECM harness connector.



3. When disconnecting ECM harness connector, loosen it with levers as far as they will go as shown in the figure.
4. Connect a break-out box (SST) and Y-cable adapter (SST) between the ECM and ECM harness connector.
   - Use extreme care not to touch 2 pins at 1 time.
   - Data is for comparison and may not be exact.

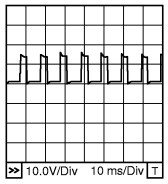


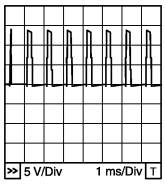
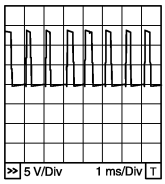
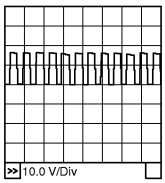
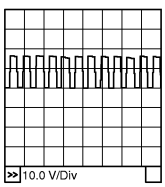
ECM INSPECTION TABLE

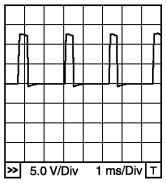
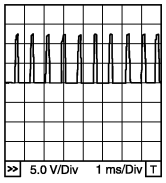
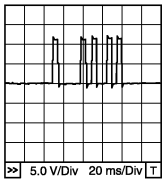
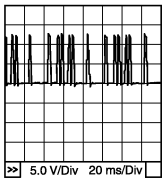
Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-II.

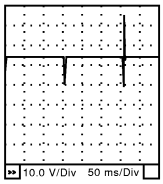
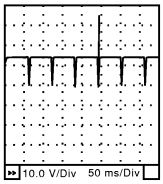
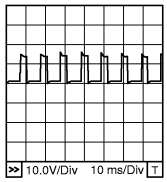
CAUTION:

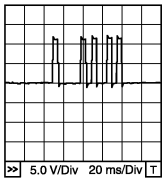
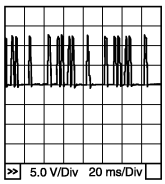
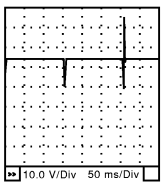
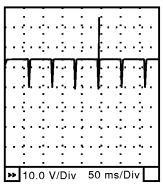
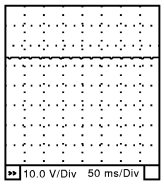
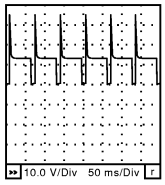
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECMs transistor. Use a ground other than ECM terminals, such as the ground.

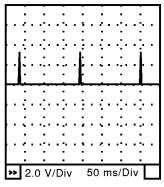
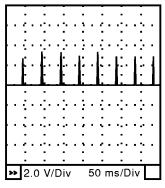
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
1	B	ECM ground	**[Engine is running]** ● Idle speed	Body ground
2	GY/R	A/F sensor 1 heater (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 5V★  PBIB1584E

TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
3	G	Throttle control motor relay power supply	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
4	L/B	Throttle control motor (Close)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal is fully released	0 - 14V★  PBIB1104E
5	L/Y	Throttle control motor (Open)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal is fully depressed	0 - 14V★  PBIB1105E
6	P/L	Heated oxygen sensor 2 heater (bank 2)	**[Engine is running]** ● Engine speed is below 3,600 rpm after the following conditions are met. – Engine: after warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 1.0V
			[Ignition switch: ON] ● Engine stopped **[Engine is running]** ● Engine speed is above 3,600 rpm.	BATTERY VOLTAGE (11 - 14V)
10	W/G	Intake valve timing control solenoid valve (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	BATTERY VOLTAGE (11 - 14V)
			[Engine is running] ● **Warm-up condition** ● When revving engine up to 2,500 rpm quickly	7 - 12V★  PBIB1790E
11	P	Intake valve timing control solenoid valve (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	BATTERY VOLTAGE (11 - 14V)
			[Engine is running] ● **Warm-up condition** ● When revving engine up to 2,500 rpm quickly	7 - 12V★  PBIB1790E

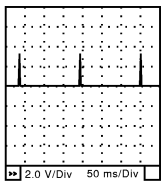
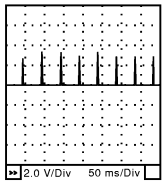
TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
12	L/W	Power steering pressure sensor	**[Engine is running]** ● Steering wheel is being turned.	0.5 - 4.5V
			[Engine is running] ● Steering wheel is not being turned.	0.4 - 0.8V
13	W/L	Crankshaft position sensor (POS)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	Approximately 1.6V★  PBIB1041E
			[Engine is running] ● Engine speed is 2,000 rpm.	Approximately 1.4V★  PBIB1042E
14	R/L	Camshaft position sensor (PHASE) (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	1.0 - 4.0V★  PBIB1039E
			[Engine is running] ● Engine speed is 2,000 rpm.	1.0 - 4.0V★  PBIB1040E
15	W	Knock sensor	**[Engine is running]** ● Idle speed	Approximately 2.5V
16	LG/B	A/F sensor 1 (Bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 3.1V
35	L/W			Approximately 2.6V
56	W/L			Approximately 2.3V
75	P/B			Approximately 2.3V

TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
21 22 23	SB R/Y R/B	Injector No. 5 Injector No. 3 Injector No. 1	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	BATTERY VOLTAGE (11 - 14V)★  SEC984C
			[Engine is running] ● **Warm-up condition** ● Engine speed is 2,000 rpm.	BATTERY VOLTAGE (11 - 14V)★  SEC985C
24	G/Y	A/F sensor 1 heater (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 5V★  PBIB1584E
25	P/B	Heated oxygen sensor 2 heater (bank 1)	**[Engine is running]** ● Engine speed is below 3,600 rpm after the following conditions are met. – Engine: after warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 1.0V
			[Ignition switch: ON] ● Engine stopped **[Engine is running]** ● Engine speed is above 3,600 rpm.	BATTERY VOLTAGE (11 - 14V)
32	BR/W	EVAP control system pressure sensor	**[Ignition switch: ON]**	Approximately 1.8 - 4.8V

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
33	R	Camshaft position sensor (PHASE) (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	1.0 - 4.0V★  PBIB1039E
			[Engine is running] ● Engine speed is 2,000 rpm.	1.0 - 4.0V★  PBIB1040E
34	Y/G	Intake air temperature sensor	**[Engine is running]**	Approximately 0 - 4.8V Output voltage varies with intake air temperature.
40 41 42	LG W/B B/R	Injector No. 6 Injector No. 4 Injector No. 2	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	BATTERY VOLTAGE (11 - 14V)★  SEC984C
			[Engine is running] ● **Warm-up condition** ● Engine speed is 2,000 rpm	BATTERY VOLTAGE (11 - 14V)★  SEC985C
45	G/W	EVAP canister purge volume control solenoid valve	**[Engine is running]** ● Idle speed ● Accelerator pedal is not depressed even slightly, after engine starting.	BATTERY VOLTAGE (11 - 14V)★  SEC990C
			[Engine is running] ● Engine speed is about 2,000 rpm (More than 100 seconds after starting engine).	BATTERY VOLTAGE (11 - 14V)★  SEC991C

TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
47	W/R	Sensor power supply (Throttle position sensor)	**[Ignition switch: ON]**	Approximately 5V
48	PU	Sensor power supply (EVAP control system pressure sensor)	**[Ignition switch: ON]**	Approximately 5V
49	B	Sensor power supply (Refrigerant pressure sensor)	**[Ignition switch: ON]**	Approximately 5V
50	G	Throttle position sensor 1	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal is fully released	More than 0.36V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal is fully depressed	Less than 4.75V
51	OR	Mass air flow sensor	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0.9 - 1.2V
			[Engine is running] ● **Warm-up condition** ● Engine speed is 2,500 rpm.	1.6 - 1.9V
55	L/B	Heated oxygen sensor 2 (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - Approximately 1.0V
57	L	A/F sensor 1 (Bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 2.6V
58	W			Approximately 2.3V
76	LG			Approximately 3.1V
77	P			Approximately 2.3V
60 61 62	PU/W L/R Y/R	Ignition signal No. 5 Ignition signal No. 3 Ignition signal No. 1	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	0 - 0.2V★  SEC986C
			[Engine is running] ● **Warm-up condition** ● Engine speed is 2,500 rpm.	0.1 - 0.4V★  SEC987C

TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
66	L	Sensor ground (Throttle position sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V
67	B/W	Sensor ground (Mass air flow sensor / IAT sensor / Power steering pressure sensor / EVAP control system pressure sensor / ASCD steering switch / Refrigerant pressure sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V
68	R/W	Sensor power supply (Power steering pressure sensor)	**[Ignition switch: ON]**	Approximately 5V
69	Y	Throttle position sensor 2	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal is fully released	Less than 4.75V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal is fully depressed	More than 0.36V
70	G/R	Refrigerant pressure sensor	**[Engine is running]** ● **Warm-up condition** ● Both A/C switch and blower switch are ON. (Compressor operates.)	1.0 - 4.0V
73	BR/Y	Engine coolant temperature sensor	**[Engine is running]**	Approximately 0 - 4.8V Output voltage varies with engine coolant temperature.
74	OR	Heated oxygen sensor 2 (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - Approximately 1.0V
78	B/Y	Sensor ground (Heated oxygen sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V

TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
79 80 81	GY/R GY G/B	Ignition signal No. 6 Ignition signal No. 4 Ignition signal No. 2	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	0 - 0.2V★  SEC986C
			[Engine is running] ● **Warm-up condition** ● Engine speed is 2,500 rpm.	0.1 - 0.4V★  SEC987C
82	G/Y	Sensor ground (APP sensor 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V
83	G/R	Sensor ground (APP sensor 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V
85	LG	Data link connector	**[Ignition switch: ON]** ● CONSULT-II or GST is disconnected.	Approximately 5V - Battery voltage (11 - 14V)
86	P	CAN communication line	**[Ignition switch: ON]**	Approximately 1.1 - 2.3V Output voltage varies with the communication status.
90	LG	Sensor power supply (APP sensor 1)	**[Ignition switch: ON]**	Approximately 5V
91	B/OR	Sensor power supply (APP sensor 2)	**[Ignition switch: ON]**	Approximately 5V
94	L	CAN communication line	**[Ignition switch: ON]**	Approximately 2.6 - 3.2V Output voltage varies with the communication status.
98	G/B	Accelerator pedal position sensor 2	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal is fully released	0.15 - 0.60V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal is fully depressed	1.95 - 2.40V
99	G/Y	ASCD steering switch	**[Ignition switch: ON]** ● ASCD steering switch: OFF	Approximately 4V
			[Ignition switch: ON] ● ON/OFF (MAIN) switch: Pressed	Approximately 0V
			[Ignition switch: ON] ● CANCEL switch: Pressed	Approximately 1V
			[Ignition switch: ON] ● COAST/SET switch: Pressed	Approximately 2V
			[Ignition switch: ON] ● ACCEL/RESUME switch: Pressed	Approximately 3V

TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
101	L/OR	Stop lamp switch	**[Ignition switch: OFF]** ● Brake pedal is fully released	Approximately 0V
			[Ignition switch: OFF] ● Brake pedal is slightly depressed	BATTERY VOLTAGE (11 - 14V)
102	BR/Y	PNP switch	**[Ignition switch: ON]** ● Shift lever: P or N (A/T), Neutral (M/T)	Approximately 0V
			[Ignition switch: ON] ● Except above position	BATTERY VOLTAGE (11 - 14V)
104	SB	Throttle control motor relay	**[Ignition switch: OFF]**	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON]	0 - 1.0V
106	G/OR	Accelerator pedal position sensor 1	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal is fully released	0.5 - 1.0V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal is fully depressed	3.9 - 4.7V
107	GY/R	Fuel tank temperature sensor	**[Engine is running]**	Approximately 0 - 4.8V Output voltage varies with fuel tank temperature.
108	B/R	ASCD brake switch	**[Ignition switch: ON]** ● Brake pedal is slightly depressed (A/T) ● Brake pedal and/or clutch pedal are slightly depressed (M/T)	Approximately 0V
			[Ignition switch: ON] ● Brake pedal is fully released (A/T models) ● Brake pedal and clutch pedal are fully released (M/T models)	BATTERY VOLTAGE (11 - 14V)
109	W/B	Ignition switch	**[Ignition switch: OFF]**	0V
			[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14V)
111	GY/L	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
113	LG/B	Fuel pump relay	**[Ignition switch: ON]** ● For 1 second after turning ignition switch ON **[Engine is running]**	0 - 1.5V
			[Ignition switch: ON] ● More than 1 second after turning ignition switch ON.	BATTERY VOLTAGE (11 - 14V)
115 116	B/W B/R	ECM ground	**[Engine is running]** ● Idle speed	Body ground
117	G/W	EVAP canister vent control valve	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
119 120	R/W P	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
121	R/W	Power supply for ECM (Back-up)	**[Ignition switch: OFF]**	BATTERY VOLTAGE (11 - 14V)

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

CONSULT-II Function

ABS009BB

FUNCTION

Diagnostic test mode	Function
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on the CONSULT-II unit.
Self-diagnostic results	Self-diagnostic results such as 1st trip DTC, DTCs and 1st trip freeze frame data or freeze frame data can be read and erased quickly.*
Data monitor	Input/Output data in the ECM can be read.
Data monitor (SPEC)	Input/Output of the specification for Basic fuel schedule, AFM, A/F feedback control value and the other data monitor items can be read.
CAN diagnostic support monitor	The results of transmit/receive diagnosis of CAN communication can be read.
Active test	Diagnostic Test Mode in which CONSULT-II drives some actuators apart from the ECMs and also shifts some parameters in a specified range.
DTC & SRT confirmation	The status of system monitoring tests and the self-diagnosis status/result can be confirmed.
Function test	This mode is used to inform customers when their vehicle condition requires periodic maintenance.
ECM part number	ECM part number can be read.

*: The following emission-related diagnostic information is cleared when the ECM memory is erased.

- Diagnostic trouble codes
- 1st trip diagnostic trouble codes
- Freeze frame data
- 1st trip freeze frame data
- System readiness test (SRT) codes
- Test values
- Others

ENGINE CONTROL COMPONENT PARTS/CONTROL SYSTEMS APPLICATION

		Item	DIAGNOSTIC TEST MODE							
			WORK SUP-PORT	SELF-DIAGNOSTIC RESULTS		DATA MONI-TOR	DATA MONI-TOR (SPEC)	ACTIVE TEST	DTC & SRT CONFIRMATION	
				DTC*1	FREEZE FRAME DATA*2				SRT STATUS	DTC WORK SUP-PORT
ENGINE CONTROL COMPONENT PARTS	INPUT	Crankshaft position sensor (POS)		×	×	×	×			
		Camshaft position sensor (PHASE)		×	×	×	×			
		Mass air flow sensor		×		×	×			
		Engine coolant temperature sensor		×	×	×	×	×		
		Air fuel ratio (A/F) sensor 1		×		×	×		×	×
		Heated oxygen sensor 2		×		×	×		×	×
		Vehicle speed sensor		×	×	×	×			
		Accelerator pedal position sensor		×		×	×			
		Throttle position sensor		×		×	×			
		Fuel tank temperature sensor		×		×	×	×		
		EVAP control system pressure sensor		×		×	×			
		Intake air temperature sensor		×	×	×	×			
		Knock sensor		×						
		Refrigerant pressure sensor				×	×			
		Closed throttle position switch (accelerator pedal position sensor signal)				×	×			
		Air conditioner switch				×	×			
		Park/neutral position (PNP) switch		×		×	×			
		Stop lamp switch		×		×	×			
		Power steering pressure sensor		×		×	×			
		Battery voltage				×	×			
		Load signal				×	×			
		Fuel level sensor		×		×	×			
		ASCD steering switch		×		×	×			
		ASCD brake switch		×		×	×			
		ASCD clutch switch		×		×	×			

Item			DIAGNOSTIC TEST MODE							
			WORK SUP-PORT	SELF-DIAGNOSTIC RESULTS		DATA MONI-TOR	DATA MONI-TOR (SPEC)	ACTIVE TEST	DTC & SRT CONFIRMATION	
				DTC*1	FREEZE FRAME DATA*2				SRT STATUS	DTC WORK SUP-PORT
ENGINE CONTROL COMPONENT PARTS	OUTPUT	Injector				×	×	×		
		Power transistor (Ignition timing)				×	×	×		
		Throttle control motor relay		×		×	×			
		Throttle control motor		×						
		EVAP canister purge volume control solenoid valve		×		×	×	×		×
		Air conditioner relay				×	×			
		Fuel pump relay	×			×	×	×		
		Cooling fan relay		×		×	×	×		
		Air fuel ratio (A/F) sensor 1 heater		×		×	×		×	
		Heated oxygen sensor 2 heater		×		×	×		×	
		EVAP canister vent control valve	×	×		×	×	×		
		Intake valve timing control solenoid valve		×		×	×	×		
		Calculated load value			×	×	×			

X: Applicable

*1: This item includes 1st trip DTCs.

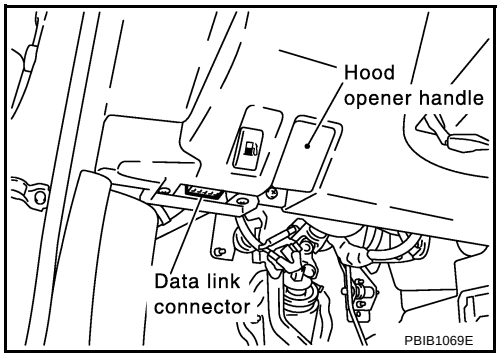
*2: This mode includes 1st trip freeze frame data or freeze frame data. The items appear on CONSULT-II screen in freeze frame data mode only if a 1st trip DTC or DTC is detected. For details, refer to EC-52 .

INSPECTION PROCEDURE

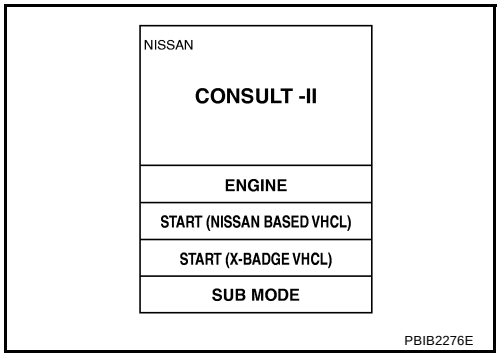
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

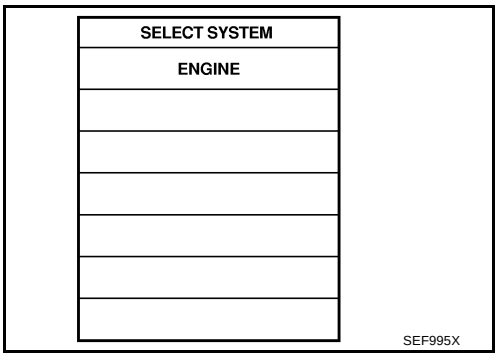
1. Turn ignition switch OFF.
2. Connect “CONSULT-II” and “CONSULT-II CONVERTER” to data link connector, which is located under LH dash panel near the hood opener handle.
3. Turn ignition switch ON.



4. Touch “START (NISSAN BASED VHCL)”.

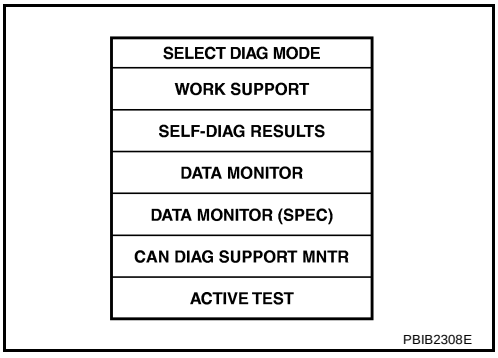


5. Touch “ENGINE”.
If “ENGINE” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



6. Perform each diagnostic test mode according to each service procedure.

For further information, see the CONSULT-II Operation Manual.



WORK SUPPORT MODE

Work Item

WORK ITEM	CONDITION	USAGE
FUEL PRESSURE RELEASE	● FUEL PUMP WILL STOP BY TOUCHING “START” DURING IDLING. CRANK A FEW TIMES AFTER ENGINE STALLS.	When releasing fuel pressure from fuel line
IDLE AIR VOL LEARN	● THE IDLE AIR VOLUME THAT KEEPS THE ENGINE WITHIN THE SPECIFIED RANGE IS MEMORIZED IN ECM.	When learning the idle air volume
SELF-LEARNING CONT	● THE COEFFICIENT OF SELF-LEARNING CONTROL MIXTURE RATIO RETURNS TO THE ORIGINAL COEFFICIENT.	When clearing the coefficient of self-learning control value
EVAP SYSTEM CLOSE	CLOSE THE EVAP CANISTER VENT CONTROL VALVE IN ORDER TO MAKE EVAP SYSTEM CLOSE UNDER THE FOLLOWING CONDITIONS. ● IGN SW ON ● ENGINE NOT RUNNING ● AMBIENT TEMPERATURE IS ABOVE 0°C (32°F). ● NO VACUUM AND NO HIGH PRESSURE IN EVAP SYSTEM ● FUEL TANK TEMP. IS MORE THAN 0°C (32°F). ● WITHIN 10 MINUTES AFTER STARTING “EVAP SYSTEM CLOSE” ● WHEN TRYING TO EXECUTE “EVAP SYSTEM CLOSE” UNDER THE CONDITION EXCEPT ABOVE, CONSULT-II WILL DISCONTINUE IT AND DISPLAY APPROPRIATE INSTRUCTION. **NOTE:** **WHEN STARTING ENGINE, CONSULT-II MAY DISPLAY “BATTERY VOLTAGE IS LOW. CHARGE BATTERY”, EVEN IN USING CHARGED BATTERY.**	When detecting EVAP vapor leak point of EVAP system
VIN REGISTRATION	● VIN IS REGISTERED IN ECM.	When registering VIN in ECM

WORK ITEM	CONDITION	USAGE
TARGET IDLE RPM ADJ*	● IDLE CONDITION	When setting target idle speed
TARGET IGN TIM ADJ*	● IDLE CONDITION	When adjusting target ignition timing

*: This function is not necessary in the usual service procedure.

SELF-DIAG RESULTS MODE

Self Diagnostic Item

Regarding items of DTC and 1st trip DTC, refer to EC-8, "INDEX FOR DTC" .

Freeze Frame Data and 1st Trip Freeze Frame Data

Freeze frame data item*	Description
DIAG TROUBLE CODE [PXXXX]	● The engine control component part/control system has a trouble code, it is displayed as PXXXX. (Refer to EC-8, "INDEX FOR DTC" .)
FUEL SYS-B1	● “Fuel injection system status” at the moment a malfunction is detected is displayed.
FUEL SYS-B2	● One mode in the following is displayed. Mode2: Open loop due to detected system malfunction Mode3: Open loop due to driving conditions (power enrichment, deceleration enleanment) Mode4: Closed loop - using oxygen sensor(s) as feedback for fuel control Mode5: Open loop - has not yet satisfied condition to go to closed loop
CAL/LD VALUE [%]	● The calculated load value at the moment a malfunction is detected is displayed.
COOLANT TEMP [°C] or [°F]	● The engine coolant temperature at the moment a malfunction is detected is displayed.
L-FUEL TRM-B1 [%]	● “Long-term fuel trim” at the moment a malfunction is detected is displayed.
L-FUEL TRM-B2 [%]	● The long-term fuel trim indicates much more gradual feedback compensation to the base fuel schedule than short-term fuel trim.
S-FUEL TRM-B1 [%]	● “Short-term fuel trim” at the moment a malfunction is detected is displayed.
S-FUEL TRM-B2 [%]	● The short-term fuel trim indicates dynamic or instantaneous feedback compensation to the base fuel schedule.
ENGINE SPEED [rpm]	● The engine speed at the moment a malfunction is detected is displayed.
VEHICL SPEED [km/h] or [mph]	● The vehicle speed at the moment a malfunction is detected is displayed.
B/FUEL SCHDL [msec]	● The base fuel schedule at the moment a malfunction is detected is displayed.
INT/A TEMP SE [°C] or [°F]	● The intake air temperature at the moment a malfunction is detected is displayed.

*: The items are the same as those of 1st trip freeze frame data.

DATA MONITOR MODE

Monitored Item

×: Applicable

Monitored item [Unit]	ECM INPUT SIGNALS	MAIN SIGNALS	Description	Remarks
ENG SPEED [rpm]	×	×	● Indicates the engine speed computed from the signals of the crankshaft position sensor (POS) and camshaft position sensor (PHASE).	● Accuracy becomes poor if engine speed drops below the idle rpm. ● If the signal is interrupted while the engine is running, an abnormal value may be indicated.
MAS A/F SE-B1 [V]	×	×	● The signal voltage of the mass air flow sensor is displayed.	● When the engine is stopped, a certain value is indicated.

Monitored item [Unit]	ECM INPUT SIGNALS	MAIN SIGNALS	Description	Remarks
B/FUEL SCHDL [msec]		×	● “Base fuel schedule” indicates the fuel injection pulse width programmed into ECM, prior to any learned on board correction.	
A/F ALPHA-B1 [%]		×	● The mean value of the air-fuel ratio feedback correction factor per cycle is indicated.	● When the engine is stopped, a certain value is indicated. ● This data also includes the data for the air-fuel ratio learning control.
A/F ALPHA-B2 [%]		×		
COOLAN TEMP/S [°C] or [°F]	×	×	● The engine coolant temperature (determined by the signal voltage of the engine coolant temperature sensor) is displayed.	● When the engine coolant temperature sensor is open or short-circuited, ECM enters fail-safe mode. The engine coolant temperature determined by the ECM is displayed.
A/F SEN1 (B1) [V]	×	×	● The A/F signal computed from the input signal of the A/F sensor 1 is displayed.	
A/F SEN1 (B2) [V]	×			
HO2S2 (B1) [V]	×		● The signal voltage of the heated oxygen sensor 2 is displayed.	
HO2S2 (B2) [V]	×			
HO2S2 MNTR (B1) [RICH/LEAN]	×		● Display of heated oxygen sensor 2 signal: RICH: Means the amount of oxygen after three way catalyst is relatively small. LEAN: Means the amount of oxygen after three way catalyst is relatively large.	● When the engine is stopped, a certain value is indicated.
HO2S2 MNTR (B2) [RICH/LEAN]	×			
VHCL SPEED SE [km/h] or [mph]	×	×	● The vehicle speed computed from the vehicle speed signal sent from combination meter is displayed.	
BATTERY VOLT [V]	×	×	● The power supply voltage of ECM is displayed.	
ACCEL SEN 1 [V]	×	×	● The accelerator pedal position sensor signal voltage is displayed.	● ACCEL SEN 2 signal is converted by ECM internally. Thus, it differ from ECM terminal voltage signal.
ACCEL SEN 2 [V]	×			
THRTL SEN 1 [V]	×	×	● The throttle position sensor signal voltage is displayed.	● THRTL SEN 2 signal is converted by ECM internally. Thus, it differ from ECM terminal voltage signal.
THRTL SEN 2 [V]	×			
FUEL T/TEMP SE [°C] or [°F]	×		● The fuel temperature (determined by the signal voltage of the fuel tank temperature sensor) is displayed.	
INT/A TEMP SE [°C] or [°F]	×	×	● The intake air temperature (determined by the signal voltage of the intake air temperature sensor) is indicated.	
EVAP SYS PRES [V]	×		● The signal voltage of EVAP control system pressure sensor is displayed.	
FUEL LEVEL SE [V]	×		● The signal voltage of the fuel level sensor is displayed.	
START SIGNAL [ON/OFF]	×	×	● Indicates start signal status [ON/OFF] computed by the ECM according to the signals of engine speed and battery voltage.	● After starting the engine, [OFF] is displayed regardless of the starter signal.
CLSD THL POS [ON/OFF]	×	×	● Indicates idle position [ON/OFF] computed by ECM according to the accelerator pedal position sensor signal.	
AIR COND SIG [ON/OFF]	×	×	● Indicates [ON/OFF] condition of the air conditioner switch as determined by the air conditioner signal.	

Monitored item [Unit]	ECM INPUT SIGNALS	MAIN SIGNALS	Description	Remarks
P/N POSI SW [ON/OFF]	×	×	● Indicates [ON/OFF] condition from the park/neutral position (PNP) switch signal.	
PW/ST SIGNAL [ON/OFF]	×	×	● [ON/OFF] condition of the power steering system (determined by the signal voltage of the power steering pressure sensor signal) is indicated.	
LOAD SIGNAL [ON/OFF]	×	×	● Indicates [ON/OFF] condition from the electrical load signal. ON: Rear window defogger switch is ON and/or lighting switch is in 2nd position. OFF: Both rear window defogger switch and lighting switch are OFF.	
IGNITION SW [ON/OFF]	×		● Indicates [ON/OFF] condition from ignition switch signal.	
HEATER FAN SW [ON/OFF]	×		● Indicates [ON/OFF] condition from the heater fan switch signal.	
BRAKE SW [ON/OFF]			● Indicates [ON/OFF] condition from the stop lamp switch signal.	
INJ PULSE-B1 [msec]		×	● Indicates the actual fuel injection pulse width compensated by ECM according to the input signals.	● When the engine is stopped, a certain computed value is indicated.
INJ PULSE-B2 [msec]				
IGN TIMING [BTDC]		×	● Indicates the ignition timing computed by ECM according to the input signals.	● When the engine is stopped, a certain value is indicated.
CAL/LD VALUE [%]			● “Calculated load value” indicates the value of the current air flow divided by peak air flow.	
MASS AIRFLOW [g·m/s]			● Indicates the mass air flow computed by ECM according to the signal voltage of the mass air flow sensor.	
PURG VOL C/V [%]			● Indicates the EVAP canister purge volume control solenoid valve control value computed by the ECM according to the input signals. ● The opening becomes larger as the value increases.	
INT/V TIM (B1) [°CA]			● Indicates [°CA] of intake camshaft advanced angle.	
INT/V TIM (B2) [°CA]				
INT/V SOL (B1) [%]			● The control value of the intake valve timing control solenoid valve (determined by ECM according to the input signals) is indicated. ● The advance angle becomes larger as the value increases.	
INT/V SOL (B2) [%]				
AIR COND RLY [ON/OFF]		×	● The air conditioner relay control condition (determined by ECM according to the input signals) is indicated.	
FUEL PUMP RLY [ON/OFF]		×	● Indicates the fuel pump relay control condition determined by ECM according to the input signals.	

Monitored item [Unit]	ECM INPUT SIGNALS	MAIN SIGNALS	Description	Remarks
VENT CONT/V [ON/OFF]			● The control condition of the EVAP canister vent control valve (determined by ECM according to the input signals) is indicated. ON: Closed OFF: Open	
THRTL RELAY [ON/OFF]			● Indicates the throttle control motor relay control condition determined by the ECM according to the input signals.	
COOLING FAN [HI/LOW/OFF]			● The control condition of the cooling fan (determined by ECM according to the input signals) is indicated. HI: High speed operation LOW: Low speed operation OFF: Stop	
HO2S2 HTR (B1) [ON/OFF]			● Indicates [ON/OFF] condition of heated oxygen sensor 2 heater determined by ECM according to the input signals.	
HO2S2 HTR (B2) [ON/OFF]				
I/P PULLY SPD [rpm]			● Indicates the engine speed computed from the turbine revolution sensor signal.	
VEHICLE SPEED [km/h] or [MPH]			● The vehicle speed computed from the vehicle speed signal sent from TCM or combination meter is displayed.	
IDL A/V LEARN [YET/CMPLT]			● Display the condition of idle air volume learning YET: Idle Air Volume Learning has not been performed yet. CMPLT: Idle Air Volume Learning has already been performed successfully.	
TRVL AFTER MIL [km] or [mile]			● Distance traveled while MIL is activated.	
A/F S1 HTR (B1) [%]			● Indicates A/F sensor 1 heater control value computed by ECM according to the input signals. ● The current flow to the heater becomes larger as the value increases.	
A/F S1 HTR (B2) [%]				
AC PRESS SEN [V]			● The signal voltage from the refrigerant pressure sensor is displayed.	
VHCL SPEED SE [km/h] or [mph]			● The vehicle speed computed from the vehicle speed signal sent from combination meter is displayed.	
SET VHCL SPD [km/h] or [mph]			● The preset vehicle speed is displayed.	
MAIN SW [ON/OFF]			● Indicates [ON/OFF] condition from ON/OFF (MAIN) switch signal.	
CANCEL SW [ON/OFF]			● Indicates [ON/OFF] condition from CANCEL switch signal.	
RESUME/ACC SW [ON/OFF]			● Indicates [ON/OFF] condition from ACCEL/RESUME switch signal.	
SET SW [ON/OFF]			● Indicates [ON/OFF] condition from COAST/SET switch signal.	

Monitored item [Unit]	ECM INPUT SIG-NALS	MAIN SIG-NALS	Description	Remarks
BRAKE SW1 [ON/OFF]			● Indicates [ON/OFF] condition from ASCD brake switch signal, and ASCD clutch switch signal (M/T models).	
BRAKE SW2 [ON/OFF]			● Indicates [ON/OFF] condition of stop lamp switch signal.	
VHCL SPD CUT [NON/CUT]			● Indicates the vehicle cruise condition. NON: Vehicle speed is maintained at the ASCD set speed. CUT: Vehicle speed increased to excessively high compared with the ASCD set speed, and ASCD operation is cut off.	
LO SPEED CUT [NON/CUT]			● Indicates the vehicle cruise condition. NON: Vehicle speed is maintained at the ASCD set speed. CUT: Vehicle speed decreased to excessively low compared with the ASCD set speed, and ASCD operation is cut off.	
AT OD MONITOR [ON/OFF]			● Indicates [ON/OFF] condition of A/T O/D according to the input signal from the TCM.	● For M/T models always “OFF” is displayed.
AT OD CANCEL [ON/OFF]			● Indicates [ON/OFF] condition of A/T O/D cancel signal sent from the TCM.	● For M/T models always “OFF” is displayed.
CRUISE LAMP [ON/OFF]			● Indicates [ON/OFF] condition of CRUISE lamp determined by the ECM according to the input signals.	
SET LAMP [ON/OFF]			● Indicates [ON/OFF] condition of SET lamp determined by the ECM according to the input signals.	
Voltage [V]			● Voltage, frequency, duty cycle or pulse width measured by the probe.	● Only “#” is displayed if item is unable to be measured. ● Figures with “#”s are temporary ones. They are the same figures as an actual piece of data which was just previously measured.
Frequency [msec], [Hz] or [%]				
DUTY-HI				
DUTY-LOW				
PLS WIDTH-HI				
PLS WIDTH-LOW				

NOTE:
Any monitored item that does not match the vehicle being diagnosed is deleted from the display automatically.

DATA MONITOR (SPEC) MODE

Monitored Item

Monitored item [Unit]	ECM INPUT SIGNALS	MAIN SIGNALS	Description	Remarks
ENG SPEED [rpm]	×	×	● Indicates the engine speed computed from the signals of the crankshaft position sensor (POS) and camshaft position sensor (PHASE).	
MAS A/F SE-B1 [V]	×	×	● The signal voltage of the mass air flow sensor specification is displayed.	● When engine is running specification range is indicated.

Monitored item [Unit]	ECM INPUT SIGNALS	MAIN SIGNALS	Description	Remarks
B/FUEL SCHDL [msec]		×	● “Base fuel schedule” indicates the fuel injection pulse width programmed into ECM, prior to any learned on board correction.	● When engine is running specification range is indicated.
A/F ALPHA-B1 [%] A/F ALPHA-B2 [%]		×	● The mean value of the air-fuel ratio feedback correction factor per cycle is indicated.	● When engine is running specification range is indicated. ● This data also includes the data for the air-fuel ratio learning control.

NOTE:
Any monitored item that does not match the vehicle being diagnosed is deleted from the display automatically.

ACTIVE TEST MODE

Test Item

TEST ITEM	CONDITION	JUDGEMENT	CHECK ITEM (REMEDY)
FUEL INJECTION	● Engine: Return to the original trouble condition ● Change the amount of fuel injection using CONSULT-II.	If trouble symptom disappears, see CHECK ITEM.	● Harness and connectors ● Fuel injectors ● Air fuel ratio (A/F) sensor 1
IGNITION TIMING	● Engine: Return to the original trouble condition ● Timing light: Set ● Retard the ignition timing using CONSULT-II.	If trouble symptom disappears, see CHECK ITEM.	● Perform Idle Air Volume Learning.
POWER BALANCE	● Engine: After warming up, idle the engine. ● A/C switch OFF ● Shift lever: N (A/T), Neutral (M/T) ● Cut off each injector signal one at a time using CONSULT-II.	Engine runs rough or dies.	● Harness and connectors ● Compression ● Fuel injector ● Power transistor ● Spark plug ● Ignition coil
COOLING FAN*	● Ignition switch: ON ● Turn the cooling fan ““HI”, “LOW” and “OFF” using CONSULT-II.	Cooling fan moves and stops.	● Harness and connectors ● Cooling fan motor ● IPDM E/R
ENG COOLANT TEMP	● Engine: Return to the original trouble condition ● Change the engine coolant temperature using CONSULT-II.	If trouble symptom disappears, see CHECK ITEM.	● Harness and connectors ● Engine coolant temperature sensor ● Fuel injectors
FUEL PUMP RELAY	● Ignition switch: ON (Engine stopped) ● Turn the fuel pump relay “ON” and “OFF” using CONSULT-II and listen to operating sound.	Fuel pump relay makes the operating sound.	● Harness and connectors ● Fuel pump relay
PURG VOL CONT/V	● Engine: After warming up, run engine at 1,500 rpm. ● Change the EVAP canister purge volume control solenoid valve opening percent using CONSULT-II.	Engine speed changes according to the opening percent.	● Harness and connectors ● Solenoid valve
FUEL/T TEMP SEN	● Change the fuel tank temperature using CONSULT-II.		

TEST ITEM	CONDITION	JUDGEMENT	CHECK ITEM (REMEDY)
VENT CONTROL/V	● Ignition switch: ON (Engine stopped) ● Turn solenoid valve “ON” and “OFF” with the CONSULT-II and listen to operating sound.	Solenoid valve makes an operating sound.	● Harness and connectors ● Solenoid valve
V/T ASSIGN ANGLE	● Engine: Return to the original trouble condition ● Change intake valve timing using CONSULT-II.	If trouble symptom disappears, see CHECK ITEM.	● Harness and connectors ● Intake valve timing control solenoid valve

*: Leaving cooling fan “OFF” with CONSULT-II while engine is running may cause the engine to overheat.

DTC & SRT CONFIRMATION MODE

SRT STATUS Mode

For details, refer to EC-53, "SYSTEM READINESS TEST (SRT) CODE" .

SRT Work Support Mode

This mode enables a technician to drive a vehicle to set the SRT while monitoring the SRT status.

DTC Work Support Mode

Test mode	Test item	Condition	Reference page
EVAPORATIVE SYSTEM	PURGE FLOW P0441	Refer to corresponding trouble diagnosis for DTC.	EC-287
	EVAP SML LEAK P0442/P1442*		EC-292
	EVAP V/S SML LEAK P0456/P1456*		EC-347
	PURG VOL CN/V P1444		EC-529
A/F SEN1	A/F SEN1 (B1) P1276		EC-496
	A/F SEN1 (B1) P1278/P1279		EC-505, EC-517
	A/F SEN1 (B2) P1286		EC-496
	A/F SEN1 (B2) P1288/P1289		EC-505, EC-517
HO2S2	HO2S2 (B1) P0139		EC-208
	HO2S2 (B1) P1146		EC-415
	HO2S2 (B1) P1147		EC-426
	HO2S2 (B2) P0159		EC-208
	HO2S2 (B2) P1166		EC-415
	HO2S2 (B2) P1167		EC-426

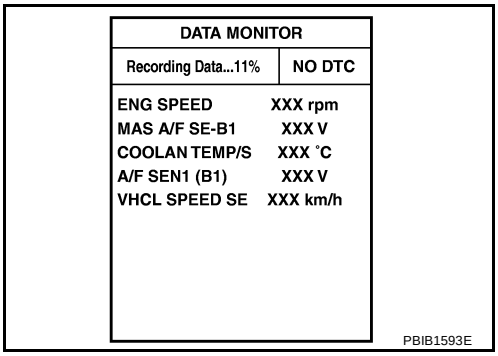
*: DTC P1442 and P1456 does not apply to Z33 models but appears in DTC Work Support Mode screens.

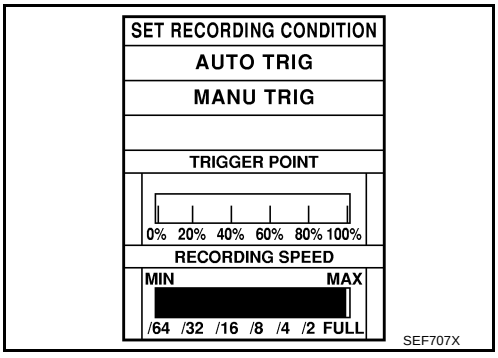
REAL TIME DIAGNOSIS IN DATA MONITOR MODE (RECORDING VEHICLE DATA)

Description

CONSULT-II has two kinds of triggers and they can be selected by touching “SETTING” in “DATA MONITOR” mode.

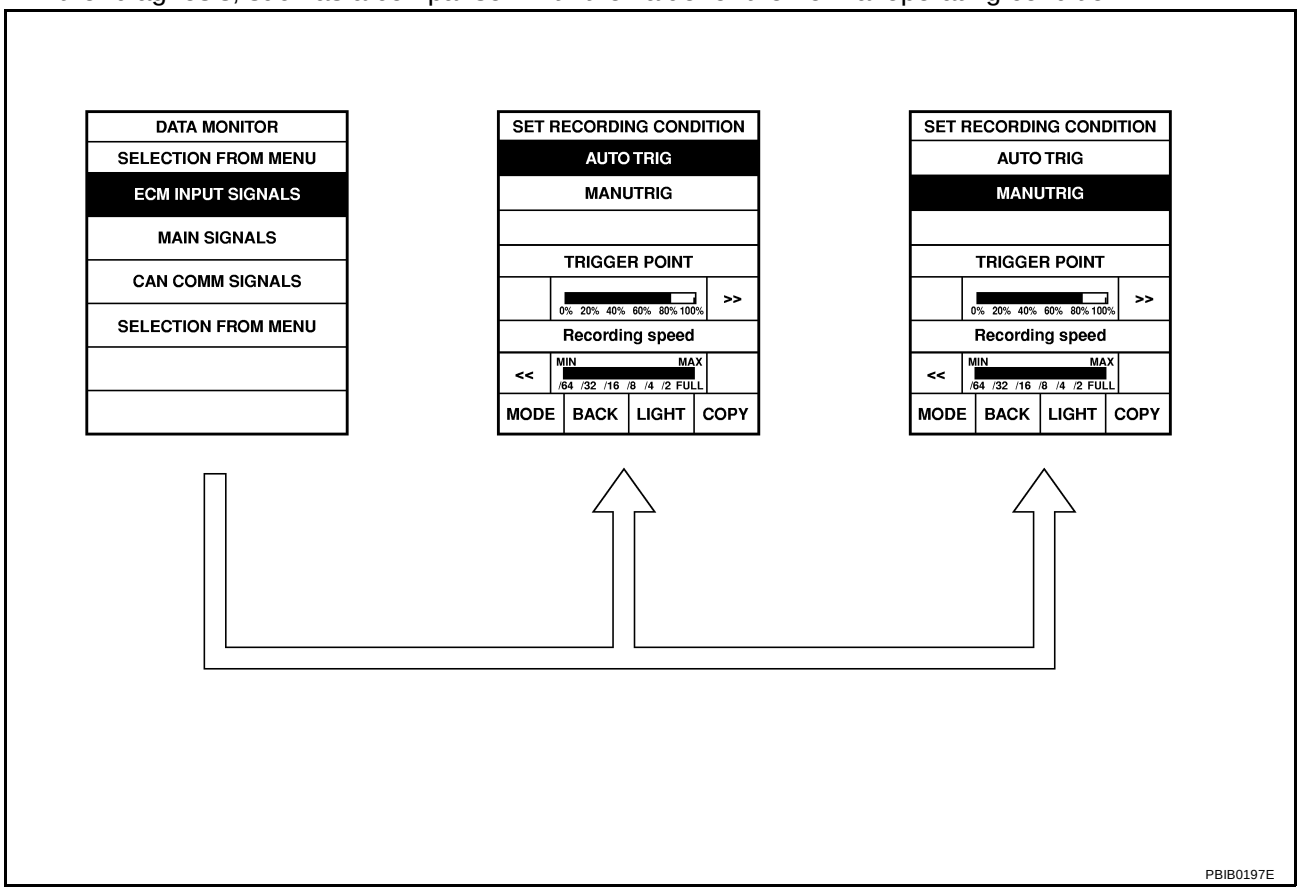
1. “AUTO TRIG” (Automatic trigger):
   - The malfunction will be identified on the CONSULT-II screen in real time.
     In other words, DTC/1st trip DTC and malfunction item will be displayed if the malfunction is detected by ECM.
     At the moment a malfunction is detected by ECM, “MONITOR” in “DATA MONITOR” screen is changed to “Recording Data... xx%” as shown at right, and the data after the malfunction detection is recorded. Then when the percentage reached 100%, “REAL-TIME DIAG” screen is displayed. If “STOP” is touched on the screen during “Recording Data... xx%”, “REAL-TIME DIAG” screen is also displayed.
     The recording time after the malfunction detection and the recording speed can be changed by “TRIGGER POINT” and “Recording Speed”. Refer to CONSULT-II Operation Manual.
2. “MANU TRIG” (Manual trigger):
   - DTC/1st trip DTC and malfunction item will not be displayed automatically on CONSULT-II screen even though a malfunction is detected by ECM.
     DATA MONITOR can be performed continuously even though a malfunction is detected.





Operation

1. “AUTO TRIG”
   - While trying to detect the DTC/1st trip DTC by performing the DTC Confirmation Procedure, be sure to select to “DATA MONITOR (AUTO TRIG)” mode. You can confirm the malfunction at the moment it is detected.
   - While narrowing down the possible causes, CONSULT-II should be set in “DATA MONITOR (AUTO TRIG)” mode, especially in case the incident is intermittent.
     When you are inspecting the circuit by gently shaking (or twisting) the suspicious connectors, components and harness in the DTC Confirmation Procedure, the moment a malfunction is found the DTC/1st trip DTC will be displayed. (Refer to INCIDENT SIMULATION TESTS in GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident" .)
2. “MANU TRIG”
   - If the malfunction is displayed as soon as “DATA MONITOR” is selected, reset CONSULT-II to “MANU TRIG”. By selecting “MANU TRIG” you can monitor and store the data. The data can be utilized for further diagnosis, such as a comparison with the value for the normal operating condition.

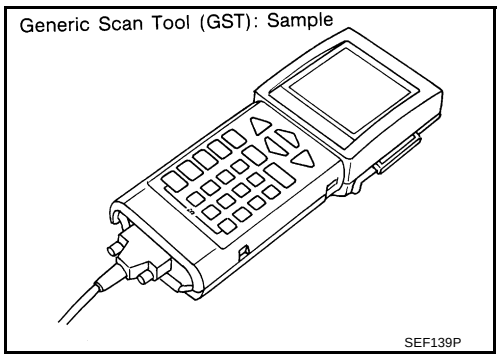


Generic Scan Tool (GST) Function

ABS009BC

DESCRIPTION

Generic Scan Tool (OBDII scan tool) complying with SAE J1978 has 8 different functions explained below.
ISO9141 is used as the protocol.
The name “GST” or “Generic Scan Tool” is used in this service manual.

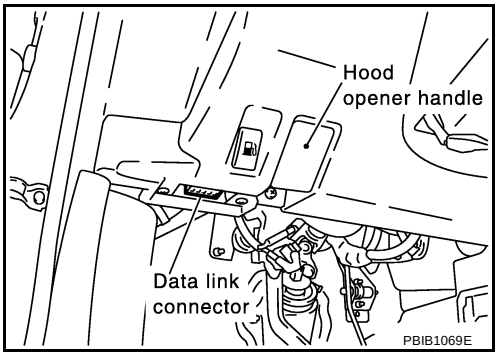


FUNCTION

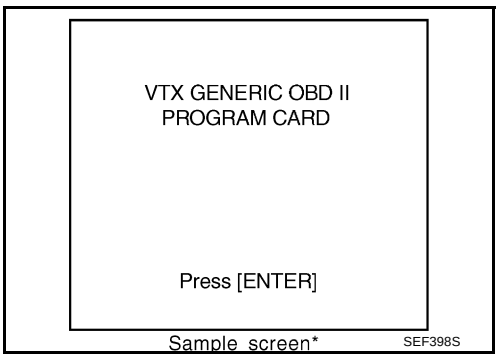
Diagnostic test mode		Function
MODE 1	READINESS TESTS	This mode gains access to current emission-related data values, including analog inputs and outputs, digital inputs and outputs, and system status information.
MODE 2	(FREEZE DATA)	This mode gains access to emission-related data value which were stored by ECM during the freeze frame. For details, refer to EC-52, "FREEZE FRAME DATA AND 1ST TRIP FREEZE FRAME DATA" .
MODE 3	DTCs	This mode gains access to emission-related power train trouble codes which were stored by ECM.
MODE 4	CLEAR DIAG INFO	This mode can clear all emission-related diagnostic information. This includes: ● Clear number of diagnostic trouble codes (MODE 1) ● Clear diagnostic trouble codes (MODE 3) ● Clear trouble code for freeze frame data (MODE 1) ● Clear freeze frame data (MODE 2) ● Reset status of system monitoring test (MODE 1) ● Clear on board monitoring test results (MODE 6 and 7)
MODE 6	(ON BOARD TESTS)	This mode accesses the results of on board diagnostic monitoring tests of specific components/systems that are not continuously monitored.
MODE 7	(ON BOARD TESTS)	This mode enables the off board test drive to obtain test results for emission-related powertrain components/systems that are continuously monitored during normal driving conditions.
MODE 8	—	This mode can close EVAP system in ignition switch ON position (Engine stopped). When this mode is performed, EVAP canitser vent control valve can be closed. In the following conditions, this mode cannot function. ● Low ambient temperature ● Low battery voltage ● Engine running ● Ignition switch OFF ● Low fuel temperature ● Too much pressure is applied to EVAP system
MODE 9	(CALIBRATION ID)	This mode enables the off-board test device to request specific vehicle information such as Vehicle Identification Number (VIN) and Calibration IDs.

INSPECTION PROCEDURE

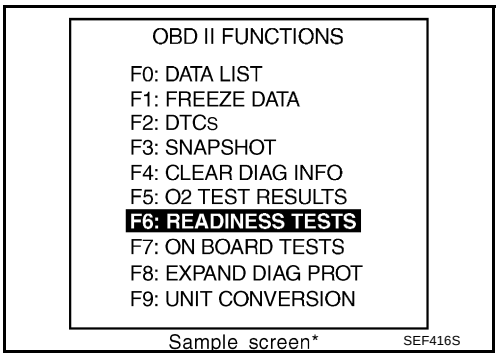
1. Turn ignition switch OFF.
2. Connect “GST” to data link connector, which is located under LH dash panel near the hood opener handle.



3. Turn ignition switch ON.
4. Enter the program according to instruction on the screen or in the operation manual.
   (*: Regarding GST screens in this section, sample screens are shown.)



5. Perform each diagnostic mode according to each service procedure.
   For further information, see the GST Operation Manual of the tool maker.



CONSULT-II Reference Value in Data Monitor

ABS009BD

Remarks:
- Specification data are reference values.
- Specification data are output/input values which are detected or supplied by the ECM at the connector.
  * Specification data may not be directly related to their components signals/values/operations.
  i.e. Adjust ignition timing with a timing light before monitoring IGN TIMING, because the monitor may show the specification data in spite of the ignition timing not being adjusted to the specification data. This IGN TIMING monitors the data calculated by the ECM according to the signals input from the camshaft position sensor and other ignition timing related sensors.

MONITOR ITEM	CONDITION		SPECIFICATION
ENG SPEED	● Run engine and compare CONSULT-II value with the tachometer indication.		Almost the same speed as the tachometer indication
MAS A/F SE-B1	● Engine: After warming up ● Air conditioner switch: OFF ● Shift lever: N (A/T), Neutral (M/T) ● No-load	Idle	Approx. 0.9 - 1.2V
		2,500 rpm	Approx. 1.6 - 1.9V
B/FUEL SCHDL	● Engine: After warming up ● Shift lever: N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No-load	Idle	2.5 - 3.5 msec
		2,000 rpm	2.5 - 3.5 msec
A/F ALPHA-B1 A/F ALPHA-B2	● Engine: After warming up	Maintaining engine speed at 2,000 rpm	54% - 155%
COOLAN TEMP/S	● Engine: After warming up		More than 70°C (158°F)
A/F SEN1 (B1) A/F SEN1 (B2)	● Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 1.5V
HO2S2 (B1) HO2S2 (B2)	● Warm-up condition ● After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	Revving engine from idle to 3,000 rpm quickly.	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S2 MNTR (B1) HO2S2 MNTR (B2)	● Warm-up condition ● After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	Revving engine from idle to 3,000 rpm quickly.	LEAN ←→ RICH

MONITOR ITEM	CONDITION		SPECIFICATION
VHCL SPEED SE	● Turn drive wheels and compare CONSULT-II value with the speedometer indication.		Almost the same speed as the speedometer indication
BATTERY VOLT	● Ignition switch: ON (Engine stopped)		11 - 14V
ACCEL SEN1	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.5 - 1.0V
		Accelerator pedal: Fully depressed	4.0 - 4.8V
ACCEL SEN2*	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.3 - 1.2V
		Accelerator pedal: Fully depressed	3.9 - 4.8V
THRTL SEN1 THRTL SEN2*	● Ignition switch: ON (Engine stopped) ● Shift lever: D (A/T), 1st (M/T)	Accelerator pedal: Fully released	More than 0.36V
		Accelerator pedal: Fully depressed	Less than 4.75V
EVAP SYS PRES	● Ignition switch: ON		Approx. 1.8 - 4.8V
START SIGNAL	● Ignition switch: ON → START → ON		OFF → ON → OFF
CLSD THL POS	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	ON
		Accelerator pedal: Slightly depressed	OFF
AIR COND SIG	● Engine: After warming up, idle the engine	Air conditioner switch: OFF	OFF
		Air conditioner switch: ON (Compressor operates.)	ON
P/N POSI SW	● Ignition switch: ON	Shift lever: P or N (A/T), Neutral (M/T)	ON
		Shift lever: Except above	OFF
PW/ST SIGNAL	● Engine: After warming up, idle the engine	Steering wheel is in neutral position. (Forward direction)	OFF
		Steering wheel is turned.	ON
LOAD SIGNAL	● Ignition switch: ON	Rear window defogger switch is ON and/or lighting switch is in 2nd.	ON
		Rear window defogger switch is OFF and lighting switch is OFF.	OFF
IGNITION SW	● Ignition switch: ON → OFF → ON		ON → OFF → ON
HEATER FAN SW	● Engine: After warming up, idle the engine	Heater fan is operating.	ON
		Heater fan is not operating	OFF
BRAKE SW	● Ignition switch: ON	Brake pedal: Fully released	OFF
		Brake pedal: Slightly depressed	ON
INJ PULSE-B1 INJ PULSE-B2	● Engine: After warming up ● Shift lever: N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No-load	Idle	2.0 - 3.0 msec
		2,000 rpm	1.9 - 2.9 msec
IGN TIMING	● Engine: After warming up ● Shift lever: N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No-load	Idle	13° - 18° BTDC
		2,000 rpm	25° - 45° BTDC
CAL/LD VALUE	● Engine: After warming up ● Shift lever: N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No-load	Idle	5% - 35%
		2,500 rpm	5% - 35%
MASS AIRFLOW	● Engine: After warming up ● Shift lever: N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No-load	Idle	2.0 - 6.0 g·m/s
		2,500 rpm	7.0 - 20.0 g·m/s

MONITOR ITEM	CONDITION		SPECIFICATION
PURG VOL C/V	● Engine: After warming up ● Shift lever: N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No-load	Idle (Accelerator pedal is not depressed even slightly, after engine starting)	0%
		2,000 rpm	—
INT/V TIM (B1) INT/V TIM (B2)	● Engine: After warming up ● Shift lever: N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No-load	Idle	–5° - 5°CA
		When revving engine up to 2,000 rpm quickly	Approx. 0° - 30°CA
INT/V SOL (B1) INT/V SOL (B2)	● Engine: After warming up ● Shift lever: N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No-load	Idle	0% - 2%
		When revving engine up to 2,000 rpm quickly	Approx. 0% - 50%
AIR COND RLY	● Engine: After warming up, idle the engine	Air conditioner switch: OFF	OFF
		Air conditioner switch: ON (Compressor operates)	ON
FUEL PUMP RLY	● For 1 second after turning ignition switch ON ● Engine running or cranking		ON
	● Except above conditions		OFF
VENT CONT/V	● Ignition switch: ON		OFF
THRTL RELAY	● Ignition switch: ON		ON
COOLING FAN	● Engine: After warming up, idle the engine ● Air conditioner switch: OFF	Engine coolant temperature is 94°C (201°F) or less	OFF
		Engine coolant temperature is between 95°C (203°F) and 99°C (210°F)	LOW
		Engine coolant temperature is 100°C (212°F) or more	HI
HO2S2 HTR (B1) HO2S2 HTR (B2)	● Engine speed is below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load		ON
	● Engine speed: Above 3,600 rpm		OFF
I/P PULLY SPD	● Vehicle speed: More than 20 km/h (12 MPH)		Almost the same speed as the tachometer indication
VEHICLE SPEED	● Turn drive wheels and compare CONSULT-II value with the speedometer indication.		Almost the same speed as the speedometer indication
TRVL AFTER MIL	● Ignition switch: ON	Vehicle has traveled after MIL has turned ON.	0 - 65,535 km (0 - 40,723 mile)
A/F S1 HTR (B1) A/F S1 HTR (B2)	● Engine: After warming up, idle the engine		0 - 100%
AC PRESS SEN	● Ignition switch: ON (Engine stopped)		Approx. 0V
	● Engine: Idle ● Air conditioner switch: OFF		1.0 - 4.0V
VHCL SPEED SE	● Turn drive wheels and compare CONSULT-II value with the speedometer indication.		Almost the same speed as the speedometer indication
SET VHCL SPD	● Engine: Running	ASCD: Operating.	The preset vehicle speed is displayed.
MAIN SW	● Ignition switch: ON	ON/OFF (MAIN) switch: Pressed	ON
		ON/OFF (MAIN) switch: Released	OFF

MONITOR ITEM	CONDITION		SPECIFICATION
CANCEL SW	● Ignition switch: ON	CANCEL switch: Pressed	ON
		CANCEL switch: Released	OFF
RESUME/ACC SW	● Ignition switch: ON	ACCEL/RESUME switch: Pressed	ON
		ACCEL/RESUME switch: Released	OFF
SET SW	● Ignition switch: ON	COAST/SET switch: Pressed	ON
		COAST/SET switch: Released	OFF
BRAKE SW1	● Ignition switch: ON	Clutch pedal (M/T) and brake pedal: Fully released	ON
		Clutch pedal (M/T) and/or brake pedal: Slightly depressed	OFF
BRAKE SW2	● Ignition switch: ON	Brake pedal: Fully released	OFF
		Brake pedal: Slightly depressed	ON
CRUISE LAMP	● Ignition switch: ON	ON/OFF (MAIN) switch: Pressed at the 1st time → at the 2nd time	ON → OFF
SET LAMP	● ON/OFF (MAIN) switch: ON ● When vehicle speed is between 40 km/h (25 MPH) and 144 km/h (89MPH)	COAST/SET switch: Pressed	ON
		COAST/SET switch: Released	OFF

*: Accelerator pedal position sensor 2 signal and throttle position sensor 2 signal are converted by ECM internally. Thus, they differ from ECM terminals voltage signal.

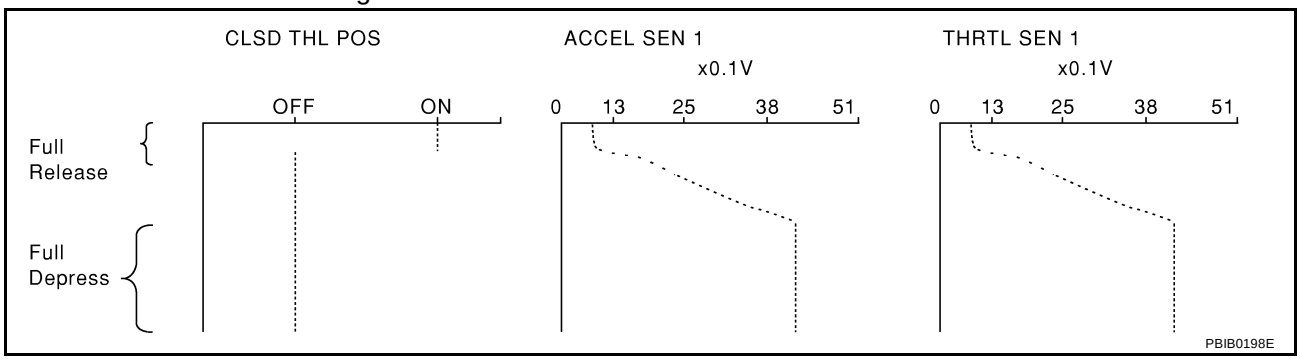
Major Sensor Reference Graph in Data Monitor Mode

ABS009BE

The following are the major sensor reference graphs in “DATA MONITOR” mode.

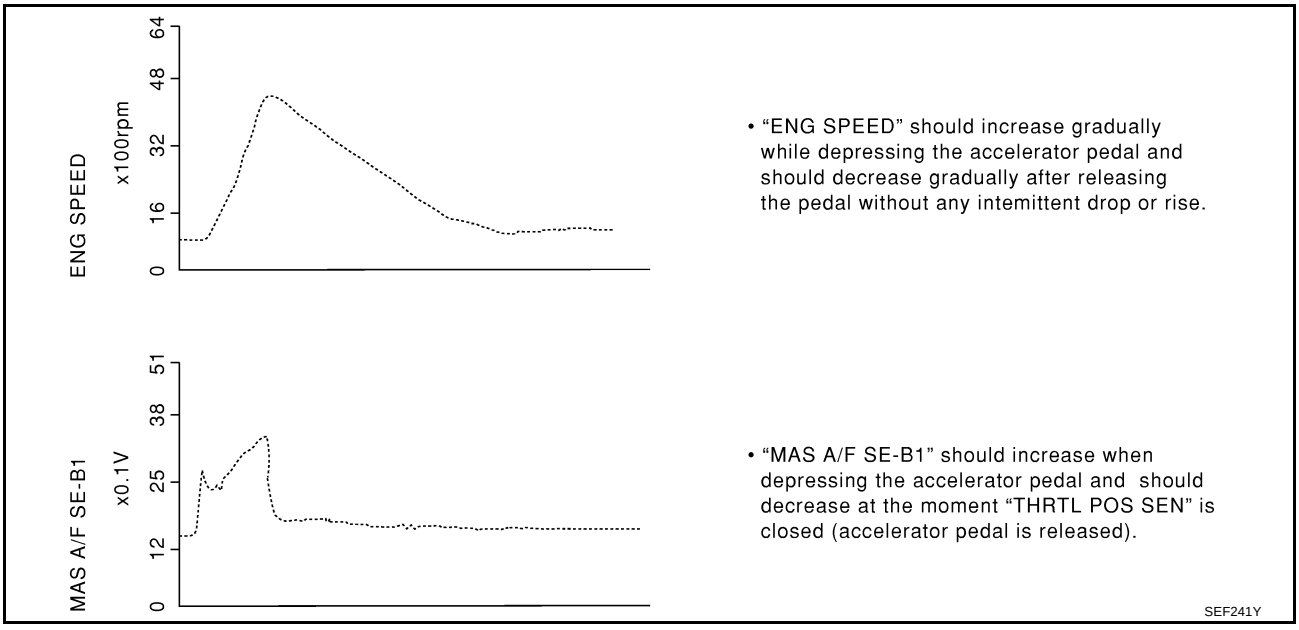
CLSD THL POS, ACCEL SEN 1, THRTL SEN 1

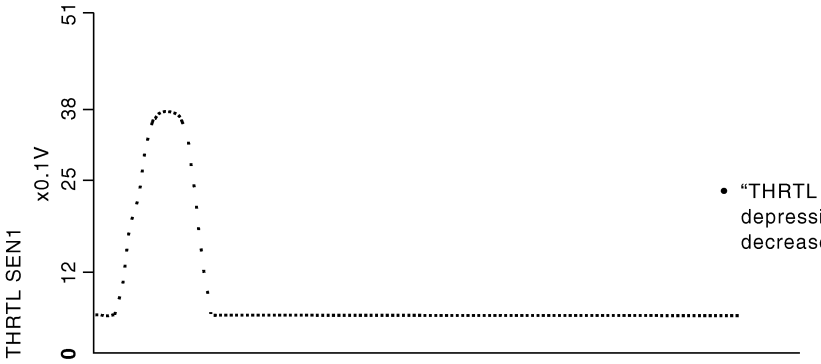
Below is the data for “CLSD THL POS”, “ACCEL SEN 1” and “THRTL SEN 1” when depressing the accelerator pedal with the ignition switch ON and with shift lever in D position (A/T), 1st position (M/T).
The signal of “ACCEL SEN 1” and “THRTL SEN 1” should rise gradually without any intermittent drop or rise after “CLSD THL POS” is changed from “ON” to “OFF”.



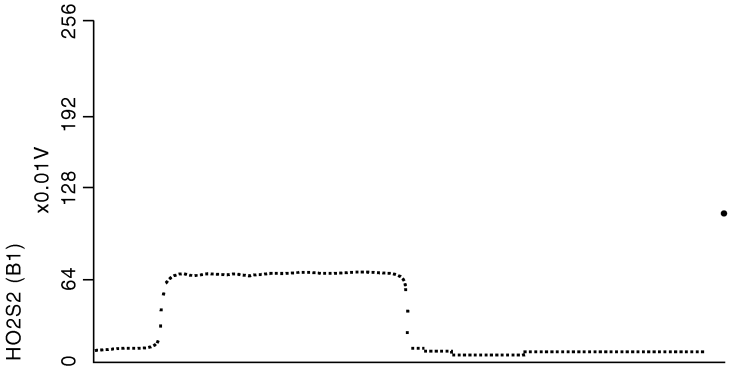
ENG SPEED, MAS A/F SE-B1, THRTL SEN 1, HO2S2 (B1), INJ PULSE-B1

Below is the data for “ENG SPEED”, “MAS A/F SE-B1”, “THRTL SEN 1”, “HO2S2 (B1)” and “INJ PULSE-B1” when revving engine quickly up to 4,800 rpm under no load after warming up engine sufficiently.
Each value is for reference, the exact value may vary.

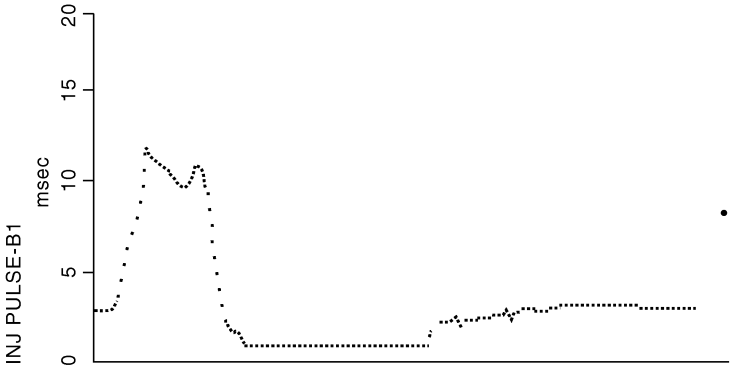




- "THRTL SEN1" should increase while depressing the accelerator pedal and should decrease while releasing it.



- "HO2S2 (B1)" may increase immediately after depressing the accelerator pedal and may decrease after releasing the pedal.



- "INJ PULSE-B1" should increase when depressing the accelerator pedal and should decrease when the pedal is released.

PBIB2099E

TROUBLE DIAGNOSIS - SPECIFICATION VALUE

PFP:00031

Description

ABS009BF

The specification (SP) value indicates the tolerance of the value that is displayed in “DATA MONITOR (SPEC)” mode of CONSULT-II during normal operation of the Engine Control System. When the value in “DATA MONITOR (SPEC)” mode is within the SP value, the Engine Control System is confirmed OK. When the value in “DATA MONITOR (SPEC)” mode is NOT within the SP value, the Engine Control System may have one or more malfunctions.
The SP value is used to detect malfunctions that may affect the Engine Control System, but will not light the MIL.
The SP value will be displayed for the following three items:

- B/FUEL SCHDL (The fuel injection pulse width programmed into ECM prior to any learned on board correction)
- A/F ALPHA-B1/B2 (The mean value of air-fuel ratio feedback correction factor per cycle)
- MAS A/F SE-B1 (The signal voltage of the mass air flow sensor)

Testing Condition

ABS009BG

- Vehicle driven distance: More than 5,000 km (3,017 miles)
- Barometric pressure: 98.3 - 104.3 kPa (1.003 - 1.064 kg/cm^2 , 14.25 - 15.12 psi)
- Atmospheric temperature: 20 - 30°C (68 - 86°F)
- Engine coolant temperature: 75 - 95°C (167 - 203°F)
- Transmission: Warmed-up*1
- Electrical load: Not applied*2
- Engine speed: Idle

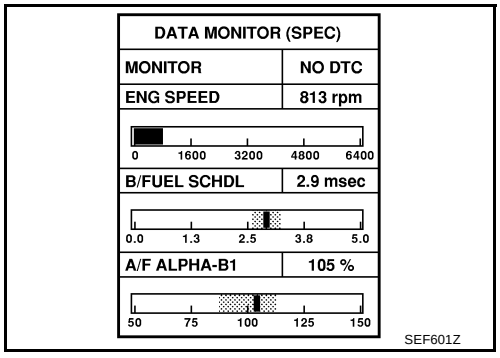
*1: For A/T models, after the engine is warmed up to normal operating temperature, drive vehicle until “ATF TEMP 1” (A/T fluid temperature sensor signal) indicates more than 60°C (140°F).
For M/T models, after the engine is warmed up to normal operating temperature, drive vehicle for 5 minutes.
*2: Rear window defogger switch, air conditioner switch, lighting switch are OFF. Steering wheel is straight ahead.

Inspection Procedure

ABS009BH

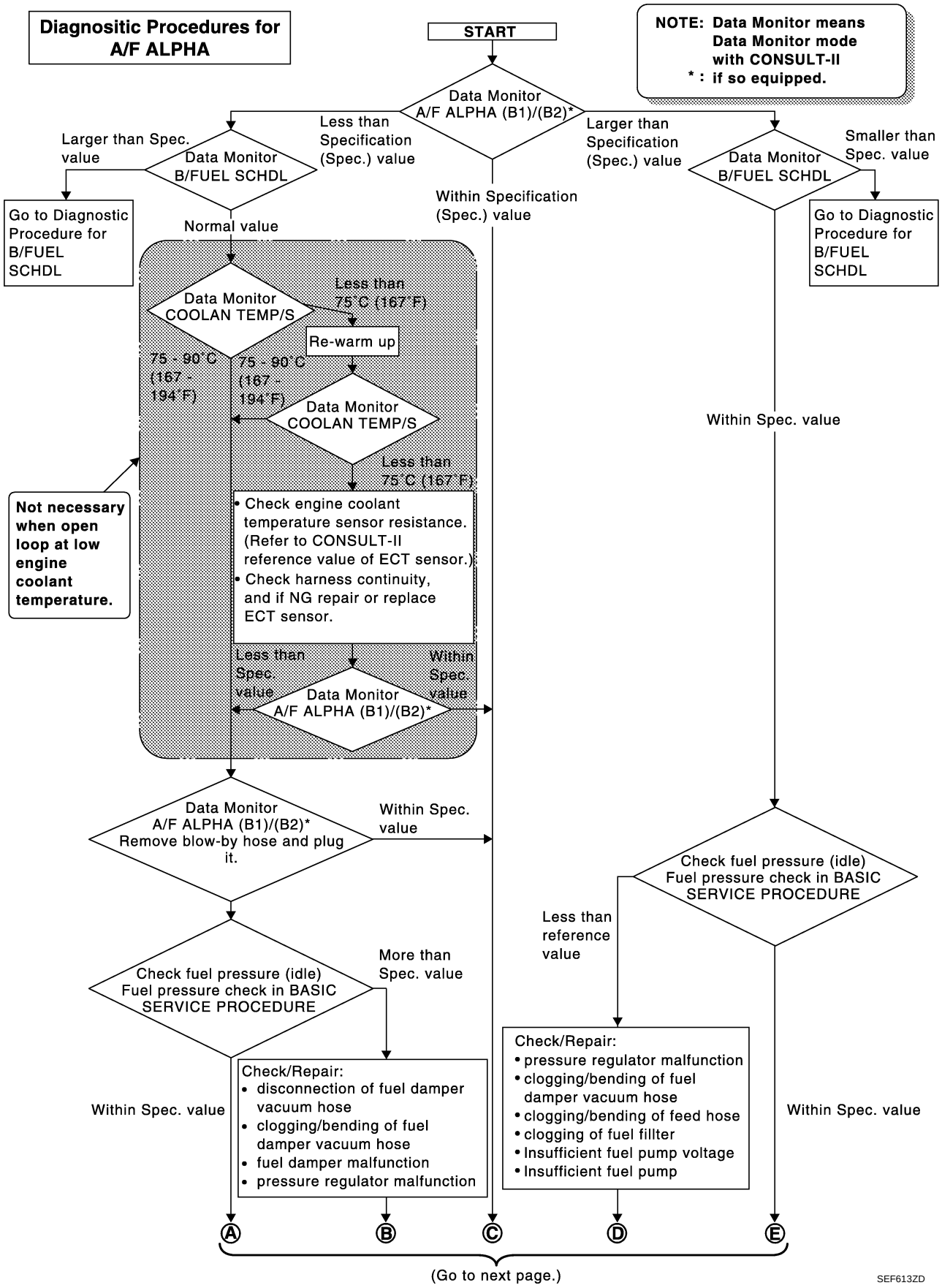
NOTE:
Perform “DATA MONITOR (SPEC)” mode in maximum scale display.

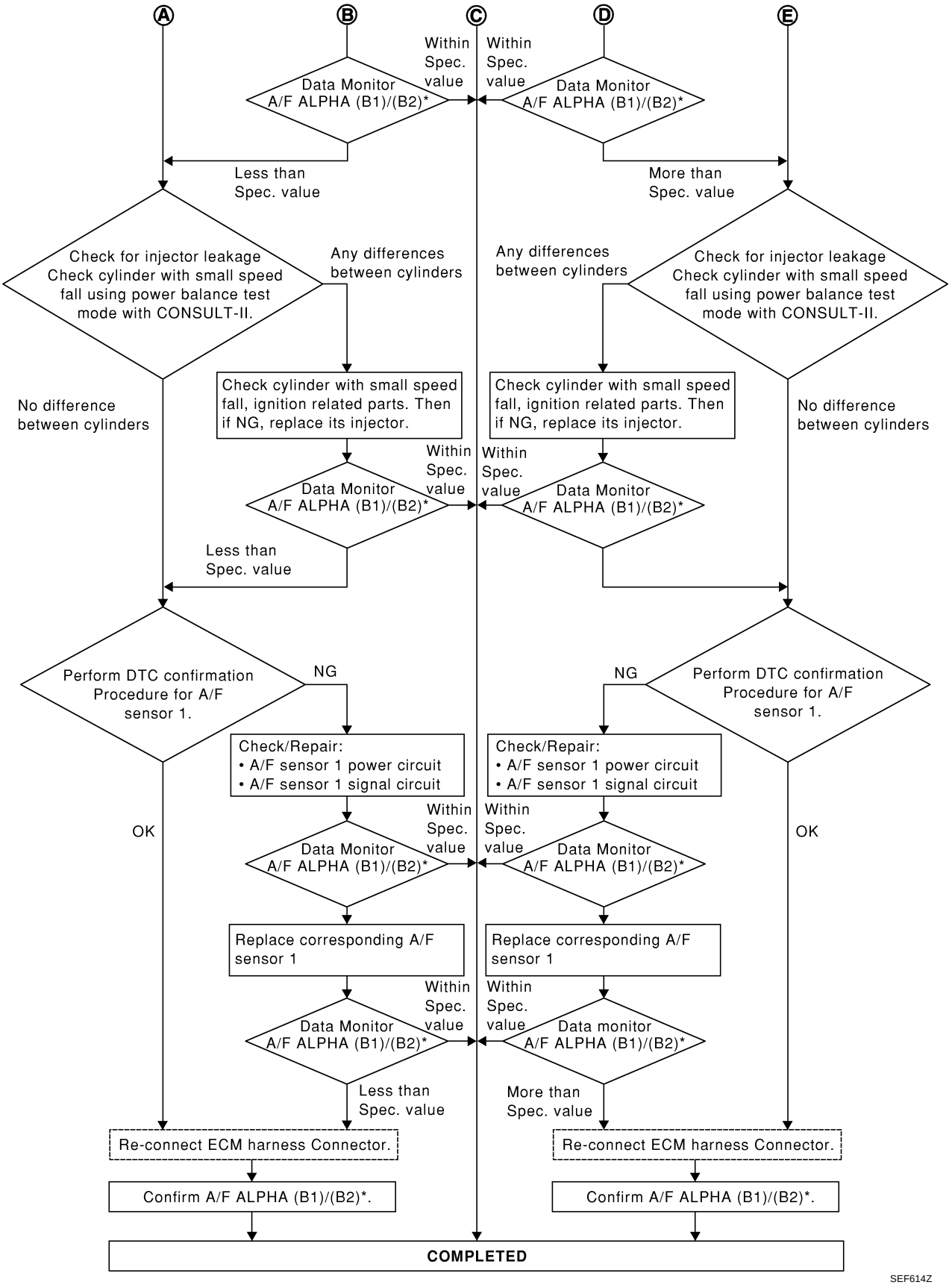
1. Perform EC-78, "Basic Inspection" .
2. Confirm that the testing conditions indicated above are met.
3. Select “B/FUEL SCHDL”, “A/F ALPHA-B1”, “A/F ALPHA-B2” and “MAS A/F SE-B1” in “DATA MONITOR (SPEC)” mode with CONSULT-II.
4. Make sure that monitor items are within the SP value.
5. If NG, go to EC-125, "Diagnostic Procedure" .

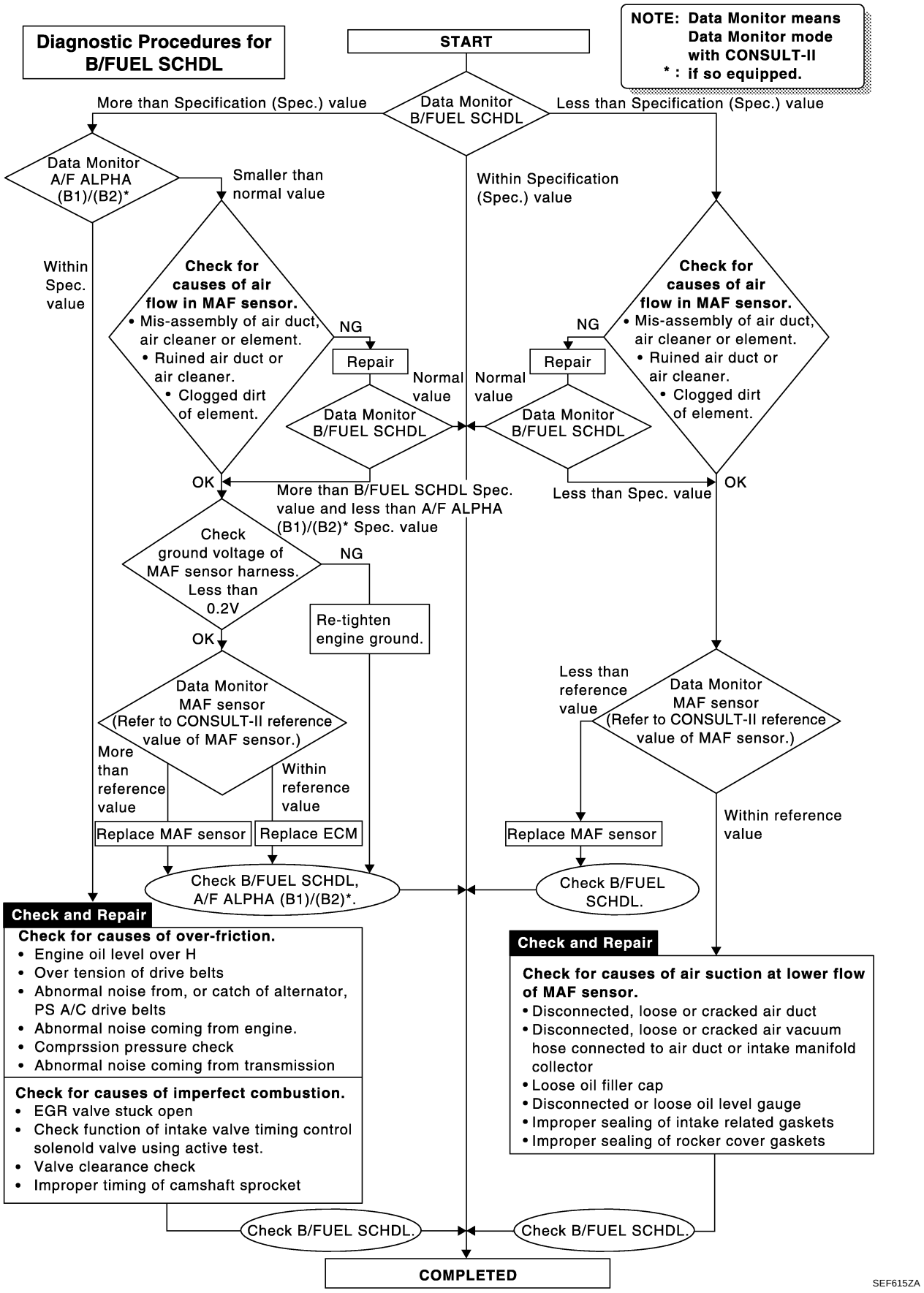


Diagnostic Procedure

ABS009BI




Ⓐ
Ⓑ
Ⓒ
Ⓓ
Ⓔ
Data Monitor A/F ALPHA (B1)/(B2)*
Within Spec. value
Within Spec. value
Data Monitor A/F ALPHA (B1)/(B2)*
Less than Spec. value
More than Spec. value
Check for injector leakage Check cylinder with small speed fall using power balance test mode with CONSULT-II.
Any differences between cylinders
Any differences between cylinders
Check for injector leakage Check cylinder with small speed fall using power balance test mode with CONSULT-II.
No difference between cylinders
Check cylinder with small speed fall, ignition related parts. Then if NG, replace its injector.
Check cylinder with small speed fall, ignition related parts. Then if NG, replace its injector.
No difference between cylinders
Within Spec. value
Within Spec. value
Data Monitor A/F ALPHA (B1)/(B2)*
Data Monitor A/F ALPHA (B1)/(B2)*
Less than Spec. value
Perform DTC confirmation Procedure for A/F sensor 1.
NG
NG
Perform DTC confirmation Procedure for A/F sensor 1.
Check/Repair:
• A/F sensor 1 power circuit
• A/F sensor 1 signal circuit
Check/Repair:
• A/F sensor 1 power circuit
• A/F sensor 1 signal circuit
OK
Within Spec. value
Within Spec. value
OK
Data Monitor A/F ALPHA (B1)/(B2)*
Data Monitor A/F ALPHA (B1)/(B2)*
Replace corresponding A/F sensor 1
Replace corresponding A/F sensor 1
Within Spec. value
Within Spec. value
Data Monitor A/F ALPHA (B1)/(B2)*
Data monitor A/F ALPHA (B1)/(B2)*
Less than Spec. value
More than Spec. value
Re-connect ECM harness Connector.
Re-connect ECM harness Connector.
Confirm A/F ALPHA (B1)/(B2)*.
Confirm A/F ALPHA (B1)/(B2)*.
COMPLETED
SEF614Z


Diagnostic Procedures for B/FUEL SCHDL
START
NOTE: Data Monitor means Data Monitor mode with CONSULT-II
* : if so equipped.
Data Monitor B/FUEL SCHDL
More than Specification (Spec.) value
Within Specification (Spec.) value
Less than Specification (Spec.) value
Data Monitor A/F ALPHA (B1)/(B2)*
Smaller than normal value
Within Spec. value
Check for causes of air flow in MAF sensor.
• Mis-assembly of air duct, air cleaner or element.
• Ruined air duct or air cleaner.
• Clogged dirt of element.
NG
Repair
Normal value
Data Monitor B/FUEL SCHDL
Check for causes of air flow in MAF sensor.
• Mis-assembly of air duct, air cleaner or element.
• Ruined air duct or air cleaner.
• Clogged dirt of element.
NG
Repair
Normal value
Data Monitor B/FUEL SCHDL
OK
More than B/FUEL SCHDL Spec. value and less than A/F ALPHA (B1)/(B2)* Spec. value
Less than Spec. value
OK
Check ground voltage of MAF sensor harness. Less than 0.2V
NG
Re-tighten engine ground.
OK
Data Monitor MAF sensor (Refer to CONSULT-II reference value of MAF sensor.)
More than reference value
Within reference value
Replace MAF sensor
Replace ECM
Check B/FUEL SCHDL, A/F ALPHA (B1)/(B2)*.
Less than reference value
Data Monitor MAF sensor (Refer to CONSULT-II reference value of MAF sensor.)
Replace MAF sensor
Check B/FUEL SCHDL.
Within reference value
Check and Repair
Check for causes of over-friction.
• Engine oil level over H
• Over tension of drive belts
• Abnormal noise from, or catch of alternator, PS A/C drive belts
• Abnormal noise coming from engine.
• Comprssion pressure check
• Abnormal noise coming from transmission
Check for causes of imperfect combustion.
• EGR valve stuck open
• Check function of intake valve timing control solenold valve using active test.
• Valve clearance check
• Improper timing of camshaft sprocket
Check and Repair
Check for causes of air suction at lower flow of MAF sensor.
• Disconnected, loose or cracked air duct
• Disconnected, loose or cracked air vacuum hose connected to air duct or intake manifold collector
• Loose oil filler cap
• Disconnected or loose oil level gauge
• Improper sealing of intake related gaskets
• Improper sealing of rocker cover gaskets
Check B/FUEL SCHDL.
Check B/FUEL SCHDL.
COMPLETED
SEF615ZA

TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT

PFP:00006

Description

ABS009BJ

Intermittent incidents (I/I) may occur. In many cases, the malfunction resolves itself (the part or circuit function returns to normal without intervention). It is important to realize that the symptoms described in the customer's complaint often do not recur on (1st trip) DTC visits. Realize also that the most frequent cause of I/I occurrences is poor electrical connections. Because of this, the conditions under which the incident occurred may not be clear. Therefore, circuit checks made as part of the standard diagnostic procedure may not indicate the specific malfunctioning area.

Common I/I Report Situations

STEP in Work Flow	Situation
II	The CONSULT-II is used. The SELF-DIAG RESULTS screen shows time data other than [0] or [1t].
III	The symptom described by the customer does not recur.
IV	(1st trip) DTC does not appear during the DTC Confirmation Procedure.
VI	The Diagnostic Procedure for PXXXX does not indicate the malfunctioning area.

Diagnostic Procedure

ABS009BK

1. INSPECTION START

Erase (1st trip) DTCs. Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .

>> GO TO 2.

2. CHECK GROUND TERMINALS

Check ground terminals for corroding or loose connection.
Refer to GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident" , "CIRCUIT INSPECTION", "Ground Inspection".

OK or NG

OK >> GO TO 3.
NG >> Repair or replace.

3. SEARCH FOR ELECTRICAL INCIDENT

Perform GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident" , "INCIDENT SIMULATION TESTS".

OK or NG

OK >> GO TO 4.
NG >> Repair or replace.

4. CHECK CONNECTOR TERMINALS

Refer to GI-24, "How to Check Terminal" , "HOW TO PROBE CONNECTORS", “How to Check Enlarged Contact Spring of Terminal”.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace connector.

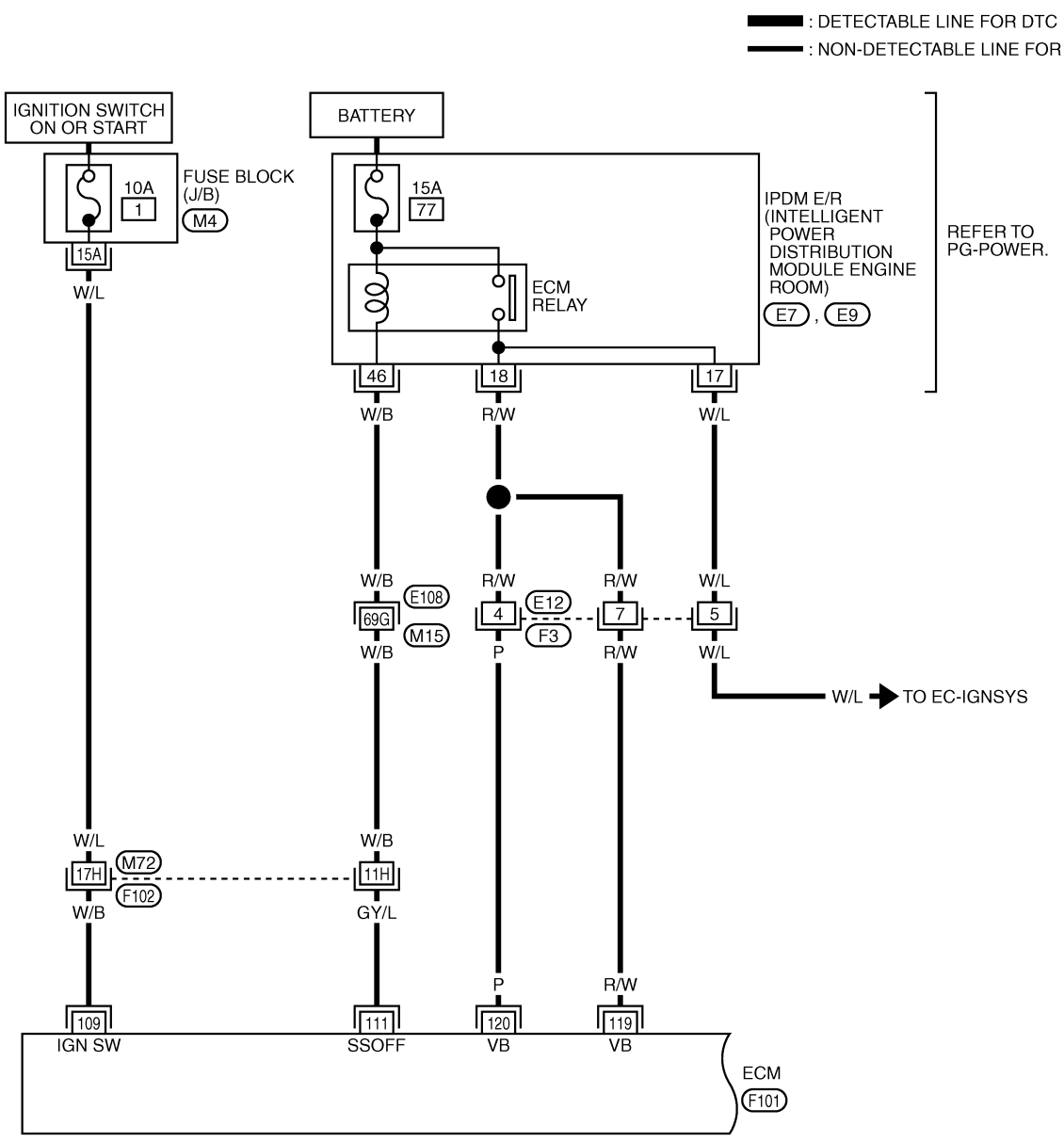
POWER SUPPLY AND GROUND CIRCUIT

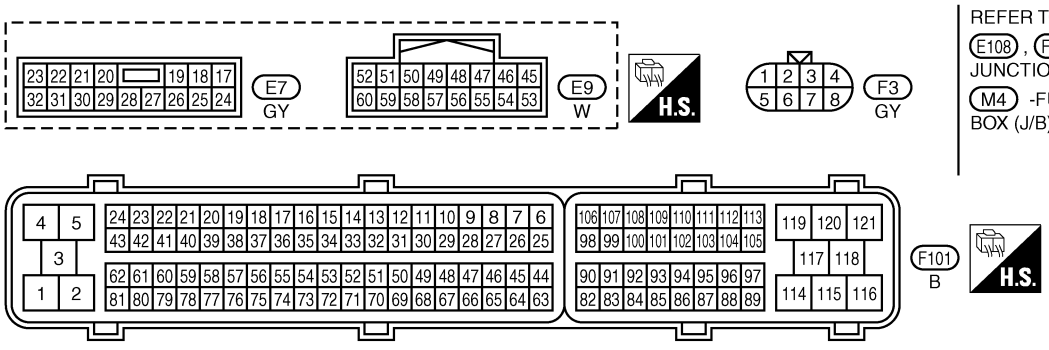
PFP:24110

Wiring Diagram

ABS009BL

EC-MAIN-01





REFER TO THE FOLLOWING.

E108 , F102 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT0612E

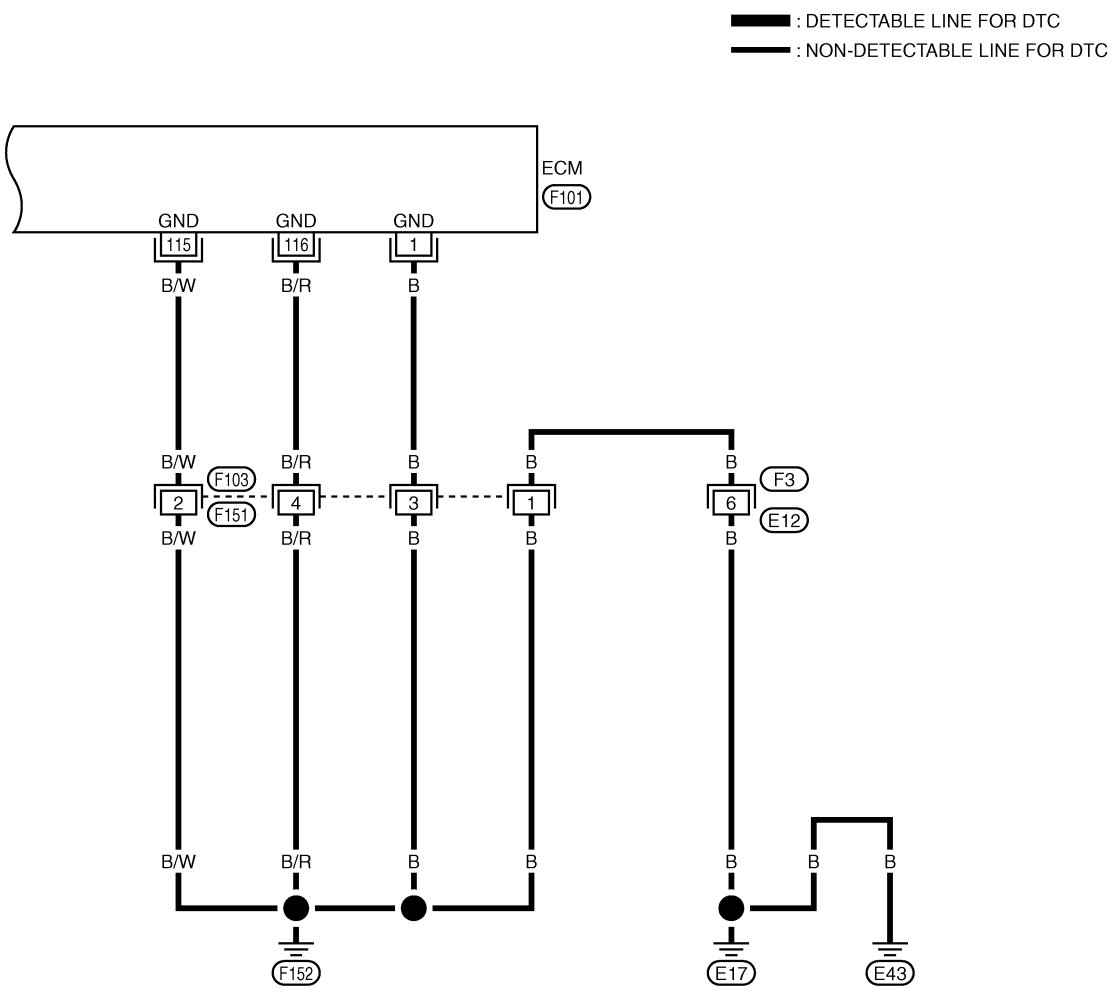
Specification data are reference values and are measured between each terminal and ground.

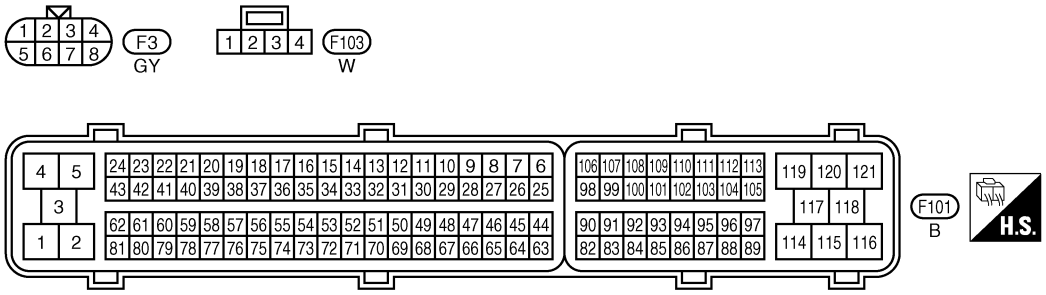
CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
109	W/B	Ignition switch	**[Ignition switch: OFF]**	0V
			[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14V)
111	GY/L	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
119 120	R/W P	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

EC-MAIN-02





TBWT0471E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
1	B	ECM ground	**[Engine is running]** ● Idle speed	Body ground
115 116	B/W B/R	ECM ground	**[Engine is running]** ● Idle speed	Body ground

Diagnostic Procedure

ABS009BM

1. INSPECTION START

Start engine.

Is engine running?

Yes or No

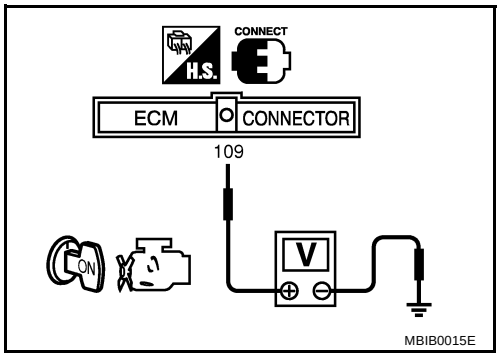
Yes >> GO TO 8.

No >> GO TO 2.

2. CHECK ECM POWER SUPPLY CIRCUIT-I

1. Turn ignition switch OFF and then ON.
2. Check voltage between ECM terminal 109 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 4.

NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

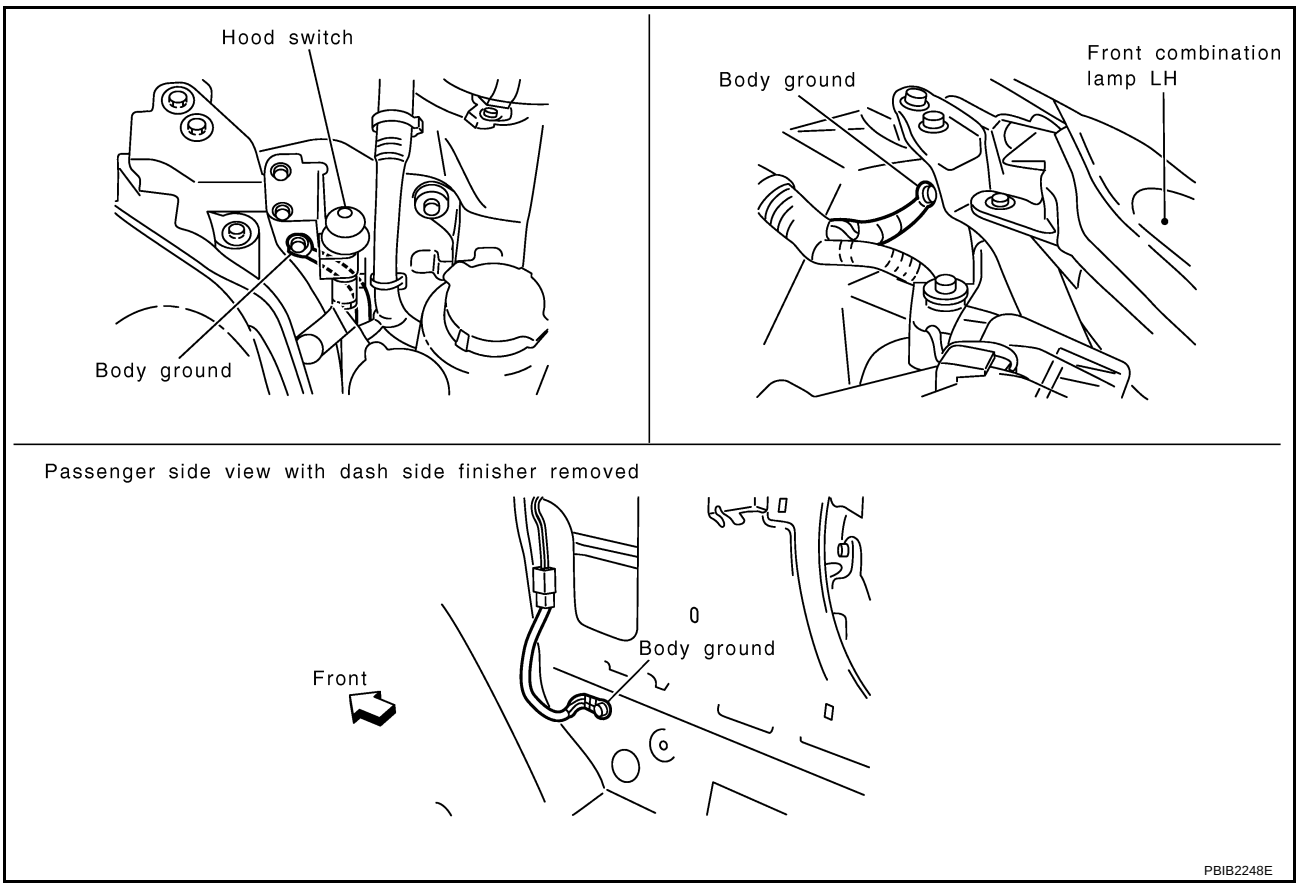
Check the following.

- Harness connectors M72, F102
- Fuse block (J/B) connector M4
- 10A fuse
- Harness for open or short between ECM and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .



OK or NG

OK >> GO TO 5.
NG >> Repair or replace ground connections.

5. CHECK ECM GROUND CIRCUIT FOR OPEN AND SHORT-I

1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminals 1, 115, 116 and ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

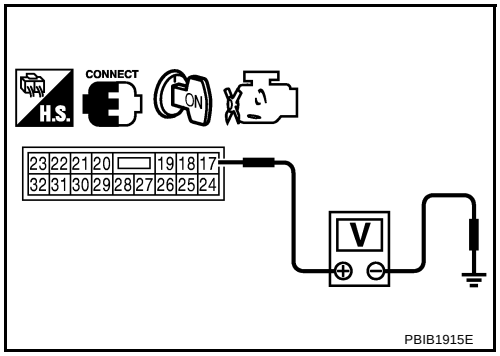
- Harness connectors F103, F151
- Harness connectors F3, E12
- Harness for open or short between ECM and ground

>> Repair open circuit or short to power in harness or connectors.

7. CHECK ECM POWER SUPPLY CIRCUIT-II

1. Reconnect ECM harness connector.
2. Turn ignition switch ON.
3. Check voltage between IPDM E/R terminal 17 and ground with CONSULT-II or tester.

Voltage: Battery voltage



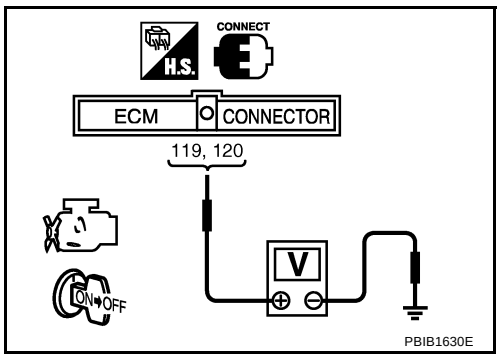
OK or NG

OK >> Go to EC-620, "IGNITION SIGNAL" .
NG >> GO TO 8.

8. CHECK ECM POWER SUPPLY CIRCUIT-III

1. Turn ignition switch ON and then OFF.
2. Check voltage between ECM terminals 119, 120 and ground with CONSULT-II or tester.

Voltage: After turning ignition switch OFF, battery voltage will exist for a few seconds, then drop approximately 0V.



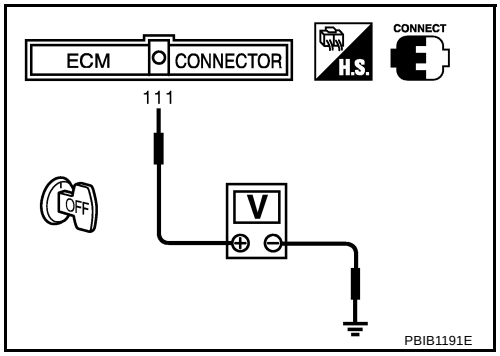
OK or NG

OK >> GO TO 15.
NG (Battery voltage does not exist.)>>GO TO 9.
NG (Battery voltage exists for more than a few seconds.)>>GO TO 12.

9. CHECK ECM POWER SUPPLY CIRCUIT-IV

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Check voltage between ECM terminal 111 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 10.
NG >> GO TO 12.

10. CHECK ECM POWER SUPPLY CIRCUIT-V

1. Disconnect ECM harness connector.
2. Disconnect IPDM E/R harness connector E7.
3. Check harness continuity between ECM terminals 119, 120 and IPDM E/R terminal 18. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 18.
NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Harness or connectors E12, F3
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

12. CHECK ECM POWER SUPPLY CIRCUIT-VI

1. Disconnect ECM harness connector.
2. Disconnect IPDM E/R harness connector E9.
3. Check harness continuity between ECM terminal 111 and IPDM E/R terminal 46.
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 14.
NG >> GO TO 13.

13. DETECT MALFUNCTIONING PART

Check the following.

- Harness or connectors E108, M15
- Harness or connectors M72, F102
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

14. CHECK 15A FUSE

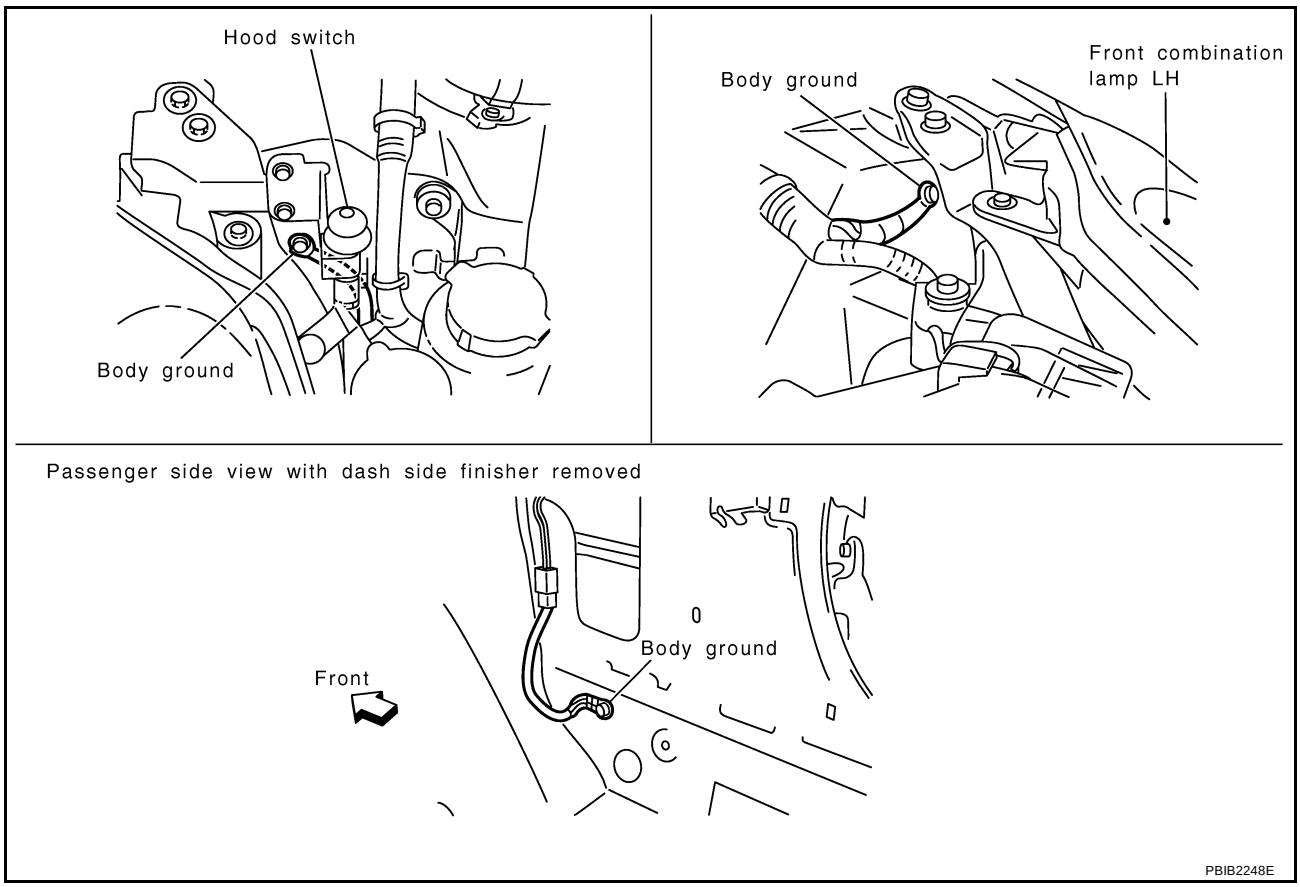
1. Disconnect 15A fuse from IPDM E/R.
2. Check 15A fuse.

OK or NG

OK >> GO TO 18.
NG >> Replace 15A fuse.

15. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .



OK or NG

OK >> GO TO 16.
NG >> Repair or replace ground connections.

16. CHECK ECM GROUND CIRCUIT FOR OPEN AND SHORT-II

1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminals 1, 115, 116 and ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 18.
NG >> GO TO 17.

17. DETECT MALFUNCTIONING PART

Check the following.

- Harness or connectors F103, F151
- Harness or connectors F3, E12
- Harness for open or short between ECM and ground.

>> Repair open circuit or short to power in harness or connectors.

18. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace IPDM E/R. Refer to PG-17, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)" .

NG >> Repair open circuit or short to ground or short to power in harness or connectors.

Ground Inspection

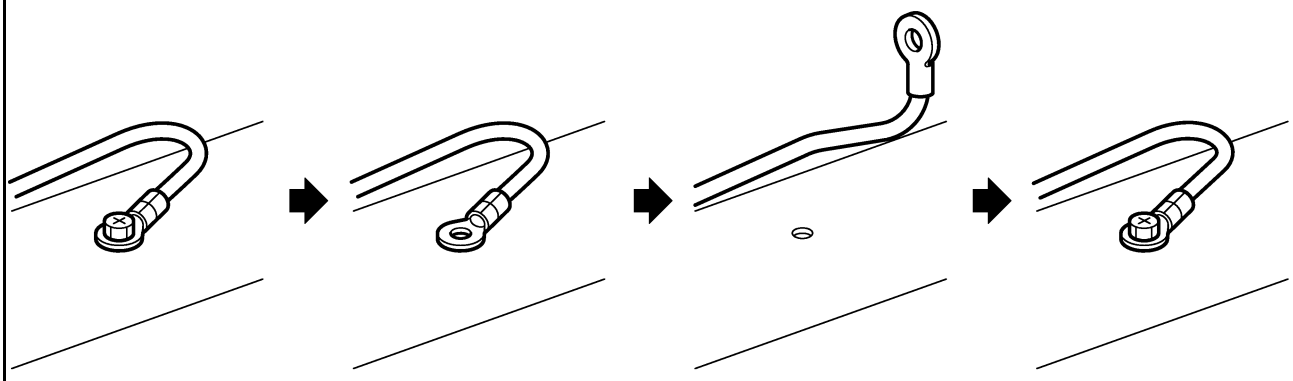
ABS00AN2

Ground connections are very important to the proper operation of electrical and electronic circuits. Ground connections are often exposed to moisture, dirt and other corrosive elements. The corrosion (rust) can become an unwanted resistance. This unwanted resistance can change the way a circuit works.
Electronically controlled circuits are very sensitive to proper grounding. A loose or corroded ground can drastically affect an electronically controlled circuit. A poor or corroded ground can easily affect the circuit. Even when the ground connection looks clean, there can be a thin film of rust on the surface.
When inspecting a ground connection follow these rules:

- Remove the ground bolt or screw.
- Inspect all mating surfaces for tarnish, dirt, rust, etc.
- Clean as required to assure good contact.
- Reinstall bolt or screw securely.
- Inspect for “add-on” accessories which may be interfering with the ground circuit.
- If several wires are crimped into one ground eyelet terminal, check for proper crimps. Make sure all of the wires are clean, securely fastened and providing a good ground path. If multiple wires are cased in one eyelet make sure no ground wires have excess wire insulation.

For detailed ground distribution information, refer to PG-31, "Ground Distribution" .

Ground Inspection



DTC U1000, U1001 CAN COMMUNICATION LINE

PFP:23710

Description

ABS009BN

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

On Board Diagnosis Logic

ABS009BO

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
U1000*1 1000*1	CAN communication line	● ECM cannot communicate to other control units. ● ECM cannot communicate for more than the specified time.	● Harness or connectors (CAN communication line is open or shorted)
U1001*2 1001*2			

*1: **This self-diagnosis has the one trip detection logic (A/T models).**
The MIL will not light up for this diagnosis (M/T models).
*2: **The MIL will not light up for this diagnosis.**

DTC Confirmation Procedure

ABS009BP

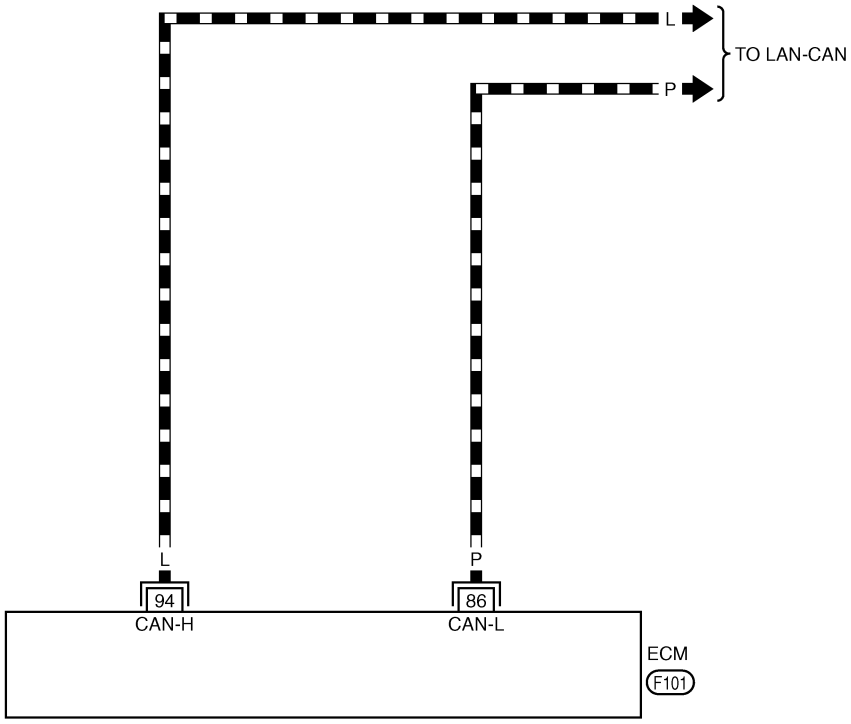
1. Turn ignition switch ON and wait at least 3 seconds.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. If 1st trip DTC is detected, go to EC-140, "Diagnostic Procedure" .

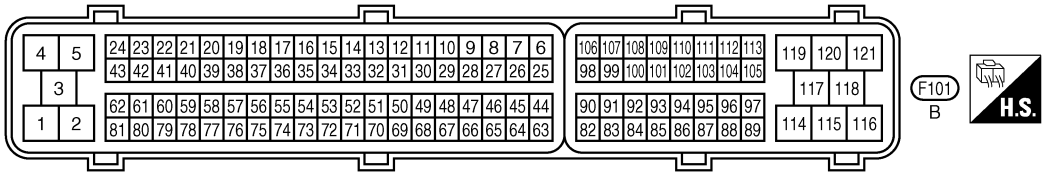
Wiring Diagram

ABS009BQ

EC-CAN-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC
: DATA LINE





TBWT0698E

Diagnostic Procedure

ABS009BR

Go to LAN-3, "Precautions When Using CONSULT-II" .

DTC P0011, P0021 IVT CONTROL

PFP:23796

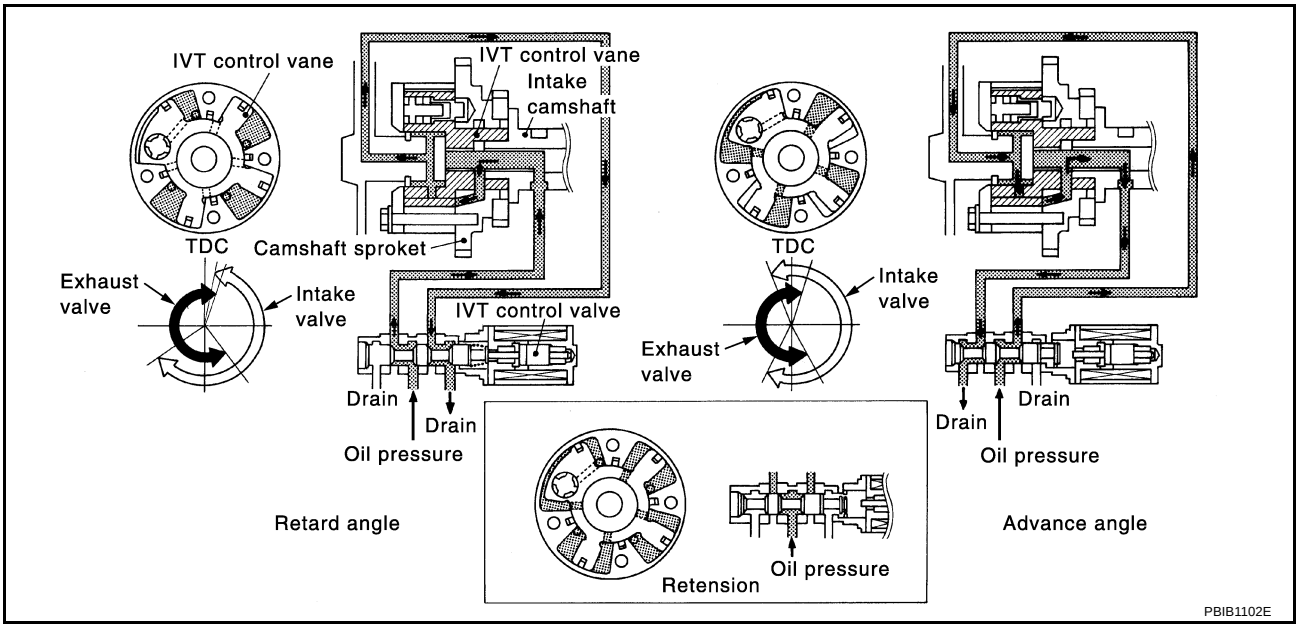
Description

ABS009BS

SYSTEM DESCRIPTION

Sensor	Input signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS)	Engine speed	Intake valve timing control	Intake valve timing control solenoid valve
Camshaft position sensor (PHASE)			
Engine coolant temperature sensor	Engine coolant temperature		
Wheel sensor*	Vehicle speed		

*: This signal is sent to ECM through CAN communication line.



This mechanism hydraulically controls cam phases continuously with the fixed operating angle of the intake valve.

The ECM receives signals such as crankshaft position, camshaft position, engine speed, and engine coolant temperature. Then, the ECM sends ON/OFF pulse duty signals to the intake valve timing control solenoid valve depending on driving status. This makes it possible to control the shut/open timing of the intake valve to increase engine torque in low/mid speed range and output in high-speed range.

CONSULT-II Reference Value in Data Monitor Mode

ABS009BT

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
INT/V TIM (B1) INT/V TIM (B2)	● Engine: After warming up ● Shift lever: N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No-load	Idle	–5° - 5°CA
		When revving engine up to 2,000 rpm quickly	Approx. 0° - 30°CA
INT/V SOL (B1) INT/V SOL (B2)	● Engine: After warming up ● Shift lever: N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No-load	Idle	0% - 2%
		When revving engine up to 2,000 rpm quickly	Approx. 0% - 50%

On Board Diagnosis Logic

ABS009BU

DTC No.	Trouble diagnosis name	Detecting condition	Possible cause
P0011 0011 (Bank 1)	Intake valve timing control performance	There is a gap between angle of target and phase-control angle degree.	● Crankshaft position sensor (POS) ● Camshaft position sensor (PHASE) ● Accumulation of debris to the signal pick-up portion of the camshaft
P0021 0021 (Bank 2)			

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode.

Detected items	Engine operating condition in fail-safe mode
Intake valve timing control	The signal is not energized to the solenoid valve and the valve control does not function.

DTC Confirmation Procedure

ABS009BV

CAUTION:

Always drive at a safe speed.

NOTE:

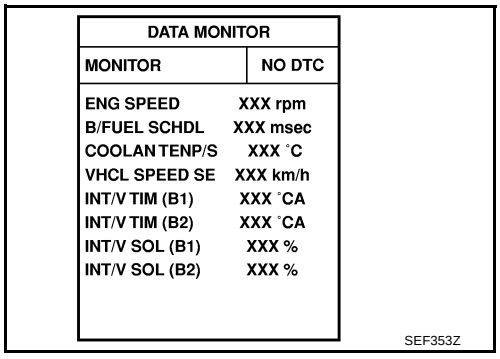
- **If DTC P0011 or P0021 is displayed with DTC P1111 or P1136, first perform trouble diagnosis for DTC P1111 or P1136. Refer to EC-389 .**
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is between 10V and 16V at idle.

WITH CONSULT-II

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-II.
2. Start engine and warm it up to the normal operating temperature.
3. Maintain the following conditions for at least 6 consecutive seconds.
   Hold the accelerator pedal as steady as possible.



VHCL SPEED SE	100 - 120 km/h (63 - 75 MPH)
ENG SPEED	2,000 - 4,000 rpm
COOLAN TEMP/S	60 - 120°C (140 - 248°F)
B/FUEL SCHDL	More than 7.26 msec
Shift lever	A/T models: D position M/T models: 5th position

4. Stop vehicle with engine running and let engine idle for 10 seconds.
5. If 1st trip DTC is detected, go to EC-143, "Diagnostic Procedure" .
   If 1st trip DTC is not detected, go to next step.
6. Maintain the following conditions for at least 20 consecutive seconds.

ENG SPEED	1,700 - 3,175 rpm (A constant rotation is maintained.)
COOLANT TEMPS	70 - 105°C (158 - 221°F)
Shift lever	1st or 2nd position
Driving location uphill	Driving vehicle uphill (Increased engine load will help maintain the driving conditions required for this test.)

7. If the 1st trip DTC is detected, go to EC-143, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-II” above.

Diagnostic Procedure

ABS009BW

1. CHECK CRANKSHAFT POSITION SENSOR (POS)

Refer to EC-273, "Component Inspection" .

OK or NG

OK >> GO TO 2.
NG >> Replace crankshaft position sensor (POS).

2. CHECK CAMSHAFT POSITION SENSOR (PHASE)

Refer to EC-282, "Component Inspection" .

OK or NG

OK >> GO TO 3.
NG >> Replace camshaft position sensor (PHASE).

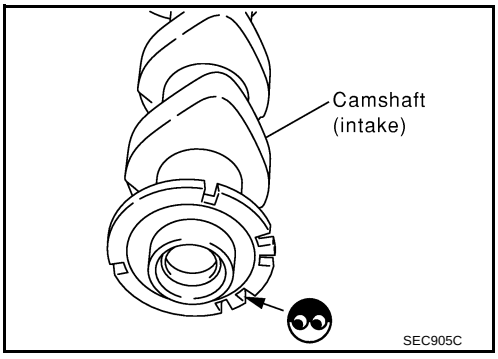
3. CHECK CAMSHAFT (INTAKE)

Check the following.

- Accumulation of debris to the signal plate of camshaft rear end
- Chipping signal plate of camshaft rear end

OK or NG

OK >> GO TO 4.
NG >> Remove debris and clean the signal plate of camshaft rear end or replace camshaft.



4. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .
For wiring diagram, refer to EC-268 for CKP sensor (POS), EC-275 and EC-277 for CMP sensor (PHASE).

>> **INSPECTION END**

DTC P0037, P0038, P0057, P0058 HO2S2 HEATER

PFP:226A0

Description

ABS009C5

SYSTEM DESCRIPTION

Sensor	Input signal to ECM	ECM function	Actuator
Camshaft position sensor (PHASE)	Engine speed	Heated oxygen sensor 2 heater control	Heated oxygen sensor 2 heater
Crankshaft position sensor (POS)			
Engine coolant temperature sensor	Engine coolant temperature		
Mass air flow sensor	Amount of intake air		

The ECM performs ON/OFF control of the heated oxygen sensor 2 heater corresponding to the engine speed, amount of intake air and engine coolant temperature.

OPERATION

Engine speed rpm	Heated oxygen sensor 2 heater
Above 3,600	OFF
Below 3,600 rpm after the following conditions are met. ● Engine: After warming up ● Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load	ON

CONSULT-II Reference Value in Data Monitor Mode

ABS009C6

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
HO2S2 HTR (B1) HO2S2 HTR (B2)	● Engine speed is below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load	ON
	● Engine speed: Above 3,600 rpm	OFF

On Board Diagnosis Logic

ABS009C7

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0037 0037 (Bank 1) P0057 0057 (Bank 2)	Heated oxygen sensor 2 heater control circuit low	The current amperage in the heated oxygen sensor 2 heater circuit is out of the normal range. (An excessively low voltage signal is sent to ECM through the heated oxygen sensor 2 heater.)	● Harness or connectors (The heated oxygen sensor 2 heater circuit is open or shorted.) ● Heater oxygen sensor 2 heater
P0038 0038 (Bank 1) P0058 0058 (Bank 2)	Heated oxygen sensor 2 heater control circuit high	The current amperage in the heated oxygen sensor 2 heater circuit is out of the normal range. (An excessively high voltage signal is sent to ECM through the heated oxygen sensor 2 heater.)	● Harness or connectors (The heated oxygen sensor 2 heater circuit is shorted.) ● Heater oxygen sensor 2 heater

DTC Confirmation Procedure

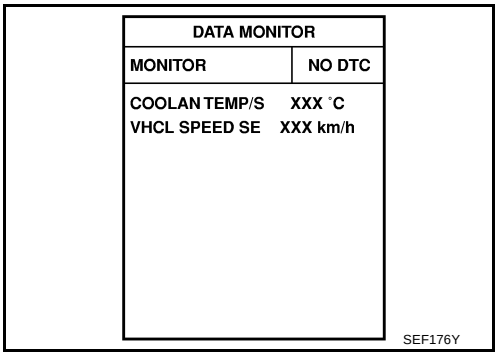
ABS009C8

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is between 10.5V and 16V at idle.

WITH CONSULT-II

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-II.
2. Start engine and warm it up to the normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start the engine and keep the engine speed between 3,500 rpm and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 1 minute.
6. If 1st trip DTC is detected, go to EC-149, "Diagnostic Procedure" .



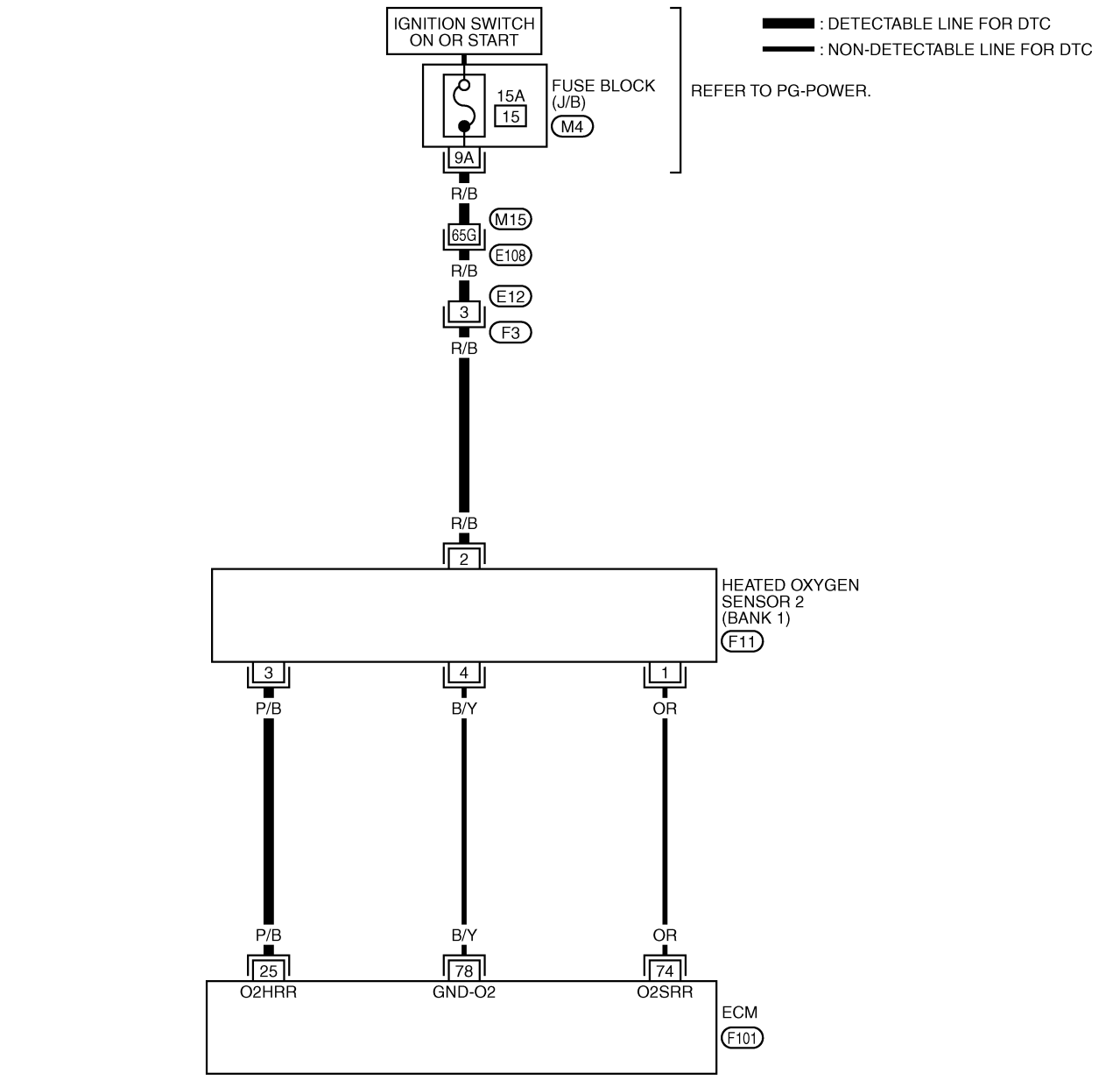
WITH GST

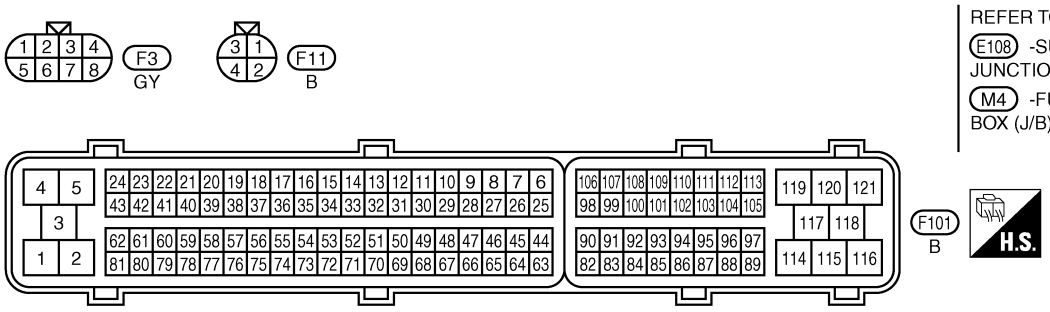
Follow the procedure “WITH CONSUT-II” above.

Wiring Diagram
BANK 1

ABS009C9

EC-O2H2B1-01





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT0474E

Specification data are reference values and are measured between each terminal and ground.

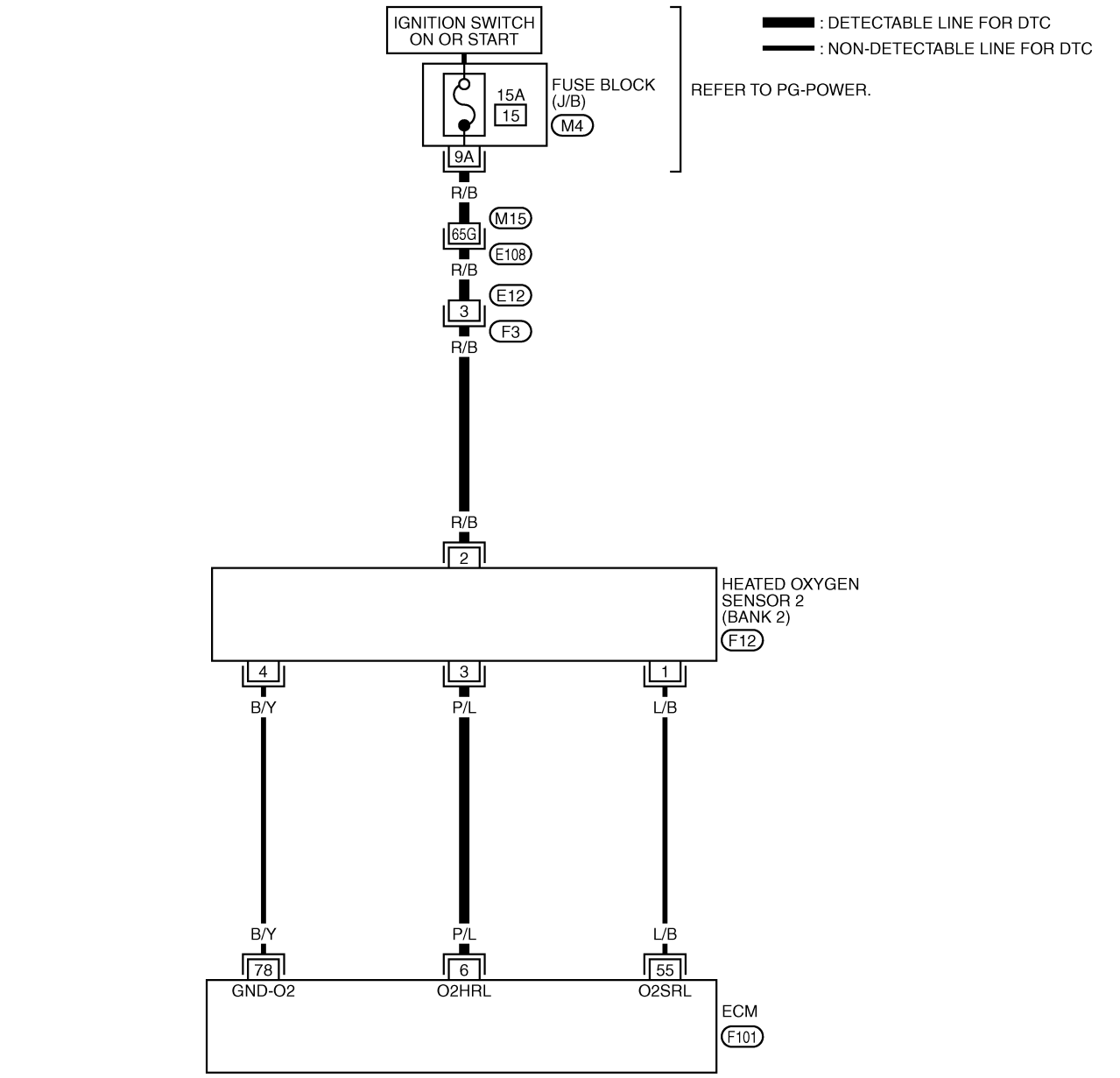
CAUTION:

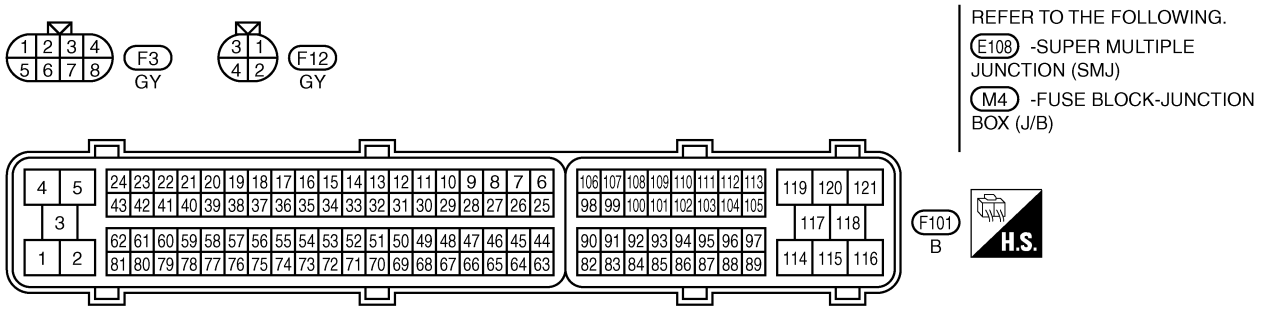
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
25	P/B	Heated oxygen sensor 2 heater (bank 1)	**[Engine is running]** ● Engine speed is below 3,600 rpm after the following conditions are met. – Engine: after warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 1.0V
			[Ignition switch: ON] ● Engine stopped **[Engine is running]** ● Engine speed is above 3,600 rpm.	BATTERY VOLTAGE (11 - 14V)

BANK 2

EC-O2H2B2-01





TBWT0475E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

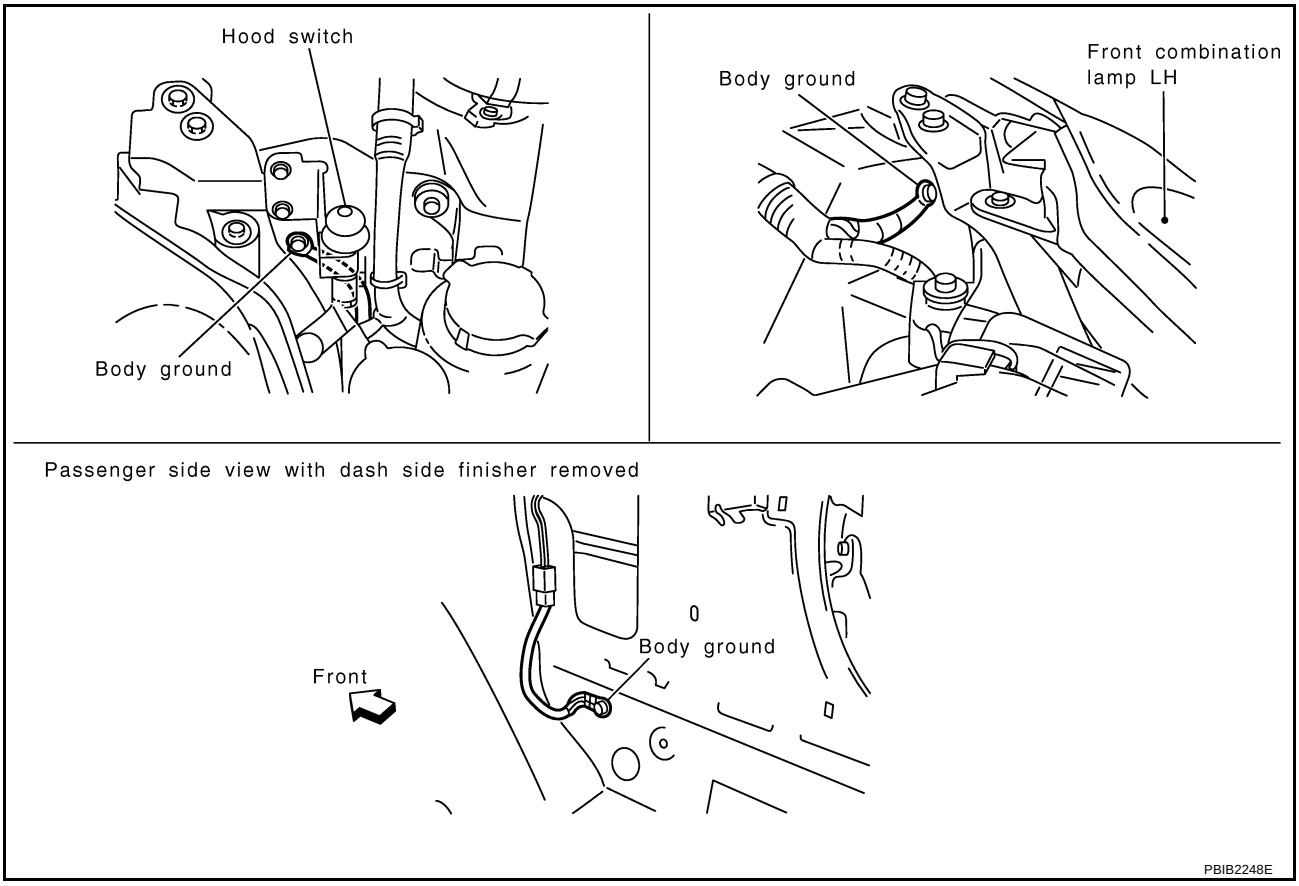
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
6	P/L	Heated oxygen sensor 2 heater (bank 2)	**[Engine is running]** ● Engine speed is below 3,600 rpm after the following conditions are met. – Engine: after warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 1.0V
			[Ignition switch: ON] ● Engine stopped **[Engine is running]** ● Engine speed is above 3,600 rpm.	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

ABS009CA

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

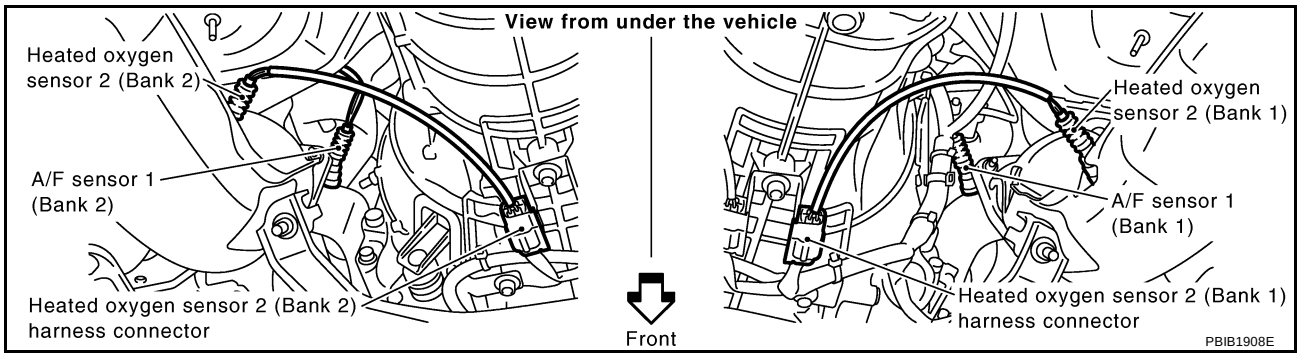


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK HO2S2 POWER SUPPLY CIRCUIT

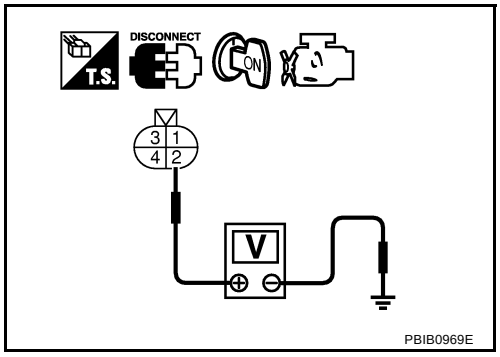
1. Disconnect heated oxygen sensor 2 harness connector.



2. Turn ignition switch ON.

3. Check voltage between HO2S2 terminal 2 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M15, E108
- Harness connectors E12, F3
- Fuse block (J/B) connector M4
- 15A fuse
- Harness for open or short between heated oxygen sensor 2 and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK HO2S2 OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal and HO2S2 terminal as follows. Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P0037, P0038	25	3	1
P0057, P0058	6	3	2

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK HEATED OXYGEN SENSOR 2 HEATER

Refer to EC-151, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace malfunctioning heated oxygen sensor 2.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

ABS009CB

HEATED OXYGEN SENSOR 2 HEATER

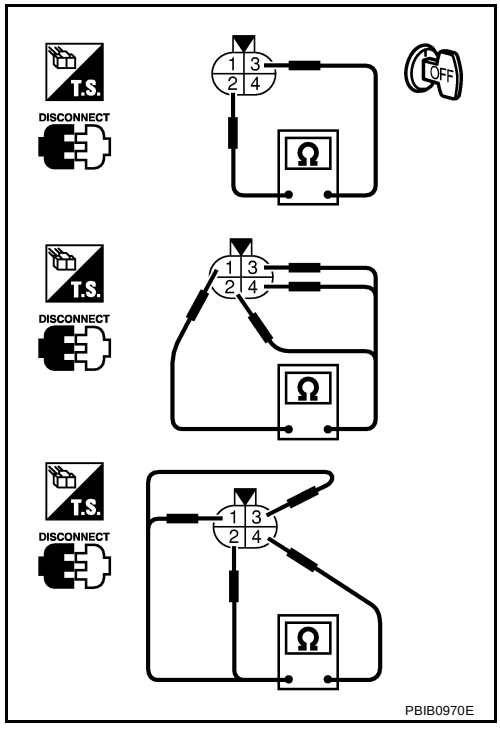
1. Check resistance between HO2S2 terminals as follows.

Terminal No.	Resistance
2 and 3	5.0 - 7.0 Ω [at 25°C (77°F)]
1 and 2, 3, 4	∞ Ω (Continuity should not exist)
4 and 1, 2, 3	

2. If NG, replace heated oxygen sensor 2.

CAUTION:

- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**



PBIB0970E

Removal and Installation

ABS009CC

HEATED OXYGEN SENSOR 2

Refer to EM-23, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

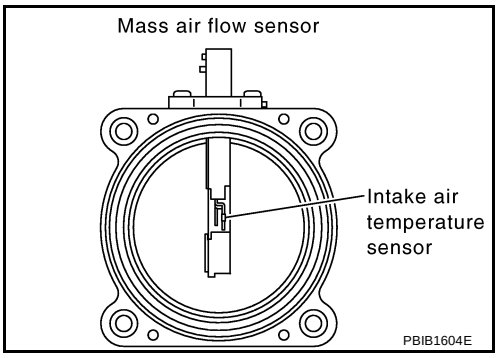
DTC P0101 MAF SENSOR

PFP:22680

Component Description

ABS009CD

The mass air flow sensor is placed in the stream of intake air. It measures the intake flow rate by measuring a part of the entire intake flow. The mass air flow control the temperature of the hot wire is to a certain amount. The heat generated by the hot wire is reduced as the intake air flows around it. The more air, the greater the heat loss. Therefore, the electric current supplied to hot wire is changed to maintain the temperature of the hot wire as air flow increases. The ECM detects the air flow by means of this current change.



CONSULT-II Reference Value in Data Monitor Mode

ABS009CE

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
MAS A/F SE-B1	● Engine: After warming up ● Air conditioner switch: OFF ● Shift lever: N (A/T), Neutral (M/T) ● No-load	Idle	Approx. 0.9 - 1.2V
		2,500 rpm	Approx. 1.6 - 1.9V
CAL/LD VALUE	● Engine: After warming up ● Shift lever: N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No-load	Idle	5% - 35%
		2,500 rpm	5% - 35%
MASS AIRFLOW	● Engine: After warming up ● Shift lever: N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No-load	Idle	2.0 - 6.0 g·m/s
		2,500 rpm	7.0 - 20.0 g·m/s

On Board Diagnosis Logic

ABS009CF

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition		Possible cause
P0101 0101	Mass air flow sensor circuit range/performance problem	A)	A high voltage from the sensor is sent to ECM under light load driving condition.	● Harness or connectors (The sensor circuit is open or shorted.) ● Mass air flow sensor
		B)	A low voltage from the sensor is sent to ECM under heavy load driving condition.	● Harness or connectors (The sensor circuit is open or shorted.) ● Intake air leaks ● Mass air flow sensor

DTC Confirmation Procedure

ABS009CG

Perform PROCEDURE FOR MALFUNCTION A first.
If the DTC cannot be confirmed, perform PROCEDURE FOR MALFUNCTION B.

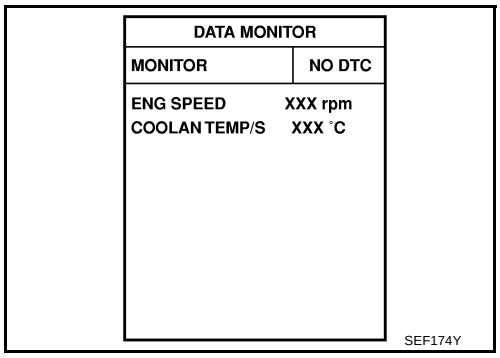
NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

PROCEDURE FOR MALFUNCTION A

NOTE:
If engine will not start or stops soon, wait at least 10 seconds with engine stopped (Ignition switch ON) instead of running engine at idle speed.

With CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Start engine and warm it up to normal operating temperature.
4. Run engine for at least 10 seconds at idle speed.
5. If DTC is detected, go to EC-157, "Diagnostic Procedure" .



With GST

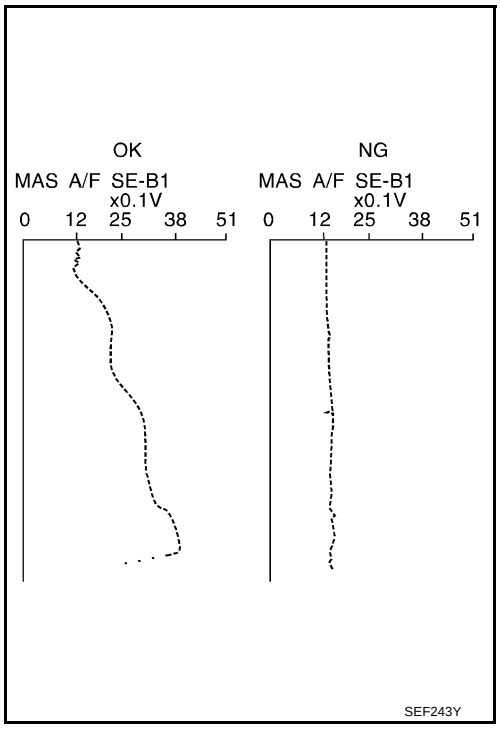
Follow the procedure “With CONSULT-II” above.

PROCEDURE FOR MALFUNCTION B

CAUTION:
Always drive vehicle at a safe speed.

With CONSULT-II

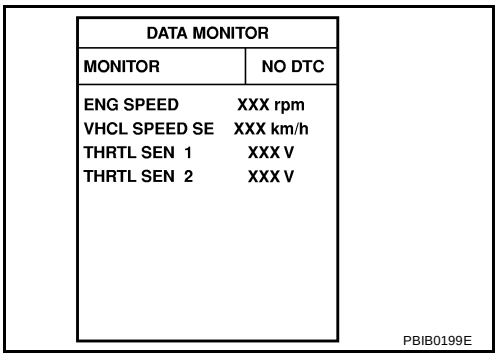
1. Turn ignition switch ON.
2. Start engine and warm it up to normal operating temperature.
   If engine cannot be started, go to EC-157, "Diagnostic Procedure" .
3. Select “DATA MONITOR” mode with CONSULT-II.
4. Check the voltage of “MAS A/F SE-B1” with “DATA MONITOR”.
5. Increases engine speed to about 4,000 rpm.
6. Monitor the linear voltage rise in response to engine speed increases.
   If NG, go to EC-157, "Diagnostic Procedure" .
   If OK, go to following step.



7. Maintain the following conditions for at least 10 consecutive seconds.

ENG SPEED	More than 2,000 rpm
THRTL SEN 1	More than 3V
THRTL SEN 2	More than 3V
Shift lever	Suitable position
Driving location	Driving vehicle uphill (Increased engine load) will help maintain the driving conditions required for this test.

8. If DTC is detected, go to EC-157, "Diagnostic Procedure" .



ABS009CH

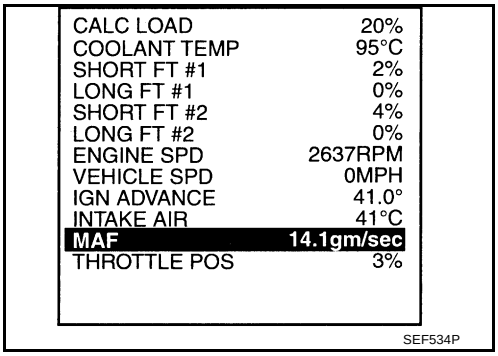
Overall Function Check

PROCEDURE FOR MALFUNCTION B

Use this procedure to check the overall function of the mass air flow sensor circuit. During this check, a DTC might not be confirmed.

With GST

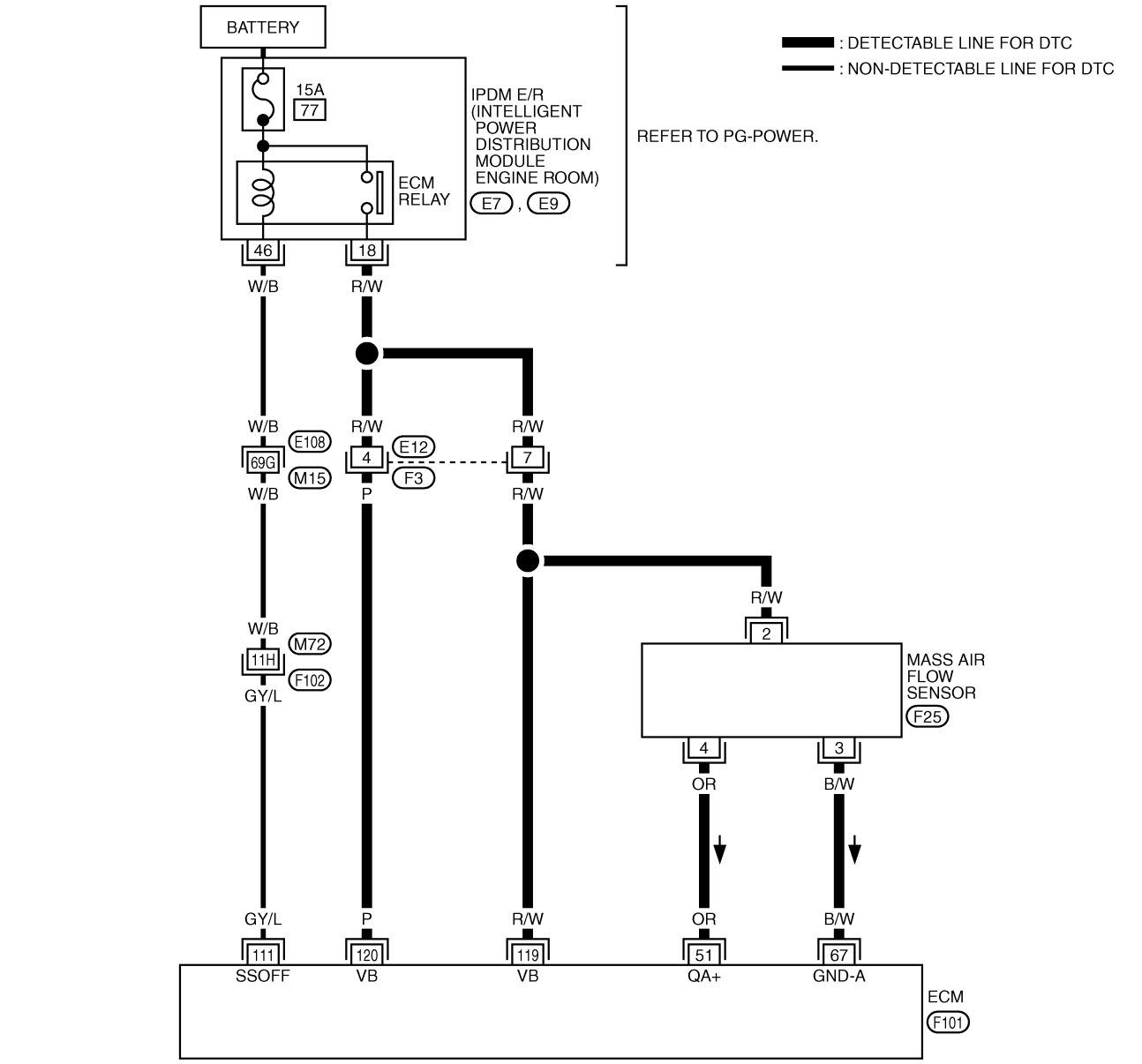
1. Start engine and warm it up to normal operating temperature.
2. Select “MODE 1” with GST.
3. Check the mass air flow sensor signal with “MODE 1”.
4. Check for linear mass air flow sensor signal value rise in response to increases to about 4,000 rpm in engine speed.
5. If NG, go to EC-157, "Diagnostic Procedure" .

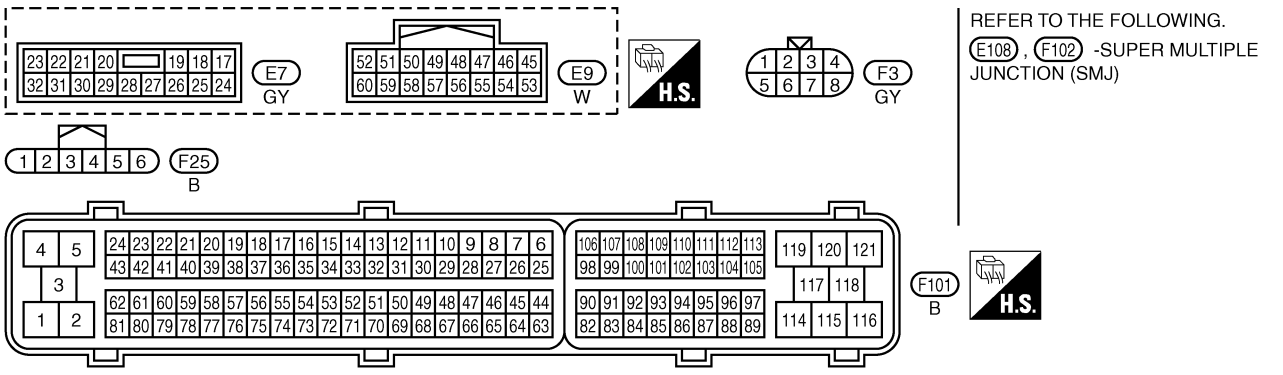


Wiring Diagram

ABS009CI

EC-MAFS-01





TBWT0613E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
51	OR	Mass air flow sensor	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0.9 - 1.2V
			[Engine is running] ● **Warm-up condition** ● Engine speed is 2,500 rpm.	1.6 - 1.9V
67	B/W	Sensor ground (Mass air flow sensor / IAT sensor / Power steering pressure sensor / EVAP control system pressure sensor / ASCD steering switch / Refrigerant pressure sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V
111	GY/L	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
119 120	R/W P	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

ABS009CJ

1. INSPECTION START

Which malfunction (A or B) is duplicated?

A or B

A >> GO TO 3.
B >> GO TO 2.

2. CHECK INTAKE SYSTEM

Check the following for connection.

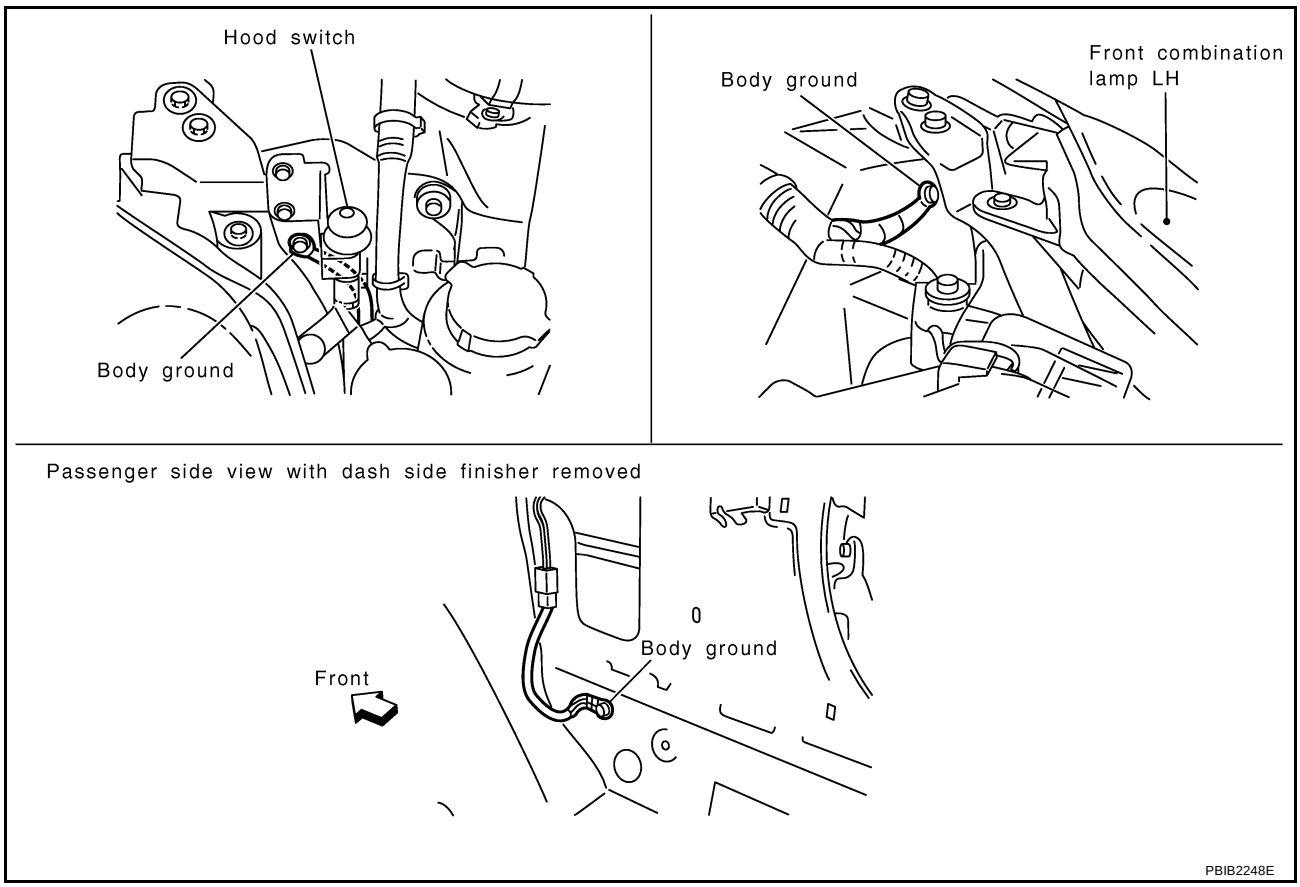
- Air duct
- Vacuum hoses
- Intake air passage between air duct to intake manifold

OK or NG

OK >> GO TO 3.
NG >> Reconnect the parts.

3. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

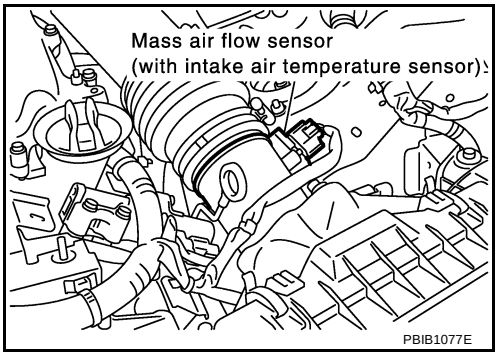


OK or NG

OK >> GO TO 4.
NG >> Repair or replace ground connections.

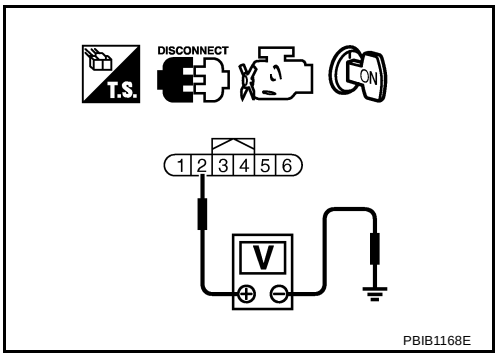
4. CHECK MAF SENSOR POWER SUPPLY CIRCUIT

1. Disconnect mass air flow (MAF) sensor harness connector.
2. Turn ignition switch ON.



3. Check voltage between MAF sensor terminal 2 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness for open or short between IPDM E/R and mass air flow sensor
- Harness for open or short between mass air flow sensor and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK MAF SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between MAF sensor terminal 3 and ECM terminal 67. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK MAF SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between MAF sensor terminal 4 and ECM terminal 51.
   Refer to Wiring Diagram.

   Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 8.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK MASS AIR FLOW SENSOR

Refer to EC-161, "Component Inspection" .

OK or NG

OK >> GO TO 9.
NG >> Replace mass air flow sensor.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

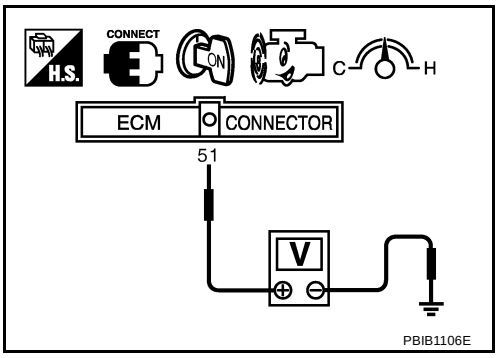
>> **INSPECTION END**

Component Inspection

ABS009CK

MASS AIR FLOW SENSOR

1. Reconnect all harness connectors disconnected.
2. Start engine and warm it up to normal operating temperature.
3. Check voltage between ECM terminal 51 (Mass air flow sensor signal) and ground.



Condition	Voltage V
Ignition switch ON (Engine stopped.)	Approx. 0.4
Idle (Engine is warmed-up to normal operating temperature.)	0.9 - 1.2
2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.6 - 1.9
Idle to about 4,000 rpm*	0.9 - 1.2 to Approx. 2.4

*: Check for linear voltage rise in response to engine being increased to about 4,000 rpm.

4. If the voltage is out of specification, proceed the following.
   - Turn ignition switch OFF.
   - Disconnect mass air flow sensor harness connector and reconnect it again.
   - Perform steps 2 and 3 again.
5. If NG, remove mass air flow sensor from air duct. Check hot wire for damage or dust.
6. If NG, clean or replace mass air flow sensor.

Removal and Installation

ABS009CL

MASS AIR FLOW SENSOR

Refer to EM-14, "AIR CLEANER AND AIR DUCT" .

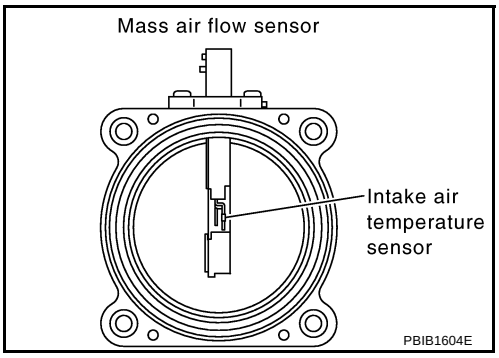
DTC P0102, P0103 MAF SENSOR

PFP:22680

Component Description

ABS009CM

The mass air flow sensor is placed in the stream of intake air. It measures the intake flow rate by measuring a part of the entire intake flow. The mass air flow control the temperature of the hot wire is to a certain amount. The heat generated by the hot wire is reduced as the intake air flows around it. The more air, the greater the heat loss. Therefore, the electric current supplied to hot wire is changed to maintain the temperature of the hot wire as air flow increases. The ECM detects the air flow by means of this current change.



CONSULT-II Reference Value in Data Monitor Mode

ABS009CN

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
MAS A/F SE-B1	● Engine: After warming up ● Air conditioner switch: OFF ● Shift lever: N (A/T), Neutral (M/T) ● No-load	Idle	Approx. 0.9 - 1.2V
		2,500 rpm	Approx. 1.6 - 1.9V
CAL/LD VALUE	● Engine: After warming up ● Shift lever: N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No-load	Idle	5% - 35%
		2,500 rpm	5% - 35%
MASS AIRFLOW	● Engine: After warming up ● Shift lever: N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No-load	Idle	2.0 - 6.0 g·m/s
		2,500 rpm	7.0 - 20.0 g·m/s

On Board Diagnosis Logic

ABS009CO

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0102 0102	Mass air flow sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted.) ● Intake air leaks ● Mass air flow sensor
P0103 0103	Mass air flow sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted.) ● Mass air flow sensor

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode and the MIL lights up.

Detected items	Engine operating condition in fail-safe mode
Mass air flow sensor circuit	Engine speed will not rise more than 2,400 rpm due to the fuel cut.

DTC Confirmation Procedure

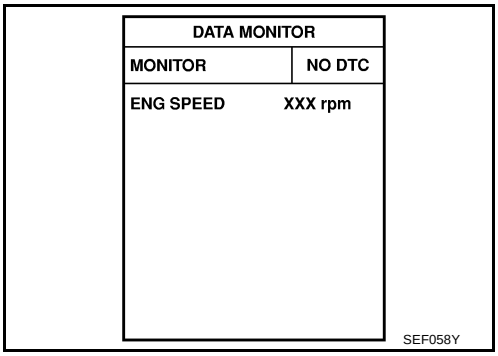
ABS009CP

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

PROCEDURE FOR DTC P0102

With CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Start engine and wait at least 5 seconds.
4. If DTC is detected, go to EC-165, "Diagnostic Procedure" .



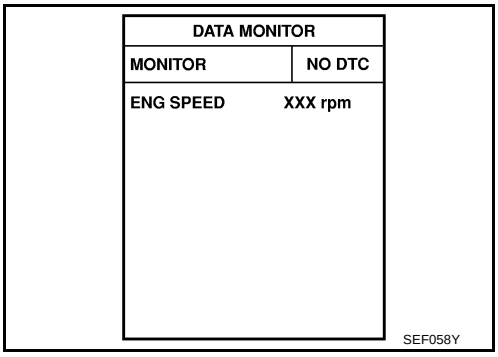
With GST

Follow the procedure “With CONSULT-II” above.

PROCEDURE FOR DTC P0103

With CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Wait at least 5 seconds.
4. If DTC is detected, go to EC-165, "Diagnostic Procedure" .
   If DTC is not detected, go to next step.
5. Start engine and wait at least 5 seconds.
6. If DTC is detected, go to EC-165, "Diagnostic Procedure" .



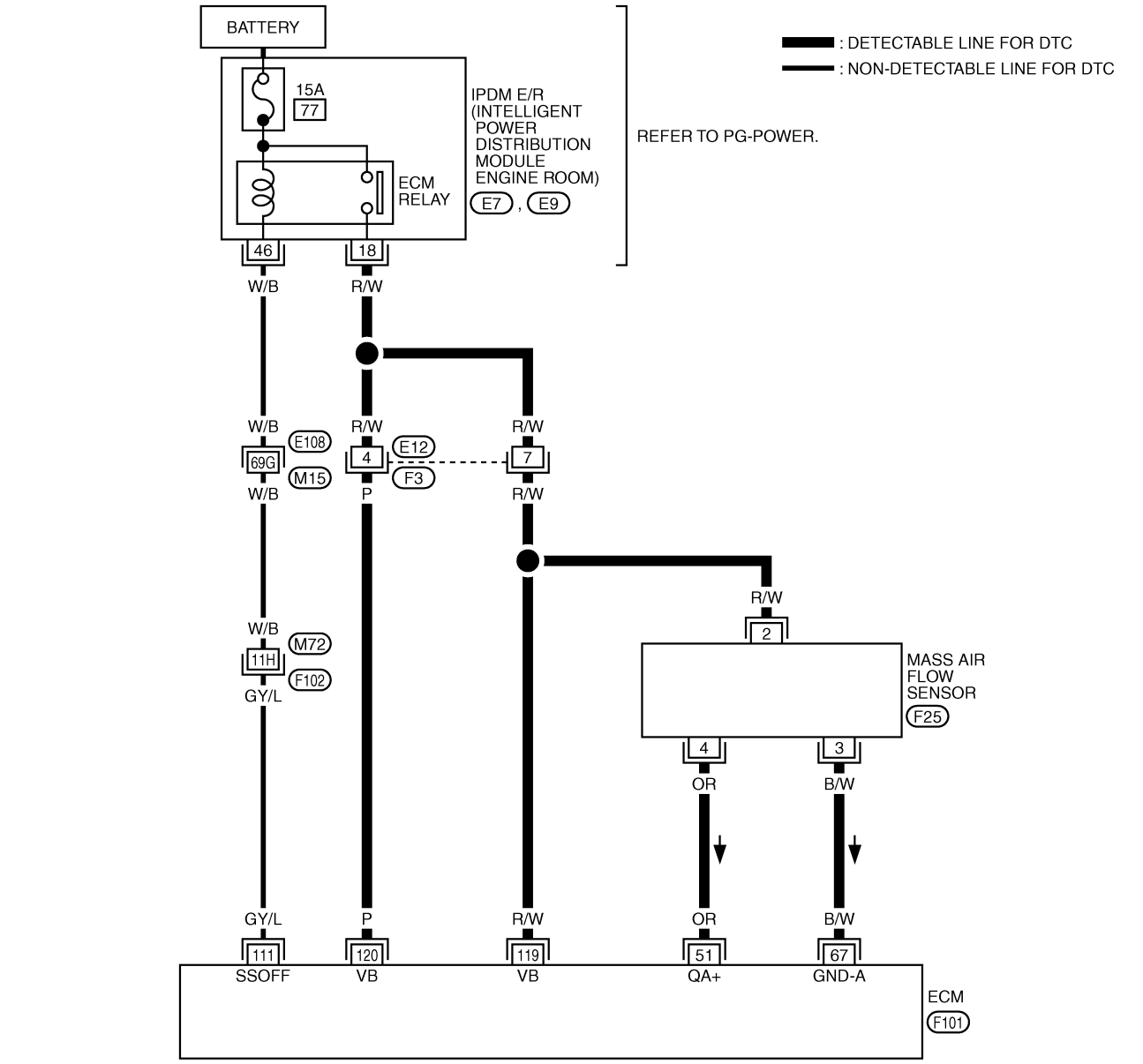
With GST

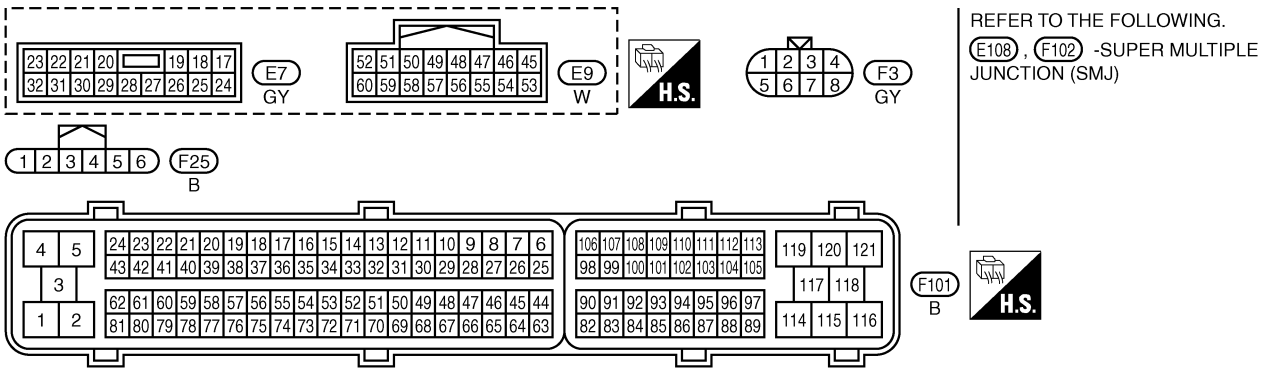
Follow the procedure “With CONSULT-II” above.

Wiring Diagram

ABS009CQ

EC-MAFS-01





TBWT0613E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
51	OR	Mass air flow sensor	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0.9 - 1.2V
			[Engine is running] ● **Warm-up condition** ● Engine speed is 2,500 rpm.	1.6 - 1.9V
67	B/W	Sensor ground (Mass air flow sensor / IAT sensor / Power steering pressure sensor / EVAP control system pressure sensor / ASCD steering switch / Refrigerant pressure sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V
111	GY/L	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
119 120	R/W P	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

ABS009CR

1. INSPECTION START

Which malfunction (P0102 or P0103) is duplicated?

P0102 or P0103

P0102 >> GO TO 2.
P0103 >> GO TO 3.

2. CHECK INTAKE SYSTEM

Check the following for connection.

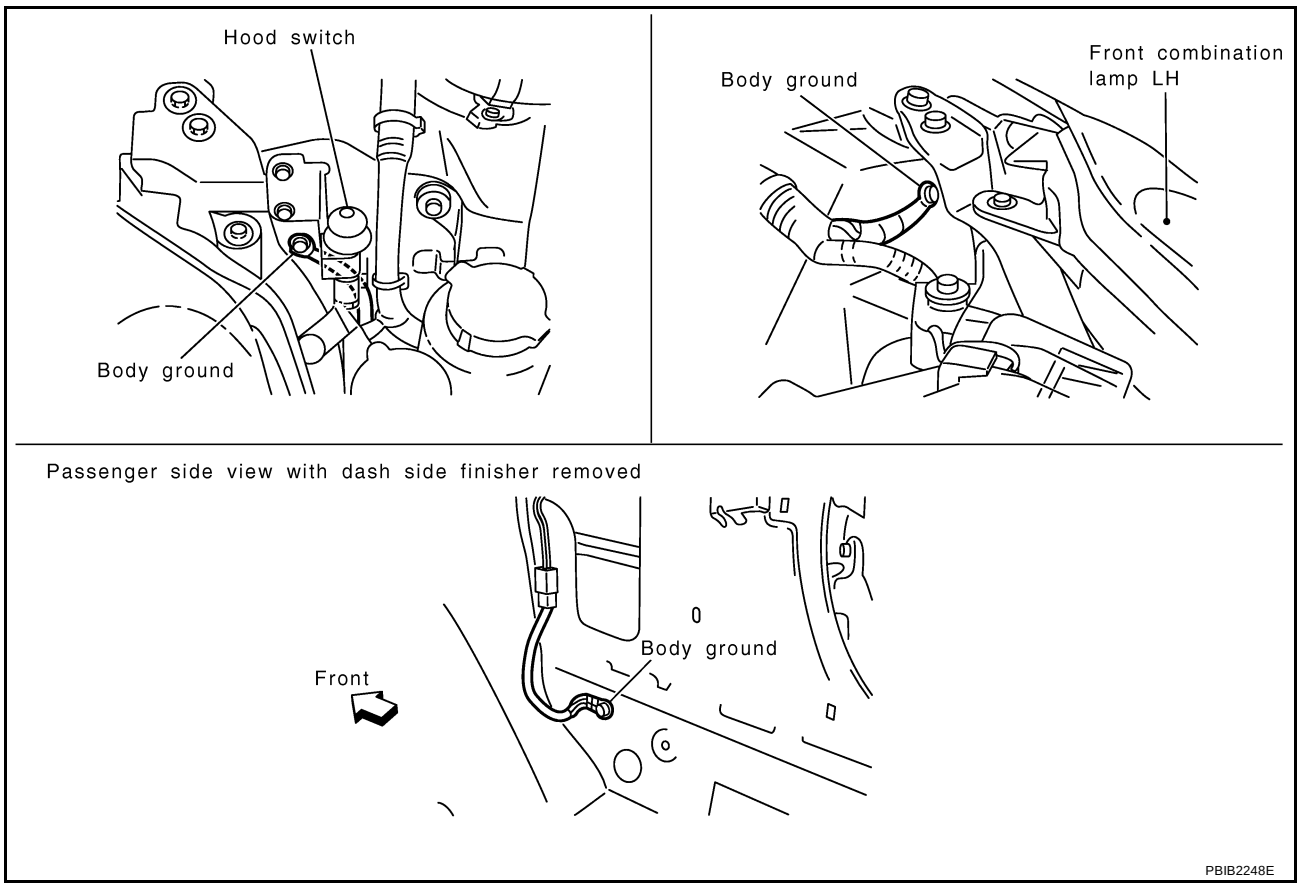
- Air duct
- Vacuum hoses
- Intake air passage between air duct to intake manifold

OK or NG

OK >> GO TO 3.
NG >> Reconnect the parts.

3. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

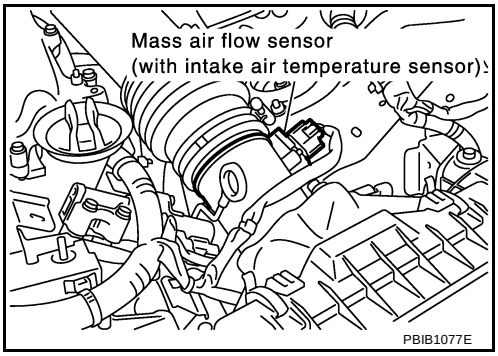


OK or NG

OK >> GO TO 4.
NG >> Repair or replace ground connections.

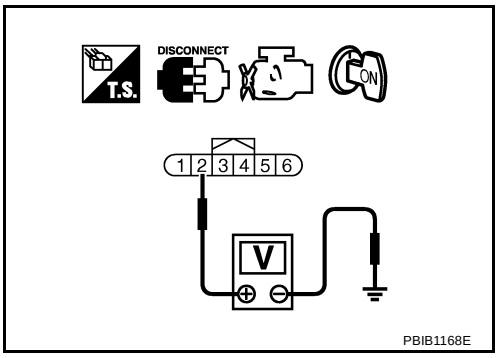
4. CHECK MAF SENSOR POWER SUPPLY CIRCUIT

1. Disconnect mass air flow (MAF) sensor harness connector.
2. Turn ignition switch ON.



3. Check voltage between MAF sensor terminal 2 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness for open or short between IPDM E/R and mass air flow sensor
- Harness for open or short between mass air flow sensor and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK MAF SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between MAF sensor terminal 3 and ECM terminal 67. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK MAF SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between MAF sensor terminal 4 and ECM terminal 51.
   Refer to Wiring Diagram.

   Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 8.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK MASS AIR FLOW SENSOR

Refer to EC-169, "Component Inspection" .

OK or NG

OK >> GO TO 9.
NG >> Replace mass air flow sensor.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

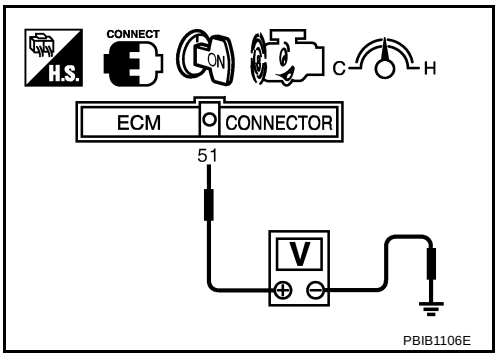
>> **INSPECTION END**

Component Inspection

ABS009CS

MASS AIR FLOW SENSOR

1. Reconnect all harness connectors disconnected.
2. Start engine and warm it up to normal operating temperature.
3. Check voltage between ECM terminal 51 (Mass air flow sensor signal) and ground.



Condition	Voltage V
Ignition switch ON (Engine stopped.)	Approx. 0.4
Idle (Engine is warmed-up to normal operating temperature.)	0.9 - 1.2
2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.6 - 1.9
Idle to about 4,000 rpm*	0.9 - 1.2 to Approx. 2.4

*: Check for linear voltage rise in response to engine being increased to about 4,000 rpm.

4. If the voltage is out of specification, proceed the following.
   - Turn ignition switch OFF.
   - Disconnect mass air flow sensor harness connector and reconnect it again.
   - Perform steps 2 and 3 again.
5. If NG, remove mass air flow sensor from air duct. Check hot wire for damage or dust.
6. If NG, clean or replace mass air flow sensor.

Removal and Installation

ABS009CT

MASS AIR FLOW SENSOR

Refer to EM-14, "AIR CLEANER AND AIR DUCT" .

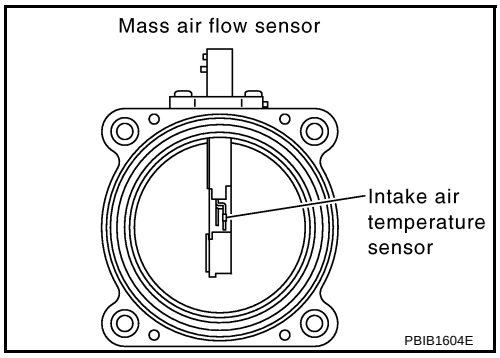
DTC P0112, P0113 IAT SENSOR

PFP:22630

Component Description

ABS009CU

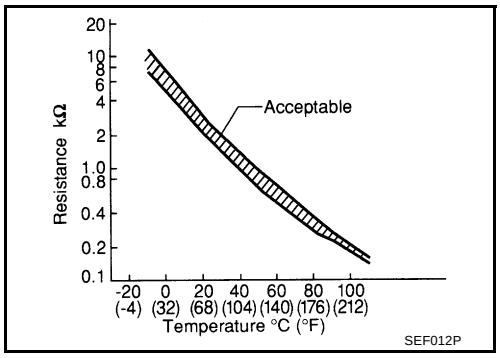
The intake air temperature sensor is built-into mass air flow sensor. The sensor detects intake air temperature and transmits a signal to the ECM.
The temperature sensing unit uses a thermistor which is sensitive to the change in temperature. Electrical resistance of the thermistor decreases in response to the temperature rise.



<Reference data>

Intake air temperature °C (°F)	Voltage* V	Resistance kΩ
25 (77)	3.32	1.94 - 2.06
80 (176)	1.23	0.295 - 0.349

*: This data is reference values and is measured between ECM terminal 34 (Intake air temperature sensor) and ground.



CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

On Board Diagnosis Logic

ABS009CV

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0112 0112	Intake air temperature sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted.) ● Intake air temperature sensor
P0113 0113	Intake air temperature sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	

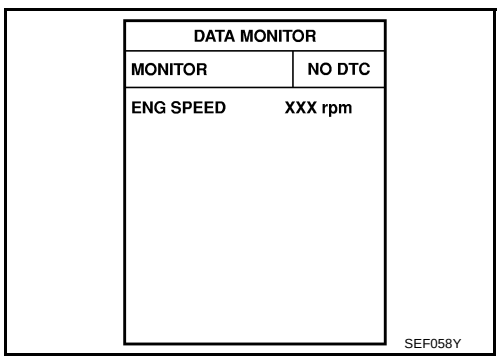
DTC Confirmation Procedure

ABS009CW

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Wait at least 5 seconds.
4. If 1st trip DTC is detected, go to EC-173, "Diagnostic Procedure" .



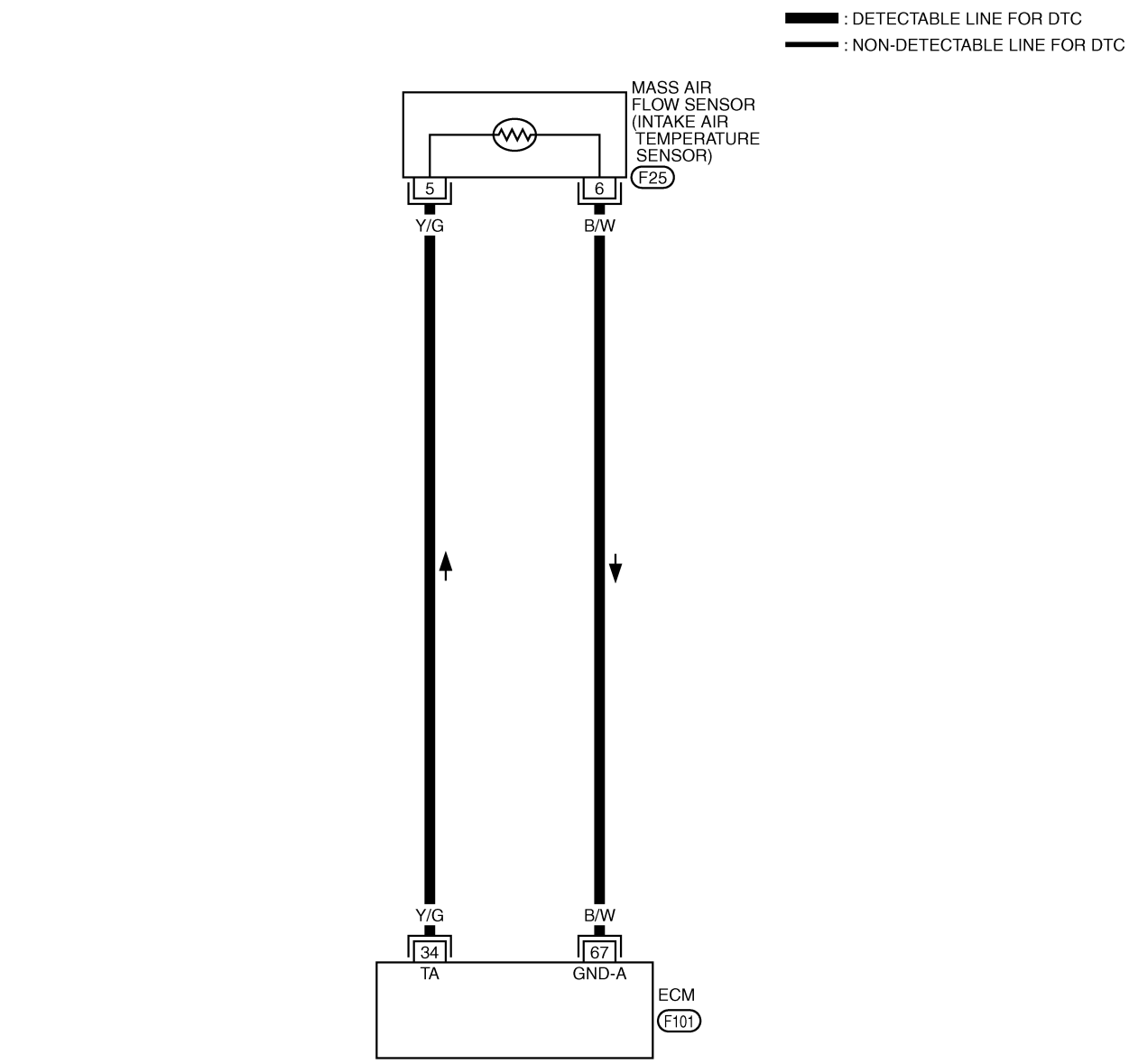
WITH GST

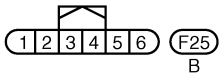
Follow the procedure “WITH CONSULT-II” above.

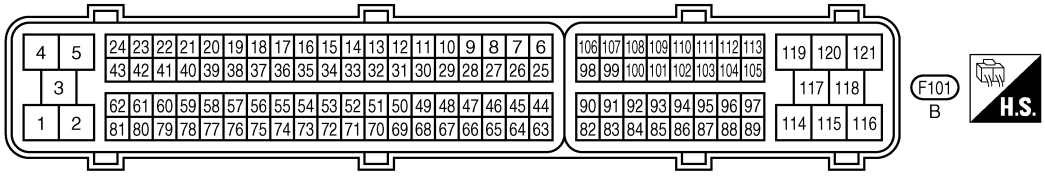
Wiring Diagram

ABS009CX

EC-IATS-01







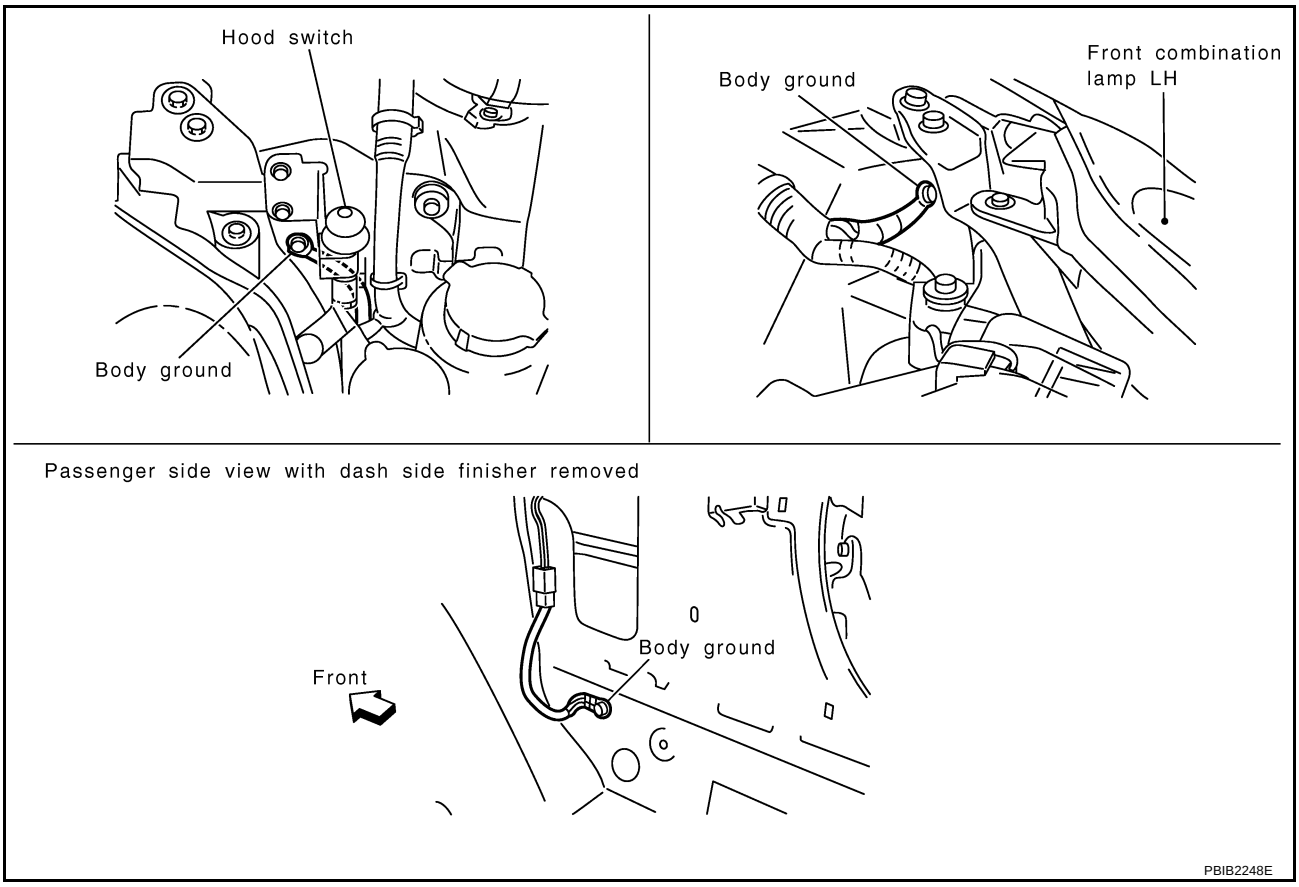
TBWT0477E

Diagnostic Procedure

ABS009CY

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

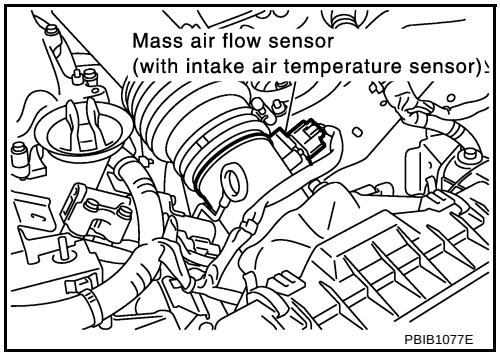


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

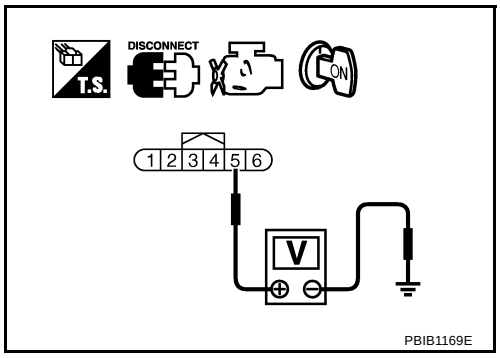
2. CHECK INTAKE AIR TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

1. Disconnect mass air flow sensor (intake air temperature sensor is built-into) harness connector.
2. Turn ignition switch ON.



3. Check voltage between mass air flow sensor terminal 5 and ground.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK INTAKE AIR TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between mass air flow sensor terminal 6 and ECM terminal 67. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK INTAKE AIR TEMPERATURE SENSOR

Refer to EC-175, "Component Inspection" .

OK or NG

OK >> GO TO 5.
NG >> Replace mass air flow sensor (with intake air temperature sensor).

5. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

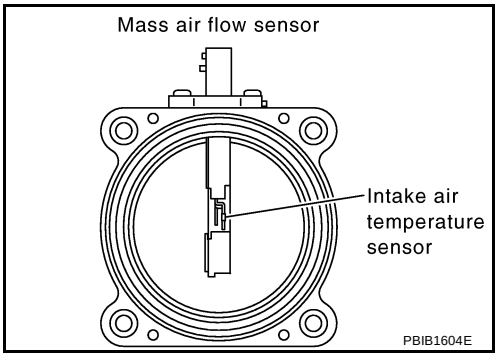
ABS009CZ

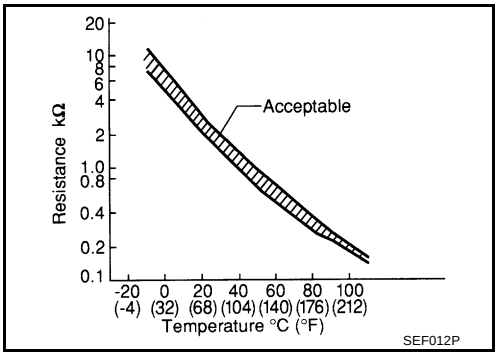
INTAKE AIR TEMPERATURE SENSOR

1. Check resistance between mass air flow sensor terminals 5 and 6 under the following conditions.

Intake air temperature °C (°F)	Resistance kΩ
25 (77)	1.94 - 2.06

2. If NG, replace mass air flow sensor (with intake air temperature sensor).





Removal and Installation

ABS009D0

MASS AIR FLOW SENSOR

Refer to EM-14, "AIR CLEANER AND AIR DUCT" .

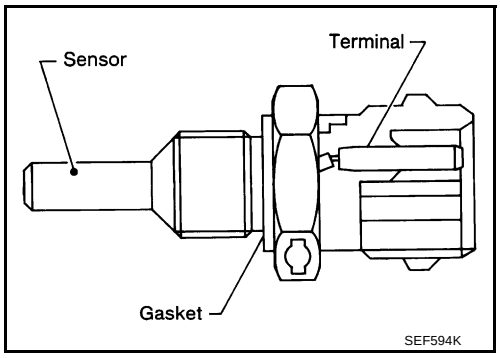
DTC P0117, P0118 ECT SENSOR

PFP:22630

Component Description

ABS009D1

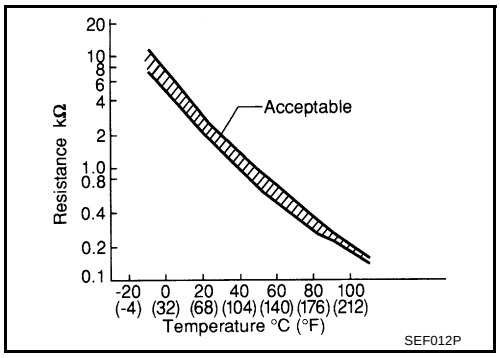
The engine coolant temperature sensor is used to detect the engine coolant temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine coolant temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Engine coolant temperature °C (°F)	Voltage* V	Resistance kΩ
–10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.1 - 2.9
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260

*: This data is reference values and is measured between ECM terminal 73 (Engine coolant temperature sensor) and ground.



CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

On Board Diagnosis Logic

ABS009D2

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble Diagnosis Name	DTC Detecting Condition	Possible Cause
P0117 0117	Engine coolant temperature sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted.) ● Engine coolant temperature sensor
P0118 0118	Engine coolant temperature sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode and the MIL lights up.

Detected items	Engine operating condition in fail-safe mode	
Engine coolant temperature sensor circuit	Engine coolant temperature will be determined by ECM based on the time after turning ignition switch ON or START. CONSULT-II displays the engine coolant temperature decided by ECM.	
	Condition	Engine coolant temperature decided (CONSULT-II display)
	Just as ignition switch is turned ON or START	40°C (104°F)
	More than approx. 4 minutes after ignition ON or START	80°C (176°F)
	Except as shown above	40 - 80°C (104 - 176°F) (Depends on the time)
	When the fail-safe system for engine coolant temperature sensor is activated, the cooling fan operates while engine is running.	

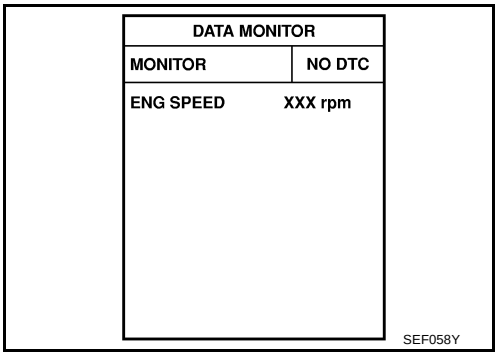
DTC Confirmation Procedure

ABS009D3

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Wait at least 5 seconds.
4. If DTC is detected, go to EC-179, "Diagnostic Procedure" .



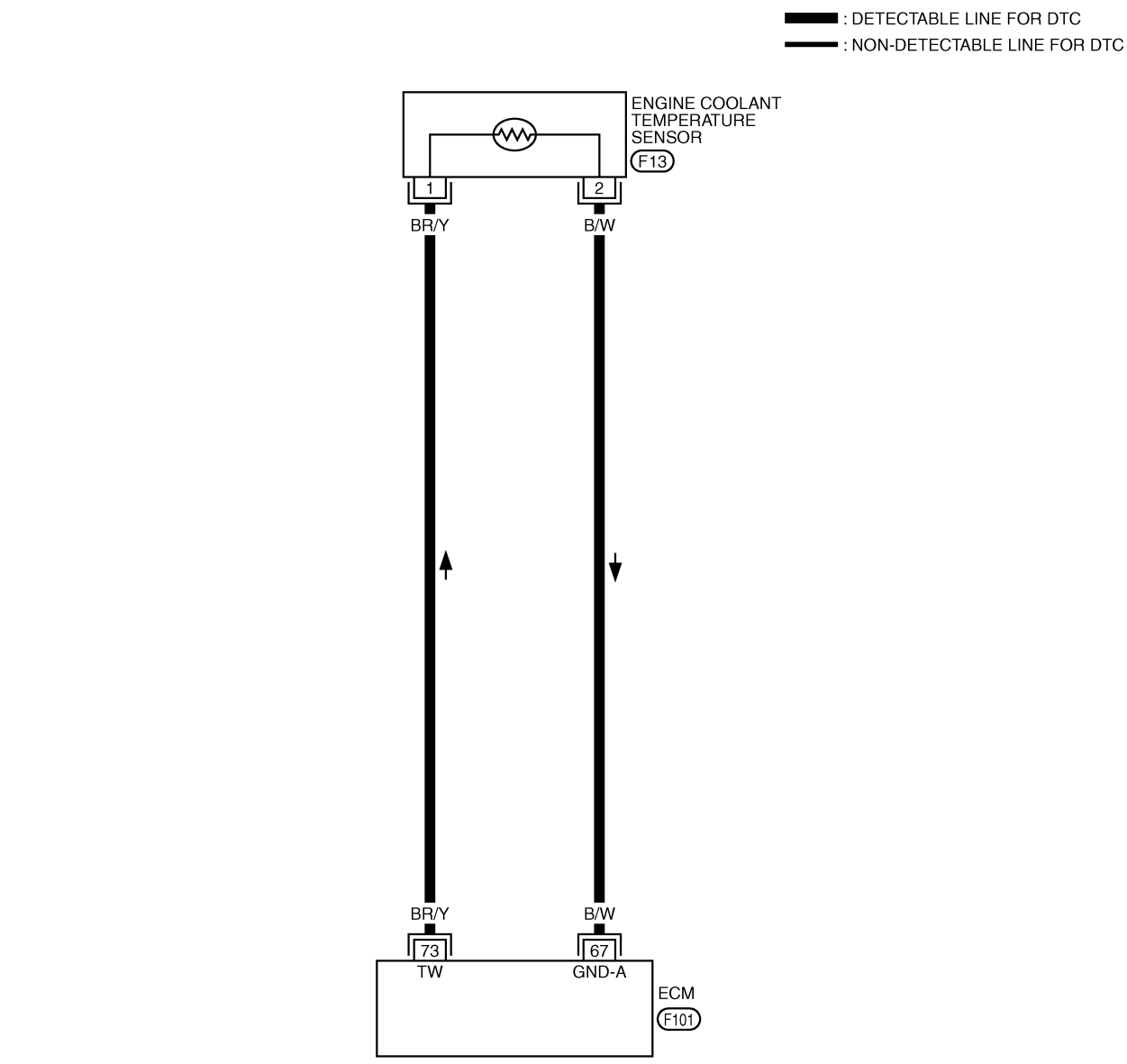
WITH GST

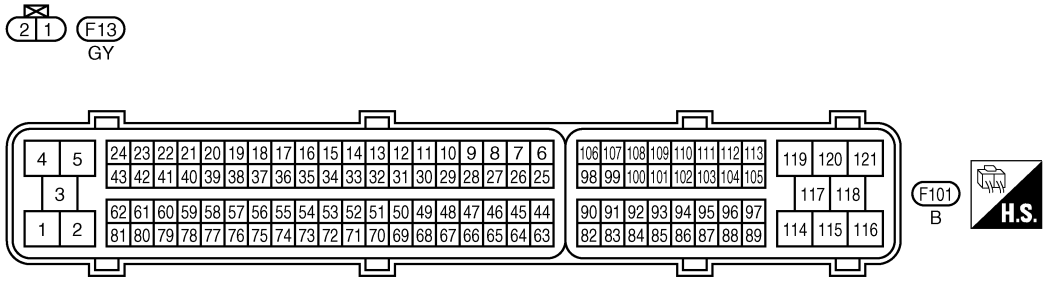
Follow the procedure “WITH CONSULT-II” above.

Wiring Diagram

ABS009D4

EC-ECTS-01





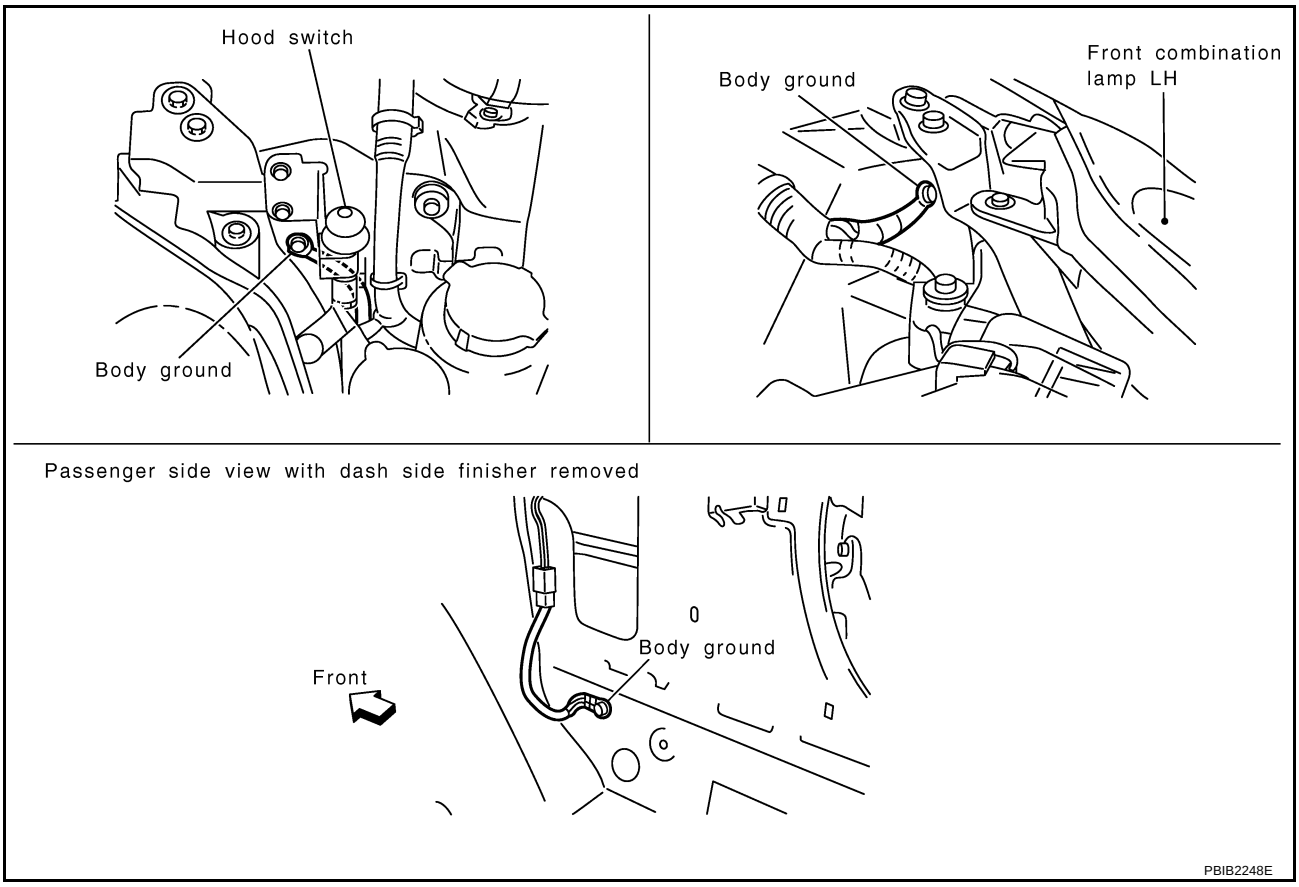
TBWT0478E

Diagnostic Procedure

ABS009D5

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

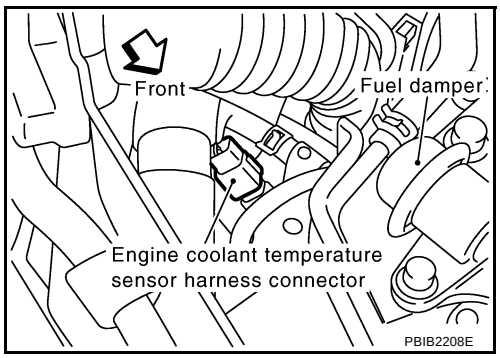


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

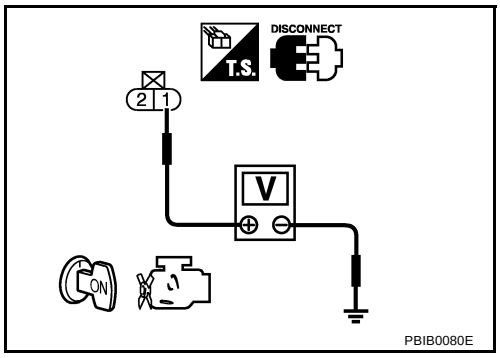
2. CHECK ECT SENSOR POWER SUPPLY CIRCUIT

1. Disconnect engine coolant temperature (ECT) sensor harness connector.
2. Turn ignition switch ON.



3. Check voltage between ECT sensor terminal 1 and ground with CONSULT-II or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK ECT SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECT sensor terminal 2 and ECM terminal 67. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-181, "Component Inspection" .

OK or NG

OK >> GO TO 5.
NG >> Replace engine coolant temperature sensor.

5. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

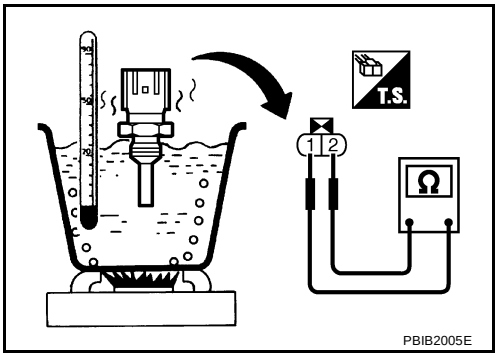
>> **INSPECTION END**

Component Inspection

ABS009D6

ENGINE COOLANT TEMPERATURE SENSOR

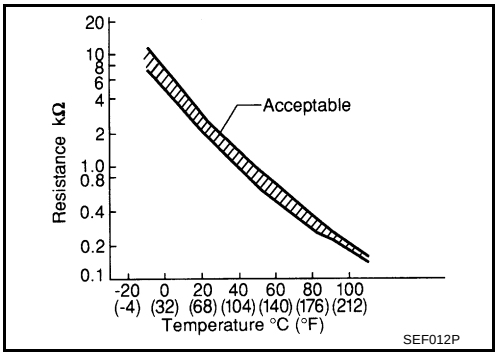
1. Check resistance between engine coolant temperature sensor terminals 1 and 2 as shown in the figure.



<Reference data>

Engine coolant temperature °C (°F)	Voltage* V	Resistance kΩ
20 (68)	3.5	2.1 - 2.9
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260

*: This data is reference values and is measured between ECM terminal 73 (Engine coolant temperature sensor) and ground.



2. If NG, replace engine coolant temperature sensor.

Removal and Installation

ABS009D7

ENGINE COOLANT TEMPERATURE SENSOR

Refer to CO-27, "WATER OUTLET AND WATER PIPING" .

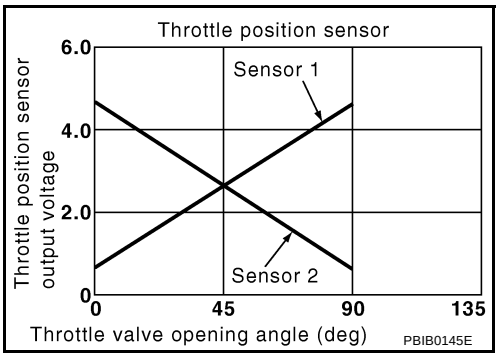
DTC P0122, P0123 TP SENSOR

PFP:16119

Component Description

ABS009D8

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc. The throttle position sensor responds to the throttle valve movement.
The throttle position sensor has the two sensors. These sensors are a kind of potentiometers which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the throttle valve and feed the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and the ECM controls the throttle control motor to make the throttle valve opening angle properly in response to driving condition.



CONSULT-II Reference Value in Data Monitor Mode

ABS009D9

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
THRTL SEN1 THRTL SEN2*	● Ignition switch: ON (Engine stopped) ● Shift lever: D (A/T), 1st (M/T)	Accelerator pedal: Fully released	More than 0.36V
		Accelerator pedal: Fully depressed	Less than 4.75V

*: Throttle position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.

On Board Diagnosis Logic

ABS009DA

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0122 0122	Throttle position sensor 2 circuit low input	An excessively low voltage from the TP sensor 2 is sent to ECM.	● Harness or connectors (The TP sensor 2 circuit is open or shorted.) (APP sensor 2 circuit is shorted.) ● Electric throttle control actuator (TP sensor 2) ● Accelerator pedal position sensor (APP sensor 2)
P0123 0123	Throttle position sensor 2 circuit high input	An excessively high voltage from the TP sensor 2 is sent to ECM.	

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operation condition in fail-safe mode
The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

DTC Confirmation Procedure

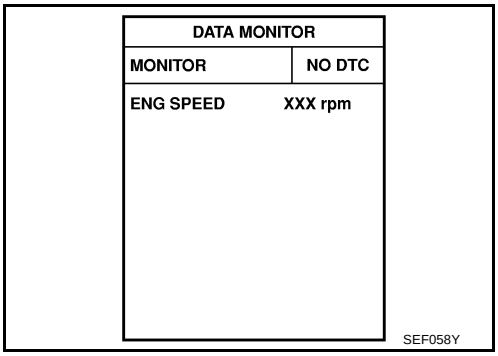
ABS009DB

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Start engine and let it idle for 1 second.
4. If DTC is detected, go to EC-186, "Diagnostic Procedure" .

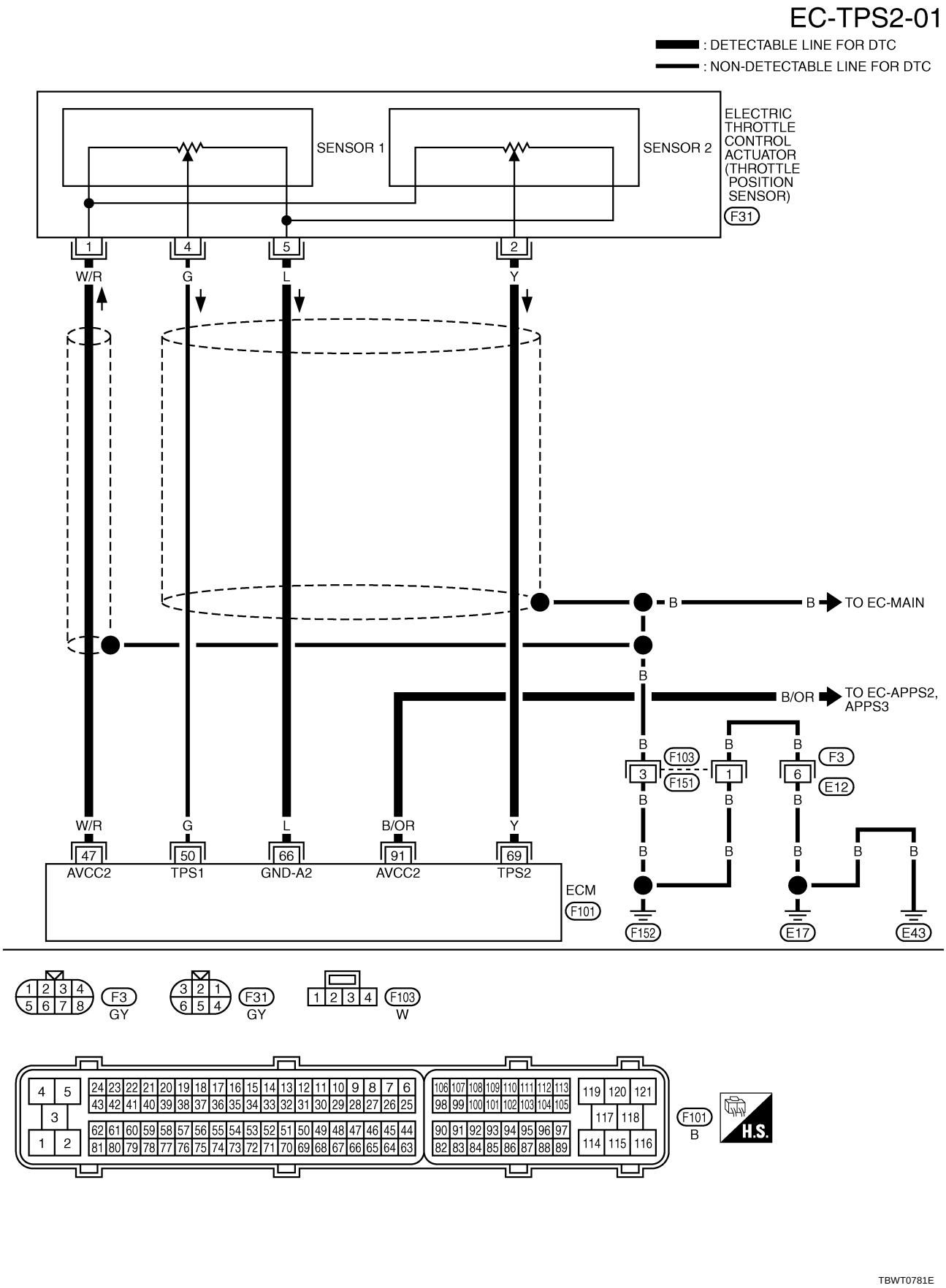


WITH GST

Follow the procedure “WITH CONSULT-II” above.

Wiring Diagram

ABS009DC



TBWT0781E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

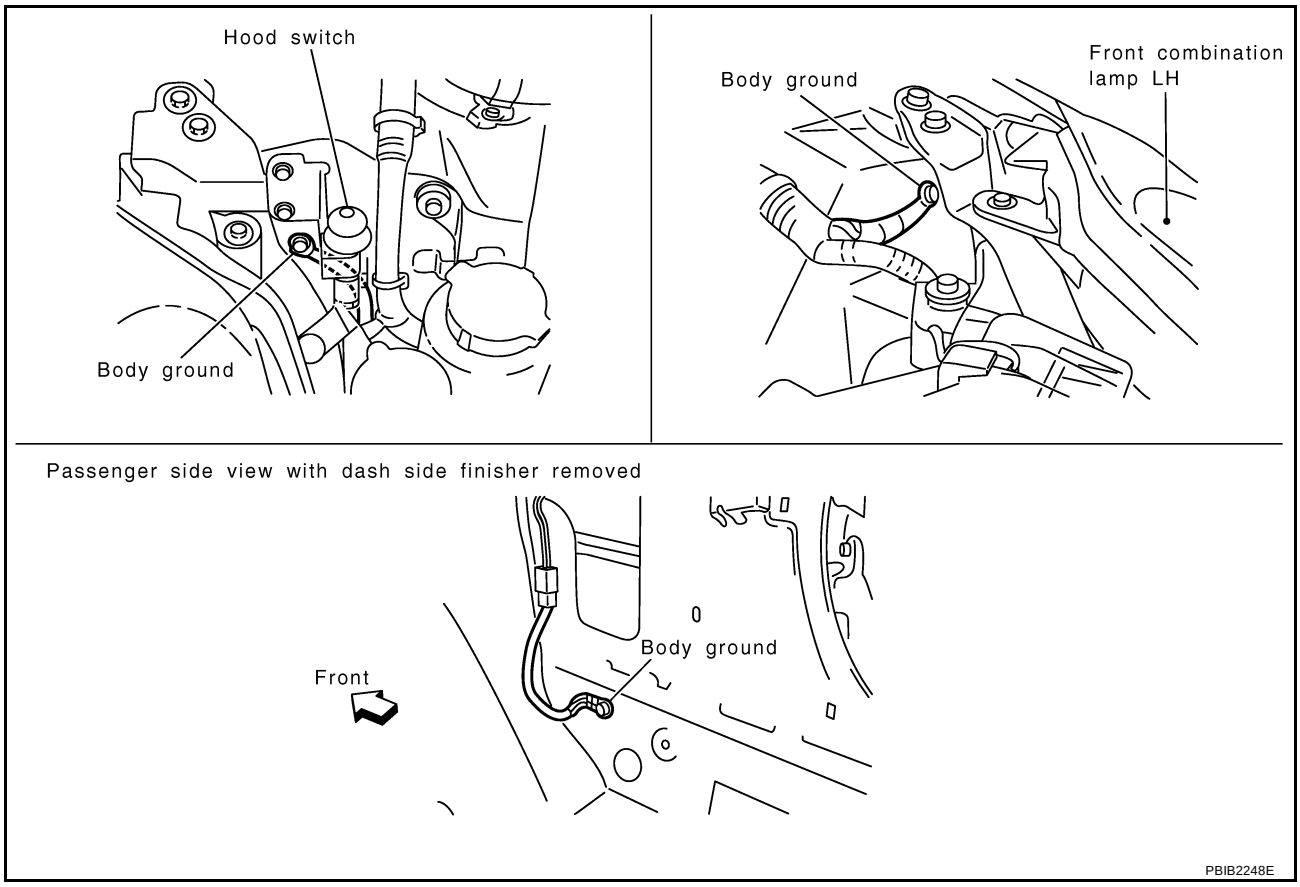
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
47	W/R	Sensor power supply (Throttle position sensor)	**[Ignition switch: ON]**	Approximately 5V
50	G	Throttle position sensor 1	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal is fully released	More than 0.36V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal is fully depressed	Less than 4.75V
66	L	Sensor ground (Throttle position sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V
69	Y	Throttle position sensor 2	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal is fully released	Less than 4.75V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal is fully depressed	More than 0.36V
91	B/OR	Sensor power supply (APP sensor 2)	**[Ignition switch: ON]**	Approximately 5V

Diagnostic Procedure

ABS009DD

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

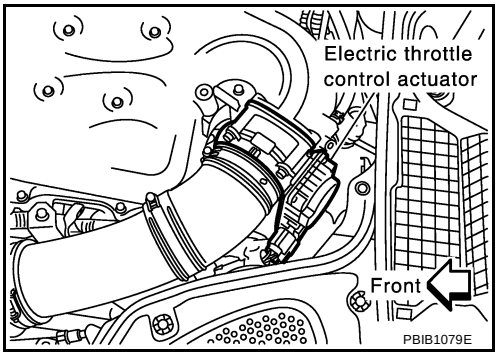


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

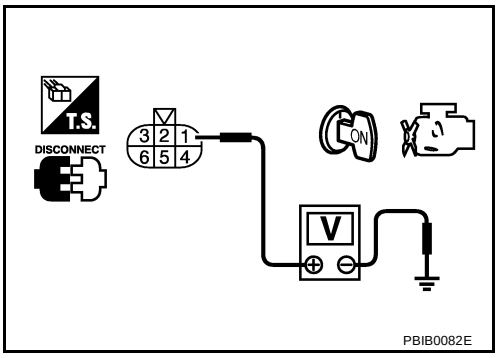
2. CHECK THROTTLE POSITION SENSOR 2 POWER SUPPLY CIRCUIT-I

1. Disconnect electric throttle control actuator harness connector.
2. Turn ignition switch ON.



3. Check voltage between electric throttle control actuator terminal 1 and ground with CONSULT-II or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK THROTTLE POSITION SENSOR 2 POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between electric throttle control actuator terminal 1 and ECM terminal 47. Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace open circuit.

4. CHECK THROTTLE POSITION SENSOR 2 POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
47	Electric throttle control actuator terminal 1	EC-184
91	APP sensor terminal 4	EC-597

OK or NG

OK >> GO TO 5.
NG >> Repair short to ground or short to power in harness or connectors.

5. CHECK APP SENSOR

Refer to EC-602, "Component Inspection" .

OK or NG

OK >> GO TO 11.
NG >> GO TO 6.

6. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-42, "Accelerator Pedal Released Position Learning" .
3. Perform EC-42, "Throttle Valve Closed Position Learning" .
4. Perform EC-43, "Idle Air Volume Learning" .

>> **INSPECTION END**

7. CHECK THROTTLE POSITION SENSOR 2 GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between electric throttle control actuator terminal 5 and ECM terminal 66. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 8.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK THROTTLE POSITION SENSOR 2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 69 and electric throttle control actuator terminal 2. Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 9.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK THROTTLE POSITION SENSOR

Refer to EC-189, "Component Inspection" .

OK or NG

OK >> GO TO 11.
NG >> GO TO 10.

10. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace the electric throttle control actuator.
2. Perform EC-42, "Throttle Valve Closed Position Learning" .
3. Perform EC-43, "Idle Air Volume Learning" .

>> **INSPECTION END**

11. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

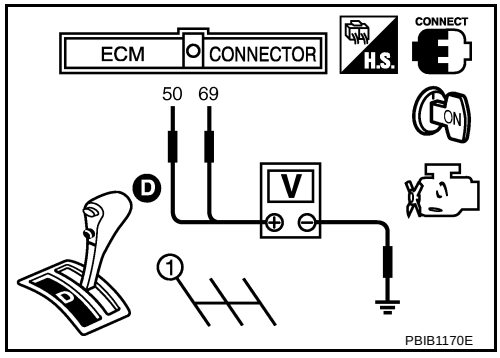
Component Inspection

ABS009DE

THROTTLE POSITION SENSOR

1. Reconnect all harness connectors disconnected.
2. Perform EC-42, "Throttle Valve Closed Position Learning" .
3. Turn ignition switch ON.
4. Set shift lever to D (A/T) or 1st (M/T) position.
5. Check voltage between ECM terminals 50 (TP sensor 1 signal), 69 (TP sensor 2 signal) and ground under the following conditions.

Terminal	Accelerator pedal	Voltage
50 (Throttle position sensor 1)	Fully released	More than 0.36V
	Fully depressed	Less than 4.75V
69 (Throttle position sensor 2)	Fully released	Less than 4.75V
	Fully depressed	More than 0.36V



6. If NG, replace electric throttle control actuator and go to the next step.
7. Perform EC-42, "Throttle Valve Closed Position Learning" .
8. Perform EC-43, "Idle Air Volume Learning" .

Removal and Installation

ABS009DF

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .

DTC P0125 ECT SENSOR

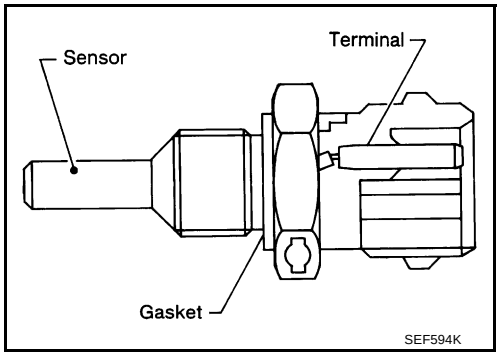
PFP:22630

Component Description

ABS009DG

NOTE:
If DTC P0125 is displayed with P0117 or P0118, first perform the trouble diagnosis for DTC P0117 or P0118. Refer to EC-176 .

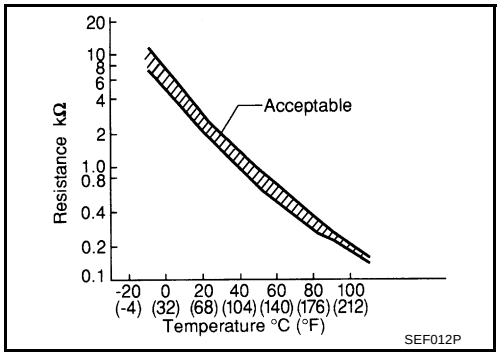
The engine coolant temperature sensor is used to detect the engine coolant temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine coolant temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Engine coolant temperature °C (°F)	Voltage* V	Resistance kΩ
–10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.1 - 2.9
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260

*: This data is reference values and is measured between ECM terminal 73 (Engine coolant temperature sensor) and ground.



CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

On Board Diagnosis Logic

ABS009DH

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0125 0125	Insufficient engine coolant temperature for closed loop fuel control	● Voltage sent to ECM from the sensor is not practical, even when some time has passed after starting the engine. ● Engine coolant temperature is insufficient for closed loop fuel control.	● Harness or connectors (High resistance in the circuit) ● Engine coolant temperature sensor ● Thermostat

DTC Confirmation Procedure

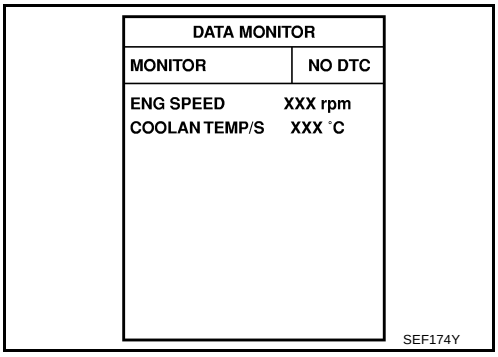
ABS009DI

CAUTION:
Be careful not to overheat engine.

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Check that “COOLAN TEMP/S” is above 10°C (50°F).
   If it is above 10°C (50°F), the test result will be OK.
   If it is below 10°C (50°F), go to following step.
4. Start engine and run it for 65 minutes at idle speed.
   If “COOLAN TEMP/S” increases to more than 10°C (50°F) within 65 minutes, stop engine because the test result will be OK.
5. If DTC is detected, go to EC-192, "Diagnostic Procedure" .



WITH GST

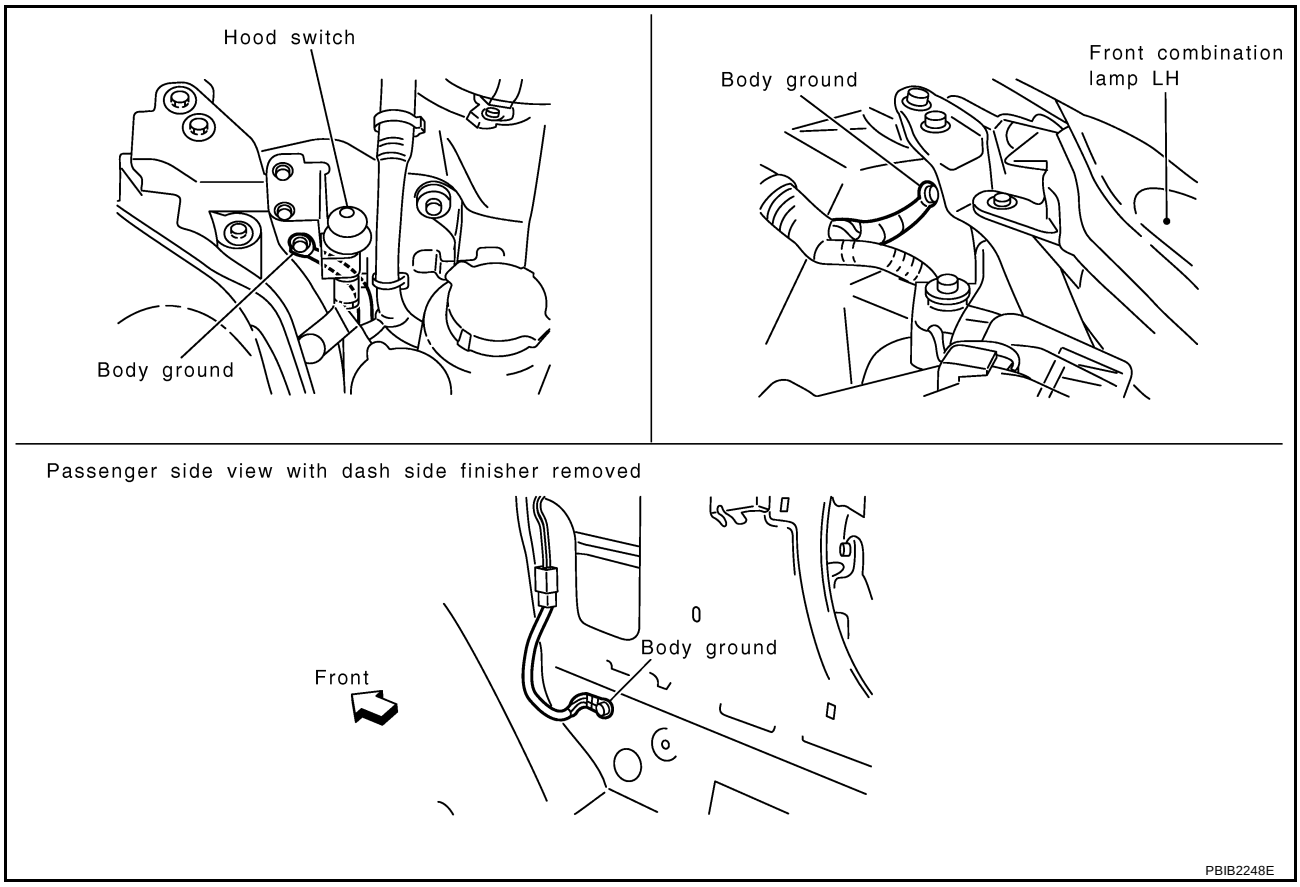
Follow the procedure “WITH CONSULT-II” above.

Diagnostic Procedure

ABS009DJ

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .



OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-193, "Component Inspection" .

OK or NG

OK >> GO TO 3.
NG >> Replace engine coolant temperature sensor.

3. CHECK THERMOSTAT OPERATION

When the engine is cold [lower than 70°C (158°F)] condition, grasp lower radiator hose and confirm the engine coolant does not flow.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace thermostat. Refer to CO-25, "WATER INLET AND THERMOSTAT ASSEMBLY" .

4. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .
Refer to EC-178, "Wiring Diagram" .

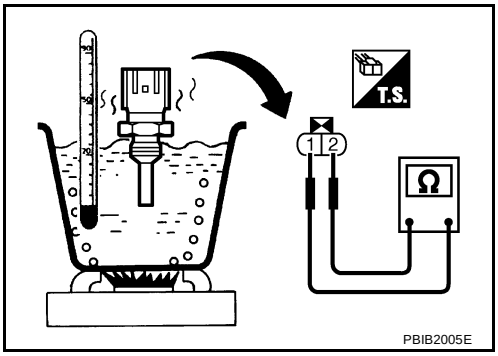
>> **INSPECTION END**

Component Inspection

ABS009DK

ENGINE COOLANT TEMPERATURE SENSOR

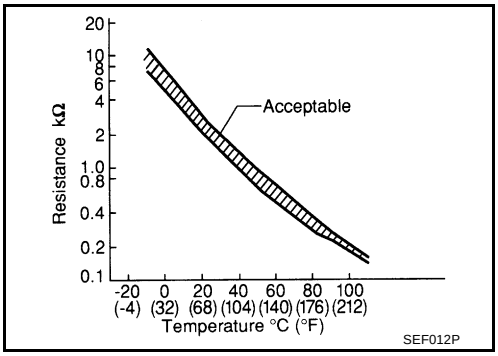
1. Check resistance between engine coolant temperature sensor terminals 1 and 2 as shown in the figure.



<Reference data>

Engine coolant temperature °C (°F)	Voltage* V	Resistance kΩ
20 (68)	3.5	2.1 - 2.9
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260

*: This data is reference values and is measured between ECM terminal 73 (Engine coolant temperature sensor) and ground.



2. If NG, replace engine coolant temperature sensor.

Removal and Installation

ABS009DL

ENGINE COOLANT TEMPERATURE SENSOR

Refer to CO-27, "WATER OUTLET AND WATER PIPING" .

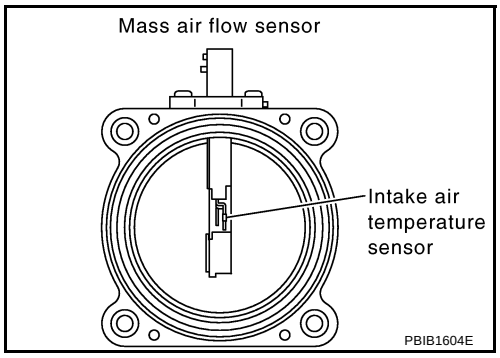
DTC P0127 IAT SENSOR

PFP:22630

Component Description

ABS009DM

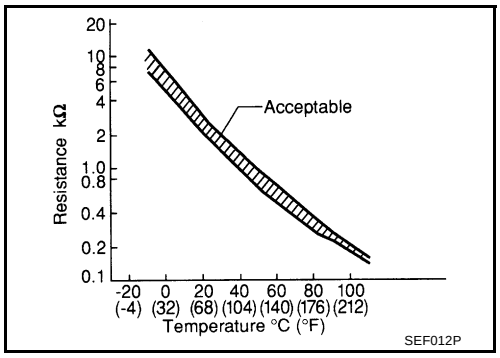
The intake air temperature sensor is built into mass air flow sensor. The sensor detects intake air temperature and transmits a signal to the ECM.
The temperature sensing unit uses a thermistor which is sensitive to the change in temperature. Electrical resistance of the thermistor decreases in response to the temperature rise.



<Reference data>

Intake air temperature °C (°F)	Voltage* V	Resistance kΩ
25 (77)	3.32	1.94 - 2.06
80 (176)	1.23	0.295 - 0.349

*: This data is reference values and is measured between ECM terminal 34 (Intake air temperature sensor) and ground.



CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

On Board Diagnosis Logic

ABS009DN

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0127 0127	Intake air temperature too high	Rationally incorrect voltage from the sensor is sent to ECM, compared with the voltage signal from engine coolant temperature sensor.	● Harness or connectors (The sensor circuit is open or shorted) ● Intake air temperature sensor

DTC Confirmation Procedure

ABS009DO

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

CAUTION:
Always drive vehicle at a safe speed.
TESTING CONDITION:
This test may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

WITH CONSULT-II

1. Wait until engine coolant temperature is less than 90°C (194°F)

a. Turn ignition switch ON.

b. Select “DATA MONITOR” mode with CONSULT-II.
c. Check the engine coolant temperature.
d. If the engine coolant temperature is not less than 90°C (194°F), turn ignition switch OFF and cool down engine.
   - Perform the following steps before engine coolant temperature is above 90°C (194°F).
2. Turn ignition switch ON.
3. Select “DATA MONITOR” mode with CONSULT-II.
4. Start engine.
5. Hold vehicle speed at more than 70 km/h (43 MPH) for 100 consecutive seconds.
6. If 1st trip DTC is detected, go to EC-195, "Diagnostic Procedure" .

DATA MONITOR	
MONITOR	NO DTC
ENG SPEED	XXX rpm
COOLAN TEMP/S	XXX °C
VHCL SPEED SE	XXX km/h
B/FUEL SCHDL	XXX msec

SEF189Y

WITH GST

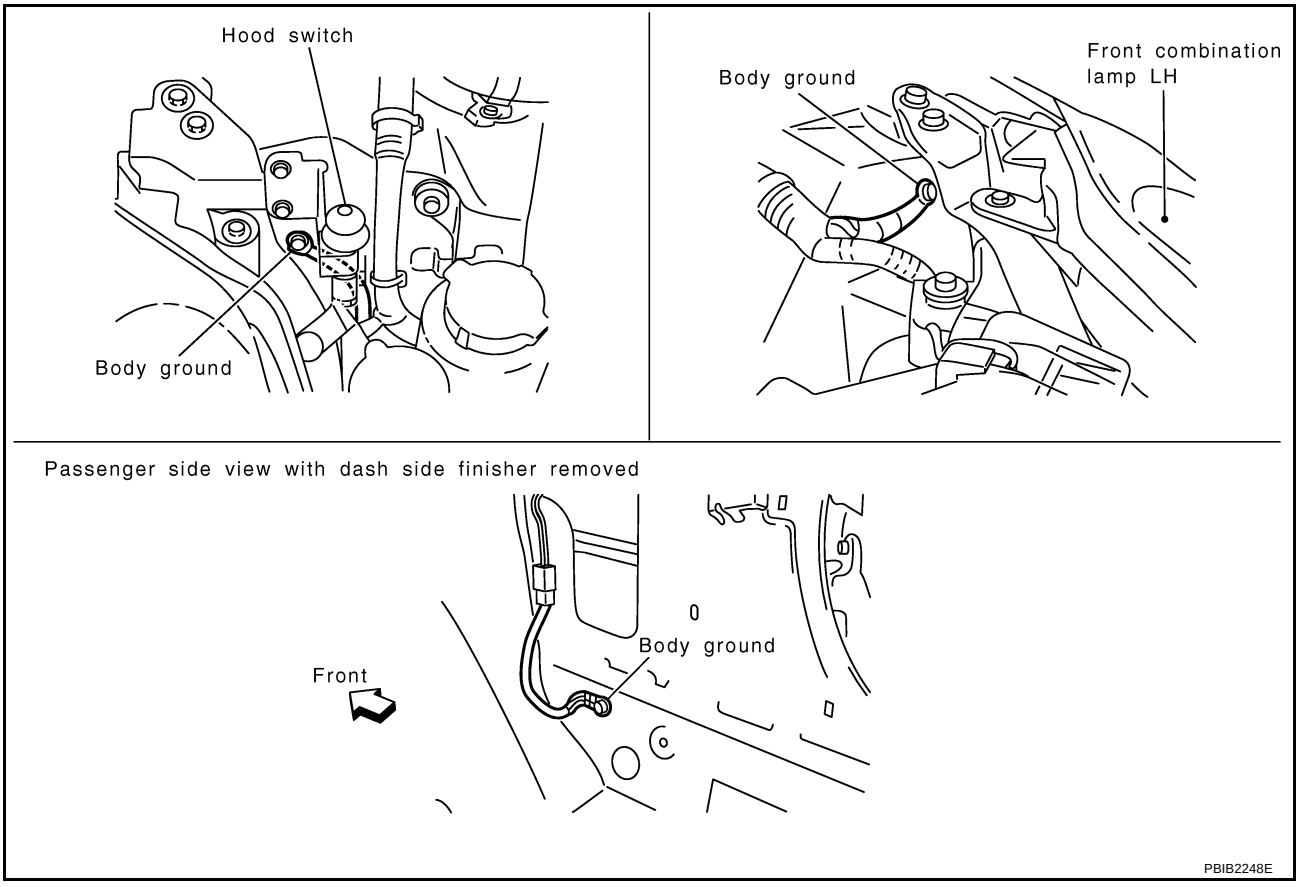
Follow the procedure “WITH CONSULT-II” above.

Diagnostic Procedure

ABS009DP

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .



PBIB2248E

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK INTAKE AIR TEMPERATURE SENSOR

Refer to EC-175, "Component Inspection" .

OK or NG

OK >> GO TO 3.
NG >> Replace mass air flow sensor (with intake air temperature sensor).

3. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .
Refer to EC-172, "Wiring Diagram" .

>> **INSPECTION END**

Component Inspection

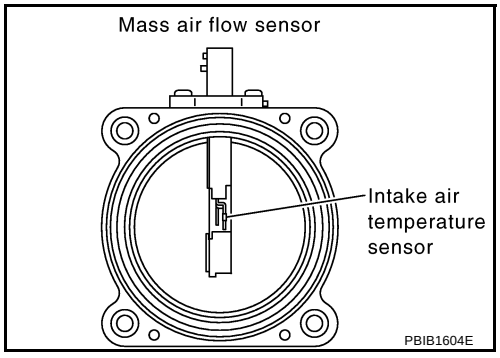
ABS009DQ

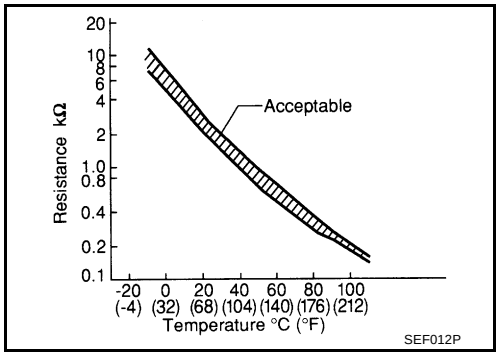
INTAKE AIR TEMPERATURE SENSOR

1. Check resistance between intake air temperature sensor terminals 5 and 6 under the following conditions.

Intake air temperature °C (°F)	Resistance kΩ
25 (77)	1.94 - 2.06

2. If NG, replace mass air flow sensor (with intake air temperature sensor).





Removal and Installation

ABS009DR

MASS AIR FLOW SENSOR

Refer to EM-14, "AIR CLEANER AND AIR DUCT" .

DTC P0128 THERMOSTAT FUNCTION

PFP:21200

On Board Diagnosis Logic

ABS009DS

Engine coolant temperature has not risen enough to open the thermostat even though the engine has run long enough.
This is due to a leak in the seal or the thermostat stuck open.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0128 0128	Thermostat function	The engine coolant temperature does not reach to specified temperature even though the engine has run long enough.	● Thermostat ● Leakage from sealing portion of thermostat ● Engine coolant temperature sensor

DTC Confirmation Procedure

ABS009DT

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:

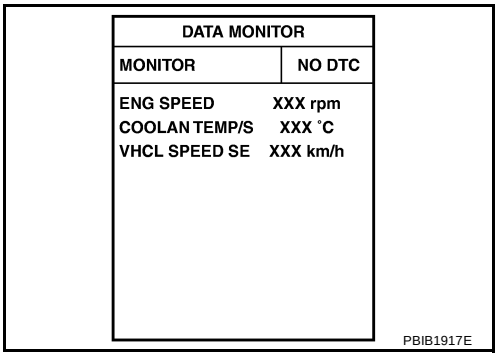
- **For best results, perform at ambient temperature of –10°C (14°F) or higher.**
- **For best results, perform at engine coolant temperature of –10°C (14°F) to 60°C (140°F).**

WITH CONSULT-II

1. Replace thermostat with new one. Refer to CO-25, "WATER INLET AND THERMOSTAT ASSEMBLY" . Use only a genuine NISSAN thermostat as a replacement. If an incorrect thermostat is used, the MIL may come on.
2. Turn ignition switch ON.
3. Select “COOLAN TEMP/S” in “DATA MONITOR” mode with CONSULT-II.
4. Check that the “COOLAN TEMP/S” is above 60°C (140°F).
   If it is below 60°C (140°F), go to following step.
   If it is above 60°C (140°F), cool down the engine to less than 60°C (140°F), then retry from step 1.
5. Drive vehicle for 10 consecutive minutes under the following conditions.

VHCL SPEED SE	80 - 120 km/h (50 - 75 MPH)

If 1st trip DTC is detected, go to EC-197, "Diagnostic Procedure" .



WITH GST

1. Follow the procedure “WITH CONSULT-II” above.

Diagnostic Procedure

ABS009DU

1. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-198, "Component Inspection" .

OK or NG

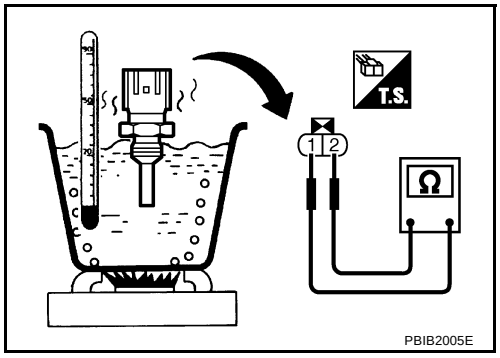
OK >> **INSPECTION END**
NG >> Replace engine coolant temperature sensor.

Component Inspection

ABS009DV

ENGINE COOLANT TEMPERATURE SENSOR

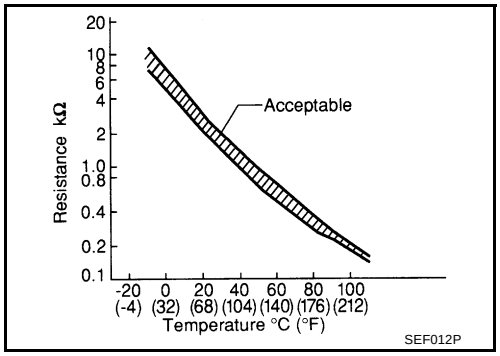
1. Check resistance between engine coolant temperature sensor terminals 1 and 2 as shown in the figure.



<Reference data>

Engine coolant temperature °C (°F)	Voltage* V	Resistance kΩ
20 (68)	3.5	2.1 - 2.9
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260

*: This data is reference values and is measured between ECM terminal 73 (Engine coolant temperature sensor) and ground.



2. If NG, replace engine coolant temperature sensor.

Removal and Installation

ABS009DW

ENGINE COOLANT TEMPERATURE SENSOR

Refer to CO-27, "WATER OUTLET AND WATER PIPING" .

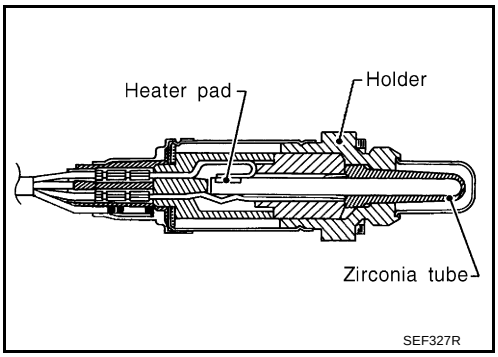
DTC P0138, P0158 HO2S2

PFP:226A0

Component Description

ABS009EN

The heated oxygen sensor 2, after three way catalyst 1, monitors the oxygen level in the exhaust gas on each bank.
Even if switching characteristics of the air fuel ratio (A/F) sensor 1 are shifted, the air-fuel ratio is controlled to stoichiometric, by the signal from the heated oxygen sensor 2.
This sensor is made of ceramic zirconia. The zirconia generates voltage from approximately 1V in richer conditions to 0V in leaner conditions.
Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



CONSULT-II Reference Value in Data Monitor Mode

ABS009EO

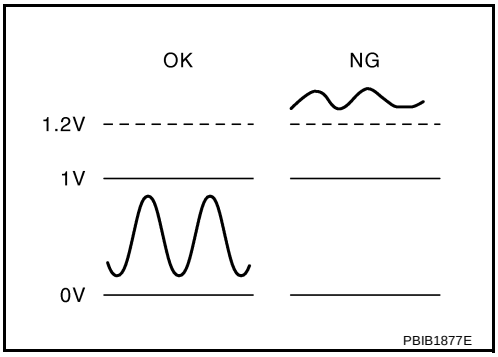
Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
HO2S2 (B1) HO2S2 (B2)	● Warm-up condition ● After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	Revving engine from idle to 3,000 rpm quickly.	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S2 MNTR (B1) HO2S2 MNTR (B2)			LEAN ←→ RICH

On Board Diagnosis Logic

ABS009EP

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the air fuel ratio (A/F) sensor 1. The oxygen storage capacity before the three way catalyst causes the longer switching time. To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the voltage is unusually high during the various driving condition such as fuel cut.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0138 0138 (Bank 1)	Heated oxygen sensor 2 circuit high voltage	An excessively high voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted) ● Heated oxygen sensor 2
P0158 0158 (Bank 2)			

DTC Confirmation Procedure

ABS009EQ

CAUTION:

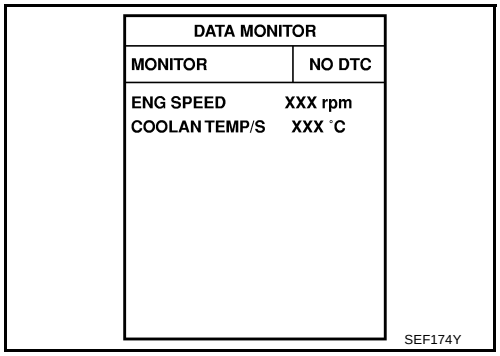
Always drive vehicle at a safe speed.

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-II

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-II.
2. Start engine and warm it up to the normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 2 minutes.
6. If 1st trip DTC is detected, go to EC-204, "Diagnostic Procedure" .



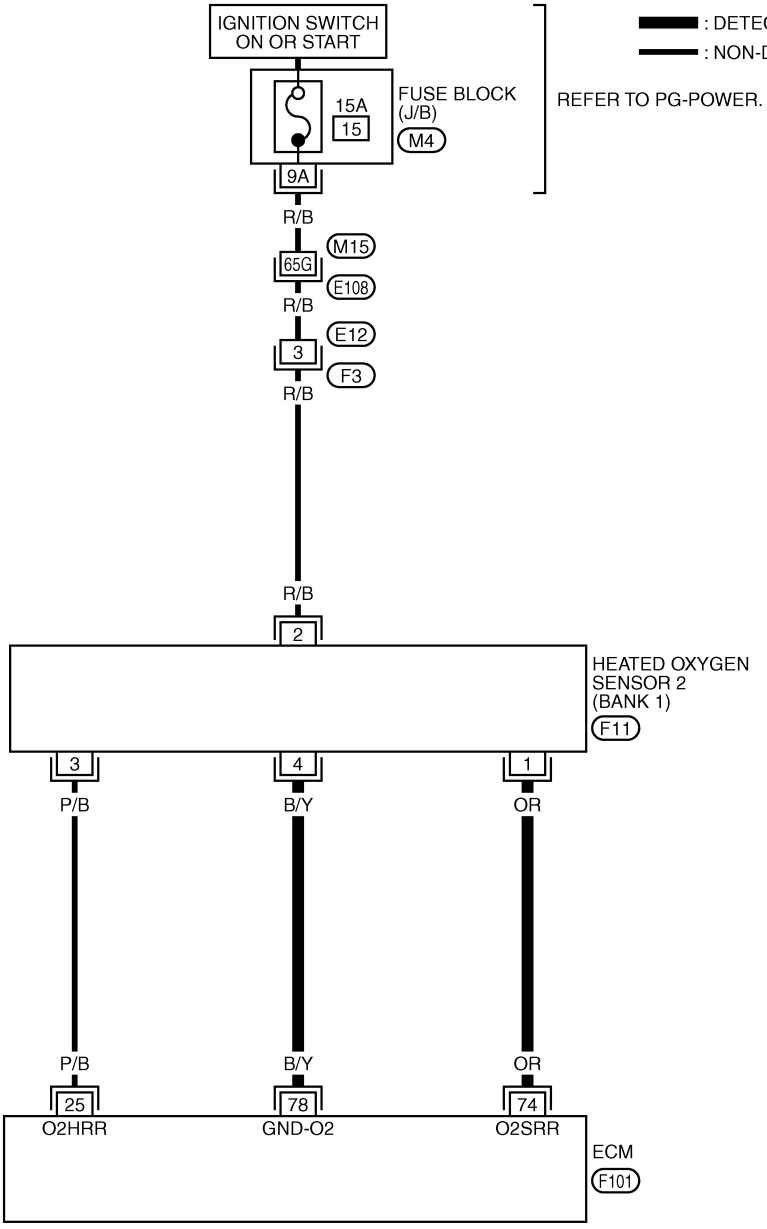
WITH GST

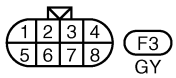
Follow the procedure “WITH CONSUT-II” above.

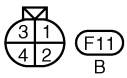
Wiring Diagram
BANK 1

ABS009ER

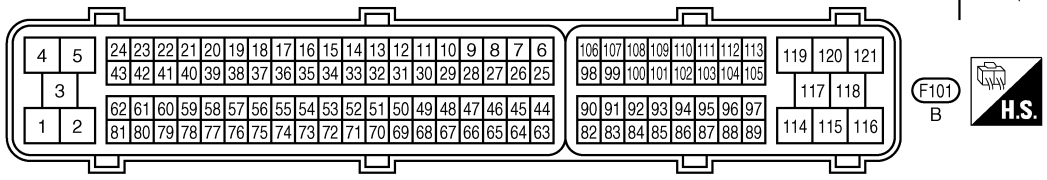
EC-O2S2B1-01







REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)



TBWT0482E

Specification data are reference values and are measured between each terminal and ground.

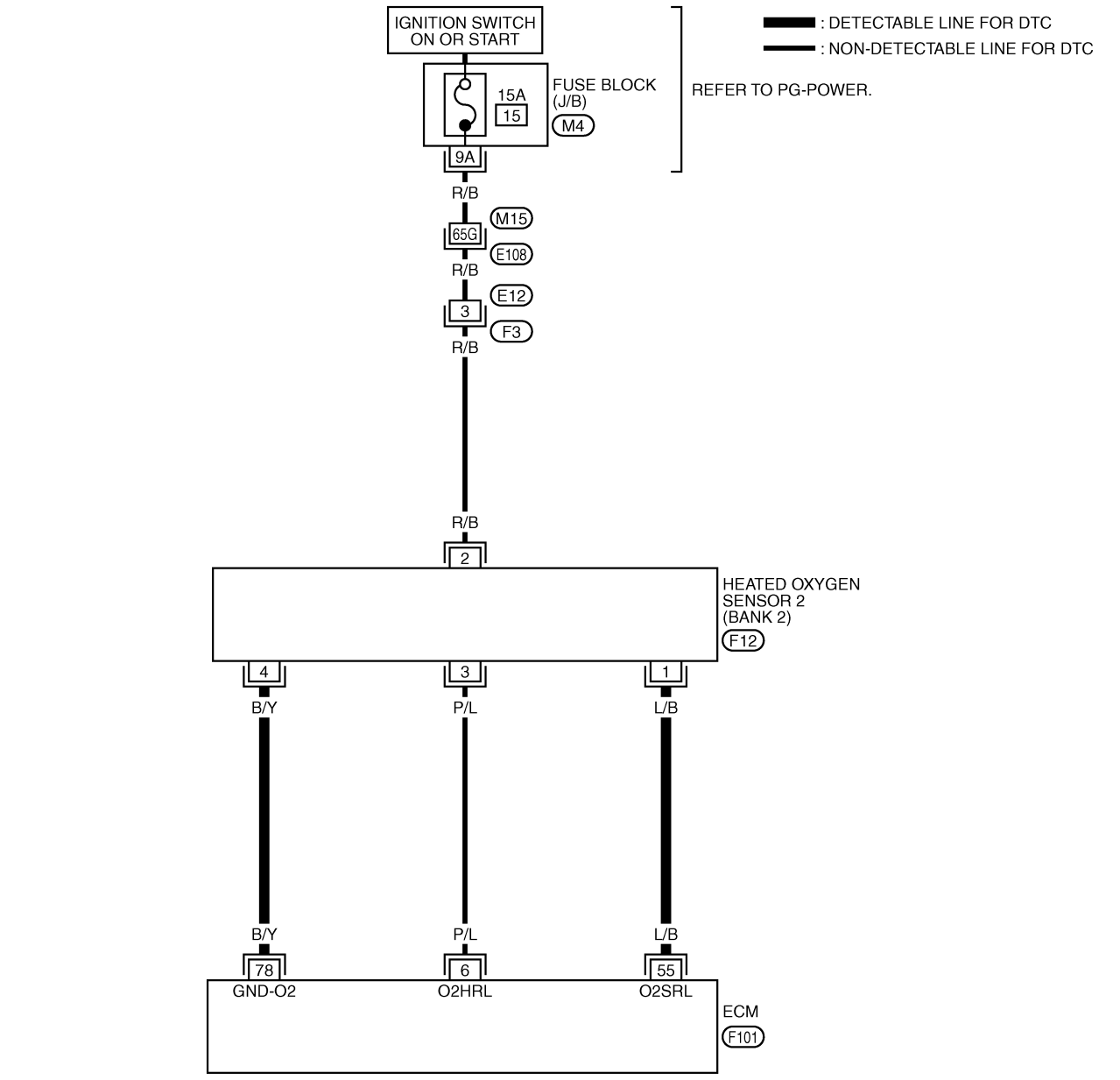
CAUTION:

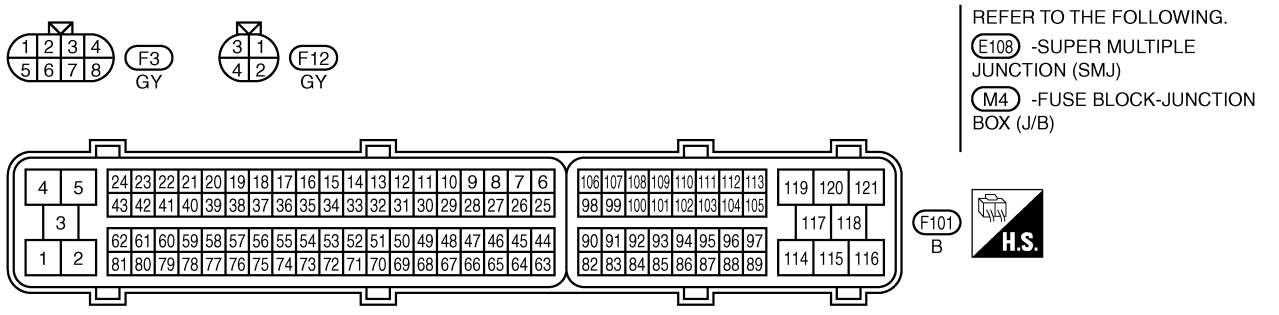
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
74	OR	Heated oxygen sensor 2 (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - Approximately 1.0V
78	B/Y	Sensor ground (Heated oxygen sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V

BANK 2

EC-O2S2B2-01





TBWT0483E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

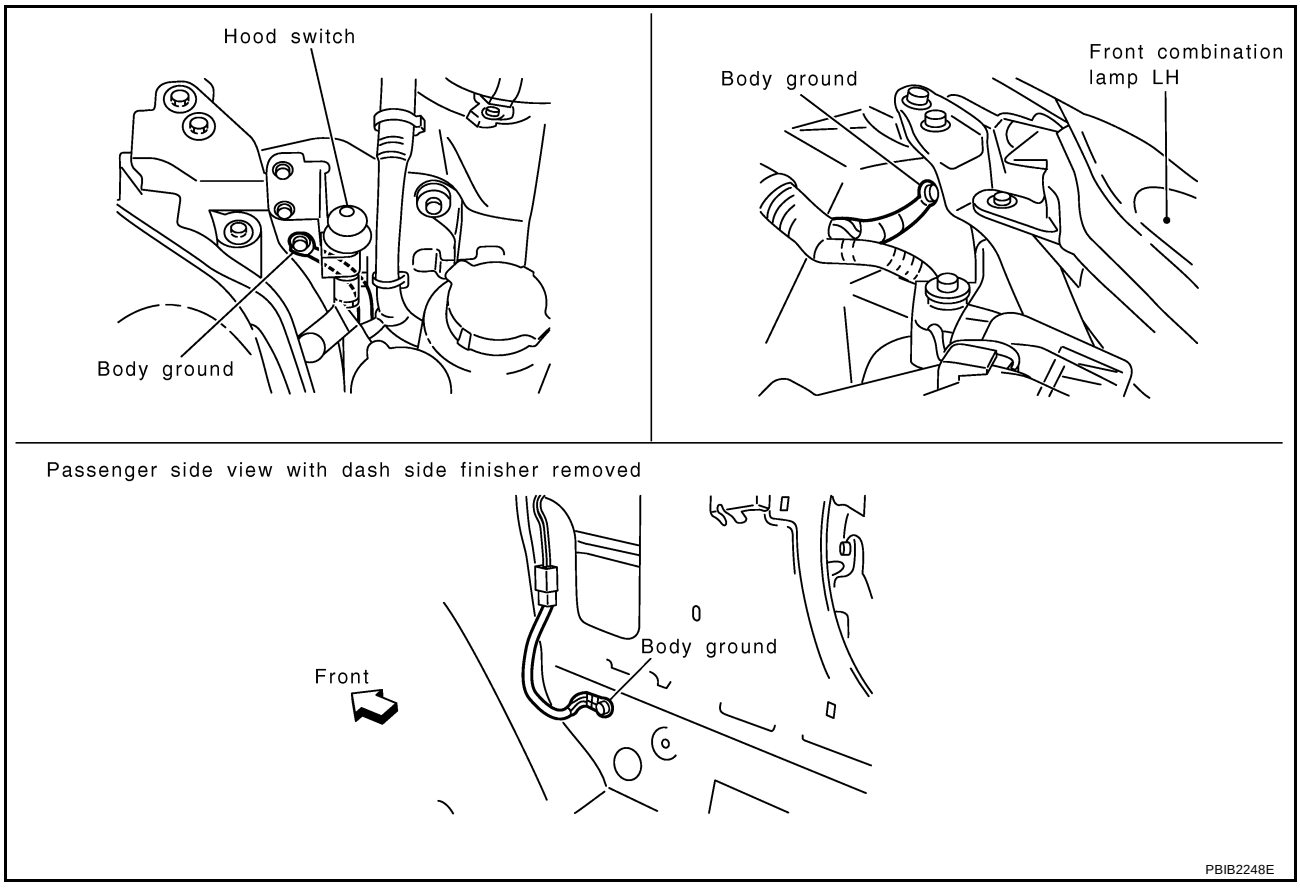
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
55	L/B	Heated oxygen sensor 2 (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - Approximately 1.0V
78	B/Y	Sensor ground (Heated oxygen sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V

Diagnostic Procedure

ABS009ES

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

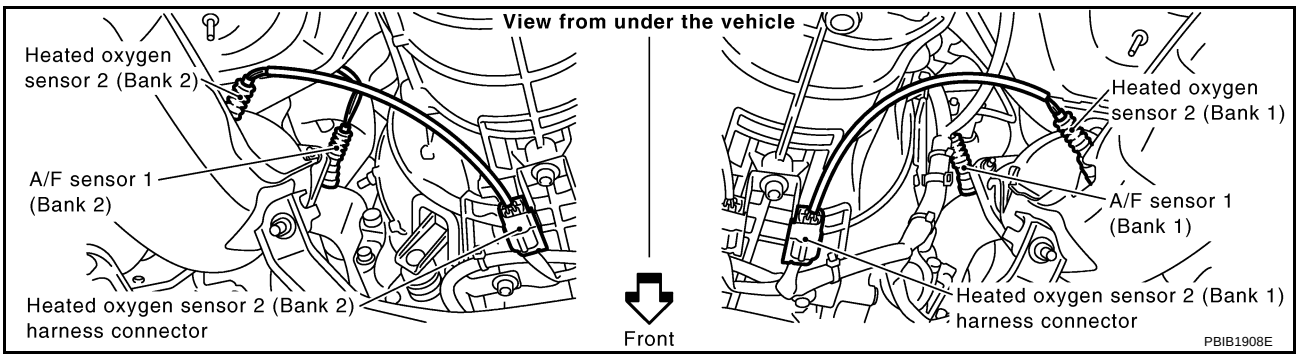


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK HO2S2 GROUND CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector.
2. Disconnect heated oxygen sensor 2 harness connector.



3. Check harness continuity between HO2S2 terminal 4 and ECM terminal 78. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal and HO2S2 terminal as follows. Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P0138	74	1	1
P0158	55	1	2

Continuity should exist.

2. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P0138	74	1	1
P0158	55	1	2

Continuity should not exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK HO2S2 CONNECTOR FOR WATER

1. Turn ignition switch OFF.
2. Disconnect heated oxygen sensor 2 harness connector.
3. Check connectors for water.

Water should not exist.

OK or NG

OK >> GO TO 5.
NG >> Repair or replace harness or connectors.

5. CHECK HEATED OXYGEN SENSOR 2

Refer to EC-206, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace malfunctioning heated oxygen sensor 2.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

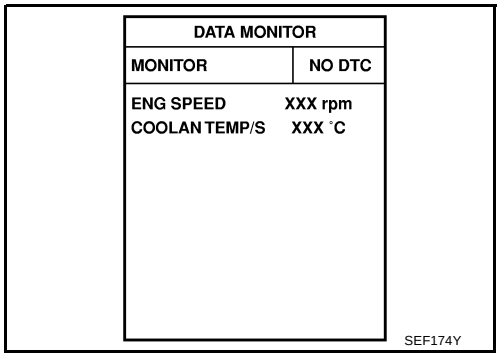
Component Inspection

ABS009ET

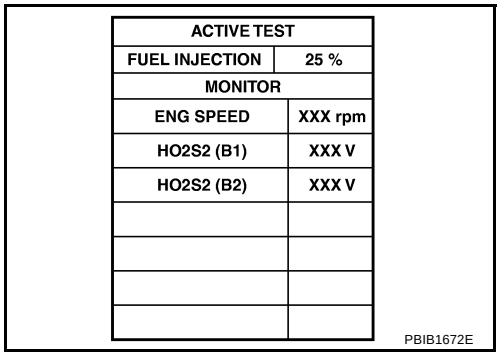
HEATED OXYGEN SENSOR 2

With CONSULT-II

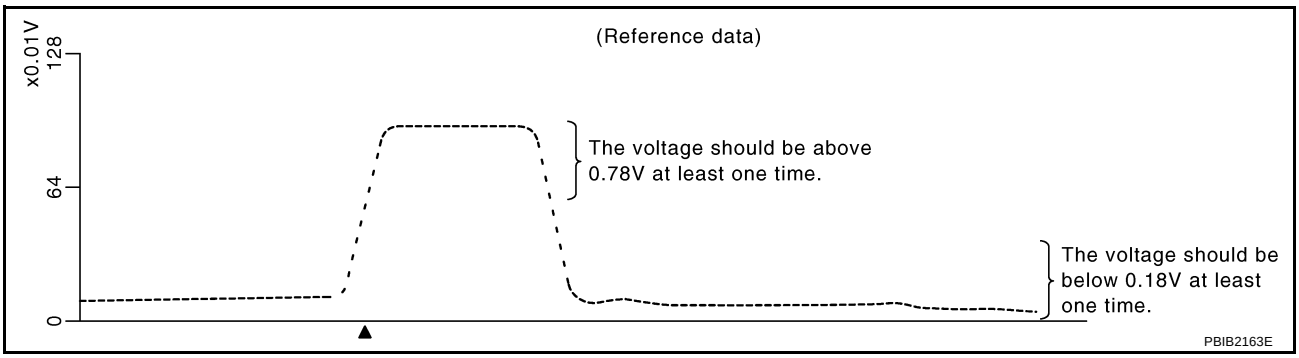
1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-II.
2. Start engine and warm it up to the normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 1 minute.



6. Select “FUEL INJECTION” in “ACTIVE TEST” mode, and select “HO2S2 (B1)/(B2)” as the monitor item with CONSULT-II.



7. Check “HO2S2 (B1)/(B2)” at idle speed when adjusting “FUEL INJECTION” to ±25%.



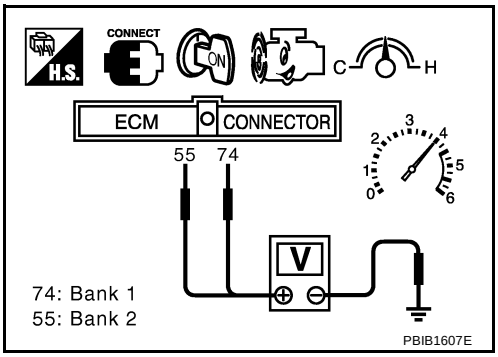
“HO2S2 (B1)/(B2)” should be above 0.78V at least once when the “FUEL INJECTION” is +25%.
“HO2S2 (B1)/(B2)” should be below 0.18V at least once when the “FUEL INJECTION” is –25%.

CAUTION:

- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

Without CONSULT-II

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Set voltmeter probes between ECM terminal 74 [HO2S2 (B1) signal] or 55 [HO2S2 (B2) signal] and ground.
6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
   (Depress and release accelerator pedal as soon as possible.)
   The voltage should be above 0.78V at least once during this procedure.
   If the voltage is above 0.78V at step 6, step 7 is not necessary.
7. Keep vehicle at idling for 10 minutes, then check voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D position (A/T), 4th gear position (M/T).
   The voltage should be below 0.18V at least once during this procedure.
8. If NG, replace heated oxygen sensor 2.



CAUTION:

- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

Removal and Installation

ABS009EU

HEATED OXYGEN SENSOR 2

Refer to EM-23, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

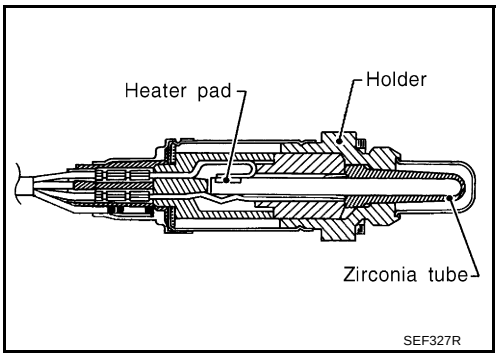
DTC P0139, P0159 HO2S2

PFP:226A0

Component Description

ABS009EV

The heated oxygen sensor 2, after three way catalyst 1, monitors the oxygen level in the exhaust gas on each bank.
Even if switching characteristics of the air fuel ratio (A/F) sensor 1 are shifted, the air-fuel ratio is controlled to stoichiometric, by the signal from the heated oxygen sensor 2.
This sensor is made of ceramic zirconia. The zirconia generates voltage from approximately 1V in richer conditions to 0V in leaner conditions.
Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



CONSULT-II Reference Value in Data Monitor Mode

ABS009EW

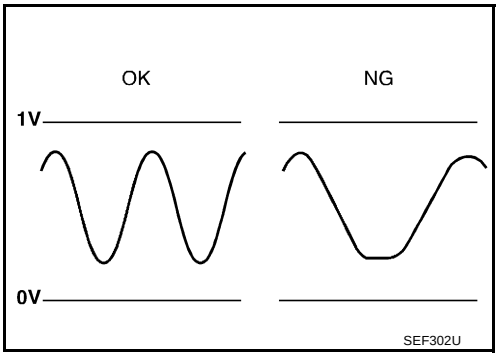
Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
HO2S2 (B1) HO2S2 (B2)	● Warm-up condition ● After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	Revving engine from idle to 3,000 rpm quickly.	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S2 MNTR (B1) HO2S2 MNTR (B2)			LEAN ←→ RICH

On Board Diagnosis Logic

ABS009EX

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the air fuel ratio (A/F) sensor 1. The oxygen storage capacity before the three way catalyst causes the longer switching time. To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the switching response of the sensor's voltage is faster than specified during the various driving condition such as fuel-cut.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0139 0139 (Bank 1)	Heated oxygen sensor 2 circuit slow response	It takes more time for the sensor to respond between rich and lean than the specified time.	● Harness or connectors (The sensor circuit is open or shorted) ● Heated oxygen sensor 2 ● Fuel pressure ● Fuel injector ● Intake air leaks
P0159 0159 (Bank 2)			

DTC Confirmation Procedure

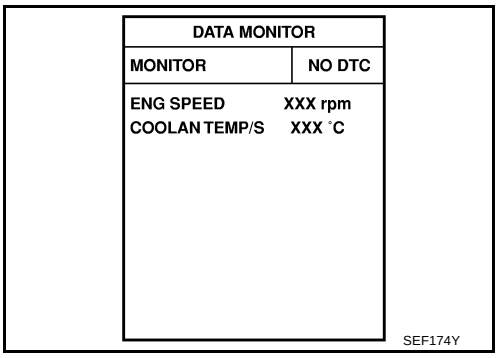
ABS009EY

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

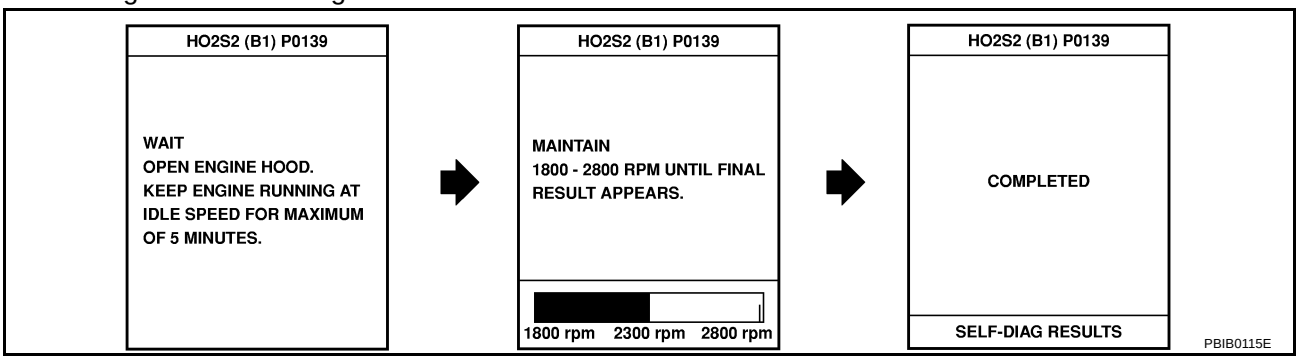
WITH CONSULT-II

TESTING CONDITION:
For better results, perform “DTC WORK SUPPORT” at a temperature of 0 to 30 °C (32 to 86 °F).

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-II.
2. Start engine and warm it up to the normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 1 minute.
6. Make sure that “COOLAN TEMP/S” indicates more than 70°C (158°F).
   If not, warm up engine and go to next step when “COOLAN TEMP/S” indication reaches to 70°C (158°F).



7. Select “HO2S2 (B1) P0139” or “HO2S2 (B2) P0159” of “HO2S2” in “DTC WORK SUPPORT” mode with CONSULT-II.
8. Start engine and following the instruction of CONSULT-II.



9. Make sure that “OK” is displayed after touching “SELF-DIAG RESULTS”.
   If “NG” is displayed, refer to EC-214, "Diagnostic Procedure" .
   If “CAN NOT BE DIAGNOSED” is displayed, perform the following.

a. Turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle).
b. Return to step 1.

Overall Function Check

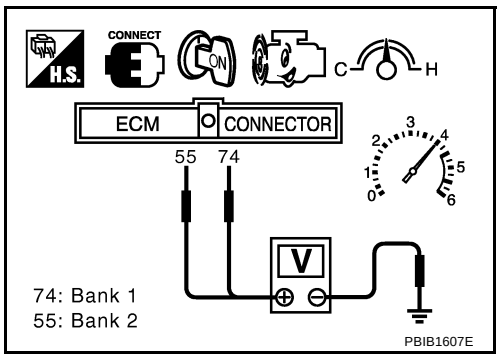
ABS009EZ

Use this procedure to check the overall function of the heated oxygen sensor 2 circuit. During this check, a 1st trip DTC might not be confirmed.

WITH GST

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Set voltmeter probes between ECM terminal 74 [HO2S2 (B1) signal] or 55 [HO2S2 (B2) signal] and ground.

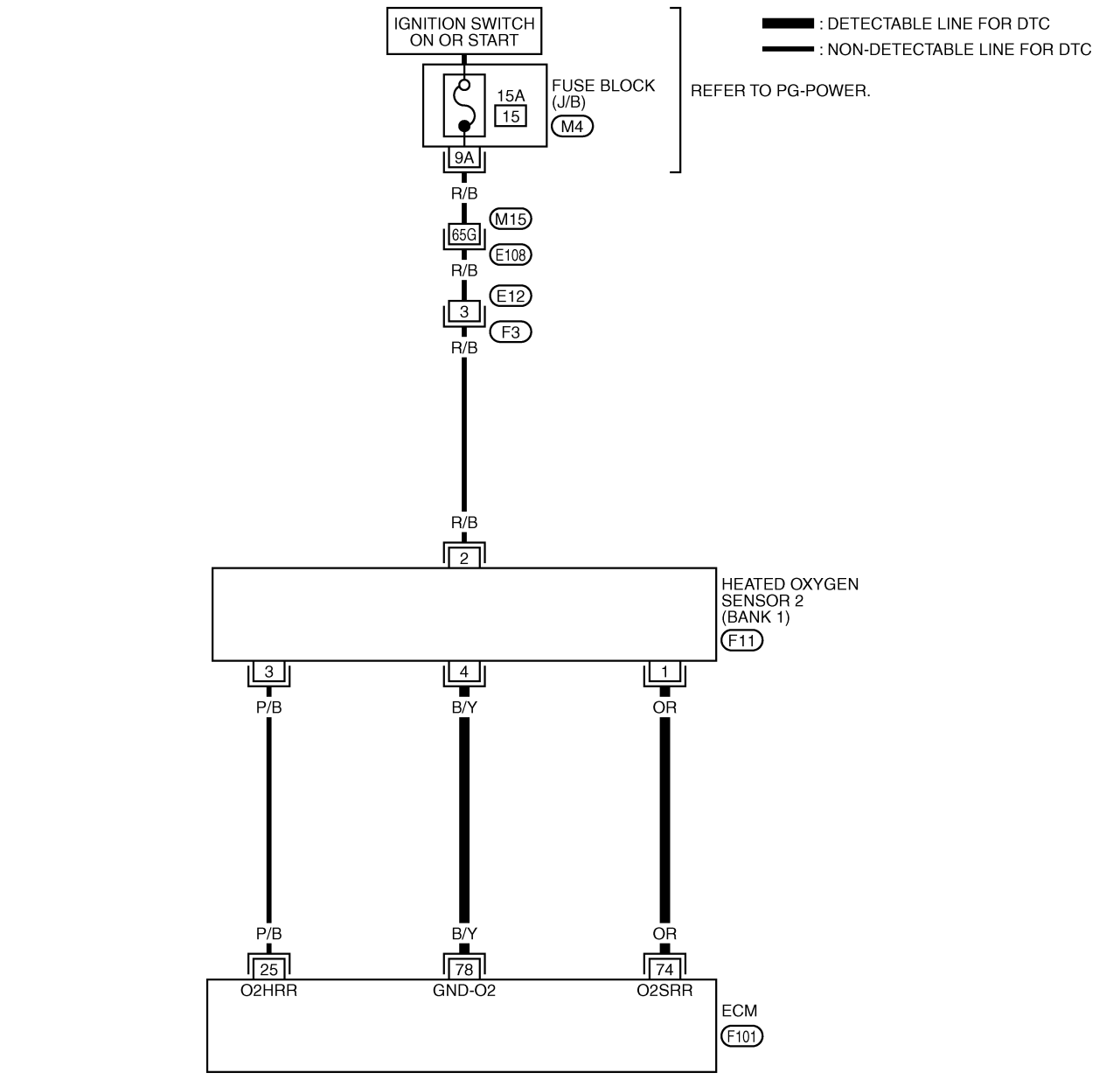
6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
   (Depress and release accelerator pedal as soon as possible.)
   A change of voltage should be more than 0.06V for 1 second during this procedure.
   If the voltage can be confirmed in step 6, step 7 is not necessary.
7. Keep vehicle at idling for 10 minutes, then check the voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D position (A/T), 4th gear position (M/T).
   A change of voltage should be more than 0.06V for 1 second during this procedure.
8. If NG, go to EC-214, "Diagnostic Procedure" .



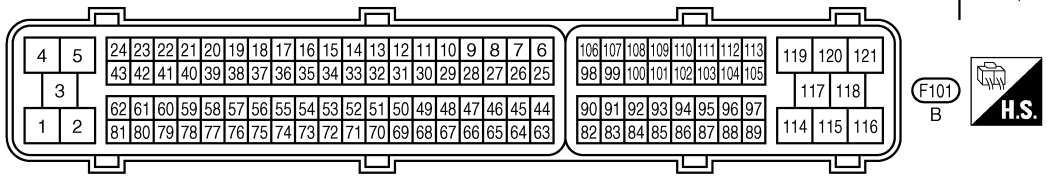
Wiring Diagram
BANK 1

ABS009F0

EC-O2S2B1-01



REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)



TBWT0482E

Specification data are reference values and are measured between each terminal and ground.

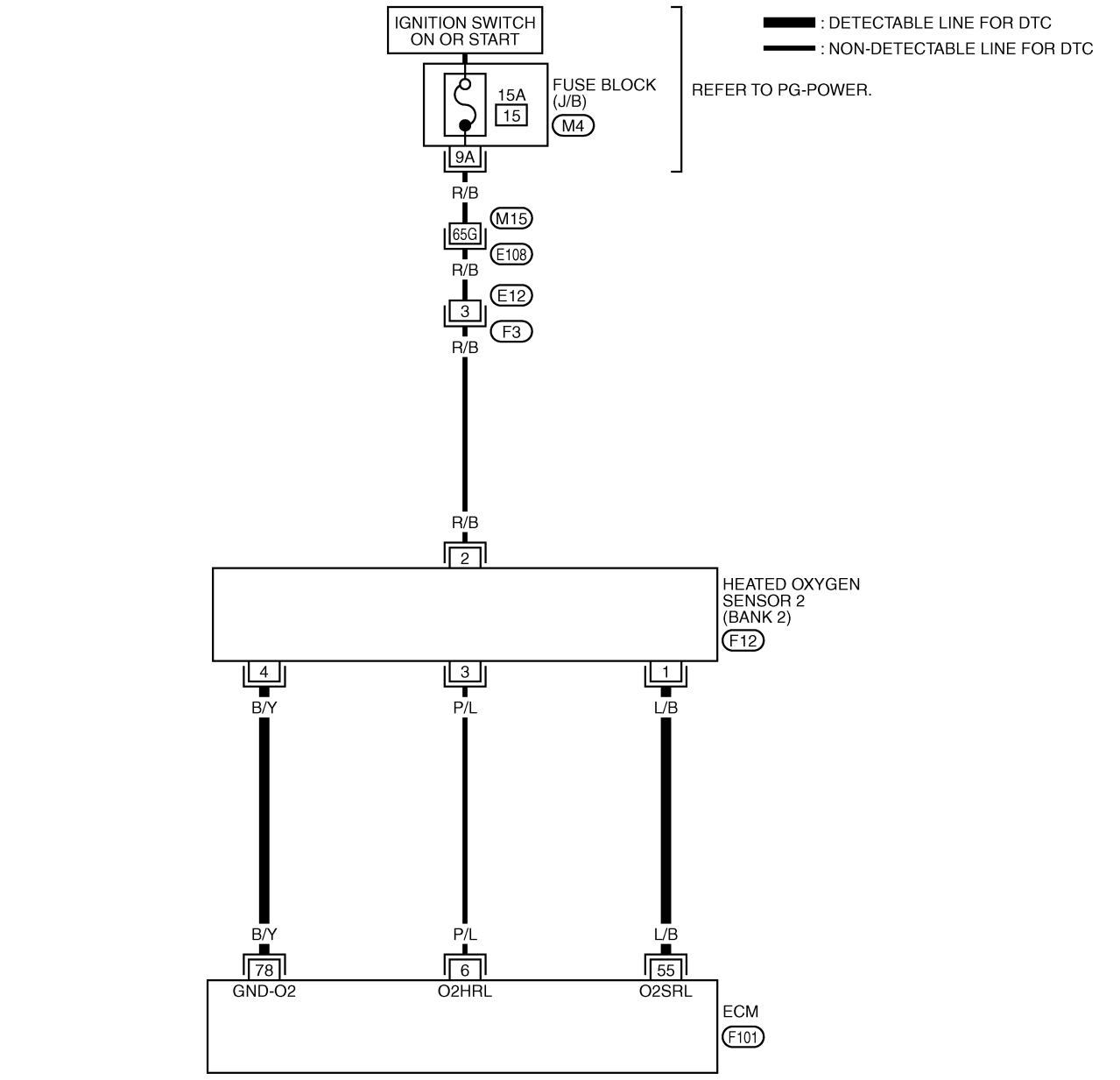
CAUTION:

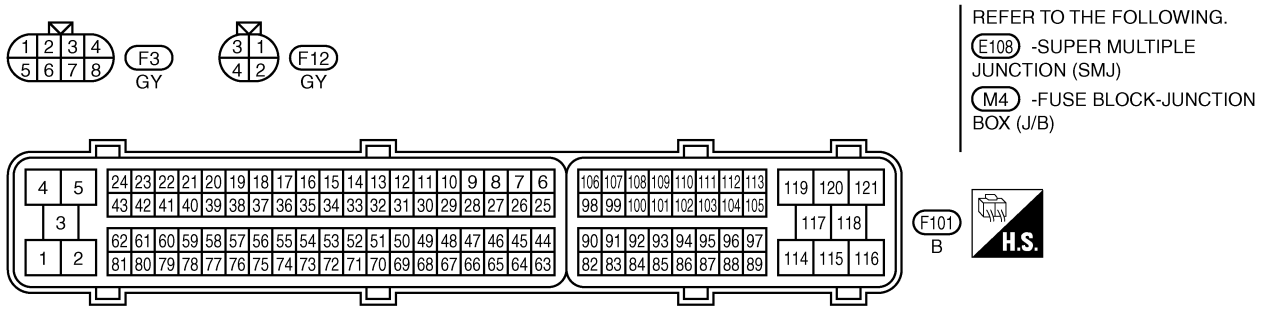
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
74	OR	Heated oxygen sensor 2 (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - Approximately 1.0V
78	B/Y	Sensor ground (Heated oxygen sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V

BANK 2

EC-O2S2B2-01





TBWT0483E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

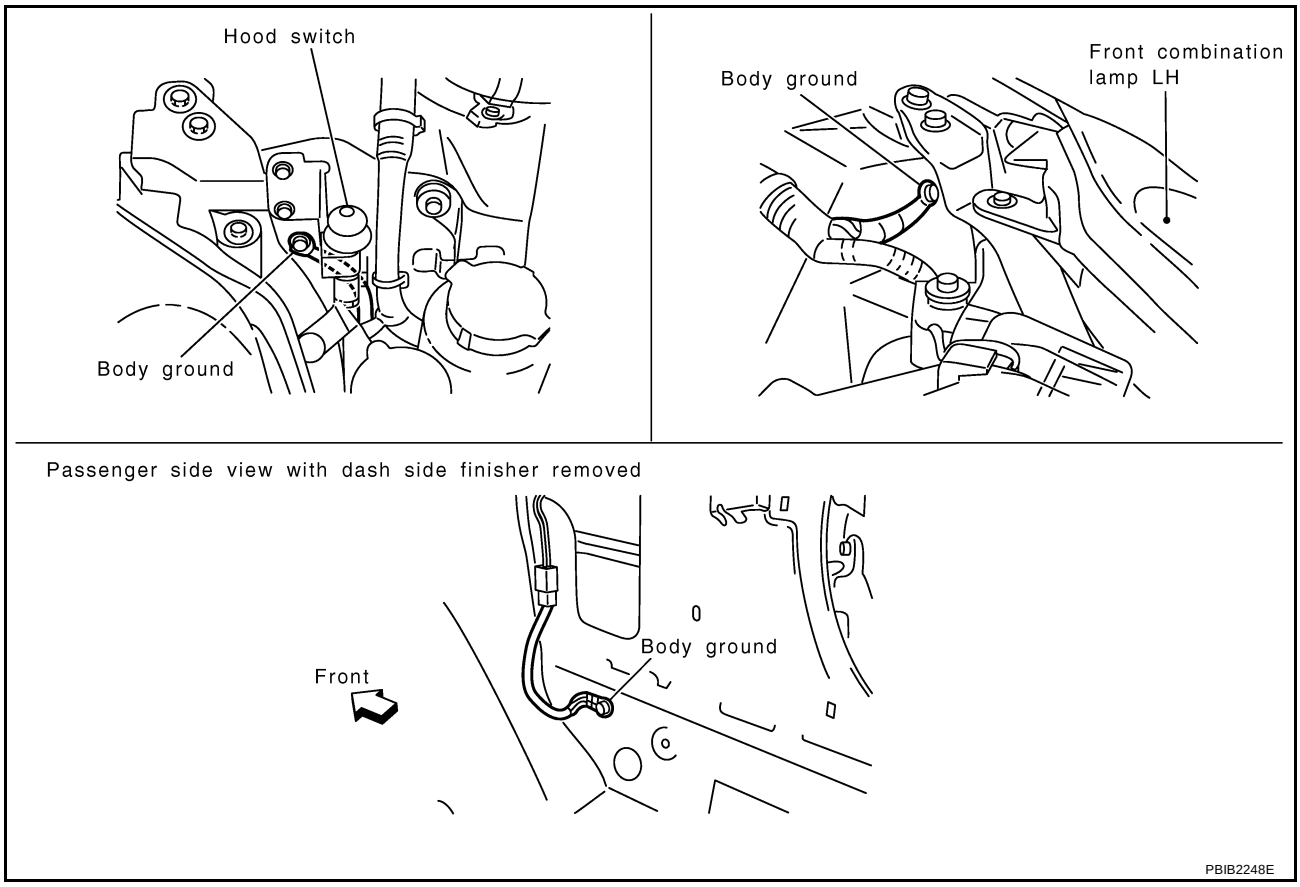
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
55	L/B	Heated oxygen sensor 2 (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - Approximately 1.0V
78	B/Y	Sensor ground (Heated oxygen sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V

Diagnostic Procedure

ABS009F1

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .



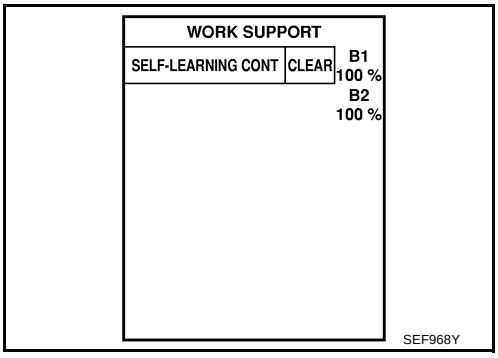
OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CLEAR THE SELF-LEARNING DATA

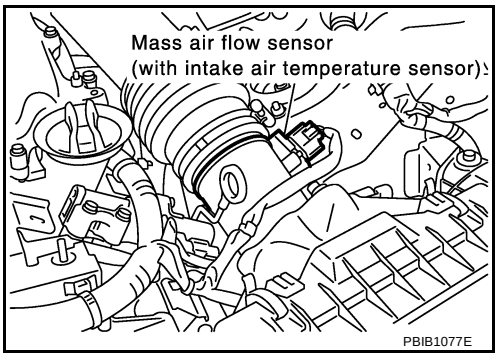
With CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-II.
3. Clear the self-learning control coefficient by touching “CLEAR”.
4. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171, P0172, P0174 or P0175 detected?
   Is it difficult to start engine?



Without CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF.
3. Disconnect mass air flow sensor harness connector, and restart and run engine for at least 5 seconds at idle speed.
4. Stop engine and reconnect mass air flow sensor harness connector.
5. Make sure DTC P0102 is displayed.
6. Erase the DTC memory. Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .
7. Make sure DTC P0000 is displayed.
8. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171, P0172, P0174 or P0175 detected?
   Is it difficult to start engine?

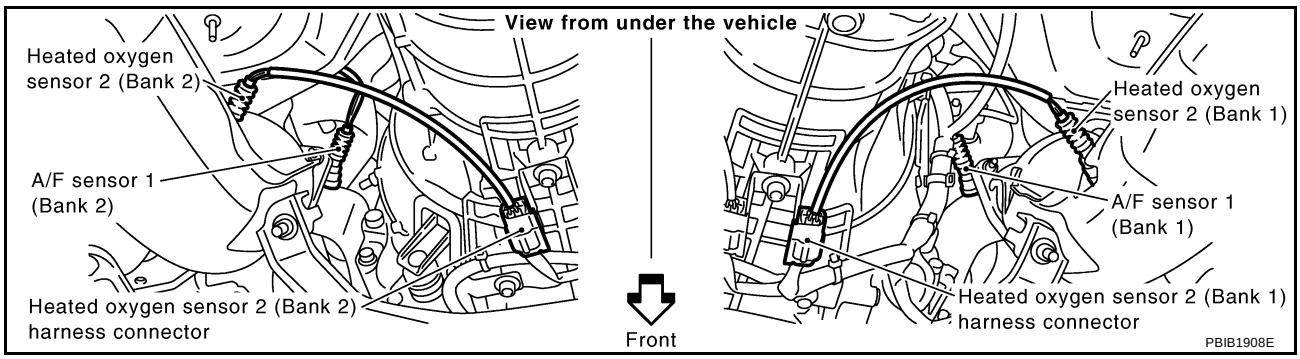


Yes or No

Yes >> Perform trouble diagnosis for DTC P0171, P0174 or P0172, P0175. Refer to EC-219 or EC-228 .
No >> GO TO 3.

3. CHECK HO2S2 GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Disconnect heated oxygen sensor 2 harness connector.



4. Check harness continuity between HO2S2 terminal 4 and ECM terminal 78.
   Refer to Wiring Diagram.

Continuity should exist.

5. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal and HO2S2 terminal as follows.
   Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P0139	74	1	1
P0159	55	1	2

Continuity should exist.

2. Check harness continuity between the following terminals and ground.
   Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P0139	74	1	1
P0159	55	1	2

Continuity should not exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK HEATED OXYGEN SENSOR 2

Refer to EC-217, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace malfunctioning heated oxygen sensor 2.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

ABS009F2

HEATED OXYGEN SENSOR 2

With CONSULT-II

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-II.
2. Start engine and warm it up to the normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 1 minute.

DATA MONITOR	
MONITOR	NO DTC
ENG SPEED	XXX rpm
COOLAN TEMP/S	XXX °C

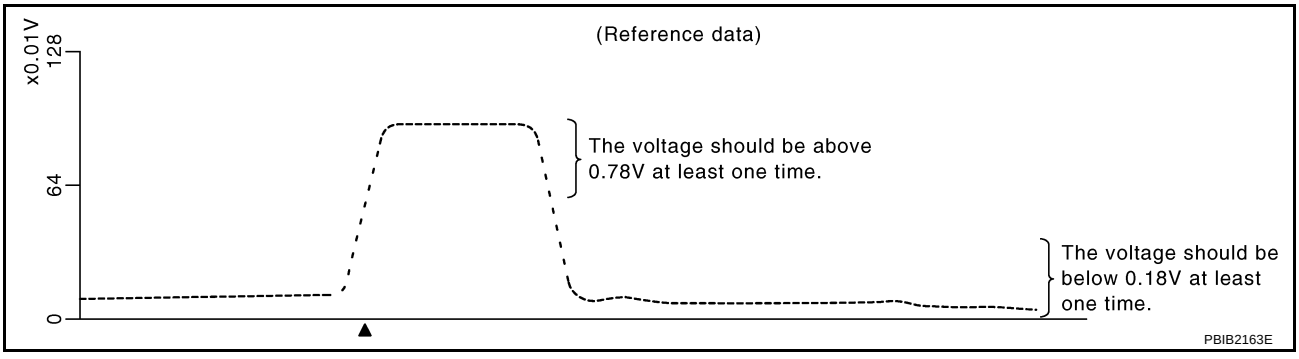
SEF174Y

6. Select “FUEL INJECTION” in “ACTIVE TEST” mode, and select “HO2S2 (B1)/(B2)” as the monitor item with CONSULT-II.

ACTIVE TEST	
FUEL INJECTION	25 %
MONITOR	
ENG SPEED	XXX rpm
HO2S2 (B1)	XXX V
HO2S2 (B2)	XXX V

PBIB1672E

7. Check “HO2S2 (B1)/(B2)” at idle speed when adjusting “FUEL INJECTION” to ±25%.



“HO2S2 (B1)/(B2)” should be above 0.78V at least once when the “FUEL INJECTION” is +25%.
“HO2S2 (B1)/(B2)” should be below 0.18V at least once when the “FUEL INJECTION” is –25%.

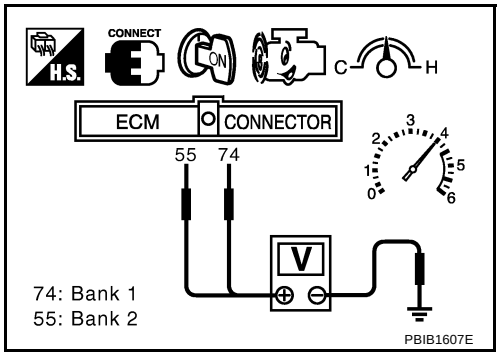
CAUTION:

- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**

- **Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

Without CONSULT-II

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Set voltmeter probes between ECM terminal 74 [HO2S2 (B1) signal] or 55 [HO2S2 (B2) signal] and ground.
6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
   (Depress and release accelerator pedal as soon as possible.)
   The voltage should be above 0.78V at least once during this procedure.
   If the voltage is above 0.78V at step 6, step 7 is not necessary.
7. Keep vehicle at idling for 10 minutes, then check voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D position (A/T), 4th gear position (M/T).
   The voltage should be below 0.18V at least once during this procedure.
8. If NG, replace heated oxygen sensor 2.



CAUTION:

- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

Removal and Installation

ABS009F3

HEATED OXYGEN SENSOR 2

Refer to EM-23, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

DTC P0171, P0174 FUEL INJECTION SYSTEM FUNCTION

PFP:16600

On Board Diagnosis Logic

ABS009F4

With the Air/Fuel Mixture Ratio Self-Learning Control, the actual mixture ratio can be brought closely to the theoretical mixture ratio based on the mixture ratio feedback signal from the air fuel ratio (A/F) sensors 1. The ECM calculates the necessary compensation to correct the offset between the actual and the theoretical ratios.

In case the amount of the compensation value is extremely large (The actual mixture ratio is too lean.), the ECM judges the condition as the fuel injection system malfunction and lights up the MIL (2 trip detection logic).

Sensor	Input signal to ECM	ECM function	Actuator
Air fuel ratio (A/F) sensor 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)	Fuel injection control	Fuel injector

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0171 0171 (Bank 1) P0174 0174 (Bank 2)	Fuel injection system too lean	● Fuel injection system does not operate properly. ● The amount of mixture ratio compensation is too large. (The mixture ratio is too lean.)	● Intake air leaks ● Air fuel ratio (A/F) sensor 1 ● Fuel injector ● Exhaust gas leaks ● Incorrect fuel pressure ● Lack of fuel ● Mass air flow sensor ● Incorrect PCV hose connection

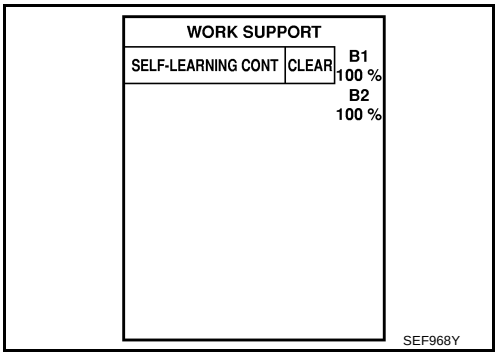
DTC Confirmation Procedure

ABS009F5

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

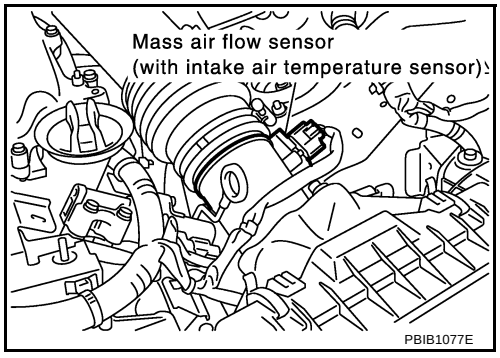
WITH CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON and select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-II.
4. Clear the self-learning control coefficient by touching “CLEAR”.
5. Select “DATA MONITOR” mode with CONSULT-II.
6. Start engine again and let it idle for at least 10 minutes.
   The 1st trip DTC P0171 or P0174 should be detected at this stage, if a malfunction exists. If so, go to EC-223, "Diagnostic Procedure" .
7. If it is difficult to start engine at step 6, the fuel injection system has a malfunction, too.
8. Crank engine while depressing accelerator pedal. If engine starts, go to EC-223, "Diagnostic Procedure" . If engine does not start, check exhaust and intake air leak visually.



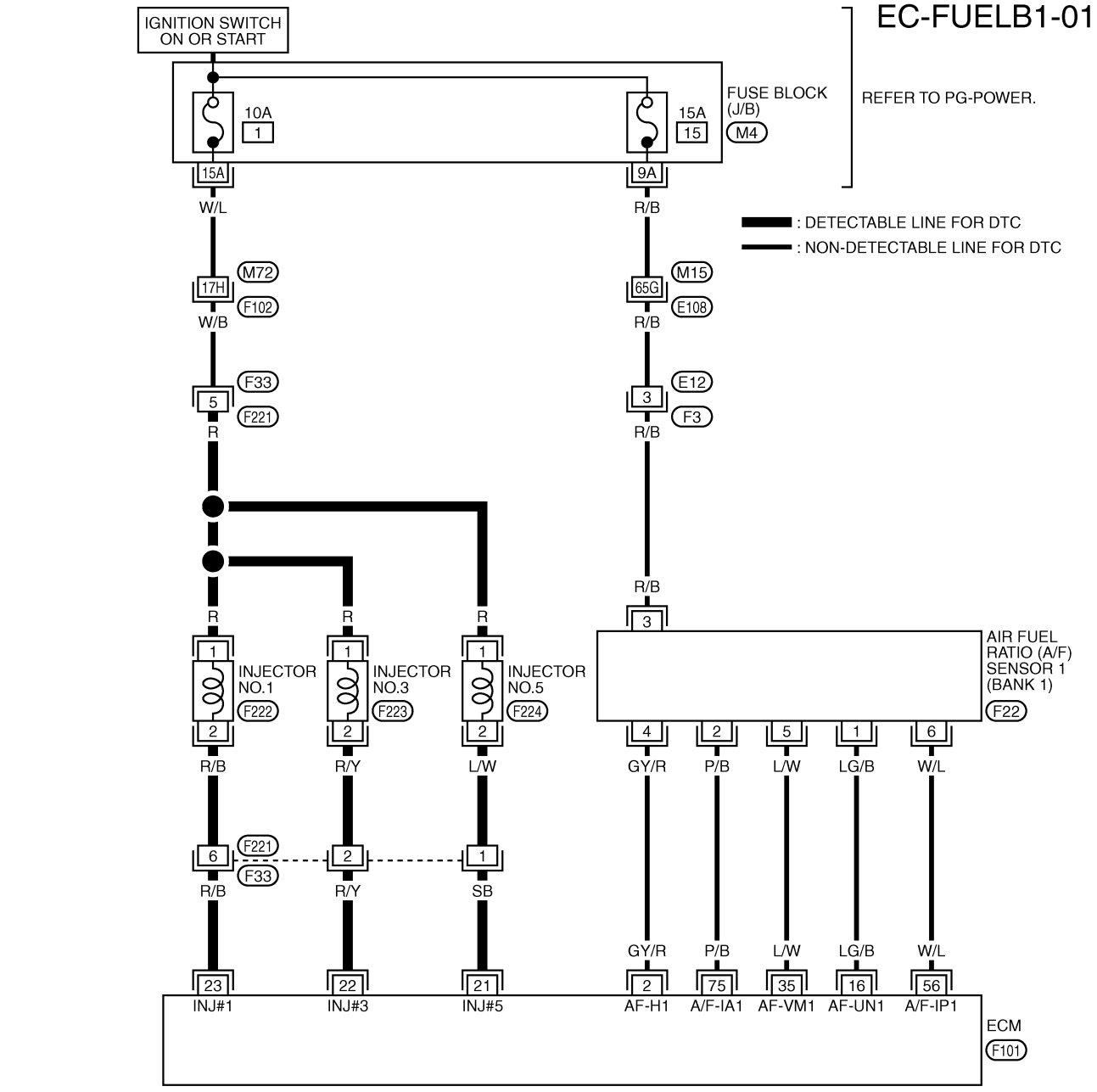
WITH GST

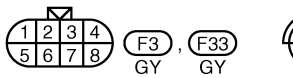
1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Disconnect mass air flow sensor harness connector. Then restart and run engine for at least 5 seconds at idle speed.
4. Stop engine and reconnect mass air flow sensor harness connector.
5. Select “MODE 3” with GST. Make sure DTC P0102 is detected.
6. Select “MODE 4” with GST and erase the DTC P0102.
7. Start engine again and let it idle for at least 10 minutes.
8. Select “MODE 7” with GST. The 1st trip DTC P0171 or P0174 should be detected at this stage, if a malfunction exists. If so, go to EC-223, "Diagnostic Procedure" .
9. If it is difficult to start engine at step 7, the fuel injection system has a malfunction.
10. Crank engine while depressing accelerator pedal. If engine starts, go to EC-223, "Diagnostic Procedure" . If engine does not start, check exhaust and intake air leak visually.

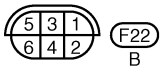


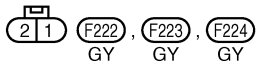
Wiring Diagram
BANK 1

ABS009F6

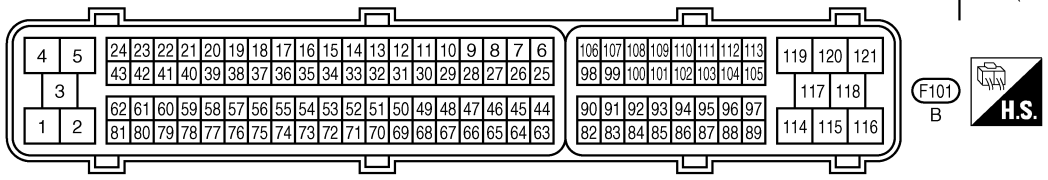






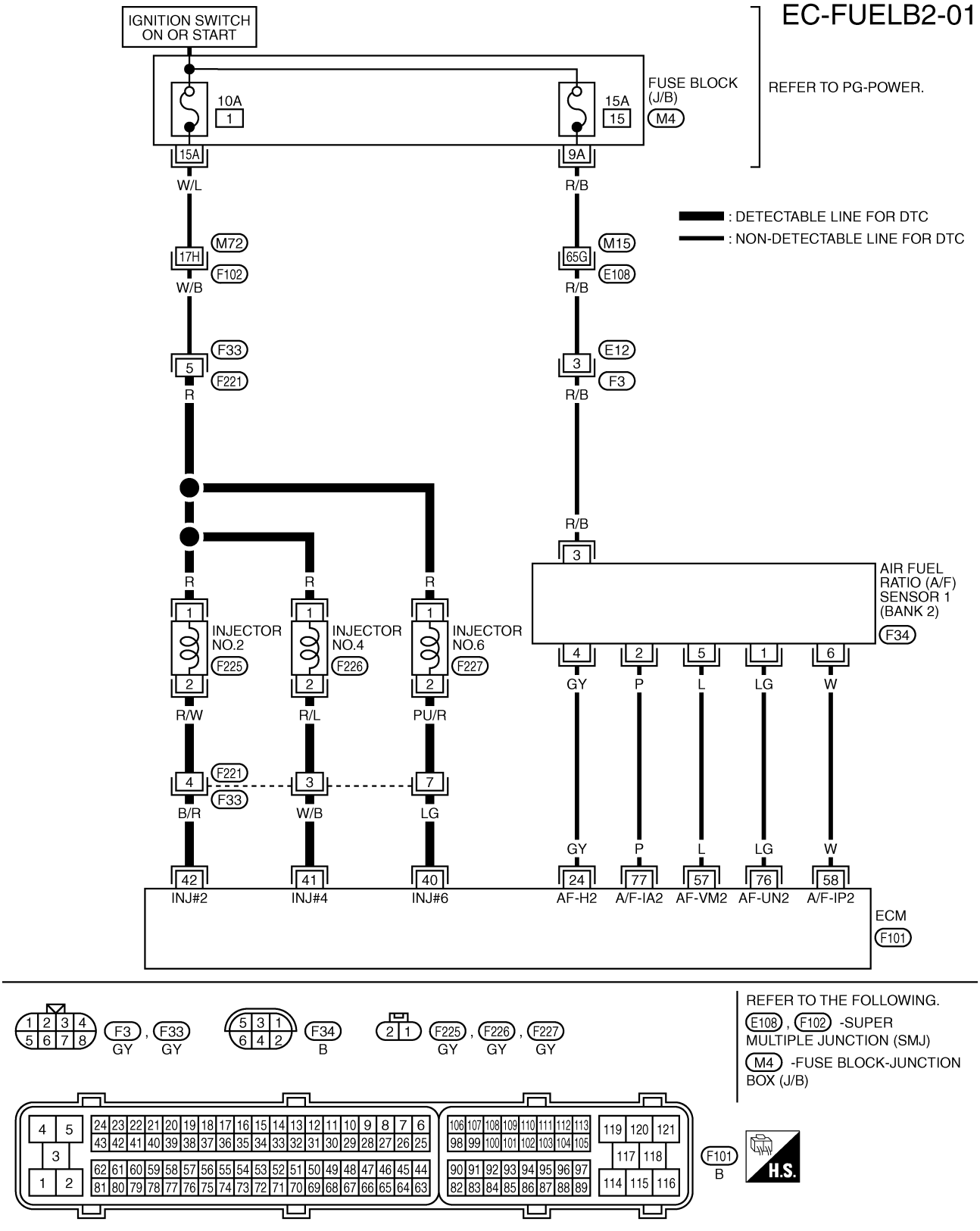


REFER TO THE FOLLOWING.
E108 , F102 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)



TBWT0702E

BANK 2



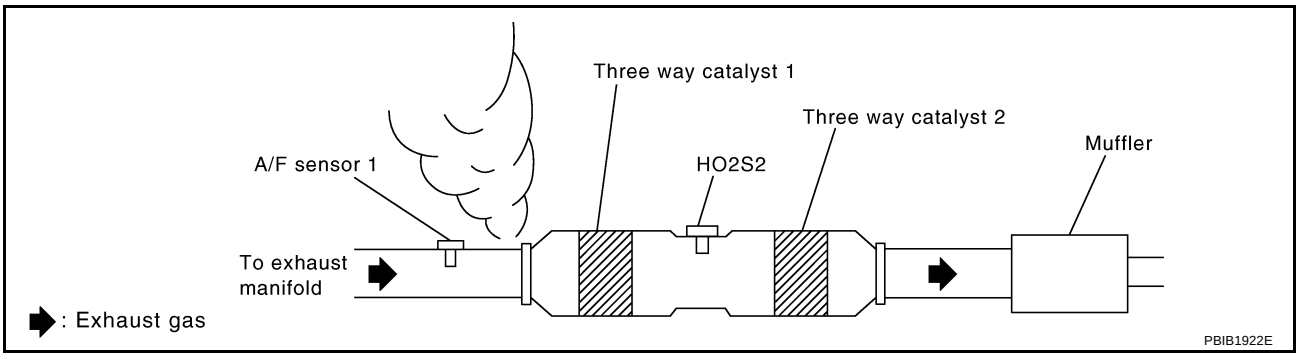
TBWT0703E

Diagnostic Procedure

ABS009F7

1. CHECK EXHAUST GAS LEAK

1. Start engine and run it at idle.
2. Listen for an exhaust gas leak before three way catalyst 1.



OK or NG

OK >> GO TO 2.
NG >> Repair or replace.

2. CHECK FOR INTAKE AIR LEAK

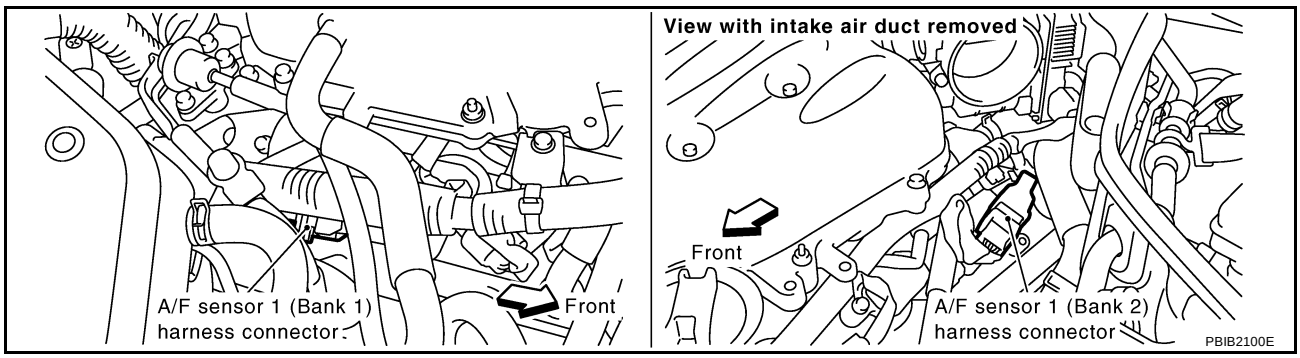
1. Listen for an intake air leak after the mass air flow sensor.
2. Check PCV hose connection.

OK or NG

OK >> GO TO 3.
NG >> Repair or replace.

3. CHECK A/F SENSOR 1 CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect corresponding A/F sensor 1 harness connector.



3. Disconnect ECM harness connector.
4. Check harness continuity between the following terminals.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	16	1	76
2	75	2	77
5	35	5	57
6	56	6	58

Continuity should exist.

5. Check harness continuity between the following terminals and ground.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	16	1	76
2	75	2	77
5	35	5	57
6	56	6	58

Continuity should not exist.

6. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK FUEL PRESSURE

1. Release fuel pressure to zero. Refer to EC-45, "FUEL PRESSURE RELEASE" .
2. Install fuel pressure gauge and check fuel pressure. Refer to EC-45, "FUEL PRESSURE CHECK" .

At idling: 350 kPa (3.57 kg/cm^2 , 51 psi)

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Fuel pump and circuit (Refer to EC-638 .)
- Fuel pressure regulator (Refer to EC-45 .)
- Fuel lines
- Fuel filter for clogging

>> Repair or replace.

6. CHECK MASS AIR FLOW SENSOR

With CONSULT-II

1. Install all removed parts.
2. Check “MASS AIR FLOW” in “DATA MONITOR” mode with CONSULT-II.

2.0 - 6.0 g·m/sec: at idling
7.0 - 20.0 g·m/sec: at 2,500 rpm

With GST

1. Install all removed parts.
2. Check mass air flow sensor signal in “MODE 1” with GST.

2.0 - 6.0 g·m/sec: at idling
7.0 - 20.0 g·m/sec: at 2,500 rpm

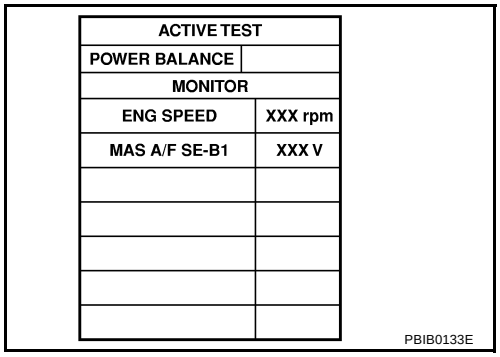
OK or NG

OK >> GO TO 7.
NG >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or grounds. Refer to EC-153, "DTC P0101 MAF SENSOR" .

7. CHECK FUNCTION OF INJECTORS

With CONSULT-II

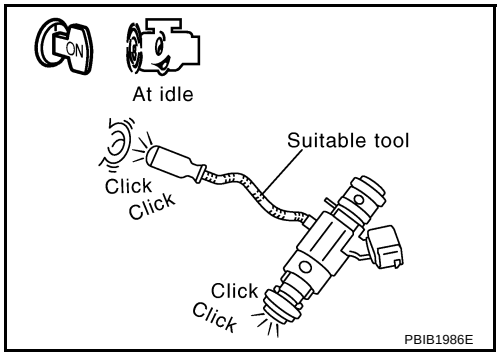
1. Start engine.
2. Perform “POWER BALANCE” in “ACTIVE TEST” mode with CONSULT-II.
3. Make sure that each circuit produces a momentary engine speed drop.



Without CONSULT-II

1. Start engine.
2. Listen to each injector operating sound.

Clicking noise should be heard.



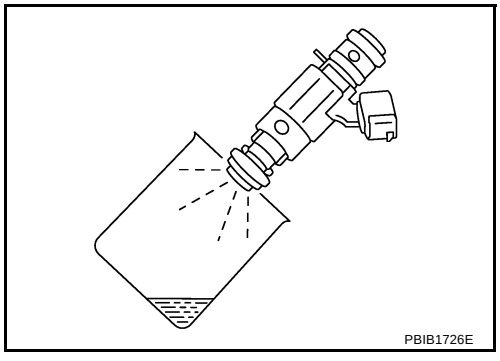
OK or NG

OK >> GO TO 8.
NG >> Perform trouble diagnosis for EC-632, "INJECTOR CIRCUIT" .

8. CHECK INJECTOR

1. Confirm that the engine is cooled down and there are no fire hazards near the vehicle.
2. Turn ignition switch OFF.
3. Disconnect all injector harness connectors.
4. Remove injector gallery assembly. Refer to EM-36, "FUEL INJECTOR AND FUEL TUBE" .
   Keep fuel hose and all injectors connected to injector gallery.
5. For DTC P0171, reconnect injector harness connectors on bank 1.
   For DTC P0174, reconnect injector harness connectors on bank 2.
6. Disconnect all ignition coil harness connectors.
7. Prepare pans or saucers under each injector.
8. Crank engine for about 3 seconds.
   For DTC P0171, make sure that fuel sprays out from injectors on bank1.
   For DTC P0174, make sure that fuel sprays out from injectors on bank 2.

Fuel should be sprayed evenly for each injector.



OK or NG

OK >> GO TO 9.
NG >> Replace injectors from which fuel does not spray out. Always replace O-ring with new ones.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

DTC P0172, P0175 FUEL INJECTION SYSTEM FUNCTION

PFP:16600

On Board Diagnosis Logic

ABS009F8

With the Air/Fuel Mixture Ratio Self-Learning Control, the actual mixture ratio can be brought closely to the theoretical mixture ratio based on the mixture ratio feedback signal from the air fuel ratio (A/F) sensors 1. The ECM calculates the necessary compensation to correct the offset between the actual and the theoretical ratios.
In case the amount of the compensation value is extremely large (The actual mixture ratio is too rich.), the ECM judges the condition as the fuel injection system malfunction and lights up the MIL (2 trip detection logic).

Sensor	Input signal to ECM	ECM function	Actuator
Air fuel ratio (A/F) sensor 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)	Fuel injection control	Fuel injector

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0172 0172 (Bank 1) P0175 0175 (Bank 2)	Fuel injection system too rich	● Fuel injection system does not operate properly. ● The amount of mixture ratio compensation is too large. (The mixture ratio is too rich.)	● Air fuel ratio (A/F) sensor 1 ● Fuel injector ● Exhaust gas leaks ● Incorrect fuel pressure ● Mass air flow sensor

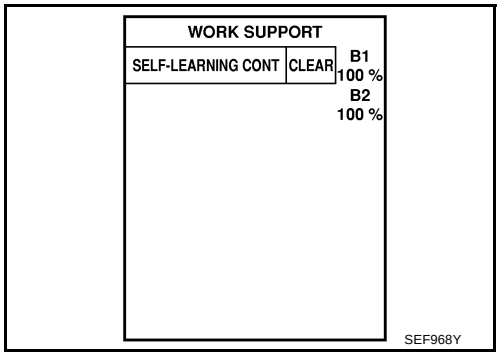
DTC Confirmation Procedure

ABS009F9

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

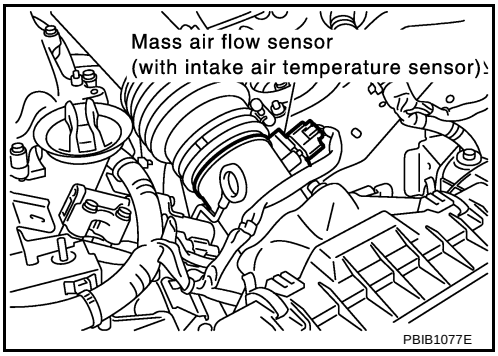
WITH CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON and select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-II.
4. Clear the self-learning control coefficient by touching “CLEAR”.
5. Select “DATA MONITOR” mode with CONSULT-II.
6. Start engine again and let it idle for at least 10 minutes.
   The 1st trip DTC P0172, P0175 should be detected at this stage, if a malfunction exists. If so, go to EC-232, "Diagnostic Procedure" .
7. If it is difficult to start engine at step 6, the fuel injection system has a malfunction, too.
8. Crank engine while depressing accelerator pedal.
   If engine starts, go to EC-232, "Diagnostic Procedure" . If engine does not start, remove ignition plugs and check for fouling, etc.



WITH GST

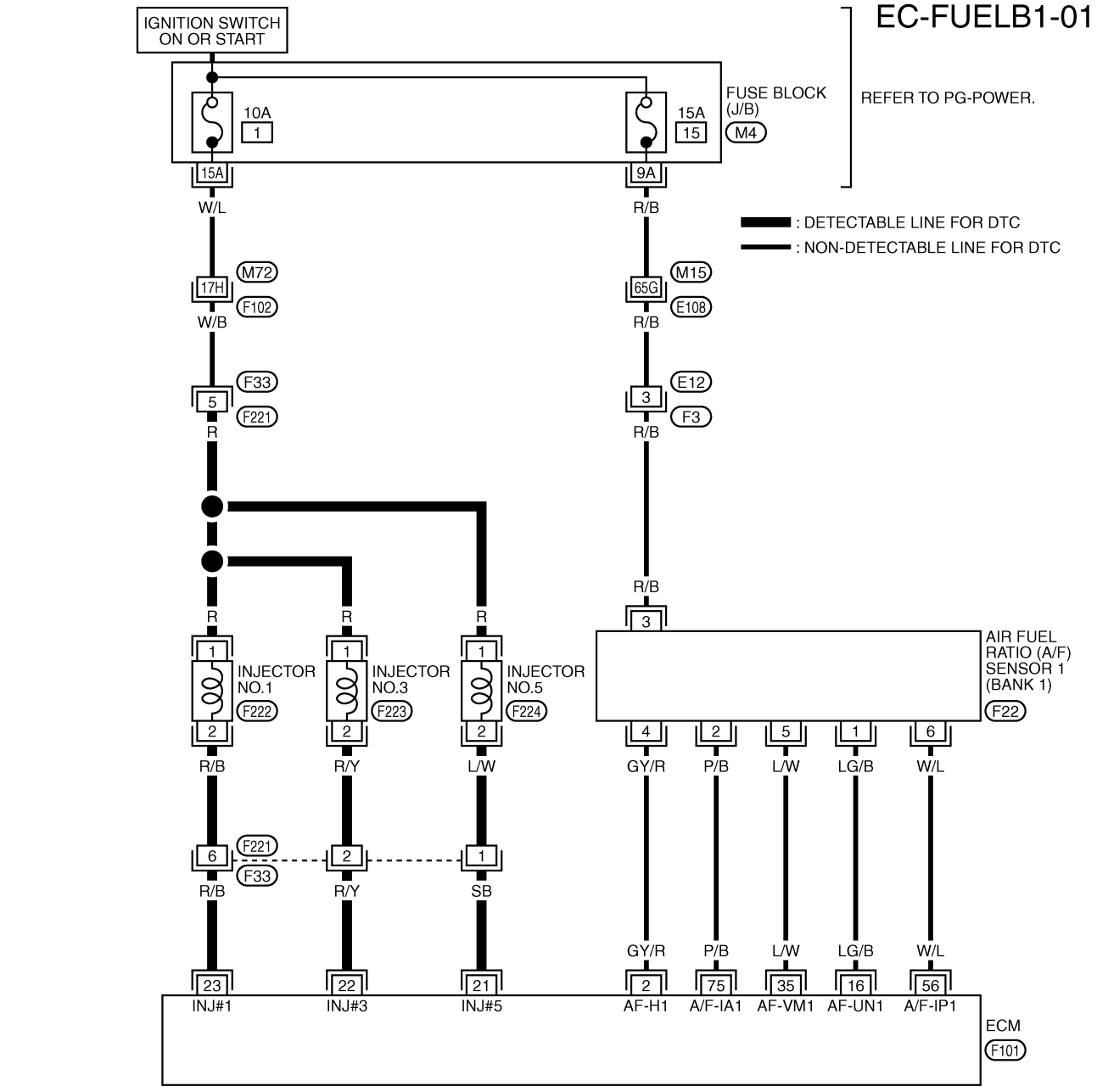
1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Disconnect mass air flow sensor harness connector. Then restart and run engine for at least 5 seconds at idle speed.
4. Stop engine and reconnect mass air flow sensor harness connector.
5. Select “MODE 3” with GST. Make sure DTC P0102 is detected.
6. Select “MODE 4” with GST and erase the DTC P0102.
7. Start engine again and let it idle for at least 10 minutes.
8. Select “MODE 7” with GST. The 1st trip DTC P0172 or P0175 should be detected at this stage, if a malfunction exists. If so, go to EC-232, "Diagnostic Procedure" .
9. If it is difficult to start engine at step 7, the fuel injection system has a malfunction.
10. Crank engine while depressing accelerator pedal.
    If engine starts, go to EC-232, "Diagnostic Procedure" . If engine does not start, remove ignition plugs and check for fouling, etc.

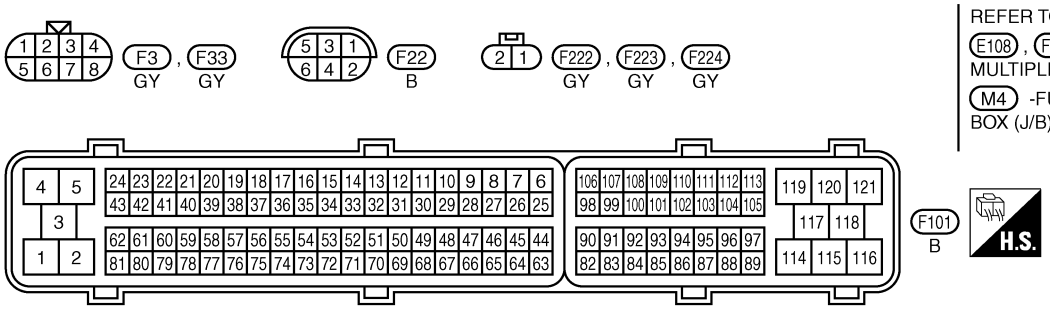


Wiring Diagram

BANK 1

ABS009FA





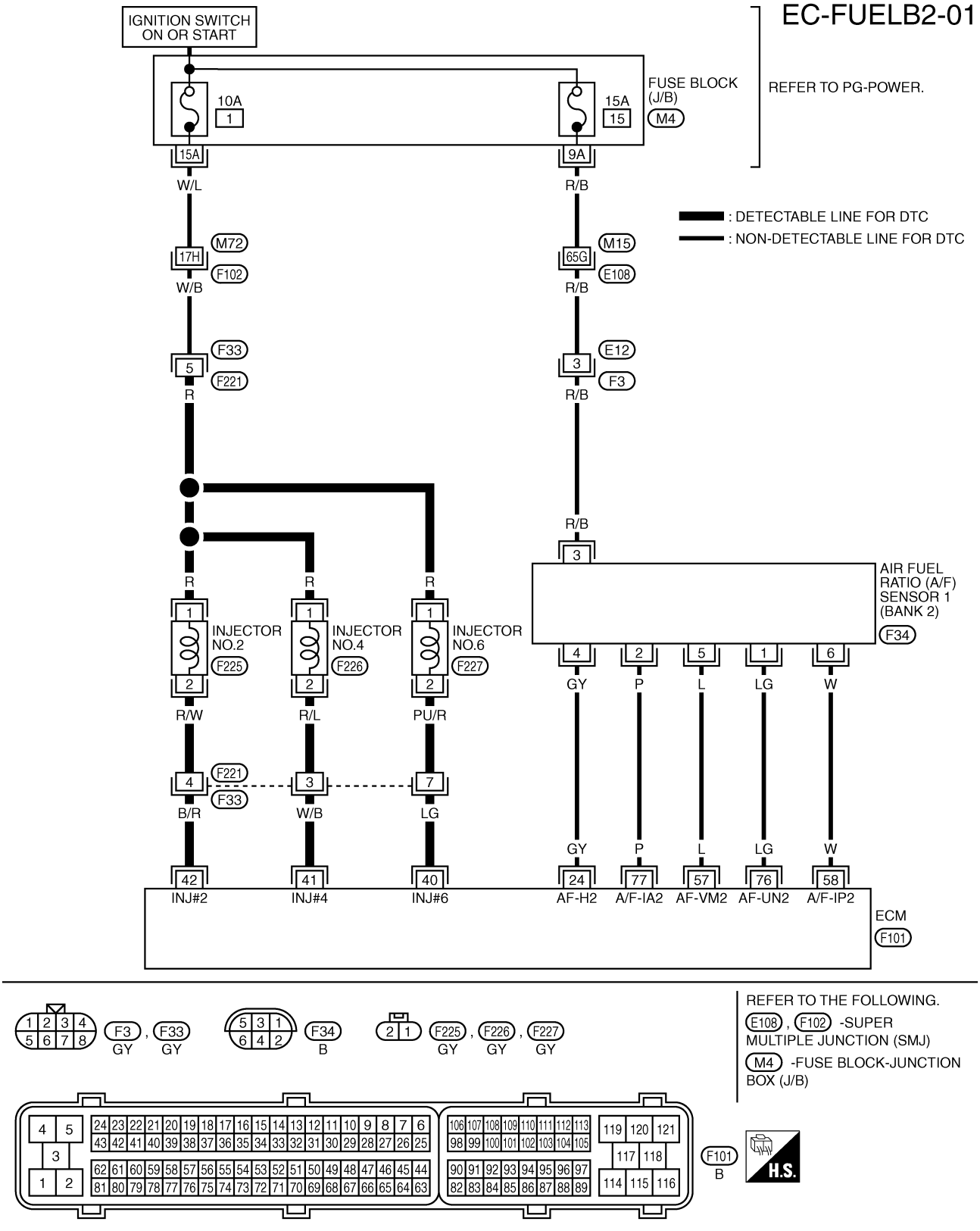
REFER TO THE FOLLOWING.

E108 , F102 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT0702E

BANK 2



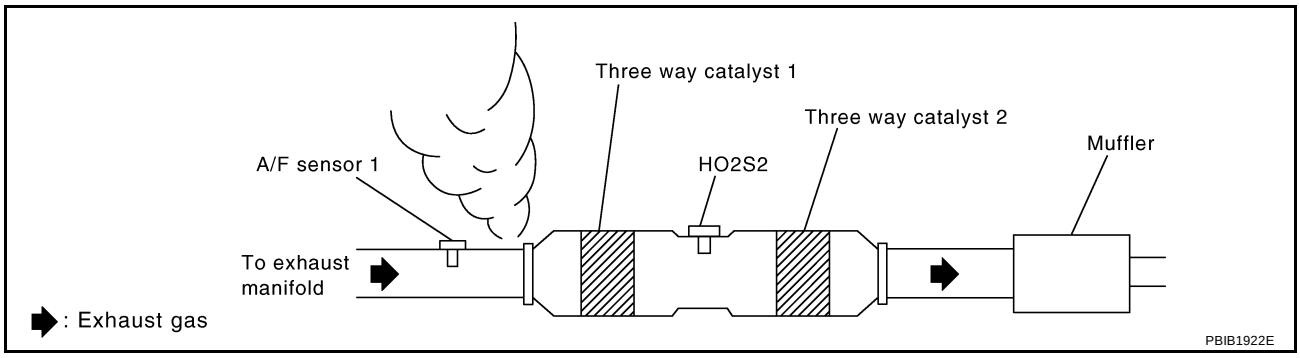
TBWT0703E

Diagnostic Procedure

ABS009FB

1. CHECK EXHAUST GAS LEAK

1. Start engine and run it at idle.
2. Listen for an exhaust gas leak before three way catalyst 1.



OK or NG

OK >> GO TO 2.
NG >> Repair or replace.

2. CHECK FOR INTAKE AIR LEAK

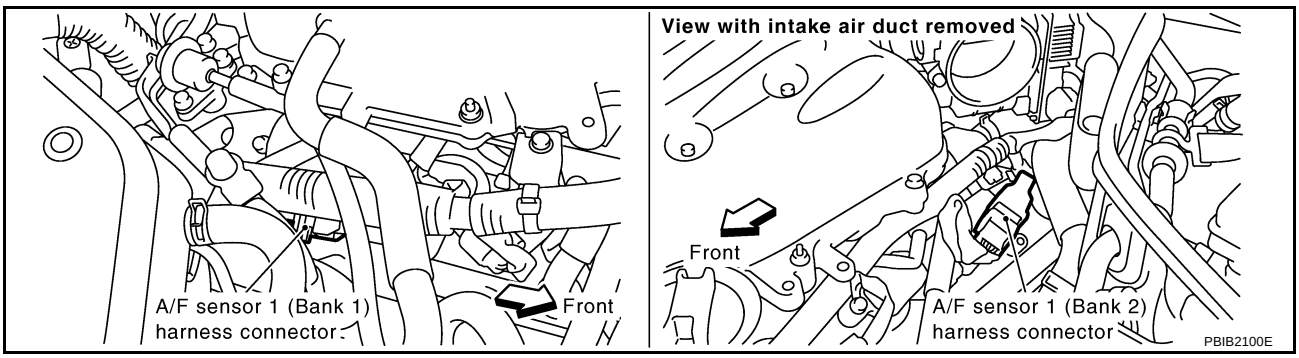
Listen for an intake air leak after the mass air flow sensor.

OK or NG

OK >> GO TO 3.
NG >> Repair or replace.

3. CHECK A/F SENSOR 1 CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect corresponding A/F sensor 1 harness connector.



3. Disconnect ECM harness connector.
4. Check harness continuity between the following terminals.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	16	1	76
2	75	2	77
5	35	5	57
6	56	6	58

Continuity should exist.

5. Check harness continuity between the following terminals and ground.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	16	1	76
2	75	2	77
5	35	5	57
6	56	6	58

Continuity should not exist.

6. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK FUEL PRESSURE

1. Release fuel pressure to zero. Refer to EC-45, "FUEL PRESSURE RELEASE" .
2. Install fuel pressure gauge and check fuel pressure. Refer to EC-45, "FUEL PRESSURE CHECK" .

At idling: 350 kPa (3.57 kg/cm^2 , 51 psi)

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Fuel pump and circuit (Refer to, EC-638 .)
- Fuel pressure regulator (Refer to EC-45 .)

>> Repair or replace.

6. CHECK MASS AIR FLOW SENSOR

With CONSULT-II

1. Install all removed parts.
2. Check “MASS AIR FLOW” in “DATA MONITOR” mode with CONSULT-II.

2.0 - 6.0 g·m/sec: at idling
7.0 - 20.0 g·m/sec: at 2,500 rpm

With GST

1. Install all removed parts.
2. Check mass air flow sensor signal in “MODE 1” with GST.

2.0 - 6.0 g·m/sec: at idling
7.0 - 20.0 g·m/sec: at 2,500 rpm

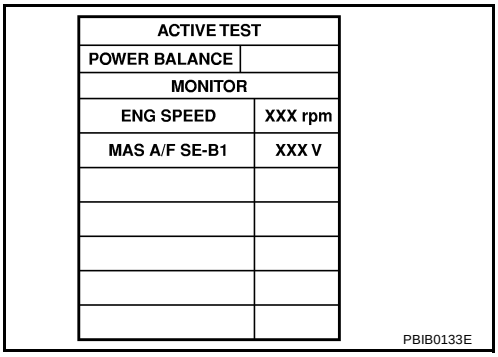
OK or NG

OK >> GO TO 7.
NG >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or grounds. Refer to EC-153, "DTC P0101 MAF SENSOR" .

7. CHECK FUNCTION OF INJECTORS

With CONSULT-II

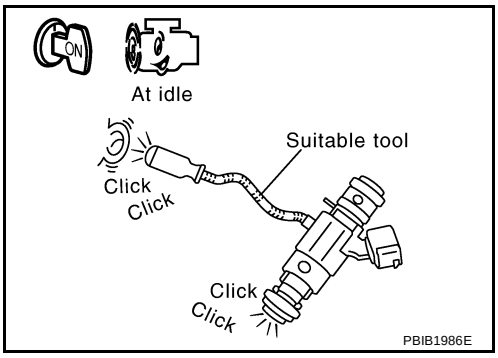
1. Start engine.
2. Perform “POWER BALANCE” in “ACTIVE TEST” mode with CONSULT-II.
3. Make sure that each circuit produces a momentary engine speed drop.



Without CONSULT-II

1. Start engine.
2. Listen to each injector operating sound.

Clicking noise should be heard.



OK or NG

OK >> GO TO 8.
NG >> Perform trouble diagnosis for EC-632, "INJECTOR CIRCUIT" .

8. CHECK INJECTOR

1. Remove injector assembly. Refer to EM-36, "FUEL INJECTOR AND FUEL TUBE" .
   Keep fuel hose and all injectors connected to injector gallery.
2. Confirm that the engine is cooled down and there are no fire hazards near the vehicle.
3. Disconnect all injector harness connectors.
4. Disconnect all ignition coil harness connectors.
5. Prepare pans or saucers under each injectors.
6. Crank engine for about 3 seconds.
   Make sure fuel does not drip from injector.

OK or NG

OK (Does not drip.)>>GO TO 9.
NG (Drips.)>>Replace the injectors from which fuel is dripping. Always replace O-ring with new one.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

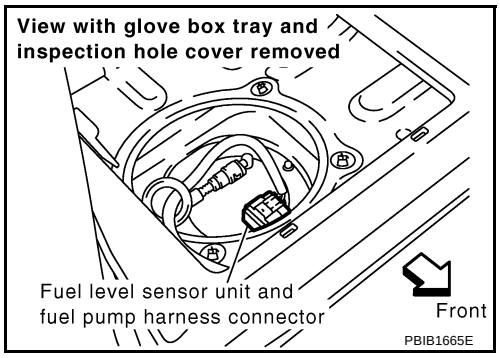
DTC P0181 FTT SENSOR

PFP:22630

Component Description

ABS009FC

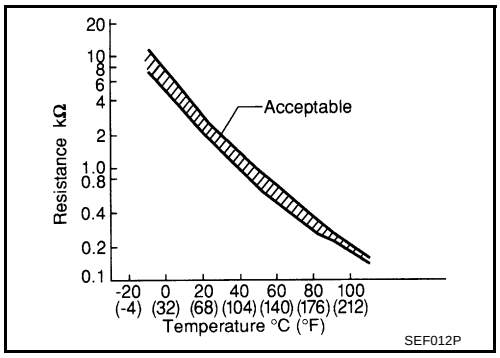
The fuel tank temperature sensor is used to detect the fuel temperature inside the fuel tank. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the fuel temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Fluid temperature °C (°F)	Voltage* V	Resistance kΩ
20 (68)	3.5	2.3 - 2.7
50 (122)	2.2	0.79 - 0.90

*: This data is reference values and is measured between ECM terminal 107 (Fuel tank temperature sensor) and ground.



CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

On Board Diagnosis Logic

ABS009FD

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0181 0181	Fuel tank temperature sensor circuit range/ performance	Rationally incorrect voltage from the sensor is sent to ECM, compared with the voltage signals from engine coolant temperature sensor and intake air temperature sensor.	● Harness or connectors (The sensor circuit is open or shorted) ● Fuel tank temperature sensor

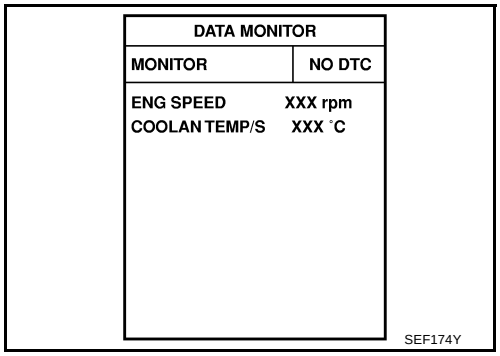
DTC Confirmation Procedure

ABS009FE

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Wait at least 10 seconds.
   If the result is NG, go to EC-239, "Diagnostic Procedure" .
   If the result is OK, go to following step.
4. Check “COOLAN TEMP/S” value.
   If “COOLAN TEMP/S” is less than 60°C (140°F), the result will be OK.
   If “COOLAN TEMP/S” is above 60°C (140°F), go to the following step.
5. Cool engine down until “COOLAN TEMP/S” is less than 60°C (140°F).
6. Wait at least 10 seconds.
7. If 1st trip DTC is detected, go to EC-239, "Diagnostic Procedure" .



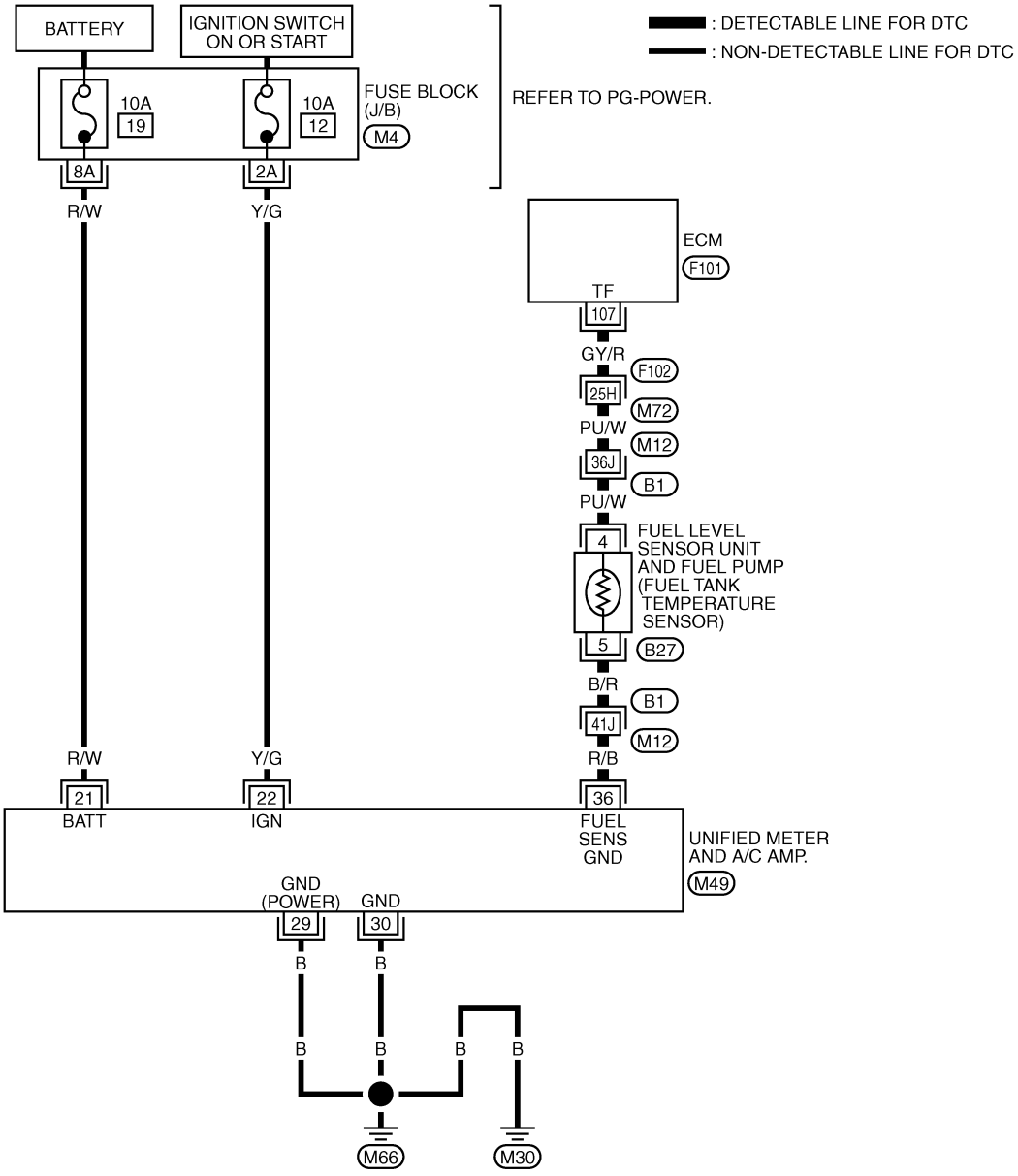
WITH GST

Follow the procedure “WITH CONSULT-II” above.

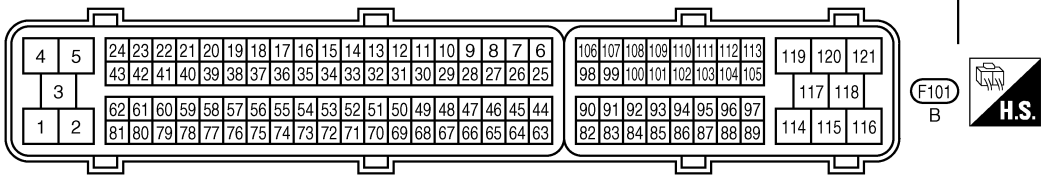
Wiring Diagram

ABS009FF

EC-FTTS-01



REFER TO THE FOLLOWING.
F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)



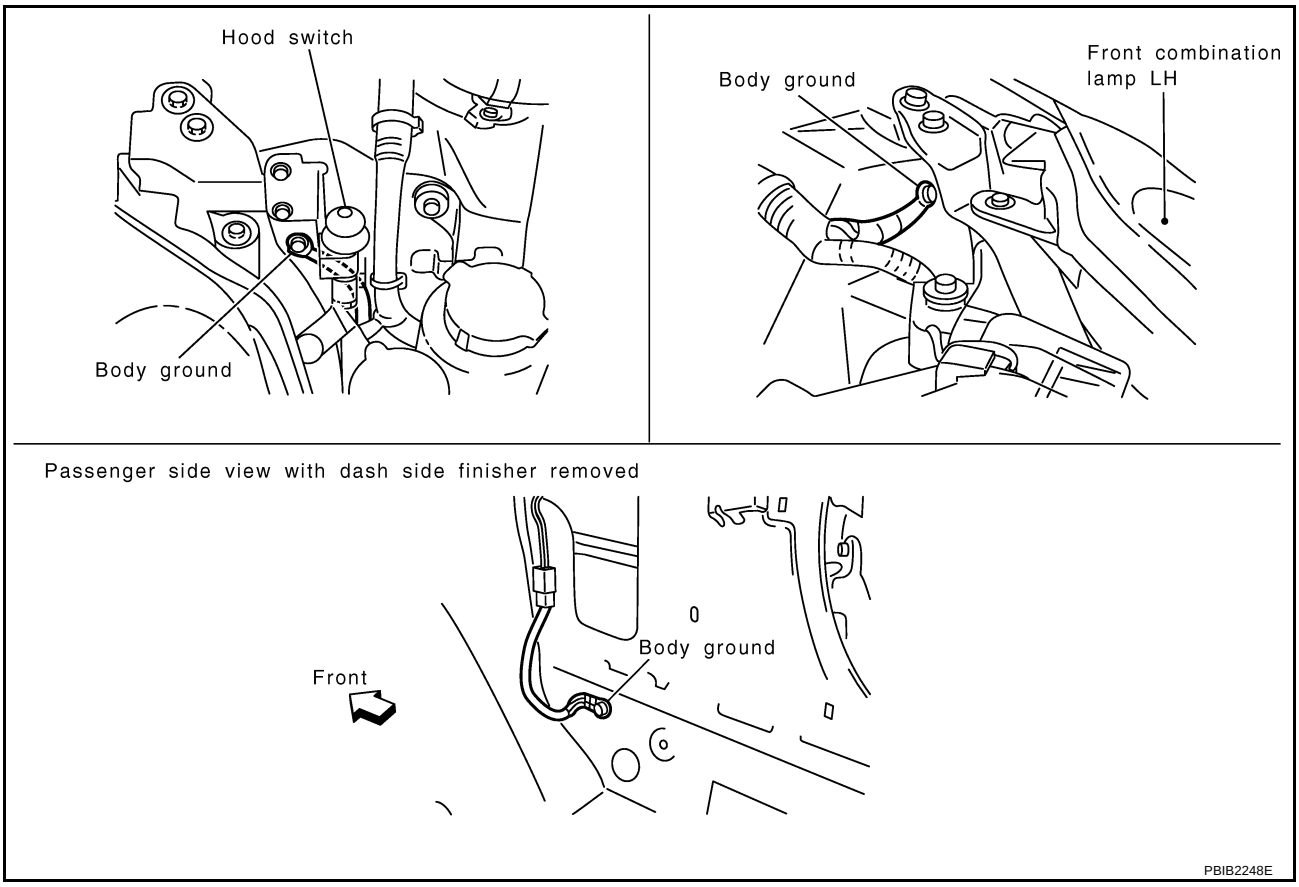
TBWT0209E

Diagnostic Procedure

ABS009FG

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

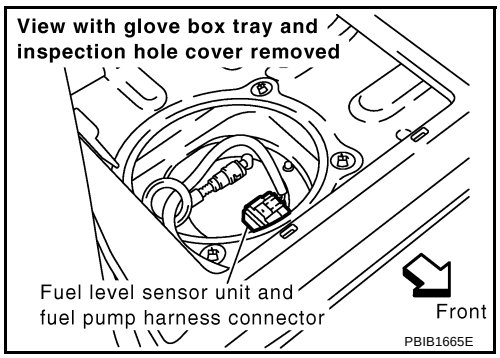


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

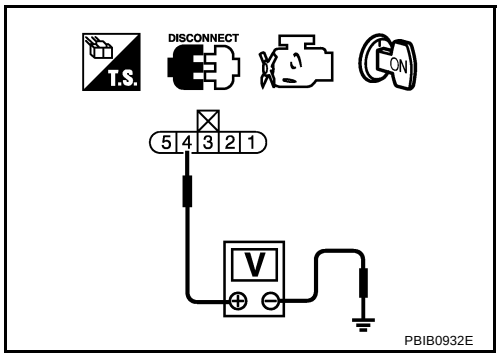
2. CHECK FUEL TANK TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

1. Disconnect “fuel level sensor unit and fuel pump” harness connector.
2. Turn ignition switch ON.



3. Check voltage between “fuel level sensor unit and fuel pump” terminal 4 and ground with CONSULT-II or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M72, F102
- Harness connectors B1, M12
- Harness for open or short between ECM and “fuel level sensor unit and fuel pump”

>> Repair open circuit or short to ground or short to power in harness or connector.

4. CHECK FUEL TANK TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect “unified meter and A/C amp.” harness connector M49.
3. Check harness continuity between “fuel level sensor unit and fuel pump” terminal 5 and “unified meter and A/C amp.” terminal 36. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B1, M12
- Harness for open or short between “fuel level sensor unit and fuel pump” and “unified meter and A/C amp.”

>> Repair open circuit or short to ground or short to power in harness or connector.

6. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-241, "Component Inspection" .

OK or NG

OK >> GO TO 7.
NG >> Replace fuel level sensor unit.

7. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

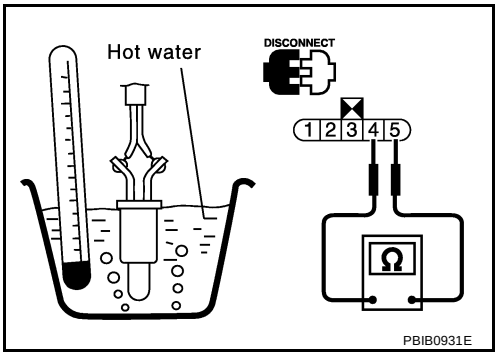
Component Inspection

ABS009FH

FUEL TANK TEMPERATURE SENSOR

1. Remove fuel level sensor unit.
2. Check resistance between “fuel level sensor unit and fuel pump” terminals 4 and 5 by heating with hot water or heat gun as shown in the figure.

Temperature °C (°F)	Resistance kΩ
20 (68)	2.3 - 2.7
50 (122)	0.79 - 0.90



Removal and Installation

ABS009FI

FUEL TANK TEMPERATURE SENSOR

Refer to FL-4, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY" .

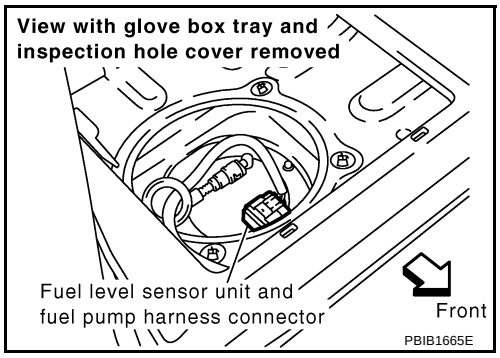
DTC P0182, P0183 FTT SENSOR

PFP:22630

Component Description

ABS009FJ

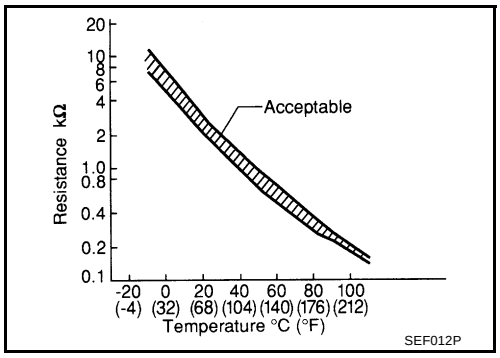
The fuel tank temperature sensor is used to detect the fuel temperature inside the fuel tank. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the fuel temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Fluid temperature °C (°F)	Voltage* V	Resistance kΩ
20 (68)	3.5	2.3 - 2.7
50 (122)	2.2	0.79 - 0.90

*: This data is reference values and is measured between ECM terminal 107 (Fuel tank temperature sensor) and ground.



CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

On Board Diagnosis Logic

ABS009FK

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0182 0182	Fuel tank temperature sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted.) ● Fuel tank temperature sensor
P0183 0183	Fuel tank temperature sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	

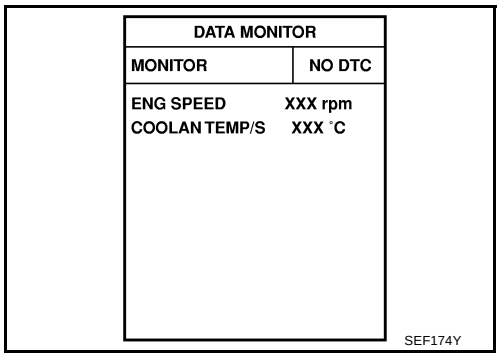
DTC Confirmation Procedure

ABS009FL

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Wait at least 5 seconds.
4. If 1st trip DTC is detected, go to EC-244, "Diagnostic Procedure" .



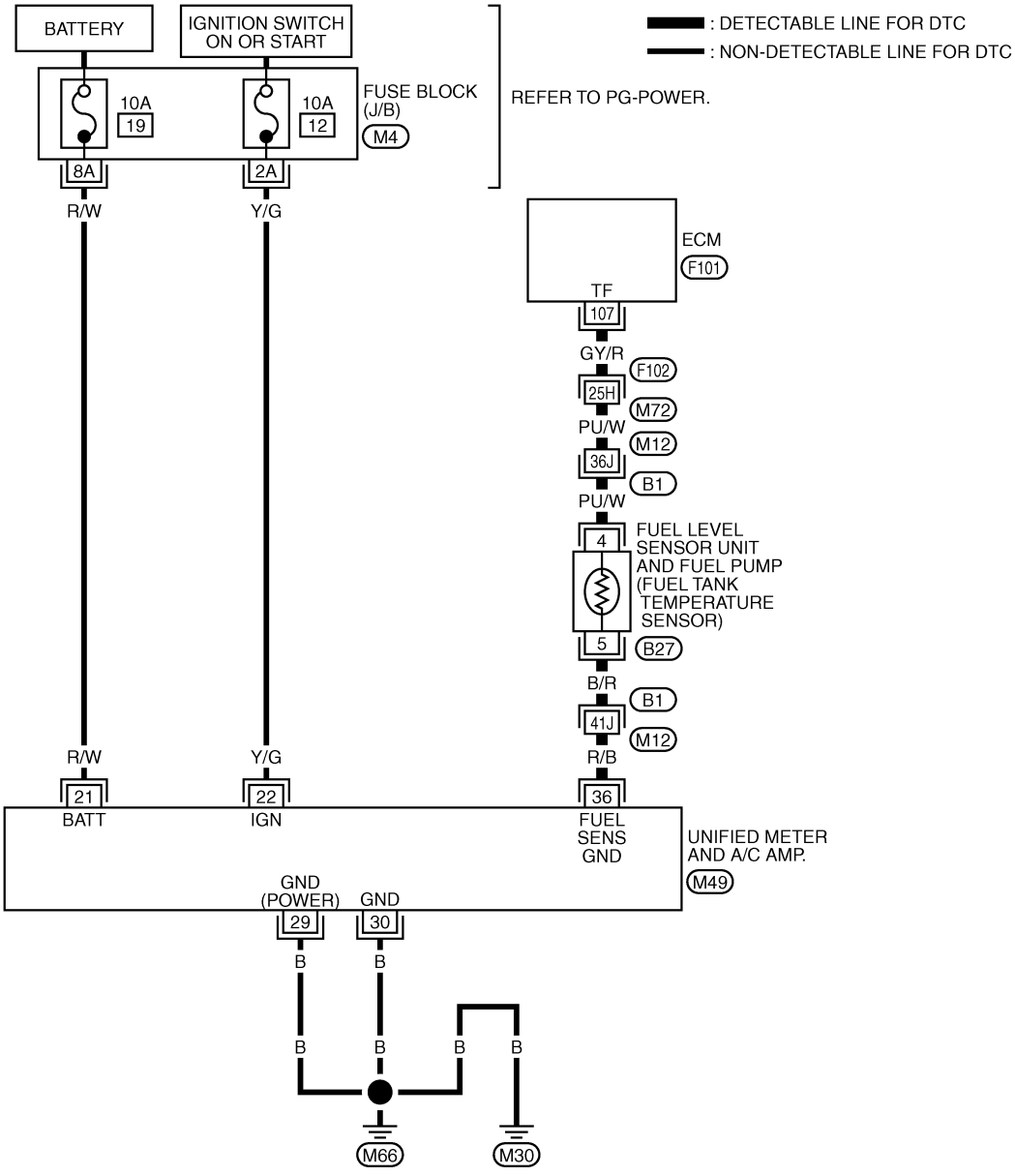
WITH GST

Follow the procedure “WITH CONSULT-II” above.

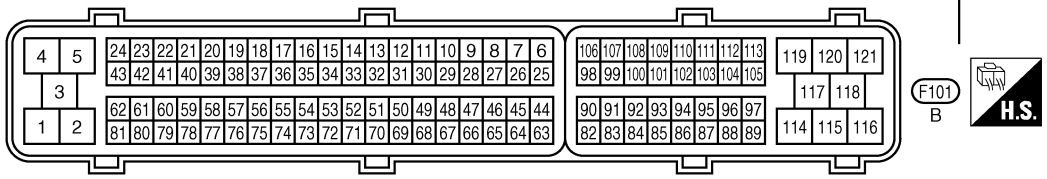
Wiring Diagram

ABS009FM

EC-FTTS-01



REFER TO THE FOLLOWING.
F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)



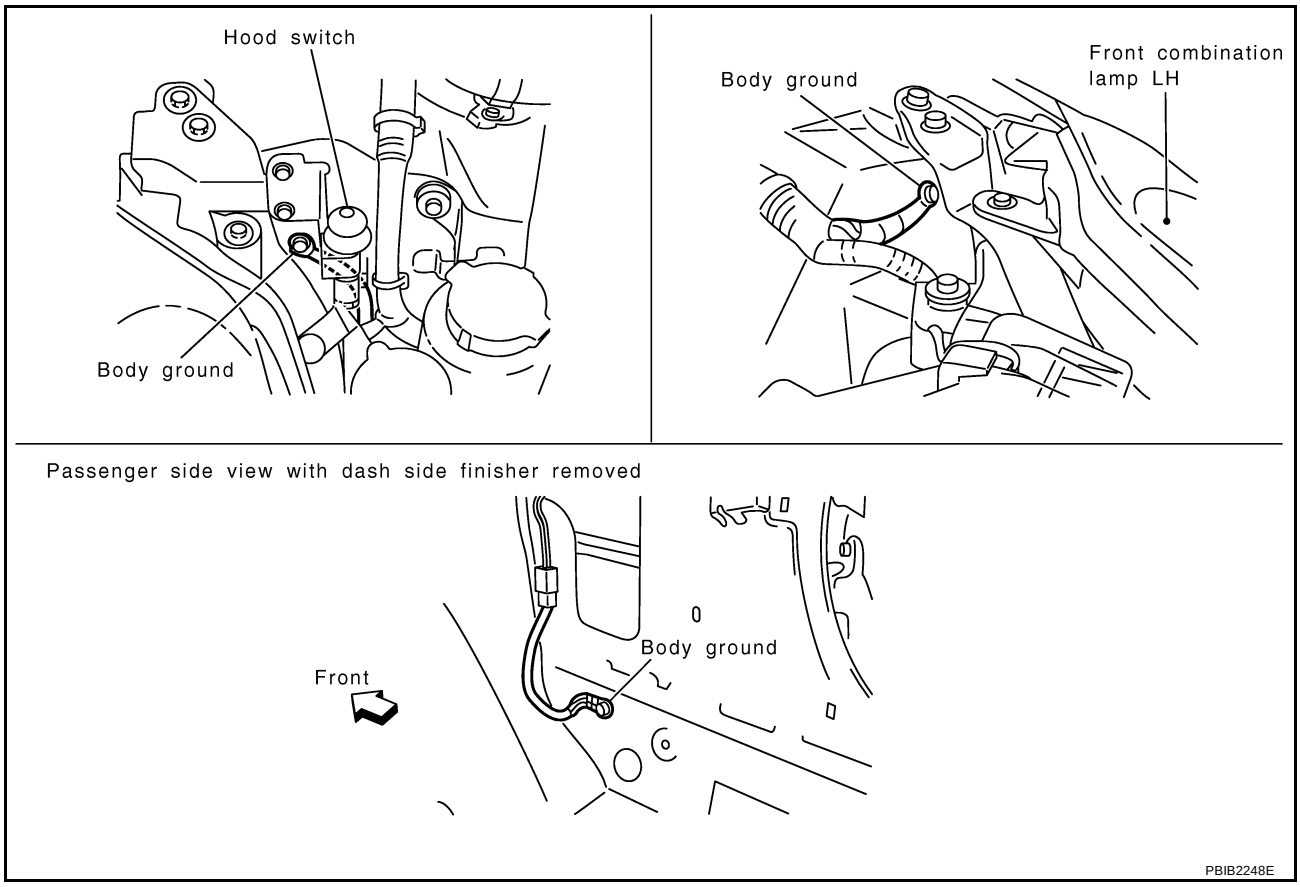
TBWT0209E

Diagnostic Procedure

ABS009FN

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

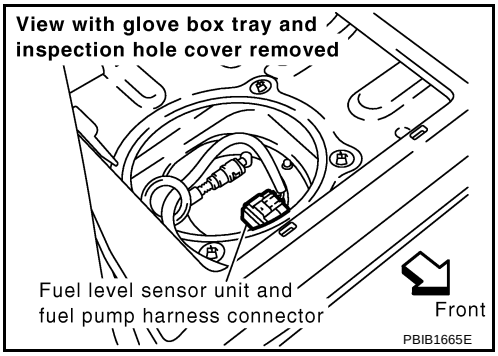


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

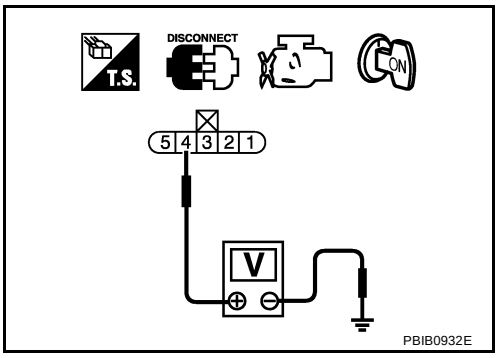
2. CHECK FUEL TANK TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

1. Disconnect “fuel level sensor unit and fuel pump” harness connector.
2. Turn ignition switch ON.



3. Check voltage between “fuel level sensor unit and fuel pump” terminal 4 and ground with CONSULT-II or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M72, F102
- Harness connectors B1, M12
- Harness for open or short between ECM and “fuel level sensor unit and fuel pump”

>> Repair open circuit or short to ground or short to power in harness or connector.

4. CHECK FUEL TANK TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect “unified meter and A/C amp.” harness connector M49.
3. Check harness continuity between “fuel level sensor unit and fuel pump” terminal 5 and “unified meter and A/C amp.” terminal 36. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B1, M12
- Harness for open or short between “fuel level sensor unit and fuel pump” and “unified meter and A/C amp.”

>> Repair open circuit short to ground or short to power in harness or connector.

6. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-241, "Component Inspection" .

OK or NG

OK >> GO TO 7.
NG >> Replace fuel level sensor unit.

7. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

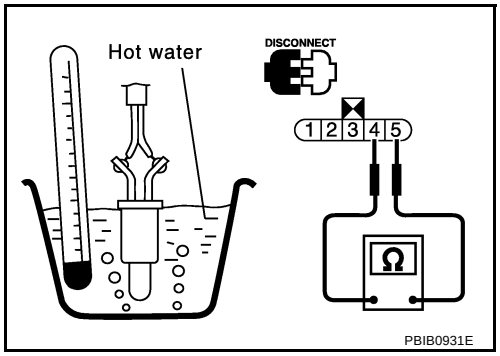
Component Inspection

ABS009FO

FUEL TANK TEMPERATURE SENSOR

1. Remove fuel level sensor unit.
2. Check resistance between “fuel level sensor unit and fuel pump” terminals 4 and 5 by heating with hot water or heat gun as shown in the figure.

Temperature °C (°F)	Resistance kΩ
20 (68)	2.3 - 2.7
50 (122)	0.79 - 0.90



Removal and Installation

ABS009FP

FUEL TANK TEMPERATURE SENSOR

Refer to FL-4, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY" .

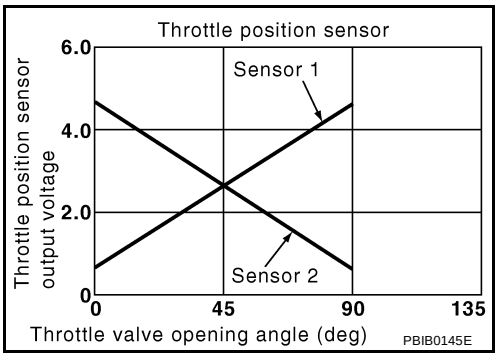
DTC P0222, P0223 TP SENSOR

PFP:16119

Component Description

ABS009FQ

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc. The throttle position sensor responds to the throttle valve movement.
The throttle position sensor has the two sensors. These sensors are a kind of potentiometers which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the throttle valve and feed the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and the ECM controls the throttle control motor to make the throttle valve opening angle properly in response to driving condition.



CONSULT-II Reference Value in Data Monitor Mode

ABS009FR

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
THRTL SEN1 THRTL SEN2*	● Ignition switch: ON (Engine stopped) ● Shift lever: D (A/T), 1st (M/T)	Accelerator pedal: Fully released	More than 0.36V
		Accelerator pedal: Fully depressed	Less than 4.75V

*: Throttle position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.

On Board Diagnosis Logic

ABS009FS

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0222 0222	Throttle position sensor 1 circuit low input	An excessively low voltage from the TP sensor 1 is sent to ECM.	● Harness or connectors (The TP sensor 1 circuit is open or shorted.) (APP sensor 2 circuit is shorted.) ● Electric throttle control actuator (TP sensor 1) ● Accelerator pedal position sensor (APP sensor 2)
P0223 0223	Throttle position sensor 1 circuit high input	An excessively high voltage from the TP sensor 1 is sent to ECM.	

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode an the MIL lights up.

Engine operation condition in fail-safe mode
The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

DTC Confirmation Procedure

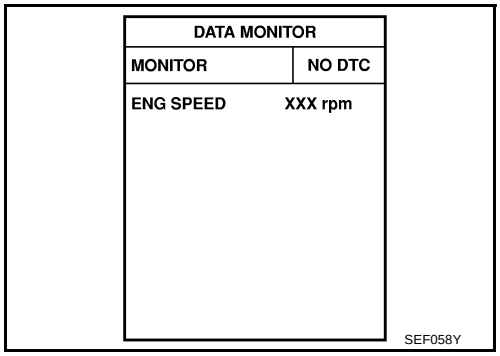
ABS009FT

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Start engine and let it idle for 1 second.
4. If DTC is detected, go to EC-251, "Diagnostic Procedure" .

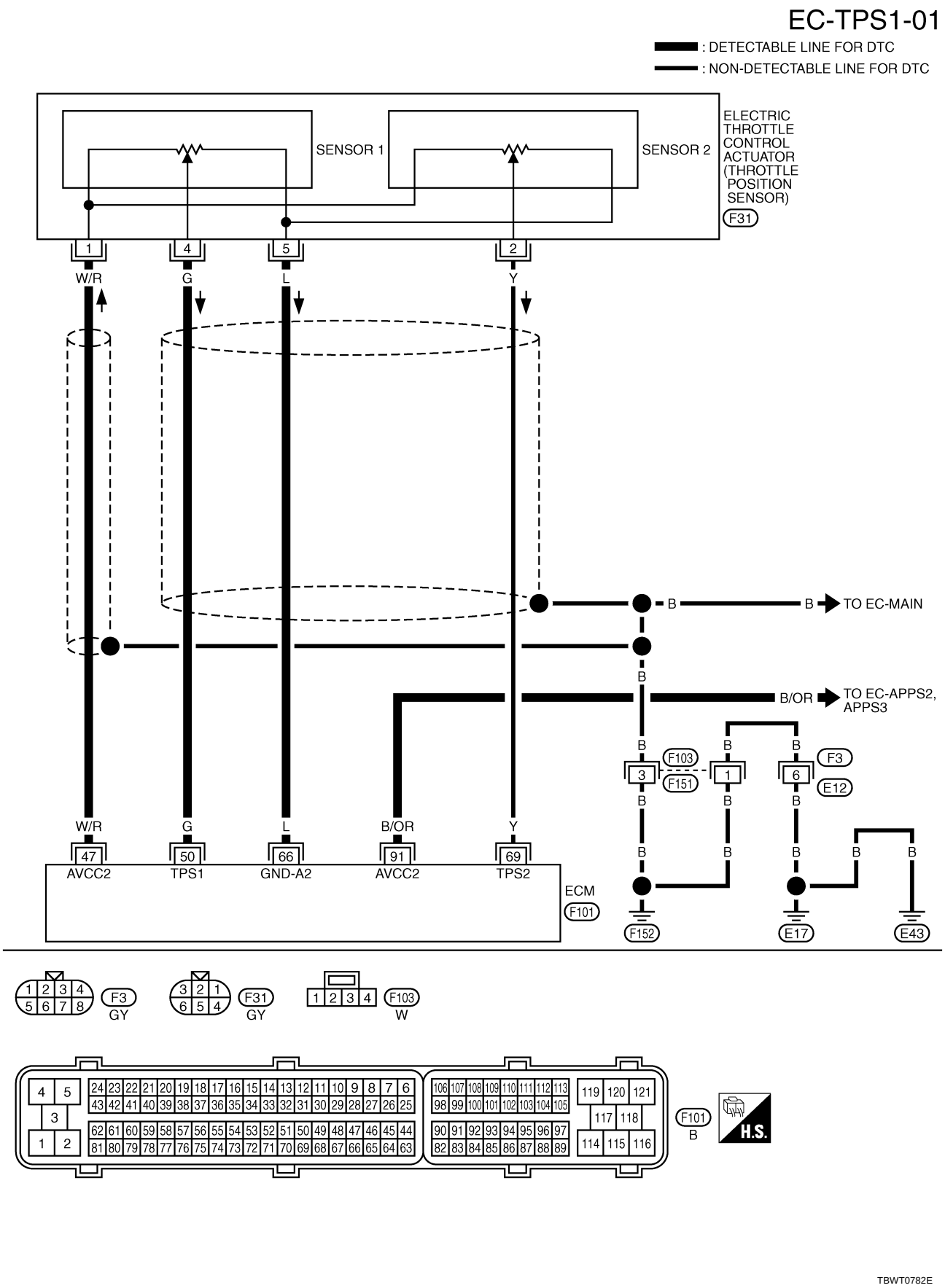


WITH GST

Follow the procedure “WITH CONSULT-II” above.

Wiring Diagram

ABS009FU



TBWT0782E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

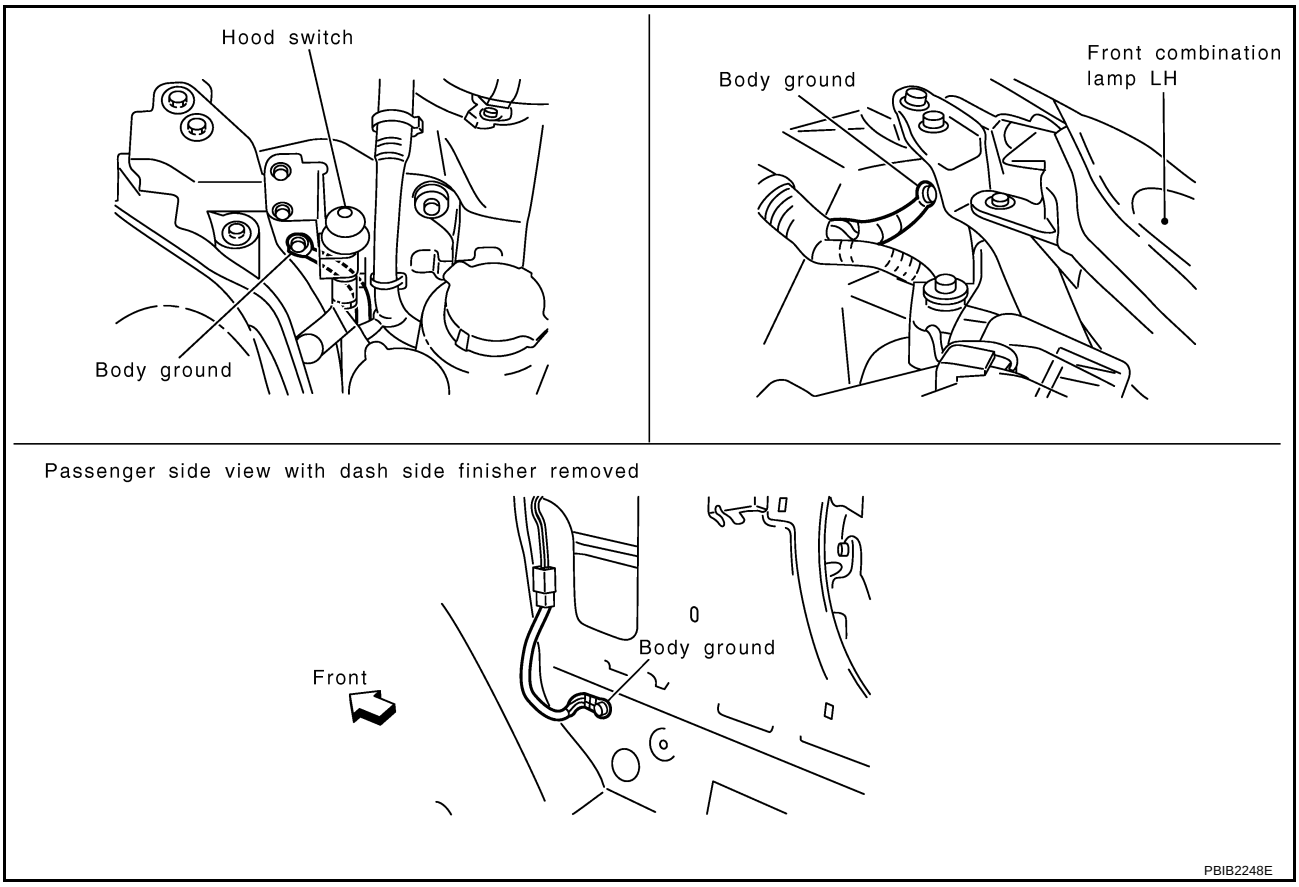
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
47	W/R	Sensor power supply (Throttle position sensor)	**[Ignition switch: ON]**	Approximately 5V
50	G	Throttle position sensor 1	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal is fully released	More than 0.36V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal is fully depressed	Less than 4.75V
66	L	Sensor ground (Throttle position sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V
69	Y	Throttle position sensor 2	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal is fully released	Less than 4.75V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal is fully depressed	More than 0.36V
91	B/OR	Sensor power supply (APP sensor 2)	**[Ignition switch: ON]**	Approximately 5V

Diagnostic Procedure

ABS009FV

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

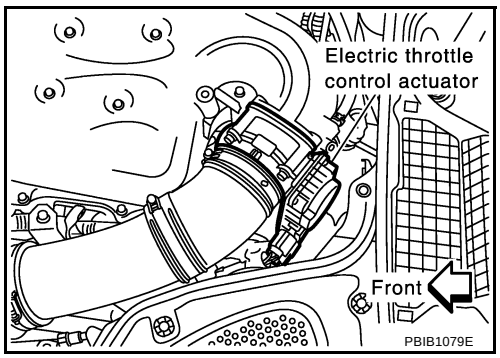


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

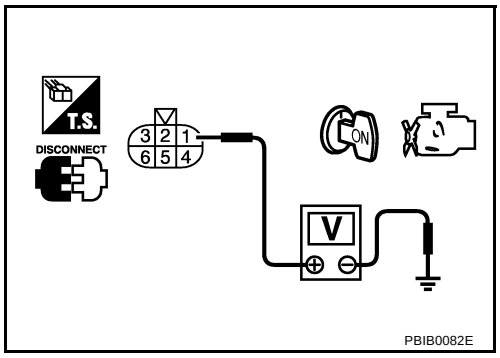
2. CHECK THROTTLE POSITION SENSOR 1 POWER SUPPLY CIRCUIT-I

1. Disconnect electric throttle control actuator harness connector.
2. Turn ignition switch ON.



3. Check voltage between electric throttle control actuator terminal 1 and ground with CONSULT-II or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 3.
NG >> GO TO 7.

3. CHECK THROTTLE POSITION SENSOR 1 POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between electric throttle control actuator terminal 1 and ECM terminal 47. Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace open circuit.

4. CHECK THROTTLE POSITION SENSOR 1 POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
47	Electric throttle control actuator terminal 1	EC-184
91	APP sensor terminal 4	EC-597

OK or NG

OK >> GO TO 5.
NG >> Repair short to ground or short to power in harness or connectors.

5. CHECK APP SENSOR

Refer to EC-602, "Component Inspection" .

OK or NG

OK >> GO TO 11.
NG >> GO TO 6.

6. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-42, "Accelerator Pedal Released Position Learning" .
3. Perform EC-42, "Throttle Valve Closed Position Learning" .
4. Perform EC-43, "Idle Air Volume Learning" .

>> **INSPECTION END**

7. CHECK THROTTLE POSITION SENSOR 1 GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between electric throttle control actuator terminal 5 and ECM terminal 66. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 8.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK THROTTLE POSITION SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 50 and electric throttle control actuator terminal 4. Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 9.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK THROTTLE POSITION SENSOR

Refer to EC-254, "Component Inspection" .

OK or NG

OK >> GO TO 11.
NG >> GO TO 10.

10. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace the electric throttle control actuator.
2. Perform EC-42, "Throttle Valve Closed Position Learning" .
3. Perform EC-43, "Idle Air Volume Learning" .

>> **INSPECTION END**

11. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

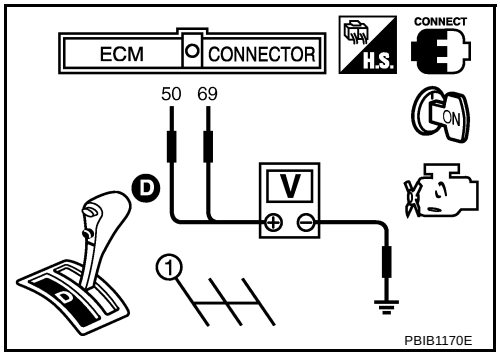
Component Inspection

ABS009FW

THROTTLE POSITION SENSOR

1. Reconnect all harness connectors disconnected.
2. Perform EC-42, "Throttle Valve Closed Position Learning" .
3. Turn ignition switch ON.
4. Set shift lever to D (A/T) or 1st (M/T) position.
5. Check voltage between ECM terminals 50 (TP sensor 1 signal), 69 (TP sensor 2 signal) and ground under the following conditions.

Terminal	Accelerator pedal	Voltage
50 (Throttle position sensor 1)	Fully released	More than 0.36V
	Fully depressed	Less than 4.75V
69 (Throttle position sensor 2)	Fully released	Less than 4.75V
	Fully depressed	More than 0.36V



6. If NG, replace electric throttle control actuator and go to the next step.
7. Perform EC-42, "Throttle Valve Closed Position Learning" .
8. Perform EC-43, "Idle Air Volume Learning" .

Removal and Installation

ABS009FX

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .

DTC P0300 - P0306 MULTIPLE CYLINDER MISFIRE, NO. 1 - 6 CYLINDER MISFIRE

PFP:00000

On Board Diagnosis Logic

ABS009FY

When a misfire occurs, engine speed will fluctuate. If the engine speed fluctuates enough to cause the crankshaft position (CKP) sensor (POS) signal to vary, ECM can determine that a misfire is occurring.

Sensor	Input Signal to ECM	ECM function
Crankshaft position sensor (POS)	Engine speed	On board diagnosis of misfire

The misfire detection logic consists of the following two conditions.

1. One Trip Detection Logic (Three Way Catalyst Damage)
   On the first trip that a misfire condition occurs that can damage the three way catalyst (TWC) due to overheating, the MIL will blink.
   When a misfire condition occurs, the ECM monitors the CKP sensor signal every 200 engine revolutions for a change.
   When the misfire condition decreases to a level that will not damage the TWC, the MIL will turn off.
   If another misfire condition occurs that can damage the TWC on a second trip, the MIL will blink.
   When the misfire condition decreases to a level that will not damage the TWC, the MIL will remain on.
   If another misfire condition occurs that can damage the TWC, the MIL will begin to blink again.
2. Two Trip Detection Logic (Exhaust quality deterioration)
   For misfire conditions that will not damage the TWC (but will affect vehicle emissions), the MIL will only light when the misfire is detected on a second trip. During this condition, the ECM monitors the CKP sensor signal every 1,000 engine revolutions.
   A misfire malfunction can be detected on any one cylinder or on multiple cylinders.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0300 0300	Multiple cylinder misfire detected	Multiple cylinder misfire.	● Improper spark plug ● Insufficient compression ● Incorrect fuel pressure ● The injector circuit is open or shorted ● Fuel injector ● Intake air leak ● The ignition signal circuit is open or shorted ● Lack of fuel ● Signal plate ● Air fuel ratio (A/F) sensor 1 ● Incorrect PCV hose connection
P0301 0301	No.1 cylinder misfire detected	No. 1 cylinder misfires.	
P0302 0302	No. 2 cylinder misfire detected	No. 2 cylinder misfires.	
P0303 0303	No. 3 cylinder misfire detected	No. 3 cylinder misfires.	
P0304 0304	No. 4 cylinder misfire detected	No. 4 cylinder misfires.	
P0305 0305	No. 5 cylinder misfire detected	No. 5 cylinder misfires.	
P0306 0306	No. 6 cylinder misfire detected	No. 6 cylinder misfires.	

DTC Confirmation Procedure

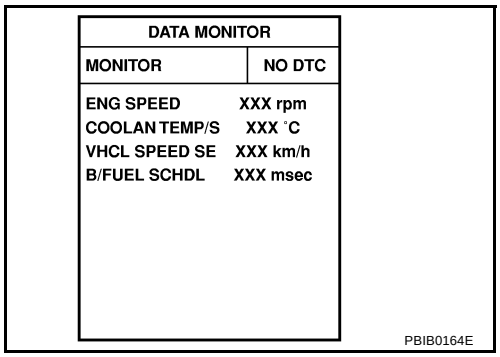
ABS009FZ

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-II

1. Turn ignition switch ON, and select “DATA MONITOR” mode with CONSULT-II.
2. Start engine and warm it up to normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Restart engine and let it idle for about 15 minutes.
5. If 1st trip DTC is detected, go to EC-256, "Diagnostic Procedure" .



NOTE:
If 1st trip DTC is not detected during above procedure, performing the following procedure is advised.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Start engine and drive the vehicle under the similar conditions to (1st trip) Freeze Frame Data for a certain time. Refer to the table below.
   Hold the accelerator pedal as steady as possible.

   The similar conditions to (1st trip) Freeze Frame Data means the vehicle operation that the following conditions should be satisfied at the same time.

Engine speed	Engine speed in the freeze frame data ± 400 rpm
Vehicle speed	Vehicle speed in the freeze frame data ± 10 km/h (6 MPH)
Engine coolant temperature (T) condition	When the freeze frame data shows lower than 70 °C (158 °F), T should be lower than 70 °C (158 °F).
	When the freeze frame data shows higher than or equal to 70 °C (158 °F), T should be higher than or equal to 70 °C (158 °F).

The time to driving varies according to the engine speed in the freeze frame data.

Engine speed	Time
Around 1,000 rpm	Approximately 10 minutes
Around 2,000 rpm	Approximately 5 minutes
More than 3,000 rpm	Approximately 3.5 minutes

WITH GST

Follow the procedure “WITH CONSULT-II” above.

Diagnostic Procedure

ABS009G0

1. CHECK FOR INTAKE AIR LEAK AND PCV HOSE

1. Start engine and run it at idle speed.
2. Listen for the sound of the intake air leak.
3. Check PCV hose connection.

OK or NG

OK >> GO TO 2.
NG >> Discover air leak location and repair.

2. CHECK FOR EXHAUST SYSTEM CLOGGING

Stop engine and visually check exhaust tube, three way catalyst and muffler for dents.

OK or NG

OK >> GO TO 3.
NG >> Repair or replace it.

3. PERFORM POWER BALANCE TEST

With CONSULT-II

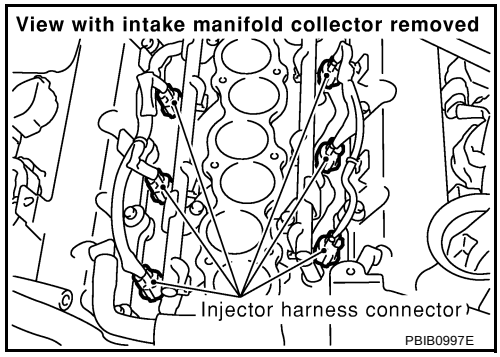
1. Perform “POWER BALANCE” in “ACTIVE TEST” mode.
2. Is there any cylinder which does not produce a momentary engine speed drop?

ACTIVE TEST	
POWER BALANCE	
MONITOR	
ENG SPEED	XXX rpm
MAS A/F SE-B1	XXX V

PBIB0133E

Without CONSULT-II

When disconnecting each injector harness connector one at a time, is there any cylinder which does not produce a momentary engine speed drop?



Yes or No

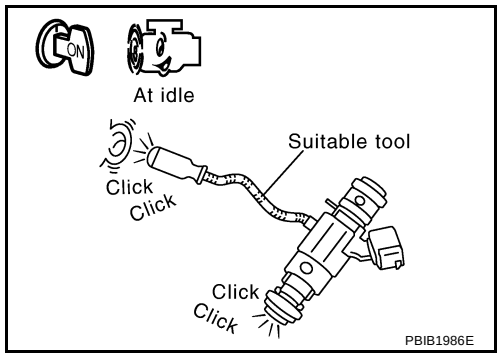
Yes >> GO TO 4.
No >> GO TO 7.

4. CHECK INJECTOR

Does each injector make an operating sound at idle?

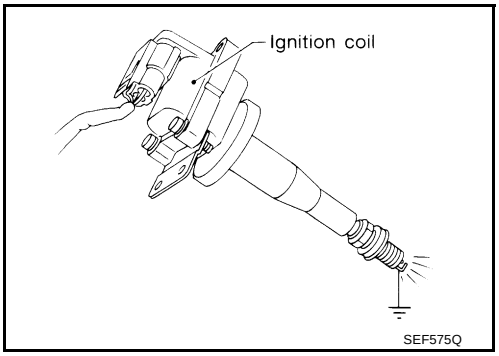
Yes or No

Yes >> GO TO 5.
No >> Check injector(s) and circuit(s). Refer to EC-632, "INJECTOR CIRCUIT" .



5. CHECK IGNITION SPARK

1. Turn ignition switch OFF.
2. Remove ignition coil assembly from rocker cover.
3. Remove spark plug from ignition coil assembly
4. Connect a known-good spark plug to the ignition coil.
5. Disconnect all injector harness connectors.
6. Place end of spark plug against a suitable ground and crank engine.
7. Check for spark.

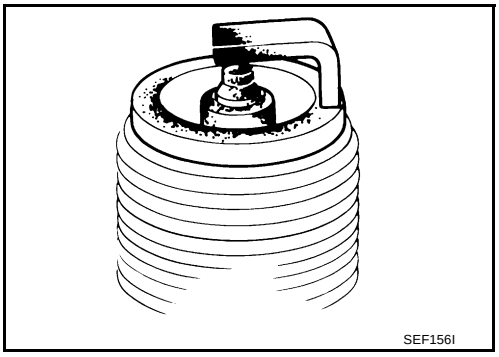


OK or NG

OK >> GO TO 6.
NG >> Check ignition coil, power transistor and their circuits. Refer to EC-620, "IGNITION SIGNAL" .

6. CHECK SPARK PLUGS

Remove the spark plugs and check for fouling, etc.



OK or NG

OK >> GO TO 7.
NG >> Repair or replace spark plug(s) with standard type one(s). For spark plug type, refer to, MA-20, "Changing Spark Plugs (Platinum-Tipped Type)" .

7. CHECK COMPRESSION PRESSURE

Check compression pressure. Refer to EM-92, "CHECKING COMPRESSION PRESSURE" .

Standard:	**1,275 kPa (13.0 kg/cm^2 , 185 psi)/300 rpm**
Minimum:	**981 kPa (10.0 kg/cm^2 , 142 psi)/300 rpm**
Difference between each cylinder:	**98 kPa (1.0 kg/cm^2 , 14 psi)/300 rpm**

OK or NG

OK >> GO TO 8.
NG >> Check pistons, piston rings, valves, valve seats and cylinder head gaskets.

8. CHECK FUEL PRESSURE

1. Install all removed parts.
2. Release fuel pressure to zero. Refer to EC-45, "FUEL PRESSURE RELEASE" .
3. Install fuel pressure gauge and check fuel pressure. Refer to EC-45, "FUEL PRESSURE CHECK" .

At idle: Approx. 350 kPa (3.57 kg/cm^2 , 51 psi)

OK or NG

OK >> GO TO 10.
NG >> GO TO 9.

9. DETECT MALFUNCTIONING PART

Check the following.

- Fuel pump and circuit (Refer to EC-638, "FUEL PUMP CIRCUIT" .)
- Fuel pressure regulator (Refer to EC-45, "FUEL PRESSURE CHECK" .)
- Fuel lines
- Fuel filter for clogging

>> Repair or replace.

10. CHECK IGNITION TIMING

Check the following items. Refer to EC-78, "Basic Inspection" .

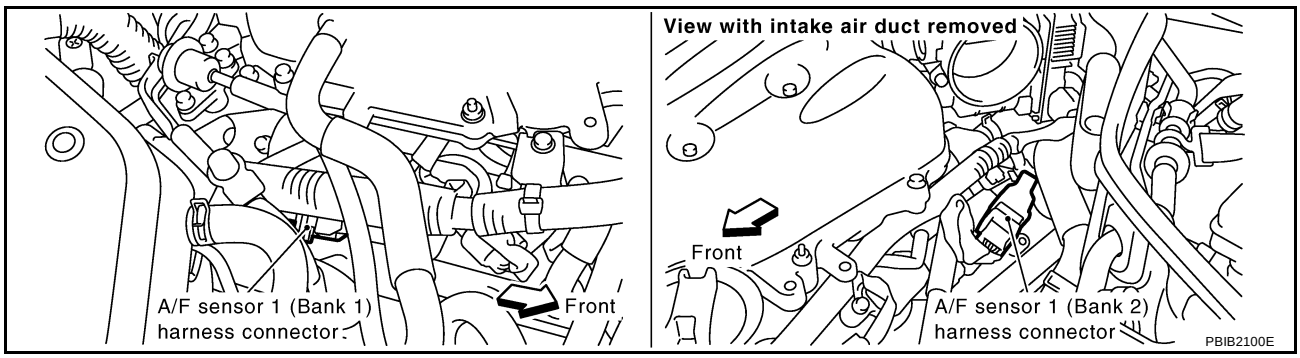
Items		Specifications
Target idle speed	A/T	650 ± 50 rpm (in P or N position)
	M/T	650 ± 50 rpm
Ignition timing	A/T	15 ± 5° BTDC (in P or N position)
	M/T	15 ± 5° BTDC

OK or NG

OK >> GO TO 11.
NG >> Follow the EC-78, "Basic Inspection" .

11. CHECK A/F SENSOR 1 CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect corresponding A/F sensor 1 harness connector.



3. Disconnect ECM harness connector.
4. Check harness continuity between the following terminals.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	16	1	76
2	75	2	77
5	35	5	57
6	56	6	58

Continuity should exist.

5. Check harness continuity between the following terminals and ground.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	16	1	76
2	75	2	77
5	35	5	57
6	56	6	58

Continuity should not exist.

6. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

12. CHECK A/F SENSOR 1 HEATER

Refer to EC-384, "Component Inspection" .

OK or NG

OK >> GO TO 13.
NG >> Replace (malfunctioning) A/F sensor 1.

13. CHECK MASS AIR FLOW SENSOR

With CONSULT-II
Check mass air flow sensor signal in “DATA MONITOR” mode with CONSULT-II.

2.0 - 6.0 g·m/sec: at idling
7.0 - 20.0 g·m/sec: at 2,500 rpm

With GST
Check mass air flow sensor signal in MODE 1 with GST.

2.0 - 6.0 g·m/sec: at idling
7.0 - 20.0 g·m/sec: at 2,500 rpm

OK or NG

OK >> GO TO 14.
NG >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or grounds. Refer to EC-153, "DTC P0101 MAF SENSOR" .

14. CHECK SYMPTOM MATRIX CHART

Check items on the rough idle symptom in EC-83, "Symptom Matrix Chart" .

OK or NG

OK >> GO TO 15.
NG >> Repair or replace.

15. ERASE THE 1ST TRIP DTC

Some tests may cause a 1st trip DTC to be set.
Erase the 1st trip DTC from the ECM memory after performing the tests. Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .

>> GO TO 16.

16. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

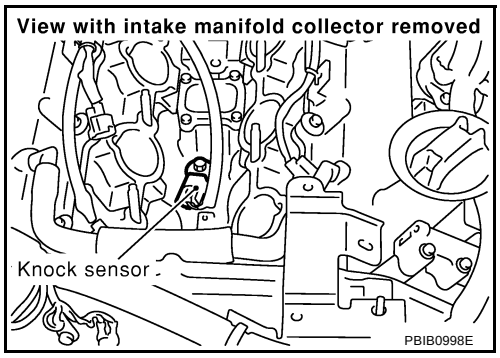
DTC P0327, P0328 KS

PFP:22060

Component Description

ABS009G1

The knock sensor is attached to the cylinder block. It senses engine knocking using a piezoelectric element. A knocking vibration from the cylinder block is sensed as vibrational pressure. This pressure is converted into a voltage signal and sent to the ECM.



On Board Diagnosis Logic

ABS009G2

The MIL will not light up for these diagnoses.

DTC No.	Trouble diagnosis name	DTC detected condition	Possible cause
P0327 0327	Knock sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted.) ● Knock sensor
P0328 0328	Knock sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	

DTC Confirmation Procedure

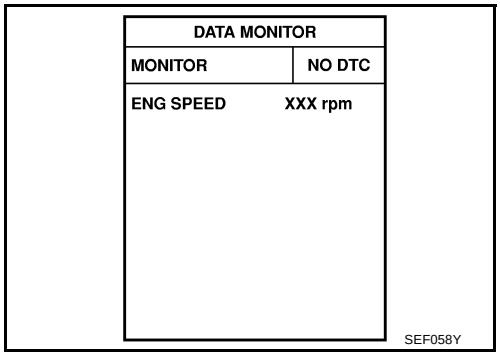
ABS009G3

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

WITH CONSULT-II

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-II.
2. Start engine and run it for at least 5 seconds at idle speed.
3. If 1st trip DTC is detected, go to EC-264, "Diagnostic Procedure" .



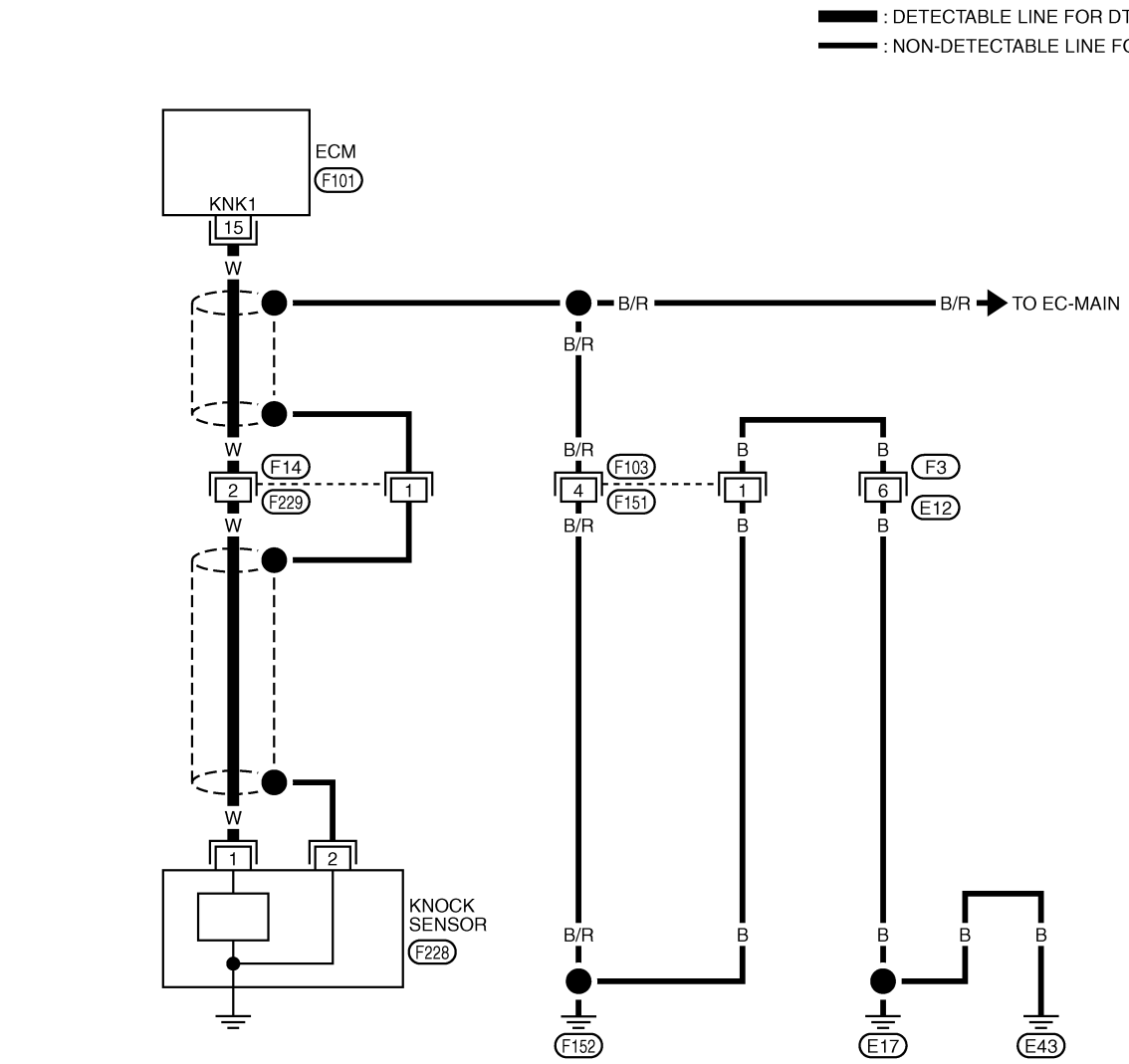
WITH GST

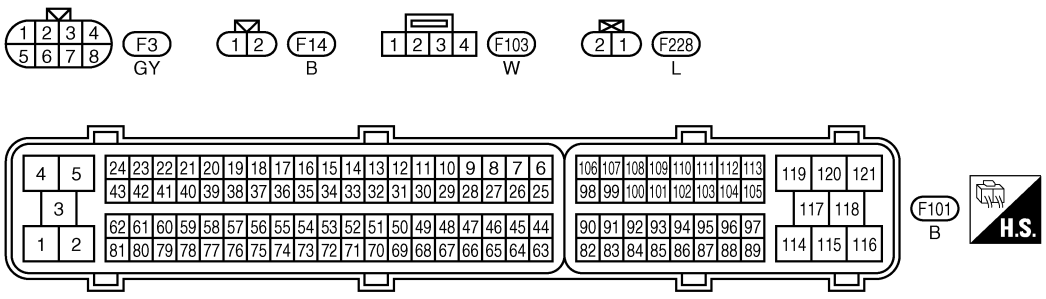
Follow the procedure “WITH CONSULT-II” above.

Wiring Diagram

ABS009G4

EC-KS-01





TBWT0487E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
15	W	Knock sensor	**[Engine is running]** ● Idle speed	Approximately 2.5V

Diagnostic Procedure

ABS009G5

1. CHECK KNOCK SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-I

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check resistance between ECM terminal 15 and ground. Refer to Wiring Diagram.

   NOTE:
   It is necessary to use an ohmmeter which can measure more than 10 MΩ.

   Resistance: Approximately 532 - 588 kΩ [at 20°C (68°F)]

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK KNOCK SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-II

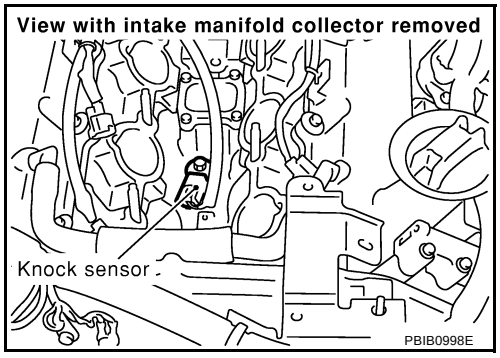
1. Disconnect knock sensor harness connector.
2. Check harness continuity between ECM terminal 15 and knock sensor terminal 1.
   Refer to Wiring Diagram.

   Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.



3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F14, F229
- Harness for open or short between ECM and knock sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK KNOCK SENSOR

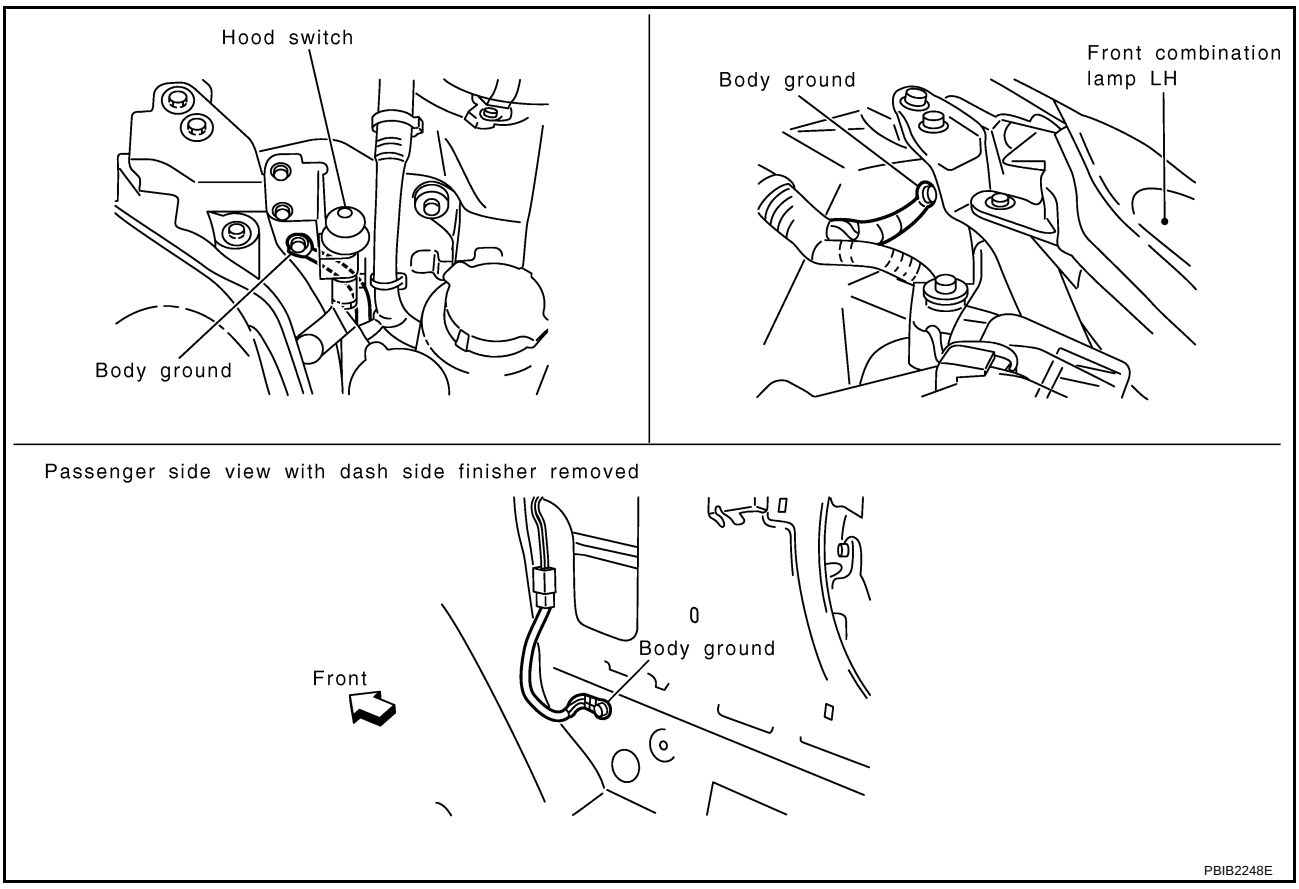
Refer to EC-266, "Component Inspection" .

OK or NG

OK >> GO TO 5.
NG >> Replace knock sensor.

5. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .



OK or NG

OK >> GO TO 6.
NG >> Repair or replace ground connections.

6. CHECK KNOCK SENSOR SHIELD CIRCUIT FOR OPEN AND SHORT

1. Disconnect knock sensor harness connector.
2. Check harness continuity between knock sensor terminal 2 and ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F14, F229
- Harness connectors F103, F151
- Harness connectors F3, E12
- Harness for open or short between knock sensor terminal 2 and ground

>> Repair open circuit or short power in harness or connectors.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

ABS009G6

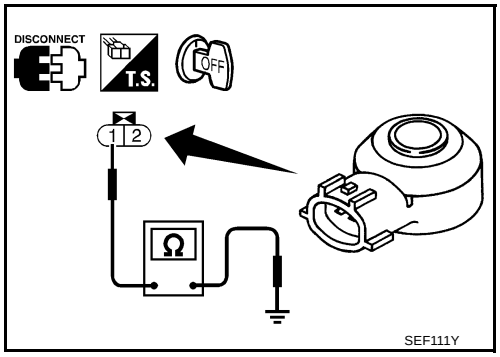
KNOCK SENSOR

Check resistance between knock sensor terminal 1 and ground.

NOTE:
It is necessary to use an ohmmeter which can measure more than 10 MΩ.

Resistance: Approximately 532 - 588 kΩ [at 20°C (68°F)]

CAUTION:
Do not use any knock sensors that have been dropped or physically damaged. Use only new ones.



Removal and Installation

ABS009G7

KNOCK SENSOR

Refer to EM-111, "CYLINDER BLOCK" .

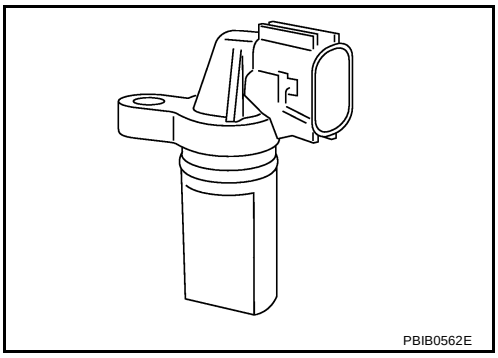
DTC P0335 CKP SENSOR (POS)

PFP:23731

Component Description

ABS009G8

The crankshaft position sensor (POS) is located on the oil pan facing the gear teeth (cogs) of the signal plate. It detects the fluctuation of the engine revolution.
The sensor consists of a permanent magnet and Hall IC.
When the engine is running, the high and low parts of the teeth cause the gap with the sensor to change.
The changing gap causes the magnetic field near the sensor to change.
Due to the changing magnetic field, the voltage from the sensor changes.
The ECM receives the voltage signal and detects the fluctuation of the engine revolution.


PBIB0562E

CONSULT-II Reference Value in Data Monitor Mode

ABS009G9

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
ENG SPEED	● Run engine and compare CONSULT-II value with the tachometer indication.	Almost the same speed as the tachometer indication.

On Board Diagnosis Logic

ABS009GA

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0335 0335	Crankshaft position sensor (POS) circuit	● The crankshaft position sensor (POS) signal is not detected by the ECM during the first few seconds of engine cranking. ● The proper pulse signal from the crankshaft position sensor (POS) is not sent to ECM while the engine is running. ● The crankshaft position sensor (POS) signal is not in the normal pattern during engine running.	● Harness or connectors (The sensor circuit is open or shorted) ● Crankshaft position sensor (POS) ● Signal plate

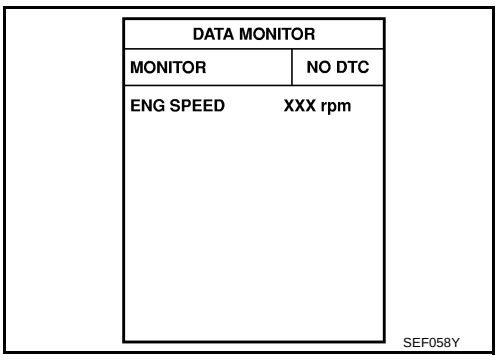
DTC Confirmation Procedure

ABS009GB

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 10.5V with ignition switch ON.

WITH CONSULT-II

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-II.
2. Crank engine for at least 2 seconds and run it for at least 5 seconds at idle speed.
3. If 1st trip DTC is detected, go to EC-270, "Diagnostic Procedure" .



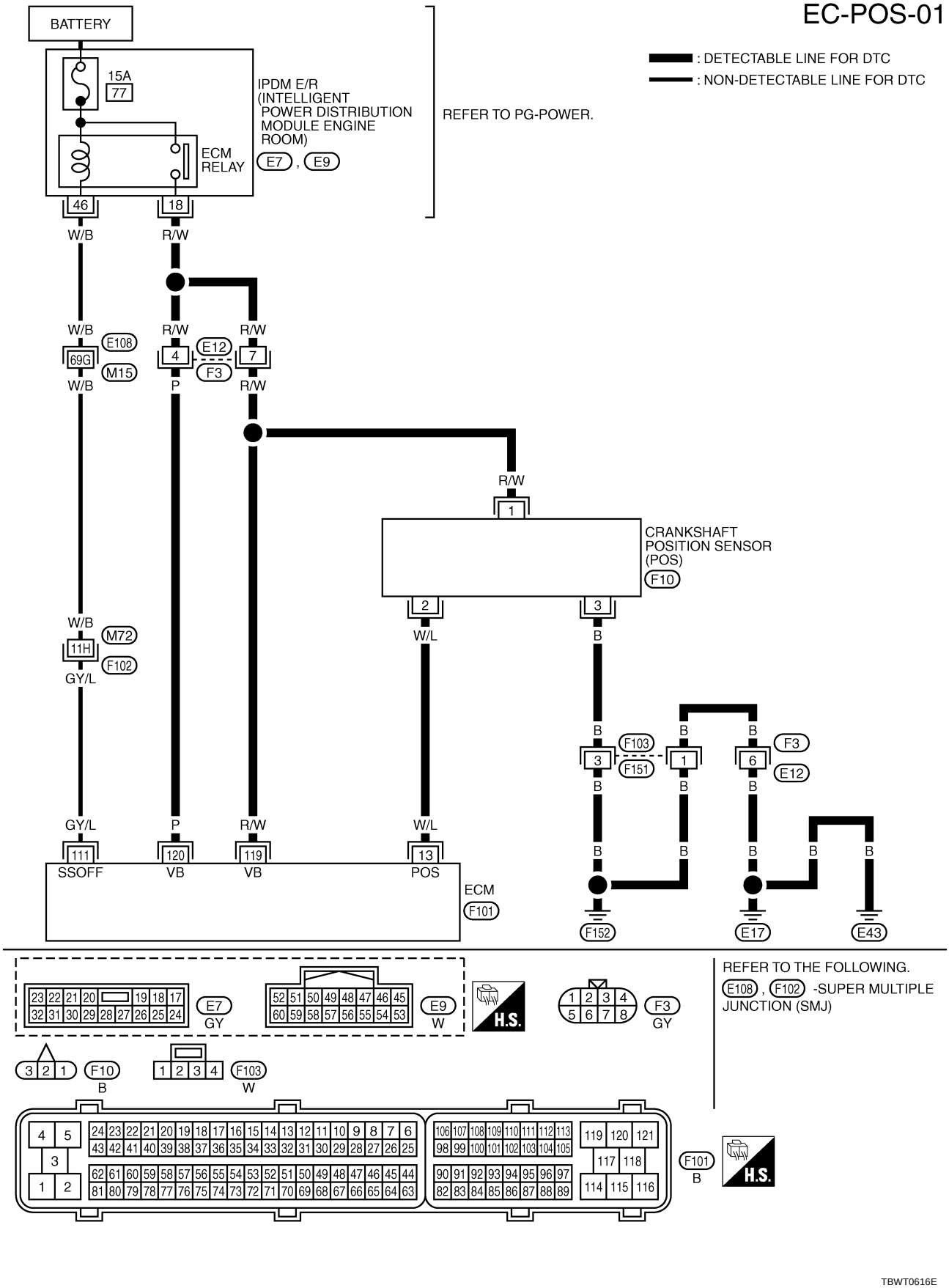
SEF058Y

WITH GST

Follow the procedure “WITH CONSULT-II” above.

Wiring Diagram

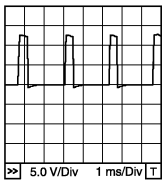
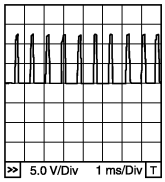
ABS009GC



TBWT0616E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-II.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
13	W/L	Crankshaft position sensor (POS)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	Approximately 1.6V★  PBIB1041E
			[Engine is running] ● Engine speed is 2,000 rpm.	Approximately 1.4V★  PBIB1042E

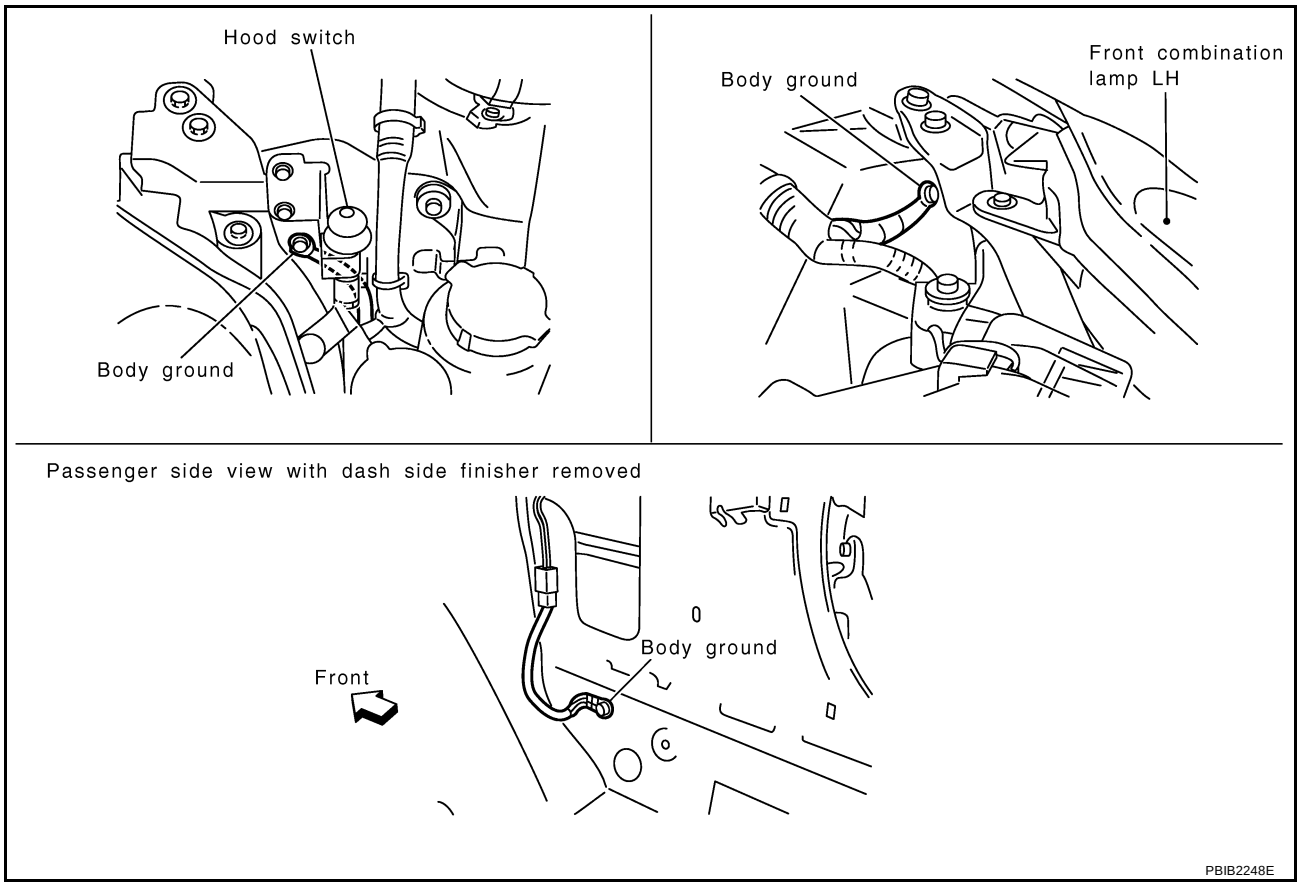
★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

ABS009GD

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

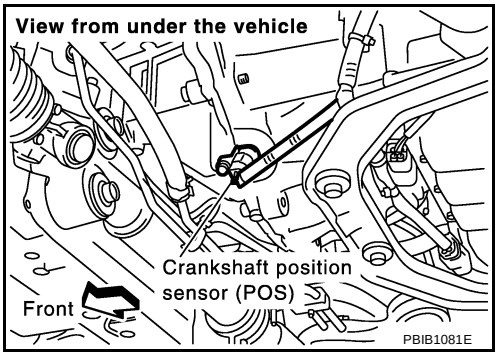


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

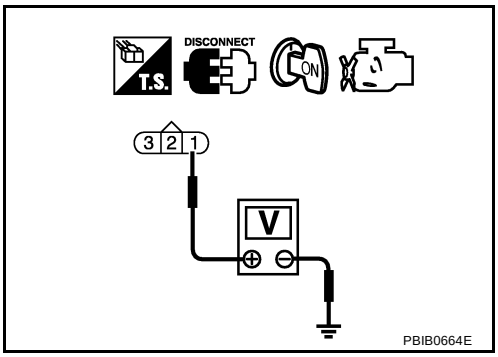
2. CHECK CRANKSHAFT POSITION (CKP) SENSOR (POS) POWER SUPPLY CIRCUIT

1. Disconnect crankshaft position (CKP) sensor (POS) harness connector.
2. Turn ignition switch ON.



3. Check voltage between CKP sensor (POS) terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness for open or short between crankshaft position sensor (POS) and ECM
- Harness for open or short between crankshaft position sensor (POS) and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK CKP SENSOR (POS) GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Check harness continuity between CKP sensor (POS) terminal 3 and ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness connectors F103, F151
- Harness for open or short between crankshaft position sensor (POS) and ground

>> Repair open circuit or short to power in harness or connectors.

6. CHECK CKP SENSOR (POS) INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminal 13 and CKP sensor (POS) terminal 2. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK CRANKSHAFT POSITION SENSOR (POS)

Refer to EC-273, "Component Inspection" .

OK or NG

OK >> GO TO 8.
NG >> Replace crankshaft position sensor (POS).

8. CHECK GEAR TOOTH

Visually check for chipping signal plate gear tooth.

OK or NG

OK >> GO TO 9.
NG >> Replace the signal plate.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

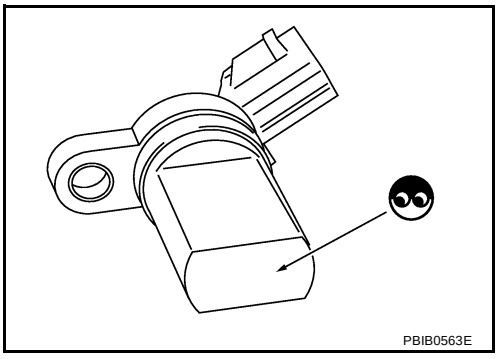
>> **INSPECTION END**

Component Inspection

ABS009GE

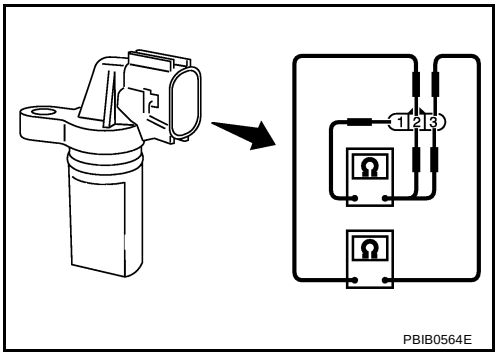
CRANKSHAFT POSITION SENSOR (POS)

1. Loosen the fixing bolt of the sensor.
2. Disconnect crankshaft position sensor (POS) harness connector.
3. Remove the sensor.
4. Visually check the sensor for chipping.



5. Check resistance as shown in the figure.

Terminal No. (Polarity)	Resistance Ω [at 25°C (77°F)]
1 (+) - 2 (-)	Except 0 or ∞
1 (+) - 3 (-)	
2 (+) - 3 (-)	



Removal and Installation

ABS009GF

CRANKSHAFT POSITION SENSOR (POS)

Refer to EM-27, "OIL PAN AND OIL STRAINER" .

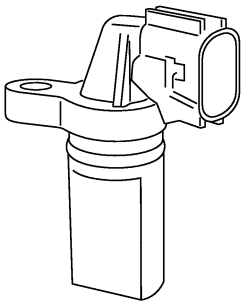
DTC P0340, P0345 CMP SENSOR (PHASE)

PFP:23731

Component Description

ABS009GG

The camshaft position sensor (PHASE) senses the retraction of intake valve camshaft to identify a particular cylinder. The camshaft position sensor (PHASE) senses the piston position.
When the crankshaft position sensor (POS) system becomes inoperative, the camshaft position sensor (PHASE) provides various controls of engine parts instead, utilizing timing of cylinder identification signals.
The sensor consists of a permanent magnet and Hall IC.
When engine is running, the high and low parts of the teeth cause the gap with the sensor to change.
The changing gap causes the magnetic field near the sensor to change.
Due to the changing magnetic field, the voltage from the sensor changes.


PBIB0562E

CONSULT-II Reference Value in Data Monitor Mode

ABS009GH

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
ENG SPEED	● Run engine and compare CONSULT-II value with the tachometer indication.	Almost the same speed as the tachometer indication.

On Board Diagnosis Logic

ABS009GI

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0340 0340 (Bank 1) P0345 0345 (Bank 2)	Camshaft position sensor (PHASE) circuit	● The cylinder No. signal is not sent to ECM for the first few seconds during engine cranking. ● The cylinder No. signal is not sent to ECM during engine running. ● The cylinder No. signal is not in the normal pattern during engine running.	● Harness or connectors (The sensor circuit is open or shorted) ● Camshaft position sensor (PHASE) ● Camshaft (Intake) ● Starter motor (Refer to SC-10 .) ● Starting system circuit (Refer to SC-10 .) ● Dead (Weak) battery

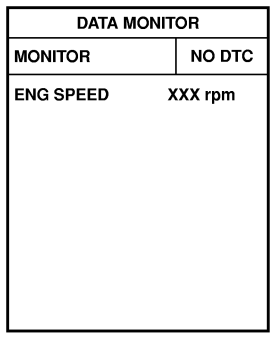
DTC Confirmation Procedure

ABS009GJ

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 10.5V with ignition switch ON.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Crank engine for at least 2 seconds and run it for at least 5 seconds at idle speed.
4. If 1st trip DTC is detected, go to EC-278, "Diagnostic Procedure" .
   If 1st trip DTC is not detected, go to next step.
5. Maintaining engine speed at more than 800 rpm for at least 5 seconds.
6. If 1st trip DTC is detected, go to EC-278, "Diagnostic Procedure" .



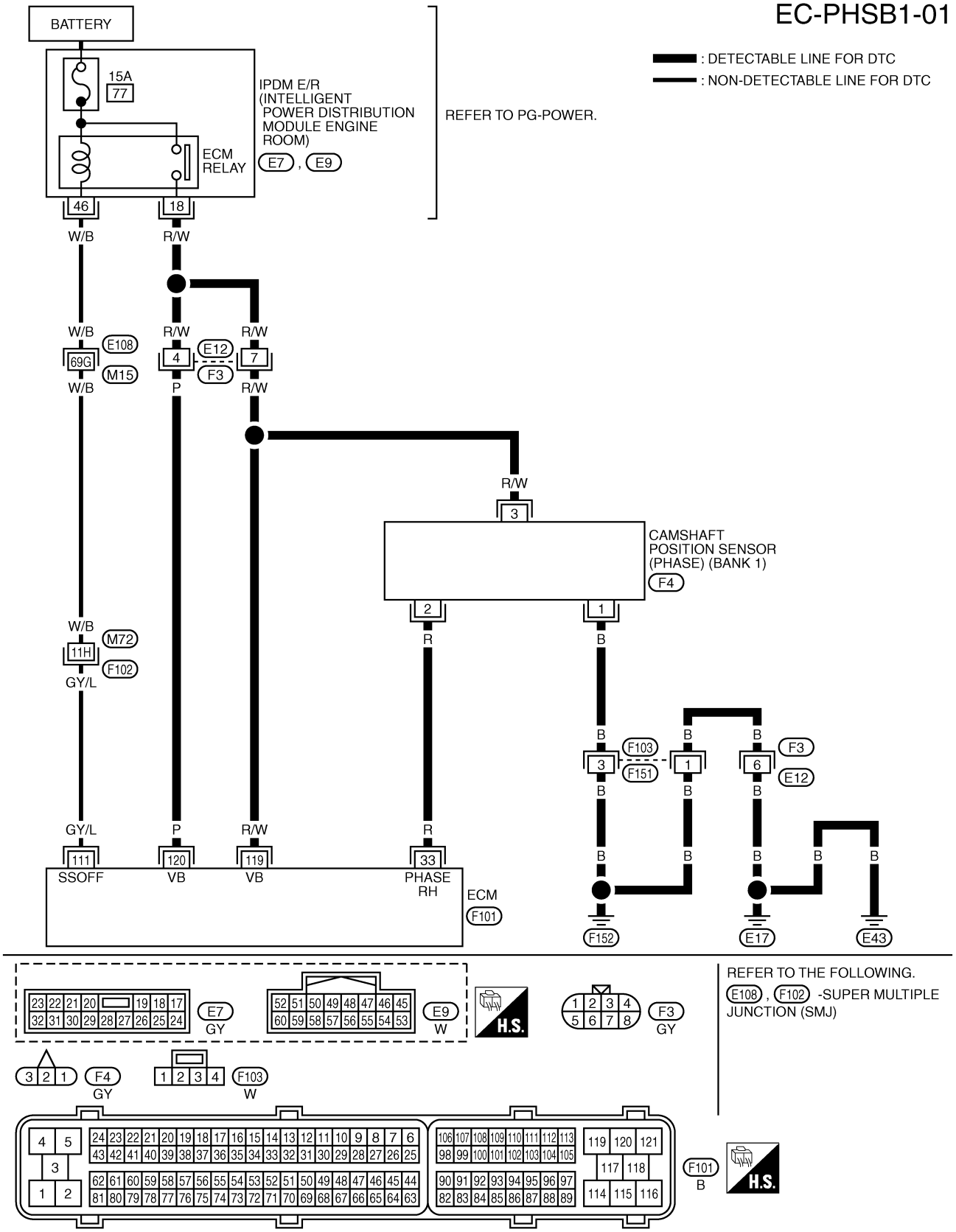
SEF058Y

WITH GST

Follow the procedure “WITH CONSULT-II” above.

Wiring Diagram
BANK 1

ABS009GK

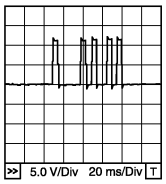
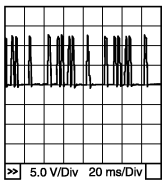


TBWT0617E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-II.

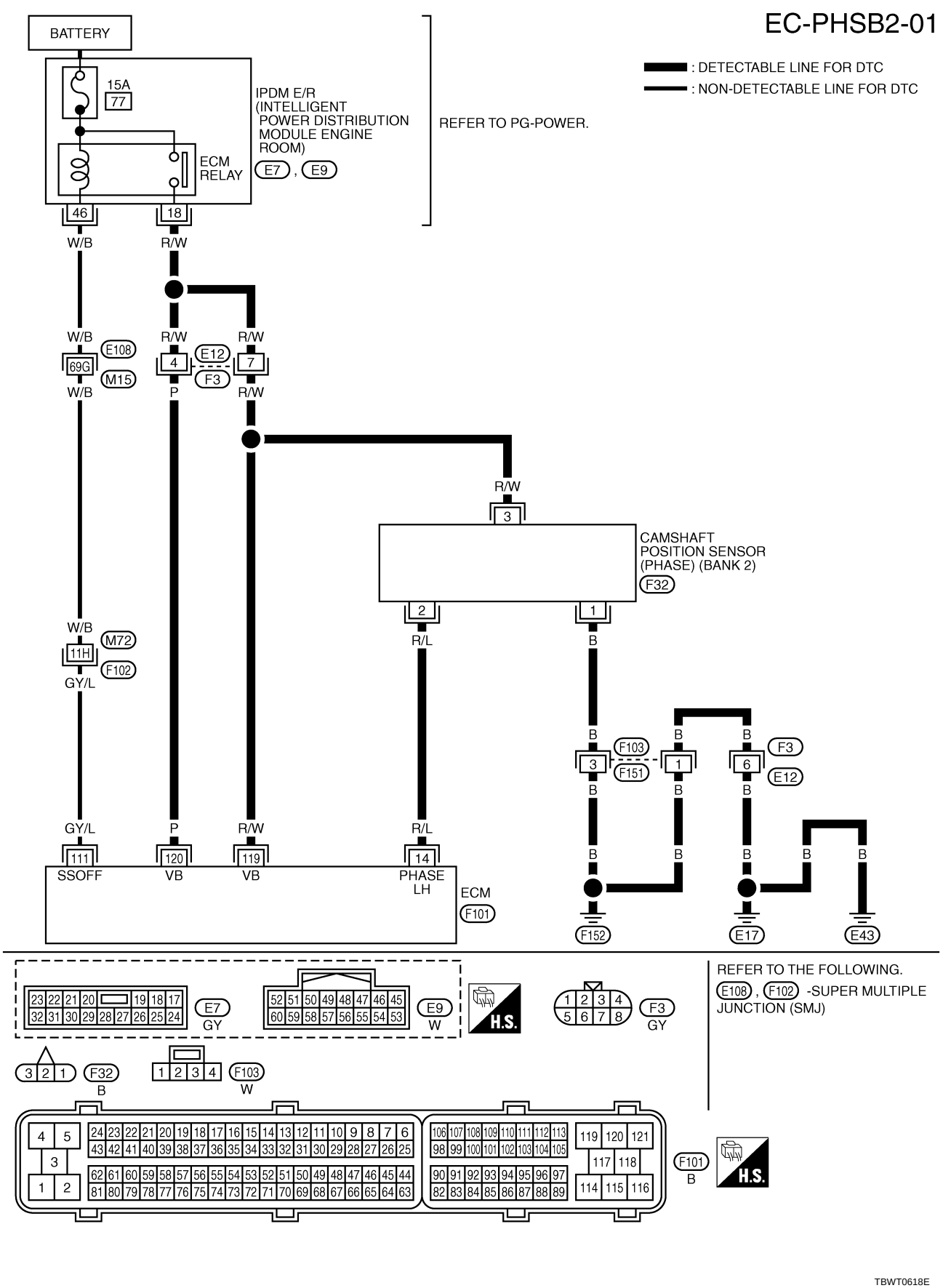
CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
33	R	Camshaft position sensor (PHASE) (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	1.0 - 4.0V★  PBIB1039E
			[Engine is running] ● Engine speed is 2,000 rpm.	1.0 - 4.0V★  PBIB1040E

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2

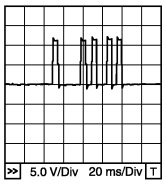
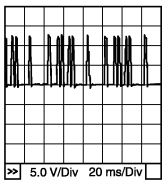


TBWT0618E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-II.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
14	R/L	Camshaft position sensor (PHASE) (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	1.0 - 4.0V★  PBIB1039E
			[Engine is running] ● Engine speed is 2,000 rpm.	1.0 - 4.0V★  PBIB1040E

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

ABS009GL

1. CHECK STARTING SYSTEM

Turn ignition switch to START position.

Does the engine turn over?

Does the starter motor operate?

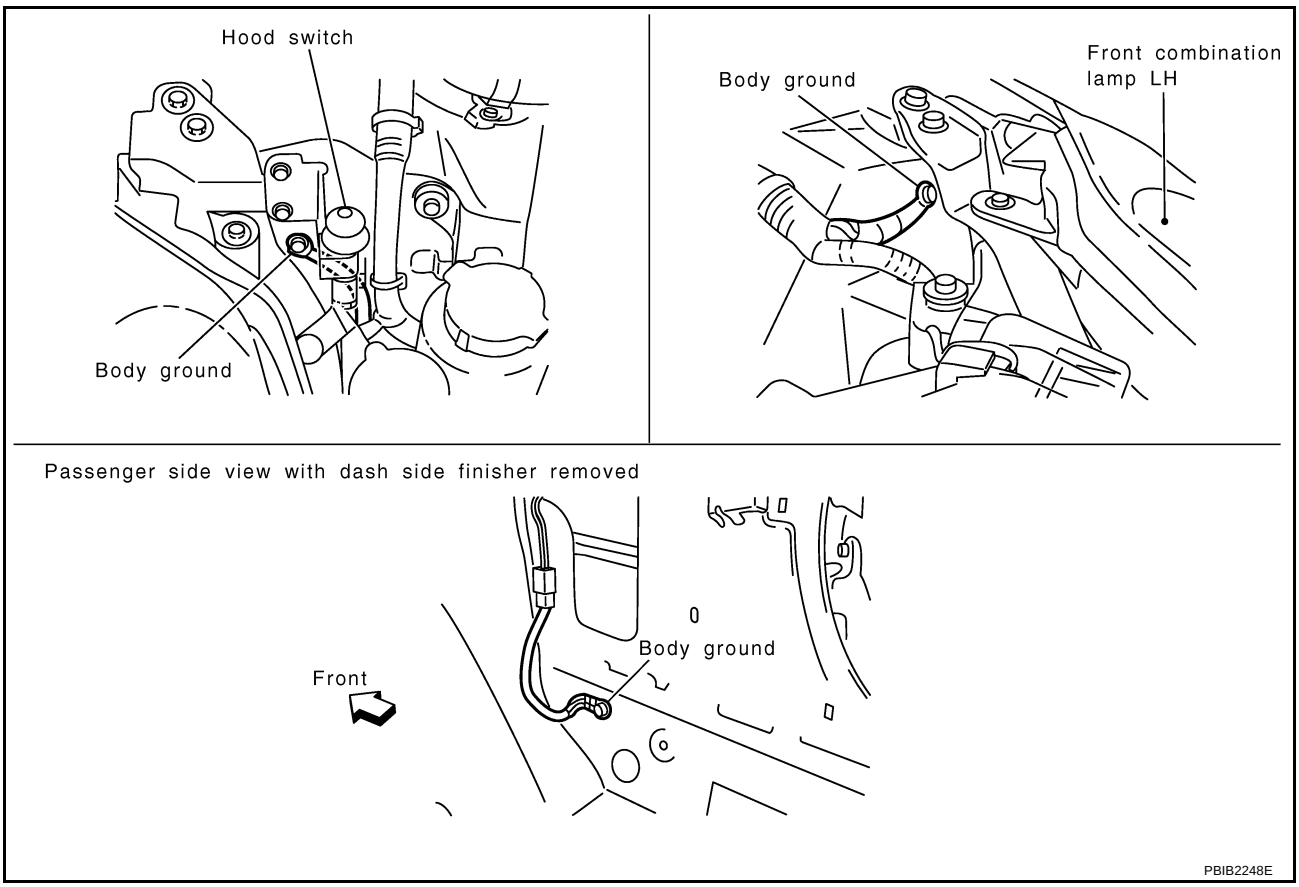
Yes or No

Yes >> GO TO 2.

No >> Check starting system. (Refer to SC-10, "STARTING SYSTEM" .)

2. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

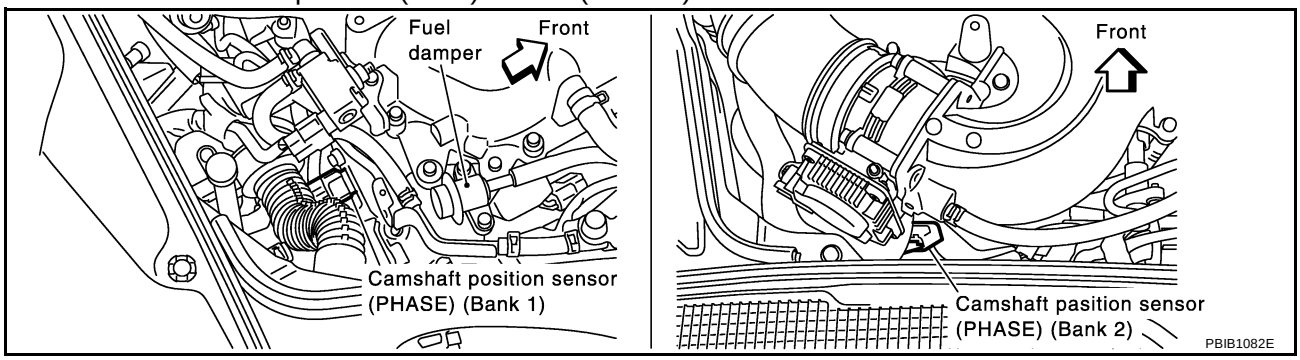


OK or NG

OK >> GO TO 3.
NG >> Repair or replace ground connections.

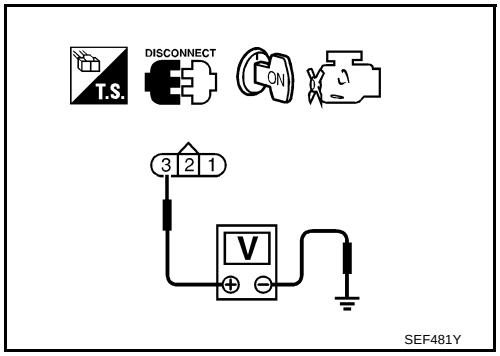
3. CHECK CAMSHAFT POSITION (CMP) SENSOR (PHASE) POWER SUPPLY CIRCUIT

1. Disconnect camshaft position (CMP) sensor (PHASE) harness connector.



2. Turn ignition switch ON.
3. Check voltage between CMP sensor (PHASE) terminal 3 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness for open or short between camshaft position sensor (PHASE) and ECM
- Harness for open or short between camshaft position sensor (PHASE) and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK CMP SENSOR (PHASE) GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Check harness continuity between CMP sensor (PHASE) terminal 1 and ground.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F103, F151
- Harness connectors E12, F3
- Harness for open or short between CMP sensor (PHASE) and ground

>> Repair open circuit or short to power in harness or connectors.

7. CHECK CMP SENSOR (PHASE) INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminal 33 or 14 and CMP sensor (PHASE) terminal 2. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 8.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK CAMSHAFT POSITION SENSOR (PHASE)

Refer to EC-282, "Component Inspection" .

OK or NG

OK >> GO TO 9.
NG >> Replace camshaft position sensor (PHASE).

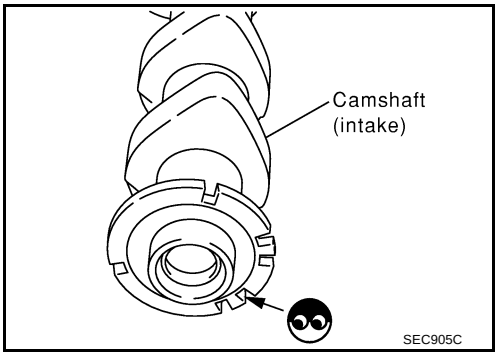
9. CHECK CAMSHAFT (INTAKE)

Check the following.

- Accumulation of debris to the signal plate of camshaft rear end
- Chipping signal plate of camshaft rear end

OK or NG

OK >> GO TO 10.
NG >> Remove debris and clean the signal plate of camshaft rear end or replace camshaft.



10. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

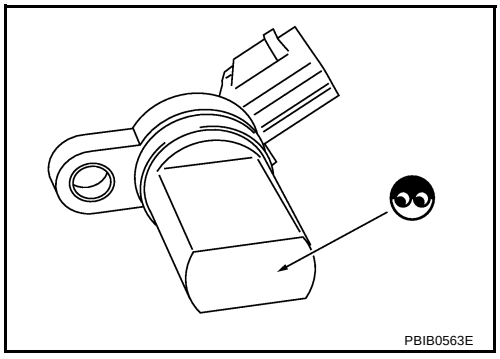
>> **INSPECTION END**

Component Inspection

ABS009GM

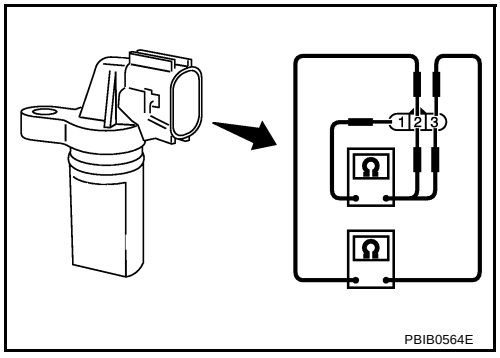
CAMSHAFT POSITION SENSOR (PHASE)

1. Loosen the fixing bolt of the sensor.
2. Disconnect camshaft position sensor (PHASE) harness connector.
3. Remove the sensor.
4. Visually check the sensor for chipping.



5. Check resistance as shown in the figure.

Terminal No. (Polarity)	Resistance Ω [at 25°C (77°F)]
1 (+) - 2 (-)	Except 0 or ∞
1 (+) - 3 (-)	
2 (+) - 3 (-)	



Removal and Installation

ABS009GN

CAMSHAFT POSITION SENSOR (PHASE)

Refer to EM-76, "CAMSHAFT" .

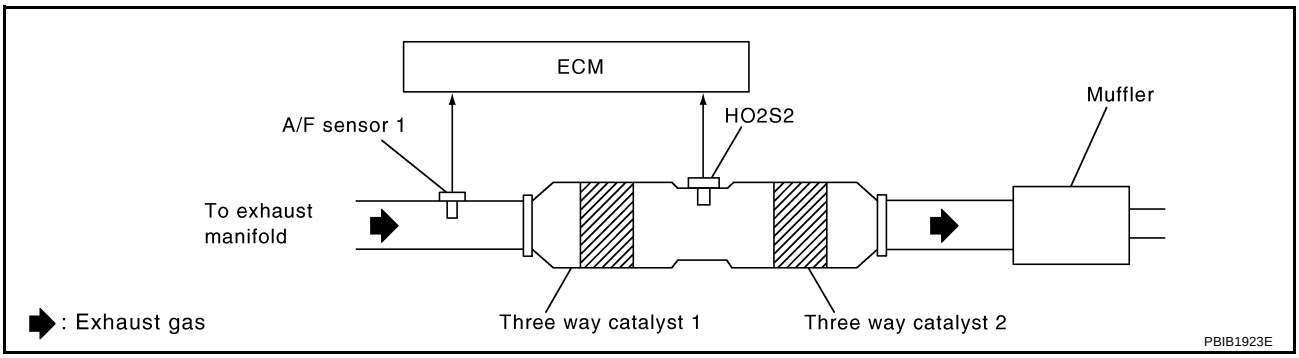
DTC P0420, P0430 THREE WAY CATALYST FUNCTION

PFP:20905

On Board Diagnosis Logic

ABS009GO

The ECM monitors the switching frequency ratio of air fuel ratio (A/F) sensor 1 and heated oxygen sensor 2. A three way catalyst 1 with high oxygen storage capacity will indicate a low switching frequency of heated oxygen sensor 2. As oxygen storage capacity decreases, the heated oxygen sensor 2 switching frequency will increase.
When the frequency ratio of air fuel ratio (A/F) sensor 1 and heated oxygen sensor 2 approaches a specified limit value, the three way catalyst 1 malfunction is diagnosed.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0420 0420 (Bank 1)	Catalyst system efficiency below threshold	● Three way catalyst 1 does not operate properly. ● Three way catalyst 1 does not have enough oxygen storage capacity.	● Three way catalyst 1 ● Exhaust tube ● Intake air leaks ● Fuel injector ● Fuel injector leaks ● Spark plug ● Improper ignition timing
P0430 0430 (Bank 2)			

DTC Confirmation Procedure

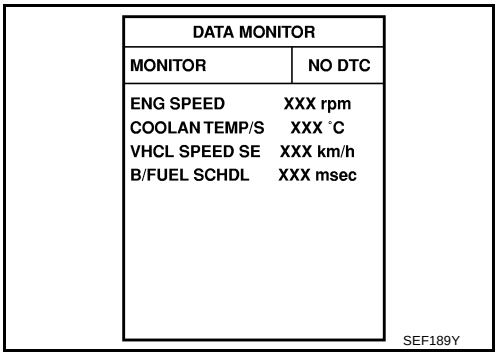
ABS009GP

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-II

TESTING CONDITION:
Do not hold engine speed for more than the specified minutes below.

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-II.
2. Start engine and warm it up to the normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 1 minute.
6. Make sure that “COOLAN TEMP/S” indicates more than 70°C (158°F).
   If not, warm up engine and go to next step when “COOLAN TEMP/S” indication reaches to 70°C (158°F).
7. Open engine hood.



8. Select “DTC & SRT CONFIRMATION” then “SRT WORK SUPPORT” mode with CONSULT-II.
9. Rev engine up to 2,000 to 3,000 rpm and hold it for 3 consecutive minutes then release the accelerator pedal completely.
   If “INCMP” of “CATALYST” changed to “CMPLT”, go to step 12.
10. Wait 5 seconds at idle.

SRT WORK SUPPORT	
CATALYST	INCMP
EVAP SYSTEM	INCMP
HO2S HTR	CMPLT
HO2S	INCMP
MONITOR	
ENG SPEED	XXX rpm
MAS A/F SE-B1	XXX V
B/FUEL SCHDL	XXX msec
A/F ALPHA-B1	XXX V
COOLAN TEMP/S	XX ˚C
A/F SEN1 (B1)	XXX V

PBIB1784E

11. Rev engine up to 2,000 to 3,000 rpm and maintain it until “INCMP” of “CATALYST” changes to “CMPLT” (It will take approximately 5 minutes).
    If not “CMPLT”, stop engine and cool it down to less than 70°C (158°F) and then retest from step 1.

SRT WORK SUPPORT	
CATALYST	CMPLT
EVAP SYSTEM	INCMP
HO2S HTR	CMPLT
HO2S	INCMP
MONITOR	
ENG SPEED	XXX rpm
MAS A/F SE-B1	XXX V
B/FUEL SCHDL	XXX msec
A/F ALPHA-B1	XXX V
COOLAN TEMP/S	XX ˚C
A/F SEN1 (B1)	XXX V

PBIB1785E

12. Select “SELF-DIAG RESULTS” mode with CONSULT-II.
13. Confirm that the 1st trip DTC is not detected.
    If the 1st trip DTC is detected, go to EC-285, "Diagnostic Procedure" .

SELF DIAG RESULTS	
DTC RESULTS	TIME
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	

SEF535Z

Overall Function Check

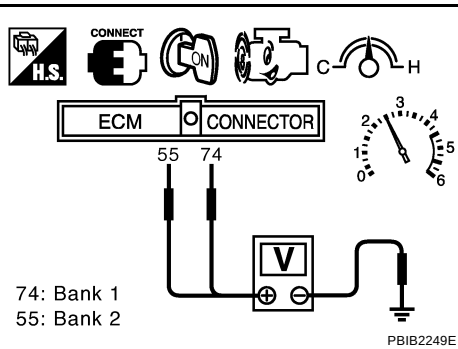
ABS009GQ

Use this procedure to check the overall function of the three way catalyst 1. During this check, a 1st trip DTC might not be confirmed.

WITH GST

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1minute.
5. Open engine hood.
6. Set voltmeters probes between ECM terminal 74 [HO2S2 (bank 1) signal], 55 [HO2S2 (bank 2) signal] and ground.
7. Keep engine speed at 2,500 rpm constant under no load.
8. Make sure that the voltage does not vary for more than 5 seconds. It the voltage fluctuation cycle take less than 5 seconds.
   Go to EC-285, "Diagnostic Procedure" .

- 1cycle: 0.6 - 1.0 → 0 - 0.3 → 0.6 - 1.0



PBIB2249E

Diagnostic Procedure

ABS009GR

1. CHECK EXHAUST SYSTEM

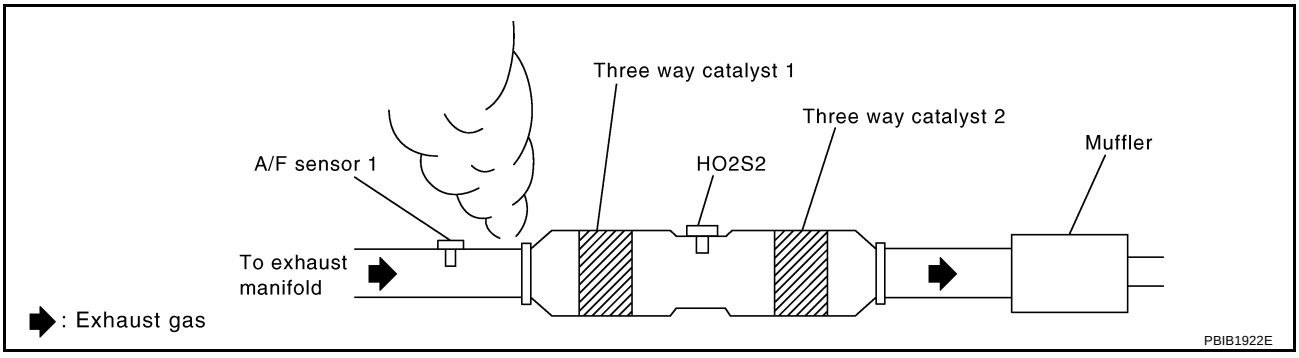
Visually check exhaust tubes and muffler for dent.

OK or NG

OK >> GO TO 2.
NG >> Repair or replace.

2. CHECK EXHAUST GAS LEAK

1. Start engine and run it at idle.
2. Listen for an exhaust gas leak before the three way catalyst 1.



OK or NG

OK >> GO TO 3.
NG >> Repair or replace.

3. CHECK INTAKE AIR LEAK

Listen for an intake air leak after the mass air flow sensor.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace.

4. CHECK IGNITION TIMING

Check the following items. Refer to EC-78, "Basic Inspection" .

Items	Specifications	
Target idle speed	A/T	650 ± 50 rpm (in P or N position)
	M/T	650 ± 50 rpm
Ignition timing	A/T	15 ± 5° BTDC (in P or N position)
	M/T	15 ± 5° BTDC

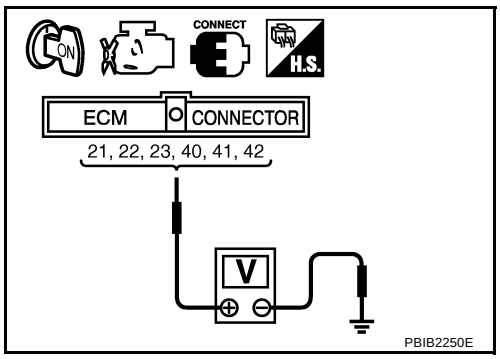
OK or NG

OK >> GO TO 5.
NG >> Follow the EC-78, "Basic Inspection" .

5. CHECK INJECTORS

1. Stop engine and then turn ignition switch ON.
2. Check voltage between ECM terminals 21, 22, 23, 40, 41, 42 and ground with CONSULT-II or tester.
   Refer to Wiring Diagram for Injectors, EC-633 .

Battery voltage should exist.

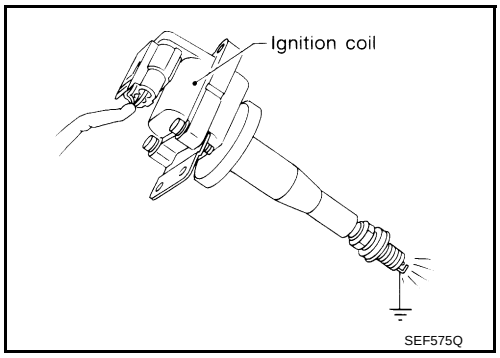


OK or NG

OK >> GO TO 6.
NG >> Perform EC-634, "Diagnostic Procedure" .

6. CHECK IGNITION SPARK

1. Turn ignition switch OFF.
2. Disconnect ignition coil assembly from rocker cover.
3. Connect a known-good spark plug to the ignition coil assembly.
4. Disconnect all injector harness connectors.
5. Place end of spark plug against a suitable ground and crank engine.
6. Check for spark.



OK or NG

OK >> GO TO 7.
NG >> Check ignition coil with power transistor and their circuit.
Refer to EC-620, "IGNITION SIGNAL" .

7. CHECK INJECTOR

1. Turn ignition switch OFF.
2. Remove injector assembly.
   Refer to EM-36, "FUEL INJECTOR AND FUEL TUBE" .
   Keep fuel hose and all injectors connected to injector gallery.
3. Disconnect all ignition coil harness connectors.
4. Reconnect injector harness connectors.
5. Turn ignition switch ON.
   Make sure fuel does not drip from injector.

OK or NG

OK (Does not drip.)>>GO TO 8.
NG (Drips.)>>Replace the injector(s) from which fuel is dripping.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

Trouble is fixed.>>**INSPECTION END**
Trouble is not fixed.>>Replace three way catalyst assembly.

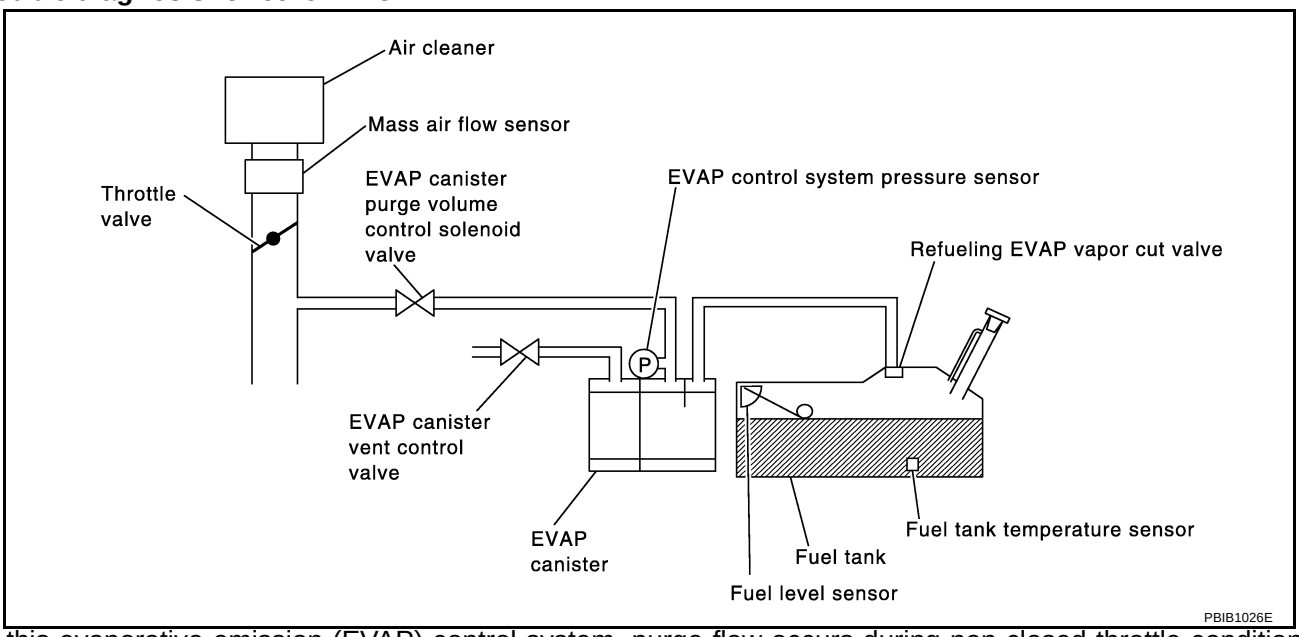
DTC P0441 EVAP CONTROL SYSTEM

PFP:14950

System Description

ABS009GS

NOTE:
If DTC P0441 is displayed with other DTC such as P2122, P2123, P2127, P2128 or P2138, first perform trouble diagnosis for other DTC.



In this evaporative emission (EVAP) control system, purge flow occurs during non-closed throttle conditions. Purge volume is related to air intake volume. Under normal purge conditions (non-closed throttle), the EVAP canister purge volume control solenoid valve is open to admit purge flow. Purge flow exposes the EVAP control system pressure sensor to intake manifold vacuum.

On Board Diagnosis Logic

ABS009GT

Under normal conditions (non-closed throttle), sensor output voltage indicates if pressure drop and purge flow are adequate. If not, a malfunction is determined.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0441 0441	EVAP control system incorrect purge flow	EVAP control system does not operate properly, EVAP control system has a leak between intake manifold and EVAP control system pressure sensor.	● EVAP canister purge volume control solenoid valve stuck closed ● EVAP control system pressure sensor and the circuit ● Loose, disconnected or improper connection of rubber tube ● Blocked rubber tube ● Cracked EVAP canister ● EVAP canister purge volume control solenoid valve circuit ● Accelerator pedal position sensor ● Blocked purge port ● EVAP canister vent control valve

DTC Confirmation Procedure

ABS009GU

CAUTION:
Always drive vehicle at a safe speed.

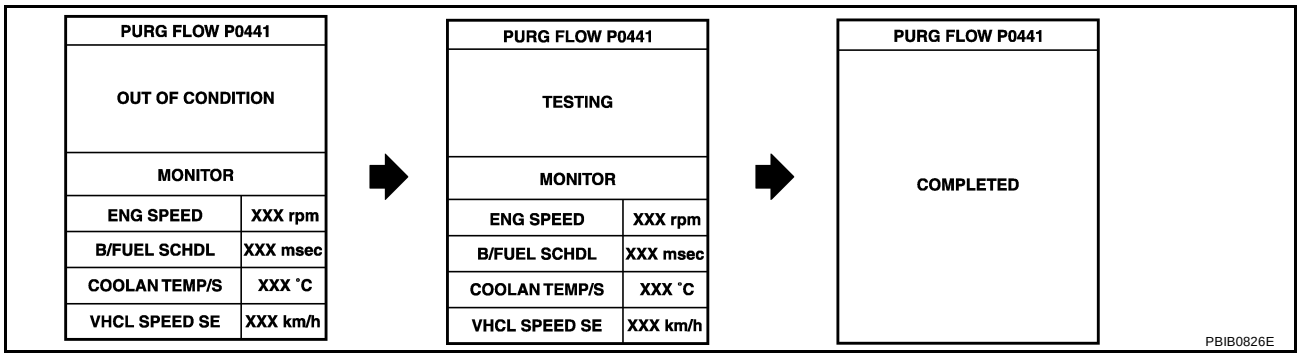
NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Always perform test at a temperature of 5°C (41°F) or more.

WITH CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and let it idle for at least 70 seconds.
4. Select “PURG FLOW P0441” of “EVAPORATIVE SYSTEM” in “DTC CONFIRMATION” mode with CONSULT-II.
5. Touch “START”.
   If “COMPLETED” is displayed, go to step 7.
6. When the following conditions are met, “TESTING” will be displayed on the CONSULT-II screen. Maintain the conditions continuously until “TESTING” changes to “COMPLETED”. (It will take at least 35 seconds.)

Shift lever	Suitable position
Vehicle speed	32 - 120 km/h (20 - 75 MPH)
ENG SPEED	500 - 3,000 rpm
B/FUEL SCHDL	1.3 - 9.0 msec
Engine coolant temperature	70 - 100°C (158 - 212°F)



If “TESTING” is not changed for a long time, retry from step 2.

7. Make sure that “OK” is displayed after touching “SELF-DIAG RESULTS”. If “NG” is displayed, refer to EC-289, "Diagnostic Procedure" .

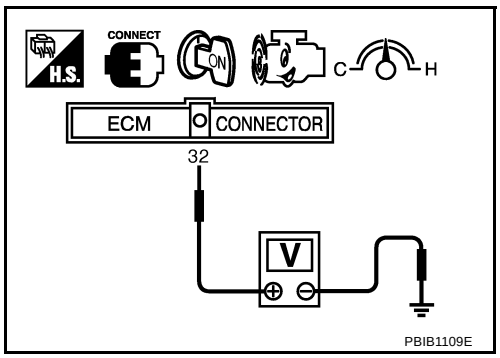
Overall Function Check

ABS009GV

Use this procedure to check the overall monitoring function of the EVAP control system purge flow monitoring. During this check, a 1st trip DTC might not be confirmed.

WITH GST

1. Lift up drive wheels.
2. Start engine (VDC switch or TCS switch OFF) and warm it up to normal operating temperature.
3. Turn ignition switch OFF, wait at least 10 seconds.
4. Start engine and wait at least 70 seconds.
5. Set voltmeter probes to ECM terminals 32 (EVAP control system pressure sensor signal) and ground.
6. Check EVAP control system pressure sensor value at idle speed and note it.
7. Establish and maintain the following conditions for at least 1 minute.



Air conditioner switch	ON
Headlamp switch	ON
Rear window defogger switch	ON
Engine speed	Approx. 3,000 rpm
Gear position	Any position other than P, N or R

8. Verify that EVAP control system pressure sensor value stays 0.1V less than the value at idle speed (measured at step 6) for at least 1 second.

9. If NG, go to EC-289, "Diagnostic Procedure" .

Diagnostic Procedure

ABS009GW

1. CHECK EVAP CANISTER

1. Turn ignition switch OFF.
2. Check EVAP canister for cracks.

OK or NG

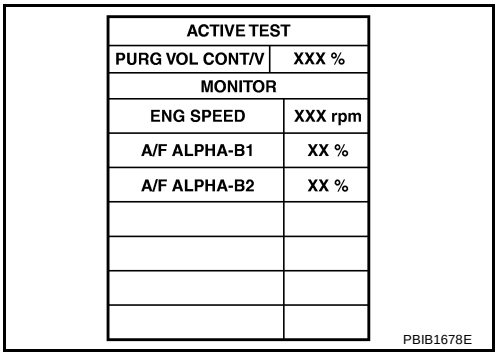
OK (With CONSULT-II)>>GO TO 2.
OK (Without CONSULT-II)>>GO TO 3.
NG >> Replace EVAP canister.

2. CHECK PURGE FLOW

With CONSULT-II

1. Disconnect vacuum hose connected to EVAP canister purge volume control solenoid valve at EVAP service port and install vacuum gauge. For the location of EVAP service port, refer to EC-674, "EVAPORATIVE EMISSION LINE DRAWING" .
2. Start engine and let it idle.
3. Select “PURG VOL CONT/V” in “ACTIVE TEST” mode with CONSULT-II.
4. Rev engine up to 2,000 rpm.
5. Touch “Qd” and “Qu” on CONSULT-II screen to adjust “PURG VOL CONT/V” opening and check vacuum existence.

PURG VOL CONT/V	Vacuum
100%	Should exist.
0%	Should not exist.



OK or NG

OK >> GO TO 7.
NG >> GO TO 4.

3. CHECK PURGE FLOW

Without CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Stop engine.
3. Disconnect vacuum hose connected to EVAP canister purge volume control solenoid valve at EVAP service port and install vacuum gauge. For the location of EVAP service port, refer to EC-674, "EVAPORATIVE EMISSION LINE DRAWING" .
4. Start engine and let it idle.

Do not depress accelerator pedal even slightly

5. Check vacuum gauge indication before 60 seconds passed after starting engine.

Vacuum should not exist.

6. Revving engine up to 2,000 rpm after 100 seconds passed after starting engine.

Vacuum should exist.

OK or NG

OK >> GO TO 7.
NG >> GO TO 4.

4. CHECK EVAP PURGE LINE

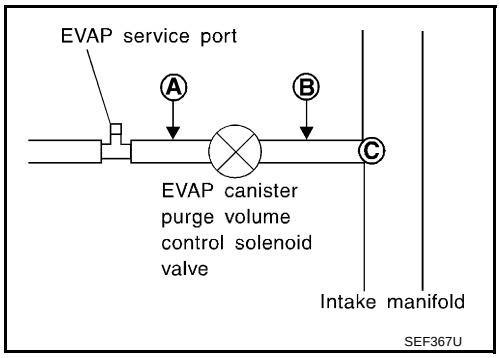
1. Turn ignition switch OFF.
2. Check EVAP purge line for improper connection or disconnection. Refer to EC-674, "EVAPORATIVE EMISSION LINE DRAWING" .

OK or NG

OK >> GO TO 5.
NG >> Repair it.

5. CHECK EVAP PURGE HOSE AND PURGE PORT

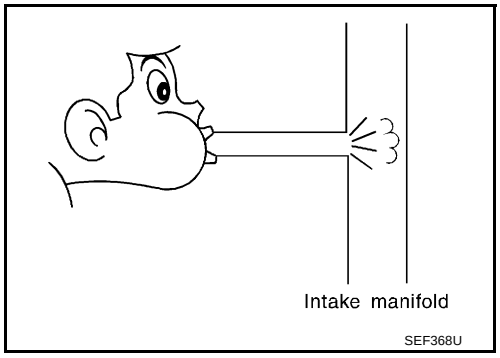
1. Disconnect purge hoses connected to EVAP service port **A** and EVAP canister purge volume control solenoid valve **B** .
2. Blow air into each hose and EVAP purge port **C** .



3. Check that air flows freely.

OK or NG

OK (With CONSULT-II)>>GO TO 6.
OK (Without CONSULT-II)>>GO TO 7.
NG >> Repair or clean hoses and/or purge port.



6. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

With CONSULT-II

1. Start engine.
2. Perform “PURG VOL CONT/V” in “ACTIVE TEST” mode with CONSULT-II. Check that engine speed varies according to the valve opening.

OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

ACTIVE TEST	
PURG VOL CONT/V	XXX %
MONITOR	
ENG SPEED	XXX rpm
A/F ALPHA-B1	XX %
A/F ALPHA-B2	XX %

PBIB1678E

7. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-306, "Component Inspection" .

OK or NG

OK >> GO TO 8.
NG >> Replace EVAP canister purge volume control solenoid valve.

8. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR

1. Disconnect EVAP control system pressure sensor harness connector.
2. Check connectors for water.

Water should not exist.

OK or NG

OK >> GO TO 9.
NG >> Replace EVAP control system pressure sensor.

9. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR FUNCTION

Refer to DTC Confirmation Procedure for DTC P0452 EC-321 , P0453 EC-330 .

OK or NG

OK >> GO TO 10.
NG >> Replace EVAP control system pressure sensor.

10. CHECK RUBBER TUBE FOR CLOGGING

1. Disconnect rubber tube connected to EVAP canister vent control valve.
2. Check the rubber tube for clogging.

OK or NG

OK >> GO TO 11.
NG >> Clean the rubber tube using an air blower.

11. CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-315, "Component Inspection" .

OK or NG

OK >> GO TO 12.
NG >> Replace EVAP canister vent control valve.

12. CHECK EVAP PURGE LINE

Inspect EVAP purge line (pipe and rubber tube). Check for evidence of leaks.
Refer to EC-674, "EVAPORATIVE EMISSION LINE DRAWING" .

OK or NG

OK >> GO TO 13.
NG >> Replace it.

13. CLEAN EVAP PURGE LINE

Clean EVAP purge line (pipe and rubber tube) using air blower.

>> GO TO 14.

14. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

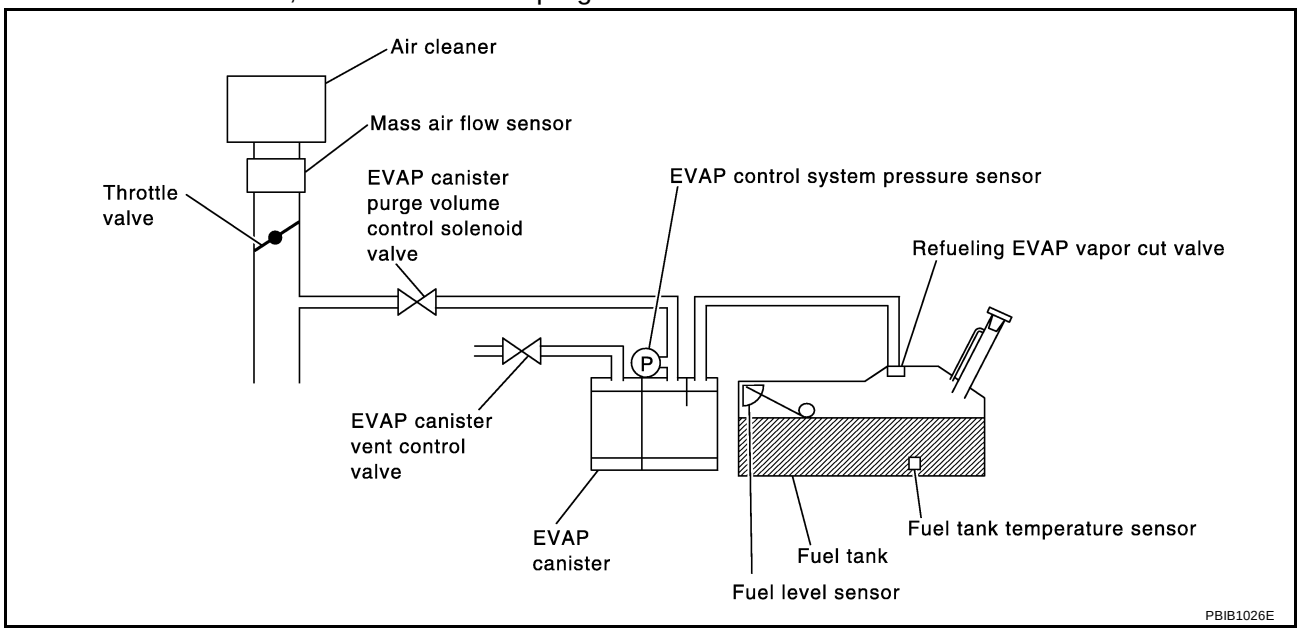
DTC P0442 EVAP CONTROL SYSTEM

PFP:14950

On Board Diagnosis Logic

ABS009GX

This diagnosis detects leaks in the EVAP purge line using engine intake manifold vacuum.
If pressure does not increase, the ECM will check for leaks in the line between the fuel tank and EVAP canister purge volume control solenoid valve, under the following Vacuum test conditions.
The EVAP canister vent control valve is closed to shut the EVAP purge line off. The EVAP canister purge volume control solenoid valve will then be opened to depressurize the EVAP purge line using intake manifold vacuum. After this occurs, the EVAP canister purge volume control solenoid valve will be closed.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0442 0442	EVAP control system small leak detected (negative pressure)	EVAP control system has a leak, EVAP control system does not operate properly.	● Incorrect fuel tank vacuum relief valve ● Incorrect fuel filler cap used ● Fuel filler cap remains open or fails to close. ● Foreign matter caught in fuel filler cap. ● Leak is in line between intake manifold and EVAP canister purge volume control solenoid valve. ● Foreign matter caught in EVAP canister vent control valve. ● EVAP canister or fuel tank leaks ● EVAP purge line (pipe and rubber tube) leaks ● EVAP purge line rubber tube bent ● Loose or disconnected rubber tube ● EVAP canister vent control valve and the circuit ● EVAP canister purge volume control solenoid valve and the circuit ● Fuel tank temperature sensor ● O-ring of EVAP canister vent control valve is missing or damaged ● EVAP canister is saturated with water ● EVAP control system pressure sensor ● Fuel level sensor and the circuit ● Refueling EVAP vapor cut valve ● ORVR system leaks

CAUTION:

- **Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may come on.**
- **If the fuel filler cap is not tightened properly, the MIL may come on.**
- **Use only a genuine NISSAN rubber tube as a replacement.**

DTC Confirmation Procedure

ABS009GY

NOTE:

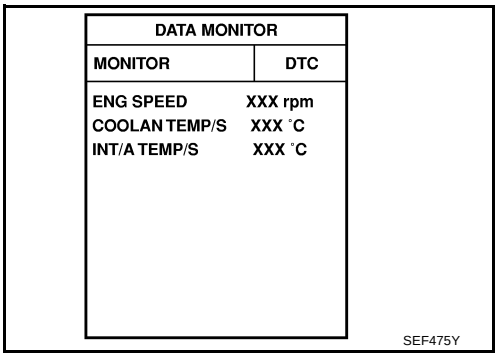
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

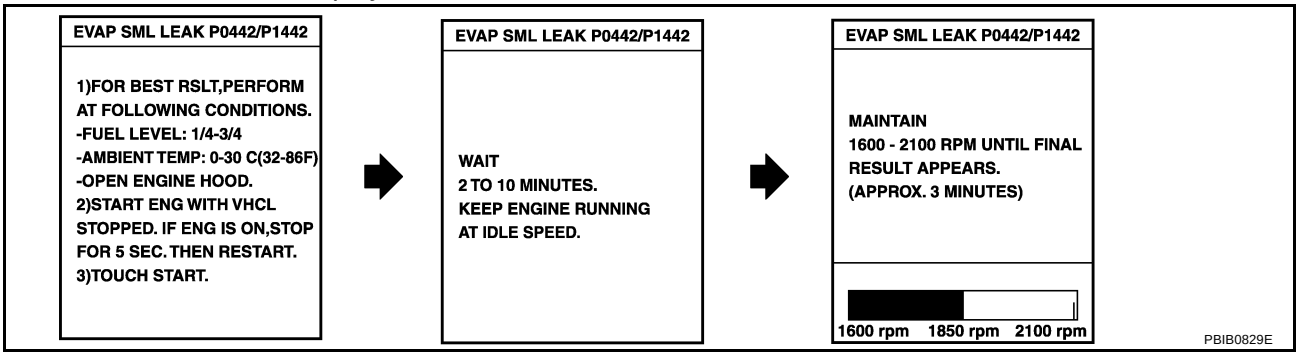
- **Perform "DTC WORK SUPPORT" when the fuel level is between 1/4 and 3/4 full, and vehicle is placed on flat level surface.**
- **Always perform test at a temperature of 0 to 30°C (32 to 86°F).**

WITH CONSULT-II

1. Turn ignition switch ON.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-II.
4. Make sure that the following conditions are met.
   COOLAN TEMP/S: 0 - 70°C (32 - 158°F)
   INT/A TEMP SE: 0 - 30°C (32 - 86°F)



5. Select "EVAP SML LEAK P0442/P1442" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CONSULT-II.
   Follow the instruction displayed.

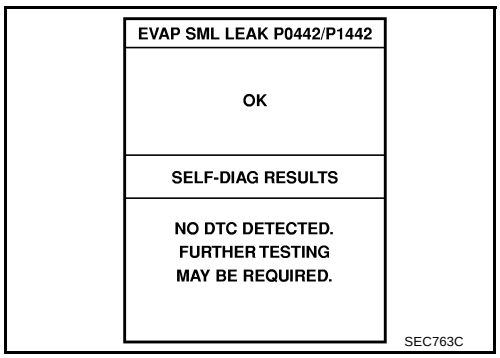


NOTE:

If the engine speed cannot be maintained within the range displayed on the CONSULT-II screen, go to EC-78, "Basic Inspection" .

6. Make sure that “OK” is displayed.
   If “NG” is displayed, refer to EC-294, "Diagnostic Procedure" .

   NOTE:
   Make sure that EVAP hoses are connected to EVAP canister purge volume control solenoid valve properly.



WITH GST

NOTE:
Be sure to read the explanation of EC-58, "Driving Pattern" before driving vehicle.

1. Start engine.
2. Drive vehicle according to EC-58, "Driving Pattern" .
3. Stop vehicle.
4. Turn ignition switch OFF, wait at least 10 seconds and then turn ON.
5. Select “MODE 7” with GST.

- If P0442 is displayed on the screen, go to EC-294, "Diagnostic Procedure" .
- If P0441 is displayed on the screen, go to Diagnostic Procedure for DTC P0441, EC-289 .

Diagnostic Procedure

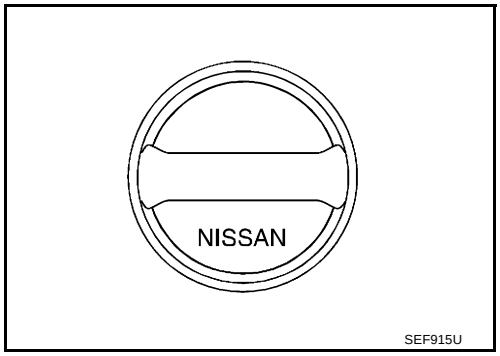
ABS009GZ

1. CHECK FUEL FILLER CAP DESIGN

1. Turn ignition switch OFF.
2. Check for genuine NISSAN fuel filler cap design.

OK or NG

OK >> GO TO 2.
NG >> Replace with genuine NISSAN fuel filler cap.



2. CHECK FUEL FILLER CAP INSTALLATION

Check that the cap is tightened properly by rotating the cap clockwise.

OK or NG

OK >> GO TO 3.
NG >> 1. Open fuel filler cap, then clean cap and fuel filler neck threads using air blower.
2. Retighten until ratcheting sound is heard.

3. CHECK FUEL FILLER CAP FUNCTION

Check for air releasing sound while opening the fuel filler cap.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. CHECK FUEL TANK VACUUM RELIEF VALVE

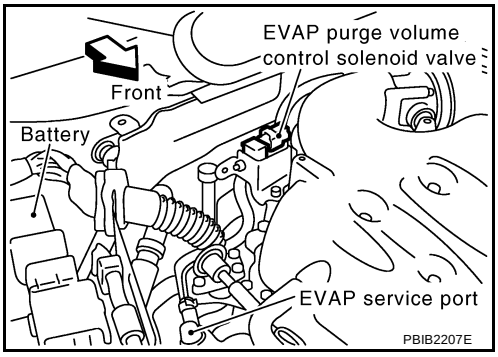
Refer to EC-676, "FUEL TANK VACUUM RELIEF VALVE (BUILT INTO FUEL FULLER CAP)" .

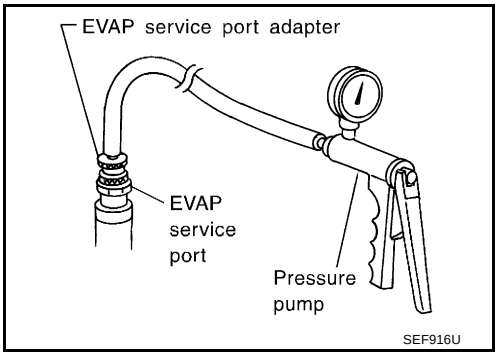
OK or NG

OK >> GO TO 5.
NG >> Replace fuel filler cap with a genuine one.

5. INSTALL THE PRESSURE PUMP

To locate the EVAP leak, install EVAP service port adapter and pressure pump to EVAP service port securely. For the location of EVAP service port, refer to EC-674, "EVAPORATIVE EMISSION LINE DRAWING" .





NOTE:
Improper installation of the EVAP service port adapter to the EVAP service port may cause leaking.

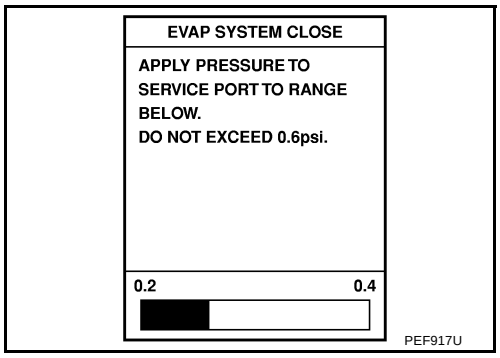
With CONSULT-II>>GO TO 6.
Without CONSULT-II>>GO TO 7.

6. CHECK FOR EVAP LEAK

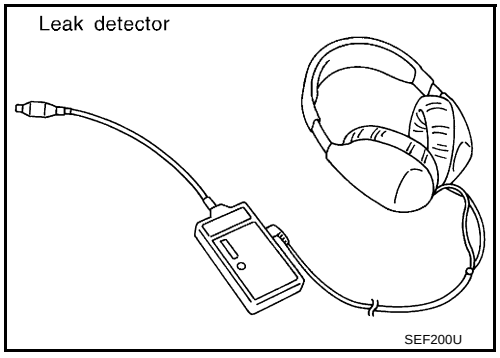
With CONSULT-II

1. Turn ignition switch ON.
2. Select “EVAP SYSTEM CLOSE” of “WORK SUPPORT” mode with CONSULT-II.
3. Touch “START” and apply pressure into the EVAP line until the pressure indicator reaches the middle of the bar graph.

   NOTE:
   - **Never use compressed air or a high pressure pump.**
   - **Do not exceed 4.12 kPa (0.042 kg/cm^2 , 0.6 psi) of pressure in the system.**



4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details.
   Refer to EC-674, "EVAPORATIVE EMISSION LINE DRAWING"
   .



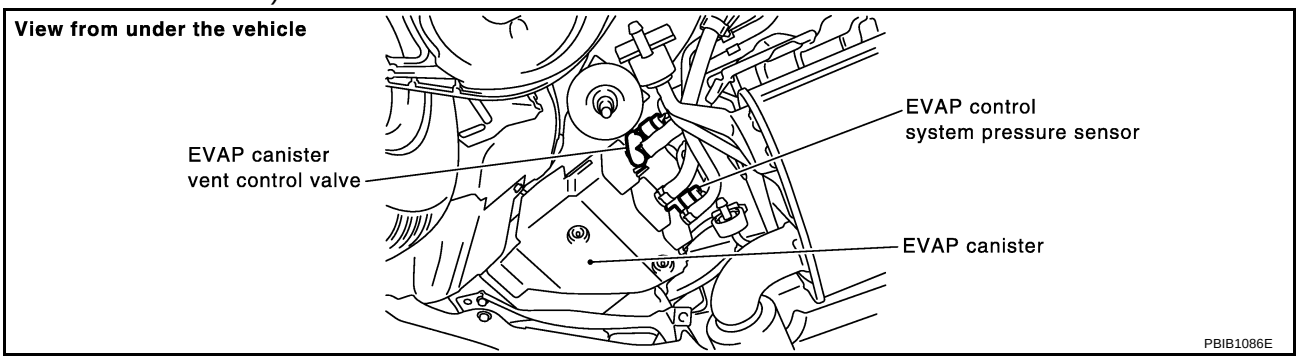
OK or NG

OK >> GO TO 8.
NG >> Repair or replace.

7. CHECK FOR EVAP LEAK

Without CONSULT-II

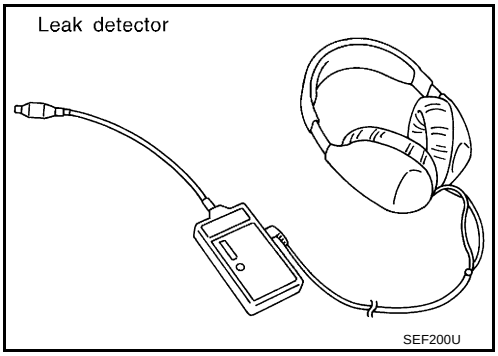
1. Turn ignition switch OFF.
2. Apply 12 volts DC to EVAP canister vent control valve. The valve will close. (Continue to apply 12 volts until the end of test.)



3. Pressurize the EVAP line using pressure pump with 1.3 to 2.7 kPa (10 to 20 mmHg, 0.39 to 0.79 inHg), then remove pump and EVAP service port adapter.

   NOTE:
   - **Never use compressed air or a high pressure pump.**
   - **Do not exceed 4.12 kPa (0.042 kg/cm^2 , 0.6 psi) of pressure in the system.**

4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details. Refer to EC-674, "EVAPORATIVE EMISSION LINE DRAWING" .



OK or NG

OK >> GO TO 8.
NG >> Repair or replace.

8. CHECK EVAP CANISTER VENT CONTROL VALVE

Check the following.

- EVAP canister vent control valve is installed properly.
  Refer to EC-677, "Removal and Installation" .
- EVAP canister vent control valve.
  Refer to EC-315, "Component Inspection" .

OK or NG

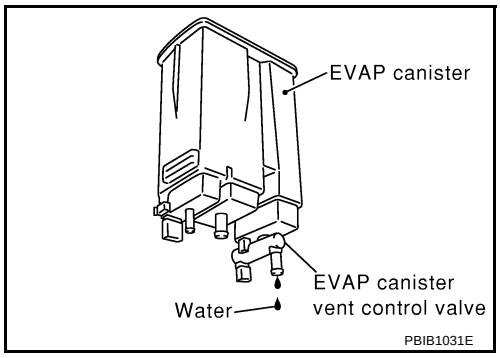
OK >> GO TO 9.
NG >> Repair or replace EVAP canister vent control valve and O-ring.

9. CHECK IF EVAP CANISTER SATURATED WITH WATER

1. Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
2. Does water drain from the EVAP canister?

Yes or No

Yes >> GO TO 10.
No (With CONSULT-II)>>GO TO 12.
No (Without CONSULT-II)>>GO TO 13.



10. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.2 kg (4.9 lb).

OK or NG

OK (With CONSULT-II)>>GO TO 12.
OK (Without CONSULT-II)>>GO TO 13.
NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister.

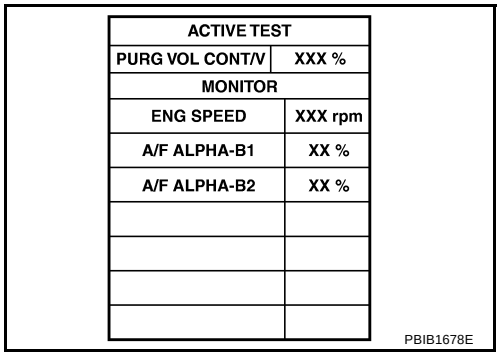
12. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

With CONSULT-II

1. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
2. Start engine.
3. Perform “PURG VOL CONT/V” in “ACTIVE TEST” mode.
4. Touch “Qu” on CONSULT-II screen to increase “PURG VOL CONT/V” opening to 100%.
5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

OK or NG

OK >> GO TO 15.
NG >> GO TO 14.



13. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

Without CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Stop engine.
3. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
4. Start engine and let it idle for at least 80 seconds.
5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

OK or NG

OK >> GO TO 16.
NG >> GO TO 14.

14. CHECK VACUUM HOSE

Check vacuum hoses for clogging or disconnection. Refer to EC-23, "Vacuum Hose Drawing" .

OK or NG

OK >> GO TO 15.
NG >> Repair or reconnect the hose.

15. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-306, "Component Inspection" .

OK or NG

OK >> GO TO 16.
NG >> Replace EVAP canister purge volume control solenoid valve.

16. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-241, "Component Inspection" .

OK or NG

OK >> GO TO 17.
NG >> Replace fuel level sensor unit.

17. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-328, "Component Inspection" .

OK or NG

OK >> GO TO 18.
NG >> Replace EVAP control system pressure sensor.

18. CHECK EVAP PURGE LINE

Check EVAP purge line (pipe, rubber tube, fuel tank and EVAP canister) for cracks or improper connection. Refer to EC-674, "EVAPORATIVE EMISSION LINE DRAWING" .

OK or NG

OK >> GO TO 19.
NG >> Repair or reconnect the hose.

19. CLEAN EVAP PURGE LINE

Clean EVAP purge line (pipe and rubber tube) using air blower.

>> GO TO 20.

20. CHECK EVAP/ORVR LINE

Check EVAP/ORVR line between EVAP canister and fuel tank for clogging, kink, looseness and improper connection. For location, refer to EC-680, "ON BOARD REFUELING VAPOR RECOVERY (ORVR)" .

OK or NG

OK >> GO TO 21.
NG >> Repair or replace hoses and tubes.

21. CHECK RECIRCULATION LINE

Check recirculation line between filler neck tube and fuel tank for clogging, kink, cracks, looseness and improper connection.

OK or NG

OK >> GO TO 22.
NG >> Repair or replace hose, tube or filler neck tube.

22. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-683, "REFUELING EVAP VAPOR CUT VALVE" .

OK or NG

OK >> GO TO 23.
NG >> Replace refueling EVAP vapor cut valve with fuel tank.

23. CHECK FUEL LEVEL SENSOR

Refer to DI-27, "FUEL LEVEL SENSOR UNIT CHECK" .

OK or NG

OK >> GO TO 24.
NG >> Replace fuel level sensor unit.

24. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

DTC P0444, P0445 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

PFP:14920

Description

ABS009H0

SYSTEM DESCRIPTION

Sensor	Input Signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed*1	EVAP canister purge flow control	EVAP canister purge volume control solenoid valve
Mass air flow sensor	Amount of intake air		
Engine coolant temperature sensor	Engine coolant temperature		
Battery	Battery voltage*1		
Throttle position sensor	Throttle position		
Accelerator pedal position sensor	Accelerator pedal position		
Air fuel ratio (A/F) sensor 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)		
Fuel tank temperature sensor	Fuel temperature in fuel tank		
Wheel sensor*2	Vehicle speed		

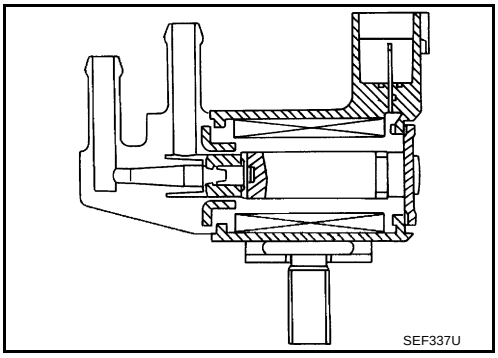
*1: ECM determines the start signal status by the signals of engine speed and battery voltage.

*2: This signal is sent to the ECM through CAN communication line.

This system controls flow rate of fuel vapor from the EVAP canister. The opening of the vapor by-pass passage in the EVAP canister purge volume control solenoid valve changes to control the flow rate. The EVAP canister purge volume control solenoid valve repeats ON/OFF operation according to the signal sent from the ECM. The opening of the valve varies for optimum engine control. The optimum value stored in the ECM is determined by considering various engine conditions. When the engine is operating, the flow rate of fuel vapor from the EVAP canister is regulated as the air flow changes.

COMPONENT DESCRIPTION

The EVAP canister purge volume control solenoid valve uses a ON/OFF duty to control the flow rate of fuel vapor from the EVAP canister. The EVAP canister purge volume control solenoid valve is moved by ON/OFF pulses from the ECM. The longer the ON pulse, the greater the amount of fuel vapor that will flow through the valve.



CONSULT-II Reference Value in Data Monitor Mode

ABS009H1

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
PURG VOL C/V	● Engine: After warming up ● Shift lever: N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No-load	Idle	0%
		2,000 rpm	—

On Board Diagnosis Logic

ABS009H2

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0444 0444	EVAP canister purge volume control solenoid valve circuit open	An excessively low voltage signal is sent to ECM through the valve	● Harness or connectors (The solenoid valve circuit is open or shorted.) ● EVAP canister purge volume control solenoid valve
P0445 0445	EVAP canister purge volume control solenoid valve circuit shorted	An excessively high voltage signal is sent to ECM through the valve	● Harness or connectors (The solenoid valve circuit is shorted.) ● EVAP canister purge volume control solenoid valve

DTC Confirmation Procedure

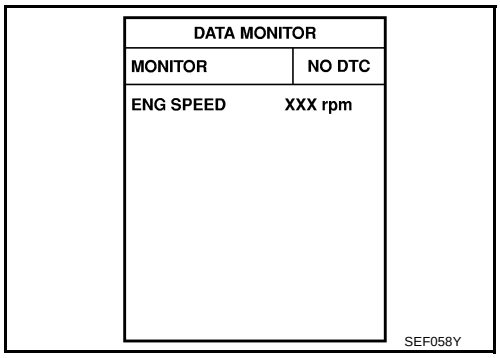
ABS009H3

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm battery voltage is more than 11V at idle.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Start engine and let it idle for at least 13 seconds.
4. If 1st trip DTC is detected, go to EC-305, "Diagnostic Procedure" .

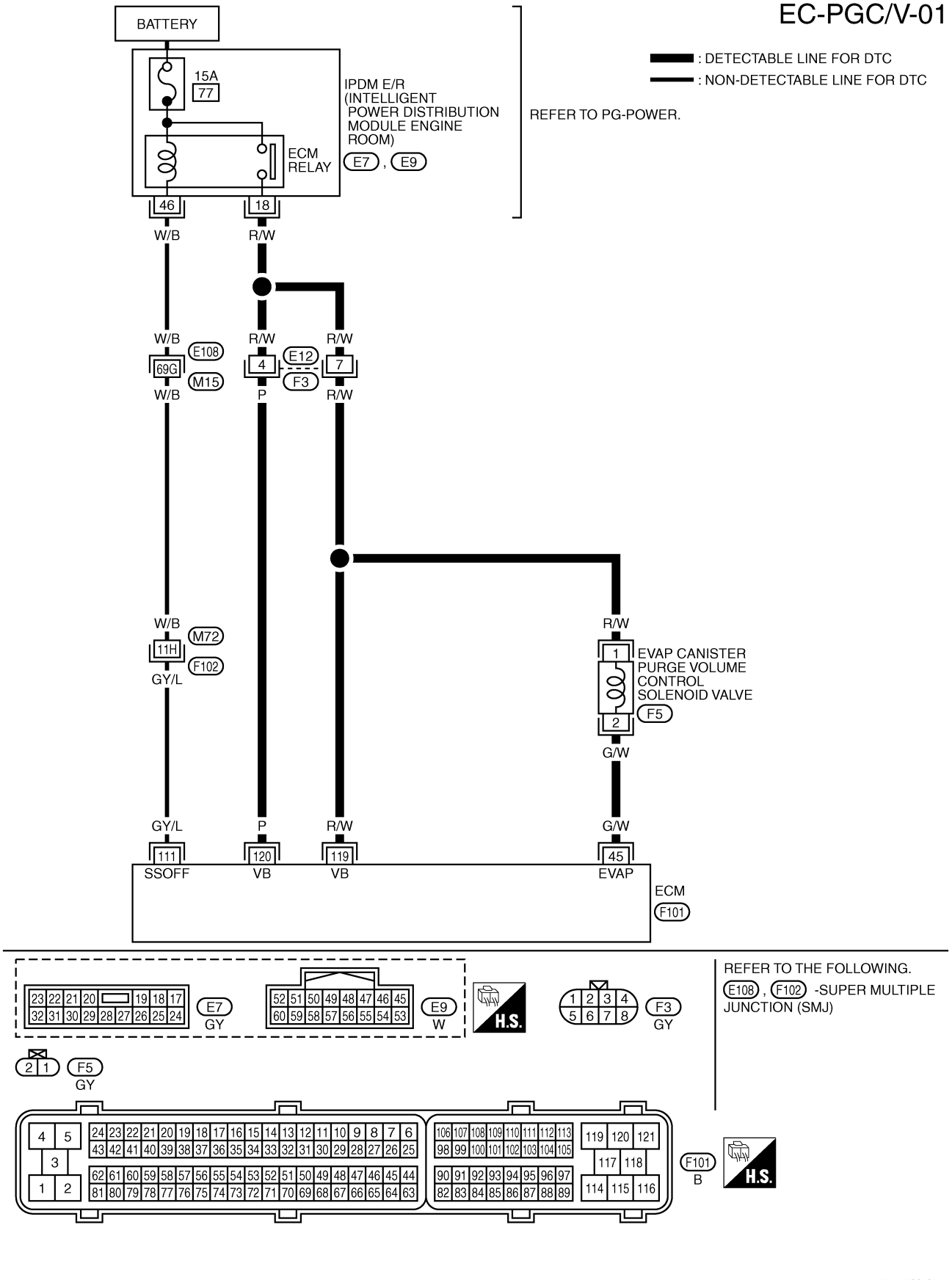


WITH GST

Follow the procedure “WITH CONSULT-II” above.

Wiring Diagram

ABS009H4

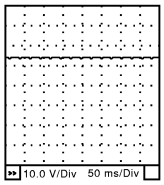
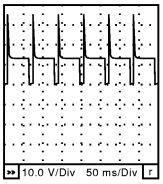


TBWT0619E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-II.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
45	G/W	EVAP canister purge volume control solenoid valve	**[Engine is running]** ● Idle speed	BATTERY VOLTAGE (11 - 14V)★  SEC990C
			[Engine is running] ● Engine speed is about 2,000 rpm (More than 100 seconds after starting engine).	BATTERY VOLTAGE (11 - 14V)★  SEC991C
111	GY/L	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
119 120	R/W P	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

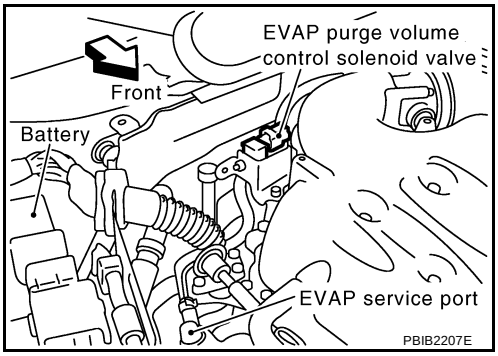
★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

ABS009H5

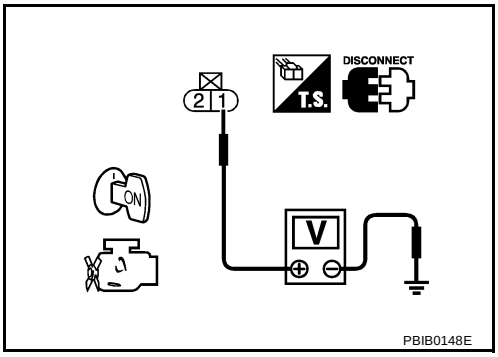
1. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect EVAP canister purge volume control solenoid valve harness connector.
3. Turn ignition switch ON.



4. Check voltage between EVAP canister purge volume control solenoid valve terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- IPDM E/R harness connector E8
- 15A fuse
- Harness for open or short between EVAP canister purge volume control solenoid valve and IPDM E/R
- Harness for open or short between EVAP canister purge volume control solenoid valve and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 45 and EVAP canister purge volume control solenoid valve terminal 2. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK (With CONSULT-II)>>GO TO 4.
OK (Without CONSULT-II)>>GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

With CONSULT-II

1. Reconnect all harness connectors disconnected.
2. Start engine.
3. Perform “PURG VOL CONT/V” in “ACTIVE TEST” mode with CONSULT-II. Check that engine speed varies according to the valve opening.

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

ACTIVE TEST	
PURG VOL CONT/V	XXX %
MONITOR	
ENG SPEED	XXX rpm
A/F ALPHA-B1	XX %
A/F ALPHA-B2	XX %

PBIB1678E

5. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-306, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace EVAP canister purge volume control solenoid valve.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

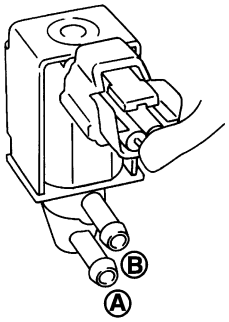
ABS009H6

EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

With CONSULT-II

Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

Condition (PURG VOL CONT/V value)	Air passage continuity between A and B
100%	Yes
0%	No

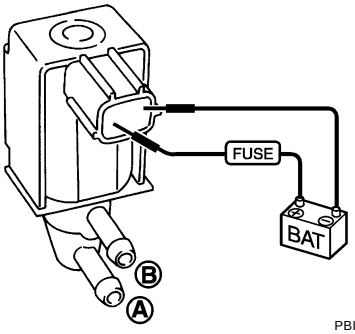


PBIB0149E

Without CONSULT-II

Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

Condition	Air passage continuity between A and B
12V direct current supply between terminals 1 and 2	Yes
No supply	No



PBIB0150E

Removal and Installation

ABS009H7

EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .

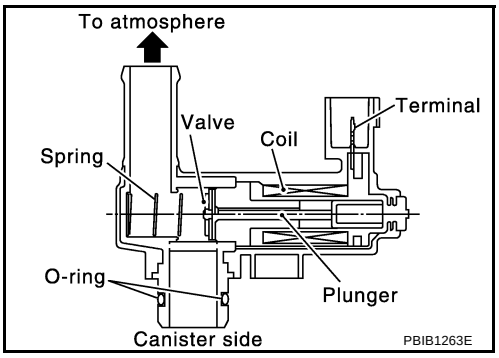
DTC P0447 EVAP CANISTER VENT CONTROL VALVE

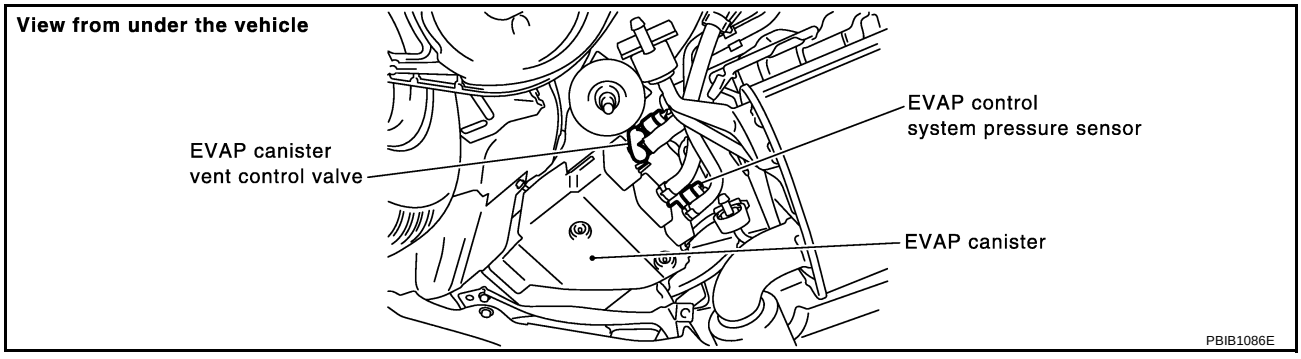
PFP:14935

Component Description

ABS009H8

The EVAP canister vent control valve is located on the EVAP canister and is used to seal the canister vent.
This solenoid valve responds to signals from the ECM. When the ECM sends an ON signal, the coil in the solenoid valve is energized. A plunger will then move to seal the canister vent. The ability to seal the vent is necessary for the on board diagnosis of other evaporative emission control system components.
This solenoid valve is used only for diagnosis, and usually remains opened.
When the vent is closed, under normal purge conditions, the evaporative emission control system is depressurized and allows “EVAP Control System” diagnosis.





CONSULT-II Reference Value in Data Monitor Mode

ABS009H9

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
VENT CONT/V	● Ignition switch: ON	OFF

On Board Diagnosis Logic

ABS009HA

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0447 0447	EVAP canister vent control valve circuit open	An improper voltage signal is sent to ECM through EVAP canister vent control valve.	● Harness or connectors (The valve circuit is open or shorted.) ● EVAP canister vent control valve

DTC Confirmation Procedure

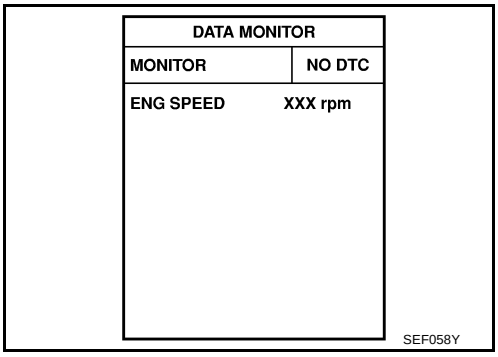
ABS009HB

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm battery voltage is more than 11V at idle.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Start engine and wait at least 8 seconds.
4. If 1st trip DTC is detected, go to EC-313, "Diagnostic Procedure"
   .



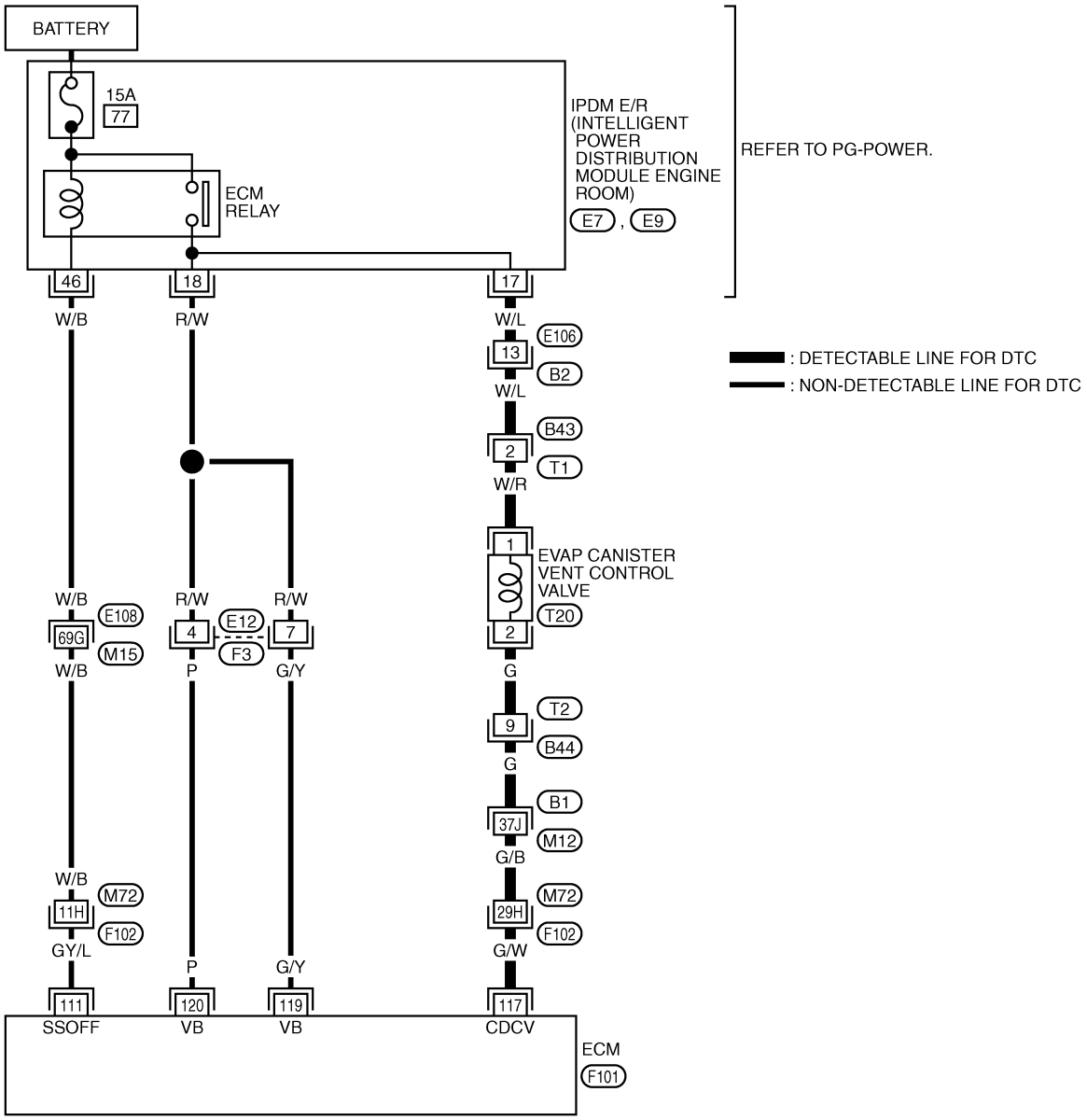
WITH GST

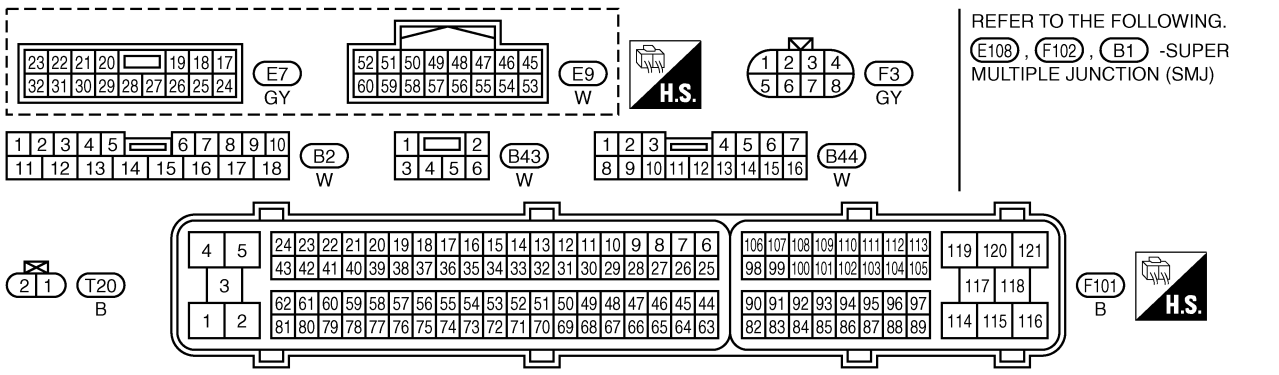
Follow the procedure “WITH CONSULT-II” above.

Wiring Diagram
COUPE MODELS

ABS009HC

EC-VENT/V-01





TBWT0620E

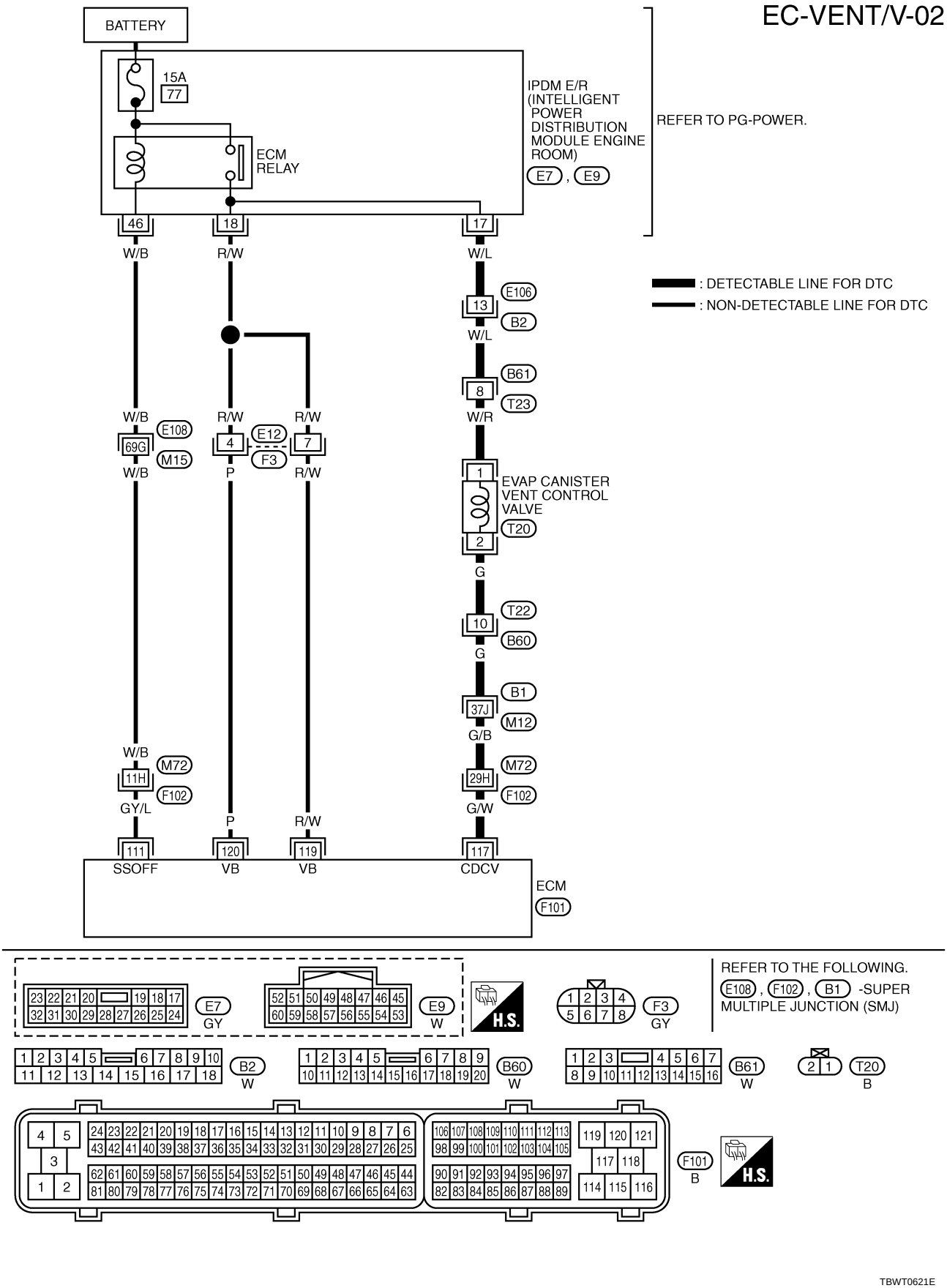
Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
111	GY/L	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
117	G/W	EVAP canister vent control valve	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
119 120	R/W P	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

ROADSTER MODELS



TBWT0621E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
111	GY/L	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
117	G/W	EVAP canister vent control valve	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
119 120	R/W P	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

ABS009HD

1. INSPECTION START

Do you have CONSULT-II?

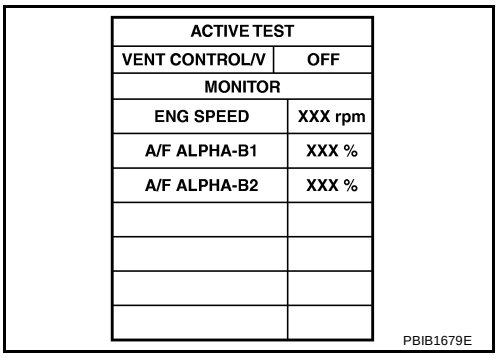
Yes or No

Yes >> GO TO 2.
No >> GO TO 3.

2. CHECK EVAP CANISTER VENT CONTROL VALVE CIRCUIT

With CONSULT-II

1. Turn ignition switch OFF and then turn ON.
2. Select “VENT CONTROL/V” in “ACTIVE TEST” mode with CONSULT-II.
3. Touch “ON/OFF” on CONSULT-II screen.
4. Check for operating sound of the valve.
   Clicking noise should be heard.

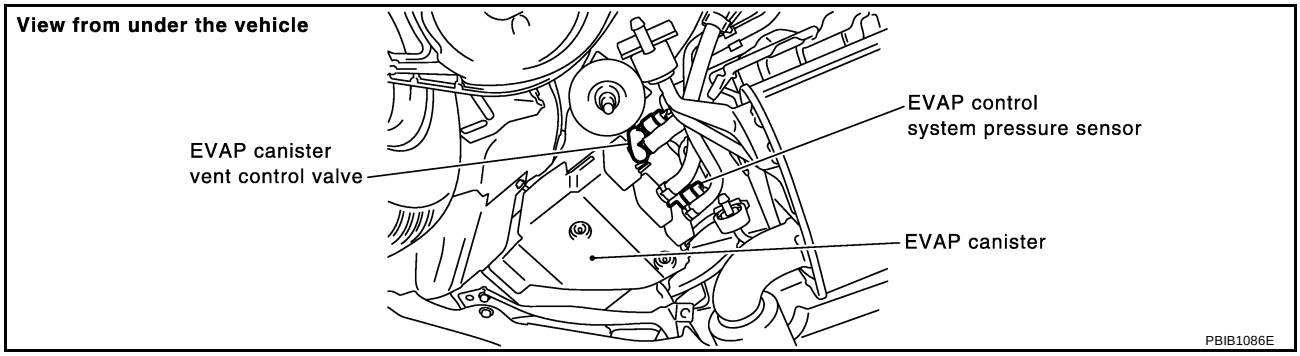


OK or NG

OK >> GO TO 7.
NG >> GO TO 3.

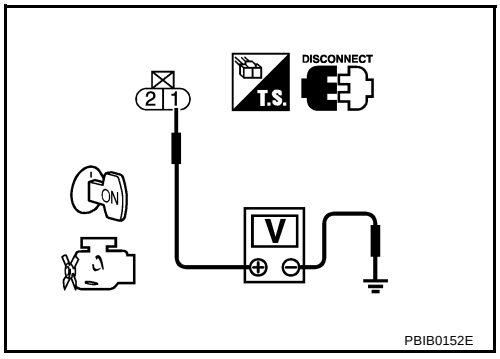
3. CHECK EVAP CANISTER VENT CONTROL VALVE POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect EVAP canister vent control valve harness connector.



3. Turn ignition switch ON.
4. Check voltage between EVAP canister vent control valve terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E106, B2
- Harness connectors B43, T1 (Coupe models)
- Harness connectors B61, T23 (Roadster models)
- IPDM E/R harness connector E8
- 15A fuse
- Harness for open or short between EVAP canister vent control valve and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK EVAP CANISTER VENT CONTROL VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 117 and EVAP canister vent control valve terminal 2. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors T2, B44 (Coupe models)
- Harness connectors T22, B60 (Roadster models)
- Harness connectors B1, M12
- Harness connectors M72, F102
- Harness for open or short between EVAP canister vent control valve and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK RUBBER TUBE FOR CLOGGING

1. Disconnect rubber tube connected to EVAP canister vent control valve.
2. Check the rubber tube for clogging.

OK or NG

OK >> GO TO 8.
NG >> Clean the rubber tube using an air blower.

8. CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-315, "Component Inspection" .

OK or NG

OK >> GO TO 9.
NG >> Replace EVAP canister vent control valve.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

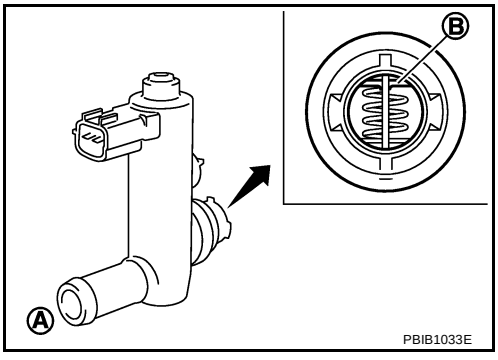
Component Inspection

ABS009HE

EVAP CANISTER VENT CONTROL VALVE

With CONSULT-II

1. Remove EVAP canister vent control valve from EVAP canister.
2. Check portion **B** of EVAP canister vent control valve for being rusted.
   If NG, replace EVAP canister vent control valve.
   If OK, go to next step.
3. Reconnect harness connectors disconnected.
4. Turn ignition switch ON.



5. Perform “VENT CONTROL/V” in “ACTIVE TEST” mode.
6. Check air passage continuity and operation delay time.
   Make sure new O-ring is installed properly.

ACTIVE TEST	
VENT CONTROL/V	OFF
MONITOR	
ENG SPEED	XXX rpm
A/F ALPHA-B1	XXX %
A/F ALPHA-B2	XXX %
HO2S1 (B1)	XXX V
HO2S1 (B2)	XXX V

PBIB0151E

Condition VENT CONTROL/V	Air passage continuity between A and B
ON	No
OFF	Yes

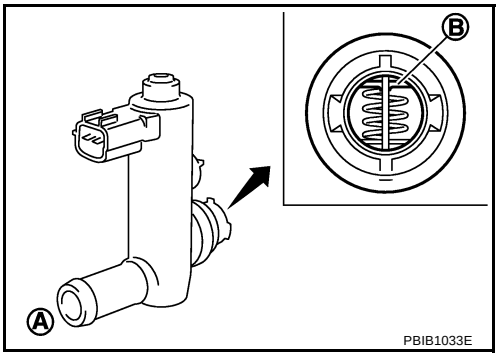
Operation takes less than 1 second.

If NG, replace EVAP canister vent control valve.
If OK, go to next step.

7. Clean the air passage (Portion **A** to **B**) of EVAP canister vent control valve using an air blower.
8. Perform step 6 again.

Without CONSULT-II

1. Remove EVAP canister vent control valve from EVAP canister.
2. Check portion **B** of EVAP canister vent control valve for being rusted.

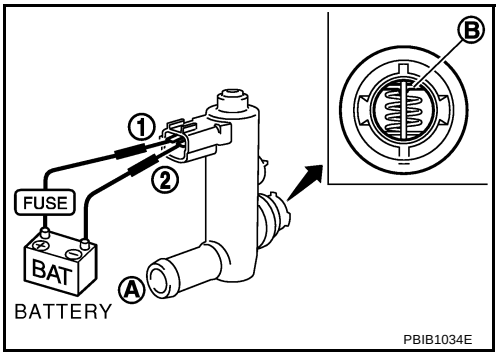


PBIB1033E

3. Check air passage continuity and operation delay time under the following conditions.
   Make sure new O-ring is installed properly.

Condition	Air passage continuity between A and B
12V direct current supply between terminals 1 and 2	No
OFF	Yes

Operation takes less than 1 second.



PBIB1034E

If NG, replace EVAP canister vent control valve.
If OK, go to next step.

4. Clean the air passage (Portion **A** to **B**) of EVAP canister vent control valve using an air blower.
5. Perform step 3 again.

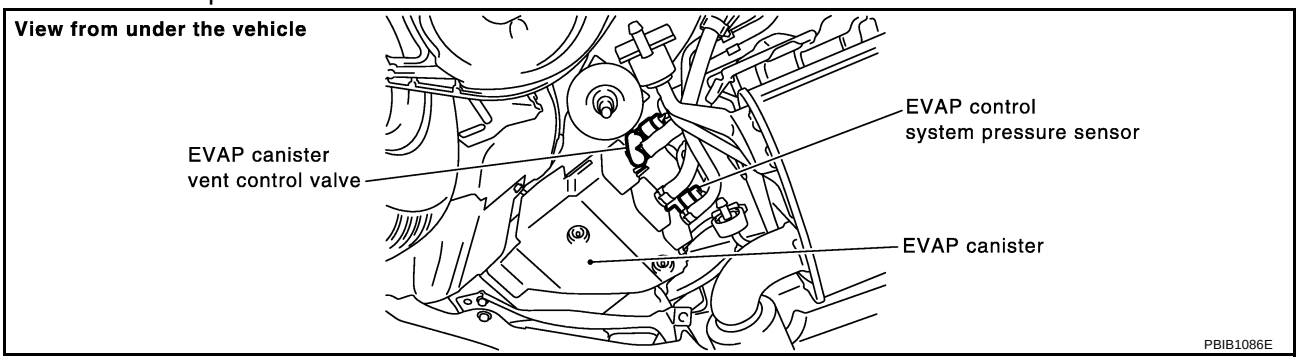
DTC P0451 EVAP CONTROL SYSTEM PRESSURE SENSOR

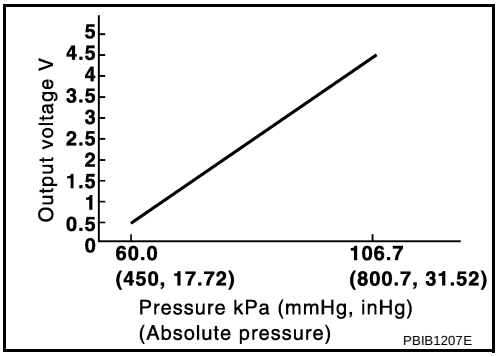
PFP:22365

Component Description

ABS009HF

The EVAP control system pressure sensor detects pressure in the purge line. The sensor output voltage to the ECM increases as pressure increases.





CONSULT-II Reference Value in Data Monitor Mode

ABS009HG

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
EVAP SYS PRES	● Ignition switch: ON	Approx. 1.8 - 4.8V

On Board Diagnosis Logic

ABS009HH

NOTE:
If DTC P0451 is displayed with DTC P1229, first perform the trouble diagnosis for DTC P1229.
Refer to EC-457.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0451 0451	EVAP control system pressure sensor performance	ECM detects a sloshing signal from the EVAP control system pressure sensor	● Harness or connectors ● EVAP control system pressure sensor

DTC Confirmation Procedure

ABS009HI

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-II

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-II.
3. Start engine and wait at least 40 seconds.

   NOTE:
   Do not depress accelerator pedal even slightly.
   If 1st trip DTC is detected, go to EC-318, "Diagnostic Procedure"
   .

DATA MONITOR	
MONITOR	NO DTC
ENG SPEED	XXX rpm
COOLAN TEMP/S	XXX °C
FUEL T/TMP SE	XXX °C

SEF194Y

WITH GST

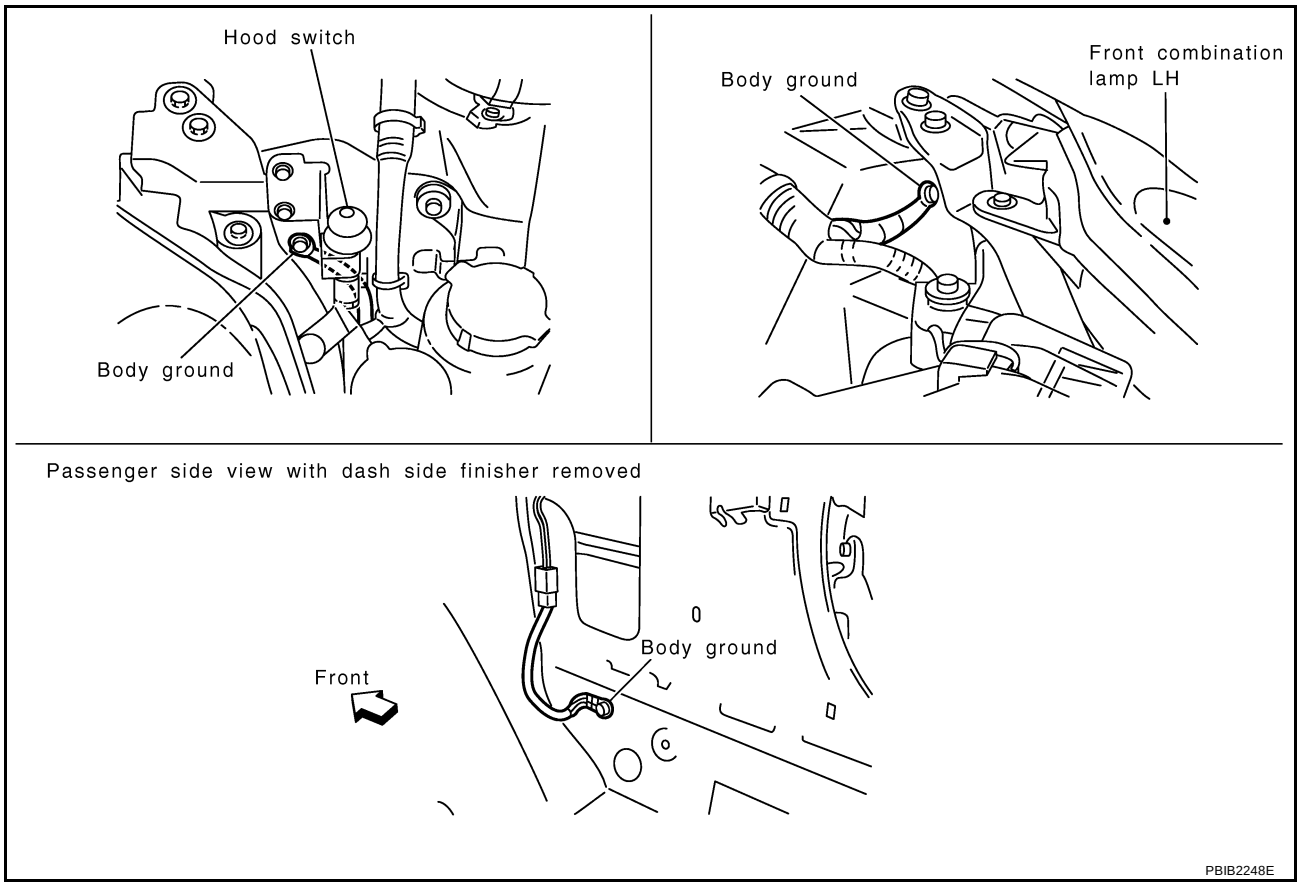
Follow the procedure “WITH CONSULT-II” above.

Diagnostic Procedure

ABS009HJ

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

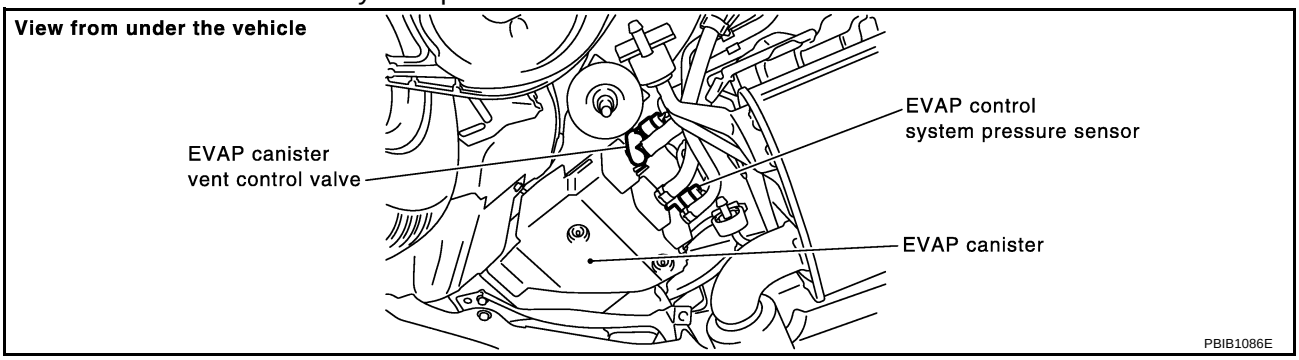


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK EVPA CONTROL SYSTEM PRESSURE SENSOR CONNECTOR FOR WATER

1. Disconnect EVAP control system pressure sensor harness connector.



2. Check sensor harness connector for water.

Water should not exist.

OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness connector.

3. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-319, "Component Inspection" .

OK or NG

OK >> GO TO 4.
NG >> Replace EVAP control system pressure sensor.

4. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .
For wiring diagram, refer to EC-322 .

>> **INSPECTION END**

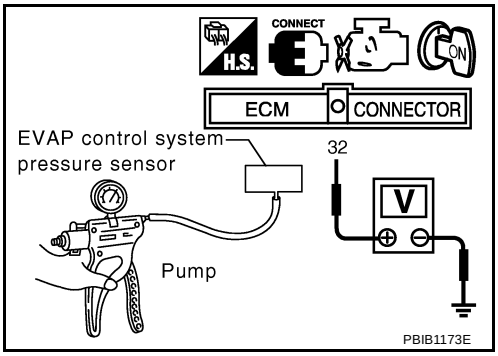
Component Inspection

ABS009HK

EVAP CONTROL SYSTEM PRESSURE SENSOR

1. Remove EVAP control system pressure sensor with its harness connector connected from EVAP canister. **Do not reuse the O-ring, replace it with a new one.**
2. Install a vacuum pump to EVAP control system pressure sensor.
3. Turn ignition switch ON and check output voltage between ECM terminal 32 and ground under the following conditions.

Applied vacuum kPa (mmHg, inHg)	Voltage V
Not applied	1.8 - 4.8
-26.7 (-200, -7.87)	2.1 to 2.5V lower than above value



CAUTION:

- **Always calibrate the vacuum pump gauge when using it.**
- **Do not apply below -93.3 kPa (-700 mmHg, -27.56 inHg) or pressure over 101.3 kPa (760 mmHg, 29.92 inHg).**

4. If NG, replace EVAP control system pressure sensor.

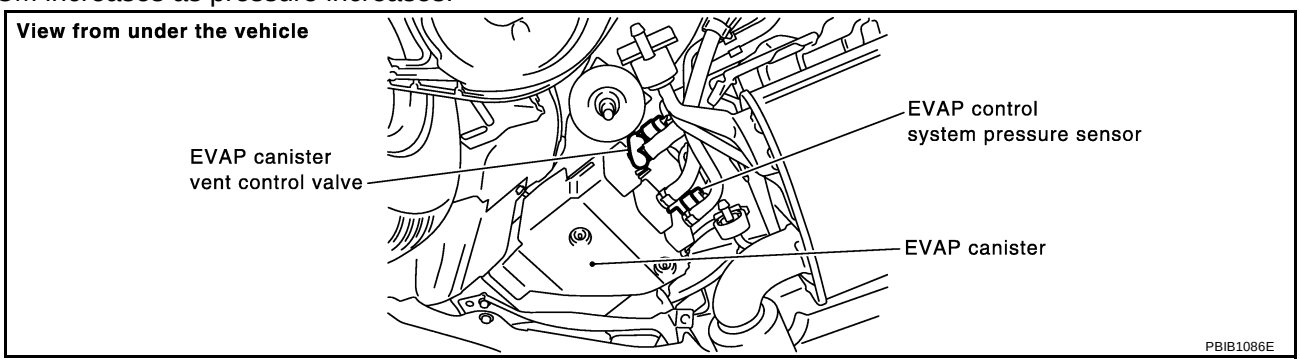
DTC P0452 EVAP CONTROL SYSTEM PRESSURE SENSOR

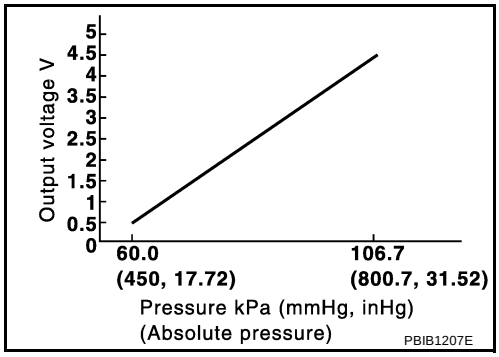
PFP:25085

Component Description

ABS009HL

The EVAP control system pressure sensor detects pressure in the purge line. The sensor output voltage to the ECM increases as pressure increases.





CONSULT-II Reference Value in Data Monitor Mode

ABS009HM

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
EVAP SYS PRES	● Ignition switch: ON	Approx. 1.8 - 4.8V

On Board Diagnosis Logic

ABS009HN

NOTE:
If DTC P0452 is displayed with DTC P1229, first perform the trouble diagnosis for DTC P1229.
Refer to EC-457 .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0452 0452	EVAP control system pressure sensor low input	An excessively low voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted.) ● EVAP control system pressure sensor

DTC Confirmation Procedure

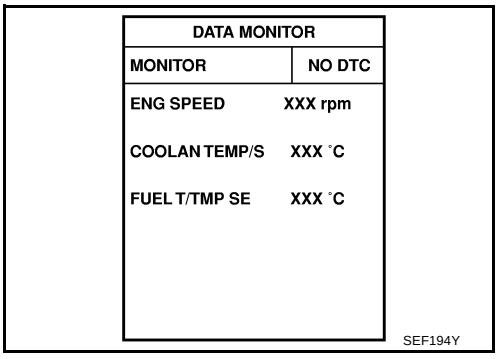
ABS009HO

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Always perform test at a temperature of 5°C (41°F) or more.

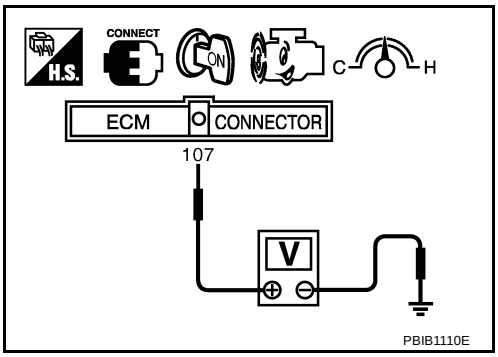
WITH CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON.
4. Select “DATA MONITOR” mode with CONSULT-II.
5. Make sure that “FUEL T/TEMP SE” is more than 0°C (32°F).
6. Start engine and wait at least 20 seconds.
   If 1st trip DTC is detected, go to EC-325, "Diagnostic Procedure"
   .



WITH GST

1. Start engine and warm it up to normal operating temperature.
2. Check that voltage between ECM terminal 107 (Fuel tank temperature sensor signal) and ground is less than 4.2V.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and wait at least 20 seconds.
5. Select “MODE 7” with GST.
   If 1st trip DTC is detected, go to EC-325, "Diagnostic Procedure"
   .

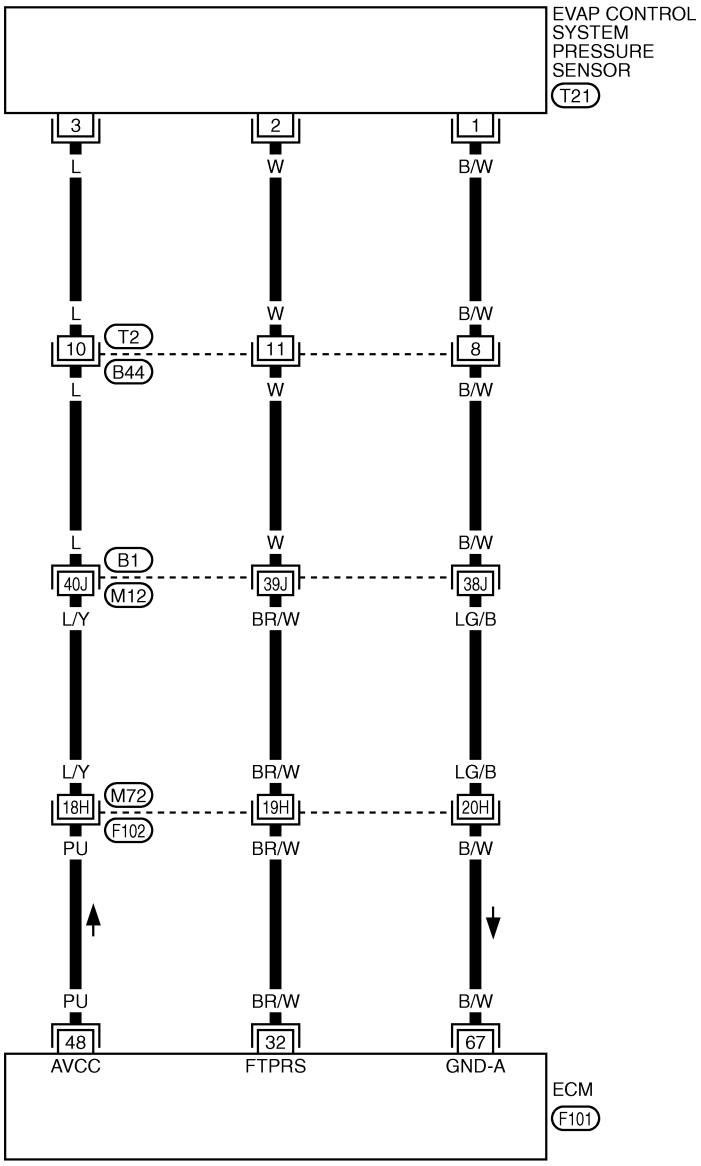


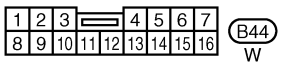
Wiring Diagram
COUPE MODELS

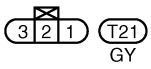
ABS009HP

EC-PRE/SE-01

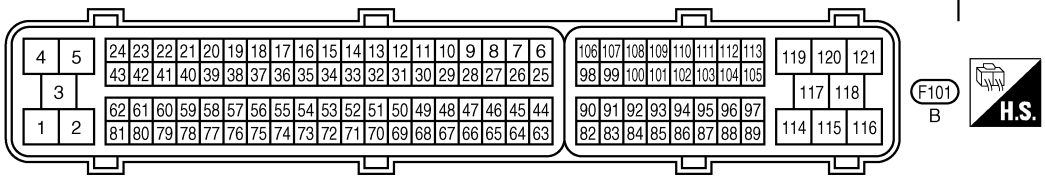
: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC







REFER TO THE FOLLOWING.
F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)



TBWT0622E

Specification data are reference values and are measured between each terminal and ground.

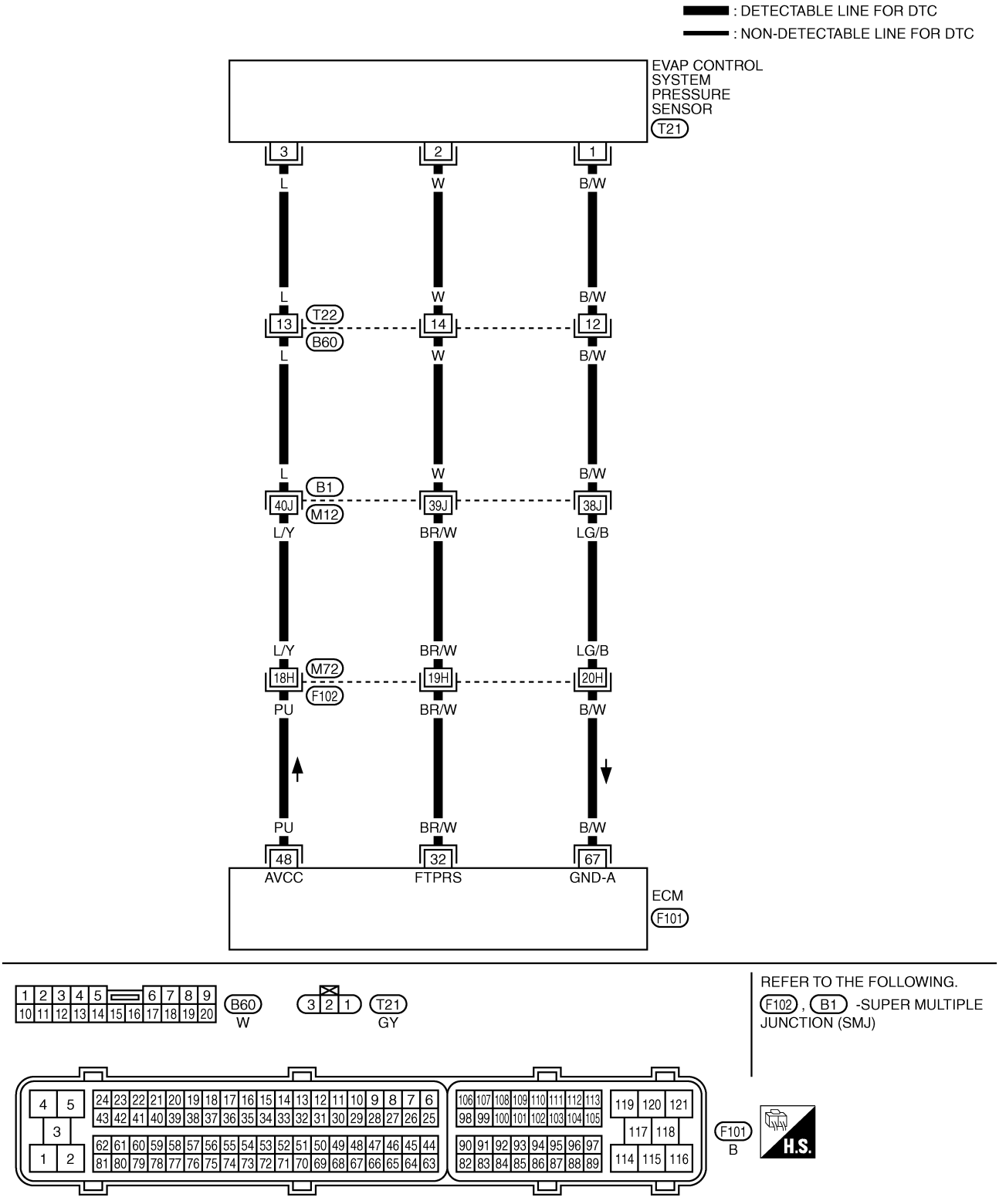
CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
32	BR/W	EVAP control system pressure sensor	**[Ignition switch: ON]**	Approximately 1.8 - 4.8V
48	PU	Sensor power supply (EVAP control system pressure sensor)	**[Ignition switch: ON]**	Approximately 5V
67	B/W	Sensor ground (Mass air flow sensor / IAT sensor / Power steering pressure sensor / EVAP control system pressure sensor / ASCD steering switch / Refrigerant pressure sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V

ROADSTER MODELS

EC-PRE/SE-02



TBWT0623E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

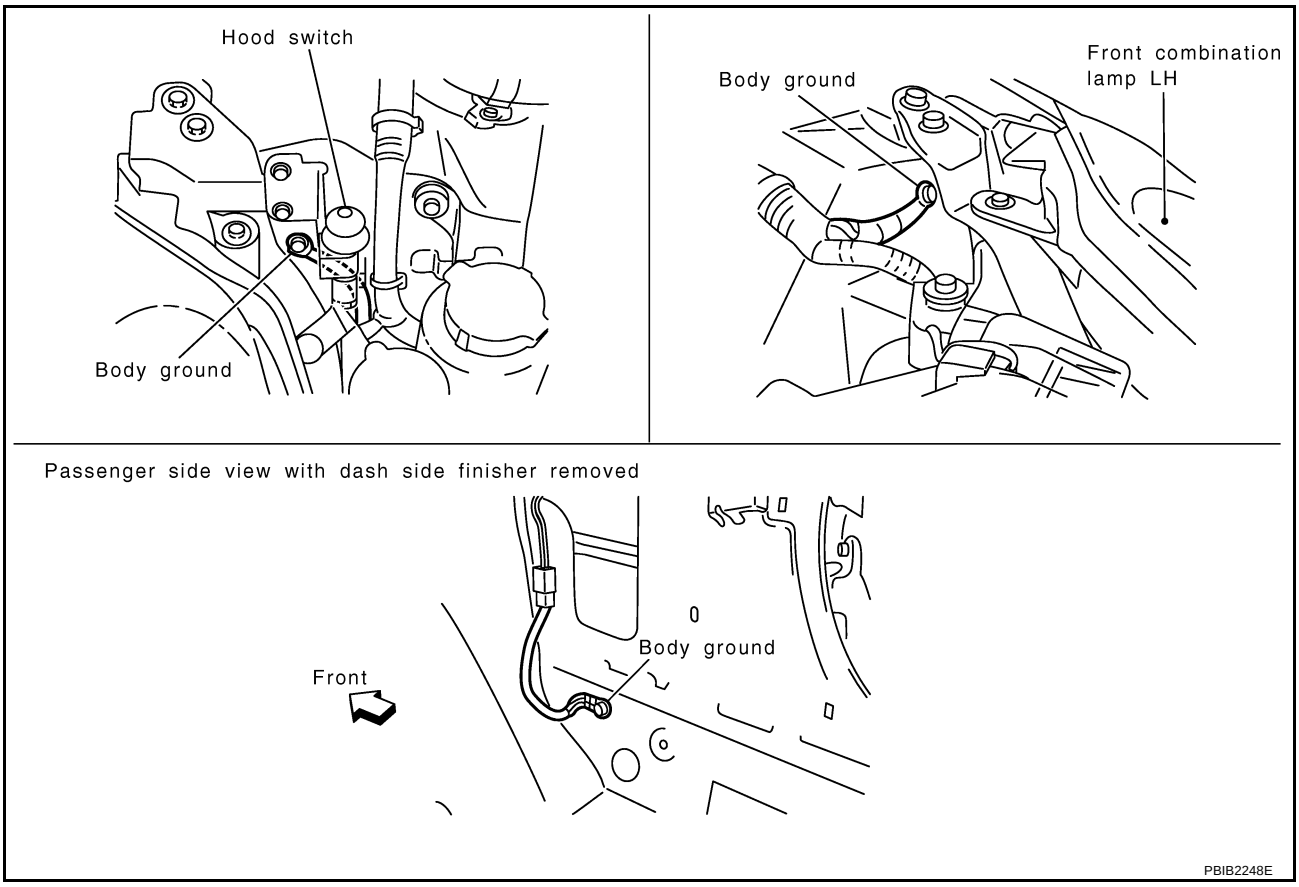
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
32	BR/W	EVAP control system pressure sensor	**[Ignition switch: ON]**	Approximately 1.8 - 4.8V
48	PU	Sensor power supply (EVAP control system pressure sensor)	**[Ignition switch: ON]**	Approximately 5V
67	B/W	Sensor ground (Mass air flow sensor / IAT sensor / Power steering pressure sensor / EVAP control system pressure sensor / ASCD steering switch / Refrigerant pressure sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V

Diagnostic Procedure

ABS009HQ

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

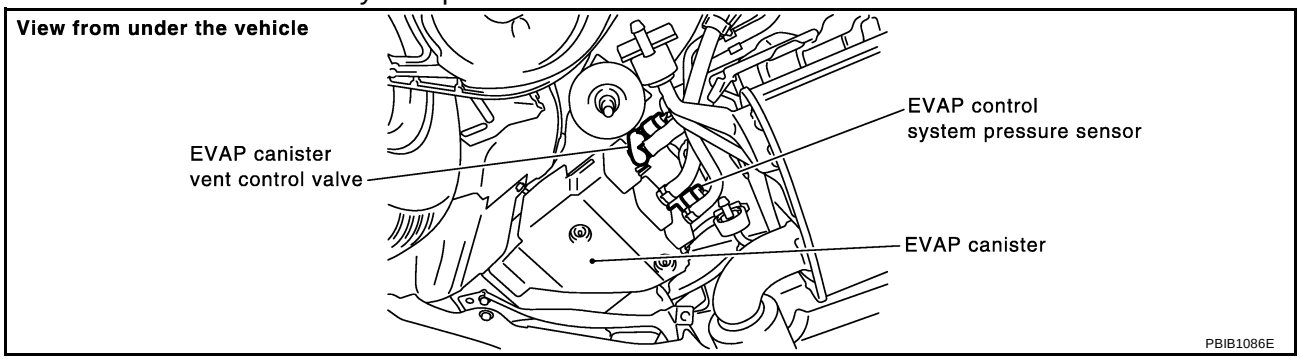


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK CONNECTOR

1. Disconnect EVAP control system pressure sensor harness connector.



2. Check sensor harness connector for water.

Water should not exist.

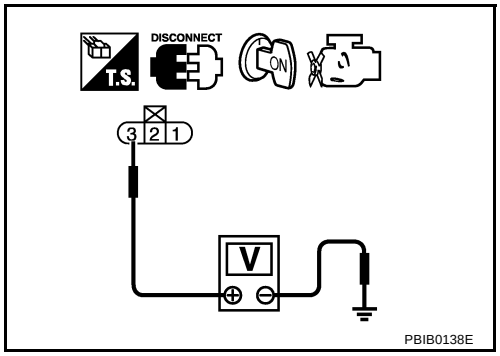
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness connector.

3. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between EVAP control system pressure sensor terminal 3 and ground with CONSULT-II or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors T2, B44 (Coupe models)
- Harness connectors T22, B60 (Roadster models)
- Harness connectors B1, M12
- Harness connectors M72, F102
- Harness for open or short between EVAP control system pressure sensor and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between EVAP control system pressure sensor terminal 1 and ECM terminal 67.
   Refer to Wiring Diagram.

   Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors T2, B44 (Coupe models)
- Harness connectors T22, B60 (Roadster models)
- Harness connectors B1, M12
- Harness connectors M72, F102
- Harness for open or short between EVAP control system pressure sensor and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 32 and EVAP control system pressure sensor terminal 2.
   Refer to Wiring Diagram.

   Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 9.
NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors T2, B44 (Coupe models)
- Harness connectors T22, B60 (Roadster models)
- Harness connectors B1, M12
- Harness connectors M72, F102
- Harness for open or short between EVAP control system pressure sensor and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-328, "Component Inspection" .

OK or NG

OK >> GO TO 10.
NG >> Replace EVAP control system pressure sensor.

10. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

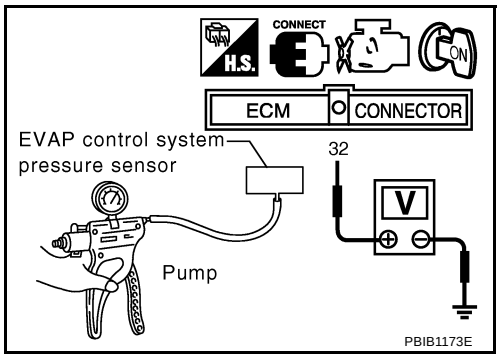
Component Inspection

ABS009HR

EVAP CONTROL SYSTEM PRESSURE SENSOR

1. Remove EVAP control system pressure sensor with its harness connector connected from EVAP canister. **Do not reuse the O-ring, replace it with a new one.**
2. Install a vacuum pump to EVAP control system pressure sensor.
3. Turn ignition switch ON and check output voltage between ECM terminal 32 and ground under the following conditions.

Applied vacuum kPa (mmHg, inHg)	Voltage V
Not applied	1.8 - 4.8
-26.7 (-200, -7.87)	2.1 to 2.5V lower than above value



CAUTION:

- **Always calibrate the vacuum pump gauge when using it.**
- **Do not apply below -93.3 kPa (-700 mmHg, -27.56 inHg) or pressure over 101.3 kPa (760 mmHg, 29.92 inHg).**

4. If NG, replace EVAP control system pressure sensor.

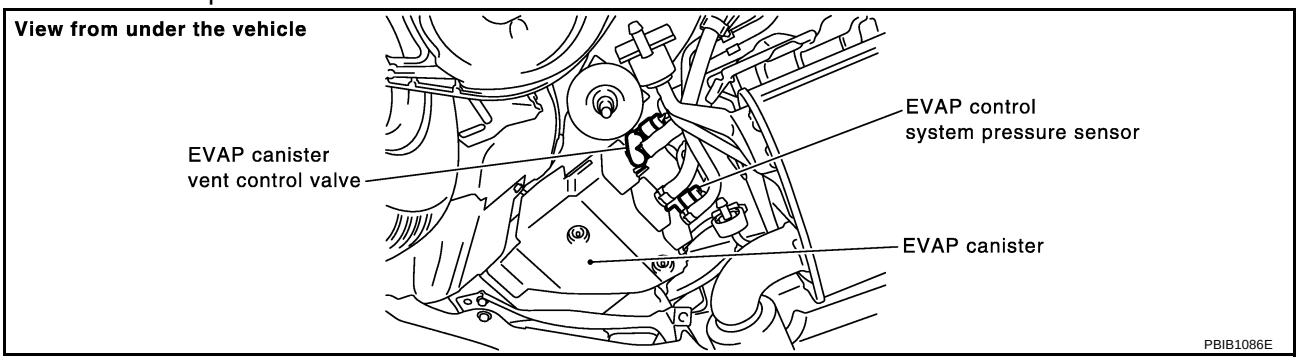
DTC P0453 EVAP CONTROL SYSTEM PRESSURE SENSOR

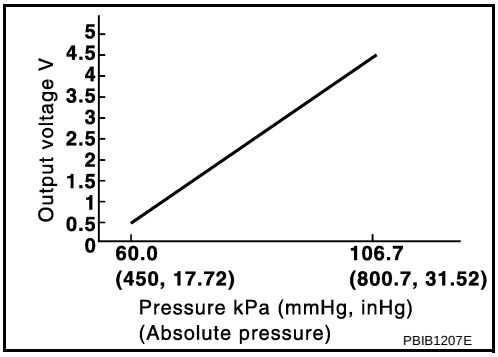
PFP:25085

Component Description

ABS009HS

The EVAP control system pressure sensor detects pressure in the purge line. The sensor output voltage to the ECM increases as pressure increases.





CONSULT-II Reference Value in Data Monitor Mode

ABS009HT

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
EVAP SYS PRES	● Ignition switch: ON	Approx. 1.8 - 4.8V

On Board Diagnosis Logic

ABS009HU

NOTE:
If DTC P0453 is displayed with DTC P1229, first perform the trouble diagnosis for DTC P1229.
Refer to EC-457 .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0453 0453	EVAP control system pressure sensor high input	An excessively high voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted.) ● EVAP control system pressure sensor ● EVAP canister vent control valve ● EVAP canister ● Rubber hose from EVAP canister vent control valve to vehicle frame

DTC Confirmation Procedure

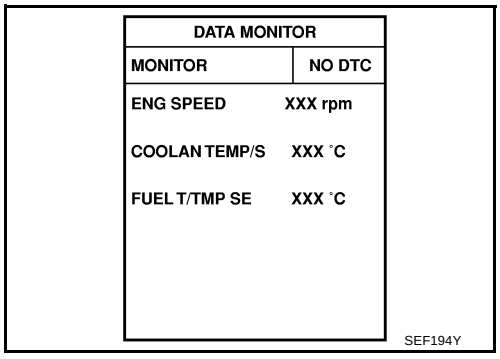
ABS009HV

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Always perform test at a temperature of 5°C (41°F) or more.

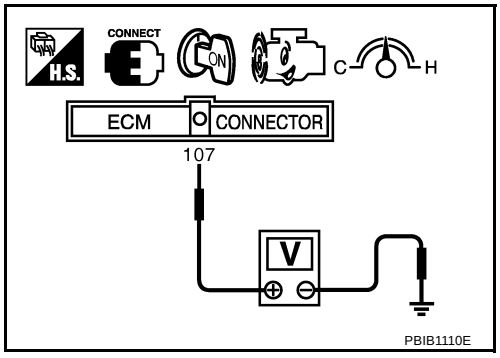
WITH CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON.
4. Select “DATA MONITOR” mode with CONSULT-II.
5. Make sure that “FUEL T/TEMP SE” is more than 0°C (32°F).
6. Start engine and wait at least 20 seconds.
7. If 1st trip DTC is detected, go to EC-334, "Diagnostic Procedure"
.



WITH GST

1. Start engine and warm it up to normal operating temperature.
2. Check that voltage between ECM terminal 107 (Fuel tank temperature sensor signal) and ground is less than 4.2V.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and wait at least 20 seconds.
5. Select “MODE 7” with GST.
   If 1st trip DTC is detected, go to EC-334, "Diagnostic Procedure"
.

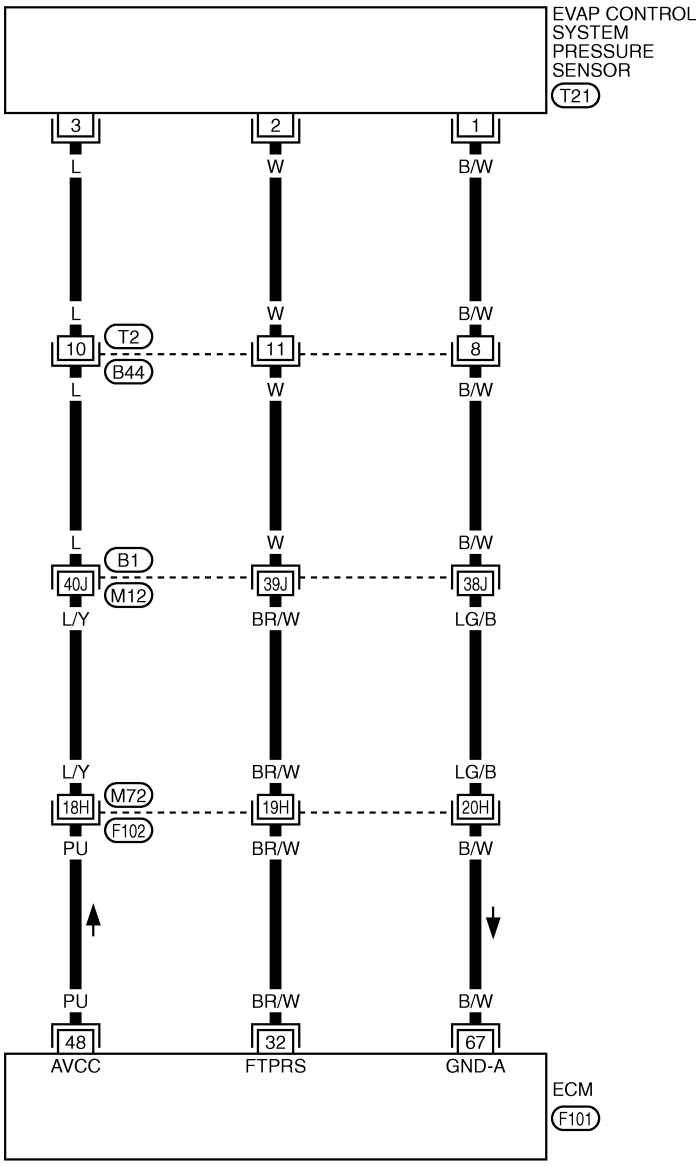


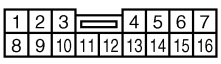
Wiring Diagram
COUPE MODELS

ABS009HW

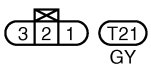
EC-PRE/SE-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC



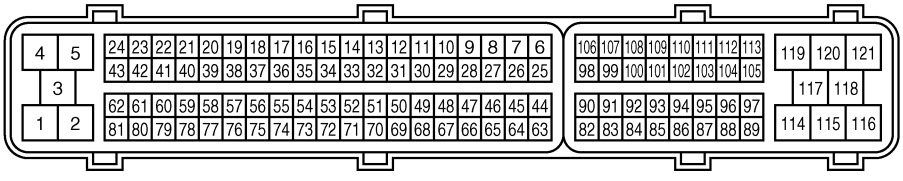


B44
W



T21
GY

REFER TO THE FOLLOWING.
F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)



F101
B

H.S.

TBWT0622E

Specification data are reference values and are measured between each terminal and ground.

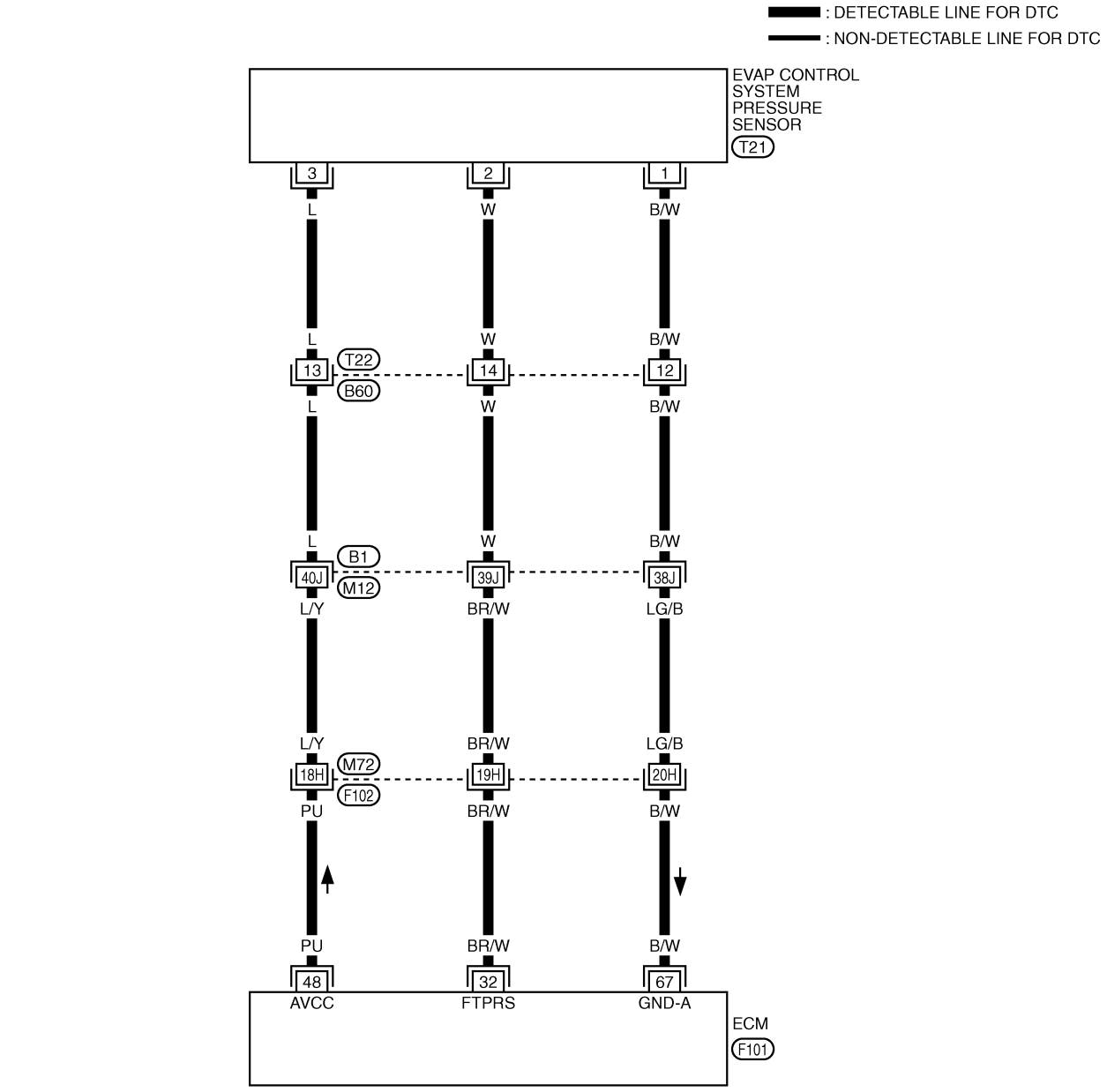
CAUTION:

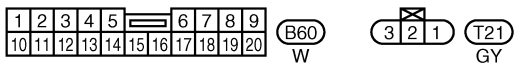
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
32	BR/W	EVAP control system pressure sensor	**[Ignition switch: ON]**	Approximately 1.8 - 4.8V
48	PU	Sensor power supply (EVAP control system pressure sensor)	**[Ignition switch: ON]**	Approximately 5V
67	B/W	Sensor ground (Mass air flow sensor / IAT sensor / Power steering pressure sensor / EVAP control system pressure sensor / ASCD steering switch / Refrigerant pressure sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V

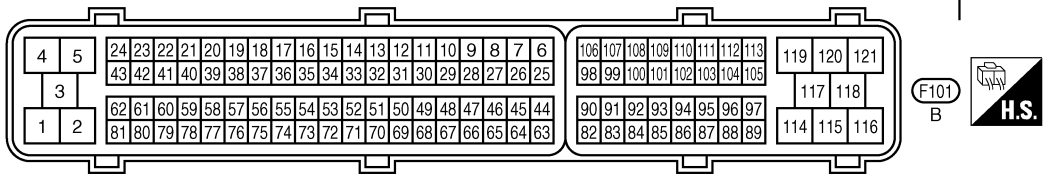
ROADSTER MODELS

EC-PRE/SE-02





REFER TO THE FOLLOWING.
F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)



TBWT0623E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

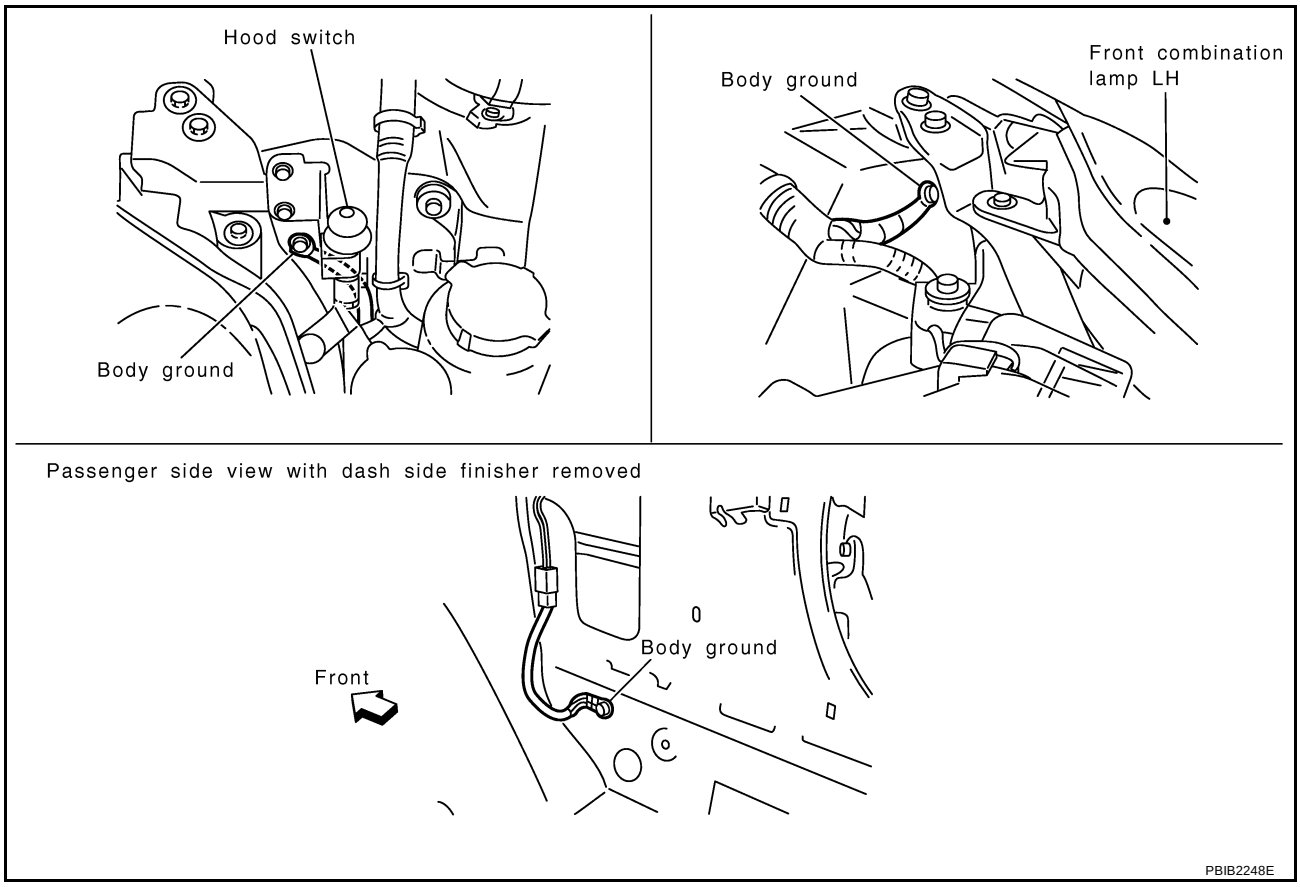
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
32	BR/W	EVAP control system pressure sensor	**[Ignition switch: ON]**	Approximately 1.8 - 4.8V
48	PU	Sensor power supply (EVAP control system pressure sensor)	**[Ignition switch: ON]**	Approximately 5V
67	B/W	Sensor ground (Mass air flow sensor / IAT sensor / Power steering pressure sensor / EVAP control system pressure sensor / ASCD steering switch / Refrigerant pressure sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V

Diagnostic Procedure

ABS009HX

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

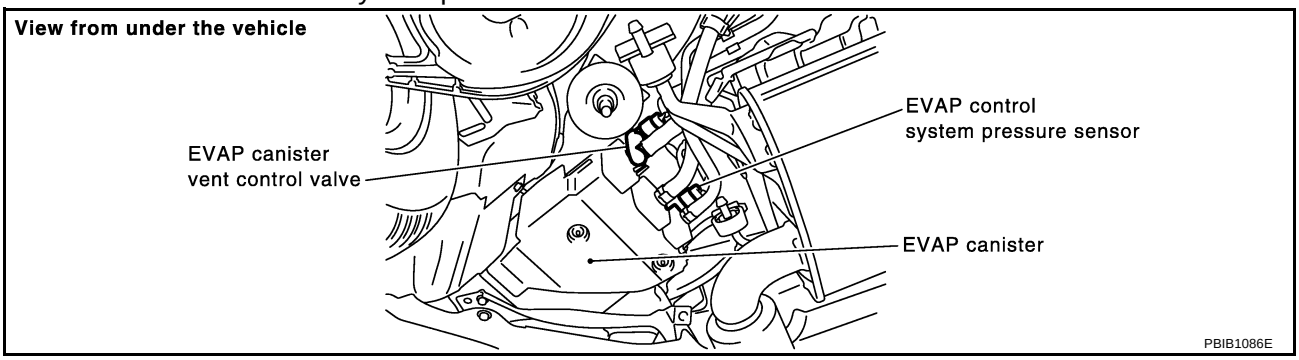


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK CONNECTOR

1. Disconnect EVAP control system pressure sensor harness connector.



2. Check sensor harness connector for water.

Water should not exist.

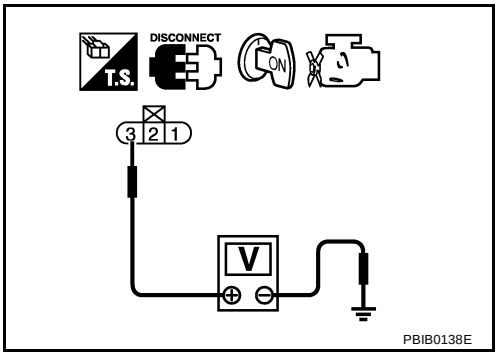
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness connector.

3. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between EVAP control system pressure sensor terminal 3 and ground with CONSULT-II or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors T2, B44 (Coupe models)
- Harness connectors T22, B60 (Roadster models)
- Harness connectors B1, M12
- Harness connectors M72, F102
- Harness for open or short between EVAP control system pressure sensor and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between EVAP control system pressure sensor terminal 1 and ECM terminal 67.
   Refer to Wiring Diagram.

   Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors T2, B44 (Coupe models)
- Harness connectors T22, B60 (Roadster models)
- Harness connectors B1, M12
- Harness connectors M72, F102
- Harness for open or short between EVAP control system pressure sensor and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 32 and EVAP control system pressure sensor terminal 2.
   Refer to Wiring Diagram.

   Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 9.
NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors T2, B44 (Coupe models)
- Harness connectors T22, B60 (Roadster models)
- Harness connectors B1, M12
- Harness connectors M72, F102
- Harness for open or short between EVAP control system pressure sensor and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK RUBBER TUBE

1. Disconnect rubber tube connected to EVAP canister vent control valve.
2. Check the rubber tube for clogging, vent and kinked.

OK or NG

OK >> GO TO 10.
NG >> Clean the rubber tube using an air blower.

10. CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-315, "Component Inspection" .

OK or NG

OK >> GO TO 11.
NG >> Replace EVAP canister vent control valve.

11. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-338, "Component Inspection" .

OK or NG

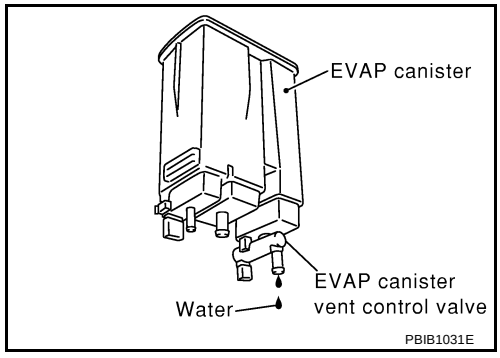
OK >> GO TO 12.
NG >> Replace EVAP control system pressure sensor.

12. CHECK IF EVAP CANISTER SATURATED WITH WATER

1. Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
2. Check if water will drain from the EVAP canister.

Yes or No

Yes >> GO TO 13.
No >> GO TO 15.



13. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.
The weight should be less than 2.2 kg (4.9 lb).

OK or NG

OK >> GO TO 15.
NG >> GO TO 14.

14. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister.

15. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

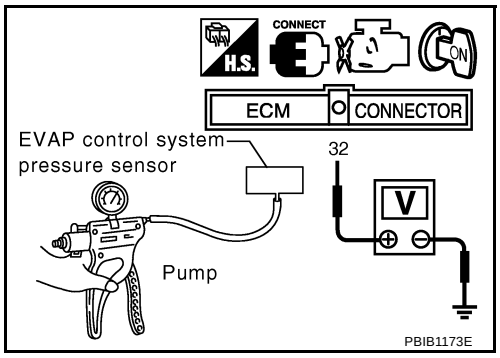
Component Inspection

ABS009HY

EVAP CONTROL SYSTEM PRESSURE SENSOR

1. Remove EVAP control system pressure sensor with its harness connector connected from EVAP canister. **Do not reuse the O-ring, replace it with a new one.**
2. Install a vacuum pump to EVAP control system pressure sensor.
3. Turn ignition switch ON and check output voltage between ECM terminal 32 and ground under the following conditions.

Applied vacuum kPa (mmHg, inHg)	Voltage V
Not applied	1.8 - 4.8
-26.7 (-200, -7.87)	2.1 to 2.5V lower than above value



CAUTION:

- **Always calibrate the vacuum pump gauge when using it.**
- **Do not apply below -93.3 kPa (-700 mmHg, -27.56 inHg) or pressure over 101.3 kPa (760 mmHg, 29.92 inHg).**

4. If NG, replace EVAP control system pressure sensor.

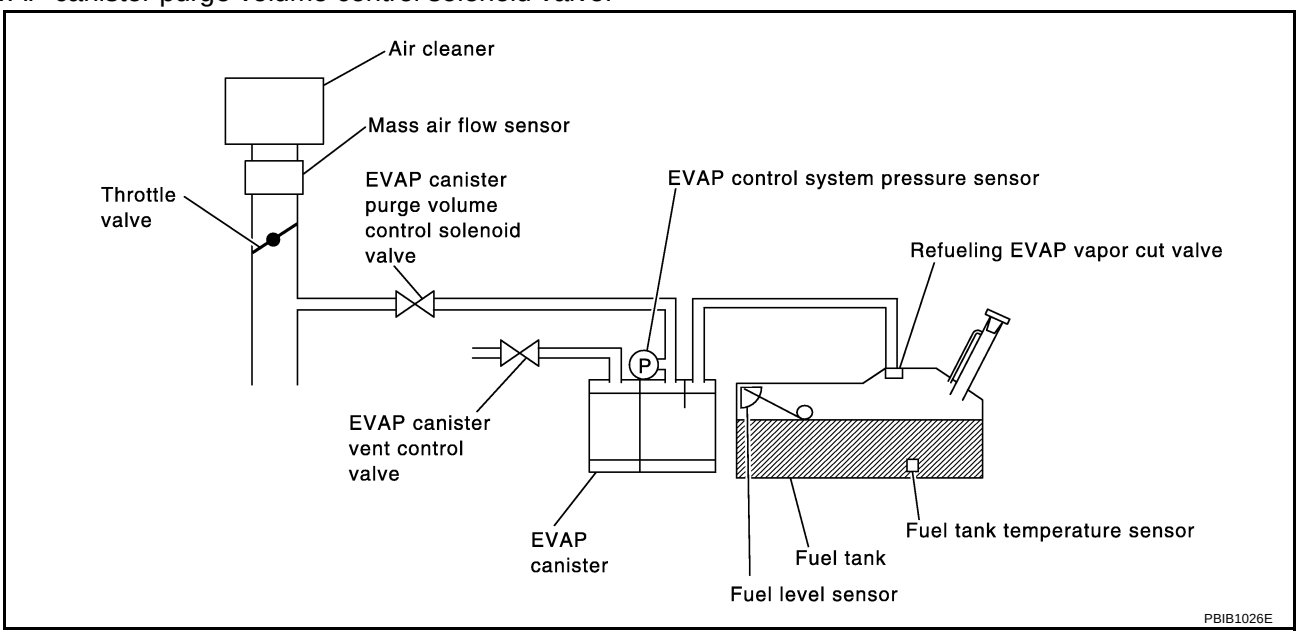
DTC P0455 EVAP CONTROL SYSTEM

PFP:14950

On Board Diagnosis Logic

ABS009HZ

This diagnosis detects a very large leak (fuel filler cap fell off etc.) in EVAP system between the fuel tank and EVAP canister purge volume control solenoid valve.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0455 0455	EVAP control system gross leak detected	EVAP control system has a very large leak such as fuel filler cap fell off, EVAP control system does not operate properly.	● Fuel filler cap remains open or fails to close. ● Incorrect fuel tank vacuum relief valve ● Incorrect fuel filler cap used ● Foreign matter caught in fuel filler cap. ● Leak is in line between intake manifold and EVAP canister purge volume control solenoid valve. ● Foreign matter caught in EVAP canister vent control valve. ● EVAP canister or fuel tank leaks ● EVAP purge line (pipe and rubber tube) leaks ● EVAP purge line rubber tube bent. ● Loose or disconnected rubber tube ● EVAP canister vent control valve and the circuit ● EVAP canister purge volume control solenoid valve and the circuit ● Fuel tank temperature sensor ● O-ring of EVAP canister vent control valve is missing or damaged. ● EVAP control system pressure sensor ● Refueling EVAP vapor cut valve ● ORVR system leaks

CAUTION:

- **Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may come on.**
- **If the fuel filler cap is not tightened properly, the MIL may come on.**

- **Use only a genuine NISSAN rubber tube as a replacement.**

DTC Confirmation Procedure

ABS009I0

CAUTION:

Never remove fuel filler cap during the DTC Confirmation Procedure.

NOTE:

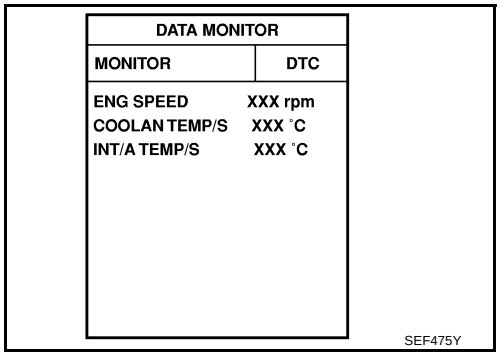
- **Make sure that EVAP hoses are connected to EVAP canister purge volume control solenoid valve properly.**
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

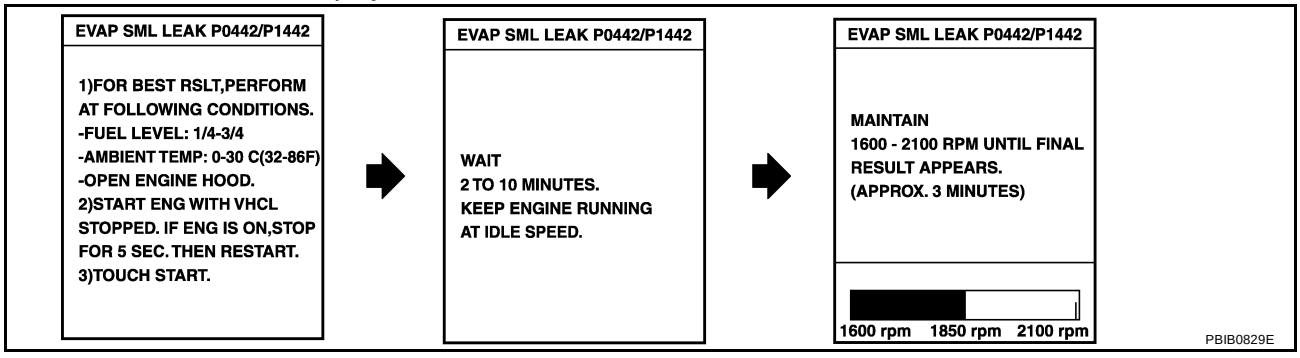
- **Perform "DTC WORK SUPPORT" when the fuel level is between 1/4 and 3/4 full, and vehicle is placed on flat level surface.**
- **Open engine hood before conducting the following procedures.**

WITH CONSULT-II

1. Tighten fuel filler cap securely until ratcheting sound is heard.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-II.
5. Make sure that the following conditions are met.
   COOLAN TEMP/S: 0 - 70°C (32 - 158°F)
   INT/A TEMP SE: 0 - 60°C (32 - 140°F)



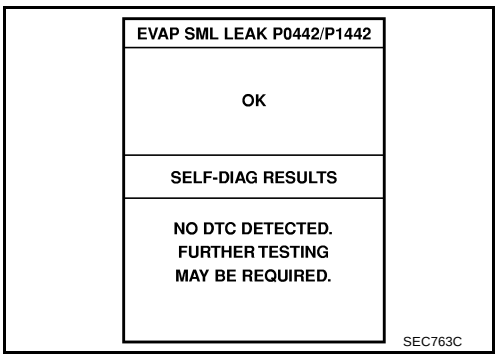
6. Select "EVAP SML LEAK P0442/P1442" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CONSULT-II.
   Follow the instruction displayed.



NOTE:

If the engine speed cannot be maintained within the range displayed on the CONSULT-II screen, go to EC-78, "Basic Inspection" .

7. Make sure that “OK” is displayed.
If “NG” is displayed, select “SELF-DIAG RESULTS” mode and make sure that “EVAP GROSS LEAK [P0455]” is displayed. If it is displayed, refer to EC-341, "Diagnostic Procedure" .
If P0442 is displayed, perform Diagnostic Procedure for DTC P0442 EC-294, "Diagnostic Procedure" .



SEC763C

WITH GST

NOTE:

Be sure to read the explanation of EC-58, "Driving Pattern" before driving vehicle.

1. Start engine.
2. Drive vehicle according to EC-58, "Driving Pattern" .
3. Stop vehicle.
4. Turn ignition switch OFF and wait at least 10 seconds.
5. Select “MODE 7” with GST.
   - If P0455 is displayed on the screen, go to EC-341, "Diagnostic Procedure" .
   - If P0442 is displayed on the screen, go to Diagnostic Procedure for DTC P0442, EC-294 .
   - If P0441 is displayed on the screen, go to Diagnostic Procedure for DTC P0441, EC-289 .

Diagnostic Procedure

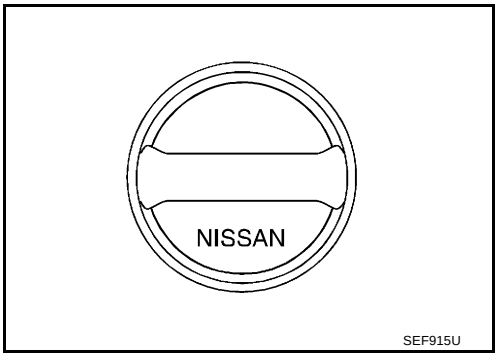
ABS009I1

1. CHECK FUEL FILLER CAP DESIGN

1. Turn ignition switch OFF.
2. Check for genuine NISSAN fuel filler cap design.

OK or NG

OK >> GO TO 2.
NG >> Replace with genuine NISSAN fuel filler cap.



SEF915U

2. CHECK FUEL FILLER CAP INSTALLATION

Check that the cap is tightened properly by rotating the cap clockwise.

OK or NG

OK >> GO TO 3.
NG >> 1. Open fuel filler cap, then clean cap and fuel filler neck threads using air blower.
2. Retighten until ratcheting sound is heard.

3. CHECK FUEL FILLER CAP FUNCTION

Check for air releasing sound while opening the fuel filler cap.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. CHECK FUEL TANK VACUUM RELIEF VALVE

Refer to EC-676, "FUEL TANK VACUUM RELIEF VALVE (BUILT INTO FUEL FULLER CAP)" .

OK or NG

OK >> GO TO 5.
NG >> Replace fuel filler cap with a genuine one.

5. CHECK EVAP PURGE LINE

Check EVAP purge line (pipe, rubber tube, fuel tank and EVAP canister) for cracks, improper connection or disconnection.
Refer to EC-674, "EVAPORATIVE EMISSION LINE DRAWING" .

OK or NG

OK >> GO TO 6.
NG >> Repair or reconnect the hose.

6. CLEAN EVAP PURGE LINE

Clean EVAP purge line (pipe and rubber tube) using air blower.

>> GO TO 7.

7. CHECK EVAP CANISTER VENT CONTROL VALVE

Check the following.

- EVAP canister vent control valve is installed properly.
  Refer to EC-677, "Removal and Installation" .
- EVAP canister vent control valve.
  Refer to EC-315, "Component Inspection" .

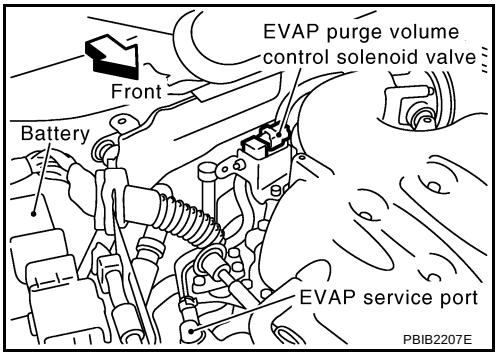
OK or NG

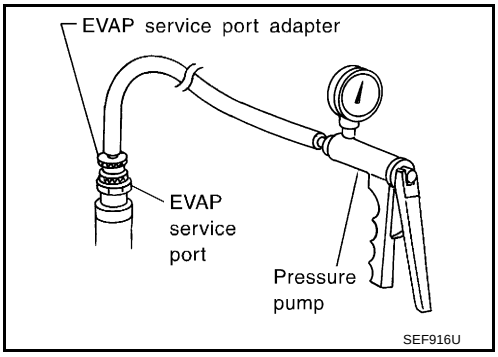
OK >> GO TO 8.
NG >> Repair or replace EVAP canister vent control valve and O-ring.

8. INSTALL THE PRESSURE PUMP

To locate the EVAP leak, install EVAP service port adapter and pressure pump to EVAP service port securely.

NOTE:
Improper installation of the EVAP service port adapter to the EVAP service port may cause leaking.





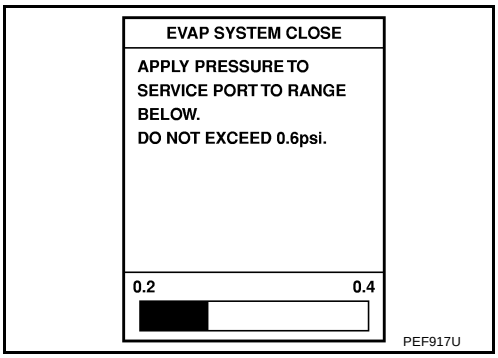
With CONSULT-II>>GO TO 9.
Without CONSULT-II>>GO TO 10.

9. CHECK FOR EVAP LEAK

With CONSULT-II

1. Turn ignition switch ON.
2. Select “EVAP SYSTEM CLOSE” of “WORK SUPPORT” mode with CONSULT-II.
3. Touch “START” and apply pressure into the EVAP line until the pressure indicator reaches the middle of the bar graph.

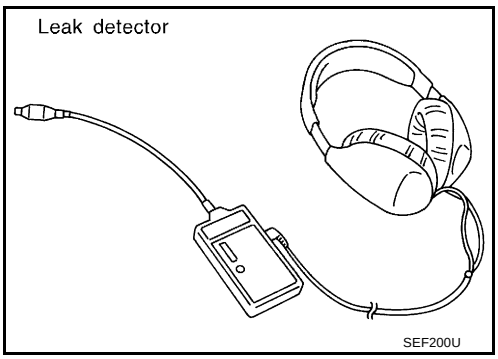
   NOTE:
   - **Never use compressed air or a high pressure pump.**
   - **Do not exceed 4.12 kPa (0.042 kg/cm^2 , 0.6 psi) of pressure in the system.**



4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details.
   Refer to EC-674, "EVAPORATIVE EMISSION LINE DRAWING"
   .

OK or NG

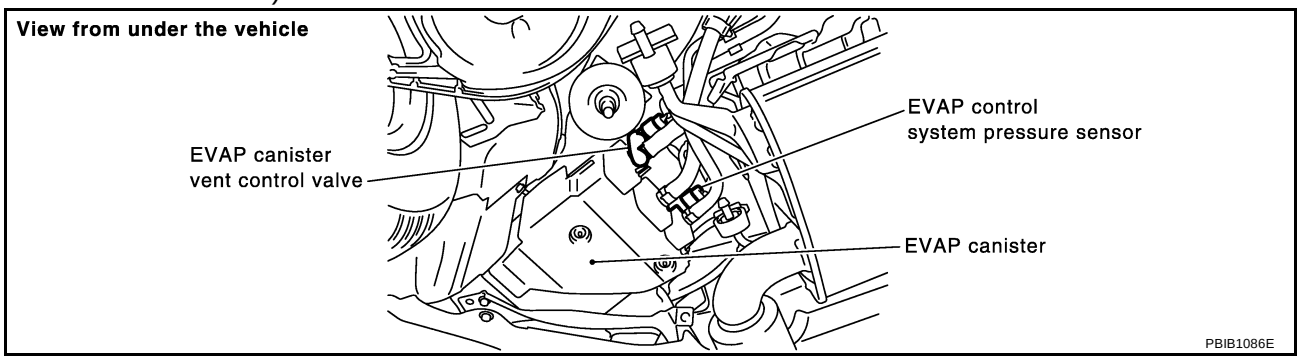
OK >> GO TO 11.
NG >> Repair or replace.



10. CHECK FOR EVAP LEAK

Without CONSULT-II

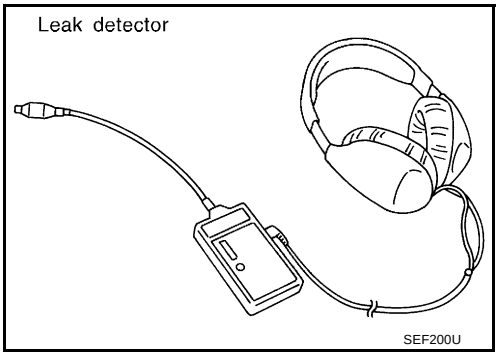
1. Turn ignition switch OFF.
2. Apply 12 volts DC to EVAP canister vent control valve. The valve will close. (Continue to apply 12 volts until the end of test.)



3. Pressurize the EVAP line using pressure pump with 1.3 to 2.7 kPa (10 to 20 mmHg, 0.39 to 0.79 inHg), then remove pump and EVAP service port adapter.

   NOTE:
   - **Never use compressed air or a high pressure pump.**
   - **Do not exceed 4.12 kPa (0.042 kg/cm^2 , 0.6 psi) of pressure in the system.**

4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details. Refer to EC-674, "EVAPORATIVE EMISSION LINE DRAWING" .



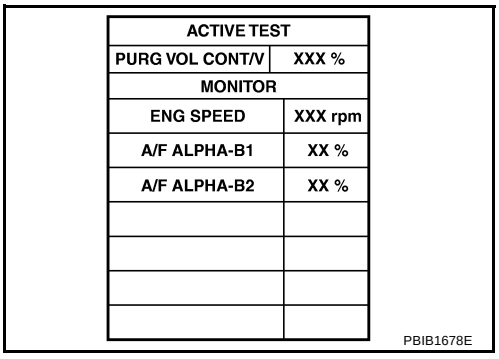
OK or NG

OK >> GO TO 12.
NG >> Repair or replace.

11. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

With CONSULT-II

1. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
2. Start engine.
3. Perform “PURG VOL CONT/V” in “ACTIVE TEST” mode.
4. Touch “Qu” on CONSULT-II screen to increase “PURG VOL CONT/V” opening to 100%.
5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.



OK or NG

OK >> GO TO 14.
NG >> GO TO 13.

12. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

Without CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Stop engine.
3. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
4. Start engine and let it idle for at least 80 seconds.
5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

OK or NG

OK >> GO TO 15.
NG >> GO TO 13.

13. CHECK VACUUM HOSE

Check vacuum hoses for clogging or disconnection. Refer to EC-23, "Vacuum Hose Drawing" .

OK or NG

OK (With CONSULT-II)>>GO TO 14.
OK (Without CONSULT-II)>>GO TO 15.
NG >> Repair or reconnect the hose.

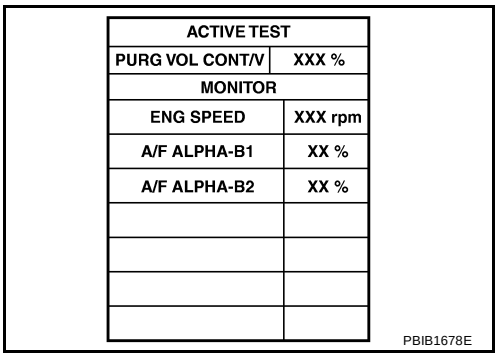
14. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

With CONSULT-II

1. Start engine.
2. Perform “PURG VOL CONT/V” in “ACTIVE TEST” mode with CONSULT-II. Check that engine speed varies according to the valve opening.

OK or NG

OK >> GO TO 16.
NG >> GO TO 15.



15. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-306, "Component Inspection" .

OK or NG

OK >> GO TO 16.
NG >> Replace EVAP canister purge volume control solenoid valve.

16. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-241, "Component Inspection" .

OK or NG

OK >> GO TO 17.
NG >> Replace fuel level sensor unit.

17. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-328, "Component Inspection" .

OK or NG

OK >> GO TO 18.
NG >> Replace EVAP control system pressure sensor.

18. CHECK EVAP/ORVR LINE

Check EVAP/ORVR line between EVAP canister and fuel tank for clogging, kink, looseness and improper connection. For location, refer to EC-680, "ON BOARD REFUELING VAPOR RECOVERY (ORVR)" .

OK or NG

OK >> GO TO 19.
NG >> Repair or replace hoses and tubes.

19. CHECK RECIRCULATION LINE

Check recirculation line between filler neck tube and fuel tank for clogging, kink, cracks, looseness and improper connection.

OK or NG

OK >> GO TO 20.
NG >> Repair or replace hose, tube or filler neck tube.

20. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-683, "REFUELING EVAP VAPOR CUT VALVE" .

OK or NG

OK >> GO TO 21.
NG >> Replace refueling EVAP vapor cut valve with fuel tank.

21. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

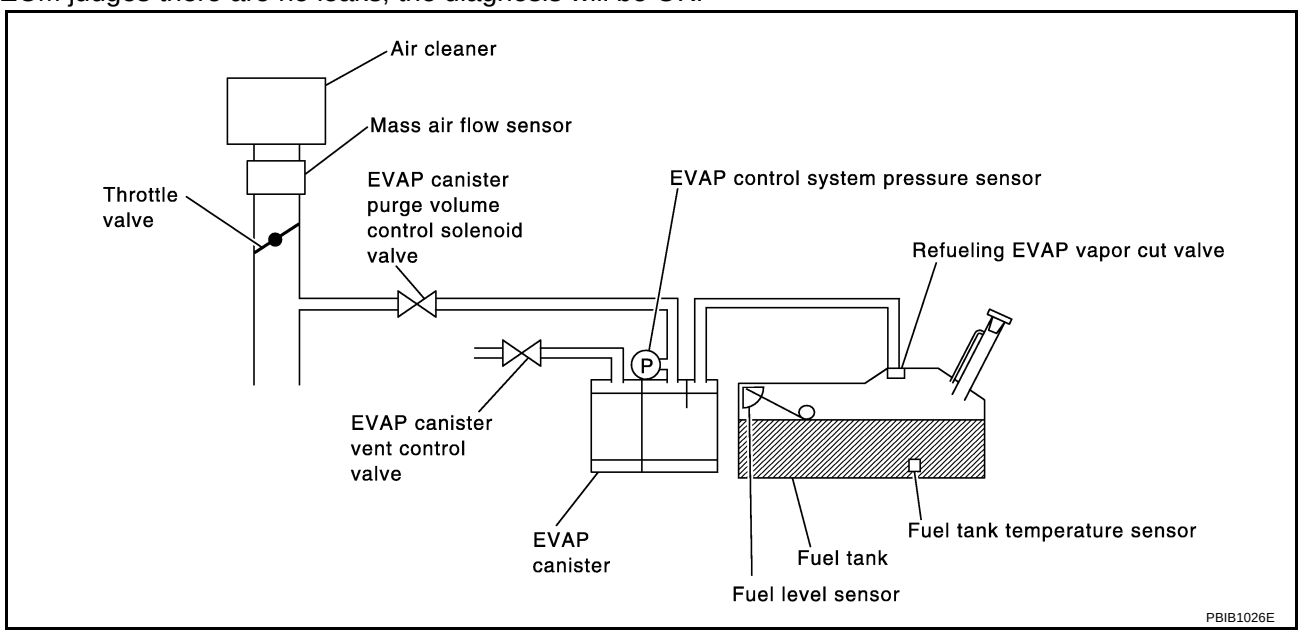
DTC P0456 EVAP CONTROL SYSTEM

PFP:14950

On Board Diagnosis Logic

ABS009I2

This diagnosis detects very small leaks in the EVAP line between fuel tank and EVAP canister purge volume control solenoid valve, using the intake manifold vacuum in the same way as conventional EVAP small leak diagnosis.
If ECM judges a leak which corresponds to a very small leak, the very small leak P0456 will be detected.
If ECM judges a leak equivalent to a small leak, EVAP small leak P0442 will be detected.
If ECM judges there are no leaks, the diagnosis will be OK.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0456 0456	Evaporative emission control system very small leak (negative pressure check)	● EVAP system has a very small leak. ● EVAP system does not operate properly.	● Incorrect fuel tank vacuum relief valve ● Incorrect fuel filler cap used ● Fuel filler cap remains open or fails to close. ● Foreign matter caught in fuel filler cap. ● Leak is in line between intake manifold and EVAP canister purge volume control solenoid valve. ● Foreign matter caught in EVAP canister vent control valve. ● EVAP canister or fuel tank leaks ● EVAP purge line (pipe and rubber tube) leaks ● EVAP purge line rubber tube bent ● Loose or disconnected rubber tube ● EVAP canister vent control valve and the circuit ● EVAP canister purge volume control solenoid valve and the circuit ● Fuel tank temperature sensor ● O-ring of EVAP canister vent control valve is missing or damaged ● EVAP canister is saturated with water ● EVAP control system pressure sensor ● Refueling EVAP vapor cut valve ● ORVR system leaks ● Fuel level sensor and the circuit ● Foreign matter caught in EVAP canister purge volume control solenoid valve

CAUTION:

- **Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may come on.**
- **If the fuel filler cap is not tightened properly, the MIL may come on.**
- **Use only a genuine NISSAN rubber tube as a replacement.**

DTC Confirmation Procedure

ABS009I3

NOTE:

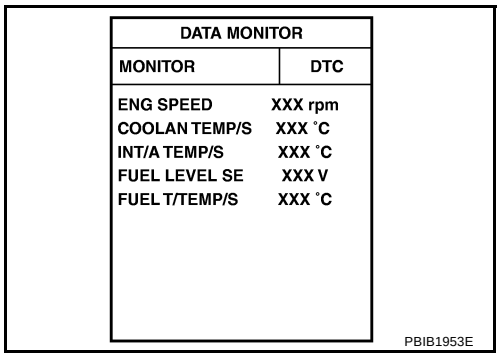
- **If DTC P0456 is displayed with P0442, first perform trouble diagnosis for DTC P0456.**
- **After repair, make sure that the hoses and clips are installed properly.**
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

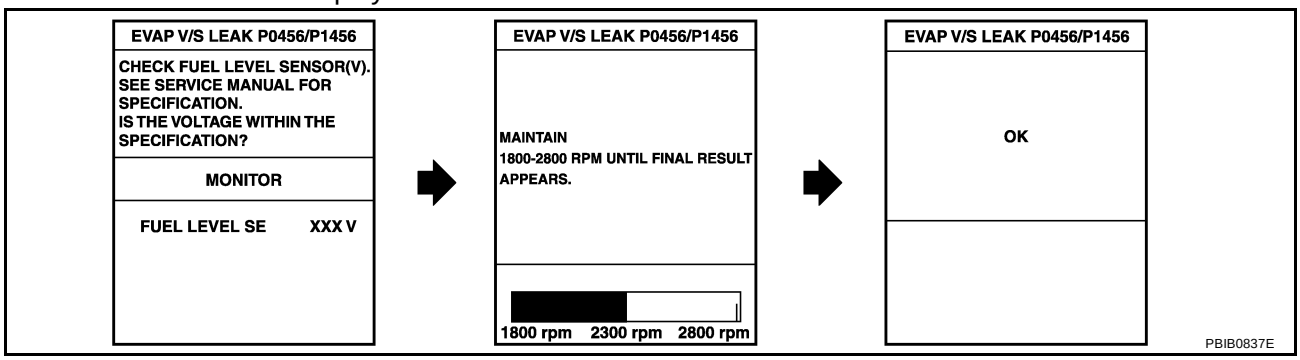
- **Open engine hood before conducting following procedure.**
- **If any of following conditions are met just before the DTC confirmation procedure, leave the vehicle for more than 1 hour.**
  - **Fuel filler cap is removed.**
  - **Refilled or drained the fuel.**
  - **EVAP component parts is/are removed.**
- **Before performing the following procedure, confirm that battery voltage is more than 11V at idle.**

WITH CONSULT-II

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-II.
2. Make sure the following conditions are met.
   FUEL LEVEL SE: 0.25 - 1.4V
   COOLAN TEMP/S: 0 - 32°C (32 - 90°F)
   FUEL T/TMP SE: 0 - 35°C (32 - 95°F)
   INT A/TEMP SE: More than 0°C (32°F)
   If NG, turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle) or refilling/draining fuel until the output voltage condition of the “FUEL LEVEL SE” meets within the range above and leave the vehicle for more than 1 hour. Then start from step 1).



3. Turn ignition switch OFF and wait at least 10 seconds.
4. Turn ignition switch ON.
5. Select “EVAP V/S LEAK P0456/P1456” of “EVAPORATIVE SYSTEM” in “DTC WORK SUPPORT” mode with CONSULT-II.
   Follow the instruction displayed.



6. Make sure that “OK” is displayed.
   If “NG” is displayed, refer to EC-350, "Diagnostic Procedure" .

   NOTE:
   - **If the engine speed cannot be maintained within the range displayed on CONSULT-II screen, go to EC-78, "Basic Inspection" .**

- **Make sure that EVAP hoses are connected to EVAP canister purge volume control solenoid valve properly.**

Overall Function Check

ABS009I4

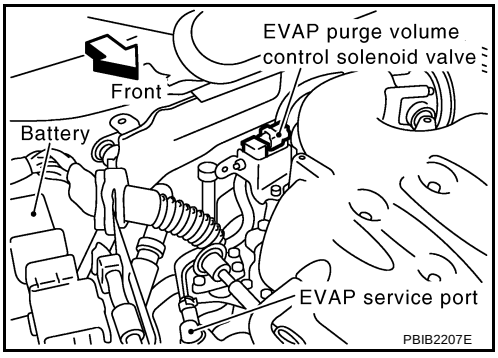
WITH GST

Use this procedure to check the overall function of the EVAP very small leak function. During this check, a 1st trip DTC might not be confirmed.

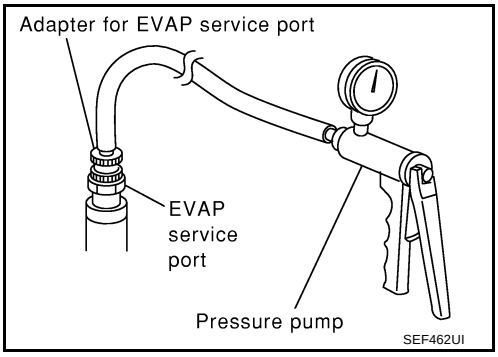
CAUTION:

- **Never use compressed air, doing so may damage the EVAP system.**
- **Do not start engine.**
- **Do not exceeded 4.12 kPa (0.042 kg/cm^2 , 0.6 psi).**

1. Attach the EVAP service port adapter securely to the EVAP service port.



2. Set the pressure pump and a hose.
3. Also set a vacuum gauge via 3-way connector and a hose.
4. Turn ignition switch ON.
5. Connect GST and select “MODE 8”.
6. Using “MODE 8” control the EVAP canister vent control valve (close).
7. Apply pressure and make sure the following conditions are satisfied.
   Pressure to be applied: 2.7 kPa (20 mmHg, 0.79 inHg)
   Time to be waited after the pressure drawn in to the EVAP system and the pressure to be dropped: 60 seconds and the pressure should not be dropped more than 0.4 kPa (3 mmHg, 0.12 inHg).
   If NG, go to EC-350, "Diagnostic Procedure" .
   If OK, go to next step.



8. Disconnect GST.
9. Start engine and warm it up to normal operating temperature.
10. Turn ignition switch OFF and wait at least 10 seconds.
11. Restart engine and let it idle for 90 seconds.
12. Keep engine speed at 2,000 rpm for 30 seconds.
13. Turn ignition switch OFF.

NOTE:
For more information, refer to GST instruction manual.

Diagnostic Procedure

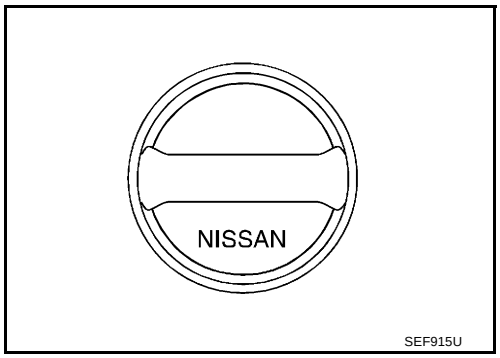
ABS009I5

1. CHECK FUEL FILLER CAP DESIGN

1. Turn ignition switch OFF.
2. Check for genuine NISSAN fuel filler cap design.

OK or NG

OK >> GO TO 2.
NG >> Replace with genuine NISSAN fuel filler cap.



2. CHECK FUEL FILLER CAP INSTALLATION

Check that the cap is tightened properly by rotating the cap clockwise.

OK or NG

OK >> GO TO 3.
NG >> 1. Open fuel filler cap, then clean cap and fuel filler neck threads using air blower.
2. Retighten until ratcheting sound is heard.

3. CHECK FUEL FILLER CAP FUNCTION

Check for air releasing sound while opening the fuel filler cap.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. CHECK FUEL TANK VACUUM RELIEF VALVE

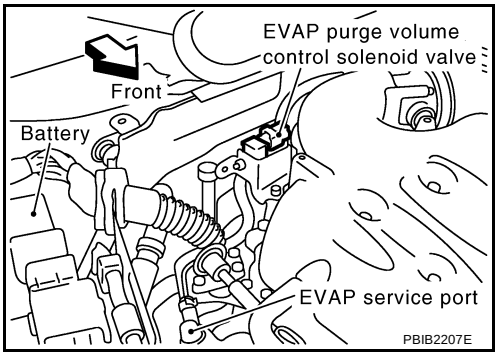
Refer to EC-676, "FUEL TANK VACUUM RELIEF VALVE (BUILT INTO FUEL FULLER CAP)" .

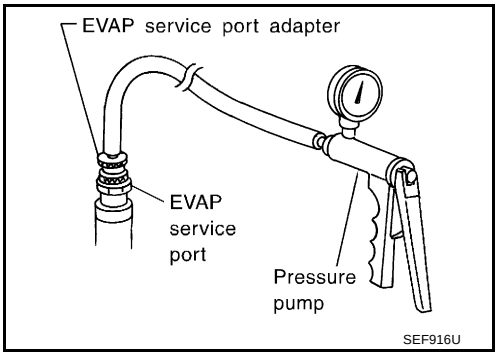
OK or NG

OK >> GO TO 5.
NG >> Replace fuel filler cap with a genuine one.

5. INSTALL THE PRESSURE PUMP

To locate the EVAP leak, install EVAP service port adapter and pressure pump to EVAP service port securely. For the location of EVAP service port, refer to EC-674, "EVAPORATIVE EMISSION LINE DRAWING" .





NOTE:
Improper installation of the EVAP service port adapter to the EVAP service port may cause leaking.

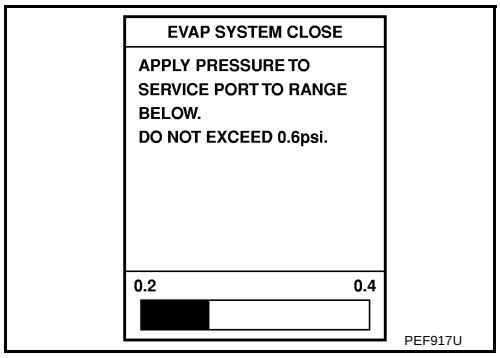
With CONSULT-II>>GO TO 6.
Without CONSULT-II>>GO TO 7.

6. CHECK FOR EVAP LEAK

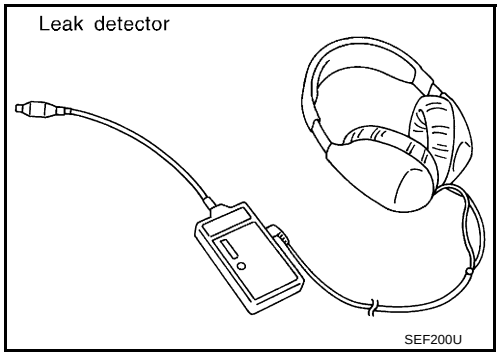
With CONSULT-II

1. Turn ignition switch ON.
2. Select “EVAP SYSTEM CLOSE” of “WORK SUPPORT” mode with CONSULT-II.
3. Touch “START” and apply pressure into the EVAP line until the pressure indicator reaches the middle of the bar graph.

   NOTE:
   - **Never use compressed air or a high pressure pump.**
   - **Do not exceed 4.12 kPa (0.042 kg/cm^2 , 0.6 psi) of pressure in the system.**



4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details.
   Refer to EC-674, "EVAPORATIVE EMISSION LINE DRAWING"
   .



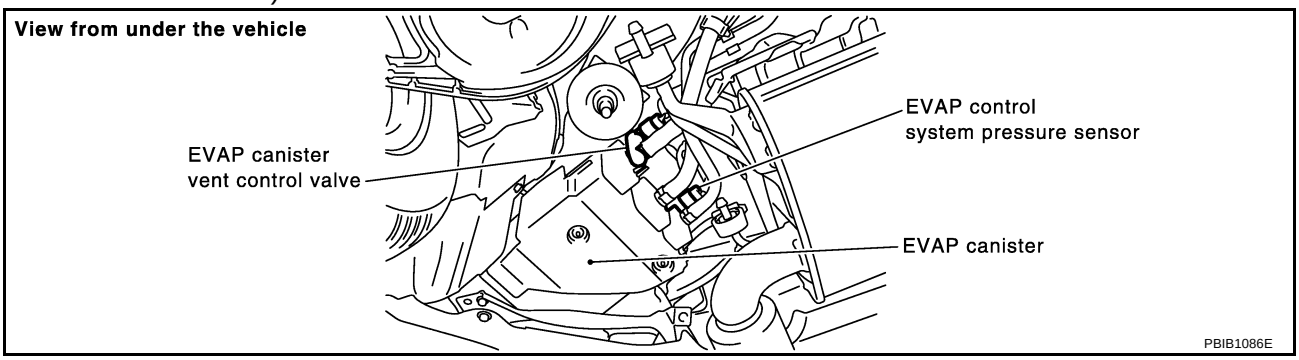
OK or NG

OK >> GO TO 8.
NG >> Repair or replace.

7. CHECK FOR EVAP LEAK

Without CONSULT-II

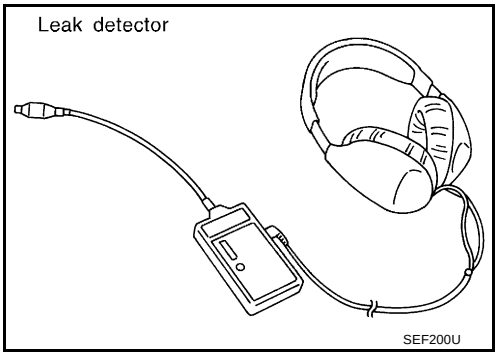
1. Turn ignition switch OFF.
2. Apply 12 volts DC to EVAP canister vent control valve. The valve will close. (Continue to apply 12 volts until the end of test.)



3. Pressurize the EVAP line using pressure pump with 1.3 to 2.7 kPa (10 to 20 mmHg, 0.39 to 0.79 inHg), then remove pump and EVAP service port adapter.

   NOTE:
   - **Never use compressed air or a high pressure pump.**
   - **Do not exceed 4.12 kPa (0.042 kg/cm^2 , 0.6 psi) of pressure in the system.**

4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details. Refer to EC-674, "EVAPORATIVE EMISSION LINE DRAWING" .



OK or NG

OK >> GO TO 8.
NG >> Repair or replace.

8. CHECK EVAP CANISTER VENT CONTROL VALVE

Check the following.

- EVAP canister vent control valve is installed properly.
  Refer to EC-677, "Removal and Installation" .
- EVAP canister vent control valve.
  Refer to EC-315, "Component Inspection" .

OK or NG

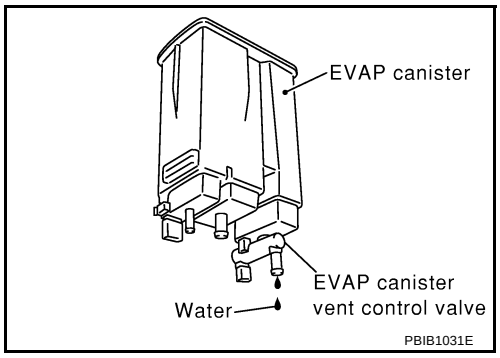
OK >> GO TO 9.
NG >> Repair or replace EVAP canister vent control valve and O-ring.

9. CHECK IF EVAP CANISTER SATURATED WITH WATER

1. Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
2. Does water drain from the EVAP canister?

Yes or No

Yes >> GO TO 10.
No (With CONSULT-II)>>GO TO 12.
No (Without CONSULT-II)>>GO TO 13.



10. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.2 kg (4.9 lb).

OK or NG

OK (With CONSULT-II)>>GO TO 12.
OK (Without CONSULT-II)>>GO TO 13.
NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister.

12. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

With CONSULT-II

1. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
2. Start engine.
3. Perform “PURG VOL CONT/V” in “ACTIVE TEST” mode.
4. Touch “Qu” on CONSULT-II screen to increase “PURG VOL CONT/V” opening to 100%.
5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

OK or NG

OK >> GO TO 15.
NG >> GO TO 14.

ACTIVE TEST	
PURG VOL CONT/V	XXX %
MONITOR	
ENG SPEED	XXX rpm
A/F ALPHA-B1	XX %
A/F ALPHA-B2	XX %

PBIB1678E

13. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

Without CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Stop engine.
3. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
4. Start engine and let it idle for at least 80 seconds.
5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

OK or NG

OK >> GO TO 16.
NG >> GO TO 14.

14. CHECK VACUUM HOSE

Check vacuum hoses for clogging or disconnection. Refer to EC-23, "Vacuum Hose Drawing" .

OK or NG

OK >> GO TO 15.
NG >> Repair or reconnect the hose.

15. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-306, "Component Inspection" .

OK or NG

OK >> GO TO 16.
NG >> Replace EVAP canister purge volume control solenoid valve.

16. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-241, "Component Inspection" .

OK or NG

OK >> GO TO 17.
NG >> Replace fuel level sensor unit.

17. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-328, "Component Inspection" .

OK or NG

OK >> GO TO 18.
NG >> Replace EVAP control system pressure sensor.

18. CHECK EVAP PURGE LINE

Check EVAP purge line (pipe, rubber tube, fuel tank and EVAP canister) for cracks or improper connection. Refer to EC-674, "EVAPORATIVE EMISSION LINE DRAWING" .

OK or NG

OK >> GO TO 19.
NG >> Repair or reconnect the hose.

19. CLEAN EVAP PURGE LINE

Clean EVAP purge line (pipe and rubber tube) using air blower.

>> GO TO 20.

20. CHECK EVAP/ORVR LINE

Check EVAP/ORVR line between EVAP canister and fuel tank for clogging, kink, looseness and improper connection. For location, refer to EC-680, "ON BOARD REFUELING VAPOR RECOVERY (ORVR)" .

OK or NG

OK >> GO TO 21.
NG >> Repair or replace hoses and tubes.

21. CHECK RECIRCULATION LINE

Check recirculation line between filler neck tube and fuel tank for clogging, kink, cracks, looseness and improper connection.

OK or NG

OK >> GO TO 22.
NG >> Repair or replace hose, tube or filler neck tube.

22. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-683, "Component Inspection" .

OK or NG

OK >> GO TO 23.
NG >> Replace refueling EVAP vapor cut valve with fuel tank.

23. CHECK FUEL LEVEL SENSOR

Refer to DI-27, "FUEL LEVEL SENSOR UNIT CHECK" .

OK or NG

OK >> GO TO 24.
NG >> Replace fuel level sensor unit.

24. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

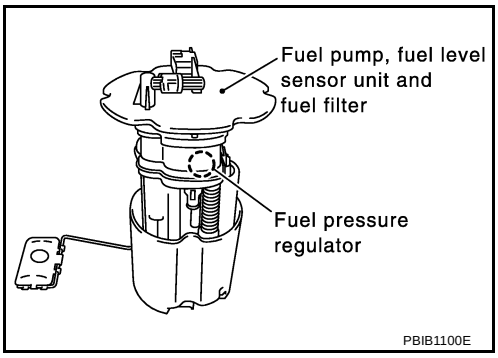
DTC P0460 FUEL LEVEL SENSOR

PFP:25060

Component Description

ABS009I6

The fuel level sensor is mounted in the fuel level sensor unit. The sensor detects a fuel level in the fuel tank and transmits a signal to the “unified meter and A/C amp.”. The “unified meter and A/C amp.” sends the fuel level sensor signal to the ECM through CAN communication line.
It consists of two parts, one is mechanical float and the other is variable resistor. Fuel level sensor output voltage changes depending on the movement of the fuel mechanical float.



On Board Diagnosis Logic

ABS009I7

NOTE:
If DTC P0460 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-138, "DTC U1000, U1001 CAN COMMUNICATION LINE" .
When the vehicle is parked, naturally the fuel level in the fuel tank is stable. It means that output signal of the fuel level sensor does not change. If ECM senses sloshing signal from the sensor, fuel level sensor malfunction is detected.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0460 0460	Fuel level sensor circuit noise	Even though the vehicle is parked, a signal being varied is sent from the fuel level sensor to ECM.	● Harness or connectors (The CAN communication line is open or shorted) ● Harness or connectors (The sensor circuit is open or shorted) ● Unified meter and A/C amp. ● Fuel level sensor

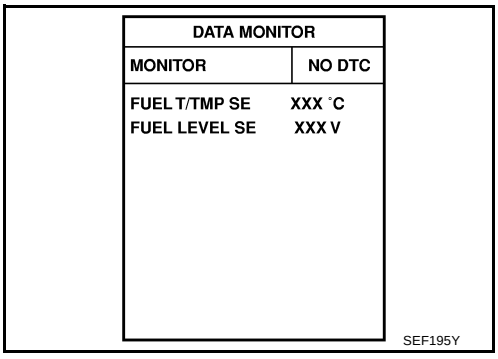
DTC Confirmation Procedure

ABS009I8

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Start engine and wait maximum of 2 consecutive minutes.
4. If 1st trip DTC is detected, go to EC-358, "Diagnostic Procedure" .



WITH GST

Follow the procedure “WITH CONSULT-II” above.

Diagnostic Procedure

ABS009I9

1. CHECK FUEL GAUGE OPERATION

Refer to DI-13, "Meter/Gauges Operation and Odo/Trip Meter" .

OK or NG

OK >> GO TO 2.
NG >> Follow the instruction of DI-13, "Meter/Gauges Operation and Odo/Trip Meter" .

2. CHECK FUEL LEVEL SENSOR AND CIRCUIT

Refer to DI-21, "Fuel Level Sensor Signal Inspection" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace malfunctioning parts.

3. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Removal and Installation

ABS009IA

FUEL LEVEL SENSOR

Refer to FL-4, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY" .

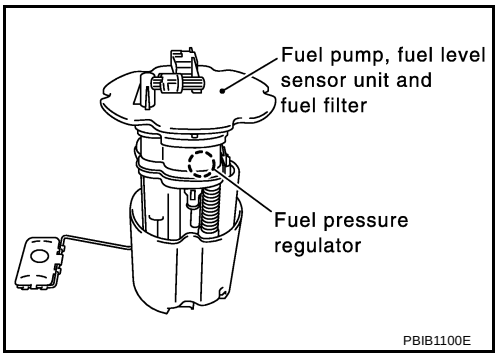
DTC P0461 FUEL LEVEL SENSOR

PFP:25060

Component Description

ABS009IB

The fuel level sensor is mounted in the fuel level sensor unit. The sensor detects a fuel level in the fuel tank and transmits a signal to the “unified meter and A/C amp.”. The “unified meter and A/C amp.” sends the fuel level sensor signal to the ECM through CAN communication line.
It consists of two parts, one is mechanical float and the other is variable resistor. Fuel level sensor output voltage changes depending on the movement of the fuel mechanical float.



On Board Diagnosis Logic

ABS009IC

NOTE:
If DTC P0461 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-138, "DTC U1000, U1001 CAN COMMUNICATION LINE" .
Driving long distances naturally affect fuel gauge level.
This diagnosis detects the fuel gauge malfunction of the gauge not moving even after a long distance has been driven.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0461 0461	Fuel level sensor circuit range/performance	The output signal of the fuel level sensor does not change within the specified range even though the vehicle has been driven a long distance.	● Harness or connectors (The CAN communication line is open or shorted) ● Harness or connectors (The sensor circuit is open or shorted) ● Unified meter and A/C amp. ● Fuel level sensor

Overall Function Check

ABS009ID

Use this procedure to check the overall function of the fuel level sensor function. During this check, a 1st trip DTC might not be confirmed.

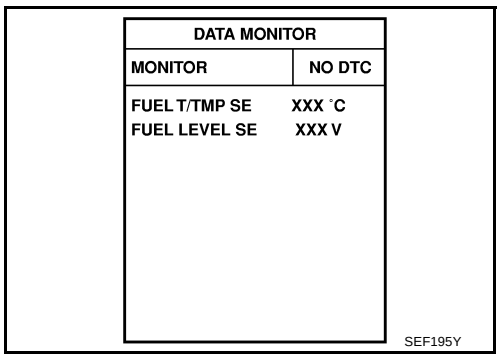
WARNING:
When performing following procedure, be sure to observe the handling of the fuel. Refer to FL-10, "FUEL TANK" .
TESTING CONDITION:
Before starting overall function check, preparation of draining fuel and refilling fuel is required.

WITH CONSULT-II

NOTE:
Start from step 10, if it is possible to confirm that the fuel cannot be drained by 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal) in advance.

1. Prepare a fuel container and a spare hose.
2. Release fuel pressure from fuel line, refer to EC-45, "FUEL PRESSURE RELEASE" .
3. Remove the fuel feed hose on the fuel level sensor unit.
4. Connect a spare fuel hose where the fuel feed hose was removed.
5. Turn ignition switch OFF and wait at least 10 seconds then turn ON.
6. Select “FUEL LEVEL SE” in “DATA MONITOR” mode with CONSULT-II.

7. Check “FUEL LEVEL SE” output voltage and note it.
8. Select “FUEL PUMP” in “ACTIVE TEST” mode with CONSULT-II.
9. Touch “ON” and drain fuel approximately 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal) and stop it.
10. Check “FUEL LEVEL SE” output voltage and note it.
11. Fill fuel into the fuel tank for 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal).
12. Check “FUEL LEVEL SE” output voltage and note it.
13. Confirm whether the voltage changes more than 0.03V during step 7 to 10 and 10 to 12.
    If NG, go to EC-360, "Diagnostic Procedure" .



WITH GST

NOTE:
Start from step 8, if it is possible to confirm that the fuel cannot be drained by 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal) in advance.

1. Prepare a fuel container and a spare hose.
2. Release fuel pressure from fuel line. Refer to EC-45, "FUEL PRESSURE RELEASE" .
3. Remove the fuel feed hose on the fuel level sensor unit.
4. Connect a spare fuel hose where the fuel feed hose was removed.
5. Turn ignition switch ON.
6. Drain fuel by 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal) from the fuel tank using proper equipment.
7. Confirm that the fuel gauge indication varies.
8. Fill fuel into the fuel tank for 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal).
9. Confirm that the fuel gauge indication varies.
10. If NG, go to EC-360, "Diagnostic Procedure" .

Diagnostic Procedure

ABS009IE

1. CHECK FUEL GAUGE OPERATION

Refer to DI-13, "Meter/Gauges Operation and Odo/Trip Meter" .

OK or NG

OK >> GO TO 2.
NG >> Follow the instruction of DI-13, "Meter/Gauges Operation and Odo/Trip Meter" .

2. CHECK FUEL LEVEL SENSOR AND CIRCUIT

Refer to DI-21, "Fuel Level Sensor Signal Inspection" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace malfunctioning parts.

3. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Removal and Installation

ABS009IF

FUEL LEVEL SENSOR

Refer to FL-4, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY"

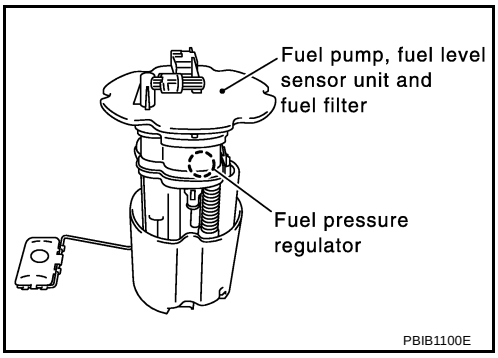
DTC P0462, P0463 FUEL LEVEL SENSOR

PFP:25060

Component Description

ABS00ALV

The fuel level sensor is mounted in the fuel level sensor unit. The sensor detects a fuel level in the fuel tank and transmits a signal to the combination meter. The combination meter sends the fuel level sensor signal to the ECM through CAN communication line.
It consists of two parts, one is mechanical float and the other is variable resistor. Fuel level sensor output voltage changes depending on the movement of the fuel mechanical float.



On Board Diagnosis Logic

ABS00ALW

NOTE:
If DTC P0462 or P0463 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-138, "DTC U1000, U1001 CAN COMMUNICATION LINE" .
This diagnosis indicates the former, to detect open or short circuit malfunction.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0462 0462	Fuel level sensor circuit low input	An excessively low voltage is sent from the sensor is sent to ECM.	● Harness or connectors (The CAN communication line is open or shorted) ● Harness or connectors (The sensor circuit is open or shorted) ● Unified meter and A/C amp. ● Fuel level sensor
P0463 0463	Fuel level sensor circuit high input	An excessively high voltage is sent from the sensor is sent to ECM.	

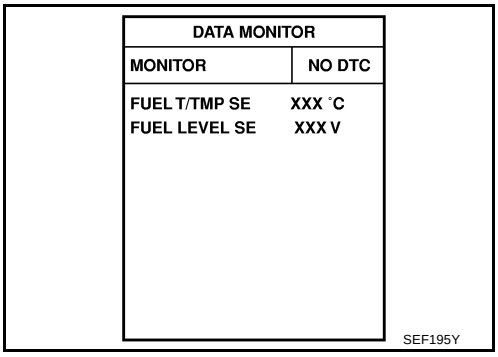
DTC Confirmation Procedure

ABS00ALX

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V at ignition switch ON.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Wait at least 5 seconds.
4. If 1st trip DTC is detected, go to EC-362, "Diagnostic Procedure" .



WITH GST

Follow the procedure “WITH CONSULT-II” above.

Diagnostic Procedure

ABS00ALY

1. CHECK FUEL GAUGE OPERATION

Refer to DI-13, "Meter/Gauges Operation and Odo/Trip Meter" .

OK or NG

OK >> GO TO 2.
NG >> Follow the instruction of DI-13, "Meter/Gauges Operation and Odo/Trip Meter" .

2. CHECK FUEL LEVEL SENSOR AND CIRCUIT

Refer to DI-21, "Fuel Level Sensor Signal Inspection" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace malfunctioning parts.

3. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Removal and Installation

ABS00ALZ

FUEL LEVEL SENSOR

Refer to FL-4, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY" .

DTC P0500 VSS

PFP:32702

Description

ABS009IL

NOTE:
If DTC P0500 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-138, "DTC U1000, U1001 CAN COMMUNICATION LINE" .
The vehicle speed signal is sent to the “unified meter and A/C amp”. from the VDC/TCS/ABS control unit (models with VDC) or “ABS actuator and electric unit (control unit)” by CAN communication line. The unified meter and A/C amp. then sends the signal to the ECM by CAN communication line.

On Board Diagnosis Logic

ABS009IM

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0500 0500	Vehicle speed sensor	The almost 0 km/h (0 MPH) signal from vehicle speed sensor is sent to ECM even when vehicle is being driven.	● Harness or connectors (The CAN communication line is open or shorted) ● Harness or connectors (The vehicle speed signal circuit is open or shorted) ● Wheel sensor ● Unified meter and A/C amp. ● VDC/TCS/ABS control unit (models with VDC) ● ABS actuator and electric unit (control unit) (models without VDC)

DTC Confirmation Procedure

ABS009IN

CAUTION:
Always drive vehicle at a safe speed.

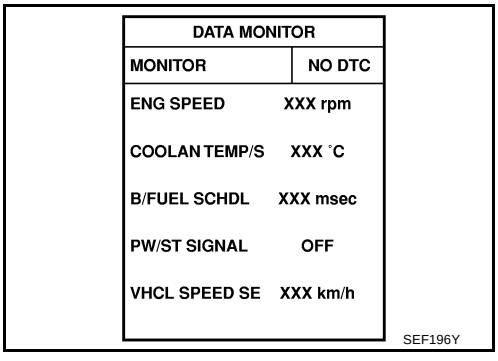
NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Steps 1 and 2 may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

WITH CONSULT-II

1. Start engine (VDC switch or TCS switch OFF).
2. Read “VHCL SPEED SE” in “DATA MONITOR” mode with CONSULT-II. The vehicle speed on CONSULT-II should exceed 10 km/h (6 MPH) when rotating wheels with suitable gear position.
   If NG, go to EC-364, "Diagnostic Procedure" .
   If OK, go to following step.
3. Select “DATA MONITOR” mode with CONSULT-II.
4. Warm engine up to normal operating temperature.
5. Maintain the following conditions for at least 60 consecutive seconds.

ENG SPEED	1,600 - 6,000 rpm
COOLAN TEMP/S	More than 70°C (158°F)
B/FUEL SCHDL	5.5 - 31.8 msec
Shift lever	Except P or N position (A/T), Neutral position (M/T)
PW/ST SIGNAL	OFF



6. If 1st trip DTC is detected, go to EC-364, "Diagnostic Procedure" .

Overall Function Check

ABS009IO

Use this procedure to check the overall function of the vehicle speed sensor circuit. During this check, a 1st trip DTC might not be confirmed.

WITH GST

1. Lift up drive wheels.
2. Start engine.
3. Read vehicle speed sensor signal in “MODE 1” with GST.
   The vehicle speed sensor on GST should be able to exceed 10 km/h (6 MPH) when rotating wheels with suitable gear position.
4. If NG, go to EC-364, "Diagnostic Procedure" .

Diagnostic Procedure

ABS009IP

1. CHECK DTC WITH “VDC/TCS/ABS CONTROL UNIT (MODELS WITH VDC)” OR “ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) (MODELS WITHOUT VDC)”

Refer to BRC-94, "TROUBLE DIAGNOSIS" (models with VDC) or refer to BRC-46, "TROUBLE DIAGNOSIS" (models without VDC).

OK or NG

OK >> GO TO 2.
NG >> Repair or replace.

2. CHECK DTC WITH UNIFIED METER AND A/C AMP.

Refer to DI-4, "COMBINATION METERS" .

>> **INSPECTION END**

DTC P0506 ISC SYSTEM

PFP:23781

Description

ABS009IQ

NOTE:
If DTC P0506 is displayed with other DTC, first perform the trouble diagnosis for the other DTC.
The ECM controls the engine idle speed to a specified level through the fine adjustment of the air, which is let into the intake manifold, by operating the electric throttle control actuator. The operating of the throttle valve is varied to allow for optimum control of the engine idling speed. The crankshaft position sensor (POS) detects the actual engine speed and sends a signal to the ECM.
The ECM controls the electric throttle control actuator so that the engine speed coincides with the target value memorized in the ECM. The target engine speed is the lowest speed at which the engine can operate steadily. The optimum value stored in the ECM is determined by taking into consideration various engine conditions, such as during warming up, deceleration, and engine load (air conditioner, power steering and cooling fan operation, etc.).

On Board Diagnosis Logic

ABS009IR

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0506 0506	Idle speed control system RPM lower than expected	The idle speed is less than the target idle speed by 100 rpm or more.	● Electric throttle control actuator ● Intake air leak

DTC Confirmation Procedure

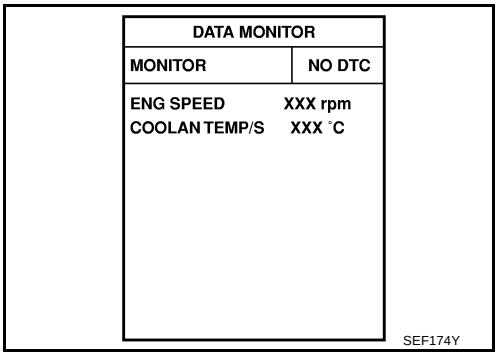
ABS009IS

NOTE:
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
- **If the target idle speed is out of the specified value, perform EC-43, "Idle Air Volume Learning" , before conducting DTC Confirmation Procedure. For the target idle speed, refer to EC-689, "SERVICE DATA AND SPECIFICATIONS (SDS)" .**

TESTING CONDITION:
- **Before performing the following procedure, confirm that battery voltage is more than 11V at idle.**
- **Always perform the test at a temperature above –10°C (14°F).**

WITH CONSULT-II

1. Open engine hood.
2. Start engine and warm it up to normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Turn ignition switch ON again and select “DATA MONITOR” mode with CONSULT-II.
5. Start engine and run it for at least 1 minute at idle speed.
6. If 1st trip DTC is detected, go to EC-366, "Diagnostic Procedure" .



WITH GST

Follow the procedure “WITH CONSULT-II” above.

Diagnostic Procedure

ABS009IT

1. CHECK INTAKE AIR LEAK

1. Start engine and let it idle.
2. Listen for an intake air leak after the mass air flow sensor.

OK or NG

OK >> GO TO 2.
NG >> Discover air leak location and repair.

2. REPLACE ECM

1. Stop engine.
2. Replace ECM.
3. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs. Refer to BL-160, "ECM Re-communicating Function" .
4. Perform EC-42, "VIN Registration" .
5. Perform EC-42, "Accelerator Pedal Released Position Learning" .
6. Perform EC-42, "Throttle Valve Closed Position Learning" .
7. Perform EC-43, "Idle Air Volume Learning" .

>> **INSPECTION END**

DTC P0507 ISC SYSTEM

PFP:23781

Description

ABS009IU

NOTE:
If DTC P0507 is displayed with other DTC, first perform the trouble diagnosis for the other DTC.
The ECM controls the engine idle speed to a specified level through the fine adjustment of the air, which is let into the intake manifold, by operating the electric throttle control actuator. The operating of the throttle valve is varied to allow for optimum control of the engine idling speed. The crankshaft position sensor (POS) detects the actual engine speed and sends a signal to the ECM.
The ECM controls the electric throttle control actuator so that the engine speed coincides with the target value memorized in the ECM. The target engine speed is the lowest speed at which the engine can operate steadily. The optimum value stored in the ECM is determined by taking into consideration various engine conditions, such as during warming up, deceleration, and engine load (air conditioner, power steering and cooling fan operation, etc.).

On Board Diagnosis Logic

ABS009IV

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0507 0507	Idle speed control system RPM higher than expected	The idle speed is more than the target idle speed by 200 rpm or more.	● Electric throttle control actuator ● Intake air leak ● PCV system

DTC Confirmation Procedure

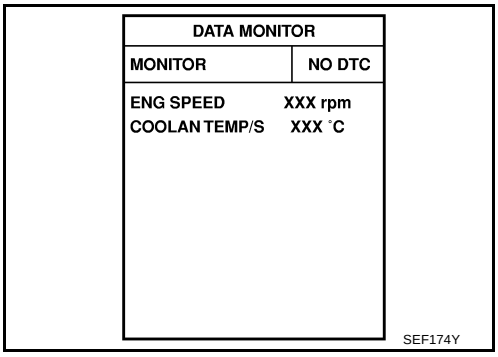
ABS009IW

NOTE:
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
- **If the target idle speed is out of the specified value, perform EC-43, "Idle Air Volume Learning" , before conducting DTC Confirmation Procedure. For the target idle speed, refer to EC-689, "SERVICE DATA AND SPECIFICATIONS (SDS)" .**

TESTING CONDITION:
- **Before performing the following procedure, confirm that battery voltage is more than 11V at idle.**
- **Always perform the test at a temperature above –10°C (14°F).**

WITH CONSULT-II

1. Open engine hood.
2. Start engine and warm it up to normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Turn ignition switch ON again and select “DATA MONITOR” mode with CONSULT-II.
5. Start engine and run it for at least 1 minute at idle speed.
6. If 1st trip DTC is detected, go to EC-368, "Diagnostic Procedure" .



WITH GST

Follow the procedure “WITH CONSULT-II” above.

Diagnostic Procedure

ABS009IX

1. CHECK PCV HOSE CONNECTION

Confirm that PCV hose is connected correctly.

OK or NG

OK >> GO TO 2.
NG >> Repair or replace.

2. CHECK INTAKE AIR LEAK

1. Start engine and let it idle.
2. Listen for an intake air leak after the mass air flow sensor.

OK or NG

OK >> GO TO 3.
NG >> Discover air leak location and repair.

3. REPLACE ECM

1. Stop engine.
2. Replace ECM.
3. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs. Refer to BL-160, "ECM Re-communicating Function" .
4. Perform EC-42, "VIN Registration" .
5. Perform EC-42, "Accelerator Pedal Released Position Learning" .
6. Perform EC-42, "Throttle Valve Closed Position Learning" .
7. Perform EC-43, "Idle Air Volume Learning" .

>> **INSPECTION END**

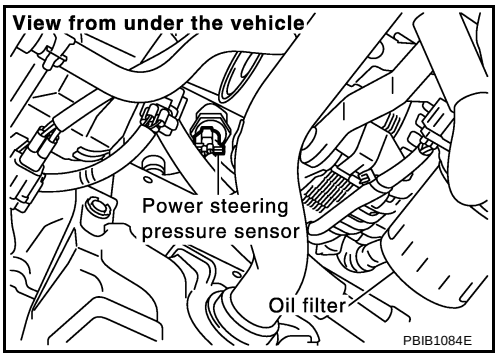
DTC P0550 PSP SENSOR

PFP:49763

Component Description

ABS009IY

Power steering pressure (PSP) sensor is installed to the power steering high-pressure tube and detects a power steering load. This sensor is a potentiometer which transforms the power steering load into output voltage, and emits the voltage signal to the ECM. The ECM controls the electric throttle control actuator and adjusts the throttle valve opening angle to increase the engine speed and adjusts the idle speed for the increased load.



CONSULT-II Reference Value in Data Monitor Mode

ABS009IZ

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
PW/ST SIGNAL	● Engine: After warming up, idle the engine	Steering wheel is in neutral position. (Forward direction)	OFF
		Steering wheel is turned.	ON

On Board Diagnosis Logic

ABS009J0

The MIL will not light up for this diagnosis.

NOTE:
If DTC P0550 is displayed with DTC P1229, first perform the trouble diagnosis for DTC P1229. Refer to EC-457 .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0550 0550	Power steering pressure sensor circuit	An excessively low or high voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted) ● Power steering pressure sensor

DTC Confirmation Procedure

ABS009J1

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Start engine and let it idle for at least 5 seconds.
4. If 1st trip DTC is detected, go to EC-372, "Diagnostic Procedure" .

WITH GST

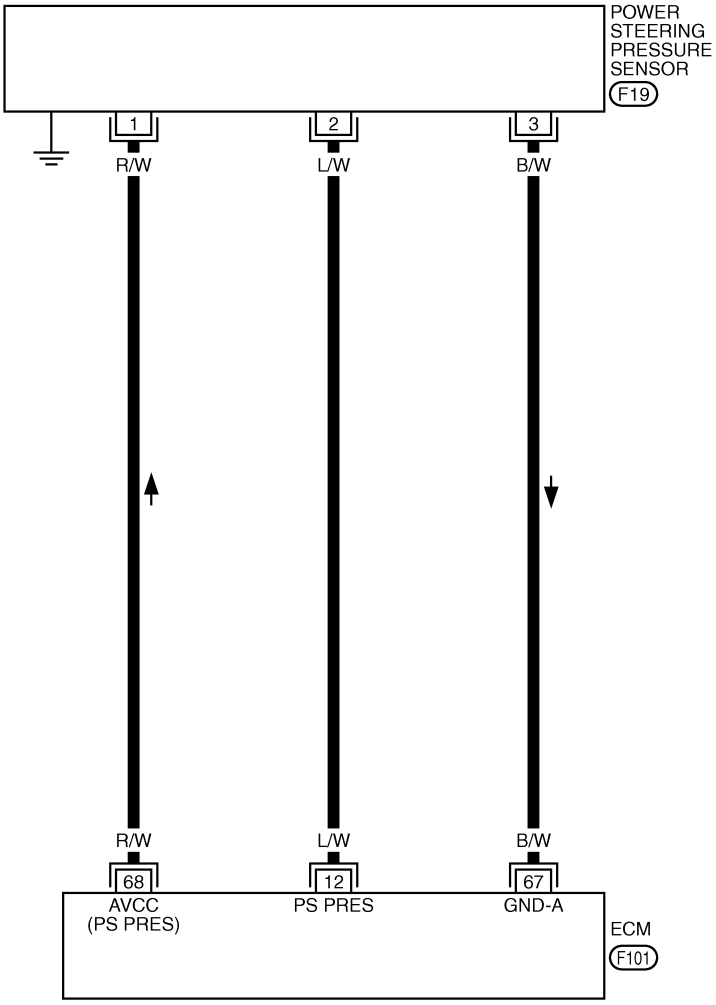
Follow the procedure “WITH CONSULT-II” above.

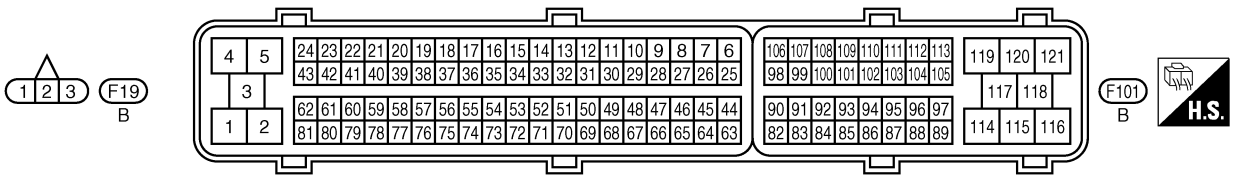
Wiring Diagram

ABS009J2

EC-PS/SEN-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





TBWT0494E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

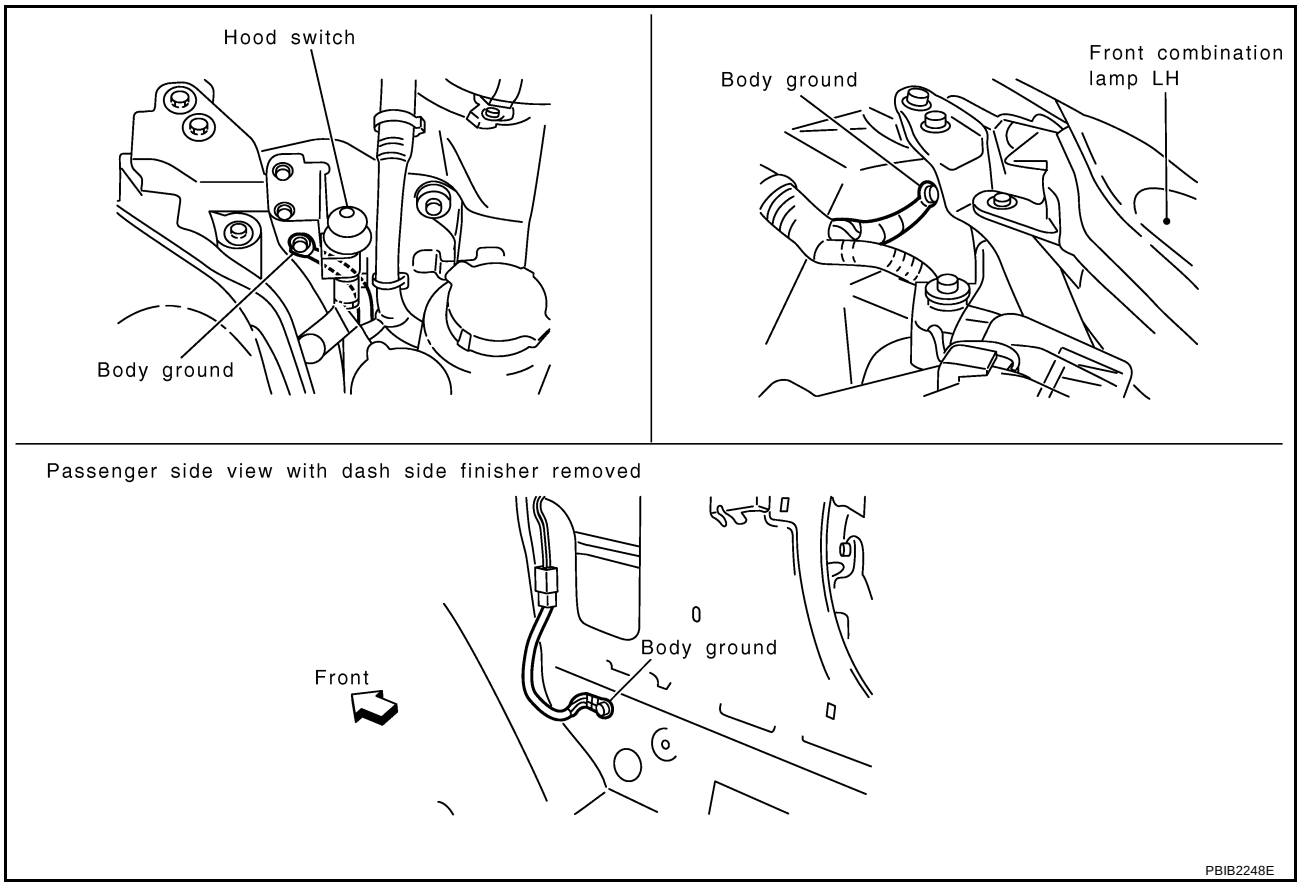
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
12	L/W	Power steering pressure sensor	**[Engine is running]** ● Steering wheel is being turned.	0.5 - 4.5V
			[Engine is running] ● Steering wheel is not being turned.	0.4 - 0.8V
67	B/W	Sensor ground (Mass air flow sensor / IAT sensor / Power steering pressure sensor / EVAP control system pressure sensor / ASCD steering switch / Refrigerant pressure sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V
68	R/W	Sensor power supply (Power steering pressure sensor)	**[Ignition switch: ON]**	Approximately 5V

Diagnostic Procedure

ABS009J3

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

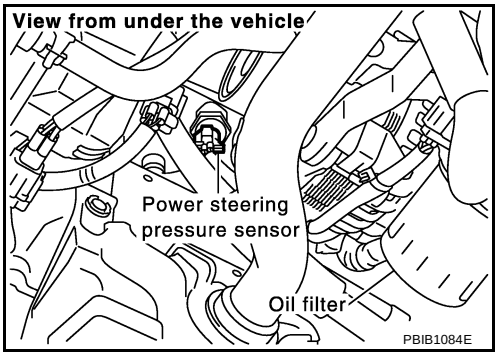


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

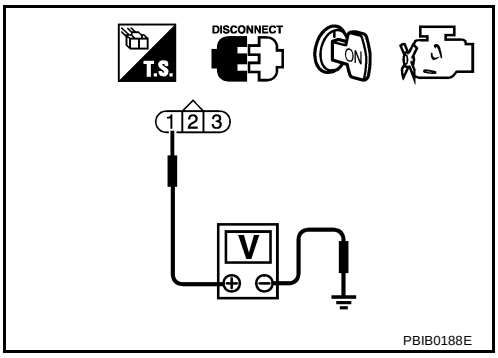
2. CHECK PSP SENSOR POWER SUPPLY CIRCUIT

1. Disconnect PSP sensor harness connector.
2. Turn ignition switch ON.



3. Check voltage between PSP sensor terminal 1 and ground with CONSULT-II or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK PSP SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between PSP sensor terminal 3 and ECM terminal 67. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK PSP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 12 and PSP sensor terminal 2.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK PSP SENSOR

Refer to EC-374, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace PSP sensor.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

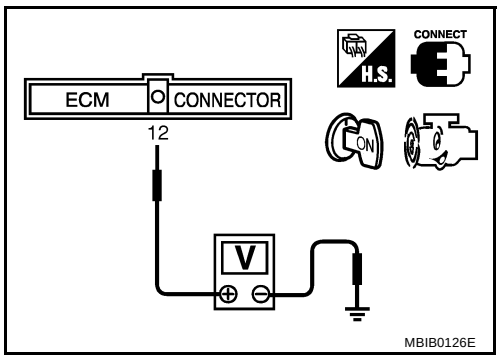
Component Inspection

ABS009J4

POWER STEERING PRESSURE SENSOR

1. Reconnect all harness connectors disconnected.
2. Start engine and let it idle.
3. Check voltage between ECM terminal 12 and ground under the following conditions.

Condition	Voltage
Steering wheel is being turned.	0.5 - 4.5V
Steering wheel is not being turned.	0.4 - 0.8V



Removal and Installation

ABS00B3F

POWER STEERING PRESSURE SENSOR

Refer to PS-34, "HYDRAULIC LINE" .

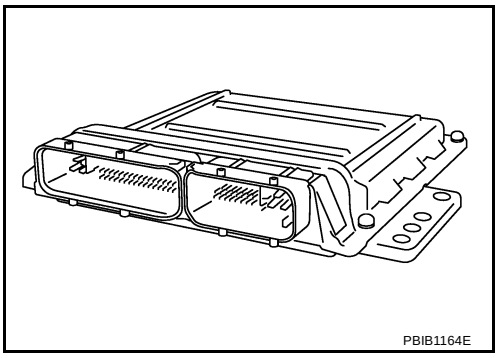
DTC P0605 ECM

PFP:23710

Component Description

ABS009J5

The ECM consists of a microcomputer and connectors for signal input and output and for power supply. The ECM controls the engine.


PBIB1164E

On Board Diagnosis Logic

ABS009J6

This self-diagnosis has one or two trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition		Possible cause
P0605 0605	Engine control module	A)	ECM calculation function is malfunctioning.	● ECM
		B)	ECM EEP-ROM system is malfunctioning.	
		C)	ECM self shut-off function is malfunctioning.	

FAIL-SAFE MODE

ECM enters fail-safe mode when the malfunction A is detected.

Detected items	Engine operation condition in fail-safe mode
Malfunction A	● ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring. ● ECM deactivates ASCD operation.

DTC Confirmation Procedure

ABS009J7

Perform PROCEDURE FOR MALFUNCTION A first. If the 1st trip DTC cannot be confirmed, perform PROCEDURE FOR MALFUNCTION B. If there is no malfunction on PROCEDURE FOR MALFUNCTION B, perform PROCEDURE FOR MALFUNCTION C.

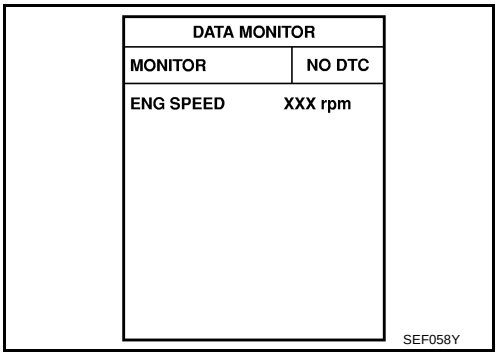
NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

PROCEDURE FOR MALFUNCTION A

With CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. If 1st trip DTC is detected, go to EC-376, "Diagnostic Procedure" .



SEF058Y

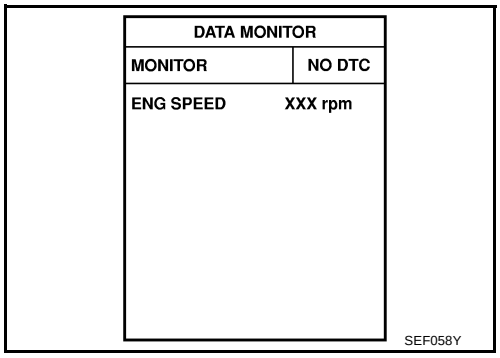
With GST

Follow the procedure “With CONSULT-II” above.

PROCEDURE FOR MALFUNCTION B

With CONSULT-II

1. Turn ignition switch ON and wait at least 1 second.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Turn ignition switch OFF, wait at least 10 seconds, and then turn ON.
4. If 1st trip DTC is detected, go to EC-376, "Diagnostic Procedure" .



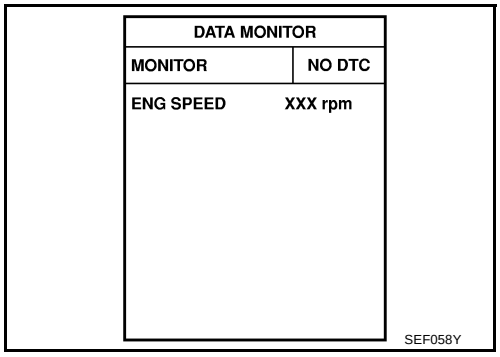
With GST

Follow the procedure “With CONSULT-II” above.

PROCEDURE FOR MALFUNCTION C

With CONSULT-II

1. Turn ignition switch ON and wait at least 1 second.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Turn ignition switch OFF, wait at least 10 seconds, and then turn ON.
4. Repeat step 3 procedure, 32 times.
5. If 1st trip DTC is detected, go to EC-376, "Diagnostic Procedure" .



With GST

Follow the procedure “With CONSULT-II” above.

Diagnostic Procedure

ABS009J8

1. INSPECTION START

With CONSULT-II

1. Turn ignition switch ON.
2. Select “SELF DIAG RESULTS” mode with CONSULT-II.
3. Touch “ERASE”.
4. **Perform DTC Confirmation Procedure.**
   See EC-375 .
5. Is the 1st trip DTC P0605 displayed again?

With GST

1. Turn ignition switch ON.
2. Select “MODE 4” with GST.
3. Touch “ERASE”.
4. **Perform DTC Confirmation Procedure.**
   See EC-375 .
5. Is the 1st trip DTC P0605 displayed again?

Yes or No

Yes >> GO TO 2.
No >> **INSPECTION END**

2. REPLACE ECM

1. Replace ECM.
2. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs. Refer to BL-160, "ECM Re-communicating Function" .
3. Perform EC-42, "VIN Registration" .
4. Perform EC-42, "Accelerator Pedal Released Position Learning" .
5. Perform EC-42, "Throttle Valve Closed Position Learning" .
6. Perform EC-43, "Idle Air Volume Learning" .

>> **INSPECTION END**

DTC P1031, P1032, P1051, P1052 A/F SENSOR 1 HEATER

PFP:22693

Description

ABS00A7Z

SYSTEM DESCRIPTION

Sensor	Input Signal to ECM	ECM function	Actuator
Camshaft position sensor (PHASE) Crankshaft position sensor (POS)	Engine speed	Air fuel ratio (A/F) sensor 1 heater control	Air fuel ratio (A/F) sensor 1 heater
Mass air flow sensor	Amount of intake air		

The ECM performs ON/OFF duty control of the A/F sensor 1 heater corresponding to the engine operating condition to keep the temperature of A/F sensor 1 element at the specified range.

CONSULT-II Reference Value in Data Monitor Mode

ABS00A80

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
A/F S1 HTR (B1) A/F S1 HTR (B2)	● Engine: After warming up, idle the engine	0 - 100%

On Board Diagnosis Logic

ABS00A81

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1031 1031 (Bank 1) P1051 1051 (Bank 2)	Air fuel ratio (A/F) sensor 1 heater control circuit low	The current amperage in the heated air fuel ratio (A/F) sensor 1 heater circuit is out of the normal range. (An excessively low voltage signal is sent to ECM through the heated air fuel ratio (A/F) sensor 1 heater.)	● Harness or connectors (The A/F sensor 1 heater circuit is open or shorted.) ● A/F sensor 1 heater
P1032 1032 (Bank 1) P1052 1052 (Bank 2)	Air fuel ratio (A/F) sensor 1 heater control circuit high	The current amperage in the heated air fuel ratio (A/F) sensor 1 heater circuit is out of the normal range. (An excessively high voltage signal is sent to ECM through the heated air fuel ratio (A/F) sensor 1 heater.)	● Harness or connectors (The A/F sensor 1 heater circuit is shorted.) ● A/F sensor 1 heater

DTC Confirmation Procedure

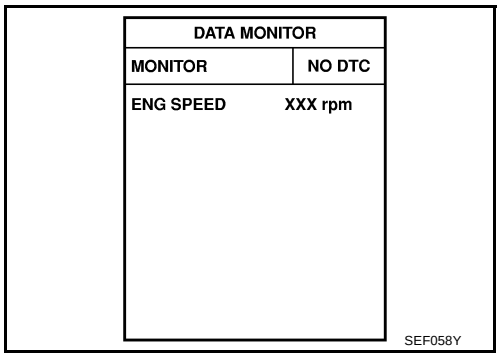
ABS00A82

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is between 10.5V and 16V at idle.

WITH CONSULT-II

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-II.
2. Start engine and let it idle for at least 10 seconds.
3. If 1st trip DTC is detected, go to EC-382, "Diagnostic Procedure" .



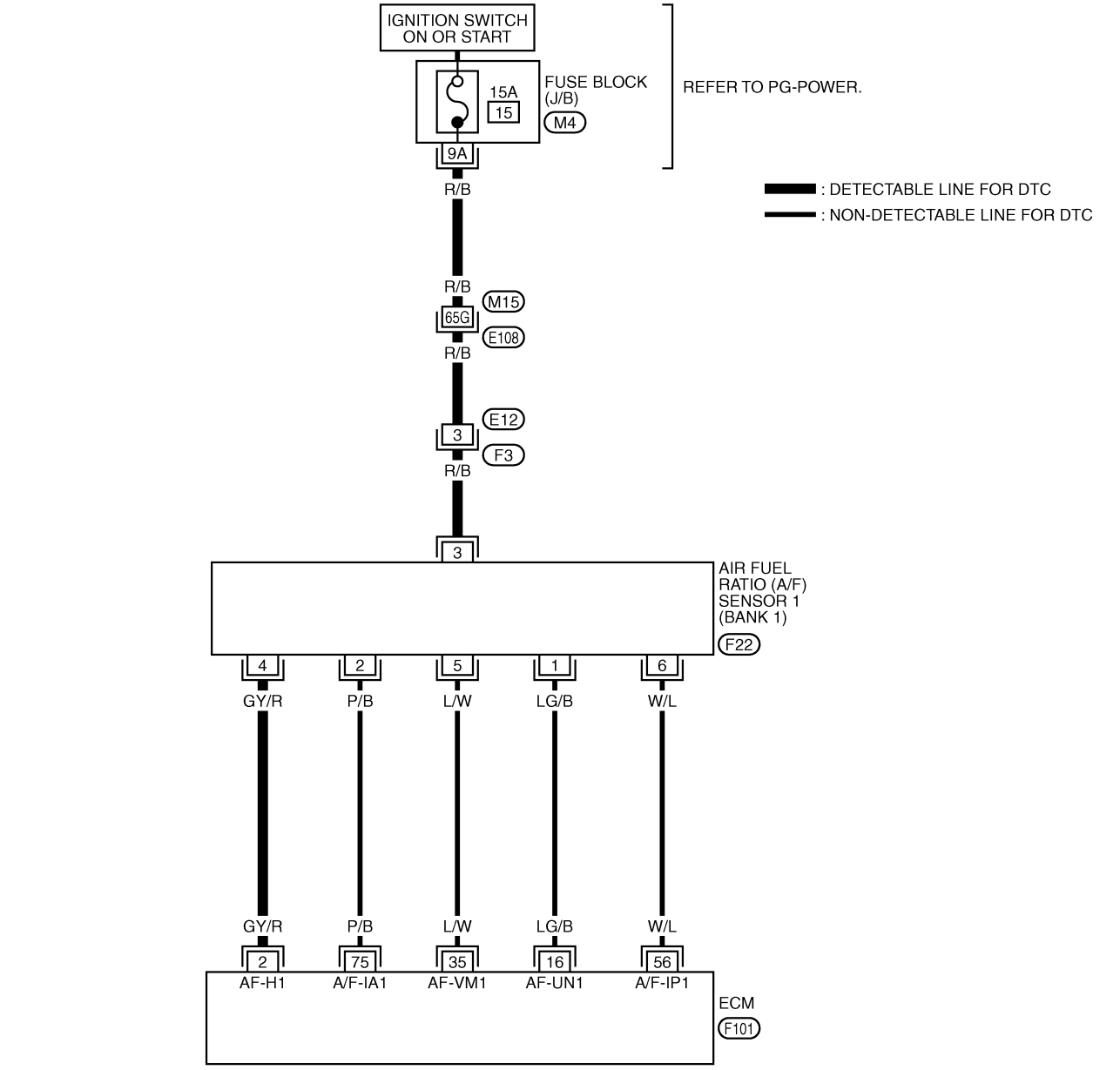
WITH GST

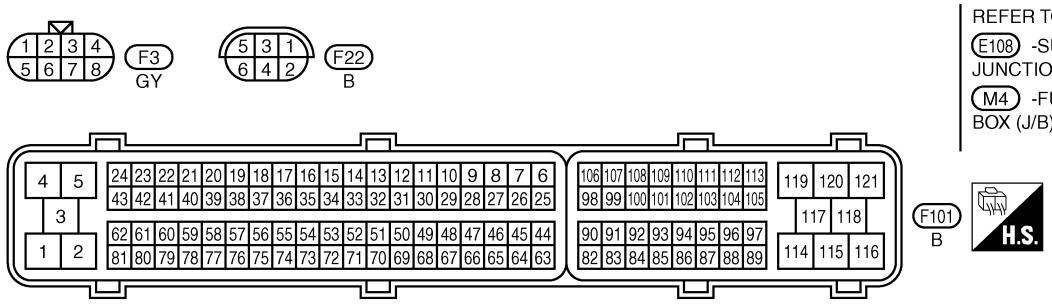
Follow the procedure “WITH CONSULT-II” above.

Wiring Diagram
BANK 1

ABS00A83

EC-AF1HB1-01





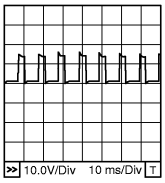
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT0704E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-II.

CAUTION:

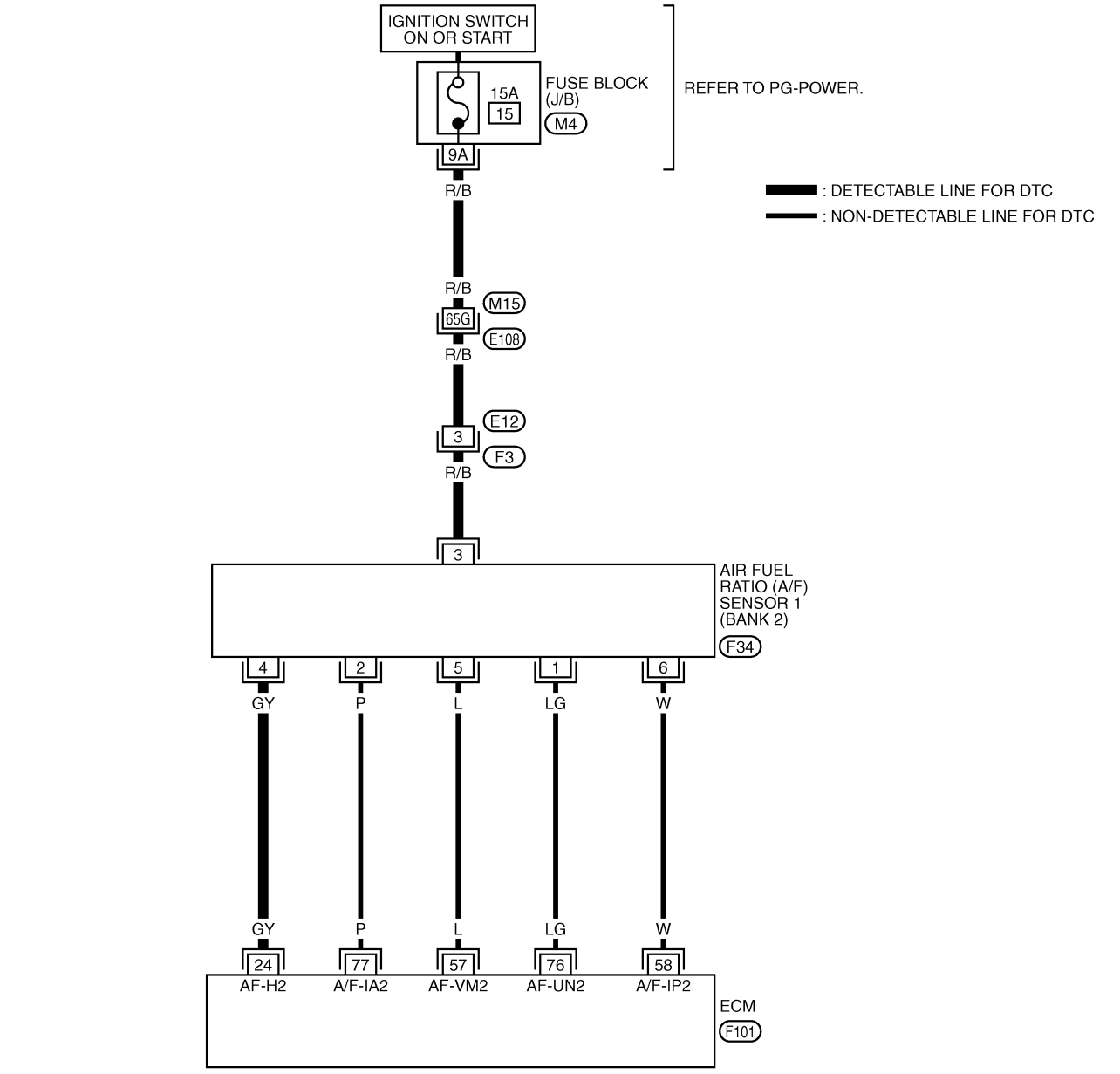
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

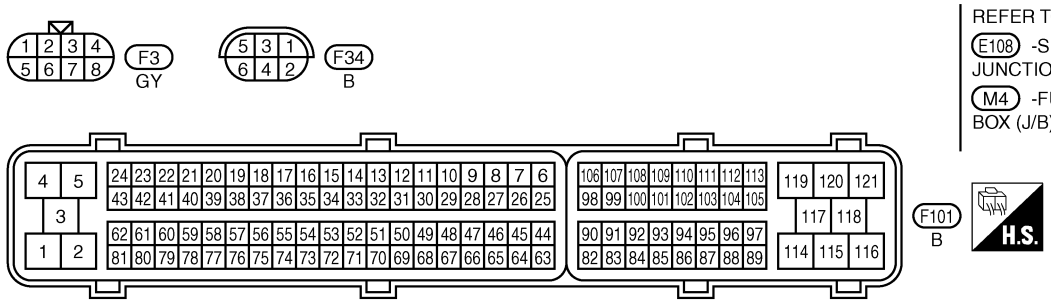
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
2	GY/R	A/F sensor 1 heater (Bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 5V★  PBIB1584E

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2

EC-AF1HB2-01





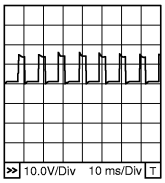
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT0705E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-II.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
24	GY	A/F sensor 1 heater (Bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 5V★  PBIB1584E

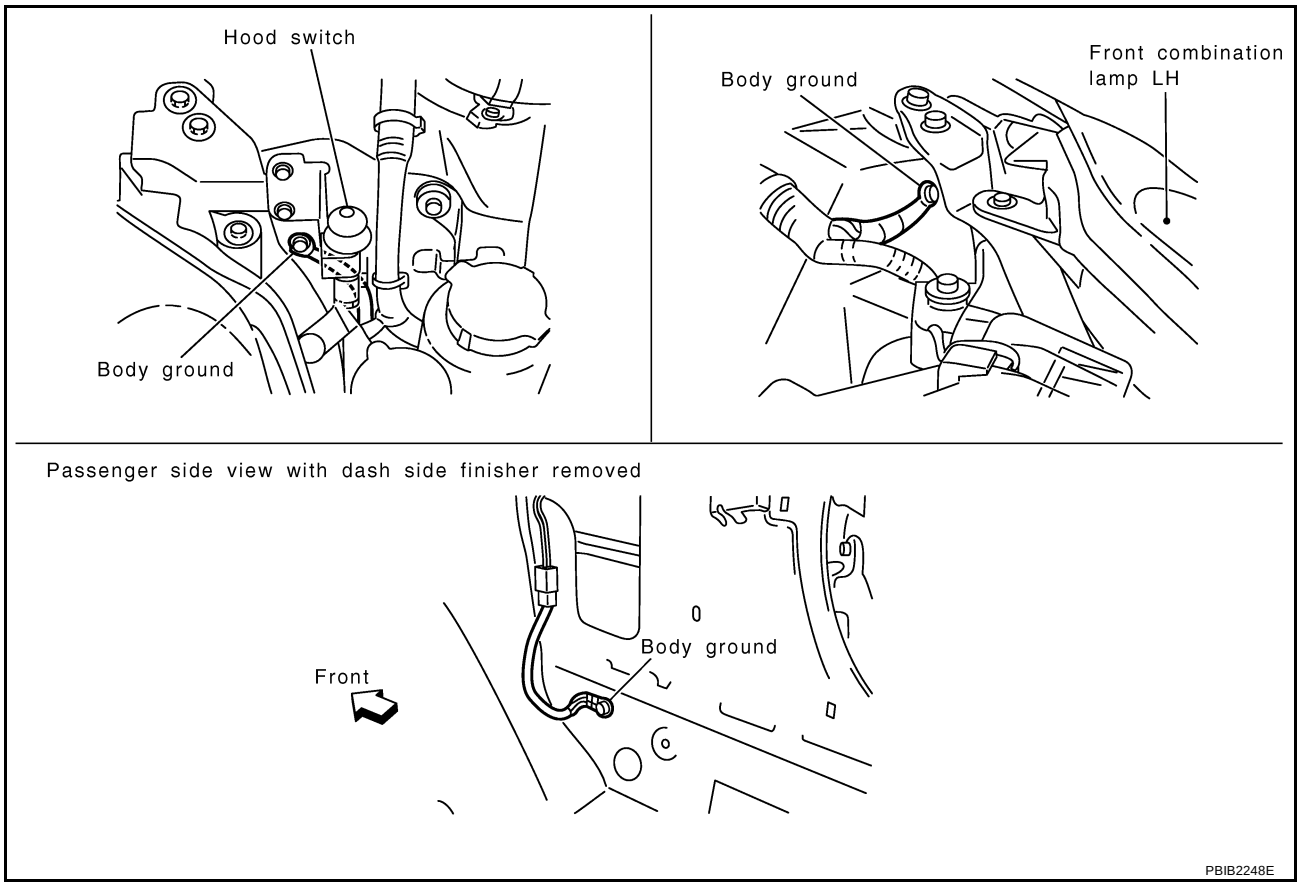
★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

ABS00A84

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

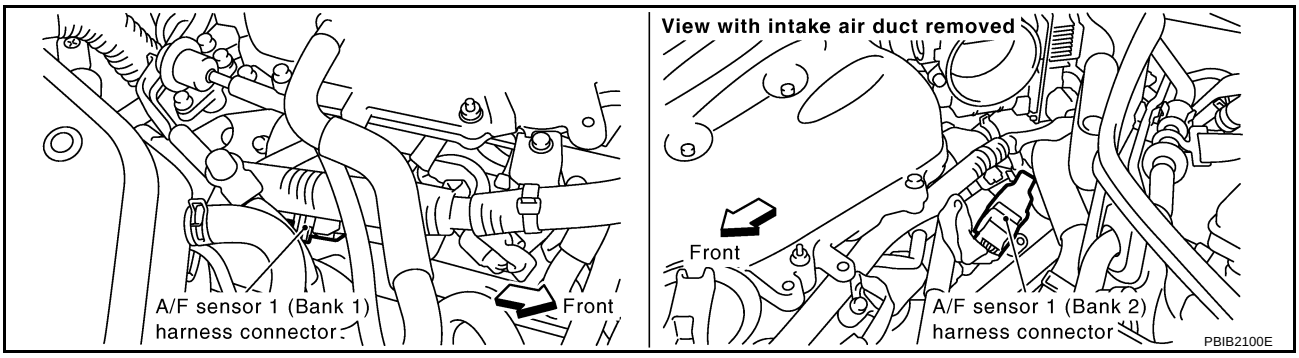


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

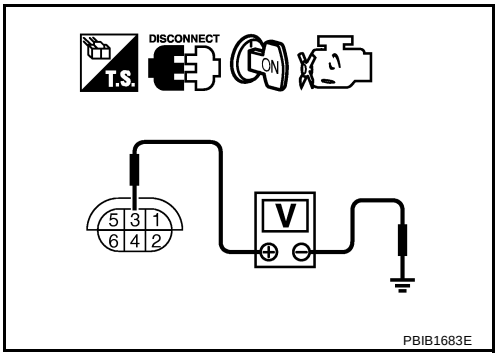
2. CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY CIRCUIT

1. Disconnect air fuel ratio (A/F) sensor 1 harness connector.



2. Turn ignition switch ON.
3. Check voltage between A/F sensor 1 terminal 3 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M15, E108
- Harness connectors E12, F3
- Fuse block (J/B) connector M4
- 15A fuse
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

4. CHECK A/F SENSOR 1 HEATER OUTPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 2 (bank 1) or 24 (bank 2) and A/F sensor 1 terminal 4. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground or short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK A/F SENSOR 1 HEATER

Refer to EC-384, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace A/F sensor 1.

6. CHECK INTERMITTENT INCIDENT

Perform EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace A/F sensor 1.
NG >> Repair or replace.

Component Inspection

ABS00A85

AIR FUEL RATIO (A/F) SENSOR 1 HEATER

Check resistance between terminals 3 and 4.

Resistance: 2.3 - 4.3Ω [at 25°C (77°F)]

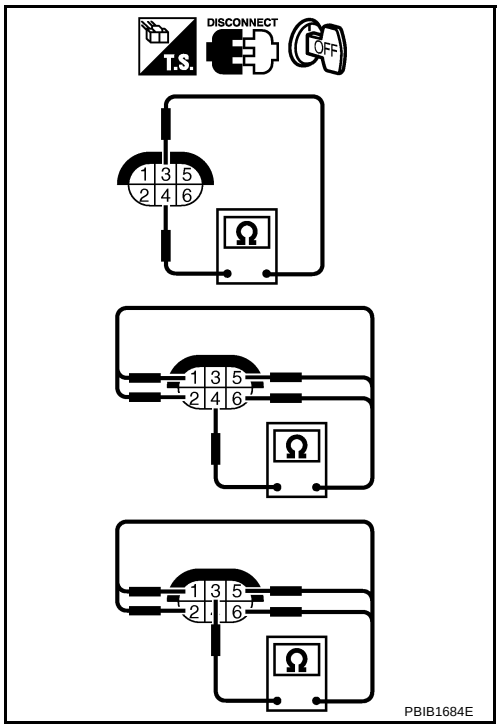
Check continuity between terminals 3 and 1, 2, 5, 6, terminals 4 and 1, 2, 5, 6.

Continuity should not exist.

If NG, replace the A/F sensor 1.

CAUTION:

- **Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new A/F sensor, clean exhaust system threads using Heated Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**



Removal and Installation

ABS00A86

AIR FUEL RATIO (A/F) SENSOR 1

Refer to EM-23, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

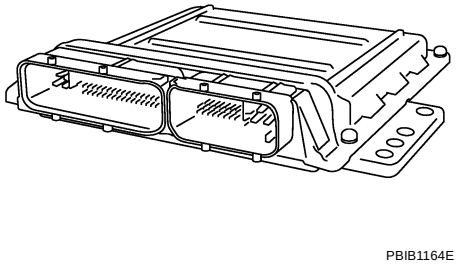
DTC P1065 ECM POWER SUPPLY

PFP:23710

Component Description

ABS009J9

Battery voltage is supplied to the ECM even when the ignition switch is turned OFF for the ECM memory function of the DTC memory, the air-fuel ratio feedback compensation value memory, the idle air volume learning value memory, etc.



PBIB1164E

On Board Diagnosis Logic

ABS009JA

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1065 1065	ECM power supply circuit	ECM back-up RAM system does not function properly.	● Harness or connectors [ECM power supply (back-up) circuit is open or shorted.] ● ECM

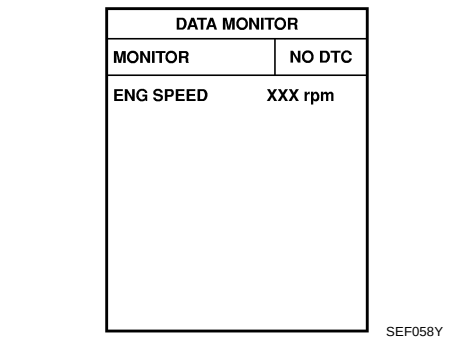
DTC Confirmation Procedure

ABS009JB

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-II

1. Turn ignition switch ON and wait at least 1 second.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Start engine and let it idle for 1 second.
4. Turn ignition switch OFF, wait at least 10 seconds, and then turn ON.
5. Repeat steps 3 and 4 four times.
6. If 1st trip DTC is detected, go to EC-387, "Diagnostic Procedure".



SEF058Y

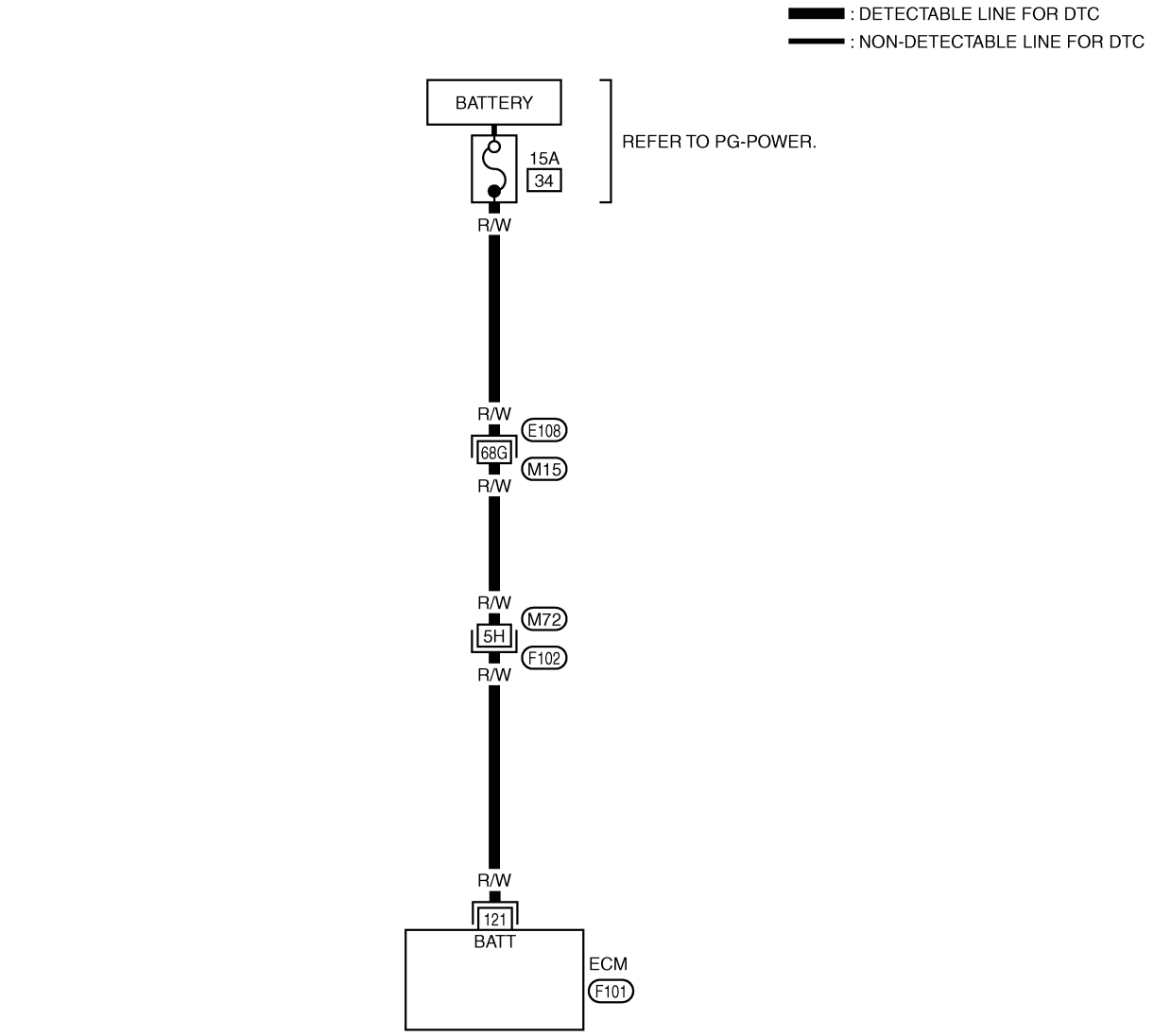
WITH GST

Follow the procedure “WITH CONSULT-II” above.

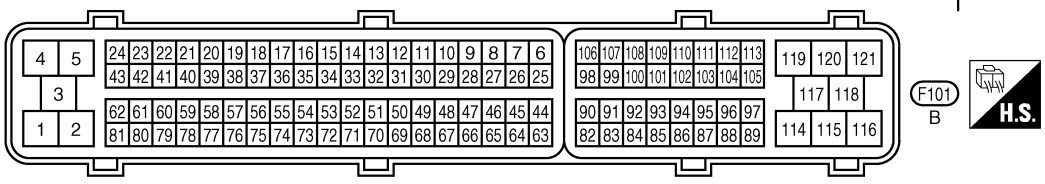
Wiring Diagram

ABS009JC

EC-ECM/PW-01



REFER TO THE FOLLOWING.
E108 , F102 -SUPER MULTIPLE JUNCTION (SMJ)



TBWT0225E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
121	R/W	Power supply for ECM (Back-up)	**[Ignition switch: OFF]**	BATTERY VOLTAGE (11 - 14V)

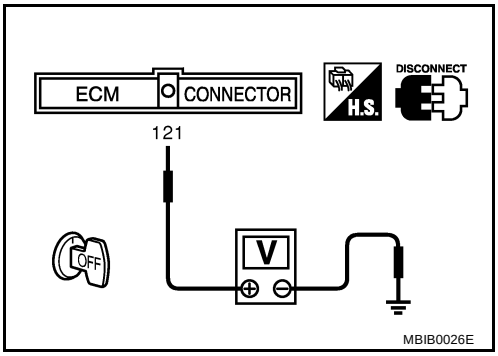
Diagnostic Procedure

ABS009JD

1. CHECK ECM POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check voltage between ECM terminal 121 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- 15A fuse
- Harness for open or short between ECM and battery

>> Repair or replace harness or connectors.

3. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness or connectors.

4. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT-II

1. Turn ignition switch ON.
2. Select “SELF DIAG RESULTS” mode with CONSULT-II.
3. Touch “ERASE”.
4. **Perform DTC Confirmation Procedure.**
   See EC-385 .
5. Is the 1st trip DTC P1065 displayed again?

With GST

1. Turn ignition switch ON.
2. Select “MODE 4” with GST.
3. Touch “ERASE”.
4. **Perform DTC Confirmation Procedure.**
   See EC-385 .
5. Is the 1st trip DTC P1065 displayed again?

Yes or No

Yes >> GO TO 5.
No >> **INSPECTION END**

5. REPLACE ECM

1. Replace ECM.
2. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs. Refer to BL-160, "ECM Re-communicating Function" .
3. Perform EC-42, "VIN Registration" .
4. Perform EC-42, "Accelerator Pedal Released Position Learning" .
5. Perform EC-42, "Throttle Valve Closed Position Learning" .
6. Perform EC-43, "Idle Air Volume Learning" .

>> **INSPECTION END**

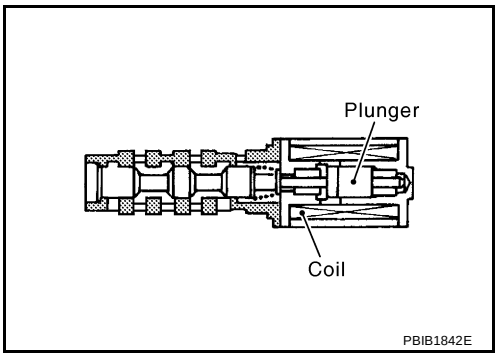
DTC P1111, P1136 IVT CONTROL SOLENOID VALVE

PFP:23796

Component Description

ABS009JE

Intake valve timing control solenoid valve is activated by ON/OFF pulse duty (ratio) signals from the ECM.
The intake valve timing control solenoid valve changes the oil amount and direction of flow through intake valve timing control unit or stops oil flow.
The longer pulse width advances valve angle.
The shorter pulse width retards valve angle.
When ON and OFF pulse widths become equal, the solenoid valve stops oil pressure flow to fix the intake valve angle at the control position.



PBIB1842E

CONSULT-II Reference Value in Data Monitor Mode

ABS009JF

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
INT/V SOL (B1) INT/V SOL (B2)	● Engine: After warming up ● Shift lever: N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No-load	Idle	0% - 2%
		When revving engine up to 2,000 rpm quickly	Approx. 0% - 50%

On Board Diagnosis Logic

ABS009JG

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1111 1111 (Bank 1)	Intake valve timing control solenoid valve circuit	An improper voltage is sent to the ECM through intake valve timing control solenoid valve.	● Harness or connectors (Intake valve timing control solenoid valve circuit is open or shorted.) ● Intake valve timing control solenoid valve
P1136 1136 (Bank 2)			

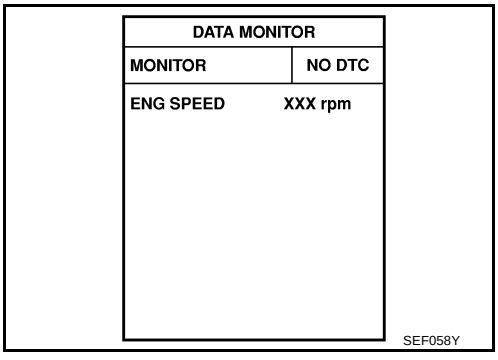
DTC Confirmation Procedure

ABS009JH

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Start engine and let it idle for 5 seconds.
4. If 1st trip DTC is detected, go to EC-393, "Diagnostic Procedure"
.



SEF058Y

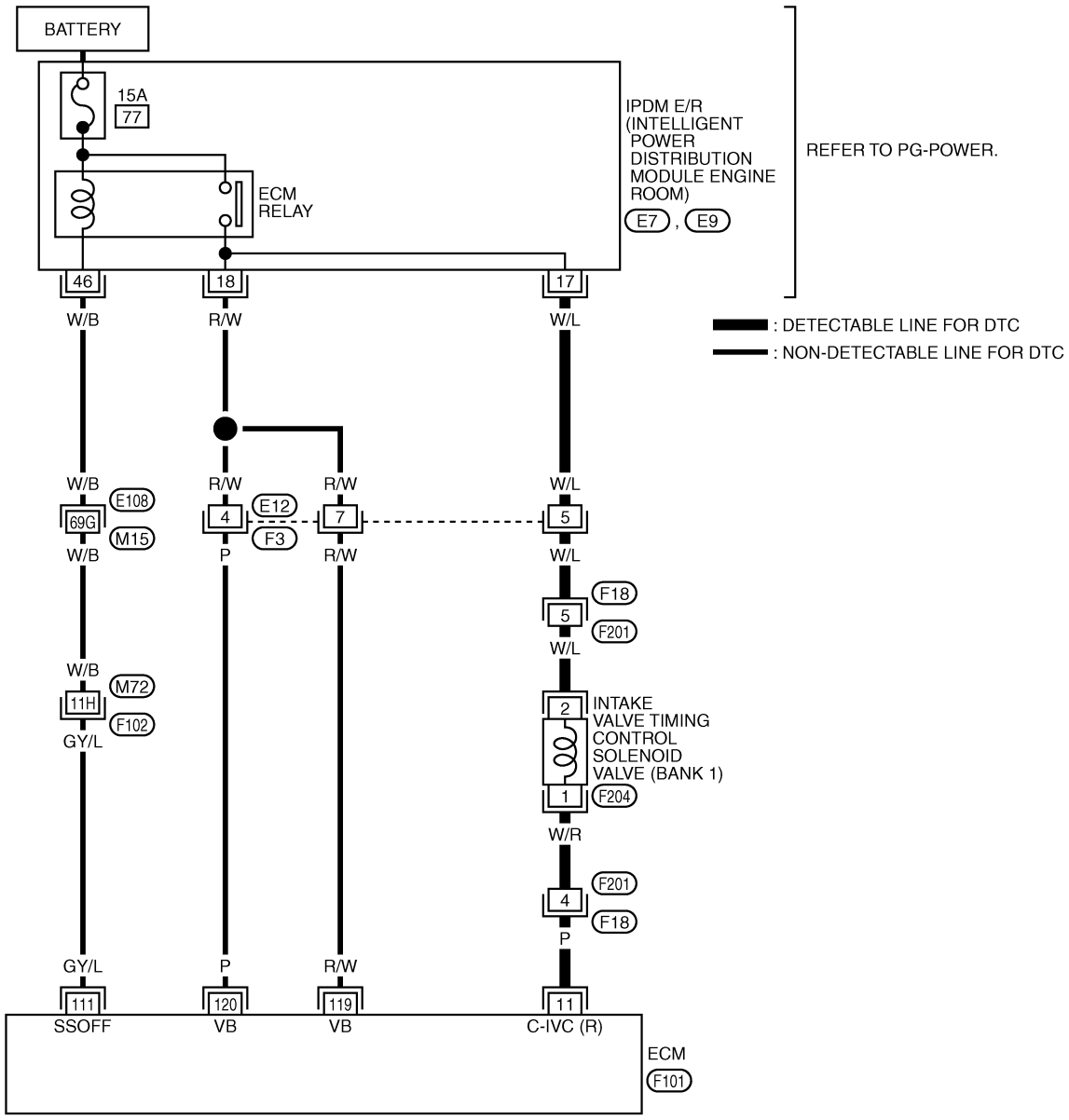
WITH GST

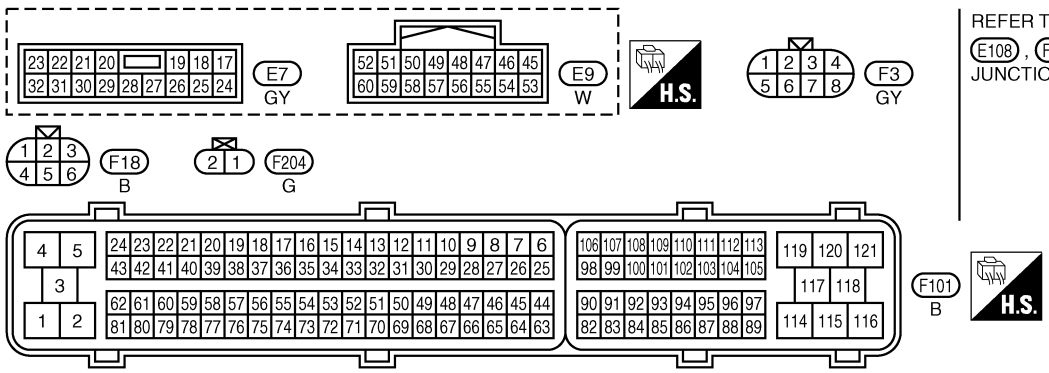
Following the procedure “WITH CONSULT-II” above.

Wiring Diagram
BANK 1

ABS009JI

EC-IVCB1-01

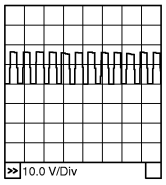




TBWT0624E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-II.

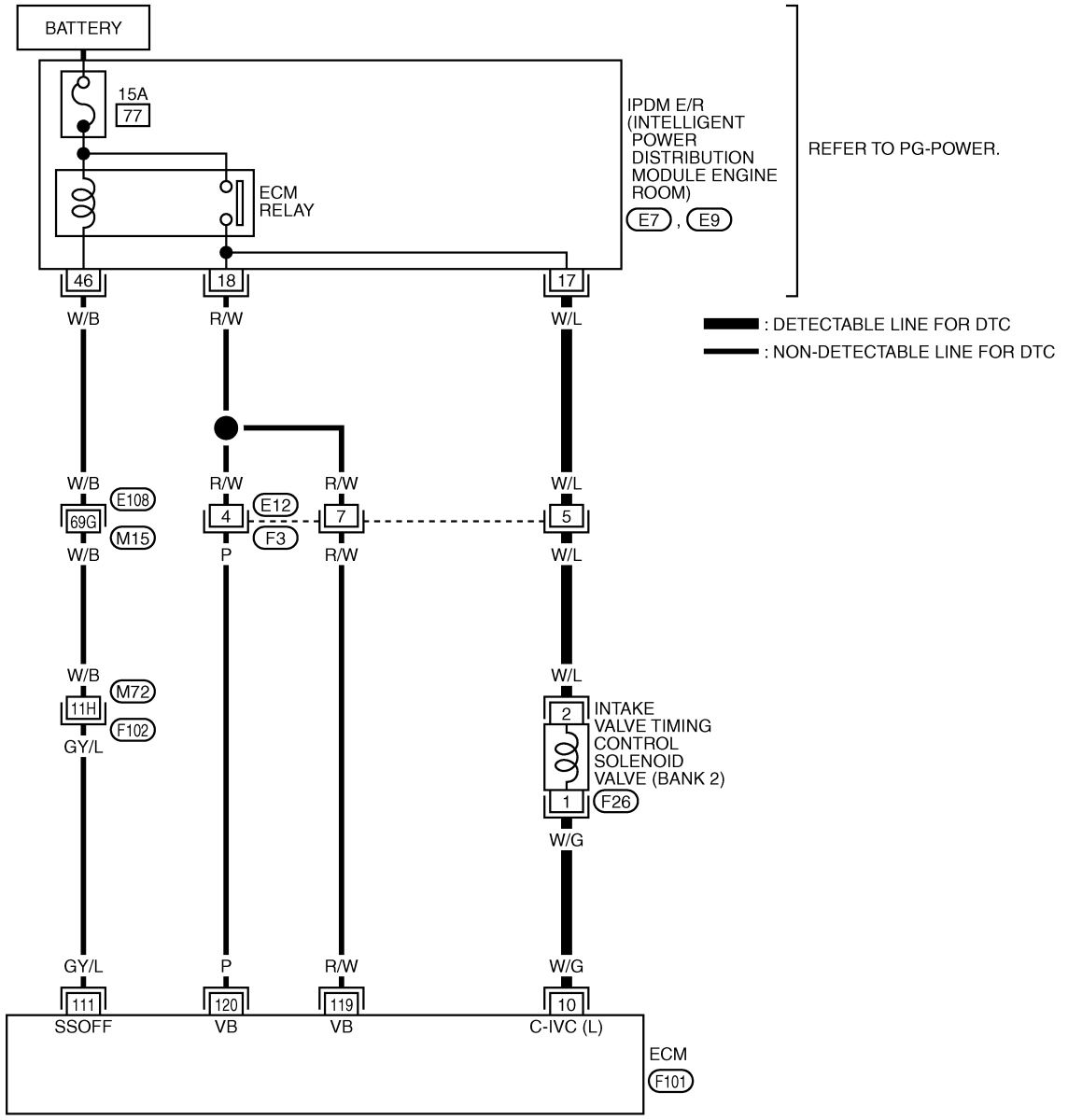
CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

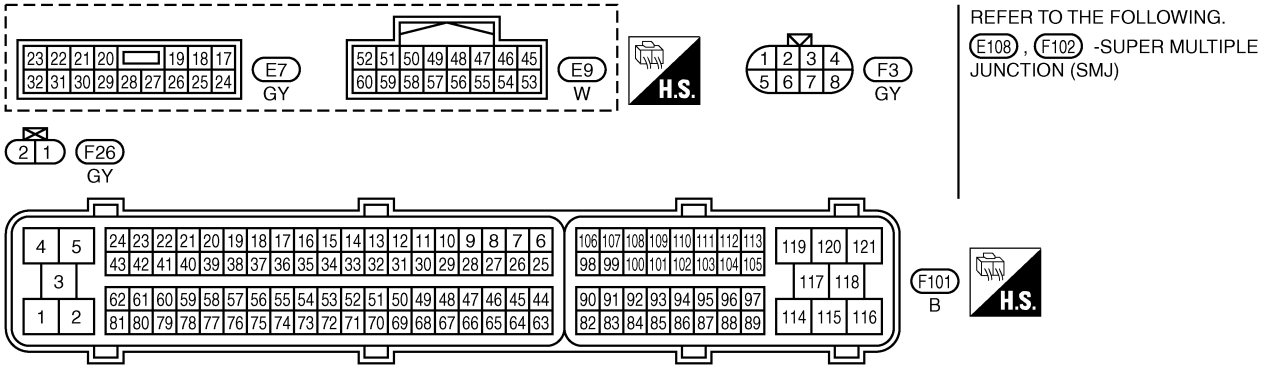
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
11	P	Intake valve timing control solenoid valve (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	BATTERY VOLTAGE (11 - 14V)
			[Engine is running] ● **Warm-up condition** ● When revving engine up to 2,500 rpm quickly	7 - 12V★  PBIB1790E

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2

EC-IVCB2-01

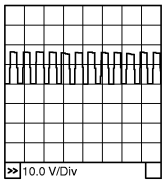




TBWT0625E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-II.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
10	W/G	Intake valve timing control solenoid valve (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	BATTERY VOLTAGE (11 - 14V)
			[Engine is running] ● **Warm-up condition** ● When revving engine up to 2,500 rpm quickly	7 - 12V★  PBIB1790E

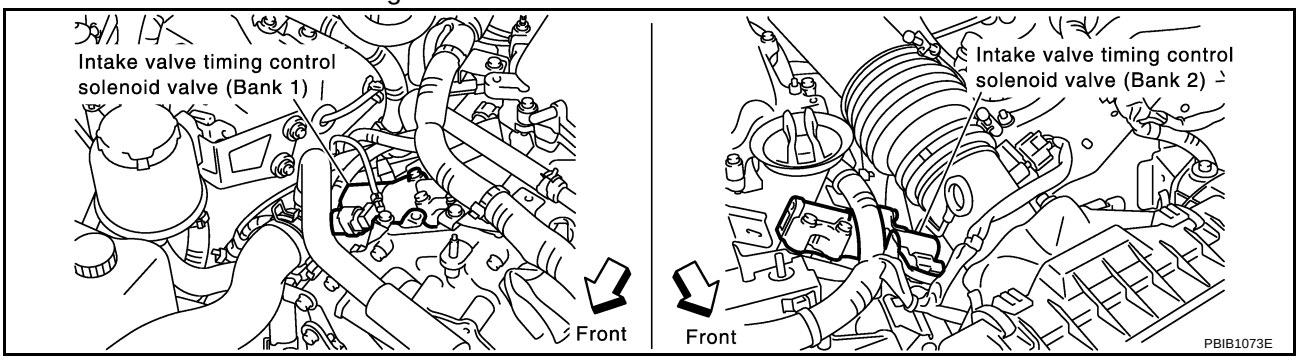
★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

ABS009JJ

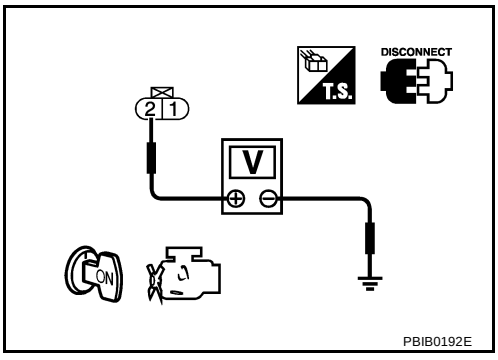
1. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect intake valve timing control solenoid valve harness connector.



3. Turn ignition switch ON.
4. Check voltage between intake valve timing control solenoid valve terminal 2 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness connectors F18, F201 (Bank 1)
- IPDM E/R harness connector E7
- Harness for open or short between intake valve timing control solenoid valve and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 11 (bank 1) or 10 (bank 2) and intake valve timing control solenoid valve terminal 1. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F18, F201 (Bank 1)
- Harness for open and short between ECM and intake valve timing control solenoid valve

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE

Refer to EC-395, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace intake valve timing control solenoid valve.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .
For wiring diagram, refer to EC-268 for CKP sensor (POS), EC-275 and EC-277 for CMP sensor (PHASE).

>> **INSPECTION END**

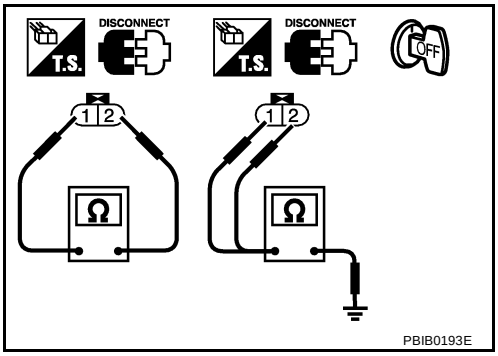
Component Inspection

ABS009JK

INTAKE VALVE TIMING CONTROL SOLENOID VALVE

1. Disconnect intake valve timing control solenoid valve harness connector.
2. Check resistance between intake valve timing control solenoid valve terminals as follows.

Terminals	Resistance
1 and 2	7.0 - 7.5Ω [at 20°C (68°F)]
1 or 2 and ground	∞Ω (Continuity should not exist)



Removal and Installation

ABS009JL

INTAKE VALVE TIMING CONTROL SOLENOID VALVE

Refer to EM-55, "TIMING CHAIN" .

DTC P1121 ELECTRIC THROTTLE CONTROL ACTUATOR

PFP:16119

Component Description

ABS009JM

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc.
The throttle control motor is operated by the ECM and it opens and closes the throttle valve.
The throttle position sensor detects the throttle valve position, and the opening and closing speed of the throttle valve and feeds the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and the ECM controls the throttle control motor to make the throttle valve opening angle properly in response to driving condition.

On Board Diagnosis Logic

ABS009JN

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition		Possible cause
P1121 1121	Electric throttle control actuator	A)	Electric throttle control actuator does not function properly due to the return spring malfunction.	● Electric throttle control actuator
		B)	Throttle valve opening angle in fail-safe mode is not in specified range.	
		C)	ECM detects the throttle valve is stuck open.	

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Detected items	Engine operating condition in fail-safe mode
Malfunction A	ECM controls the electric throttle actuator by regulating the throttle opening around the idle position. The engine speed will not rise more than 2,000 rpm.
Malfunction B	ECM controls the electric throttle control actuator by regulating the throttle opening to 20 degrees or less.
Malfunction C	While the vehicle is driving, it slows down gradually by fuel cut. After the vehicle stops, the engine stalls. The engine can restart in N or P position, and engine speed will not exceed 1,000 rpm or more.

DTC Confirmation Procedure

ABS009JO

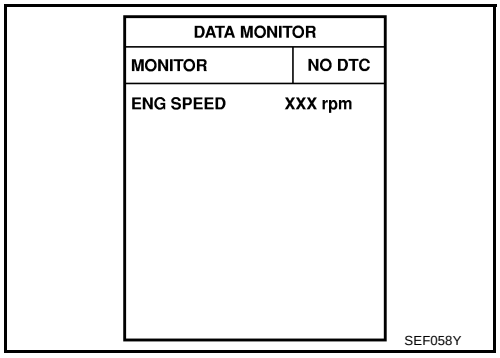
NOTE:

- **Perform PROCEDURE FOR MALFUNCTION A AND B first. If the DTC cannot be confirmed, perform PROCEDURE FOR MALFUNCTION C.**
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

PROCEDURE FOR MALFUNCTION A AND B

With CONSULT-II

1. Turn ignition switch ON and wait at least 1 second.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Set shift lever to D position (A/T) or 1st position (M/T), and wait at least 3 seconds.
4. Set shift lever to P position (A/T) or Neutral position (M/T).
5. Turn ignition switch OFF and wait at least 10 seconds.
6. Turn ignition switch ON and wait at least 1 second.
7. Set shift lever to D position (A/T) or 1st position (M/T), and wait at least 3 seconds.
8. Set shift lever to P position (A/T) or Neutral position (M/T).
9. Turn ignition switch OFF, wait at least 10 seconds, and then turn ON.
10. If DTC is detected, go to EC-397, "Diagnostic Procedure" .



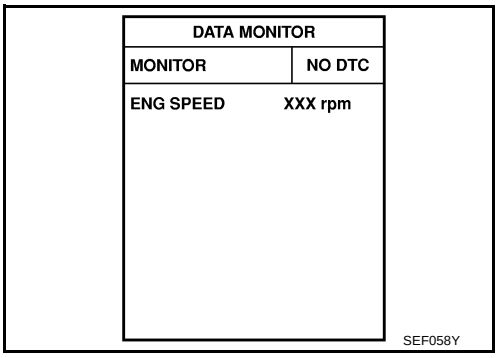
With GST

Follow the procedure “With CONSULT-II” above.

PROCEDURE FOR MALFUNCTION C

With CONSULT-II

1. Turn ignition switch ON and wait at least 1 second.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Set shift lever to D position (A/T) or 1st position (M/T) and wait at least 3 seconds.
4. Set shift lever to N, P position (A/T) or Neutral (M/T) position.
5. Start engine and let it idle for 3 seconds.
6. If DTC is detected, go to EC-397, "Diagnostic Procedure" .



With GST

Follow the procedure “With CONSULT-II” above.

Diagnostic Procedure

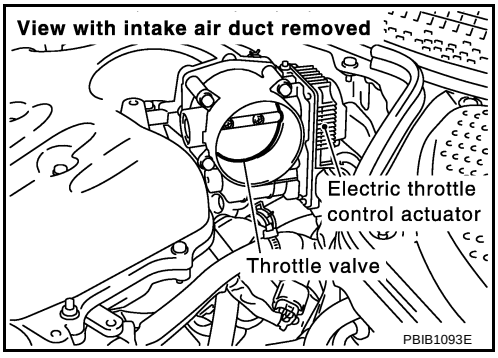
ABS009JP

1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

1. Remove the intake air duct.
2. Check if a foreign matter is caught between the throttle valve and the housing.

OK or NG

OK >> GO TO 2.
NG >> Remove the foreign matter and clean the electric throttle control actuator inside.



2. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace the electric throttle control actuator.
2. Perform EC-42, "Throttle Valve Closed Position Learning" .
3. Perform EC-43, "Idle Air Volume Learning" .

>> **INSPECTION END**

DTC P1122 ELECTRIC THROTTLE CONTROL FUNCTION

PFP:16119

Description

ABS009JQ

NOTE:
If DTC P1122 is displayed with DTC P1121 or 1126, first perform the trouble diagnosis for DTC P1121 or P1126. Refer to EC-396 or EC-405 .
Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc.
The throttle control motor is operated by the ECM and it opens and closes the throttle valve.
The current opening angle of the throttle valve is detected by the throttle position sensor and it provides feedback to the ECM to control the throttle control motor to make the throttle valve opening angle properly in response to driving condition.

On Board Diagnosis Logic

ABS009JR

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1122 1122	Electric throttle control performance problem	Electric throttle control function does not operate properly.	● Harness or connectors (Throttle control motor circuit is open or shorted) ● Electric throttle control actuator

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode
ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

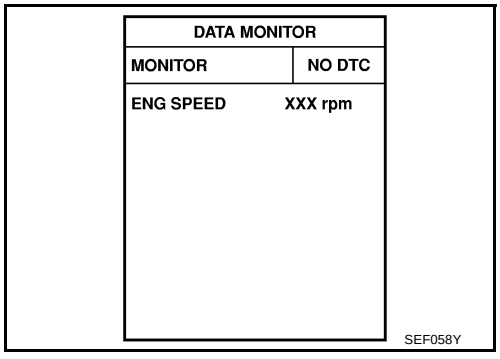
DTC Confirmation Procedure

ABS009JS

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V when engine is running.

WITH CONSULT-II

1. Turn ignition switch ON and wait at least 2 seconds.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Start engine and let it idle for 5 seconds.
4. If DTC is detected, go to EC-401, "Diagnostic Procedure" .

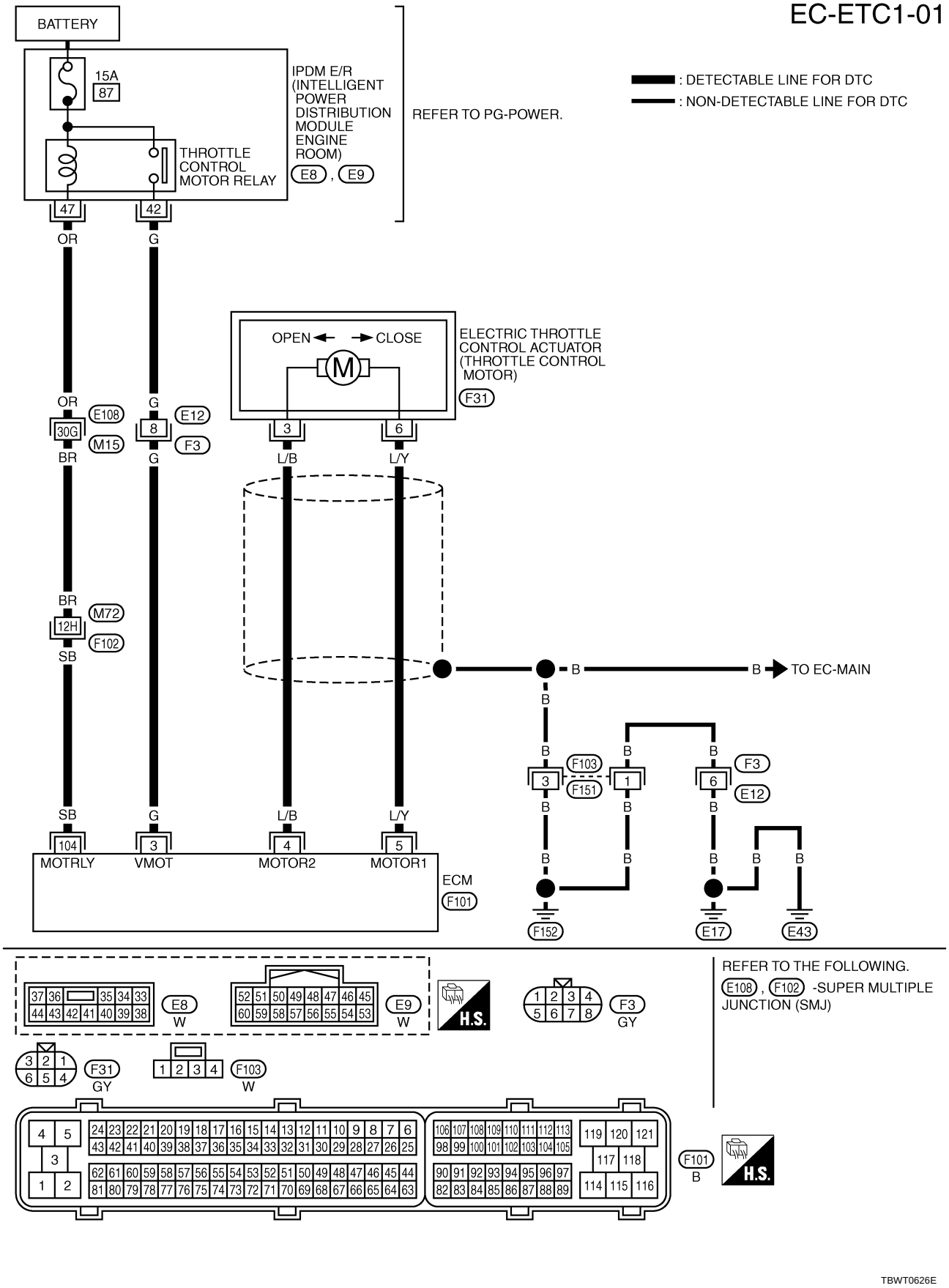


WITH GST

Follow the procedure “WITH CONSULT-II” above.

Wiring Diagram

ABS009JT

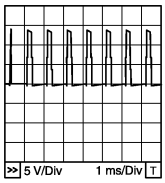
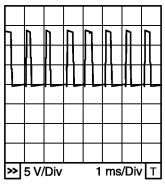


TBWT0626E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-II.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
3	G	Throttle control motor relay power supply	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
4	L/B	Throttle control motor (Close)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal is released	0 - 14V★  PBIB1104E
5	L/Y	Throttle control motor (Open)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal is fully depressed	0 - 14V★  PBIB1105E
104	SB	Throttle control motor relay	**[Ignition switch: OFF]**	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON]	0 - 1.0V

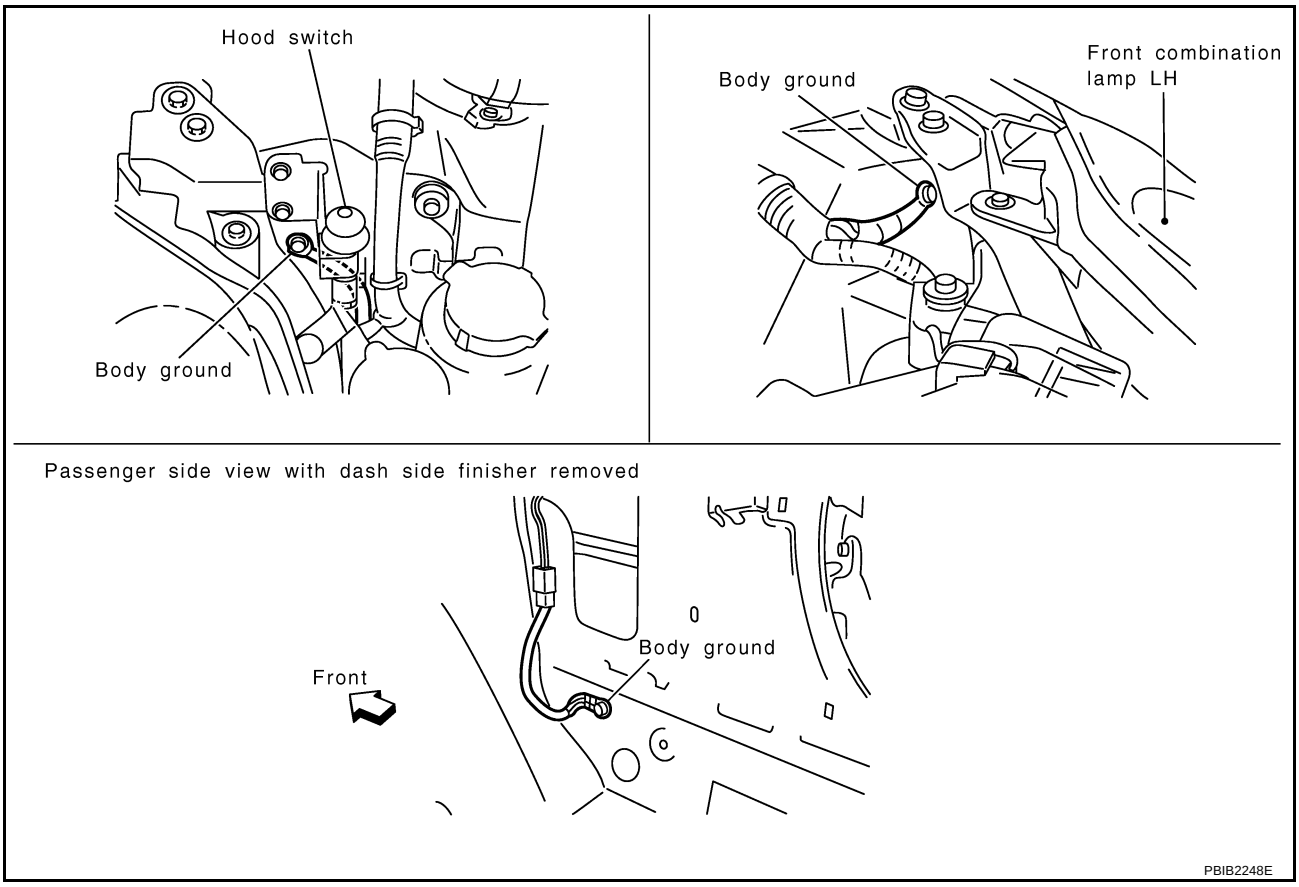
★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

ABS009JU

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .



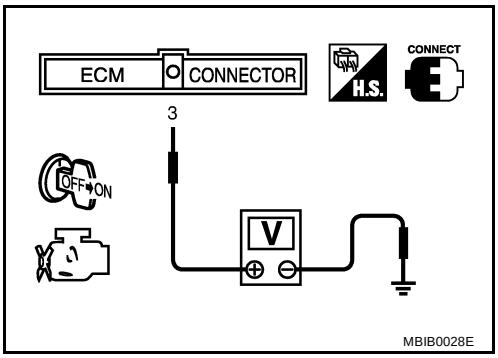
OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT-I

1. Check voltage between ECM terminal 3 and ground under the following conditions with CONSULT-II or tester.

Ignition switch	Voltage
OFF	Approximately 0V
ON	Battery voltage (11 - 14V)



OK or NG

OK >> GO TO 10.
NG >> GO TO 3.

3. CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Disconnect IPDM E/R harness connector E8.
4. Check continuity between ECM terminal 3 and IPDM E/R terminal 42.
   Refer to Wiring Diagram.

   Continuity should exist.

5. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

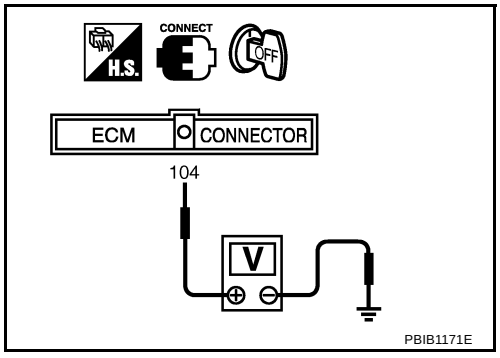
- Harness connectors E12, F3
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT-I

1. Reconnect all harness connectors disconnected.
2. Check voltage between ECM terminal 104 and ground with CONSULT-II or tester.

   Voltage: Battery voltage



OK or NG

OK >> GO TO 9.
NG >> GO TO 6.

6. CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT-II

1. Disconnect ECM harness connector.
2. Disconnect IPDM E/R harness connector E9.
3. Check continuity between ECM terminal 104 and IPDM E/R terminal 47.
   Refer to Wiring Diagram.

   Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK FUSE

1. Disconnect 15A fuse.
2. Check 15A fuse for blown.

OK or NG

OK >> GO TO 9.
NG >> Replace 15A fuse.

9. CHECK INTERMITTENT INCIDENT

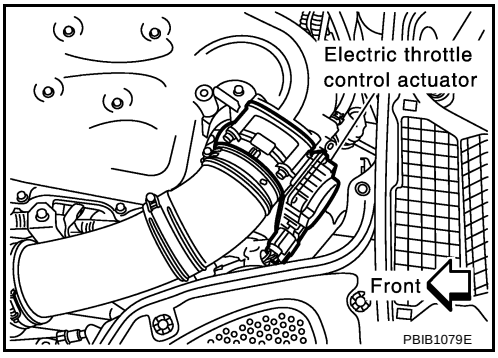
Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace IPDM E/R. Refer to PG-17, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)" .
NG >> Repair or replace harness or connectors.

10. CHECK THROTTLE CONTROL MOTOR OUTPUT SIGNAL CIRCUIT FOR OPEN OR SHORT

1. Turn ignition switch OFF.
2. Disconnect electric throttle control actuator harness connector.
3. Disconnect ECM harness connector.
4. Check harness continuity between the following terminals. Refer to Wiring Diagram.



Electric throttle control actuator terminal	ECM terminal	Continuity
3	5	Should not exist
	4	Should exist
6	5	Should exist
	4	Should not exist

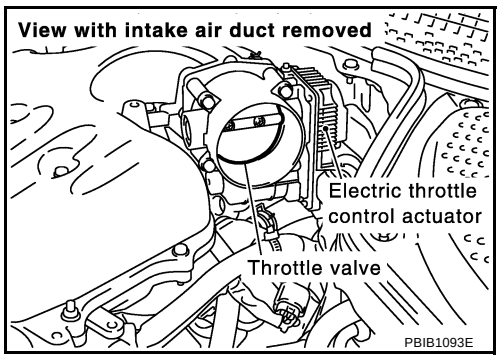
5. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 11.
NG >> Repair or replace.

11. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

1. Remove the intake air duct.
2. Check if foreign matter is caught between the throttle valve and the housing.



OK or NG

OK >> GO TO 12.
NG >> Remove the foreign matter and clean the electric throttle control actuator inside.

12. CHECK THROTTLE CONTROL MOTOR

Refer to EC-404, "Component Inspection" .

OK or NG

OK >> GO TO 13.
NG >> GO TO 14.

13. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> GO TO 14.
NG >> Repair or replace harness or connectors.

14. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace the electric throttle control actuator.
2. Perform EC-42, "Throttle Valve Closed Position Learning" .
3. Perform EC-43, "Idle Air Volume Learning" .

>> **INSPECTION END**

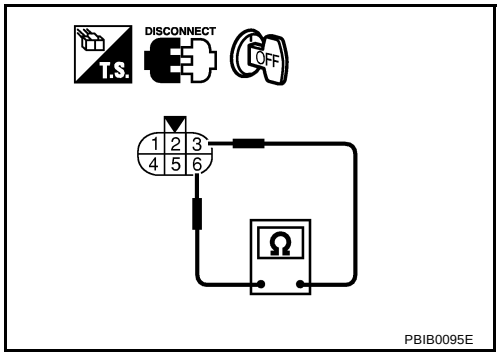
Component Inspection

ABS009JV

THROTTLE CONTROL MOTOR

1. Disconnect electric throttle control actuator harness connector.
2. Check resistance between terminals 3 and 6.

Resistance: Approximately 1 - 15 Ω [at 25 °C (77°F)]



3. If NG, replace electric throttle control actuator and go to next step.
4. Perform EC-42, "Throttle Valve Closed Position Learning" .
5. Perform EC-43, "Idle Air Volume Learning" .

Remove and Installation

ABS009JW

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .

DTC P1124, P1126 THROTTLE CONTROL MOTOR RELAY

PFP:16119

Component Description

ABS009JX

Power supply for the throttle control motor is provided to the ECM via throttle control motor relay. The throttle control motor relay is ON/OFF controlled by the ECM. When the ignition switch is turned ON, the ECM sends an ON signal to throttle control motor relay and battery voltage is provided to the ECM. When the ignition switch is turned OFF, the ECM sends an OFF signal to throttle control motor relay and battery voltage is not provided to the ECM.

CONSULT-II Reference Value in Data Monitor Mode

ABS009JY

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
THRTL RELAY	● Ignition switch: ON	ON

On Board Diagnosis Logic

ABS009JZ

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1124 1124	Throttle control motor relay circuit short	ECM detect the throttle control motor relay is stuck ON.	● Harness or connectors (Throttle control motor relay circuit is shorted) ● Throttle control motor relay
P1126 1126	Throttle control motor relay circuit open	ECM detects a voltage of power source for throttle control motor is excessively low.	● Harness or connectors (Throttle control motor relay circuit is open) ● Throttle control motor relay

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode
ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

DTC Confirmation Procedure

ABS009K0

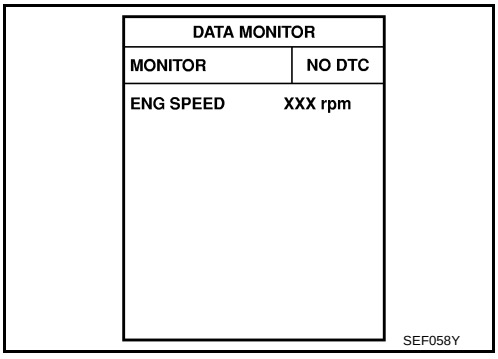
NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

PROCEDURE FOR DTC P1124

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 8V.

With CONSULT-II

1. Turn ignition switch ON and wait at least 1 second.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. If DTC is detected, go to EC-408, "Diagnostic Procedure" .



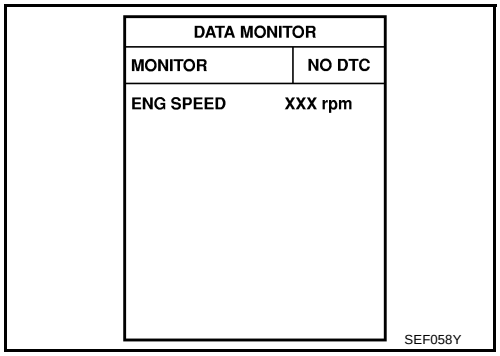
With GST

Follow the procedure “With CONSULT-II” above.

PROCEDURE FOR DTC P1126

With CONSULT-II

1. Turn ignition switch ON and wait at least 2 seconds.
2. Select “DATA MONITOR””mode with CONSULT-II.
3. Start engine and let it idle for 5 seconds.
4. If DTC is detected, go to EC-408, "Diagnostic Procedure" .

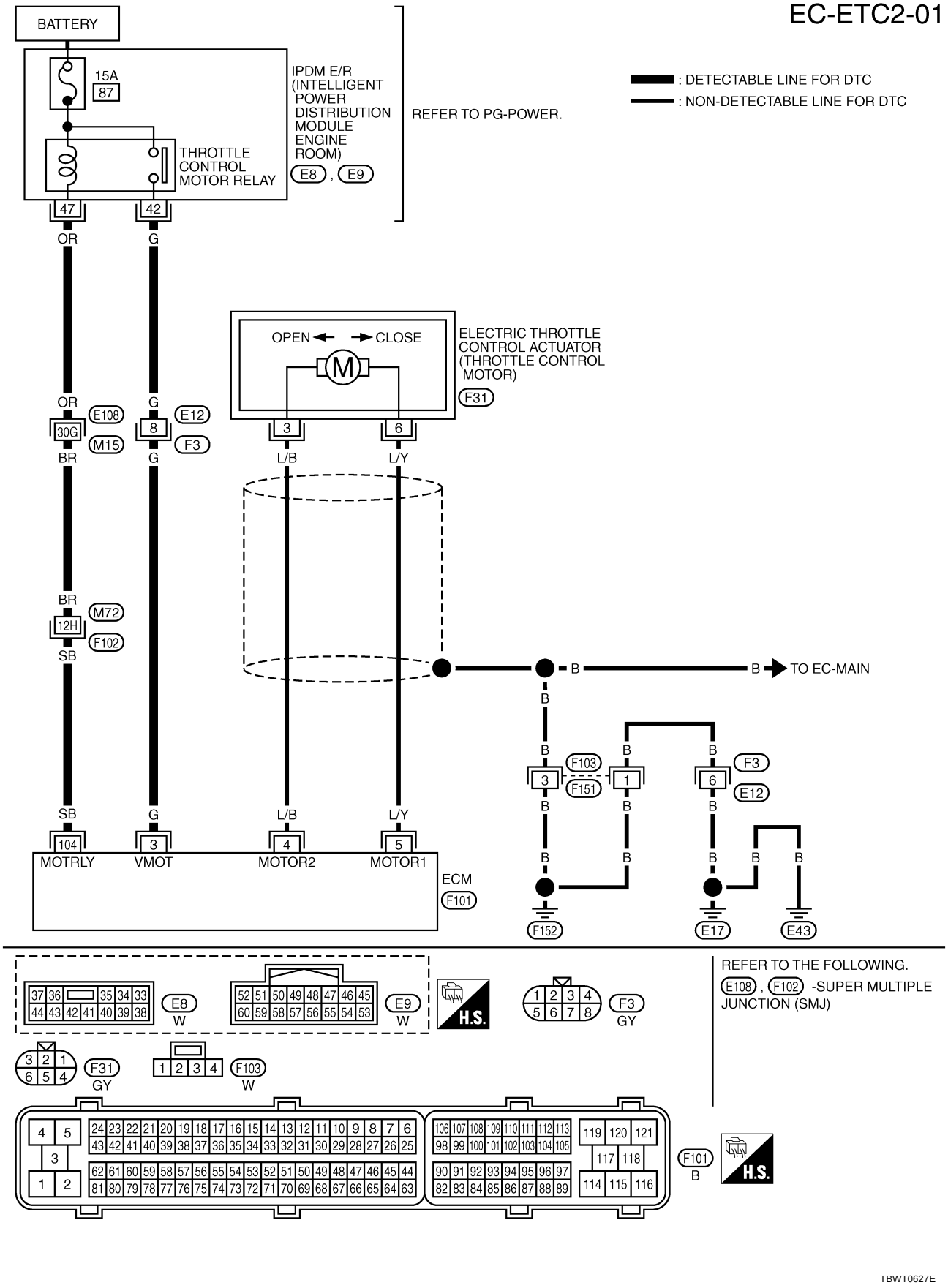


With GST

Follow the procedure “With CONSULT-II” above.

Wiring Diagram

ABS009K1



TBWT0627E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
3	G	Throttle control motor relay power supply	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
104	SB	Throttle control motor relay	**[Ignition switch: OFF]**	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON]	0 - 1.0V

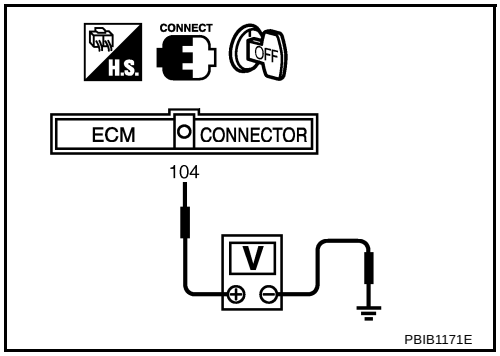
Diagnostic Procedure

ABS009K2

1. CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT-I

1. Turn ignition switch OFF.
2. Check voltage between ECM terminal 104 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT-II

1. Disconnect ECM harness connector.
2. Disconnect IPDM E/R harness connector E9.
3. Check continuity between ECM terminal 104 and IPDM E/R terminal 47. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK FUSE

1. Disconnect 15A fuse.
2. Check 15A fuse for blown.

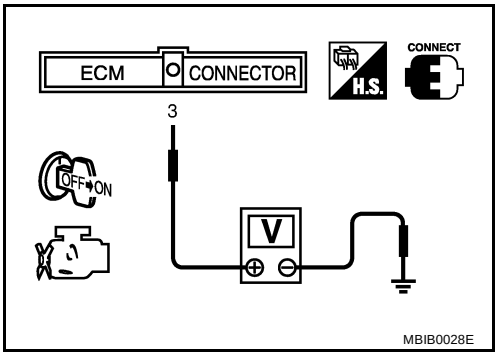
OK or NG

OK >> GO TO 8.
NG >> Replace 15A fuse.

5. CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT-I

1. Check voltage between ECM terminal 3 and ground under the following conditions with CONSULT-II or tester.

Ignition switch	Voltage
OFF	Approximately 0V
ON	Battery voltage (11 - 14V)



OK or NG

OK >> GO TO 8.
NG >> GO TO 6.

6. CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Disconnect IPDM E/R harness connector E8.
4. Check continuity between ECM terminal 3 and IPDM E/R terminal 42. Refer to Wiring Diagram.

Continuity should exist.

5. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace IPDM E/R. Refer to PG-17, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)" .
NG >> Repair or replace harness or connectors.

DTC P1128 THROTTLE CONTROL MOTOR

PFP:16119

Component Description

ABS009K3

The throttle control motor is operated by the ECM and it opens and closes the throttle valve.
The current opening angle of the throttle valve is detected by the throttle position sensor and it provides feedback to the ECM to control the throttle control motor to make the throttle valve opening angle properly in response to driving condition.

On Board Diagnosis Logic

ABS009K4

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1128 1128	Throttle control motor circuit short	ECM detects short in both circuits between ECM and throttle control motor.	● Harness or connectors (Throttle control motor circuit is shorted.) ● Electric throttle control actuator (Throttle control motor)

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode
ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

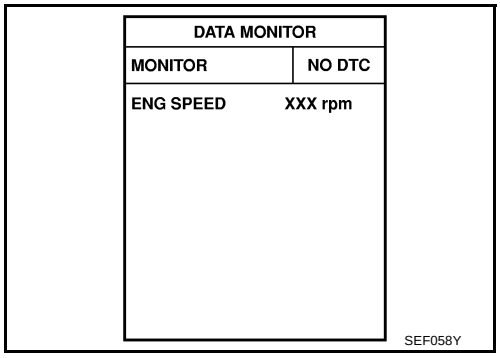
DTC Confirmation Procedure

ABS009K5

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-II

1. Turn ignition switch ON and wait at least 2 seconds.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Start engine and let it idle for 5 seconds.
4. If DTC is detected, go to EC-413, "Diagnostic Procedure" .

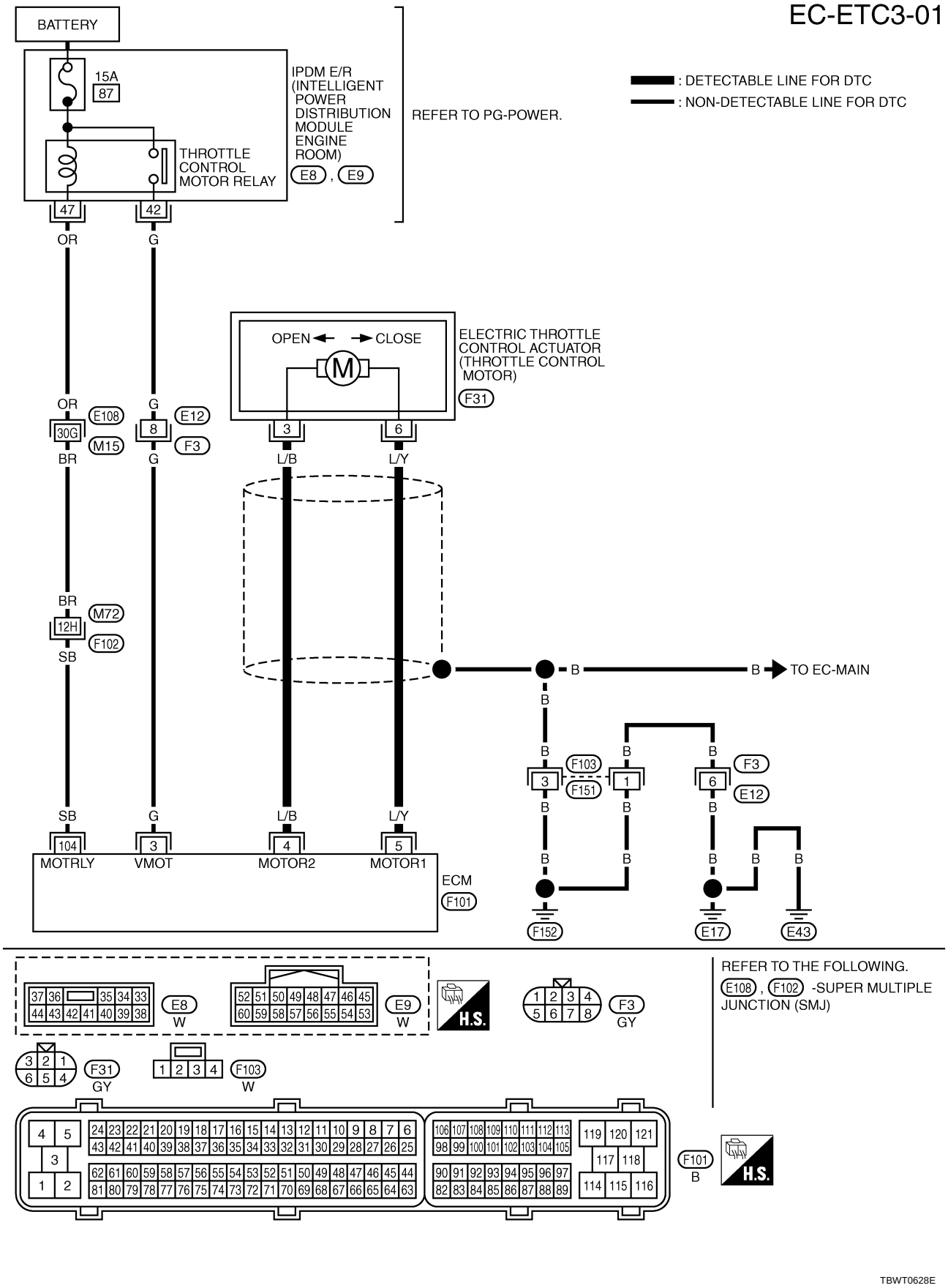


WITH GST

Follow the procedure “WITH CONSULT-II” above.

Wiring Diagram

ABS009K6

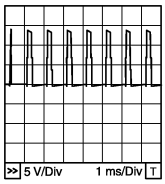
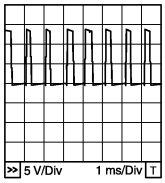


TBWT0628E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-II.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
4	L/B	Throttle control motor (Close)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal is fully released	0 - 14V★  PBIB1104E
5	L/Y	Throttle control motor (Open)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal is fully depressed	0 - 14V★  PBIB1105E

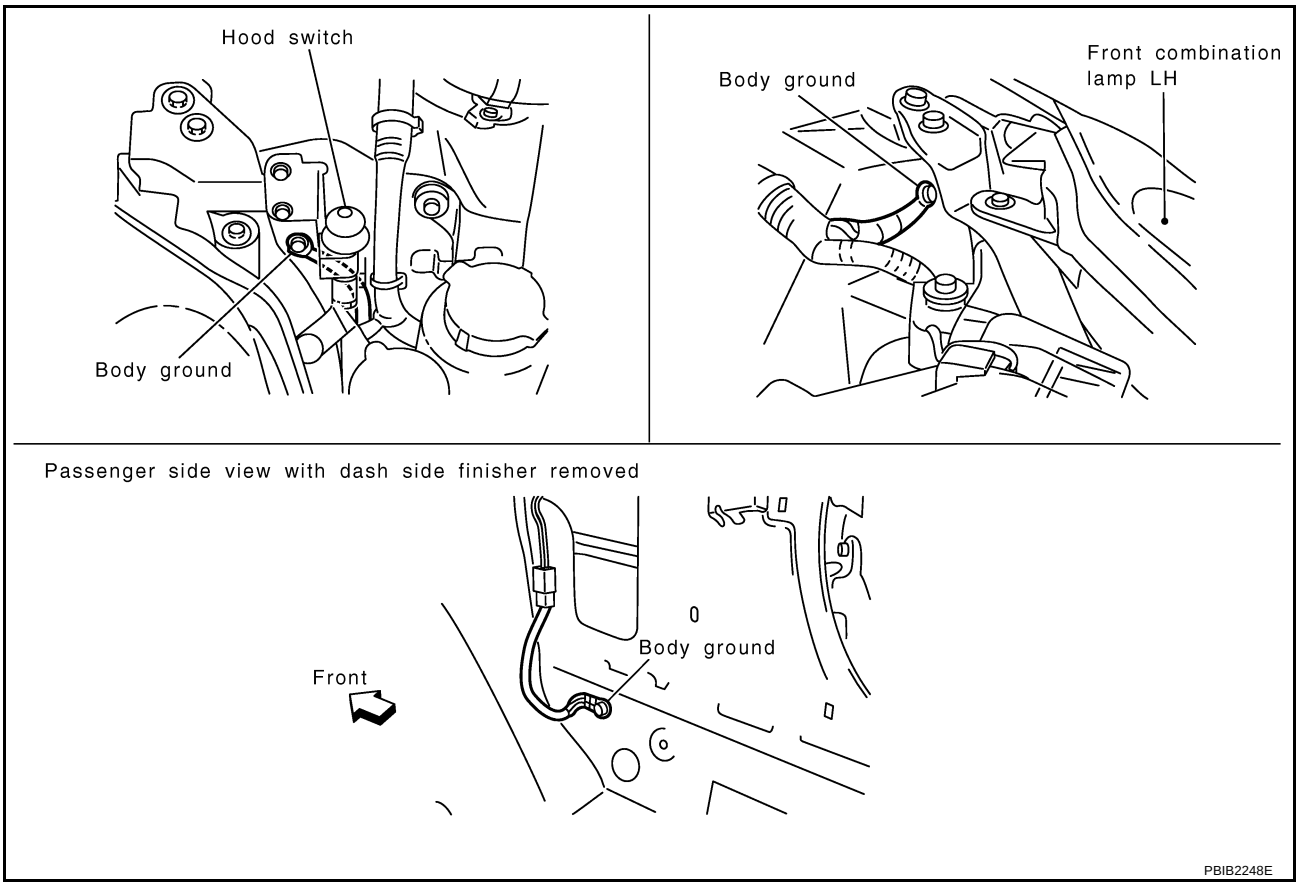
★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

ABS009K7

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

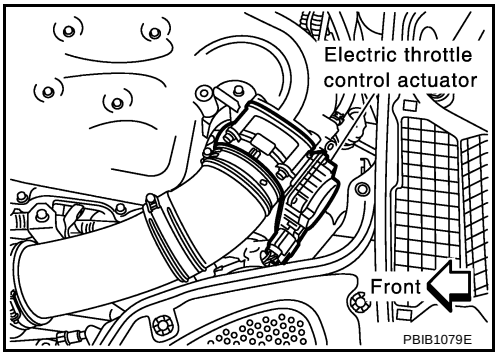


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK THROTTLE CONTROL MOTOR OUTPUT SIGNAL CIRCUIT FOR OPEN OR SHORT

1. Turn ignition switch OFF.
2. Disconnect electric throttle control actuator harness connector.
3. Disconnect ECM harness connector.
4. Check harness continuity between the following terminals. Refer to Wiring Diagram.



Electric throttle control actuator terminal	ECM terminal	Continuity
3	5	Should not exist
	4	Should exist
6	5	Should exist
	4	Should not exist

5. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 3.
NG >> Repair or replace.

3. CHECK THROTTLE CONTROL MOTOR

Refer to EC-414, "Component Inspection" .

OK or NG

OK >> GO TO 4.
NG >> GO TO 5.

4. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> GO TO 5.
NG >> Repair or replace harness or connectors.

5. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace the electric throttle control actuator.
2. Perform EC-42, "Throttle Valve Closed Position Learning" .
3. Perform EC-43, "Idle Air Volume Learning" .

>> **INSPECTION END**

Component Inspection

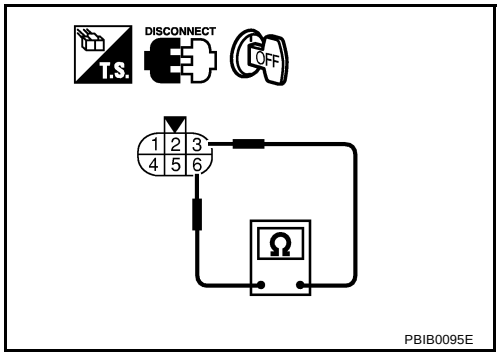
ABS009K8

THROTTLE CONTROL MOTOR

1. Disconnect electric throttle control actuator harness connector.
2. Check resistance between terminals 3 and 6.

Resistance: Approximately 1 - 15 Ω [at 25 °C (77°F)]

3. If NG, replace electric throttle control actuator and go to next step.
4. Perform EC-42, "Throttle Valve Closed Position Learning" .
5. Perform EC-43, "Idle Air Volume Learning" .



Removal and Installation

ABS009K9

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .

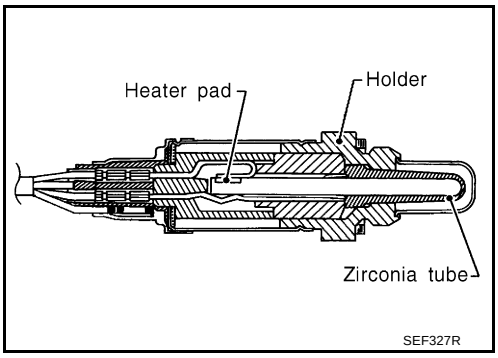
DTC P1146, P1166 HO2S2

PFP:226A0

Component Description

ABS009KQ

The heated oxygen sensor 2, after three way catalyst 1, monitors the oxygen level in the exhaust gas on each bank.
Even if switching characteristics of the air fuel ratio (A/F) sensor 1 are shifted, the air-fuel ratio is controlled to stoichiometric, by the signal from the heated oxygen sensor 2.
This sensor is made of ceramic zirconia. The zirconia generates voltage from approximately 1V in richer conditions to 0V in leaner conditions.
Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



CONSULT-II Reference Value in Data Monitor Mode

ABS009KR

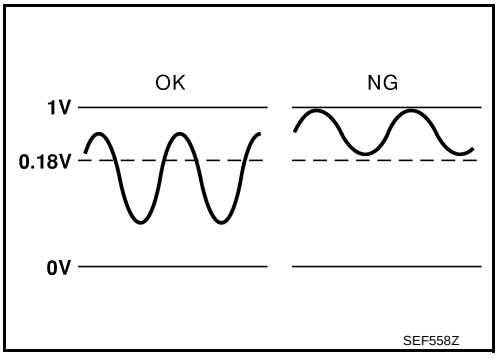
Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
HO2S2 (B1) HO2S2 (B2)	● Warm-up condition ● After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	Revving engine from idle to 3,000 rpm quickly.	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S2 MNTR (B1) HO2S2 MNTR (B2)			LEAN ←→ RICH

On Board Diagnosis Logic

ABS009KS

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the air fuel ratio (A/F) sensor 1. The oxygen storage capacity of the three way catalyst causes the longer switching time. To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the minimum voltage of sensor is sufficiently low during the various driving condition such as fuel-cut.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1146 1146 (Bank 1)	Heated oxygen sensor 2 minimum voltage monitoring	The minimum voltage from the sensor is not reached to the specified voltage.	● Harness or connectors (The sensor circuit is open or shorted) ● Heated oxygen sensor 2 ● Fuel pressure ● Fuel injector
P1166 1166 (Bank 2)			

DTC Confirmation Procedure

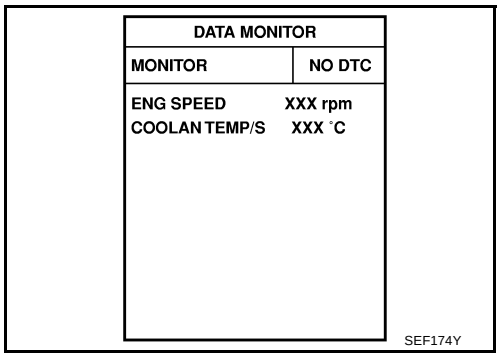
ABS009KT

NOTE:
If DTC confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

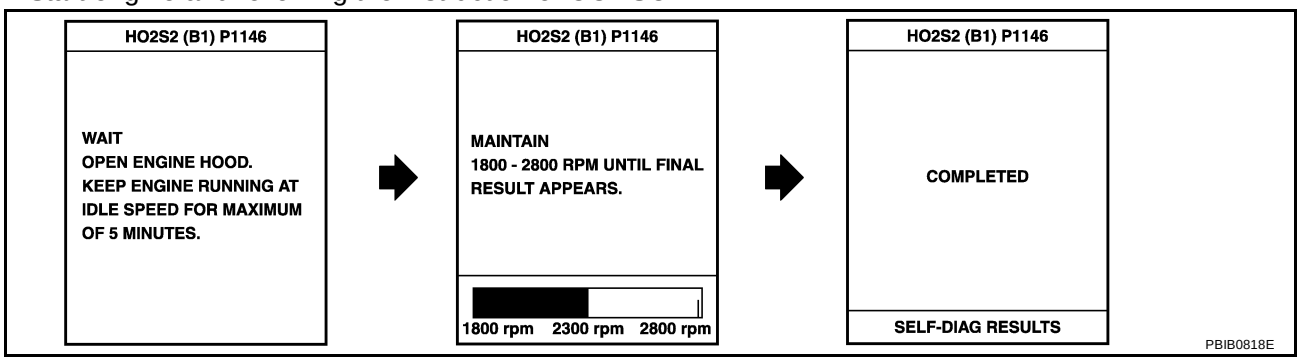
WITH CONSULT-II

TESTING CONDITION:
For better results, perform "DTC WORK SUPPORT" at a temperature of 0 to 30 °C (32 to 86 °F).

1. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-II.
2. Start engine and warm it up to the normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 1 minute.
6. Make sure that "COOLAN TEMP/S" indicates more than 70°C (158°F).
   If not, warm up engine and go to next step when "COOLAN TEMP/S" indication reaches to 70°C (158°F).



7. Open engine hood.
8. Select "HO2S2 (B1) P1146" or "HO2S2 (B2) P1166" of "HO2S2" in "DTC WORK SUPPORT" mode with CONSULT-II.
9. Start engine and following the instruction of CONSULT-II.



10. Make sure that "OK" is displayed after touching "SELF-DIAG RESULTS".
    If "NG" is displayed, refer to EC-421, "Diagnostic Procedure" .
    If "CAN NOT BE DIAGNOSED" is displayed, perform the following.

a. Turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle).
b. Return to step 1.

Overall Function Check

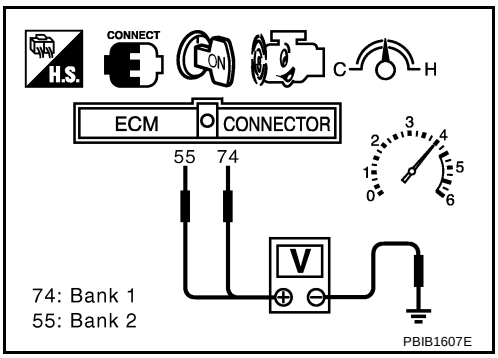
ABS009KU

Use this procedure to check the overall function of the heated oxygen sensor 2 circuit. During this check, a 1st trip DTC might not be confirmed.

WITH GST

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Set voltmeter probes between ECM terminal 74 [HO2S2 (B1) signal] or 55 [HO2S2 (B2) signal] and ground.

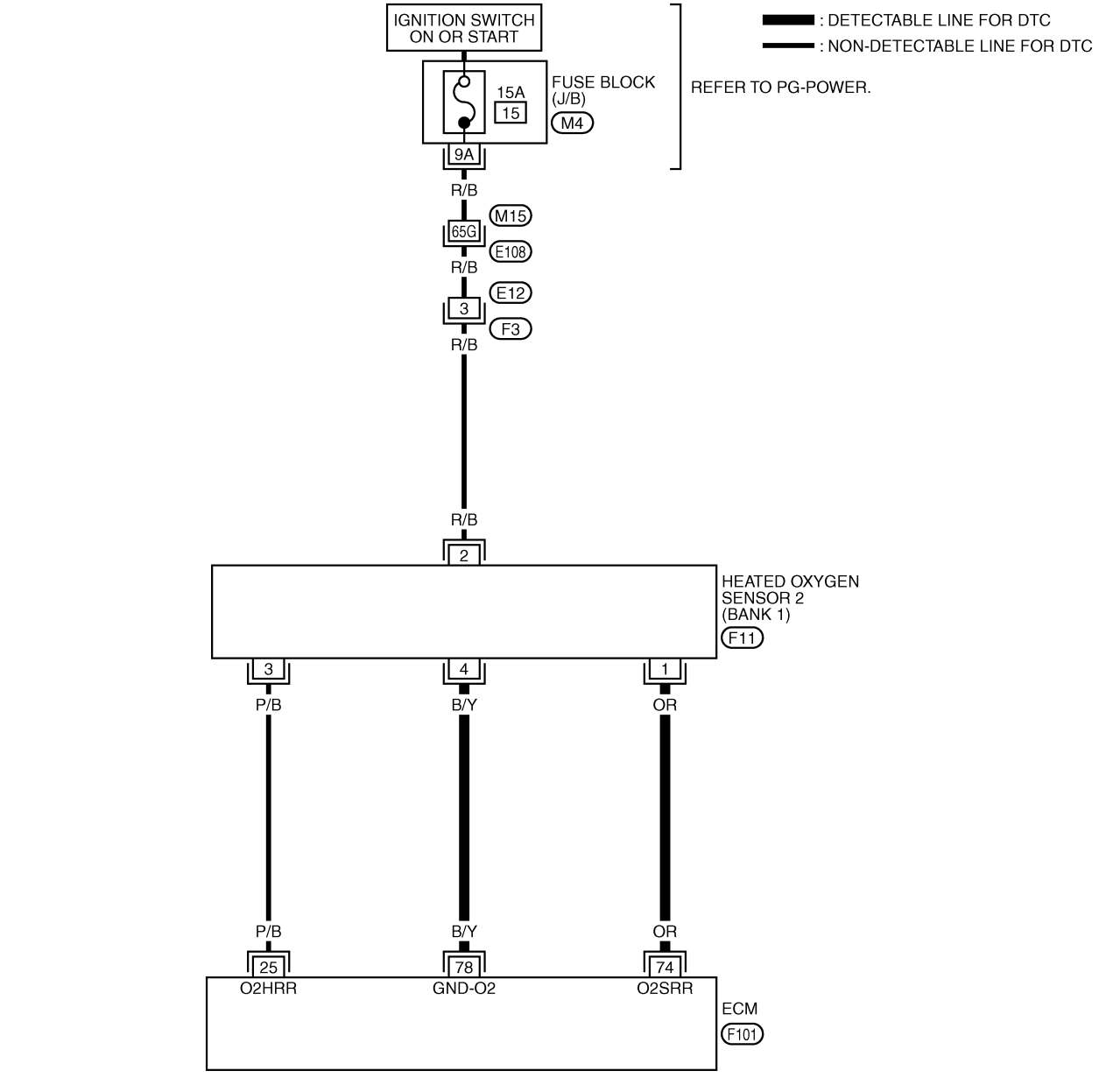
6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
(Depress and release accelerator pedal as soon as possible.)
The voltage should be below 0.18V at least once during this procedure.
If the voltage can be confirmed in step 6, step 7 is not necessary.
7. Keep vehicle at idling for 10 minutes, then check the voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D position (A/T), 4th gear (M/T).
The voltage should be below 0.18V at least once during this procedure.
8. If NG, go to EC-421, "Diagnostic Procedure" .

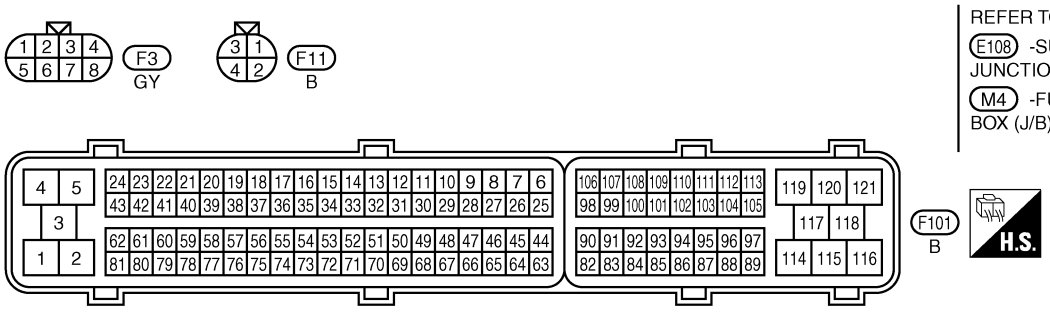


Wiring Diagram
BANK 1

ABS009KV

EC-O2S2B1-01





TBWT0482E

Specification data are reference values and are measured between each terminal and ground.

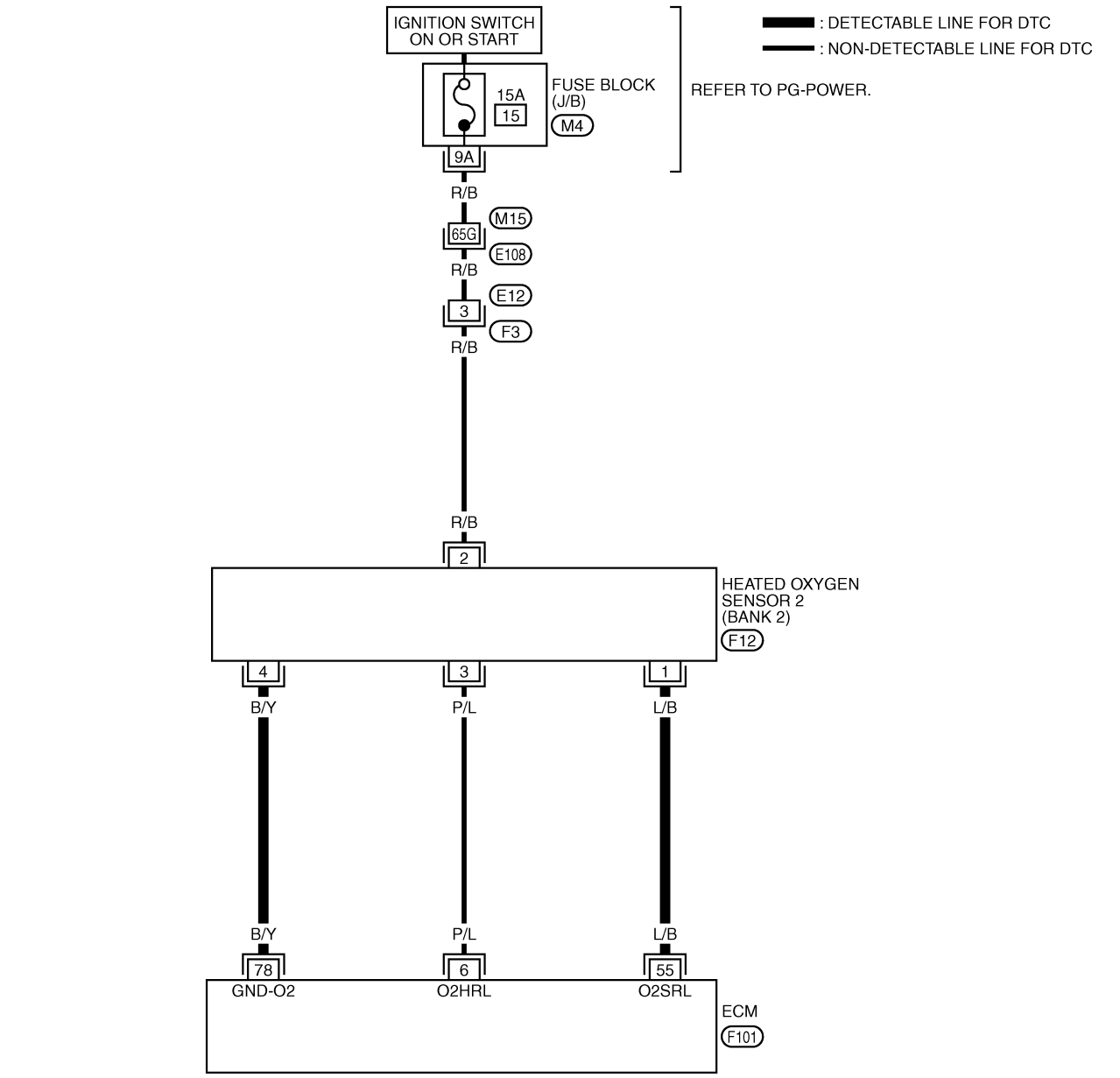
CAUTION:

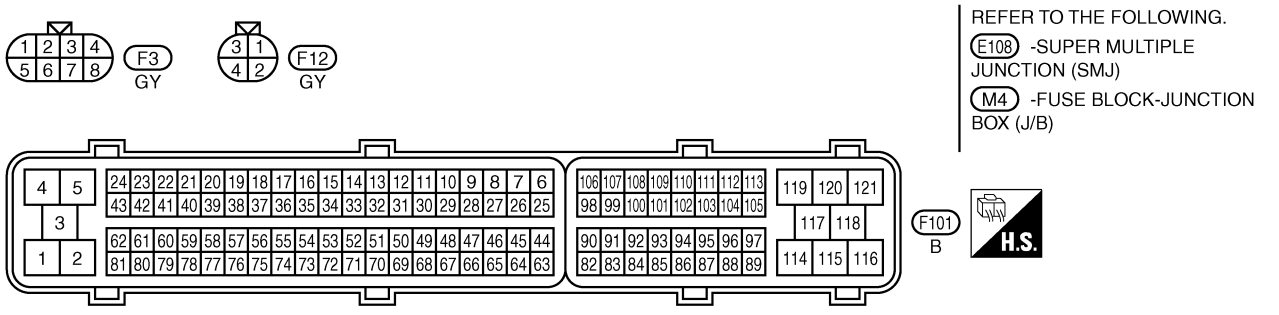
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
74	OR	Heated oxygen sensor 2 (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - Approximately 1.0V
78	B/Y	Sensor ground (Heated oxygen sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V

BANK 2

EC-O2S2B2-01





TBWT0483E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

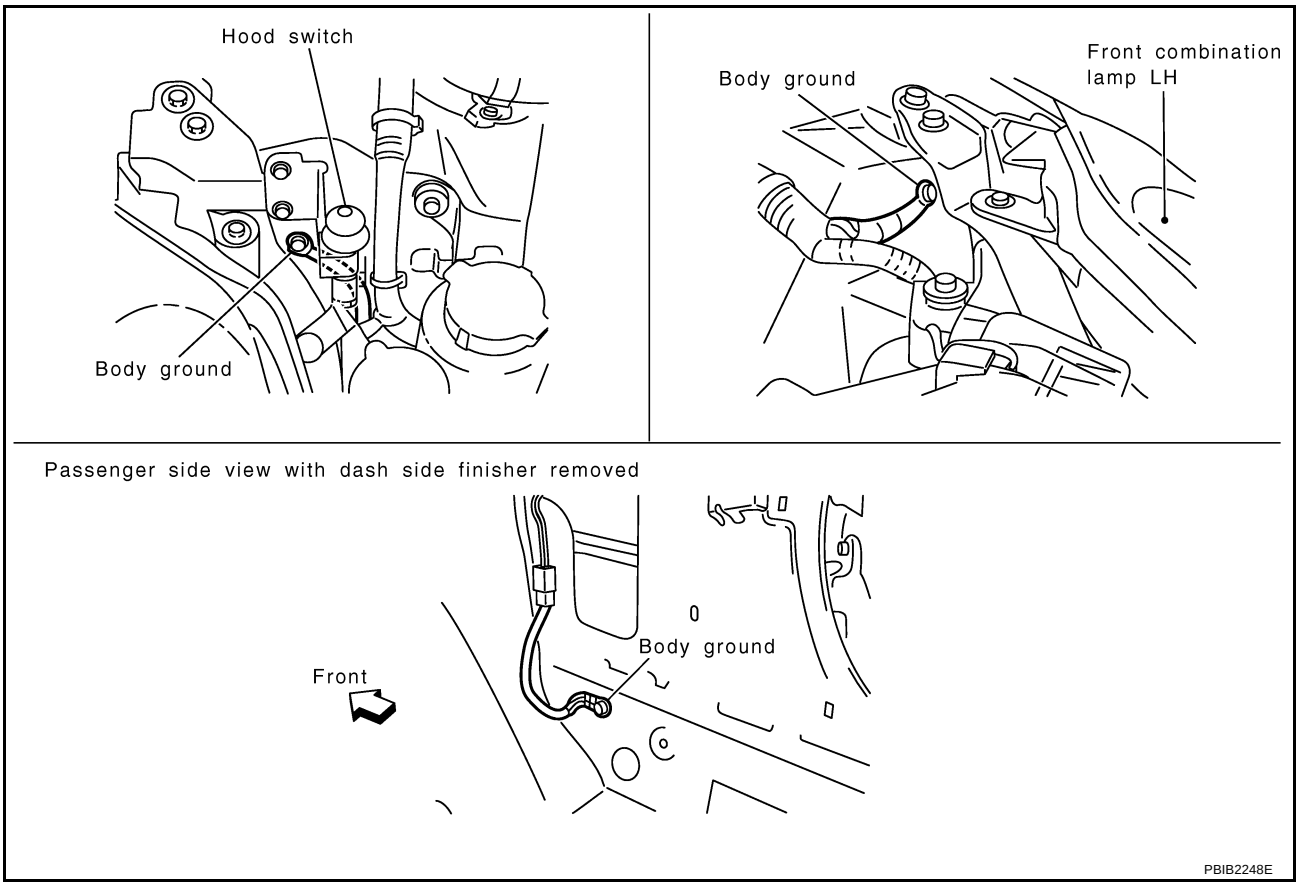
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
55	L/B	Heated oxygen sensor 2 (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - Approximately 1.0V
78	B/Y	Sensor ground (Heated oxygen sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V

Diagnostic Procedure

ABS009KW

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .



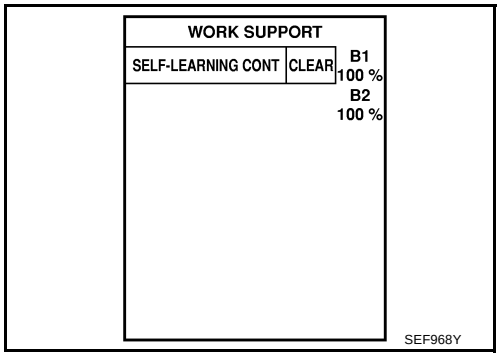
OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CLEAR THE SELF-LEARNING DATA

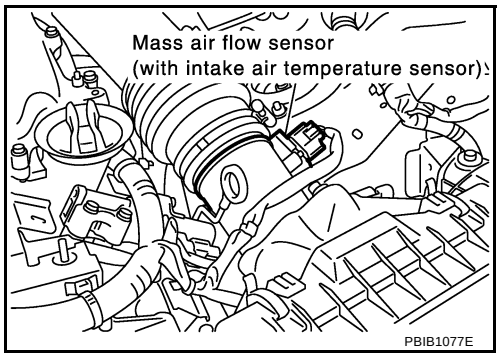
With CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-II.
3. Clear the self-learning control coefficient by touching “CLEAR”.
4. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0172 or P0175 detected?
   Is it difficult to start engine?



Without CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF.
3. Disconnect mass air flow sensor harness connector, and restart and run engine for at least 5 seconds at idle speed.
4. Stop engine and reconnect mass air flow sensor harness connector.
5. Make sure DTC P0102 is displayed.
6. Erase the DTC memory. Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .
7. Make sure DTC P0000 is displayed.
8. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0172 or P0175 detected?
   Is it difficult to start engine?

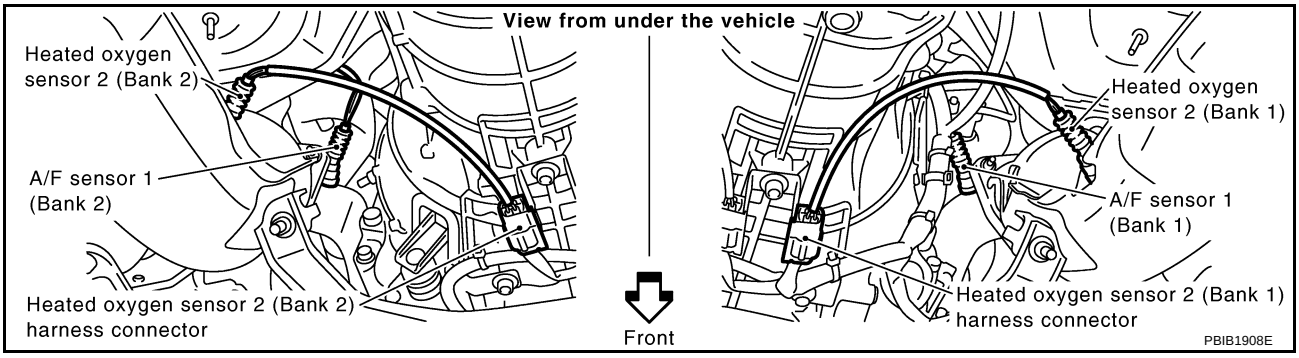


Yes or No

Yes >> Perform trouble diagnosis for DTC P0172, P0175. Refer to EC-228 .
No >> GO TO 3.

3. CHECK HO2S2 GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Disconnect heated oxygen sensor 2 harness connector.



4. Check harness continuity between HO2S2 terminal 4 and ECM terminal 78. Refer to Wiring Diagram.

Continuity should exist.

5. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal and HO2S2 terminal as follows. Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P1146	74	1	1
P1166	55	1	2

Continuity should exist.

2. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P1146	74	1	1
P1166	55	1	2

Continuity should not exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK HEATED OXYGEN SENSOR 2

Refer to EC-424, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace malfunctioning heated oxygen sensor 2.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

ABS009KX

HEATED OXYGEN SENSOR 2

With CONSULT-II

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-II.
2. Start engine and warm it up to the normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 1 minute.

DATA MONITOR	
MONITOR	NO DTC
ENG SPEED	XXX rpm
COOLAN TEMP/S	XXX °C

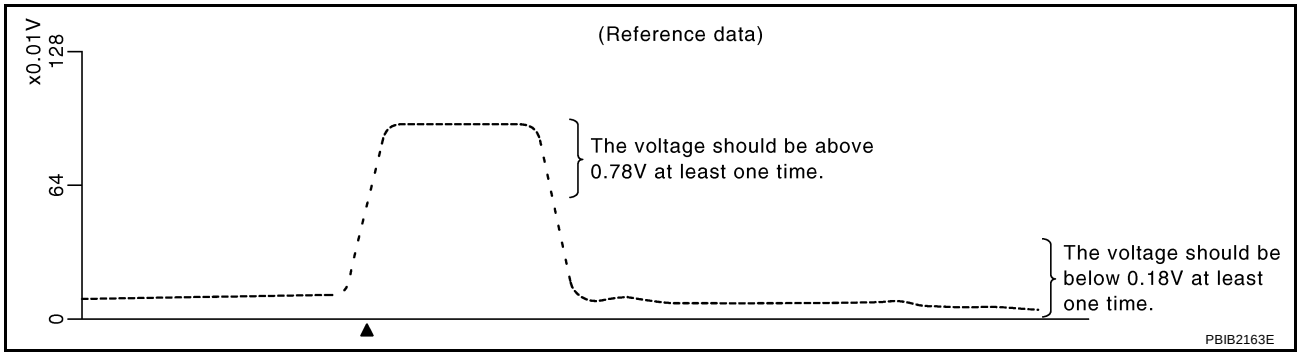
SEF174Y

6. Select “FUEL INJECTION” in “ACTIVE TEST” mode, and select “HO2S2 (B1)/(B2)” as the monitor item with CONSULT-II.

ACTIVE TEST	
FUEL INJECTION	25 %
MONITOR	
ENG SPEED	XXX rpm
HO2S2 (B1)	XXX V
HO2S2 (B2)	XXX V

PBIB1672E

7. Check “HO2S2 (B1)/(B2)” at idle speed when adjusting “FUEL INJECTION” to ±25%.



“HO2S2 (B1)/(B2)” should be above 0.78V at least once when the “FUEL INJECTION” is +25%.
“HO2S2 (B1)/(B2)” should be below 0.18V at least once when the “FUEL INJECTION” is −25%.

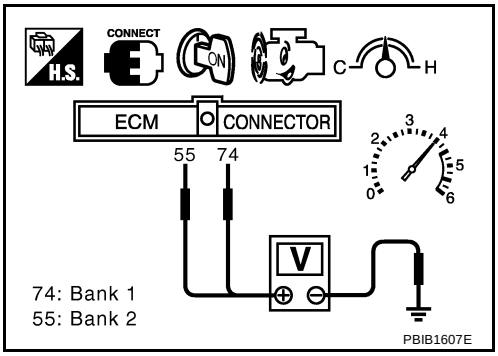
CAUTION:

- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**

- **Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

Without CONSULT-II

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Set voltmeter probes between ECM terminal 74 [HO2S2 (B1) signal] or 55 [HO2S2 (B2) signal] and ground.
6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
   (Depress and release accelerator pedal as soon as possible.)
   The voltage should be above 0.78V at least once during this procedure.
   If the voltage is above 0.78V at step 6, step 7 is not necessary.
7. Keep vehicle at idling for 10 minutes, then check voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D position (A/T), 4th gear position (M/T).
   The voltage should be below 0.18V at least once during this procedure.
8. If NG, replace heated oxygen sensor 2.



CAUTION:

- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

Removal and Installation

ABS009KY

HEATED OXYGEN SENSOR 2

Refer to EM-23, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

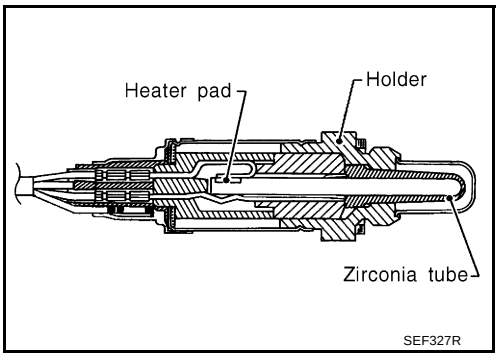
DTC P1147, P1167 HO2S2

PFP:226A0

Component Description

ABS009KZ

The heated oxygen sensor 2, after three way catalyst 1, monitors the oxygen level in the exhaust gas on each bank.
Even if switching characteristics of the air fuel ratio (A/F) sensor 1 are shifted, the air-fuel ratio is controlled to stoichiometric, by the signal from the heated oxygen sensor 2.
This sensor is made of ceramic zirconia. The zirconia generates voltage from approximately 1V in richer conditions to 0V in leaner conditions.
Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



CONSULT-II Reference Value in Data Monitor Mode

ABS009L0

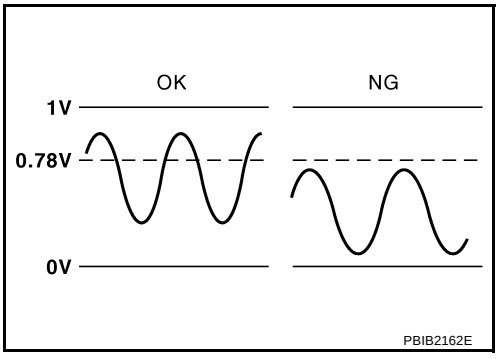
Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
HO2S2 (B1) HO2S2 (B2)	● Warm-up condition ● After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	Revving engine from idle to 3,000 rpm quickly.	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S2 MNTR (B1) HO2S2 MNTR (B2)			LEAN ←→ RICH

On Board Diagnosis Logic

ABS009L1

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the air fuel ratio (A/F) sensor 1. The oxygen storage capacity before the three way catalyst causes the longer switching time. To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the maximum voltage of the sensor is sufficiently high during the various driving condition such as fuel-cut.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1147 1147 (Bank 1)	Heated oxygen sensor 2 maximum voltage monitoring	The maximum voltage from the sensor is not reached to the specified voltage.	● Harness or connectors (The sensor circuit is open or shorted) ● Heated oxygen sensor 2 ● Fuel pressure ● Fuel injector ● Intake air leaks
P1167 1167 (Bank 2)			

DTC Confirmation Procedure

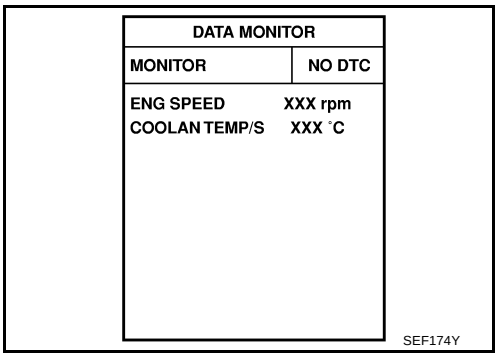
ABS009L2

NOTE:
If DTC confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

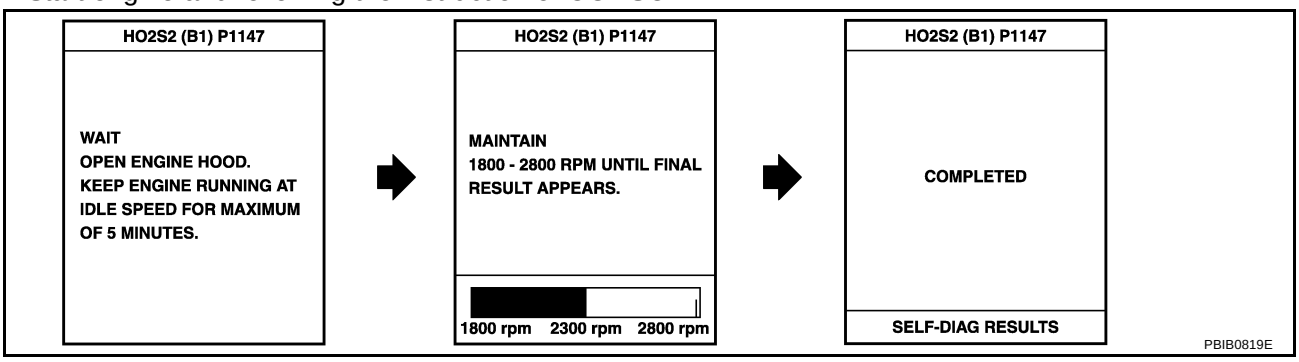
WITH CONSULT-II

TESTING CONDITION:
For better results, perform "DTC WORK SUPPORT" at a temperature of 0 to 30 °C (32 to 86 °F).

1. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-II.
2. Start engine and warm it up to the normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 1 minute.
6. Make sure that "COOLAN TEMP/S" indicates more than 70°C (158°F).
   If not, warm up engine and go to next step when "COOLAN TEMP/S" indication reaches to 70°C (158°F).



7. Open engine hood.
8. Select "HO2S2 (B1) P1147" or "HO2S2 (B2) P1167" of "HO2S2" in "DTC WORK SUPPORT" mode with CONSULT-II.
9. Start engine and following the instruction of CONSULT-II.



10. Make sure that "OK" is displayed after touching "SELF-DIAG RESULTS".
    If "NG" is displayed, refer to EC-432, "Diagnostic Procedure" .
    If "CAN NOT BE DIAGNOSED" is displayed, perform the following.

a. Turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle).
b. Return to step 1.

Overall Function Check

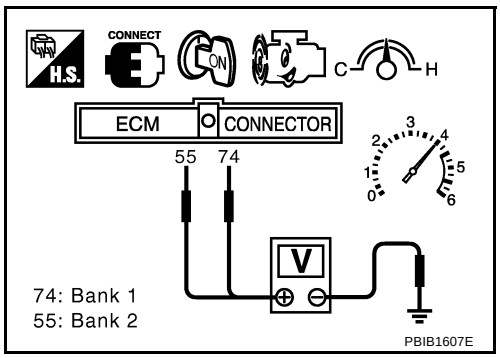
ABS009L3

Use this procedure to check the overall function of the heated oxygen sensor 2 circuit. During this check, a 1st trip DTC might not be confirmed.

WITH GST

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Set voltmeter probes between ECM terminal 74 [HO2S2 (B1) signal] or 55 [HO2S2 (B2) signal] and ground.

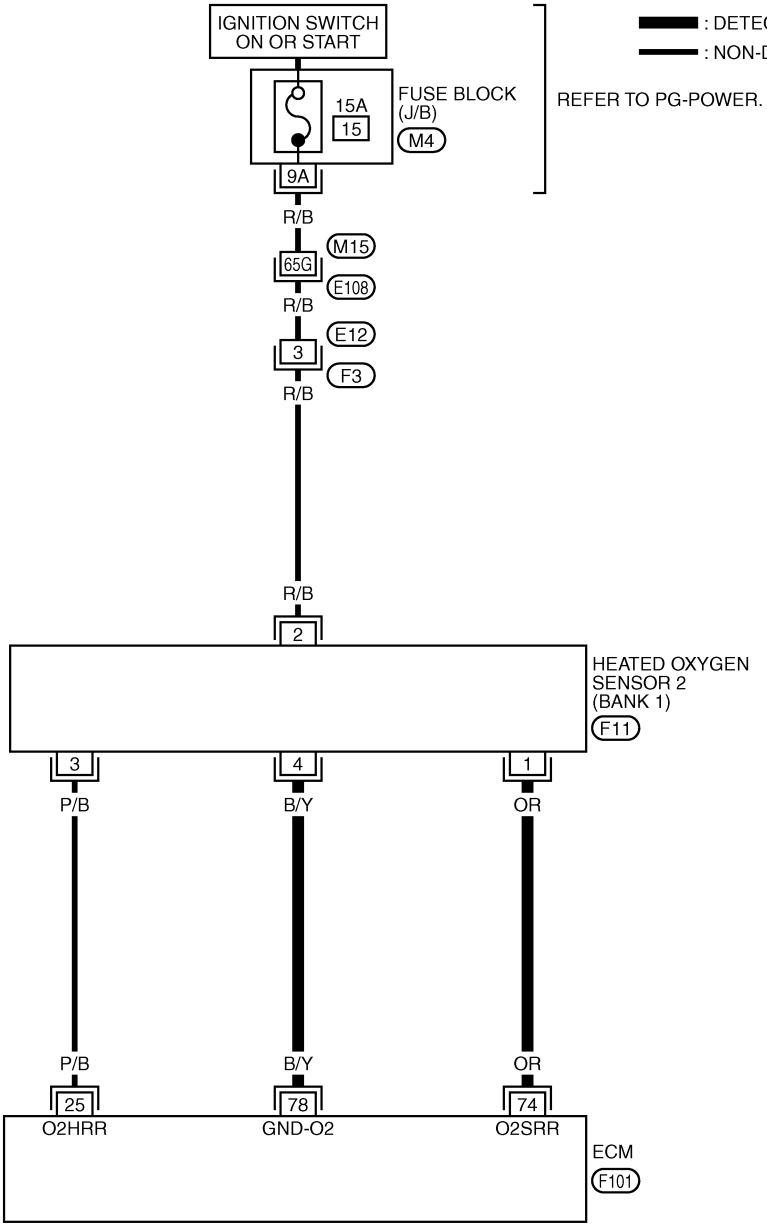
6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
   (Depress and release accelerator pedal as soon as possible.)
   The voltage should be above 0.78V at least once during this procedure.
   If the voltage can be confirmed in step 6, step 7 is not necessary.
7. Keep vehicle at idling for 10 minutes, then check the voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D position (A/T), 4th gear position (M/T).
   The voltage should be above 0.78V at least once during this procedure.
8. If NG, go to EC-432, "Diagnostic Procedure" .



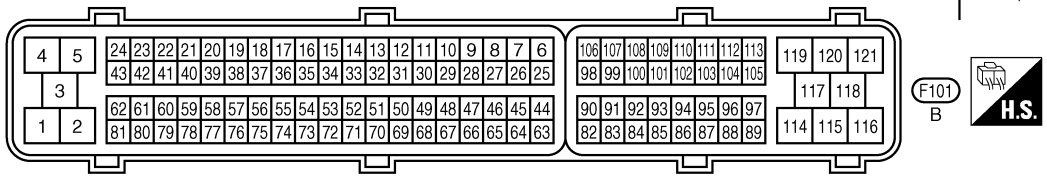
Wiring Diagram
BANK 1

ABS009L4

EC-O2S2B1-01



REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)



TBWT0482E

Specification data are reference values and are measured between each terminal and ground.

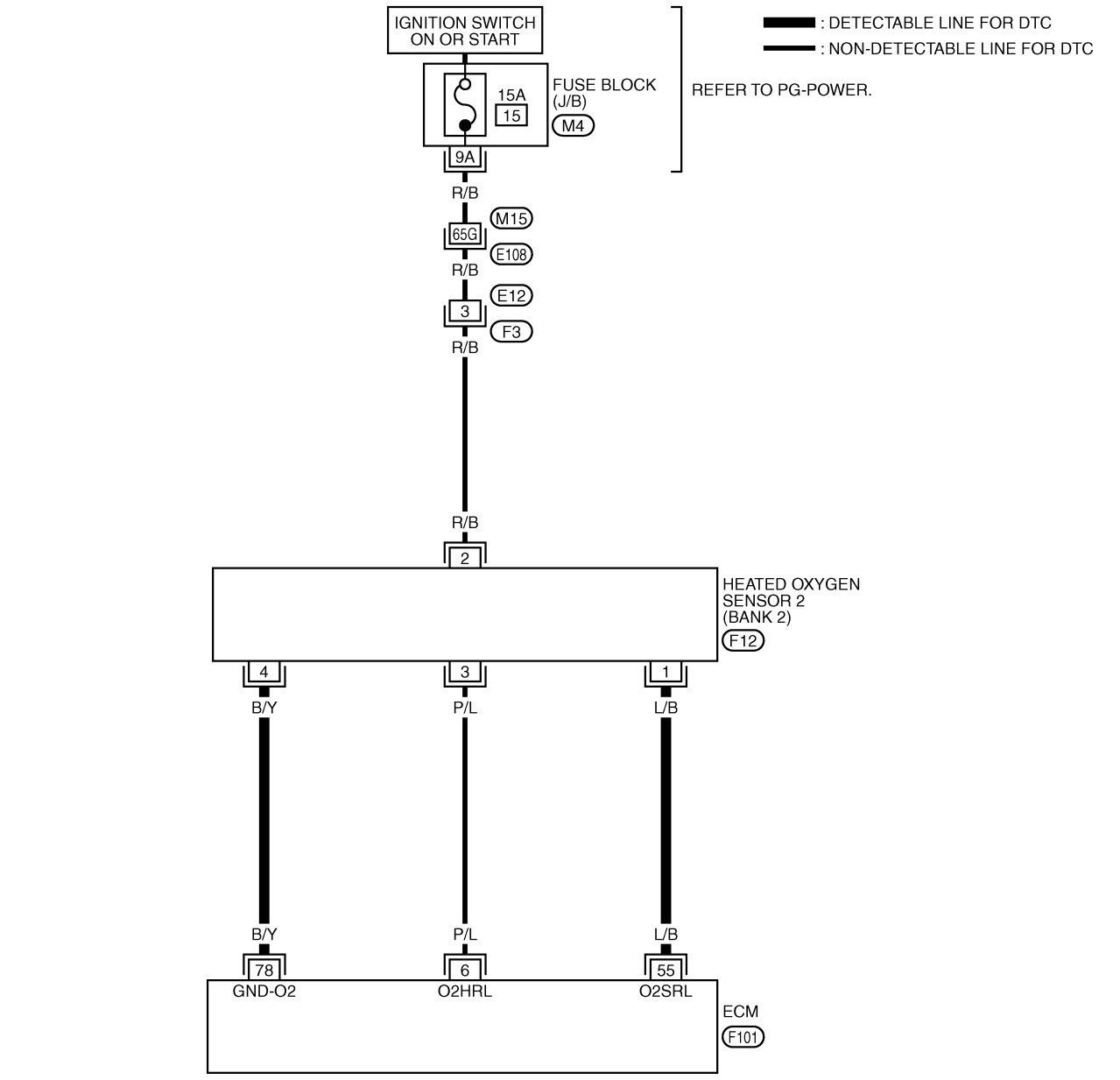
CAUTION:

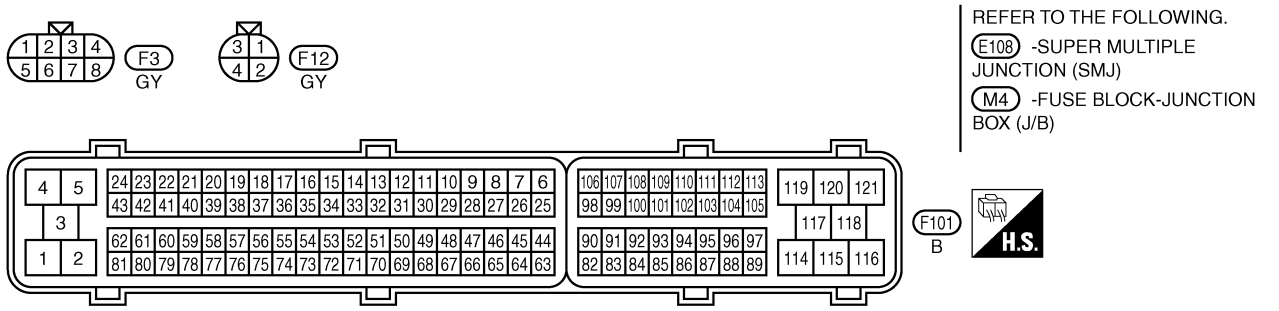
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
74	OR	Heated oxygen sensor 2 (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - Approximately 1.0V
78	B/Y	Sensor ground (Heated oxygen sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V

BANK 2

EC-O2S2B2-01





TBWT0483E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

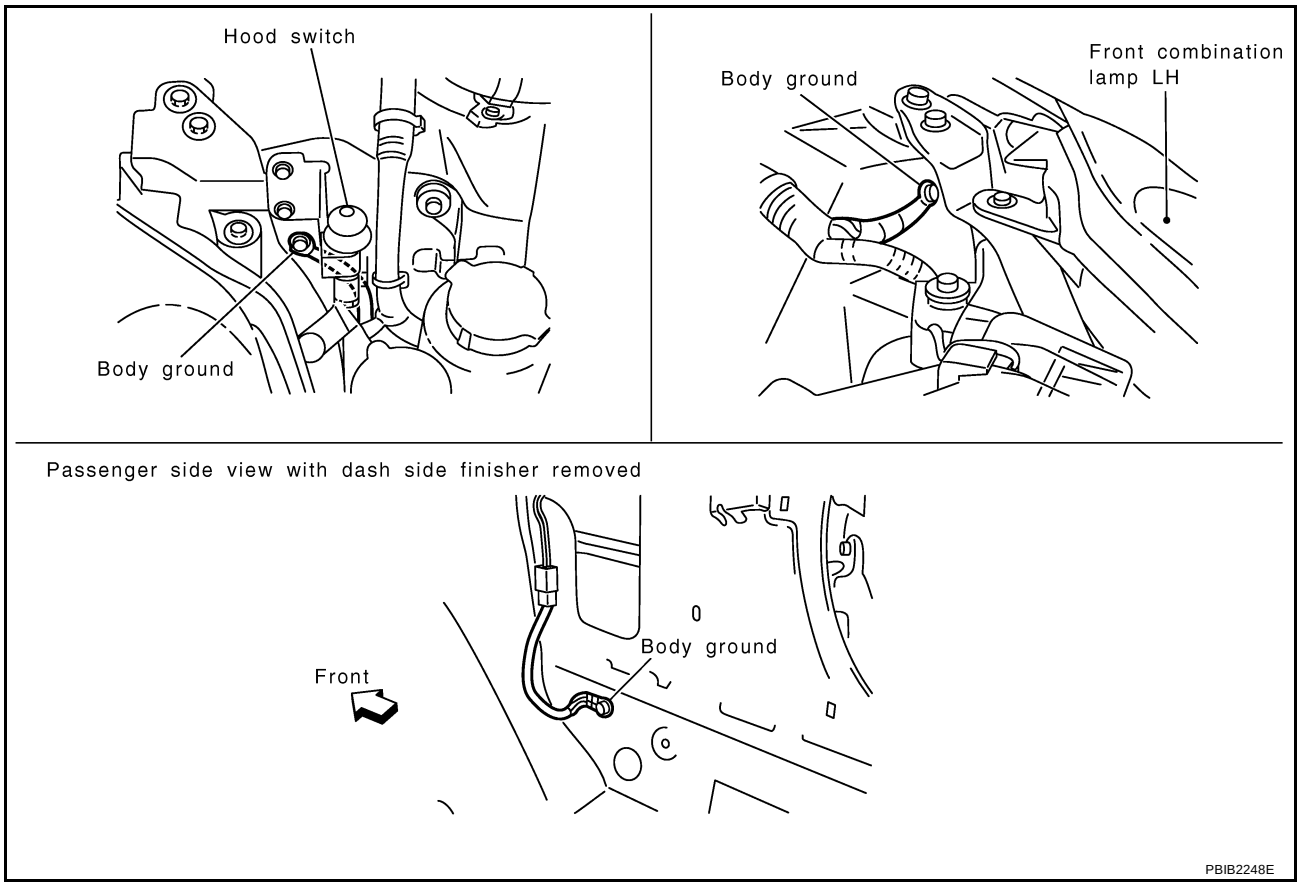
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
55	L/B	Heated oxygen sensor 2 (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – After keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - Approximately 1.0V
78	B/Y	Sensor ground (Heated oxygen sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V

Diagnostic Procedure

ABS009L5

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .



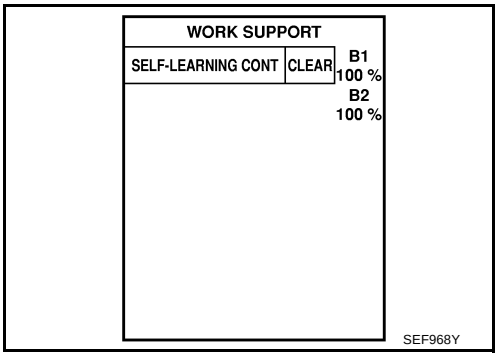
OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CLEAR THE SELF-LEARNING DATA

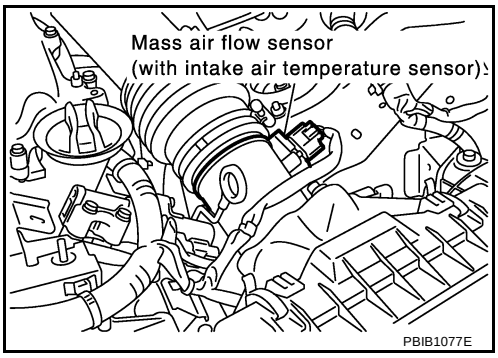
With CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-II.
3. Clear the self-learning control coefficient by touching “CLEAR”.
4. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171 or P0174 detected?
   Is it difficult to start engine?



Without CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF.
3. Disconnect mass air flow sensor harness connector, and restart and run engine for at least 5 seconds at idle speed.
4. Stop engine and reconnect mass air flow sensor harness connector.
5. Make sure DTC P0102 is displayed.
6. Erase the DTC memory. Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .
7. Make sure DTC P0000 is displayed.
8. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171 or P0174 detected?
   Is it difficult to start engine?

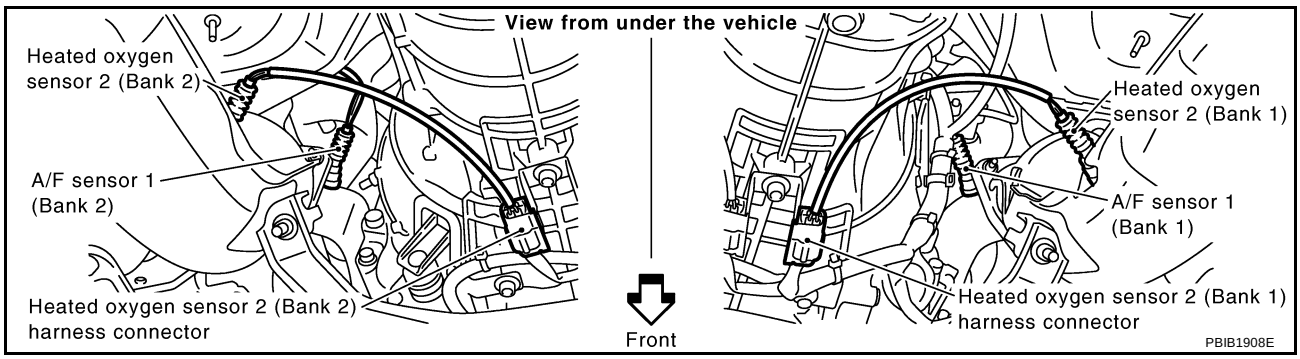


Yes or No

Yes >> Perform trouble diagnosis for DTC P0171or P0174. Refer to EC-219 .
No >> GO TO 3.

3. CHECK HO2S2 GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Disconnect heated oxygen sensor 2 harness connector.



4. Check harness continuity between HO2S2 terminal 4 and ECM terminal 78.
   Refer to Wiring Diagram.

Continuity should exist.

5. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal and HO2S2 terminal as follows.
   Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P1147	74	1	1
P1167	55	1	2

Continuity should exist.

2. Check harness continuity between the following terminals and ground.
   Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P1147	74	1	1
P1167	55	1	2

Continuity should not exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK HEATED OXYGEN SENSOR 2

Refer to EC-435, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace malfunctioning heated oxygen sensor 2.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

ABS009L6

HEATED OXYGEN SENSOR 2

With CONSULT-II

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-II.
2. Start engine and warm it up to the normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 1 minute.

DATA MONITOR	
MONITOR	NO DTC
ENG SPEED	XXX rpm
COOLAN TEMP/S	XXX °C

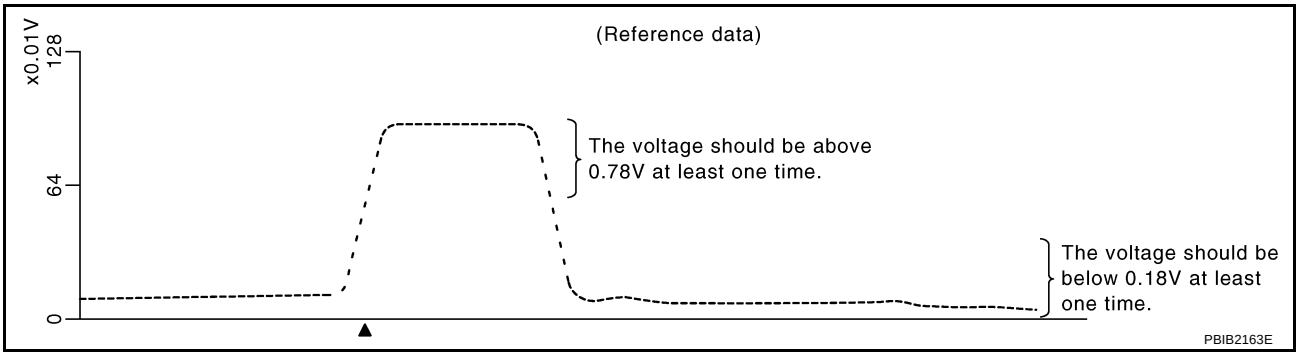
SEF174Y

6. Select “FUEL INJECTION” in “ACTIVE TEST” mode, and select “HO2S2 (B1)/(B2)” as the monitor item with CONSULT-II.

ACTIVE TEST	
FUEL INJECTION	25 %
MONITOR	
ENG SPEED	XXX rpm
HO2S2 (B1)	XXX V
HO2S2 (B2)	XXX V

PBIB1672E

7. Check “HO2S2 (B1)/(B2)” at idle speed when adjusting “FUEL INJECTION” to ±25%.



“HO2S2 (B1)/(B2)” should be above 0.78V at least once when the “FUEL INJECTION” is +25%.
“HO2S2 (B1)/(B2)” should be below 0.18V at least once when the “FUEL INJECTION” is –25%.

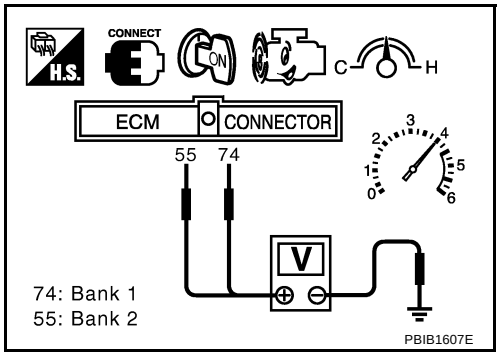
CAUTION:

- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**

- **Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

Without CONSULT-II

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Set voltmeter probes between ECM terminal 74 [HO2S2 (B1) signal] or 55 [HO2S2 (B2) signal] and ground.
6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
   (Depress and release accelerator pedal as soon as possible.)
   The voltage should be above 0.78V at least once during this procedure.
   If the voltage is above 0.78V at step 6, step 7 is not necessary.
7. Keep vehicle at idling for 10 minutes, then check voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D position (A/T), 4th gear position (M/T).
   The voltage should be below 0.18V at least once during this procedure.
8. If NG, replace heated oxygen sensor 2.



CAUTION:

- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

Removal and Installation

ABS009L7

HEATED OXYGEN SENSOR 2

Refer to EM-23, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

DTC P1148, P1168 CLOSED LOOP CONTROL

PFP:22690

On Board Diagnosis Logic

ABS00AMM

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1148 1148 (Bank 1)	Closed loop control function	The closed loop control function for bank 1 does not operate even when vehicle is driving in the specified condition.	● Harness or connectors [The air fuel ratio (A/F) sensor 1 circuit is open or shorted.] ● Air fuel ratio (A/F) sensor 1 ● Air fuel ratio (A/F) sensor 1 heater
P1168 1168 (Bank 2)		The closed loop control function for bank 2 does not operate even when vehicle is driving in the specified condition.	

DTC P1148 or P1168 is displayed with another DTC for air fuel ratio (A/F) sensor 1.
Perform the trouble diagnosis for the corresponding DTC.

DTC P1211 TCS CONTROL UNIT

PFP:47850

Description

ABS009LC

The malfunction information related to TCS is transferred through the CAN communication line from VDC/TCS/ABS control unit (models with VDC) or "ABS actuator and electric unit (control unit)" (models without VDC) to ECM.

Be sure to erase the malfunction information such as DTC not only for VDC/TCS/ABS control unit (models with VDC) or "ABS actuator and electric unit (control unit)" (models without VDC) but also for ECM after TCS related repair.

On Board Diagnosis Logic

ABS009LD

Freeze frame data is not stored in the ECM for this self-diagnosis. The MIL will not light up for this self-diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1211 1211	TCS control unit	ECM receives a malfunction information from VDC/TCS/ABS control unit (models with VDC) or "ABS actuator and electric unit (control unit)" (models without VDC).	● VDC/TCS/ABS control unit (models with VDC) ● ABS actuator and electric unit (control unit) (models without VDC) ● TCS related parts

DTC Confirmation Procedure

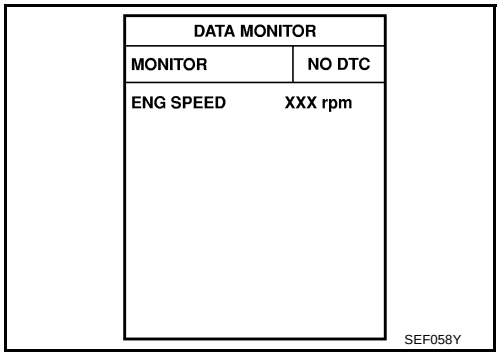
ABS009LE

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5V at idle.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Start engine and let it idle for at least 60 seconds.
4. If 1st trip DTC is detected, go to EC-438, "Diagnostic Procedure" .



WITH GST

Follow the procedure “WITH CONSULT-II” above.

Diagnostic Procedure

ABS009LF

Go to BRC-46, "TROUBLE DIAGNOSIS" .

DTC P1212 TCS COMMUNICATION LINE

PFP:47850

Description

ABS009LG

NOTE:
If DTC P1212 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-138, "DTC U1000, U1001 CAN COMMUNICATION LINE" .
This CAN communication line is used to control the smooth engine operation during the TCS operation. Pulse signals are exchanged between ECM and VDC/TCS/ABS control unit (moels with VDC) or "ABS actuator and electric unit (control unit)" (models without VDC).
Be sure to erase the malfunction information such as DTC not only for VDC/TCS/ABS control unit (models with VDC) or "ABS actuator and electric unit (control unit)" (models without VDC) but also for ECM after TCS related repair.

On Board Diagnosis Logic

ABS009LH

Freeze frame data is not stored in the ECM for this self-diagnosis. The MIL will not light up for this self-diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1212 1212	TCS communication line	ECM can not receive the information from VDC/TCS/ABS control unit (models with VDC) or "ABS actuator and electric unit (control unit)" (models without VDC) continuously.	● Harness or connectors (The CAN communication line is open or shorted.) ● VDC/TCS/ABS control unit (models with VDC) ● ABS actuator and electric unit (control unit) (models without VDC) ● Dead (Weak) battery

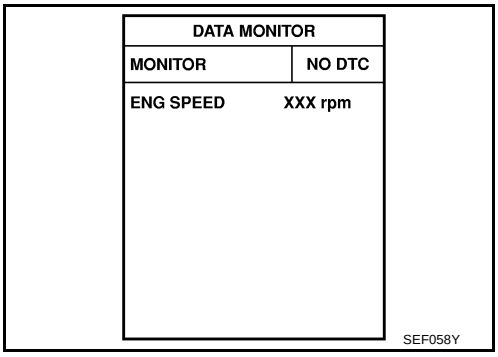
DTC Confirmation Procedure

ABS009LI

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 10.5V at idle.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Start engine and let it idle for at least 10 seconds.
4. If a 1st trip DTC is detected, go to EC-439, "Diagnostic Procedure" .



WITH GST

Follow the procedure “WITH CONSULT-II” above.

Diagnostic Procedure

ABS009LJ

1. CHECK VDC/TCS/ABS CONTROL UNIT (MOELS WITH VDC) OR “ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) (MODELS WITHOUT VDC)” FUNCTION

Refer to BRC-94, "TROUBLE DIAGNOSIS" or refer to BRC-46, "TROUBLE DIAGNOSIS" .

>> **INSPECTION END**

DTC P1217 ENGINE OVER TEMPERATURE

PFP:00000

Description

ABS009LK

SYSTEM DESCRIPTION

NOTE:
If DTC P1217 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-138, "DTC U1000, U1001 CAN COMMUNICATION LINE" .

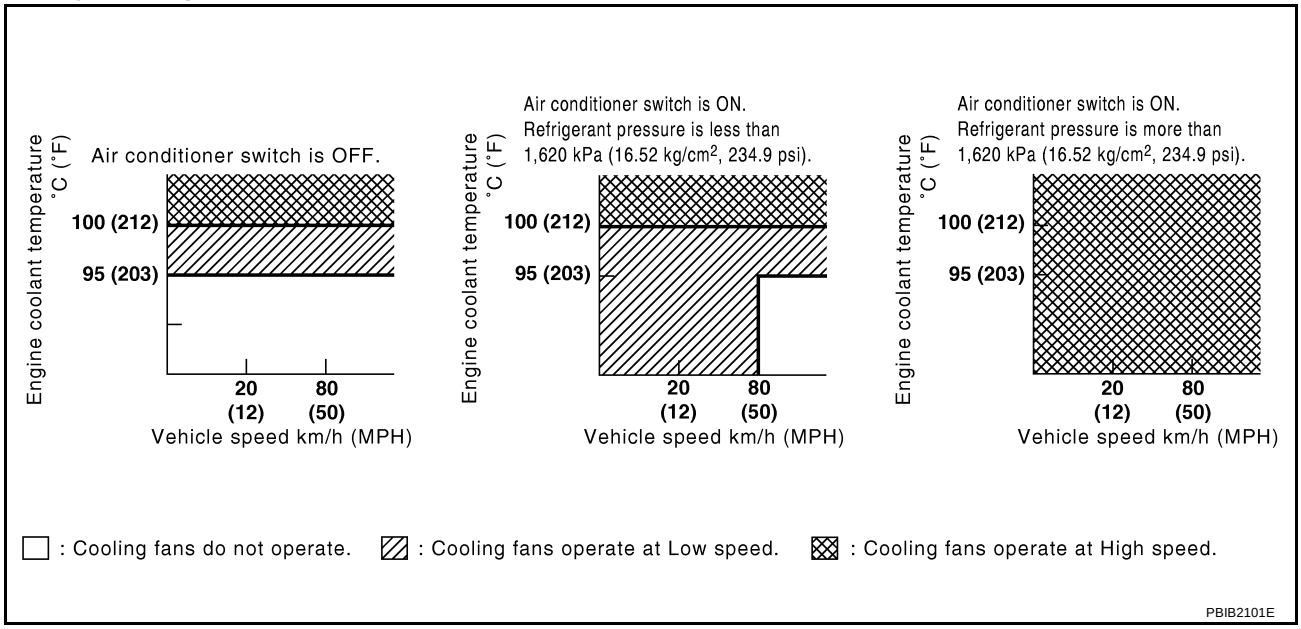
Cooling Fan Control

Sensor	Input Signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed*1	Cooling fan control	IPDM E/R (Cooling fan relays)
Battery	Battery voltage*1		
Wheel sensor	Vehicle speed*2		
Engine coolant temperature sensor	Engine coolant temperature		
Air conditioner switch	Air conditioner ON signal*2		
Refrigerant pressure sensor	Refrigerant pressure		

*1: The ECM determines the start signal status by the signals of engine speed and battery voltage.
*2: This signal is sent to ECM through CAN communication line.

The ECM controls the cooling fan corresponding to the vehicle speed, engine coolant temperature, refrigerant pressure, and air conditioner ON signal. The control system has 3-step control [HIGH/LOW/OFF].

Cooling Fan Operation



Cooling Fan Relay Operation

The ECM controls cooling fan relays in the IPDM E/R through CAN communication line.

Cooling fan speed	Cooling fan relay		
	1	2	3
Stop	OFF	OFF	OFF
Low	ON	OFF	OFF
High	ON	ON	ON

COMPONENT DESCRIPTION

Cooling Fan Motor

The cooling fan operates at each speed when the current flows in the cooling fan motor as follows.

Cooling fan speed	Cooling fan motor terminals	
	(+)	(−)
Low	1	4
	2	3
High	1 and 2	3 and 4

CONSULT-II Reference Value in Data Monitor Mode

ABS009LL

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
AIR COND SIG	● Engine: After warming up, idle the engine	Air conditioner switch: OFF	OFF
		Air conditioner switch: ON (Compressor operates.)	ON
COOLING FAN	● Engine: After warming up, idle the engine ● Air conditioner switch: OFF	Engine coolant temperature is 94°C (201°F) or less	OFF
		Engine coolant temperature is between 95°C (203°F) and 99°C (210°F)	LOW
		Engine coolant temperature is 100°C (212°F) or more	HI

On Board Diagnosis Logic

ABS009LM

If the cooling fan or another component in the cooling system malfunctions, engine coolant temperature will rise.
When the engine coolant temperature reaches an abnormally high temperature condition, a malfunction is indicated.
This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1217 1217	Engine over temperature (Overheat)	● Cooling fan does not operate properly (Overheat). ● Cooling fan system does not operate properly (Overheat). ● Engine coolant was not added to the system using the proper filling method. ● Engine coolant is not within the specified range.	● Harness or connectors (The cooling fan circuit is open or shorted.) ● Cooling fan ● IPDM E/R (Cooling fan relays) ● Radiator hose ● Radiator ● Radiator cap ● Water pump ● Thermostat For more information, refer to EC-452, "Main 12 Causes of Overheating" .

CAUTION:

When a malfunction is indicated, be sure to replace the coolant. Refer to CO-9, "Changing Engine Coolant" . Also, replace the engine oil. Refer to LU-8, "Changing Engine Oil" .

1. **Fill radiator with coolant up to specified level with a filling speed of 2 liters per minute. Be sure to use coolant with the proper mixture ratio. Refer to MA-13, "ANTI-FREEZE COOLANT MIXTURE RATIO" .**
2. **After refilling coolant, run engine to ensure that no water-flow noise is emitted.**

Overall Function Check

ABS009LN

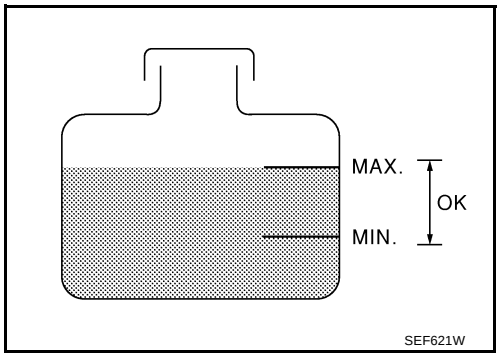
Use this procedure to check the overall function of the cooling fan. During this check, a DTC might not be confirmed.

WARNING:

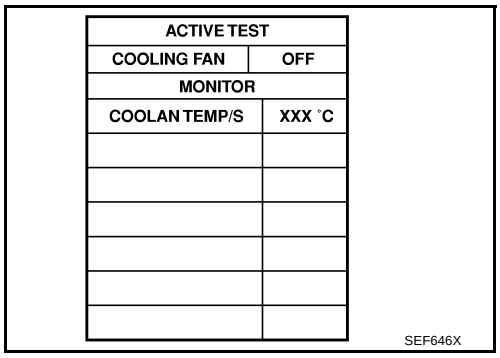
Never remove the radiator cap when the engine is hot. Serious burns could be caused by high pressure fluid escaping from the radiator.
Wrap a thick cloth around cap. Carefully remove the cap by turning it a quarter turn to allow built-up pressure to escape. Then turn the cap all the way off.

WITH CONSULT-II

1. Check the coolant level in the reservoir tank and radiator.
   Allow engine to cool before checking coolant level.
   If the coolant level in the reservoir tank and/or radiator is below the proper range, skip the following steps and go to EC-446, "Diagnostic Procedure" .
2. Confirm whether customer filled the coolant or not. If customer filled the coolant, skip the following steps and go to EC-446, "Diagnostic Procedure" .
3. Turn ignition switch ON.

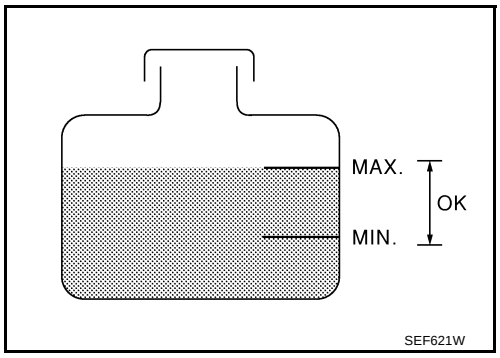


4. Perform “COOLING FAN” in “ACTIVE TEST” mode with CONSULT-II.
5. If the results are NG, go to EC-446, "Diagnostic Procedure" .

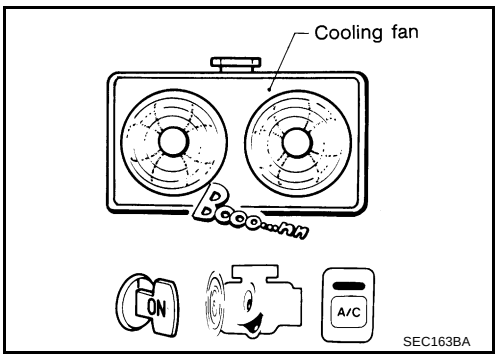


WITH GST

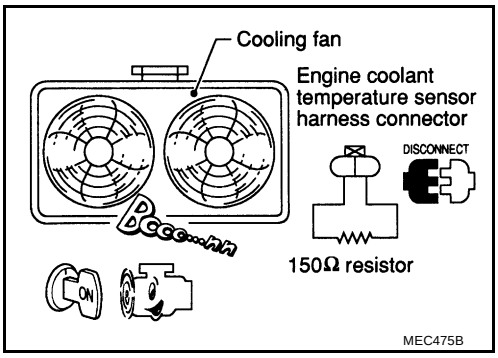
1. Check the coolant level in the reservoir tank and radiator.
   Allow engine to cool before checking coolant level.
   If the coolant level in the reservoir tank and/or radiator is below the proper range, skip the following steps and go to EC-446, "Diagnostic Procedure" .
2. Confirm whether customer filled the coolant or not. If customer filled the coolant, skip the following steps and go to EC-446, "Diagnostic Procedure" .
3. Start engine.
   Be careful not to overheat engine.
4. Turn air conditioner switch ON.
5. Turn blower fan switch ON.



6. Make sure that cooling fan operates at low speed.
   If NG, go to EC-446, "Diagnostic Procedure" .
   If OK, go to the following step.
7. Turn ignition switch OFF.
8. Turn air conditioner switch and blower fan switch OFF.
9. Disconnect engine coolant temperature sensor harness connector.
10. Connect 150Ω resistor to engine coolant temperature sensor harness connector.



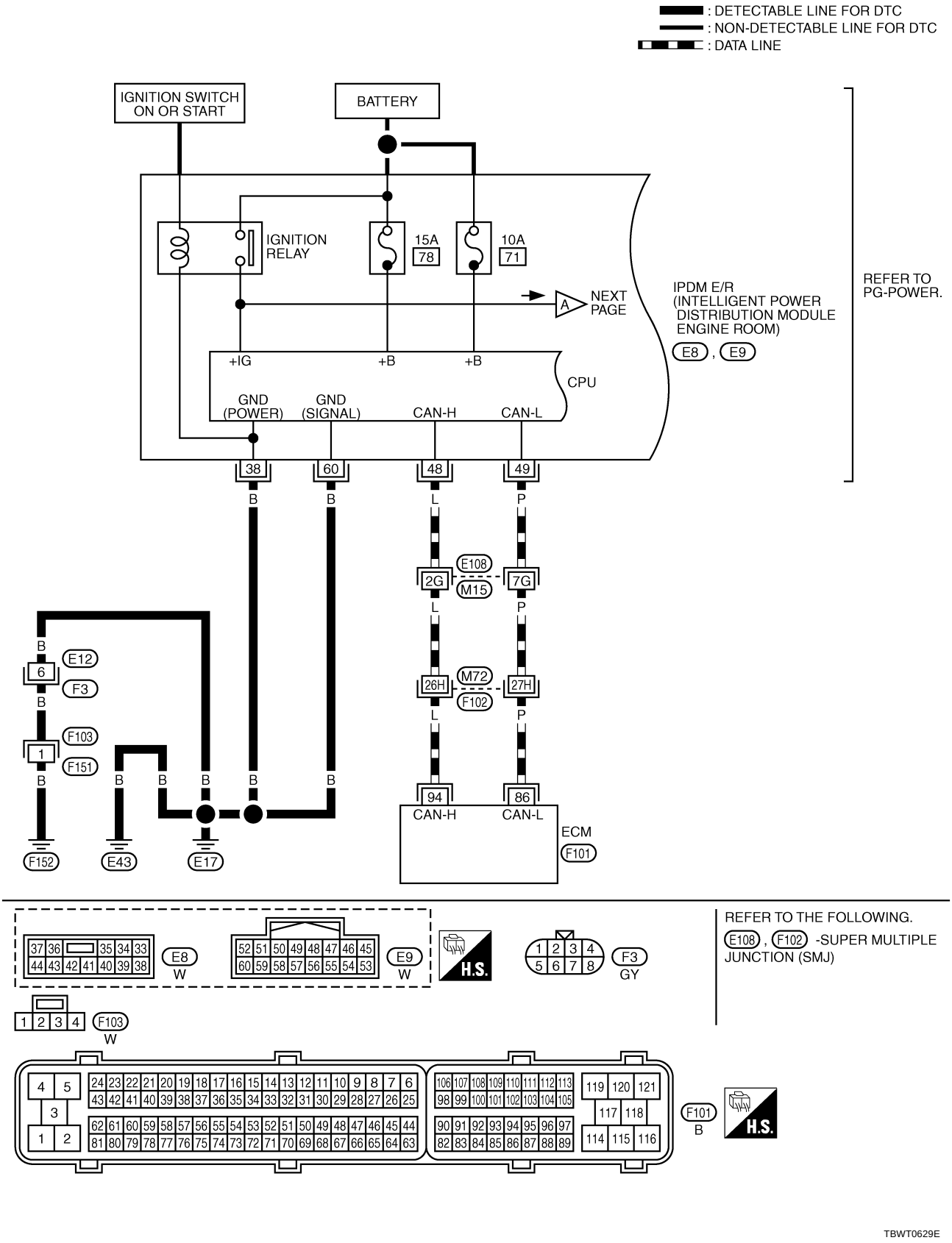
11. Restart engine and make sure that cooling fan operates at higher speed than low speed.
    Be careful not to overheat engine.
12. If NG, go to EC-446, "Diagnostic Procedure" .



Wiring Diagram

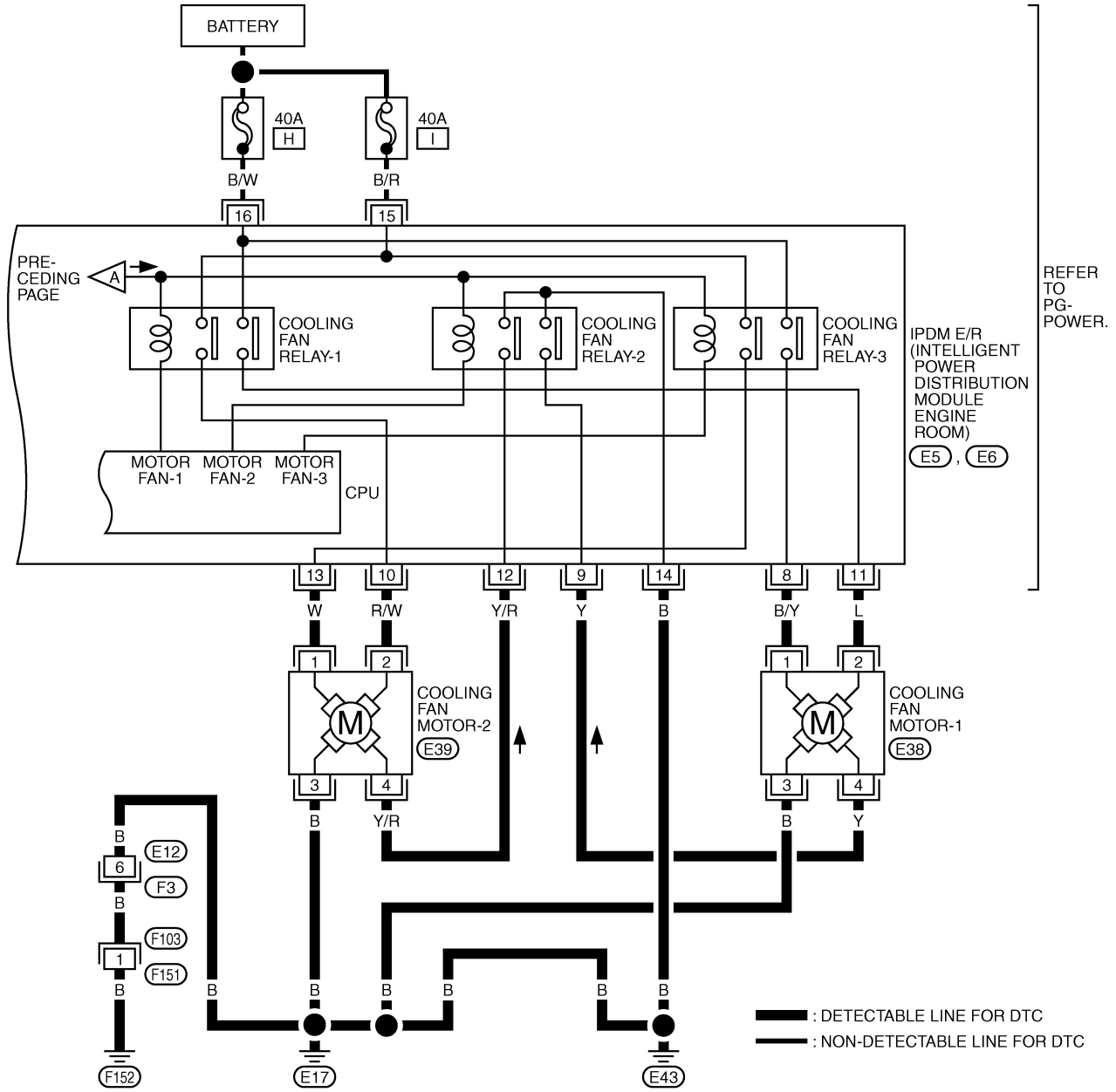
ABS009LO

EC-COOL/F-01



TBWT0629E

EC-COOL/F-02



TBWT0630E

Diagnostic Procedure

ABS009LP

1. INSPECTION START

Do you have CONSULT-II?

Yes or No

Yes >> GO TO 2.
No >> GO TO 4.

2. CHECK COOLING FAN LOW SPEED OPERATION

With CONSULT-II

1. Start engine and let it idle.
2. Select “COOLING FAN” in “ACTIVE TEST” mode with CONSULT-II and touch “LOW” on the CONSULT-II screen.
3. Make sure that cooling fans-1 and -2 operate at low speed.

OK or NG

OK >> GO TO 3.
NG >> Check cooling fan low speed control circuit. (Go to EC-449, "PROCEDURE A" .)

ACTIVE TEST	
COOLING FAN	LOW
MONITOR	
COOLAN TEMP/S	XXX °C

SEF784Z

3. CHECK COOLING FAN HIGH SPEED OPERATION

With CONSULT-II

1. Touch “HIGH” on the CONSULT-II screen.
2. Make sure that cooling fans-1 and -2 operate at higher speed than low speed.

OK or NG

OK >> GO TO 6.
NG >> Check cooling fan high speed control circuit. (Go to EC-451, "PROCEDURE B" .)

ACTIVE TEST	
COOLING FAN	HIGH
MONITOR	
COOLAN TEMP/S	XXX °C

SEF785Z

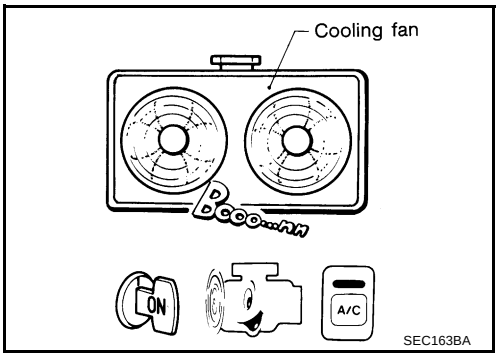
4. CHECK COOLING FAN LOW SPEED OPERATION

Without CONSULT-II

1. Start engine and let it idle.
2. Turn air conditioner switch ON.
3. Turn blower fan switch ON.
4. Make sure that cooling fans-1 and -2 operate at low speed.

OK or NG

OK >> GO TO 5.
NG >> Check cooling fan low speed control circuit. (Go to EC-449, "PROCEDURE A" .)

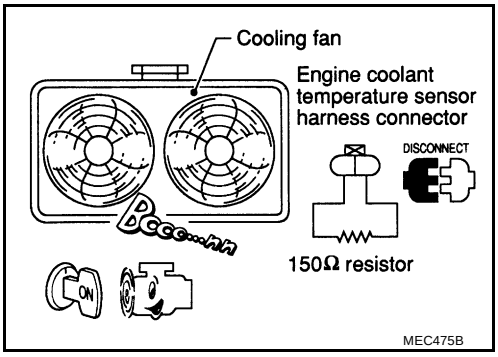


SEC163BA

5. CHECK COOLING FAN HIGH SPEED OPERATION

Without CONSULT-II

1. Turn ignition switch OFF.
2. Turn air conditioner switch and blower fan switch OFF.
3. Disconnect engine coolant temperature sensor harness connector.
4. Connect 150Ω resistor to engine coolant temperature sensor harness connector.
5. Restart engine and make sure that cooling fans-1 and -2 operate at higher speed than low speed.



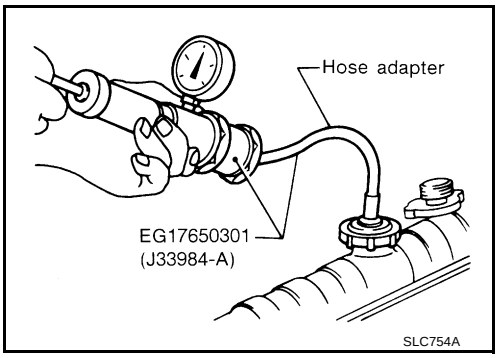
OK or NG

OK >> GO TO 6.
NG >> Check cooling fan high speed control circuit. (Go to EC-451, "PROCEDURE B" .)

6. CHECK COOLING SYSTEM FOR LEAK

Apply pressure to the cooling system with a tester, and check if the pressure drops.

Testing pressure: 157 kPa (1.6 kg/cm^2 , 23 psi)



CAUTION:
Higher than the specified pressure may cause radiator damage. Pressure should not drop.

OK or NG

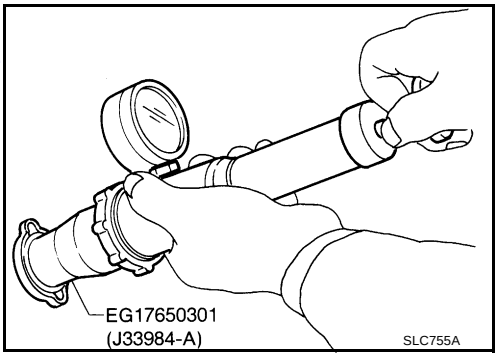
OK >> GO TO 7.
NG >> Check the following for leak. Refer to CO-9, "LEAK CHECK" .

- Hose
- Radiator
- Water pump

7. CHECK RADIATOR CAP

Apply pressure to cap with a tester.

Radiator cap relief pressure: 59 - 98 kPa (0.6 - 1.0 kg/cm^2 , 9 - 14 psi)



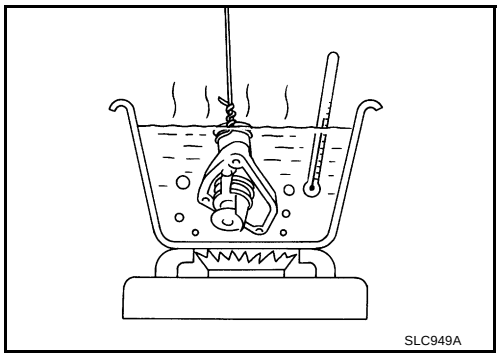
OK or NG

OK >> GO TO 8.
NG >> Replace radiator cap.

8. CHECK THERMOSTAT

1. Check valve seating condition at normal room temperatures.
   It should seat tightly.
2. Check valve opening temperature and valve lift.

   Valve opening temperature: **76.5°C (170°F) [standard]**
   Valve lift: **More than 8.6 mm/90°C (0.339 in/194°F)**



3. Check if valve is closed at 5°C (9°F) below valve opening temperature.
   For details, refer to CO-25, "WATER INLET AND THERMOSTAT ASSEMBLY" .

OK or NG

OK >> GO TO 9.
NG >> Replace thermostat

9. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-181, "Component Inspection" .

OK or NG

OK >> GO TO 10.
NG >> Replace engine coolant temperature sensor.

10. CHECK MAIN 12 CAUSES

If the cause cannot be isolated, go to EC-452, "Main 12 Causes of Overheating" .

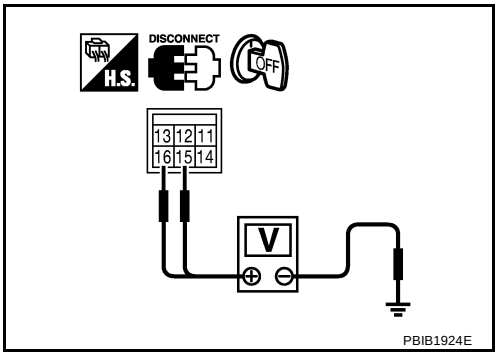
>> **INSPECTION END**

PROCEDURE A

1. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R harness connector E6.
3. Check voltage between IPDM E/R terminals 15, 16 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- 40A fusible links
- Harness for open or short between IPDM E/R and battery

>> Repair open circuit or short to ground or short to power in harness or connectors.

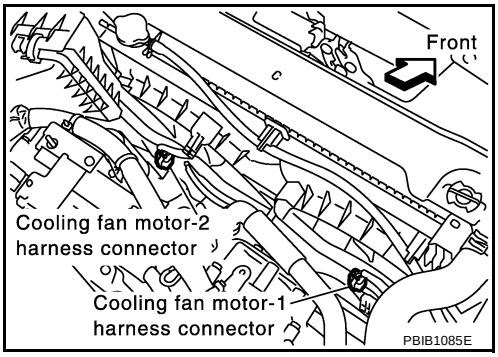
3. CHECK COOLING FAN MOTORS CIRCUIT

1. Disconnect cooling fan motor-1 harness connector and cooling fan motor-2 harness connector.
2. Disconnect IPDM E/R harness connector E5.
3. Check harness continuity between cooling fan motor-1 terminal 2 and IPDM E/R terminal 11, cooling fan motor-1 terminal 3 and ground.
   Refer to wiring diagram.

Continuity should exist.

4. Check harness continuity between cooling fan motor-2 terminal 2 and IPDM E/R terminal 10, cooling fan motor-2 terminal 3 and ground.
   Refer to wiring diagram.

Continuity should exist.



5. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connector E12, F3
- Harness connector F103, F151
- Harness for open or short between cooling fan motor-1 and IPDM E/R
- Harness for open or short between cooling fan motor-1 and ground
- Harness for open or short between cooling fan motor-2 and IPDM E/R
- Harness for open or short between cooling fan motor-2 and ground

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK COOLING FAN MOTORS

Refer to EC-452, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace cooling fan motors.

6. CHECK INTERMITTENT INCIDENT

Perform EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

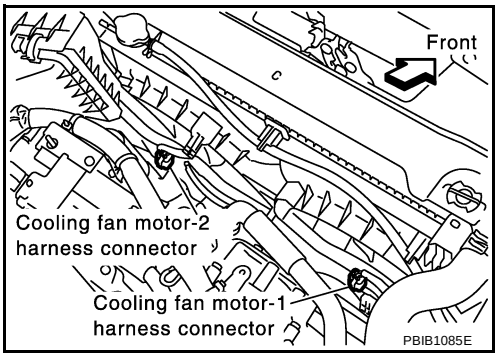
OK >> Replace IPDM E/R. Refer to PG-17, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)" .
NG >> Repair or replace harness or connector.

PROCEDURE B

1. CHECK COOLING FAN MOTORS CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect cooling fan motor-1 harness connector and cooling fan motor-2 harness connector.
3. Disconnect IPDM E/R harness connectors E5, E6.
4. Check harness continuity between the following;
   cooling fan motor-1 terminal 1 and IPDM E/R terminal 8,
   cooling fan motor-1 terminal 4 and IPDM E/R terminal 9,
   IPDM E/R terminal 14 and ground,
   Refer to wiring diagram.

   Continuity should exist.



5. Also check harness connector for short to ground or short to power.
6. Check harness continuity between the following;
   cooling fan motor-2 terminal 1 and IPDM E/R terminal 13,
   cooling fan motor-2 terminal 4 and IPDM E/R terminal 12,
   Refer to wiring diagram.

   Continuity should exist.

7. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connector E12, F3
- Harness connector F103, F151
- Harness for open or short between cooling fan motor-1 and IPDM E/R
- Harness for open or short between cooling fan motor-2 and IPDM E/R
- Harness for open or short between IPDM E/R and ground

>> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK COOLING FAN MOTORS

Refer to EC-452, "Component Inspection" .

OK or NG

OK >> GO TO 4.
NG >> Replace cooling fan motors.

4. CHECK INTERMITTENT INCIDENT

Perform EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace IPDM E/R. Refer to PG-17, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)" .
NG >> Repair or replace harness connectors.

Main 12 Causes of Overheating

ABS009LQ

Engine	Step	Inspection item	Equipment	Standard	Reference page
OFF	1	● Blocked radiator ● Blocked condenser ● Blocked radiator grille ● Blocked bumper	● Visual	No blocking	—
	2	● Coolant mixture	● Coolant tester	50 - 50% coolant mixture	MA-13
	3	● Coolant level	● Visual	Coolant up to MAX level in reservoir tank and radiator filler neck	CO-9
	4	● Radiator cap	● Pressure tester	59 - 98 kPa (0.6 - 1.0 kg/cm^2 , 9 - 14 psi) (Limit)	CO-14
ON*2	5	● Coolant leaks	● Visual	No leaks	CO-9
ON*2	6	● Thermostat	● Touch the upper and lower radiator hoses	Both hoses should be hot	CO-25
ON*1	7	● Cooling fan	● CONSULT-II	Operating	See trouble diagnosis for DTC P1217 (EC-440).
OFF	8	● Combustion gas leak	● Color checker chemical tester 4 Gas analyzer	Negative	—
ON*3	9	● Coolant temperature gauge	● Visual	Gauge less than 3/4 when driving	—
		● Coolant overflow to reservoir tank	● Visual	No overflow during driving and idling	CO-9
OFF*4	10	● Coolant return from reservoir tank to radiator	● Visual	Should be initial level in reservoir tank	CO-9
OFF	11	● Cylinder head	● Straight gauge feeler gauge	0.1 mm (0.004 in) Maximum distortion (warping)	EM-92
	12	● Cylinder block and pistons	● Visual	No scuffing on cylinder walls or piston	EM-111

*1: Turn the ignition switch ON.
*2: Engine running at 3,000 rpm for 10 minutes.
*3: Drive at 90 km/h (55 MPH) for 30 minutes and then let idle for 10 minutes.
*4: After 60 minutes of cool down time.
For more information, refer to CO-5, "OVERHEATING CAUSE ANALYSIS" .

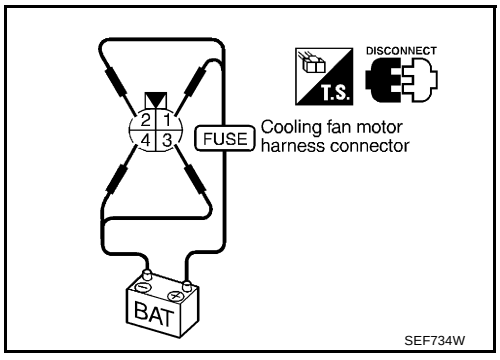
Component Inspection

ABS009LR

COOLING FAN MOTORS-1 AND -2

1. Disconnect cooling fan motor harness connectors.
2. Supply cooling fan motor terminals with battery voltage and check operation.

	Speed	terminals	
		(+)	(–)
Cooling fan motor	Low	1	4
		2	3
	High	1 and 2	3 and 4



Cooling fan motor should operate.
If NG, replace cooling fan motor.

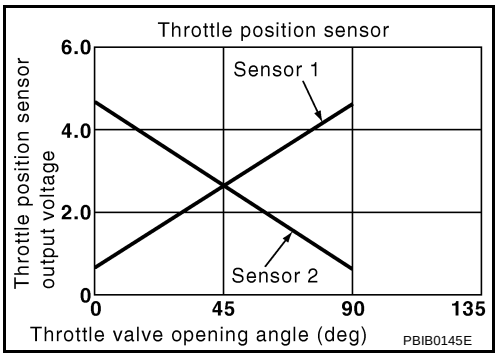
DTC P1225 TP SENSOR

PFP:16119

Component Description

ABS009LS

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc. The throttle position sensor responds to the throttle valve movement.
The throttle position sensor has the two sensors. These sensors are a kind of potentiometers which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the throttle valve and feed the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and the ECM controls the throttle control motor to make the throttle valve opening angle properly in response to driving condition.



On Board Diagnosis Logic

ABS009LT

The MIL will not light up for this diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1225 1225	Closed throttle position learning performance problem	Closed throttle position learning value is excessively low.	● Electric throttle control actuator (TP sensor 1 and 2)

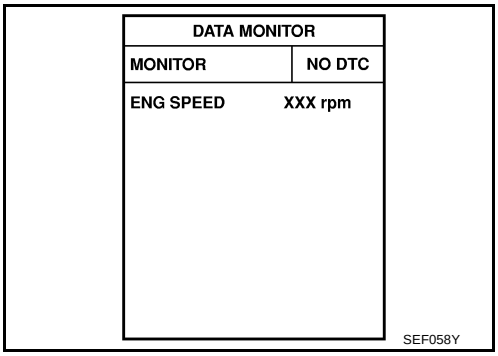
DTC Confirmation Procedure

ABS009LU

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Turn ignition switch ON.
5. If 1st trip DTC is detected, go to EC-454, "Diagnostic Procedure" .



WITH GST

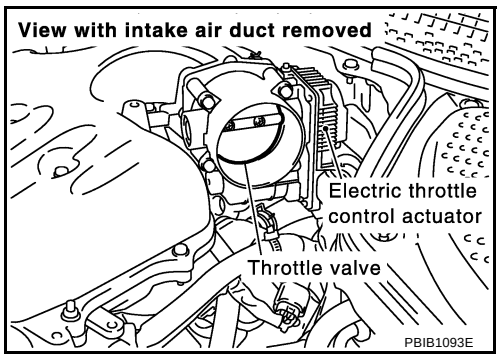
Follow the procedure “WITH CONSULT-II” above.

Diagnostic Procedure

ABS009LV

1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

1. Turn ignition switch OFF.
2. Remove the intake air duct.
3. Check if foreign matter is caught between the throttle valve and the housing.



OK or NG

OK >> GO TO 2.
NG >> Remove the foreign matter and clean the electric throttle control actuator inside.

2. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace the electric throttle control actuator.
2. Perform EC-42, "Throttle Valve Closed Position Learning" .
3. Perform EC-43, "Idle Air Volume Learning" .

>> **INSPECTION END**

Removal and Installation

ABS009LW

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .

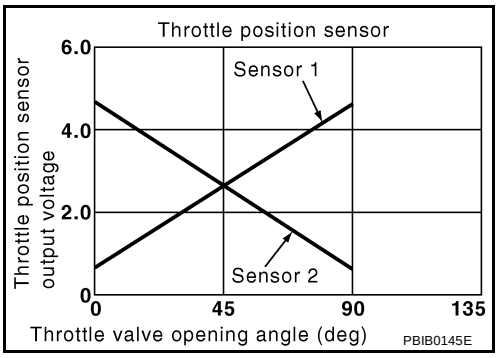
DTC P1226 TP SENSOR

PFP:16119

Component Description

ABS009LX

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc. The throttle position sensor responds to the throttle valve movement.
The throttle position sensor has the two sensors. These sensors are a kind of potentiometers which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the throttle valve and feed the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and the ECM controls the throttle control motor to make the throttle valve opening angle properly in response to driving condition.



On Board Diagnosis Logic

ABS009LY

The MIL will not light up for this diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1226 1226	Closed throttle position learning performance problem	Closed throttle position learning is not performed successfully, repeatedly.	● Electric throttle control actuator (TP sensor 1 and 2)

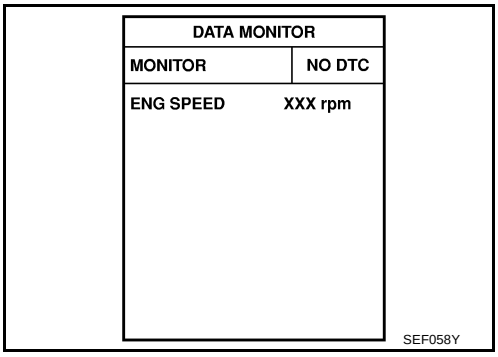
DTC Confirmation Procedure

ABS009LZ

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Turn ignition switch ON.
5. Repeat steps 3 and 4 for 32 times.
6. If 1st trip DTC is detected, go to EC-456, "Diagnostic Procedure" .



WITH GST

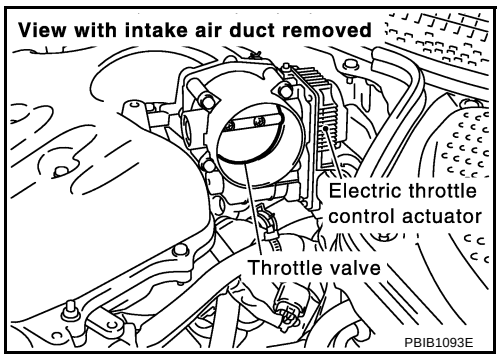
Follow the procedure “With CONSULT-II” above.

Diagnostic Procedure

ABS009M0

1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

1. Turn ignition switch OFF.
2. Remove the intake air duct.
3. Check if foreign matter is caught between the throttle valve and the housing.



OK or NG

OK >> GO TO 2.
NG >> Remove the foreign matter and clean the electric throttle control actuator inside.

2. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace the electric throttle control actuator.
2. Perform EC-42, "Throttle Valve Closed Position Learning" .
3. Perform EC-43, "Idle Air Volume Learning" .

>> **INSPECTION END**

Removal and Installation

ABS009M1

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .

DTC P1229 SENSOR POWER SUPPLY

PFP:16119

On Board Diagnosis Logic

ABS009M2

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1229 1229	Sensor power supply circuit short	ECM detects a voltage of power source for sensor is excessively low or high.	● Harness or connectors (APP sensor 1 circuit is shorted.) (EVAP control system pressure sensor circuit is shorted.) (PSP sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) ● Accelerator pedal position sensor (APP sensor 1) ● EVAP control system pressure sensor ● Power steering pressure sensor ● Refrigerant pressure sensor

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operation condition in fail-safe mode
ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

DTC Confirmation Procedure

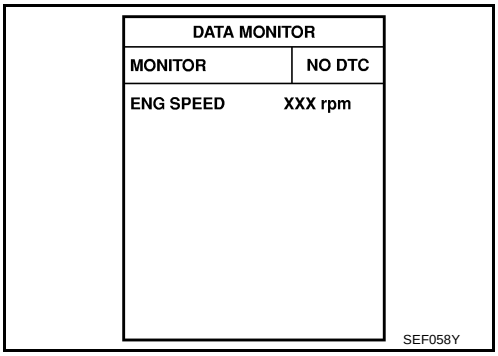
ABS009M3

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Start engine and let it idle for 1 second.
4. If DTC is detected, go to EC-459, "Diagnostic Procedure" .



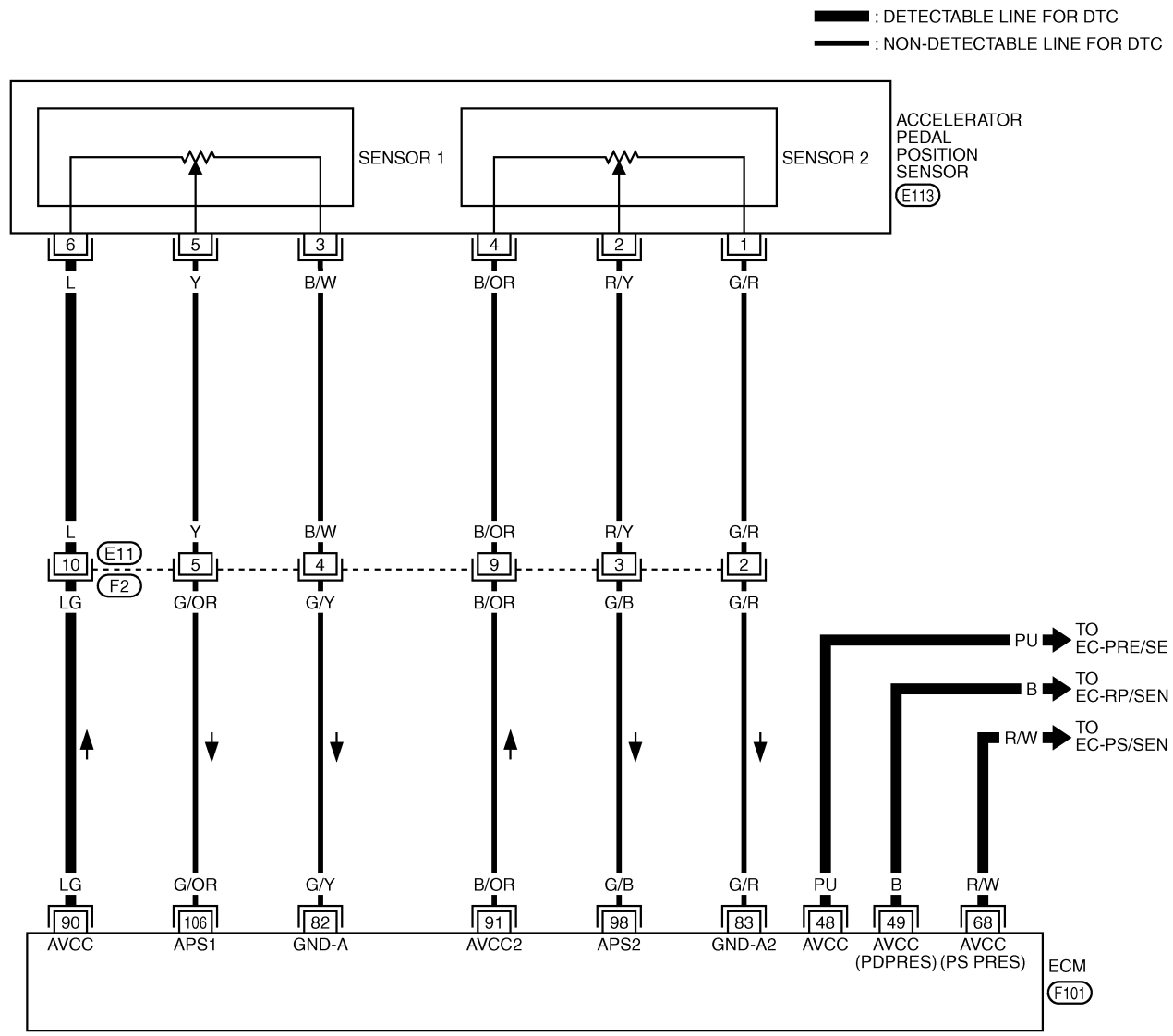
WITH GST

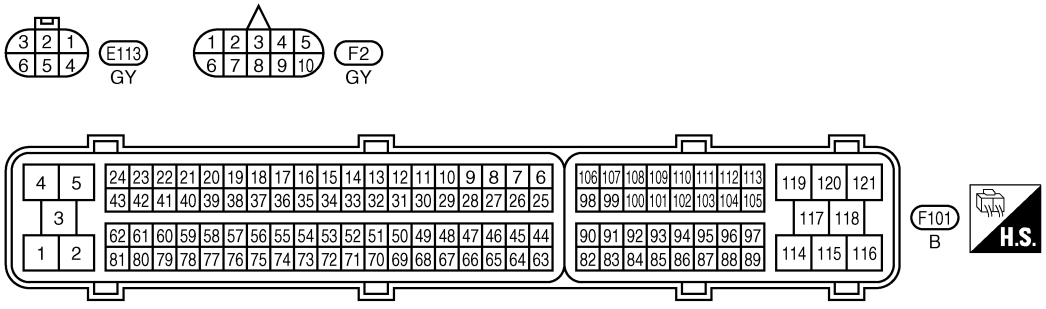
Follow the procedure “WITH CONSULT-II” above.

Wiring Diagram

ABS009M4

EC-SEN/PW-01





TBWM0512E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

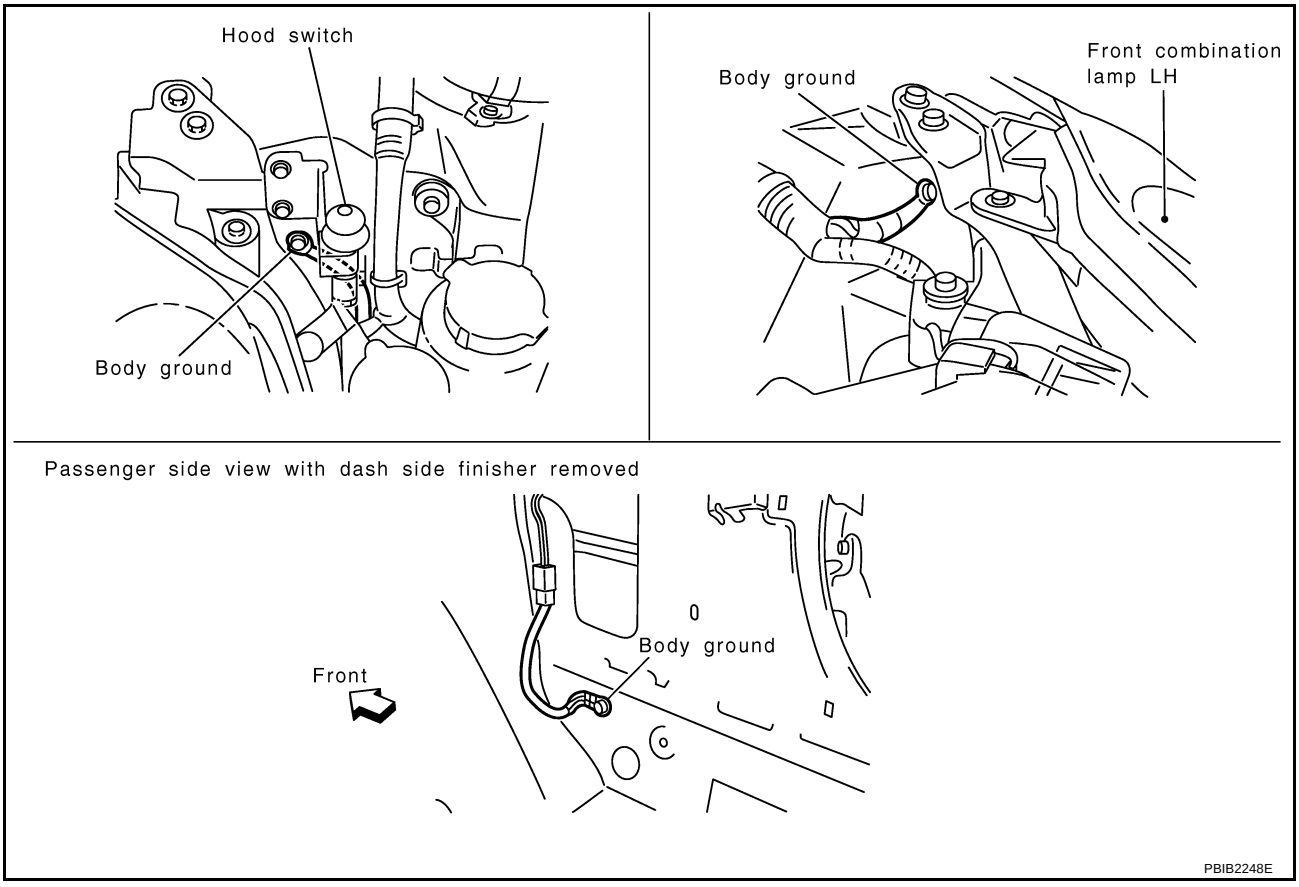
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
48	PU	Sensor power supply (EVAP control system pressure sensor)	**[Ignition switch: ON]**	Approximately 5V
49	B	Sensor power supply (Refrigerant pressure sensor)	**[Ignition switch: ON]**	Approximately 5V
68	R/W	Sensor power supply (Power steering pressure sensor)	**[Ignition switch: ON]**	Approximately 5V
90	LG	Sensor power supply (APP sensor 1)	**[Ignition switch: ON]**	Approximately 5V

Diagnostic Procedure

ABS009M5

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

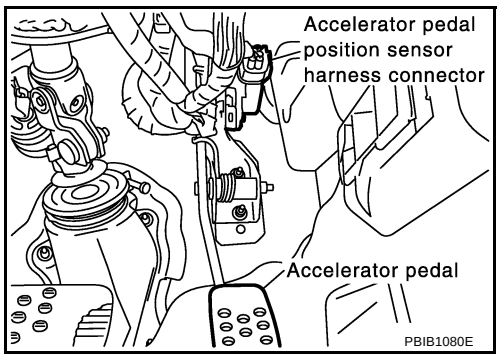


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

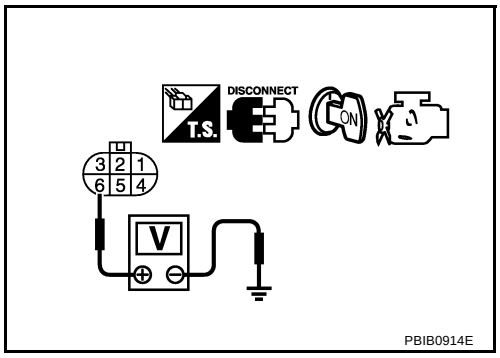
2. CHECK ACCELERATOR PEDAL POSITION SENSOR 1 POWER SUPPLY CIRCUIT

1. Disconnect accelerator pedal position (APP) sensor harness connector.
2. Turn ignition switch ON.



3. Check voltage between APP sensor terminal 6 and ground with CONSULT-II or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. CHECK SENSOR POWER SUPPLY CIRCUITS

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
90	APP sensor terminal 6	EC-589
48	EVAP control system pressure sensor terminal 3	EC-322
49	Refrigerant pressure sensor terminal 1	EC-646
68	PSP sensor terminal 1	EC-370

OK or NG

OK >> GO TO 4.
NG >> Repair short to ground or short to power in harness or connectors.

4. CHECK COMPONENTS

Check the following.

- EVAP control system pressure sensor (Refer to EC-319, "Component Inspection" .)
- Refrigerant pressure sensor (Refer to ATC-86, "COMPONENT INSPECTION" .)
- Power steering pressure sensor (Refer to EC-374, "Component Inspection" .)

OK or NG

OK >> GO TO 7.
NG >> Replace malfunctioning component.

5. CHECK APP SENSOR

Refer to EC-593, "Component Inspection" .

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-42, "Accelerator Pedal Released Position Learning" .
3. Perform EC-42, "Throttle Valve Closed Position Learning" .
4. Perform EC-43, "Idle Air Volume Learning" .

>> **INSPECTION END**

7. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

DTC P1271, P1281 A/F SENSOR 1

PFP:22693

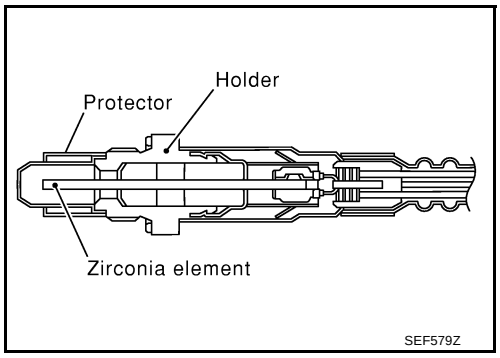
Component Description

ABS00A87

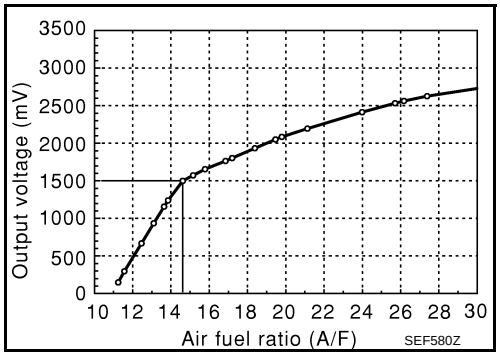
The air fuel ratio (A/F) sensor 1 is a planar dual-cell limit current sensor. The sensor element of the A/F sensor 1 is the combination of a Nernst concentration cell (sensor cell) with an oxygen-pump cell, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range ($0.7 < \lambda <$ air).

The exhaust gas components diffuse through the diffusion gap at the electrode of the oxygen pump and Nernst concentration cell, where they are brought to thermodynamic balance.



An electronic circuit controls the pump current through the oxygen-pump cell so that the composition of the exhaust gas in the diffusion gap remains constant at $\lambda = 1$. Therefore, the A/F sensor 1 is able to indicate air/fuel ratio by this pumping of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of 700 - 800°C (1,292 - 1,472°F).



CONSULT-II Reference Value in Data Monitor Mode

ABS00A88

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
A/F SEN1 (B1) A/F SEN1 (B2)	● Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 1.5V

On Board Diagnosis Logic

ABS00A89

To judge the malfunction, the diagnosis checks that the A/F signal computed by ECM from the A/F sensor 1 signal is not inordinately low.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible Cause
P1271 1271 (Bank 1)	Air fuel ratio (A/F) sensor 1 circuit no activity detected	● The A/F signal computed by ECM from the A/F sensor 1 signal is constantly approx. 0V.	● Harness or connectors (The A/F sensor 1 circuit is open or shorted.) ● Air fuel ratio (A/F) sensor 1
P1281 1281 (Bank 2)			

DTC Confirmation Procedure

ABS00A8A

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

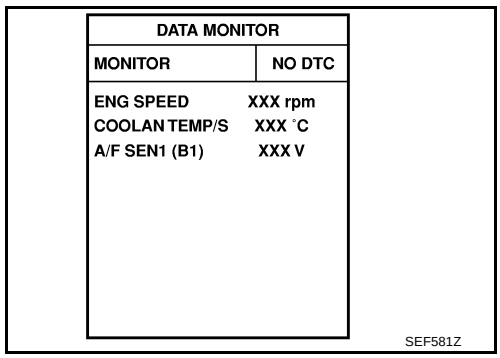
TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

WITH CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Select “A/F SEN1 (B1)” or “A/F SEN1 (B2)” in “DATA MONITOR” mode with CONSULT-II.

3. Check “A/F SEN1 (B1)” or “A/F SEN1 (B2)” indication.
   If the indication is constantly approx. 0V, go to EC-467, "Diagnostic Procedure" .
   If the indication is not constantly approx. 0V, go to next step.
4. Turn ignition switch OFF, wait at least 10 seconds and then restart engine.
5. Drive and accelerate vehicle to more than 40 km/h (25 MPH) within 20 seconds after restarting engine.
6. Maintain the following conditions for about 20 consecutive seconds.



ENG SPEED	1,000 - 3,200 rpm
VHCL SPEED SE	More than 40 km/h (25 MPH)
B/FUEL SCHDL	1.5 - 9.0 msec
Gear position	Suitable position

NOTE:
- **Keep the accelerator pedal as steady as possible during the cruising.**
- **If this procedure is not completed within 1 minute after restarting engine at step 4, return to step 4.**

7. If 1st trip DTC is displayed, go to EC-467, "Diagnostic Procedure" .

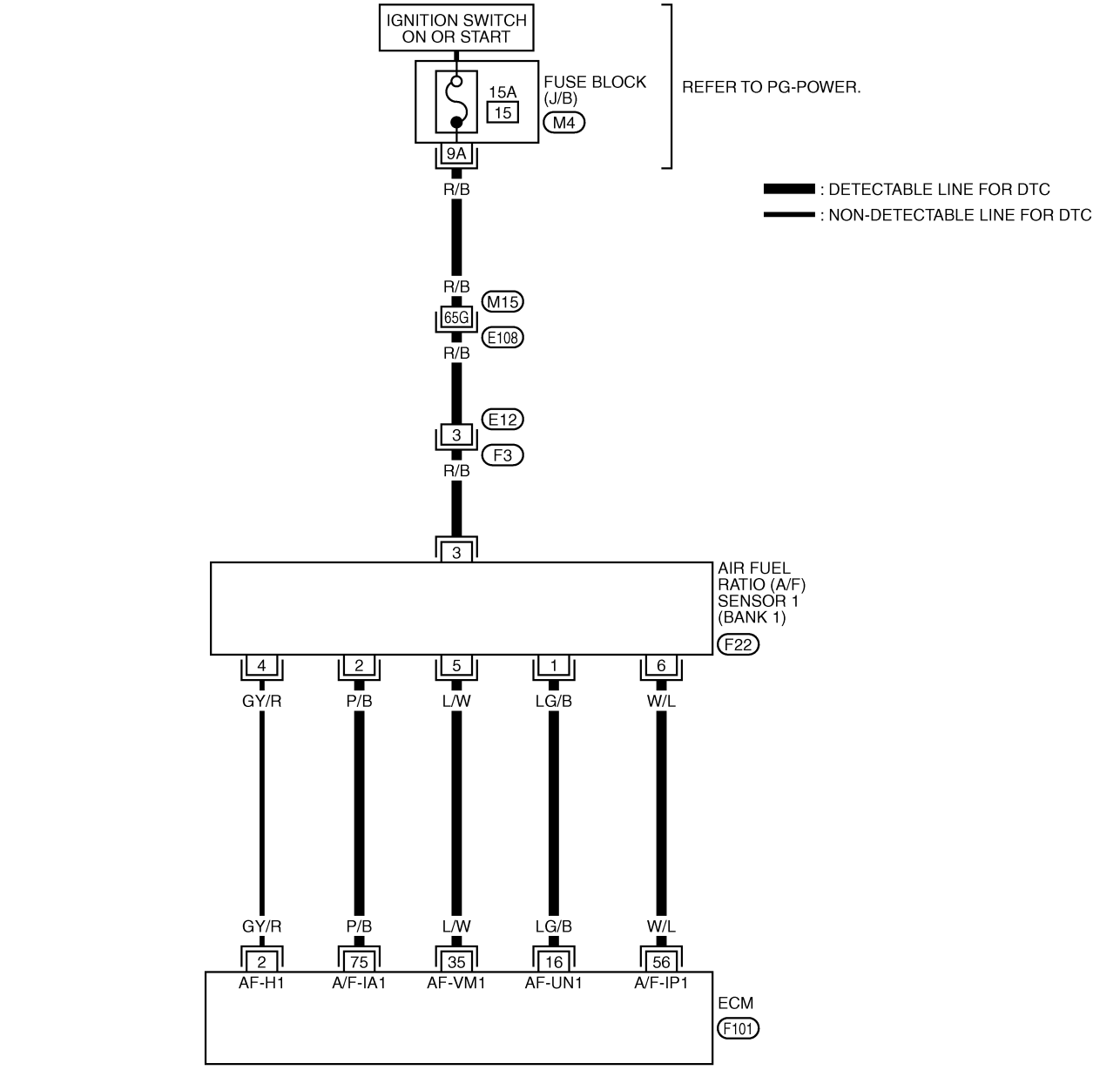
WITH GST

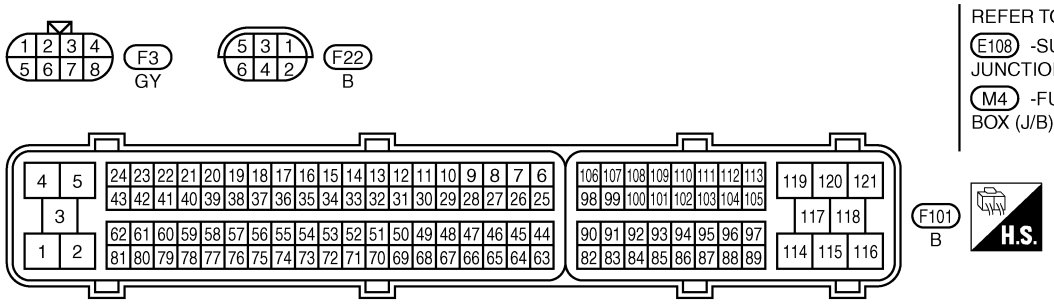
Follow the procedure “WITH CONSULT-II” above.

Wiring Diagram
BANK 1

ABS00A8B

EC-AF1B1-01





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT0706E

Specification data are reference values and are measured between each terminal and ground.

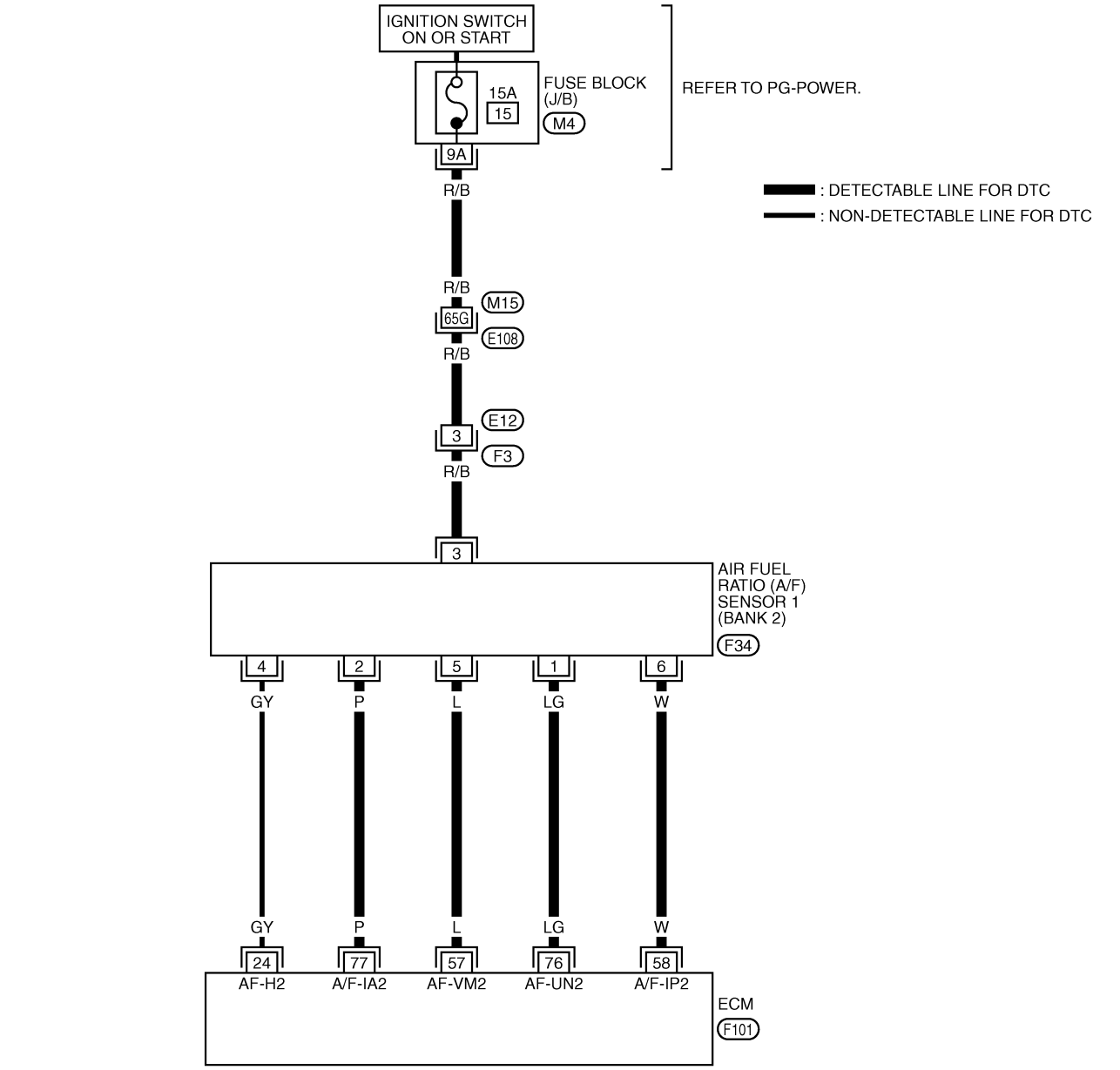
CAUTION:

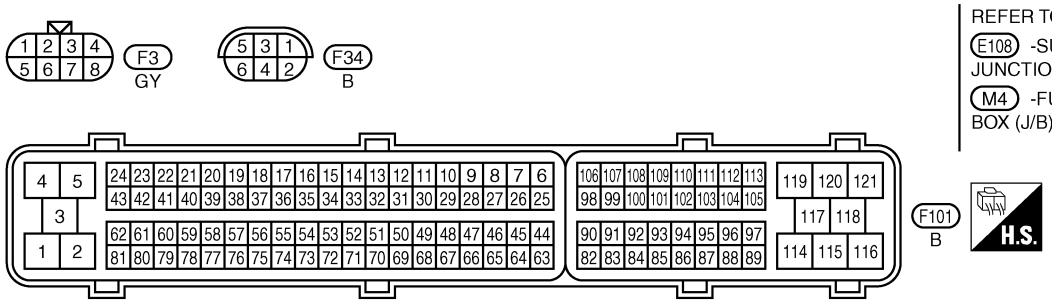
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
16	LG/B	A/F sensor 1 (Bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 3.1V
35	L/W			Approximately 2.6V
56	W/L			Approximately 2.3V
75	P/B			Approximately 2.3V

BANK 2

EC-AF1B2-01





TBWT0707E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

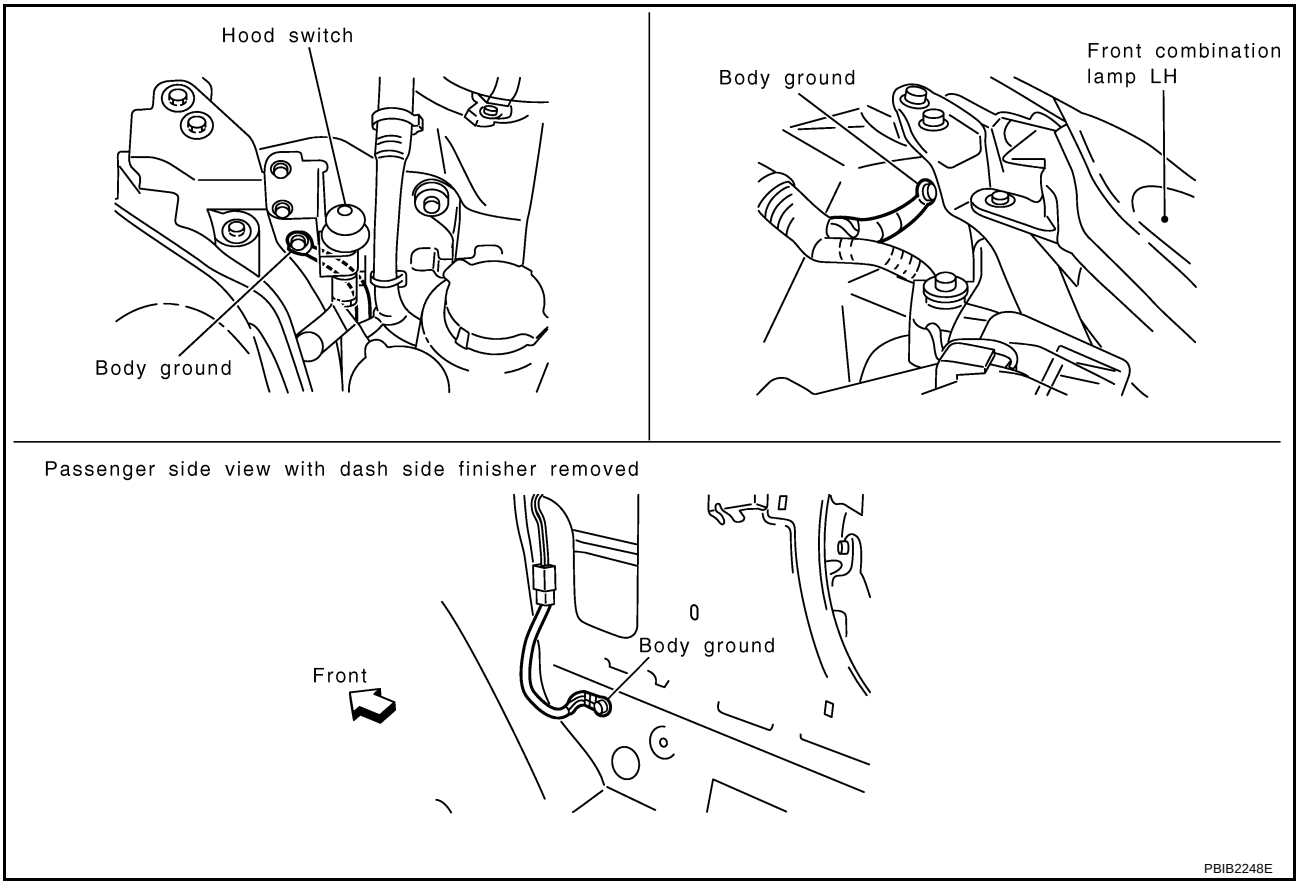
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
57	L	A/F sensor 1 (Bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 2.6V
58	W			Approximately 2.3V
76	LG			Approximately 3.1V
77	P			Approximately 2.3V

Diagnostic Procedure

ABS00A8C

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

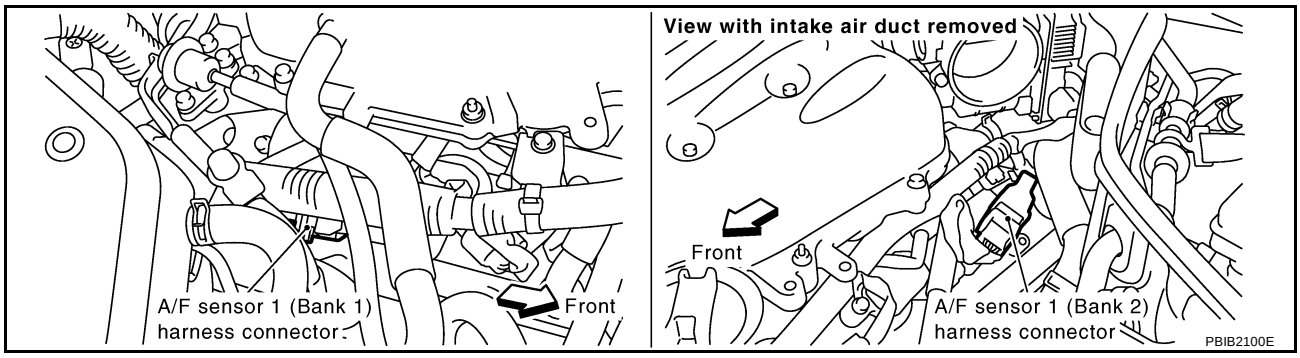


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

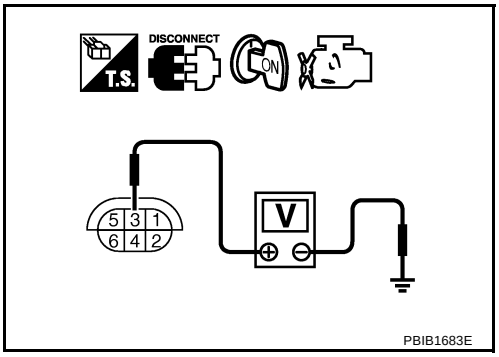
2. CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY CIRCUIT

1. Disconnect A/F sensor 1 harness connector.



2. Turn ignition switch ON.
3. Check voltage between A/F sensor 1 terminal 3 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M15, E108
- Harness connectors E12, F3
- Fuse block (J/B) connector M4
- 15A fuse
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

4. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between the following terminals.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	16	1	76
2	75	2	77
5	35	5	57
6	56	6	58

Continuity should exist.

4. Check harness continuity between the following terminals and ground.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	16	1	76
2	75	2	77
5	35	5	57
6	56	6	58

Continuity should not exist.

5. Also check harness for short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK INTERMITTENT INCIDENT

Perform EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace A/F sensor 1.
NG >> Repair or replace.

Removal and Installation

ABS00A8D

AIR FUEL RATIO (A/F) SENSOR 1

Refer to EM-23, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

DTC P1272, P1282 A/F SENSOR 1

PFP:22693

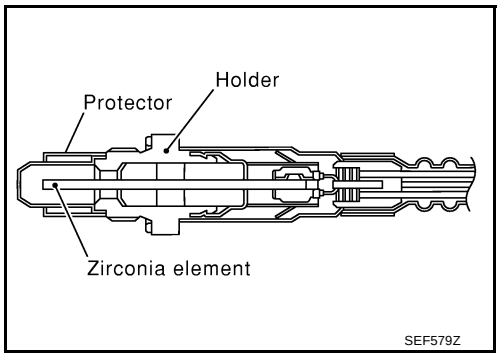
Component Description

ABS00A8E

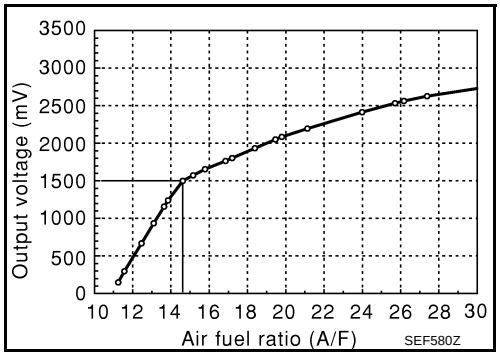
The air fuel ratio (A/F) sensor 1 is a planar dual-cell limit current sensor. The sensor element of the A/F sensor 1 is the combination of a Nernst concentration cell (sensor cell) with an oxygen-pump cell, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range ($0.7 < \lambda <$ air).

The exhaust gas components diffuse through the diffusion gap at the electrode of the oxygen pump and Nernst concentration cell, where they are brought to thermodynamic balance.



An electronic circuit controls the pump current through the oxygen-pump cell so that the composition of the exhaust gas in the diffusion gap remains constant at $\lambda = 1$. Therefore, the A/F sensor 1 is able to indicate air/fuel ratio by this pumping of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of 700 - 800°C (1,292 - 1,472°F).



CONSULT-II Reference Value in Data Monitor Mode

ABS00A8F

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
A/F SEN1 (B1) A/F SEN1 (B2)	● Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 1.5V

On Board Diagnosis Logic

ABS00A8G

To judge the malfunction, the diagnosis checks that the A/F signal computed by ECM from the A/F sensor 1 signal is not inordinately high.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible Cause
P1272 1272 (Bank 1)	Air fuel ratio (A/F) sensor 1 circuit no activity detected	● The A/F signal computed by ECM from the A/F sensor 1 signal is constantly approx. 5V.	● Harness or connectors (The A/F sensor 1 circuit is open or shorted.) ● Air fuel ratio (A/F) sensor 1
P1282 1282 (Bank 2)			

DTC Confirmation Procedure

ABS00A8H

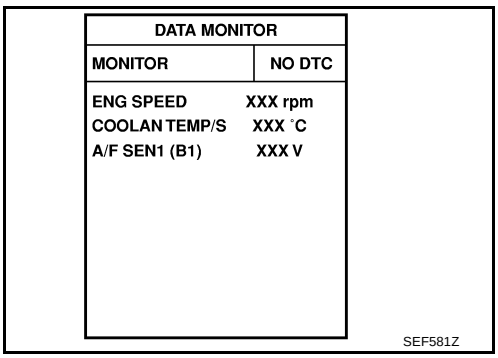
NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

WITH CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Select “A/F SEN1 (B1)” or “A/F SEN1 (B2)” in “DATA MONITOR” mode with CONSULT-II.

3. Check “A/F SEN1 (B1)” or “A/F SEN1 (B2)” indication.
   If the indication is constantly approx. 5V, go to EC-475, "Diagnostic Procedure" .
   If the indication is not constantly approx. 5V, go to next step.
4. Turn ignition switch OFF, wait at least 10 seconds and then restart engine.
5. Drive and accelerate vehicle to more than 40 km/h (25 MPH) within 20 seconds after restarting engine.
6. Maintain the following conditions for about 20 consecutive seconds.



ENG SPEED	1,000 - 3,200 rpm
VHCL SPEED SE	More than 40 km/h (25 MPH)
B/FUEL SCHDL	1.5 - 9.0 msec
shift lever	Suitable position

NOTE:
- **Keep the accelerator pedal as steady as possible during the cruising.**
- **If this procedure is not completed within 1 minute after restarting engine at step 4, return to step 4.**

7. If 1st trip DTC is displayed, go to EC-475, "Diagnostic Procedure" .

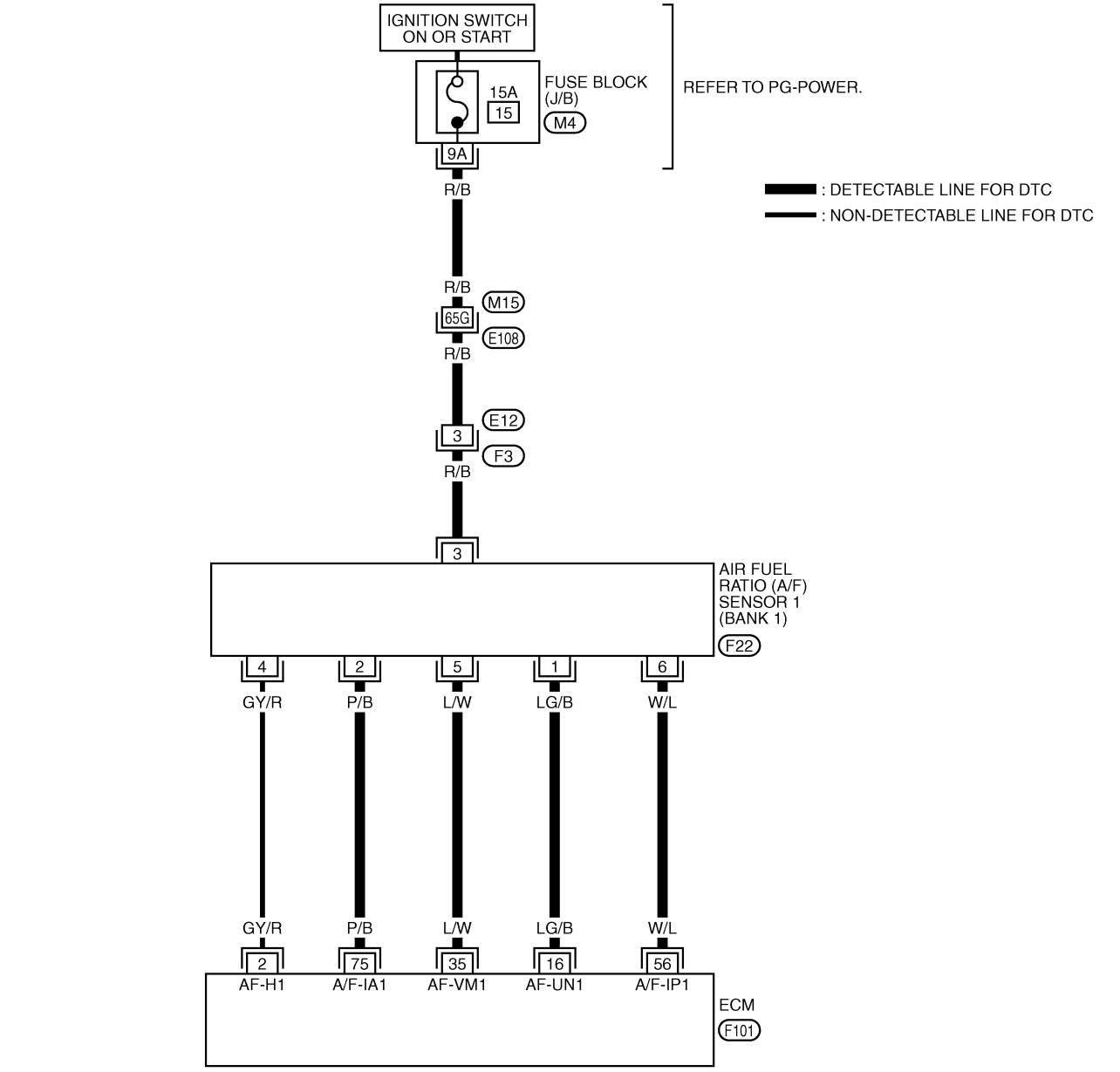
WITH GST

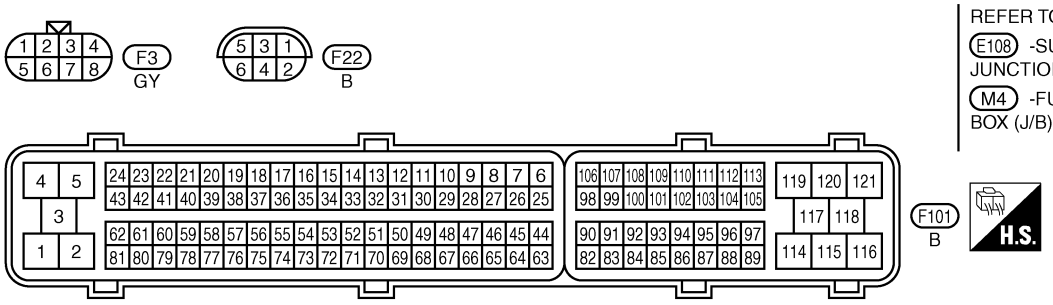
Follow the procedure “WITH CONSULT-II” above.

Wiring Diagram
BANK 1

ABS00A8I

EC-AF1B1-01





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT0706E

Specification data are reference values and are measured between each terminal and ground.

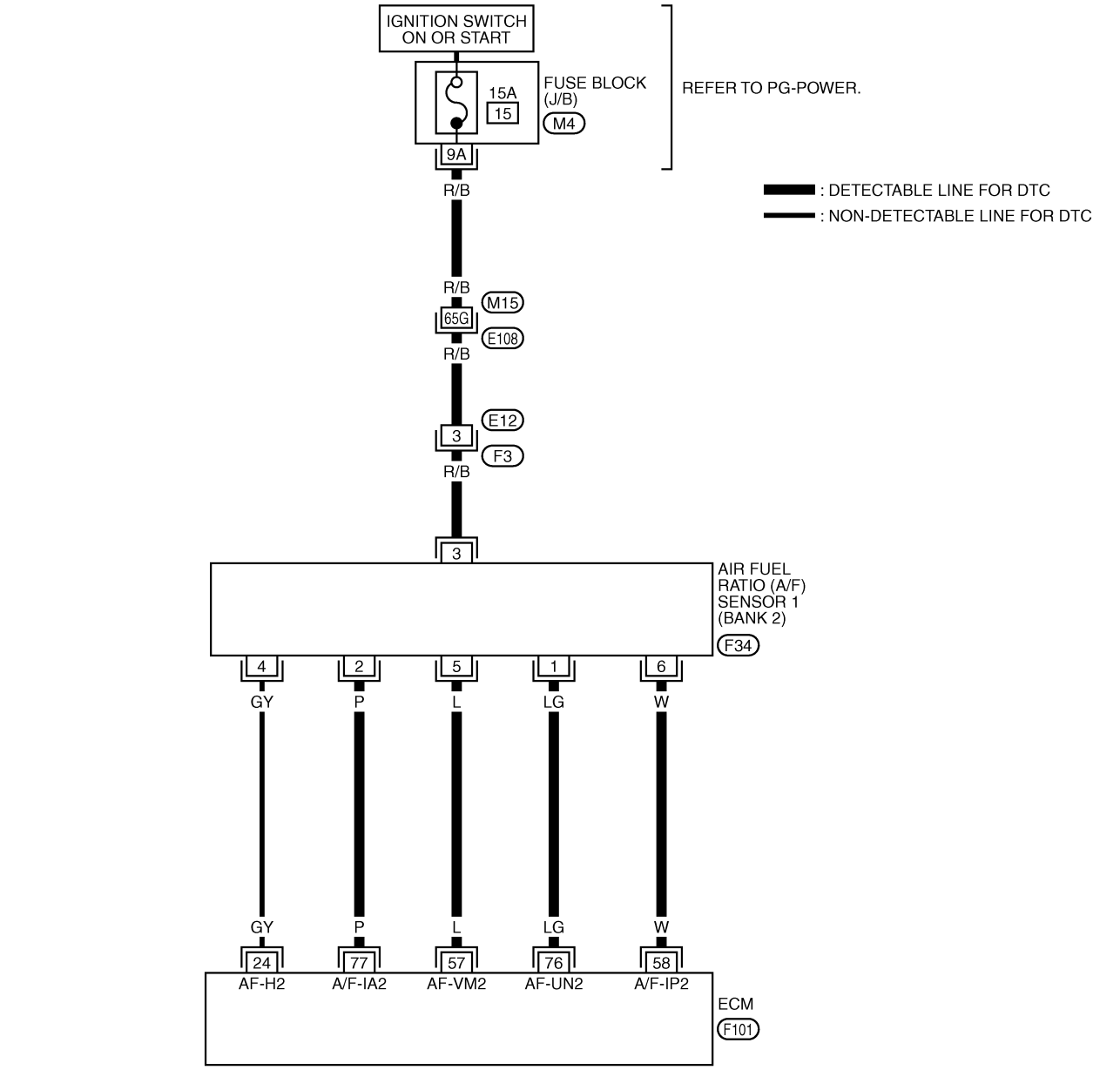
CAUTION:

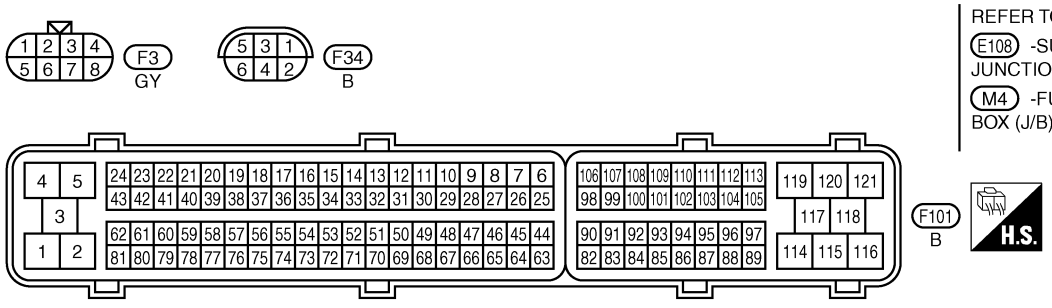
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
16	LG/B	A/F sensor 1 (Bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 3.1V
35	L/W			Approximately 2.6V
56	W/L			Approximately 2.3V
75	P/B			Approximately 2.3V

BANK 2

EC-AF1B2-01





TBWT0707E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

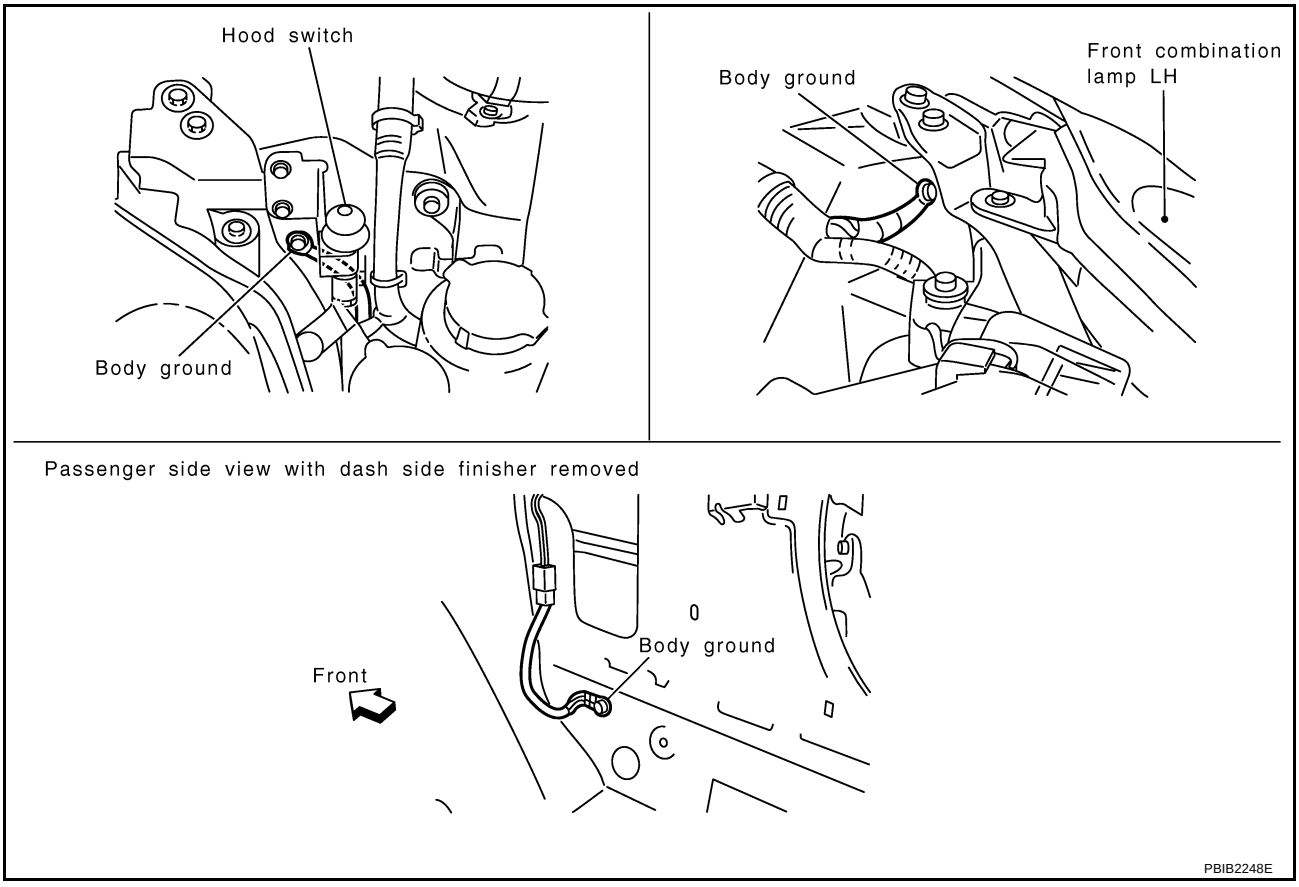
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
57	L	A/F sensor 1 (Bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 2.6V
58	W			Approximately 2.3V
76	LG			Approximately 3.1V
77	P			Approximately 2.3V

Diagnostic Procedure

ABS00A8J

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

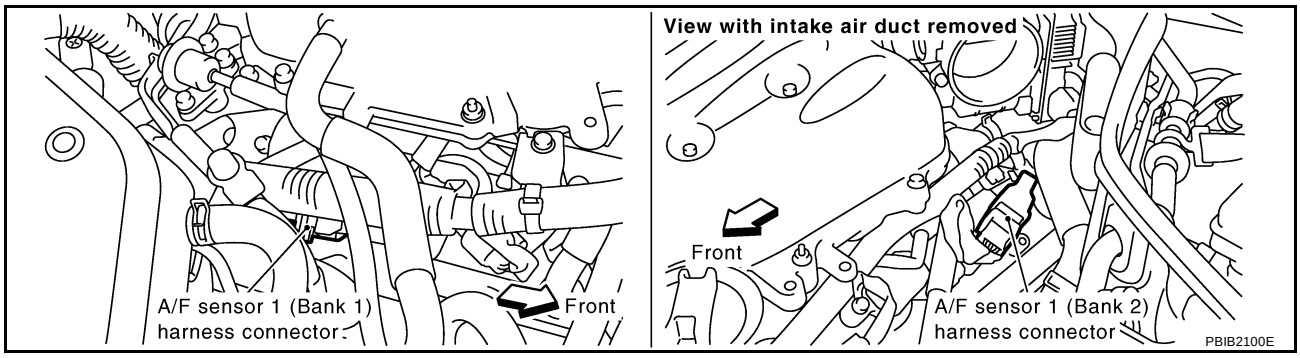


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

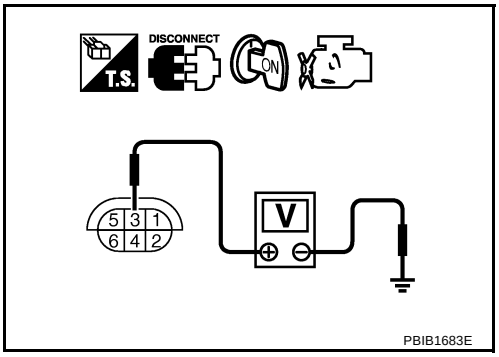
2. CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY CIRCUIT

1. Disconnect A/F sensor 1 harness connector.



2. Turn ignition switch ON.
3. Check voltage between A/F sensor 1 terminal 3 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M15, E108
- Harness connectors E12, F3
- Fuse block (J/B) connector M4
- 15A fuse
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

4. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between the following terminals.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	16	1	76
2	75	2	77
5	35	5	57
6	56	6	58

Continuity should exist.

4. Check harness continuity between the following terminals and ground.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	16	1	76
2	75	2	77
5	35	5	57
6	56	6	58

Continuity should not exist.

5. Also check harness for short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK INTERMITTENT INCIDENT

Perform EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace A/F sensor 1.
NG >> Repair or replace.

Removal and Installation

ABS00A8K

AIR FUEL RATIO (A/F) SENSOR 1

Refer to EM-23, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

DTC P1273, P1283 A/F SENSOR 1

PFP:22693

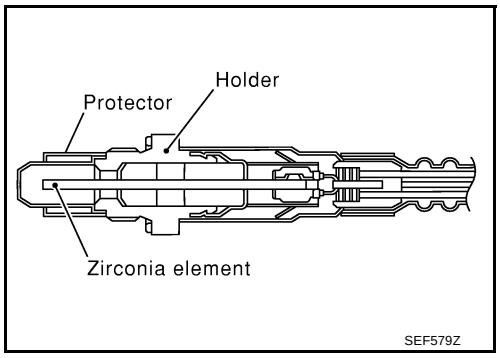
Component Description

ABS00A8L

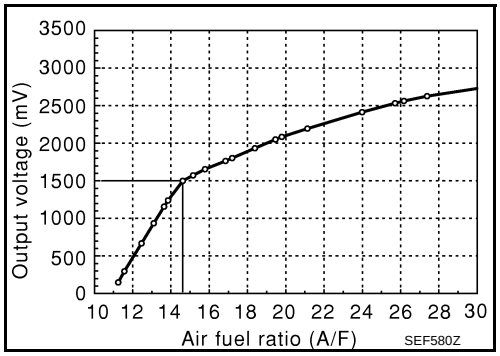
The air fuel ratio (A/F) sensor 1 is a planar dual-cell limit current sensor. The sensor element of the A/F sensor 1 is the combination of a Nernst concentration cell (sensor cell) with an oxygen-pump cell, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range ($0.7 < \lambda <$ air).

The exhaust gas components diffuse through the diffusion gap at the electrode of the oxygen pump and Nernst concentration cell, where they are brought to thermodynamic balance.



An electronic circuit controls the pump current through the oxygen-pump cell so that the composition of the exhaust gas in the diffusion gap remains constant at $\lambda = 1$. Therefore, the A/F sensor 1 is able to indicate air/fuel ratio by this pumping of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of 700 - 800°C (1,292 - 1,472°F).



CONSULT-II Reference Value in Data Monitor Mode

ABS00A8M

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
A/F SEN1 (B1) A/F SEN1 (B2)	● Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 1.5V

On Board Diagnosis Logic

ABS00A8N

To judge the malfunction, the A/F signal computed by ECM from the A/F sensor 1 signal is monitored not to be shifted LEAN side or RICH side.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible Cause
P1273 1273 (Bank 1) P1283 1283 (Bank 2)	Air fuel ratio (A/F) sensor 1 lean shift monitoring	● The output voltage computed by ECM from the A/F sensor 1 signal is shifted to the lean side for a specified period.	● Air fuel ratio (A/F) sensor 1 ● Air fuel ratio (A/F) sensor 1 heater ● Fuel pressure ● Fuel injector ● Intake air leaks

DTC Confirmation Procedure

ABS00A8O

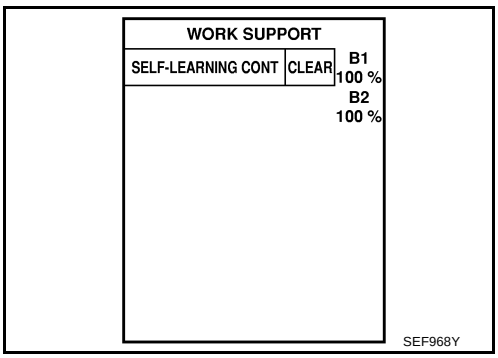
NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

WITH CONSULT-II

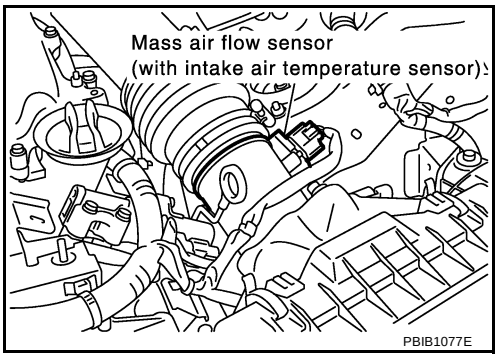
1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON and select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-II.

4. Clear the self-learning coefficient by touching “CLEAR”.
5. Turn ignition switch OFF and wait at least 10 seconds.
6. Start engine and keep the engine speed between 3,500 and 4,000 rpm for 1 minute under no load.
7. Let engine idle for 1 minute.
8. Keep engine speed between 2,500 and 3,000 rpm for 20 minutes.
9. If 1st trip DTC is detected, go to EC-483, "Diagnostic Procedure" .



WITH GST

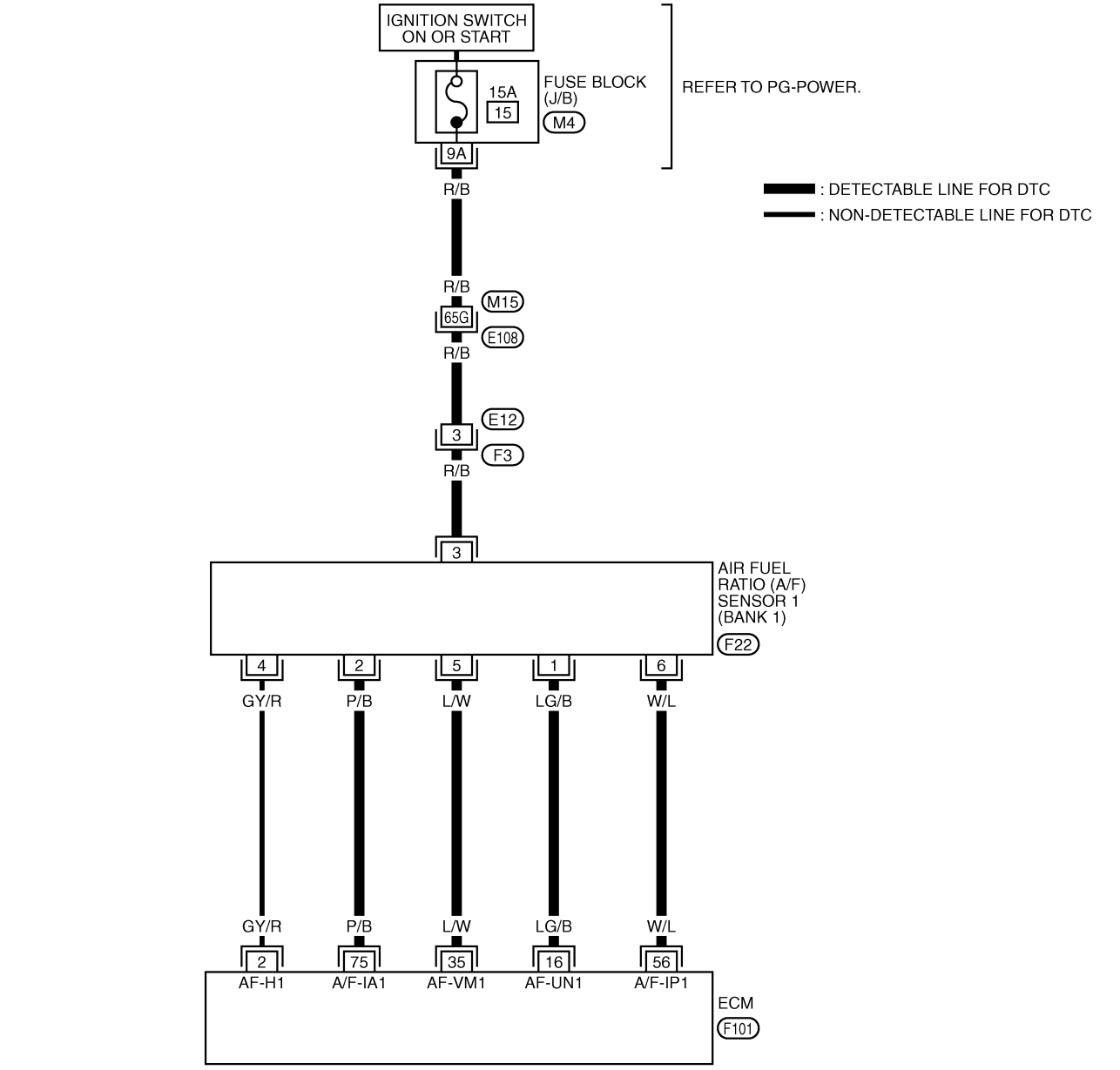
1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Disconnect mass air flow sensor harness connector.
4. Start engine and let it idle for at least 5 seconds.
5. Stop engine and reconnect mass air flow sensor harness connector.
6. Select “MODE 3” with GST and make sure that DTC P0102 is detected.
7. Select “MODE 4” with GST and erase the DTC P0102.
8. Start engine and keep the engine speed between 3,500 and 4,000 rpm for 1 minute under no load.
9. Let engine idle for 1 minute.
10. Keep engine speed between 2,500 and 3,000 rpm for 20 minutes.
11. Select “MODE 7” with GST.
    If 1st trip DTC is detected, go to EC-483, "Diagnostic Procedure" .

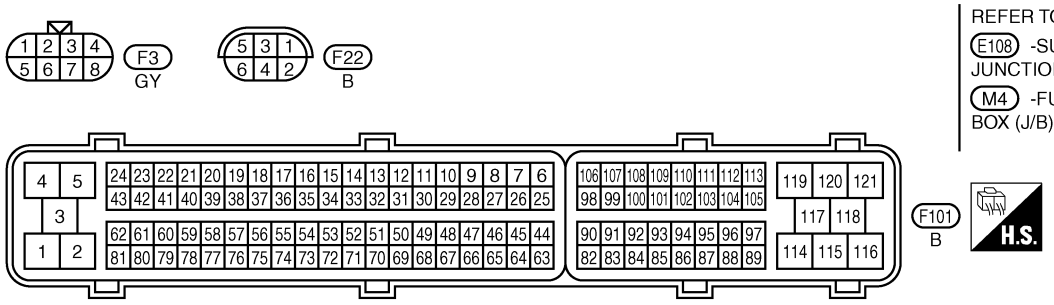


Wiring Diagram
BANK 1

ABS00A8P

EC-AF1B1-01





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT0706E

Specification data are reference values and are measured between each terminal and ground.

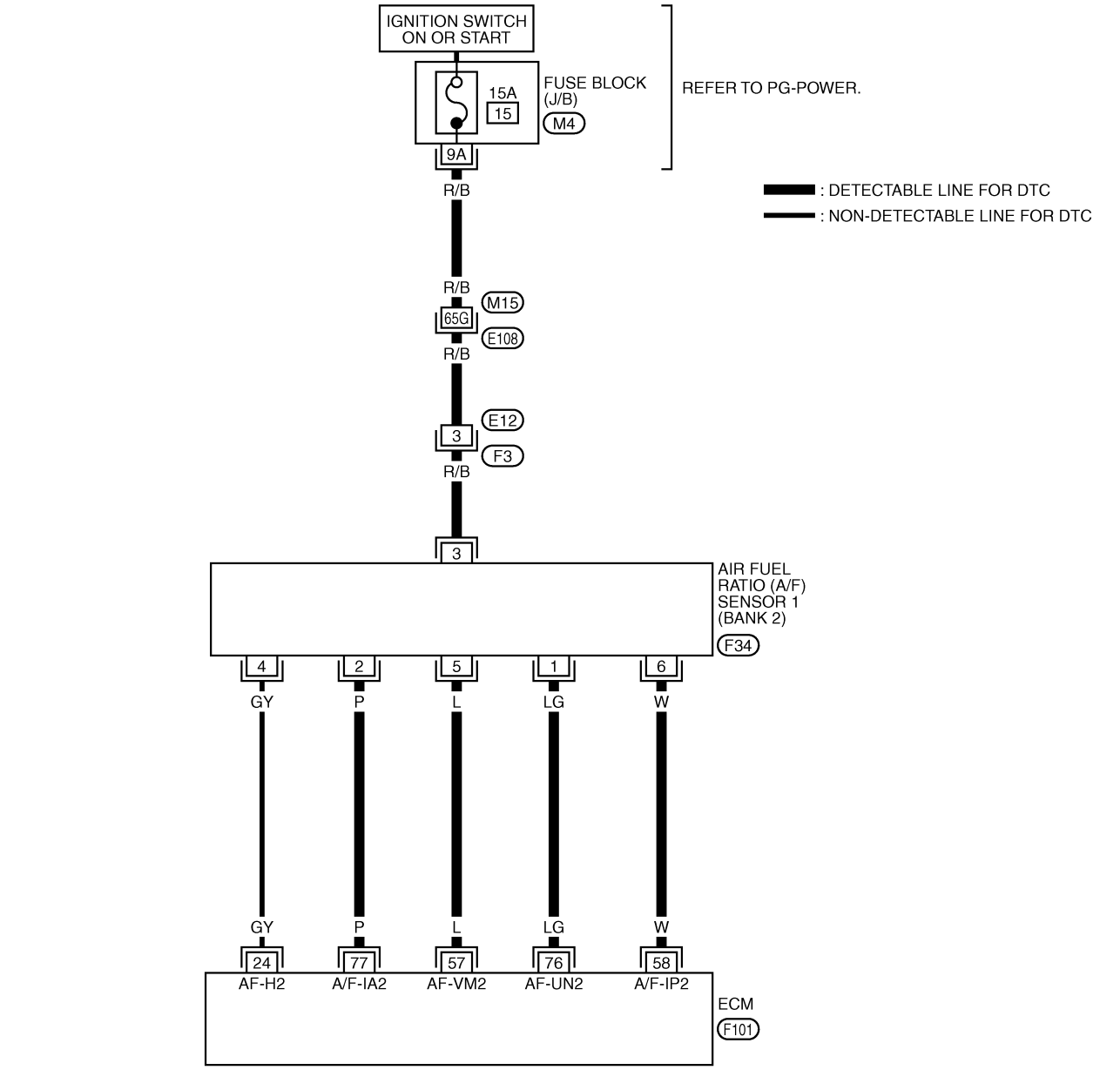
CAUTION:

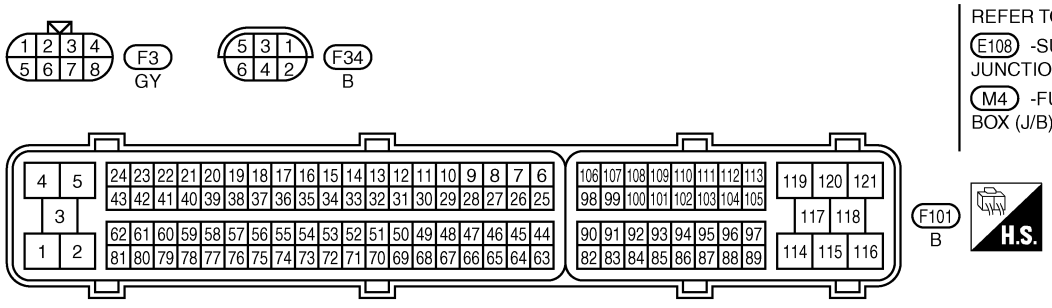
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
16	LG/B	A/F sensor 1 (Bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 3.1V
35	L/W			Approximately 2.6V
56	W/L			Approximately 2.3V
75	P/B			Approximately 2.3V

BANK 2

EC-AF1B2-01





TBWT0707E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

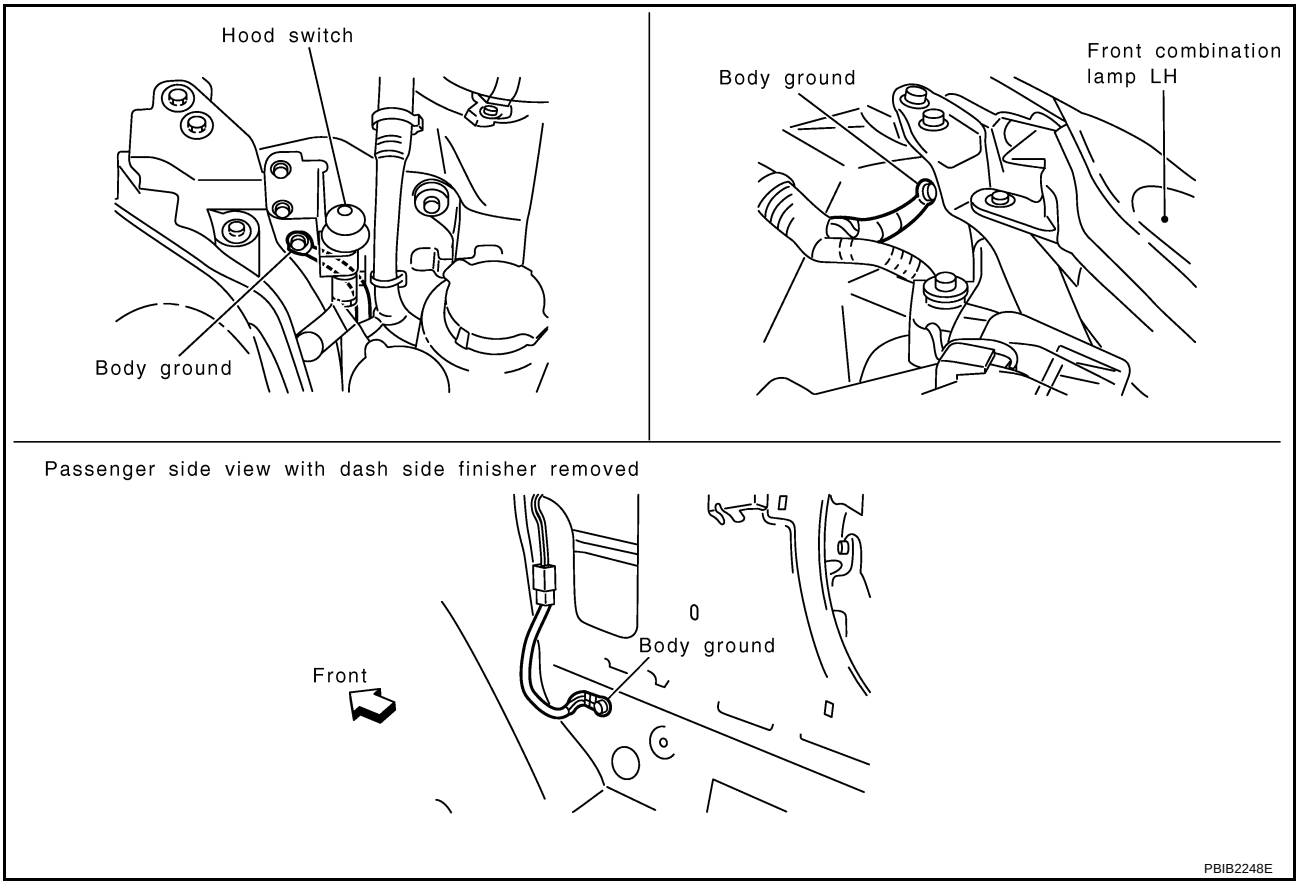
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
57	L	A/F sensor 1 (Bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 2.6V
58	W			Approximately 2.3V
76	LG			Approximately 3.1V
77	P			Approximately 2.3V

Diagnostic Procedure

ABS00A8Q

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

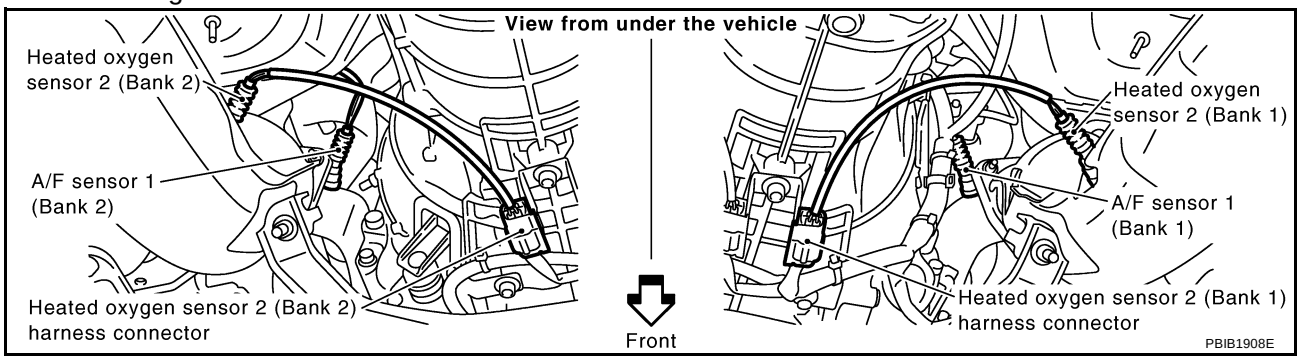


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. RETIGHTEN A/F SENSOR 1

Loosen and retighten the A/F sensor 1.



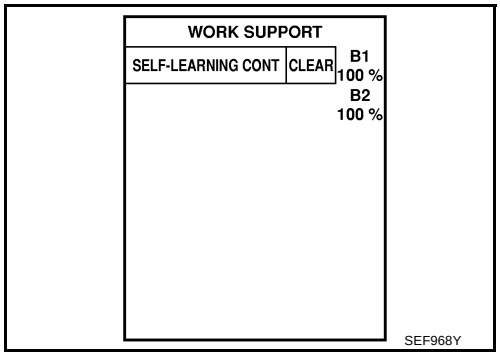
Tightening torque: 40 - 60 N-m (4.1 - 6.1 kg-m, 30 - 44 ft-lb)

>> GO TO 3.

3. CLEAR THE SELF-LEARNING DATA

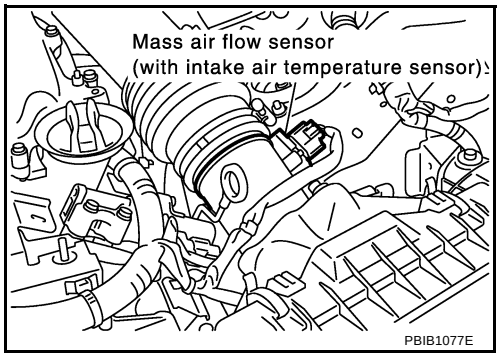
With CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-II.
3. Clear the self-learning control coefficient by touching “CLEAR”.
4. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171 or P0174 detected?
   Is it difficult to start engine?



Without CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF.
3. Disconnect mass air flow sensor harness connector.
4. Restart engine and let it idle for at least 5 seconds.
5. Stop engine and reconnect mass air flow sensor harness connector.
6. Make sure DTC P0102 is displayed.
7. Erase the DTC memory. Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .
8. Make sure DTC P0000 is displayed.
9. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171 or P0174 detected?
   Is it difficult to start engine?

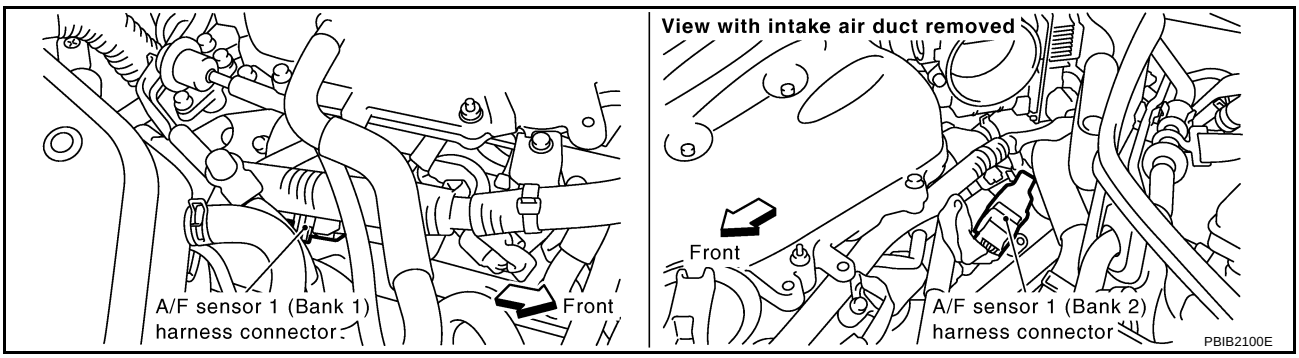


Yes or No

Yes >> Perform trouble diagnosis for DTC P0171 or P0174. Refer to EC-219 .
No >> GO TO 4.

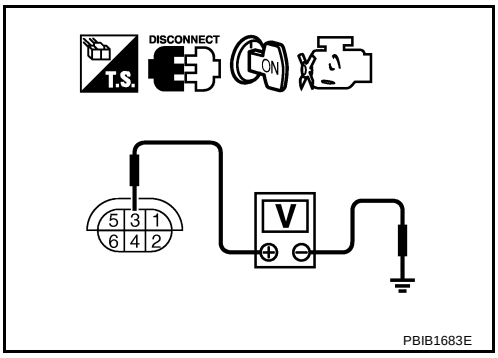
4. CHECK A/F SENSOR 1 POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect A/F sensor 1 harness connector.



3. Turn ignition switch ON.
4. Check voltage between A/F sensor 1 terminal 3 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M15, E108
- Harness connectors E12, F3
- Fuse block (J/B) connector M4
- 15A fuse
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

6. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between the following terminals.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	16	1	76
2	75	2	77
5	35	5	57
6	56	6	58

Continuity should exist.

4. Check harness continuity between the following terminals and ground.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	16	1	76
2	75	2	77
5	35	5	57
6	56	6	58

Continuity should not exist.

5. Also check harness for short to power.

OK or NG

OK >> GO TO 7.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK A/F SENSOR 1 HEATER

Refer to EC-384, "Component Inspection" .

OK or NG

OK >> GO TO 8.
NG >> Replace A/F sensor 1.

8. CHECK INTERMITTENT INCIDENT

Perform EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace A/F sensor 1.
NG >> Repair or replace.

Removal and Installation

ABS00A8R

AIR FUEL RATIO (A/F) SENSOR 1

Refer to EM-23, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

DTC P1274, P1284 A/F SENSOR 1

PFP:22693

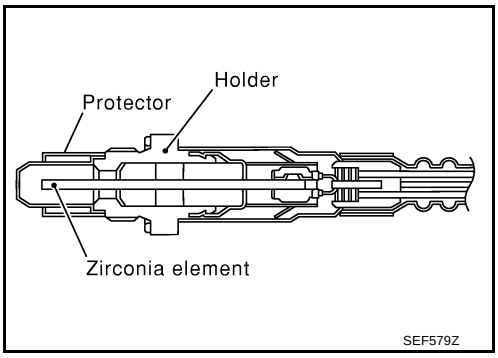
Component Description

ABS00A8S

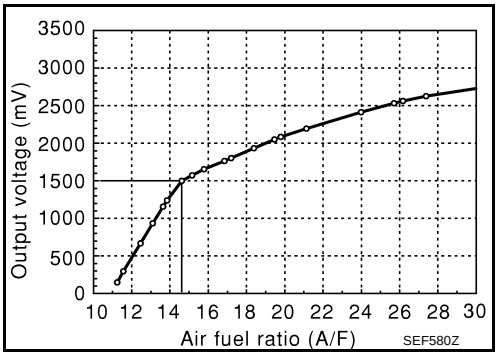
The air fuel ratio (A/F) sensor 1 is a planar dual-cell limit current sensor. The sensor element of the A/F sensor 1 is the combination of a Nernst concentration cell (sensor cell) with an oxygen-pump cell, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range ($0.7 < \lambda <$ air).

The exhaust gas components diffuse through the diffusion gap at the electrode of the oxygen pump and Nernst concentration cell, where they are brought to thermodynamic balance.



An electronic circuit controls the pump current through the oxygen-pump cell so that the composition of the exhaust gas in the diffusion gap remains constant at $\lambda = 1$. Therefore, the A/F sensor 1 is able to indicate air/fuel ratio by this pumping of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of 700 - 800°C (1,292 - 1,472°F).



CONSULT-II Reference Value in Data Monitor Mode

ABS00A8T

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
A/F SEN1 (B1) A/F SEN1 (B2)	● Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 1.5V

On Board Diagnosis Logic

ABS00A8U

To judge the malfunction, the A/F signal computed by ECM from the A/F sensor 1 signal is monitored not to be shifted to the LEAN side or RICH side.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible Cause
P1274 1274 (Bank 1)	Air fuel ratio (A/F) sensor 1 rich shift monitoring	● The A/F signal computed by ECM from the A/F sensor 1 signal is shifted to the rich side for a specified period.	● Air fuel ratio (A/F) sensor 1 ● Air fuel ratio (A/F) sensor 1 heater ● Fuel pressure ● Fuel injector
P1284 1284 (Bank 2)			

DTC Confirmation Procedure

ABS00A8V

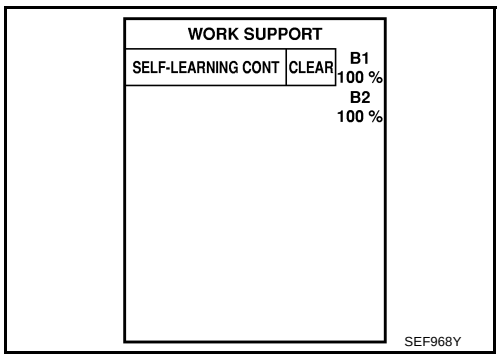
NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

WITH CONSULT-II

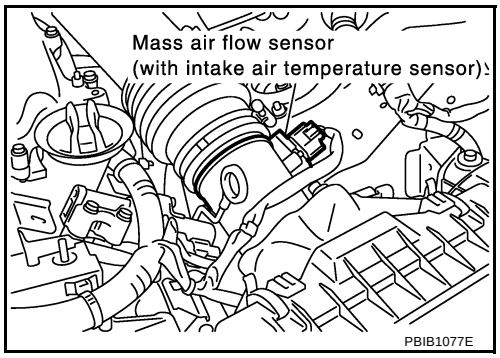
1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON and select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-II.

4. Clear the self-learning coefficient by touching “CLEAR”.
5. Turn ignition switch OFF and wait at least 10 seconds.
6. Start engine and keep the engine speed between 3,500 and 4,000 rpm for 1 minute under no load.
7. Let engine idle for 1 minute.
8. Keep engine speed between 2,500 and 3,000 rpm for 20 minutes.
9. If 1st trip DTC is detected, go to EC-492, "Diagnostic Procedure" .



WITH GST

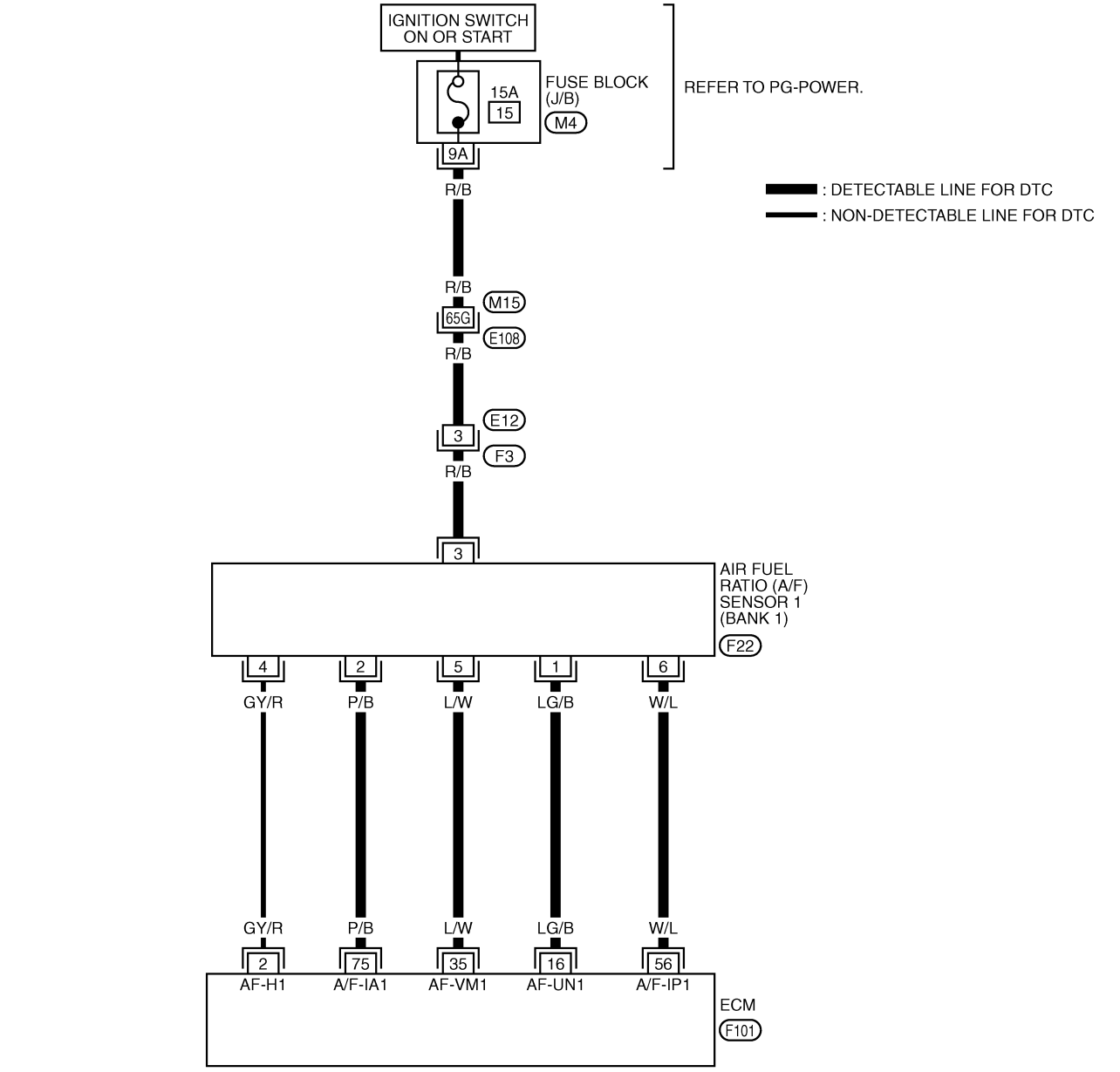
1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Disconnect mass air flow sensor harness connector.
4. Start engine and let it idle for at least 5 seconds.
5. Stop engine and reconnect mass air flow sensor harness connector.
6. Select “MODE 3” with GST and make sure that DTC P0102 is detected.
7. Select “MODE 4” with GST and erase the DTC P0102.
8. Start engine and keep the engine speed between 3,500 and 4,000 rpm for 1 minute under no load.
9. Let engine idle for 1 minute.
10. Keep engine speed between 2,500 and 3,000 rpm for 20 minutes.
11. Select “MODE 7” with GST.
    If 1st trip DTC is detected, go to EC-492, "Diagnostic Procedure" .

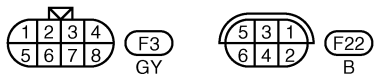


Wiring Diagram
BANK 1

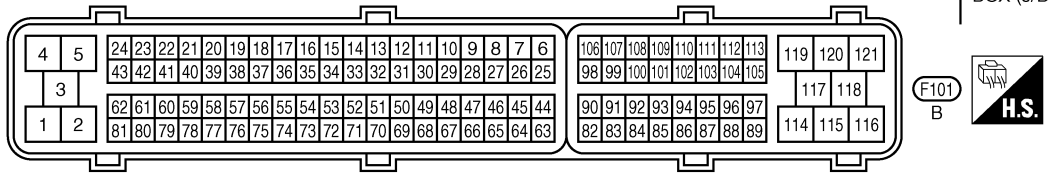
ABS00A8W

EC-AF1B1-01





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)



TBWT0706E

Specification data are reference values and are measured between each terminal and ground.

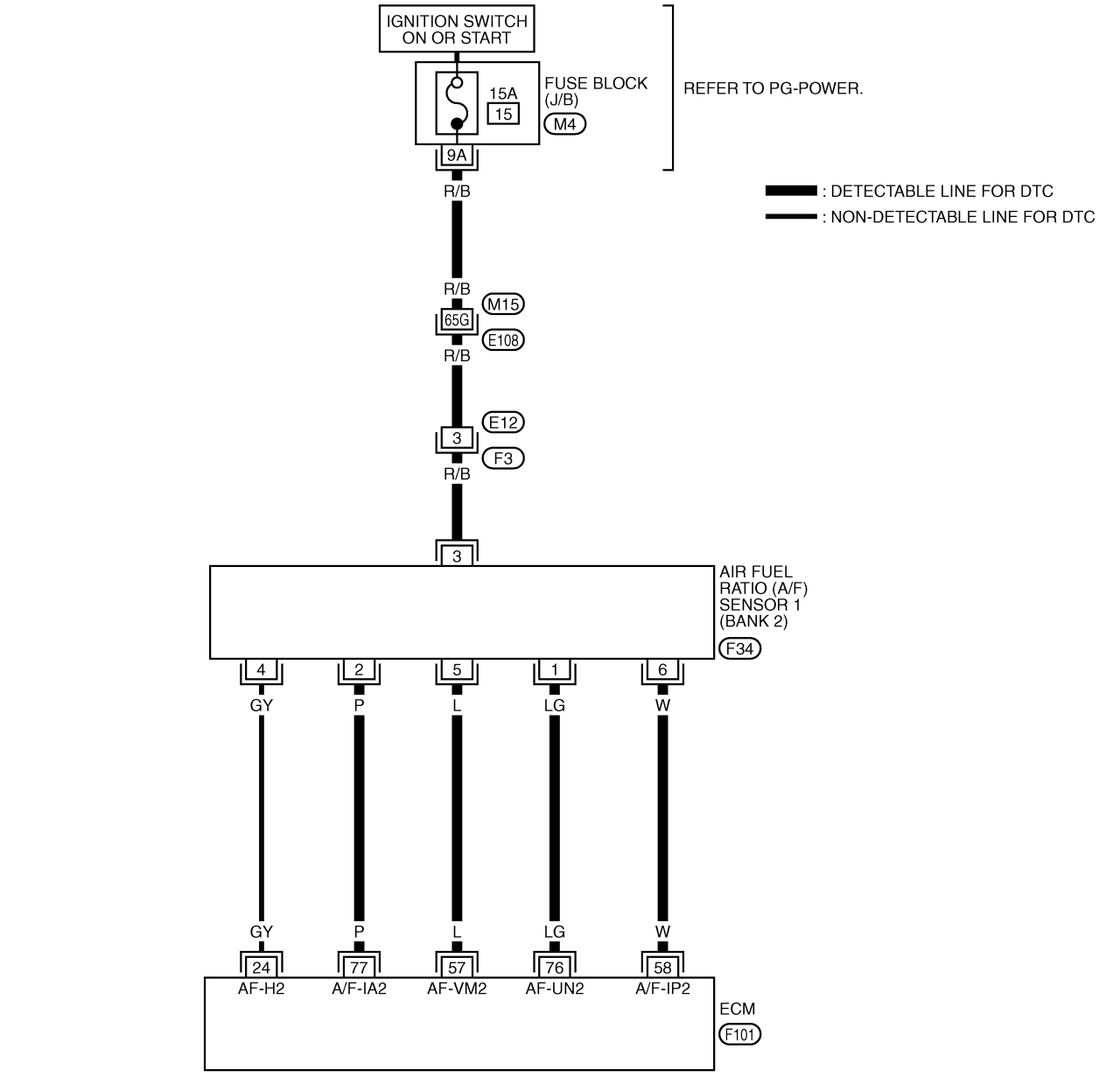
CAUTION:

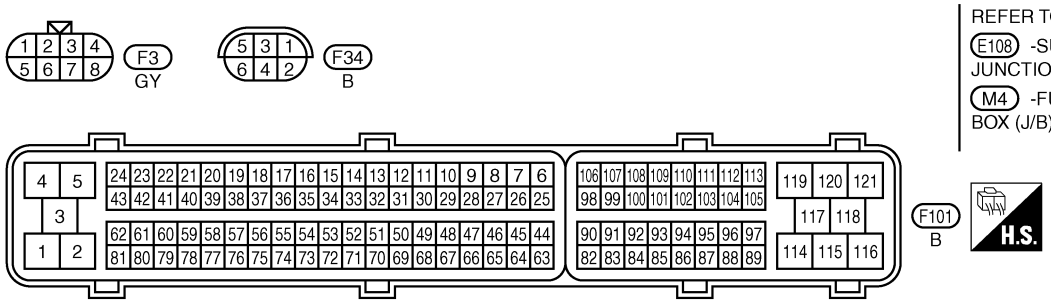
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
16	LG/B	A/F sensor 1 (Bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 3.1V
35	L/W			Approximately 2.6V
56	W/L			Approximately 2.3V
75	P/B			Approximately 2.3V

BANK 2

EC-AF1B2-01





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT0707E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

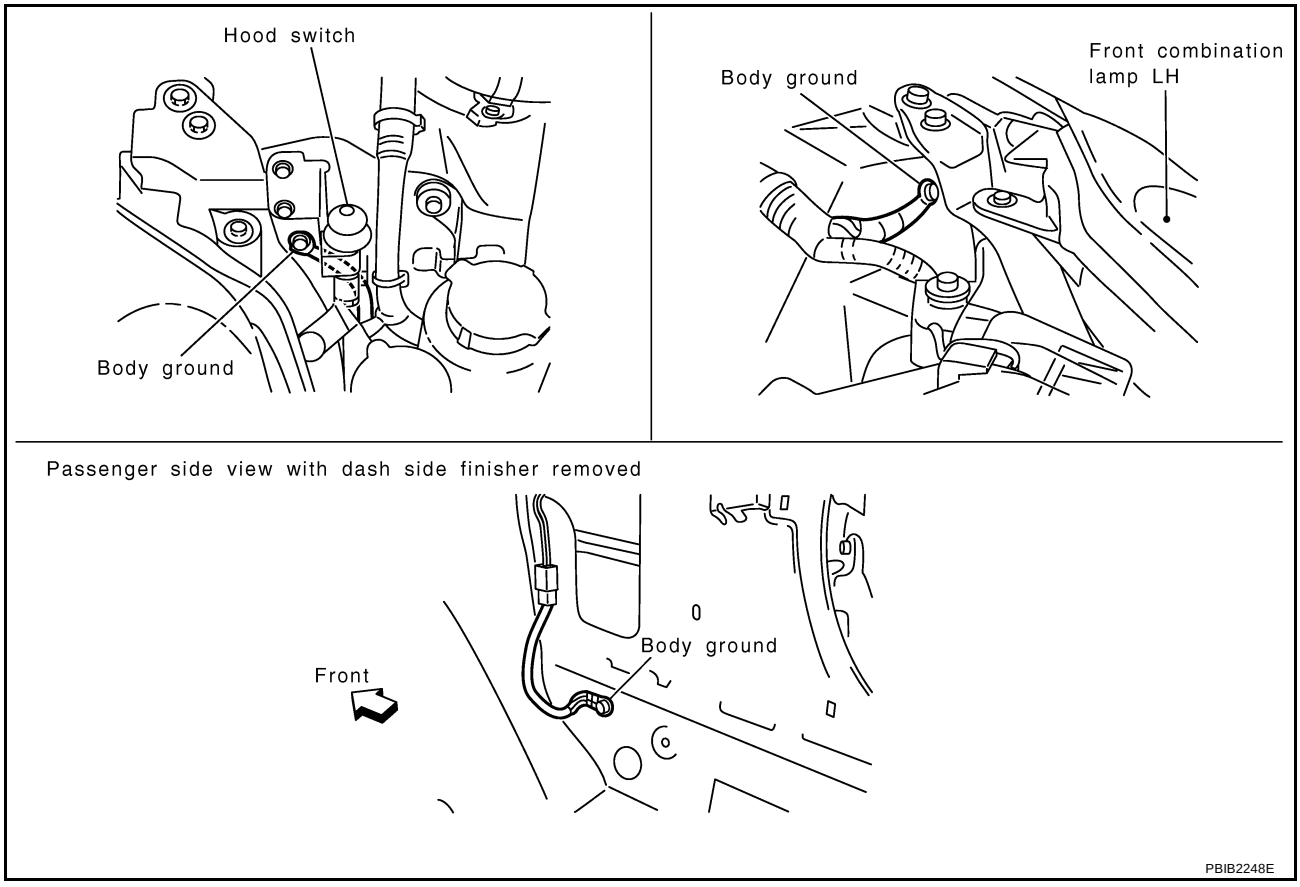
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
57	L	A/F sensor 1 (Bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 2.6V
58	W			Approximately 2.3V
76	LG			Approximately 3.1V
77	P			Approximately 2.3V

Diagnostic Procedure

ABS00A8X

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

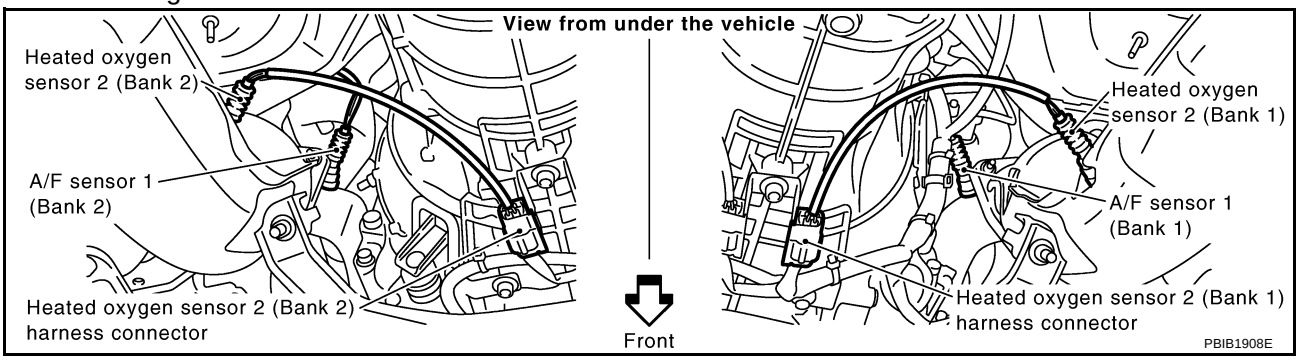


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. RETIGHTEN A/F SENSOR 1

Loosen and retighten the A/F sensor 1.



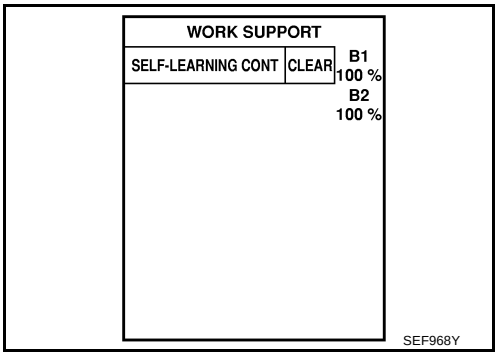
Tightening torque: 40 - 60 N-m (4.1 - 6.1 kg-m, 30 - 44 ft-lb)

>> GO TO 3.

3. CLEAR THE SELF-LEARNING DATA.

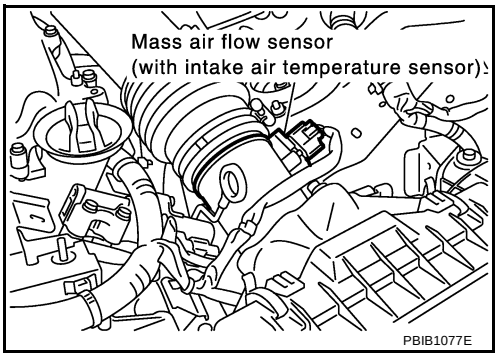
With CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-II.
3. Clear the self-learning control coefficient by touching “CLEAR”.
4. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0172 or P0175 detected?
   Is it difficult to start engine?



Without CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF.
3. Disconnect mass air flow sensor harness connector.
4. Restart engine and let it idle for at least 5 seconds.
5. Stop engine and reconnect mass air flow sensor harness connector.
6. Make sure DTC P0102 is displayed.
7. Erase the DTC memory. Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .
8. Make sure DTC P0000 is displayed.
9. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0172 or P0175 detected?
   Is it difficult to start engine?

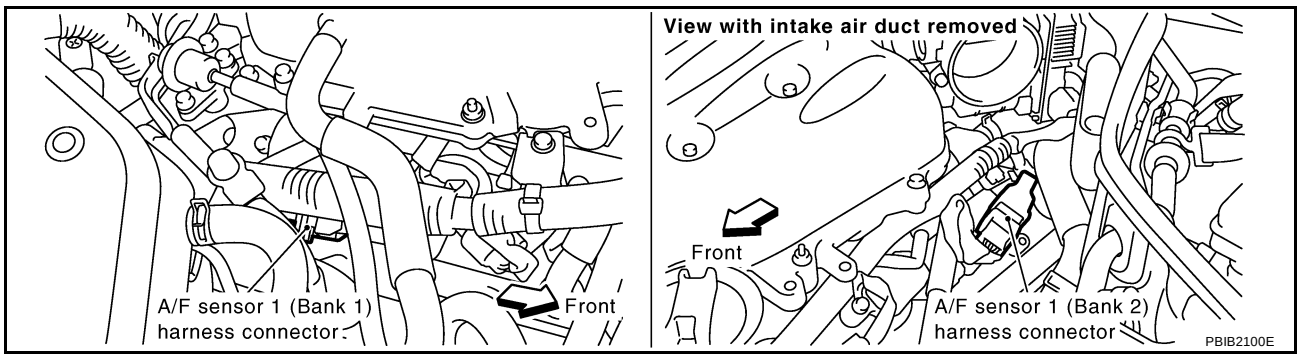


Yes or No

Yes >> Perform trouble diagnosis for DTC P0172 or P0175. Refer to EC-228 .
No >> GO TO 4.

4. CHECK HARNESS CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect A/F sensor 1 harness connector.



3. Check harness connector for water.
   Water should not exit.

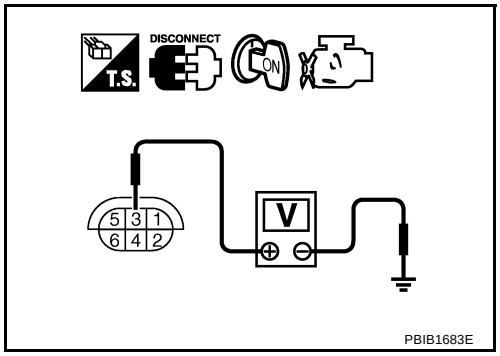
OK or NG

OK >> GO TO 5.
NG >> Repair or replace harness connector.

5. CHECK A/F SENSOR 1 POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between A/F sensor 1 terminal 3 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M15, E108
- Harness connectors E12, F3
- Fuse block (J/B) connector M4
- 15A fuse
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

7. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between the following terminals.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	16	1	76
2	75	2	77
5	35	5	57
6	56	6	58

Continuity should exist.

4. Check harness continuity between the following terminals and ground.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	16	1	76
2	75	2	77
5	35	5	57
6	56	6	58

Continuity should not exist.

5. Also check harness for short to power.

OK or NG

OK >> GO TO 8.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK A/F SENSOR 1 HEATER

Refer to EC-384, "Component Inspection" .

OK or NG

OK >> GO TO 9.
NG >> Replace A/F sensor 1.

9. CHECK INTERMITTENT INCIDENT

Perform EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace A/F sensor 1.
NG >> Repair or replace.

Removal and Installation

ABS00A8Y

AIR FUEL RATIO (A/F) SENSOR 1

Refer to EM-23, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

DTC P1276, P1286 A/F SENSOR 1

PFP:22693

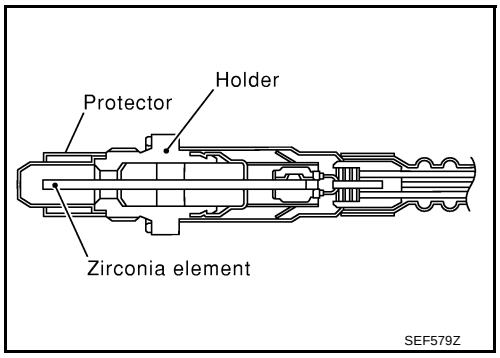
Component Description

ABS00A8Z

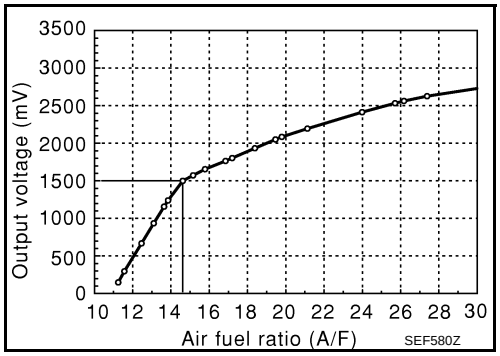
The air fuel ratio (A/F) sensor 1 is a planar dual-cell limit current sensor. The sensor element of the A/F sensor 1 is the combination of a Nernst concentration cell (sensor cell) with an oxygen-pump cell, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range ($0.7 < \lambda <$ air).

The exhaust gas components diffuse through the diffusion gap at the electrode of the oxygen pump and Nernst concentration cell, where they are brought to thermodynamic balance.



An electronic circuit controls the pump current through the oxygen-pump cell so that the composition of the exhaust gas in the diffusion gap remains constant at $\lambda = 1$. Therefore, the A/F sensor 1 is able to indicate air/fuel ratio by this pumping of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of 700 - 800°C (1,292 - 1,472°F).



CONSULT-II Reference Value in Data Monitor Mode

ABS00A90

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
A/F SEN1 (B1) A/F SEN1 (B2)	● Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 1.5V

On Board Diagnosis Logic

ABS00A91

To judge the malfunction, the diagnosis checks that the A/F signal computed by ECM from the A/F sensor 1 signal fluctuates according to fuel feedback control.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible Cause
P1276 1276 (Bank 1)	Air fuel ratio (A/F) sensor 1 circuit high voltage	● The A/F signal computed by ECM from the A/F sensor 1 signal is constantly approx. 1.5V.	● Harness or connectors (The A/F sensor 1 circuit is open or shorted.) ● Air fuel ratio (A/F) sensor 1
P1286 1286 (Bank 2)			

DTC Confirmation Procedure

ABS00A92

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

WITH CONSULT-II

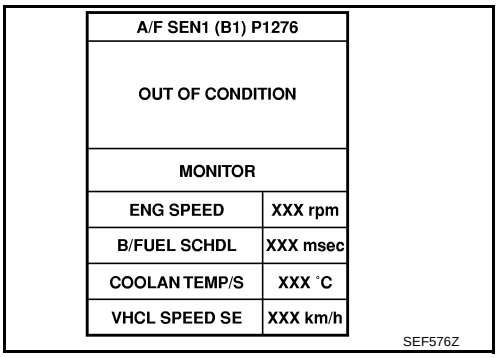
1. Start engine and warm it up to normal operating temperature.
2. Select “A/F SEN1 (B1)” or “A/F SEN1 (B2)” in “DATA MONITOR” mode with CONSULT-II.
3. Check “A/F SEN1 (B1)” or “A/F SEN1 (B2)” indication.

If the indication is constantly approx. 1.5V and does not fluctuates, go to EC-502, "Diagnostic Procedure" .
If the indication fluctuates around 1.5V, go to next step.

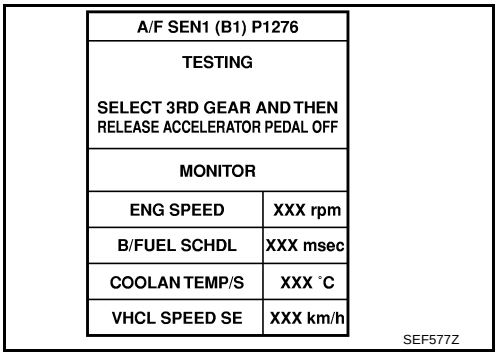
4. Select “A/F SEN1 (B1) P1276” or “A/F SEN1 (B2) P1286” of “A/F SEN1” in “DTC WORK SUPPORT” mode with CONSULT-II.
5. Touch “START”.
6. When the following conditions are met, “TESTING” will be displayed on the CONSULT-II screen.

ENG SPEED	1,100 - 3,200 rpm
Vehicle speed	More than 64 km/h (46 MPH)
B/FUEL SCHDL	1.0 - 8.0 msec
Shift lever	● D position with “OD” ON (A/T) ● 5th position (M/T)

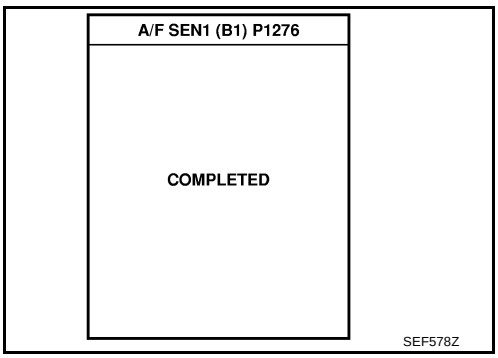
If “TESTING” is not displayed after 20 seconds, retry from step 2.



7. Release accelerator pedal fully.
   NOTE:
   Never apply brake during releasing the accelerator pedal.



8. Make sure that “TESTING” changes to “COMPLETED”.
   If “TESTING” changed to “OUT OF CONDITION”, retry from step 6.
9. Make sure that “OK” is displayed after touching “SELF-DIAG RESULT”.
   If “NG” is displayed, go to EC-502, "Diagnostic Procedure" .



Overall Function Check

ABS00A93

Use this procedure to check the overall function of the A/F sensor 1 circuit. During this check, a 1st trip DTC might not be confirmed.

WITH GST

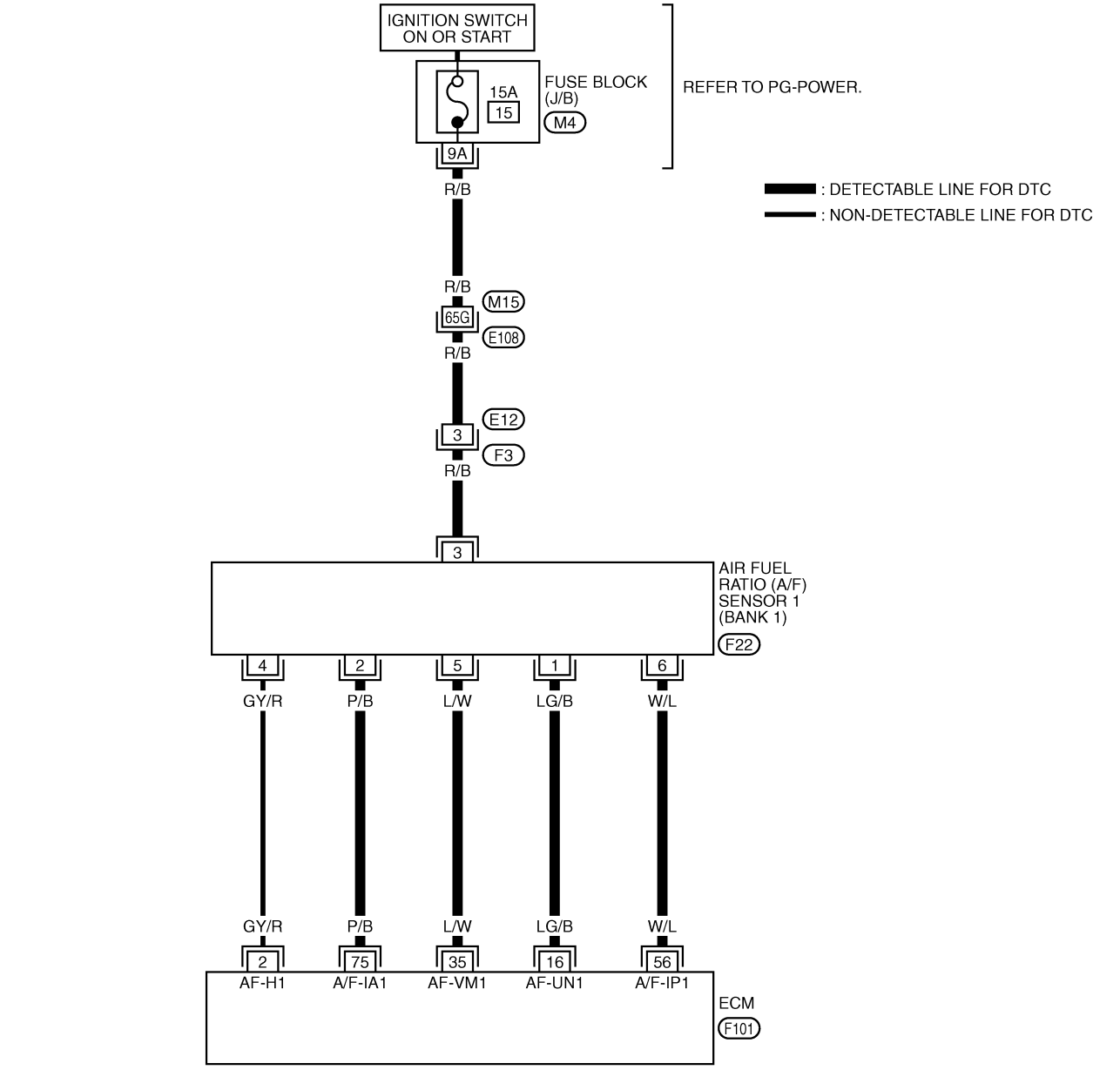
1. Start engine and warm it up to normal operating temperature.
2. Drive the vehicle at a speed of 80 km/h (50 MPH) for a few minutes in the suitable gear position.
3. Set D position with “OD” ON (A/T) or 5th position (M/T), then release the accelerator pedal fully until the vehicle speed decreases to 50 km/h (30 MPH).
   NOTE:
   Never apply brake during releasing the accelerator pedal.
4. Repeat steps 2 to 3 for five times.
5. Stop the vehicle and turn ignition switch OFF.
6. Wait at least 10 seconds and restart engine.
7. Repeat steps 2 to 3 for five times.

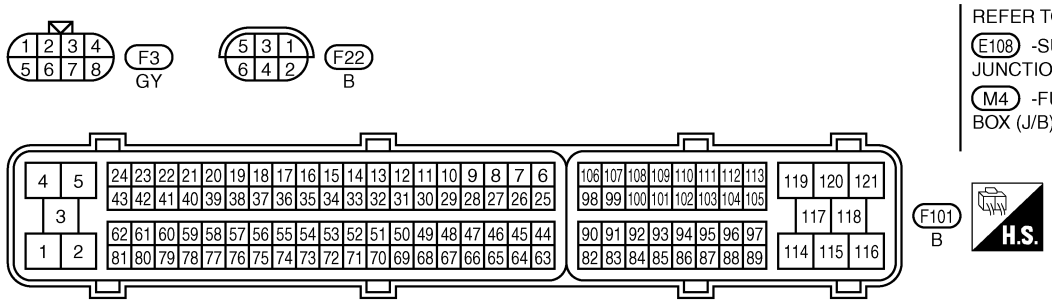
8. Stop the vehicle and connect GST to the vehicle.
9. Make sure that no DTC is displayed.
   If the DTC is displayed, go to EC-502, "Diagnostic Procedure" .

Wiring Diagram
BANK 1

ABS00A94

EC-AF1B1-01





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT0706E

Specification data are reference values and are measured between each terminal and ground.

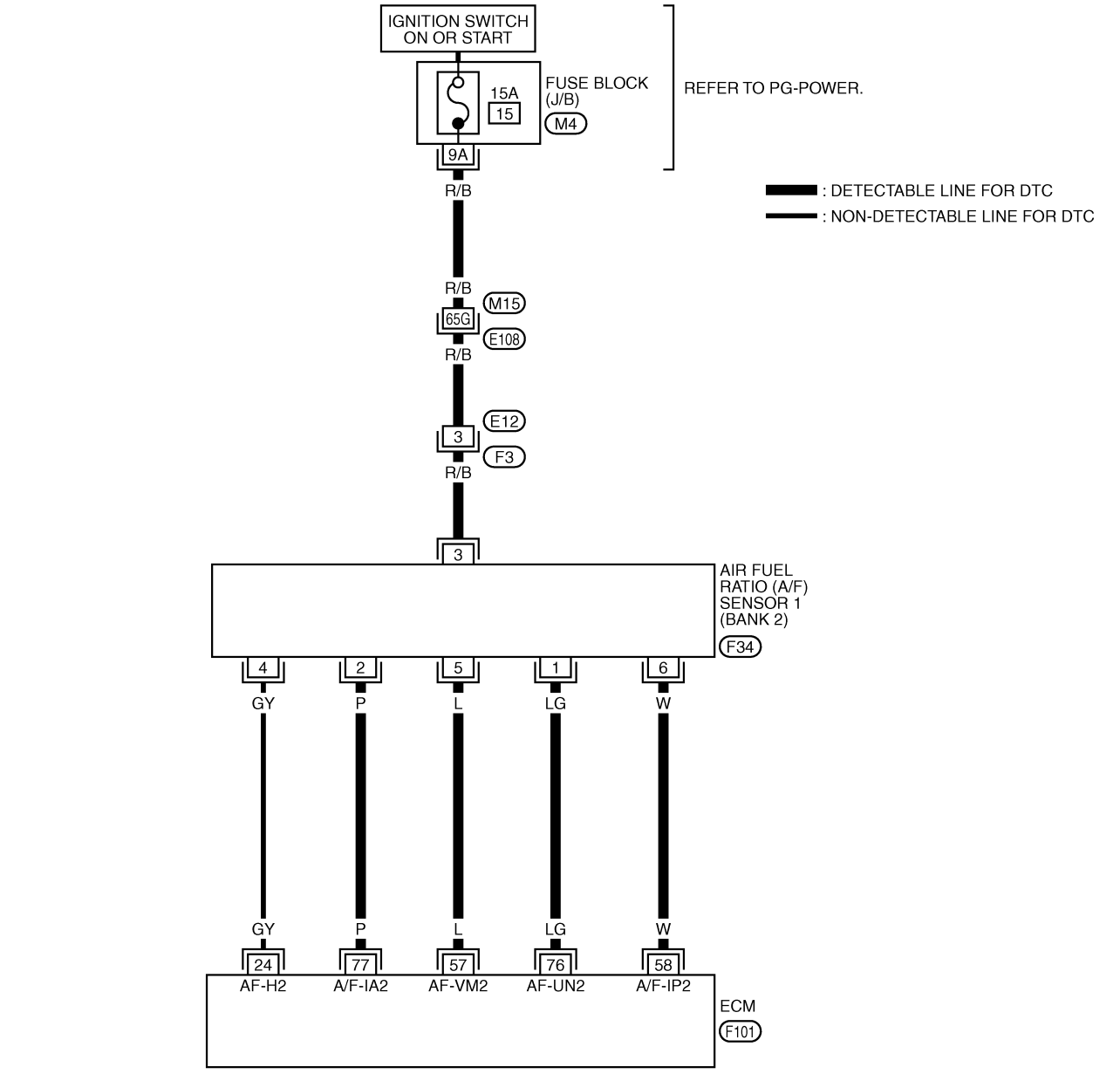
CAUTION:

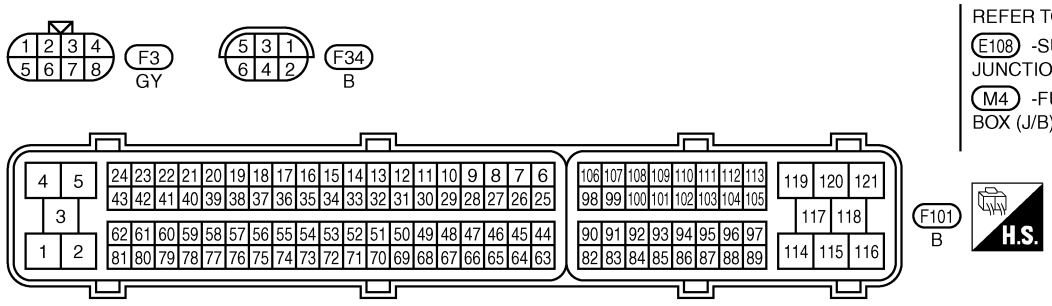
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
16	LG/B	A/F sensor 1 (Bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 3.1V
35	L/W			Approximately 2.6V
56	W/L			Approximately 2.3V
75	P/B			Approximately 2.3V

BANK 2

EC-AF1B2-01





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT0707E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

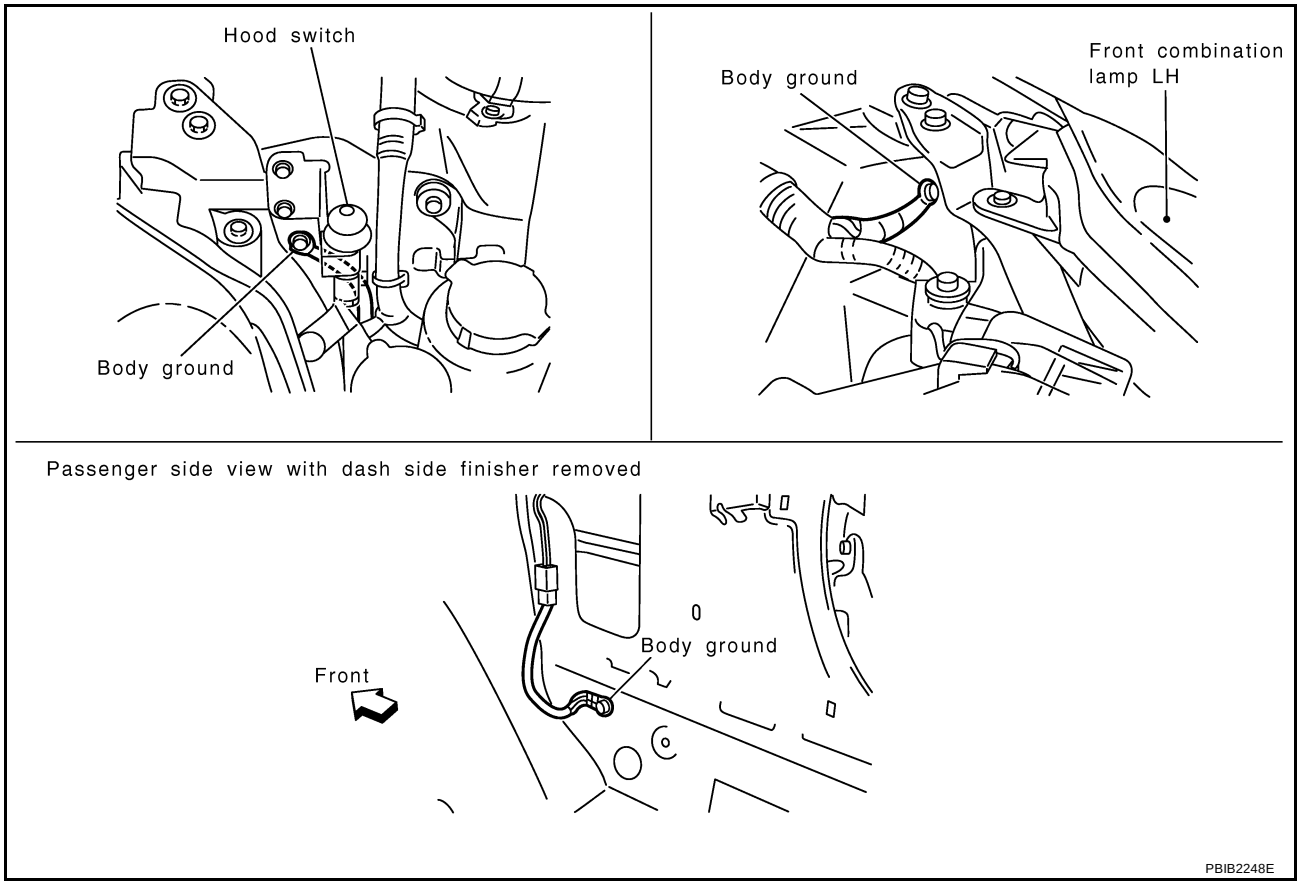
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
57	L	A/F sensor 1 (Bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 2.6V
58	W			Approximately 2.3V
76	LG			Approximately 3.1V
77	P			Approximately 2.3V

Diagnostic Procedure

ABS00A95

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

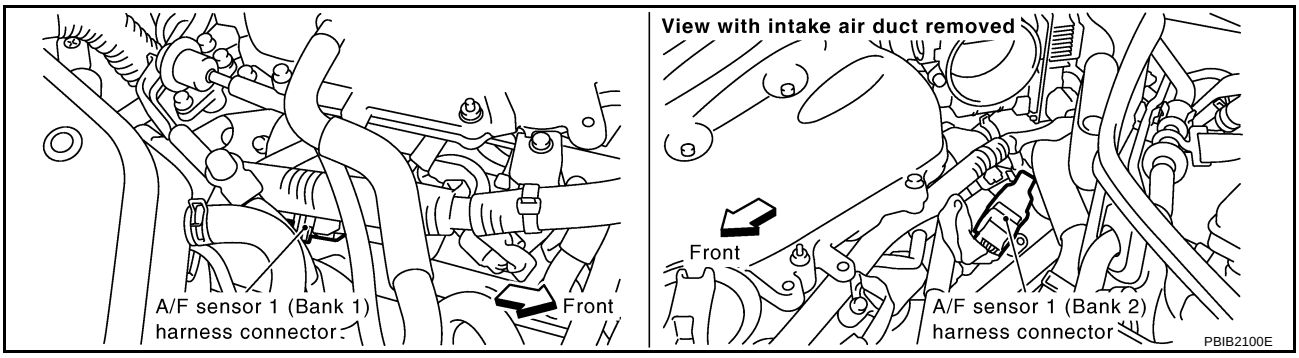


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

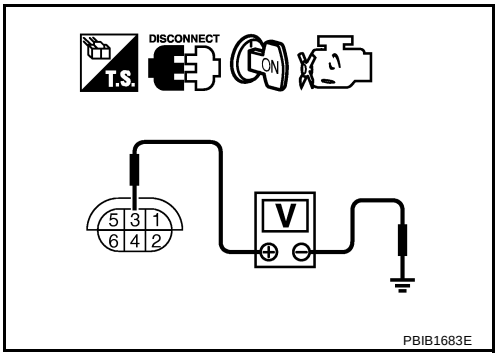
2. CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY CIRCUIT

1. Disconnect A/F sensor 1 harness connector.



2. Turn ignition switch ON.
3. Check voltage between A/F sensor 1 terminal 3 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M15, E108
- Harness connectors E12, F3
- Fuse block (J/B) connector M4
- 15A fuse
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

4. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between the following terminals.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	16	1	76
2	75	2	77
5	35	5	57
6	56	6	58

Continuity should exist.

4. Check harness continuity between the following terminals and ground.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	16	1	76
2	75	2	77
5	35	5	57
6	56	6	58

Continuity should not exist.

5. Also check harness for short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK INTERMITTENT INCIDENT

Perform EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace A/F sensor 1.
NG >> Repair or replace.

Removal and Installation

ABS00A96

AIR FUEL RATIO (A/F) SENSOR 1

Refer to EM-23, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

DTC P1278, P1288 A/F SENSOR 1

PFP:22693

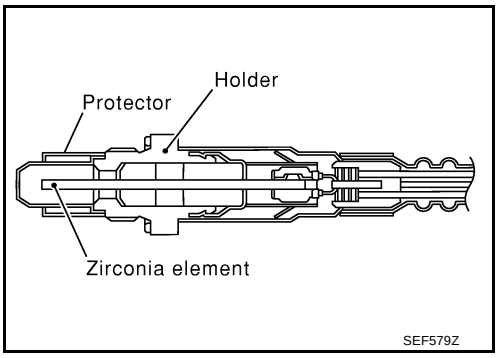
Component Description

ABS00A97

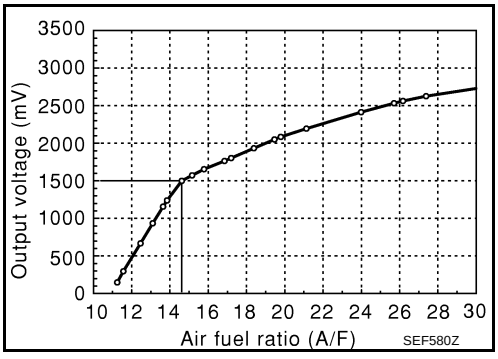
The air fuel ratio (A/F) sensor 1 is a planar dual-cell limit current sensor. The sensor element of the A/F sensor 1 is the combination of a Nernst concentration cell (sensor cell) with an oxygen-pump cell, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range ($0.7 < \lambda <$ air).

The exhaust gas components diffuse through the diffusion gap at the electrode of the oxygen pump and Nernst concentration cell, where they are brought to thermodynamic balance.



An electronic circuit controls the pump current through the oxygen-pump cell so that the composition of the exhaust gas in the diffusion gap remains constant at $\lambda = 1$. Therefore, the A/F sensor 1 is able to indicate air/fuel ratio by this pumping of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of 700 - 800°C (1,292 - 1,472°F).



CONSULT-II Reference Value in Data Monitor Mode

ABS00A98

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
A/F SEN1 (B1) A/F SEN1 (B2)	● Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 1.5V

On Board Diagnosis Logic

ABS00A99

To judge the malfunction of A/F sensor 1, this diagnosis measures response time of the A/F signal computed by ECM from the A/F sensor 1 signal. The time is compensated by engine operating (speed and load), fuel feedback control constant, and the A/F sensor 1 temperature index. Judgment is based on whether the compensated time (the A/F signal cycling time index) is inordinately long or not.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible Cause
P1278 1278 (Bank 1)	Air fuel ratio (A/F) sensor 1 circuit slow response	● The response (from RICH to LEAN) of the A/F signal computed by ECM from A/F sensor 1 signal takes more than the specified time.	● Harness or connectors (The A/F sensor 1 circuit is open or shorted.) ● Air fuel ratio (A/F) sensor 1 ● Air fuel ratio (A/F) sensor 1 heater ● Fuel pressure ● Fuel injector ● Intake air leaks ● Exhaust gas leaks ● PCV ● Mass air flow sensor
P1288 1288 (Bank 2)			

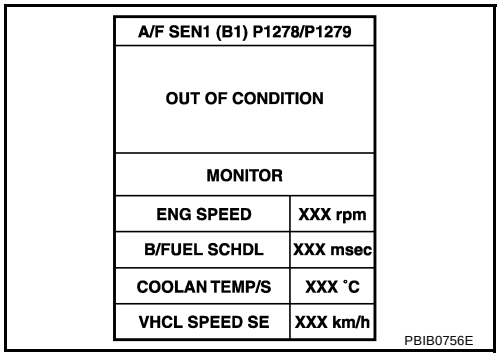
DTC Confirmation Procedure

ABS00A9A

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

WITH CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1minute under no load.
4. Let engine idle for 1 minute.
5. Select “A/F SEN1(B1) P1278/P1279” or “A/F SEN1(B1) P1288/P1289” of “A/F SEN1” in “DTC WORK SUPPORT” mode with CONSULT-II.
6. Touch “START”.
   If “COMPLETED” appears on CONSULT-II screen, go to step 10.
   If “COMPLETED” does not appear on CONSULT-II screen, go to the following step.

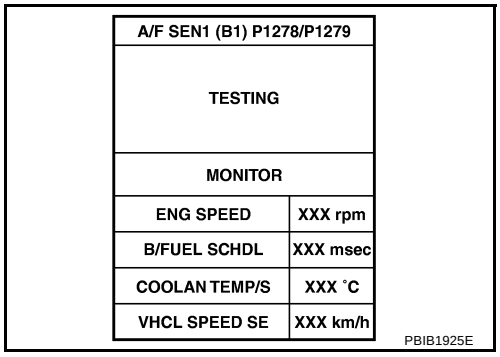


7. After perform the following procedure, “TESTING” will be displayed on the CONSULT-II screen.

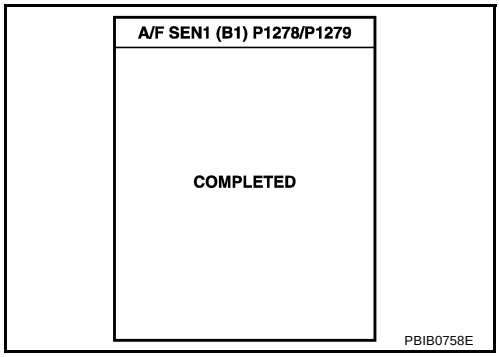
a. Increase the engine speed up to 4,000 to 5,000 rpm and keep it for 10 seconds.

b. Fully release accelerator pedal and then let engine idle for about 10 seconds.
   If “TESTING” is not displayed after 10 seconds, refer to EC-124, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .

8. Wait for about 20 seconds at idle at under the condition that “TESTING” is displayed on the CONSULT-II screen.



9. Make sure that “TESTING” changes to “COMPLETED”.
   If “TESTING” changed to “OUT OF CONDITION”, refer to EC-124, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .
10. Make sure that “OK” is displayed after touching “SELF-DIAG RESULT”.
    If “NG” is displayed, go to EC-511, "Diagnostic Procedure" .



WITH GST

1. Start engine and warm it up to normal operating temperature.
2. Select “MODE 1” with GST.
3. Calculate the total value of “Short term fuel trim” and “Long term fuel trim” indications.
   Make sure that the total percentage should be within ±15%.
   If OK, go to the following step.
   If NG, check the following.

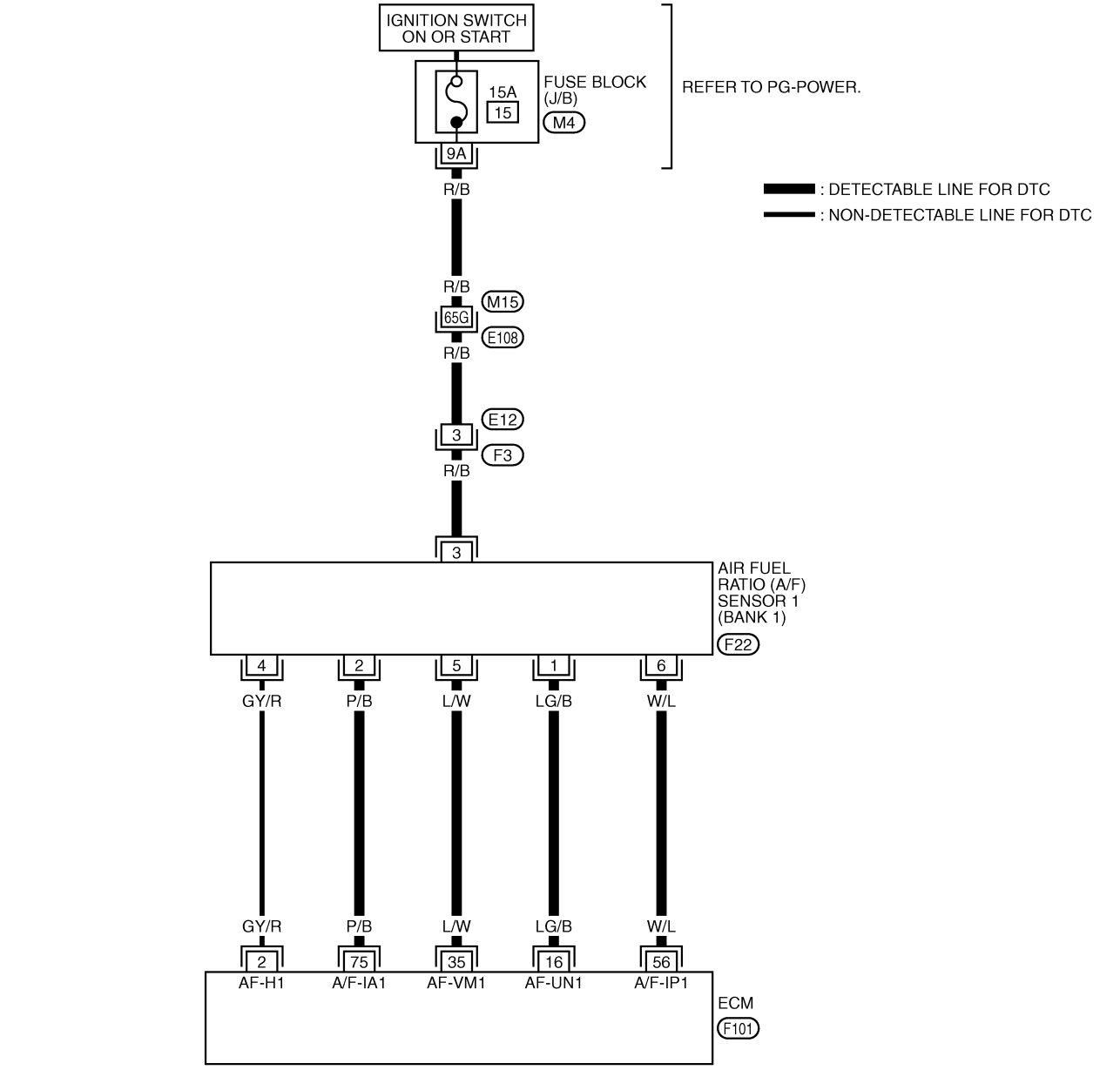
- Intake air leaks
- Exhaust gas leaks
- Incorrect fuel pressure
- Lack of fuel
- Fuel injector
- Incorrect PCV hose connection
- PCV valve
- Mass air flow sensor

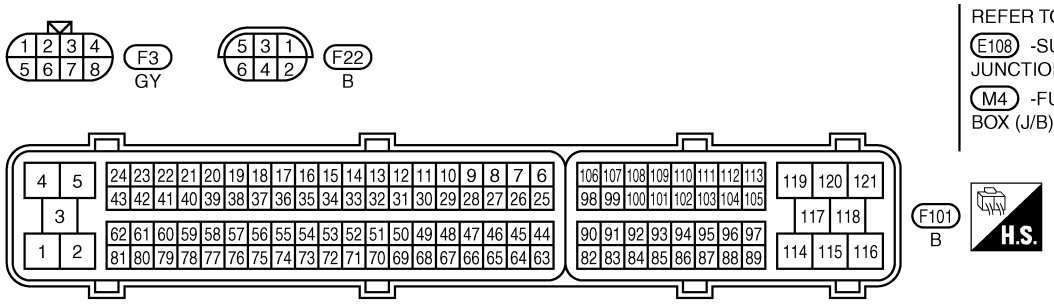
4. Turn ignition switch OFF and wait at least 10 seconds.
5. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1minute under no load.
6. Let engine idle for 1 minute.
7. Increase the engine speed up to 4,000 to 5,000 rpm and keep it for 10 seconds.
8. Fully release accelerator pedal and then let engine idle for about 1 minute.
9. Select “MODE 7” with GST.
   If 1st trip DTC is detected, go to EC-511, "Diagnostic Procedure" .

Wiring Diagram
BANK 1

ABS00A9B

EC-AF1B1-01





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT0706E

Specification data are reference values and are measured between each terminal and ground.

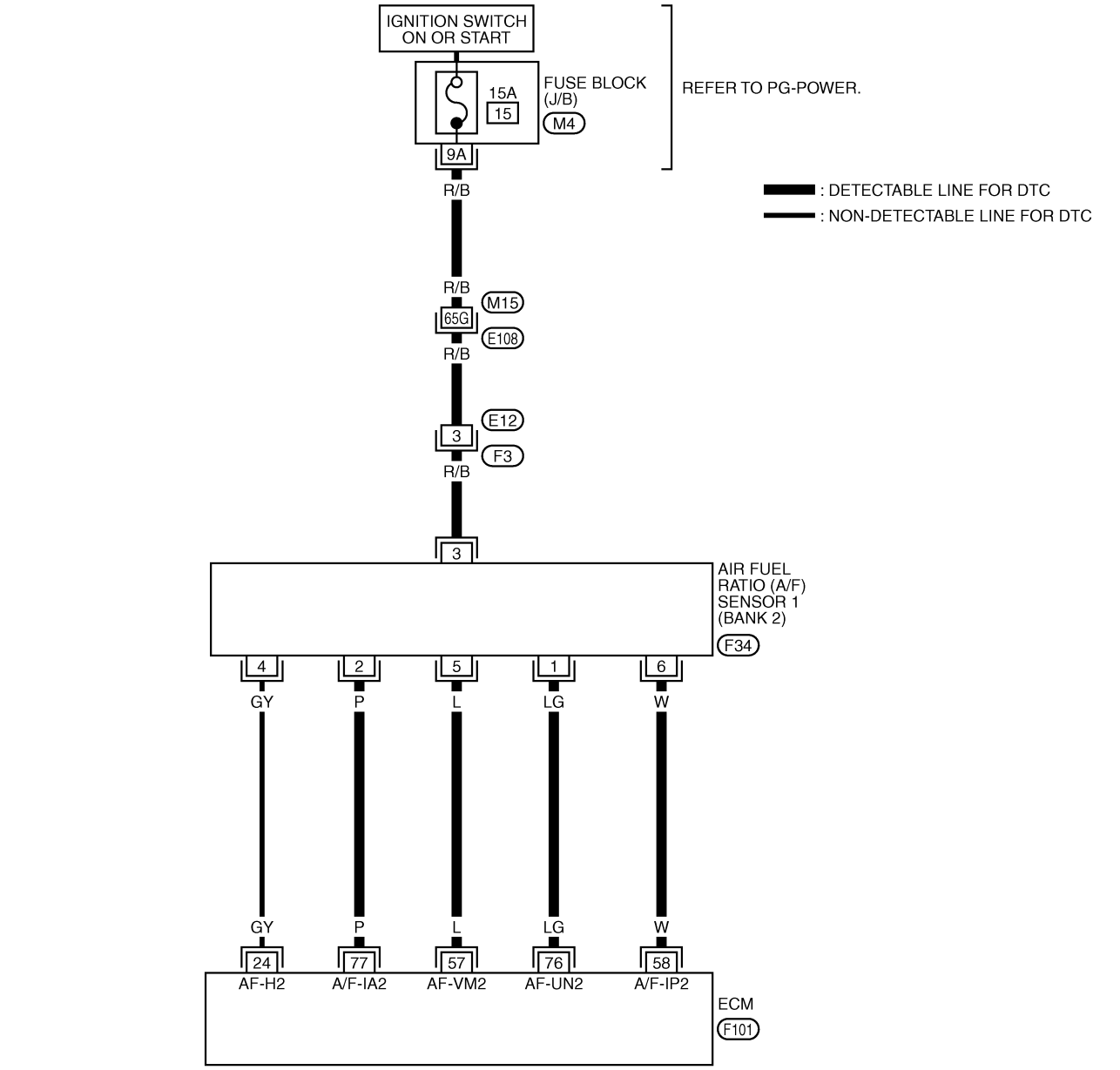
CAUTION:

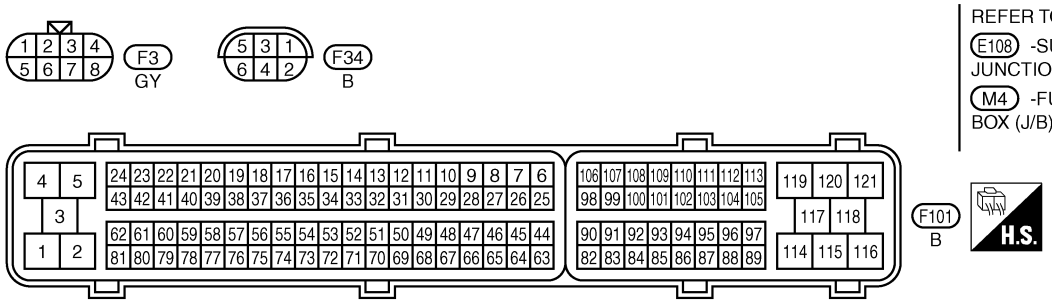
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
16	LG/B	A/F sensor 1 (Bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 3.1V
35	L/W			Approximately 2.6V
56	W/L			Approximately 2.3V
75	P/B			Approximately 2.3V

BANK 2

EC-AF1B2-01





TBWT0707E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

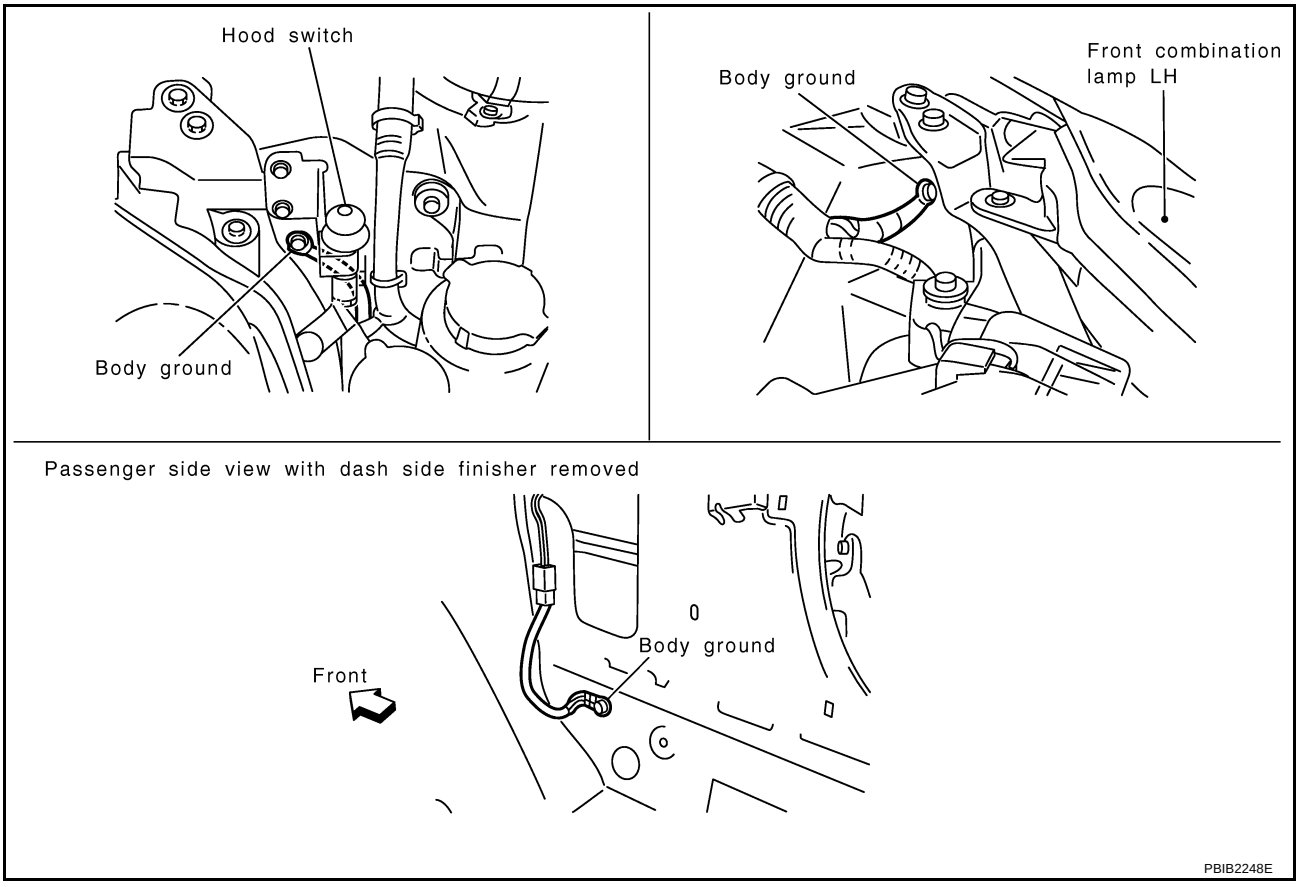
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
57	L	A/F sensor 1 (Bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 2.6V
58	W			Approximately 2.3V
76	LG			Approximately 3.1V
77	P			Approximately 2.3V

Diagnostic Procedure

ABS00A9C

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

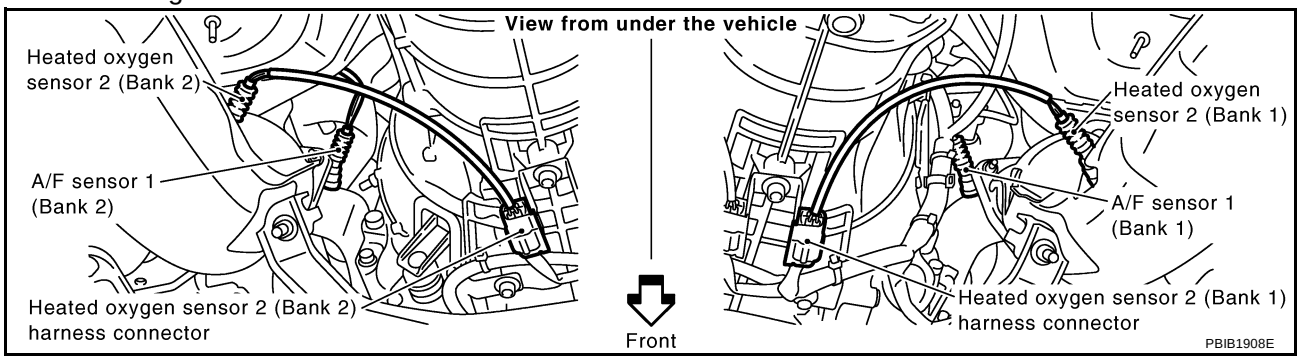


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. RETIGHTEN A/F SENSOR 1

Loosen and retighten the A/F sensor 1.

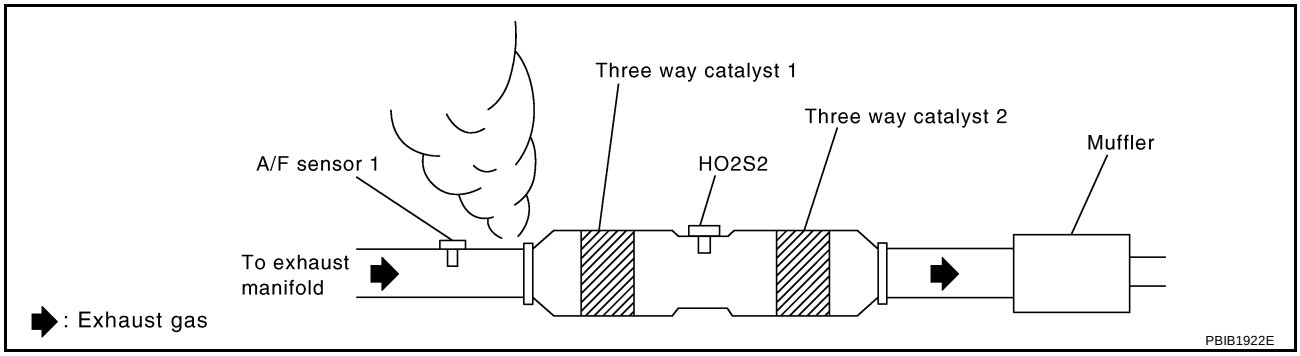


Tightening torque: 40 - 60 N-m (4.1 - 6.1 kg-m, 30 - 44 ft-lb)

>> GO TO 3.

3. CHECK EXHAUST GAS LEAK

1. Start engine and run it at idle.
2. Listen for an exhaust gas leak before three way catalyst 1.



OK or NG

OK >> GO TO 4.
NG >> Repair or replace.

4. CHECK FOR INTAKE AIR LEAK

Listen for an intake air leak after the mass air flow sensor.

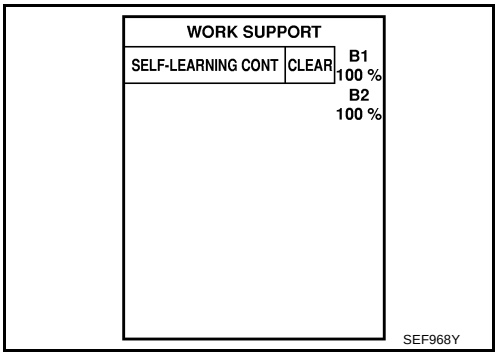
OK or NG

OK >> GO TO 5.
NG >> Repair or replace.

5. CLEAR THE SELF-LEARNING DATA

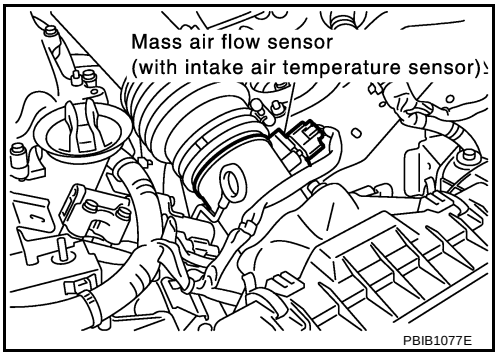
With CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-II.
3. Clear the self-learning control coefficient by touching “CLEAR” or “START”.
4. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171, P172, P0174 or P0175 detected?
   Is it difficult to start engine?



Without CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF.
3. Disconnect mass air flow sensor harness connector.
4. Restart engine and let it idle for at least 5 seconds.
5. Stop engine and reconnect mass air flow sensor harness connector.
6. Make sure DTC P0102 is displayed.
7. Erase the DTC memory. Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .
8. Make sure DTC P0000 is displayed.
9. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171, P0172, P0174 or P0175 detected?
   Is it difficult to start engine?

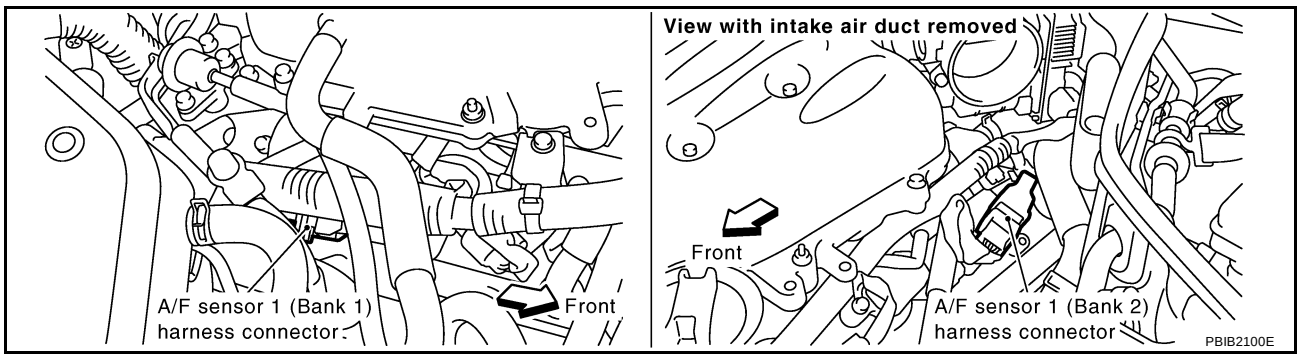


Yes or No

Yes >> Perform trouble diagnosis for DTC P0171, P0174 or P0172, P0175. Refer to EC-219 or EC-228 .
No >> GO TO 6.

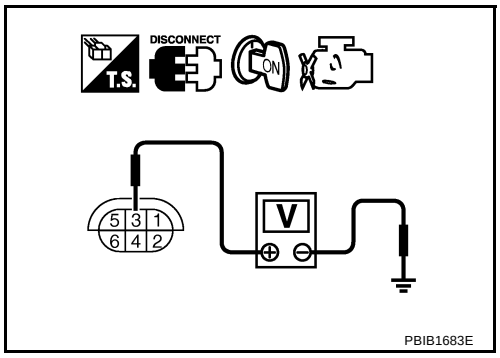
6. CHECK A/F SENSOR 1 POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect A/F sensor 1 harness connector.



3. Turn ignition switch ON.
4. Check voltage between A/F sensor 1 terminal 3 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M15, E108
- Harness connectors E12, F3
- Fuse block (J/B) connector M4
- 15A fuse
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

8. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between the following terminals.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	16	1	76
2	75	2	77
5	35	5	57
6	56	6	58

Continuity should exist.

4. Check harness continuity between the following terminals and ground.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	16	1	76
2	75	2	77
5	35	5	57
6	56	6	58

Continuity should not exist.

5. Also check harness for short to power.

OK or NG

OK >> GO TO 9.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK AIR FUEL RATIO (A/F) SENSOR 1 HEATER

Refer to EC-384, "Component Inspection" .

OK or NG

OK >> GO TO 10.
NG >> Replace A/F sensor 1.

10. CHECK MASS AIR FLOW SENSOR

Refer to EC-161, "Component Inspection" .

OK or NG

OK >> GO TO 11.
NG >> Replace mass air flow sensor.

11. CHECK PCV VALVE

Refer to EC-685, "POSITIVE CRANKCASE VENTILATION" .

OK or NG

OK >> GO TO 12.
NG >> Repair or replace PCV valve.

12. CHECK INTERMITTENT INCIDENT

Perform EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace A/F sensor 1.
NG >> Repair or replace.

Removal and Installation

ABS00A9D

AIR FUEL RATIO (A/F) SENSOR 1

Refer to EM-23, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

DTC P1279, P1289 A/F SENSOR 1

PFP:22693

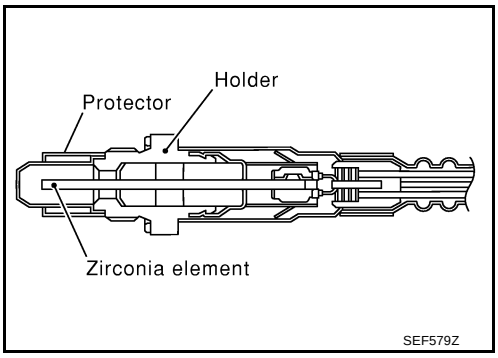
Component Description

ABS00A9E

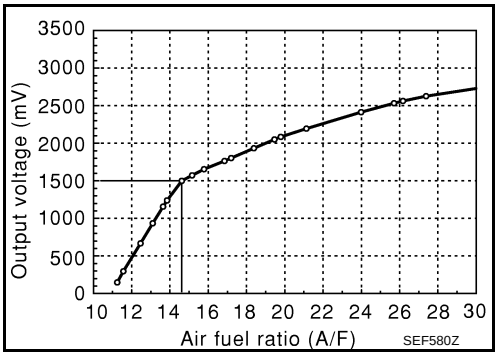
The air fuel ratio (A/F) sensor 1 is a planar dual-cell limit current sensor. The sensor element of the A/F sensor 1 is the combination of a Nernst concentration cell (sensor cell) with an oxygen-pump cell, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range ($0.7 < \lambda <$ air).

The exhaust gas components diffuse through the diffusion gap at the electrode of the oxygen pump and Nernst concentration cell, where they are brought to thermodynamic balance.



An electronic circuit controls the pump current through the oxygen-pump cell so that the composition of the exhaust gas in the diffusion gap remains constant at $\lambda = 1$. Therefore, the A/F sensor 1 is able to indicate air/fuel ratio by this pumping of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of 700 - 800°C (1,292 - 1,472°F).



CONSULT-II Reference Value in Data Monitor Mode

ABS00A9F

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
A/F SEN1 (B1) A/F SEN1 (B2)	● Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 1.5V

On Board Diagnosis Logic

ABS00A9G

To judge the malfunction of A/F sensor 1, this diagnosis measures response time of the A/F signal computed by ECM from the air fuel ration A/F sensor 1 signal. The time is compensated by engine operating (speed and load), fuel feedback control constant, and the A/F sensor 1 temperature index. Judgment is based on whether the compensated time (the A/F signal cycling time index) is inordinately long or not.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible Cause
P1279 1279 (Bank 1) P1289 1289 (Bank 2)	Air fuel ratio (A/F) sensor 1 circuit slow response	● The response (from LEAN to RICH) of the A/F signal computed by ECM from A/F sensor 1 signal takes more than the specified time.	● Harness or connectors (The A/F sensor 1 circuit is open or shorted.) ● Air fuel ratio (A/F) sensor 1 ● Air fuel ratio (A/F) sensor 1 heater ● Fuel pressure ● Fuel injector ● Intake air leaks ● Exhaust gas leaks ● PCV ● Mass air flow sensor

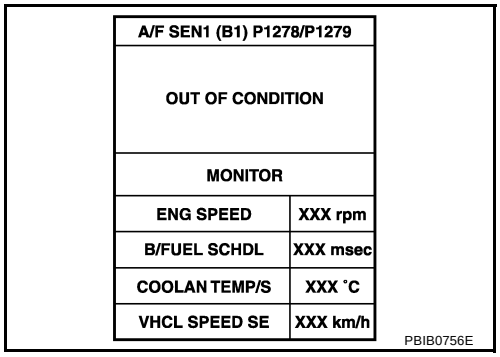
DTC Confirmation Procedure

ABS00A9H

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

WITH CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1minute under no load.
4. Let engine idle for 1 minute.
5. Select “A/F SEN1(B1) P1278/P1279” or “A/F SEN1(B1) P1288/P1289” of “A/F SEN1” in “DTC WORK SUPPORT” mode with CONSULT-II.
6. Touch “START”.
   If “COMPLETED” appears on CONSULT-II screen, go to step 10.
   If “COMPLETED” does not appear on CONSULT-II screen, go to the following step.

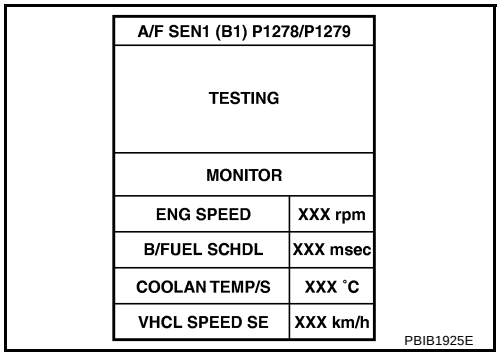


7. After perform the following procedure, “TESTING” will be displayed on the CONSULT-II screen.

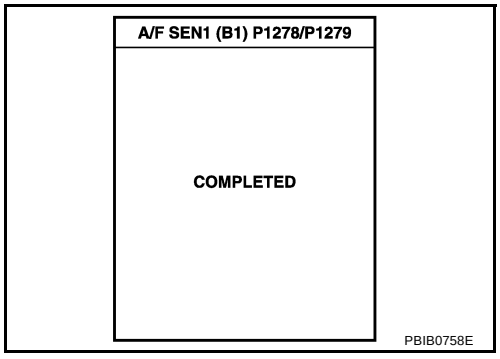
a. Increase the engine speed up to 4,000 to 5,000 rpm and keep it for 10 seconds.

b. Fully release accelerator pedal and then let engine idle for about 10 seconds.
   If “TESTING” is not displayed after 10 seconds, refer to **EC-124, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE"** **.**

8. Wait for about 20 seconds at idle at under the condition that “TESTING” is displayed on the CONSULT-II screen.



9. Make sure that “TESTING” changes to “COMPLETED”.
   If “TESTING” changed to “OUT OF CONDITION”, refer to **EC-124, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE"** **.**
10. Make sure that “OK” is displayed after touching “SELF-DIAG RESULT”.
    If “NG” is displayed, go to EC-523, "Diagnostic Procedure" .



WITH GST

1. Start engine and warm it up to normal operating temperature.
2. Select “MODE 1” with GST.
3. Calculate the total value of “Short term fuel trim” and “Long term fuel trim” indications.
   Make sure that the total percentage should be within ±15%.
   If OK, go to the following step.
   If NG, check the following.

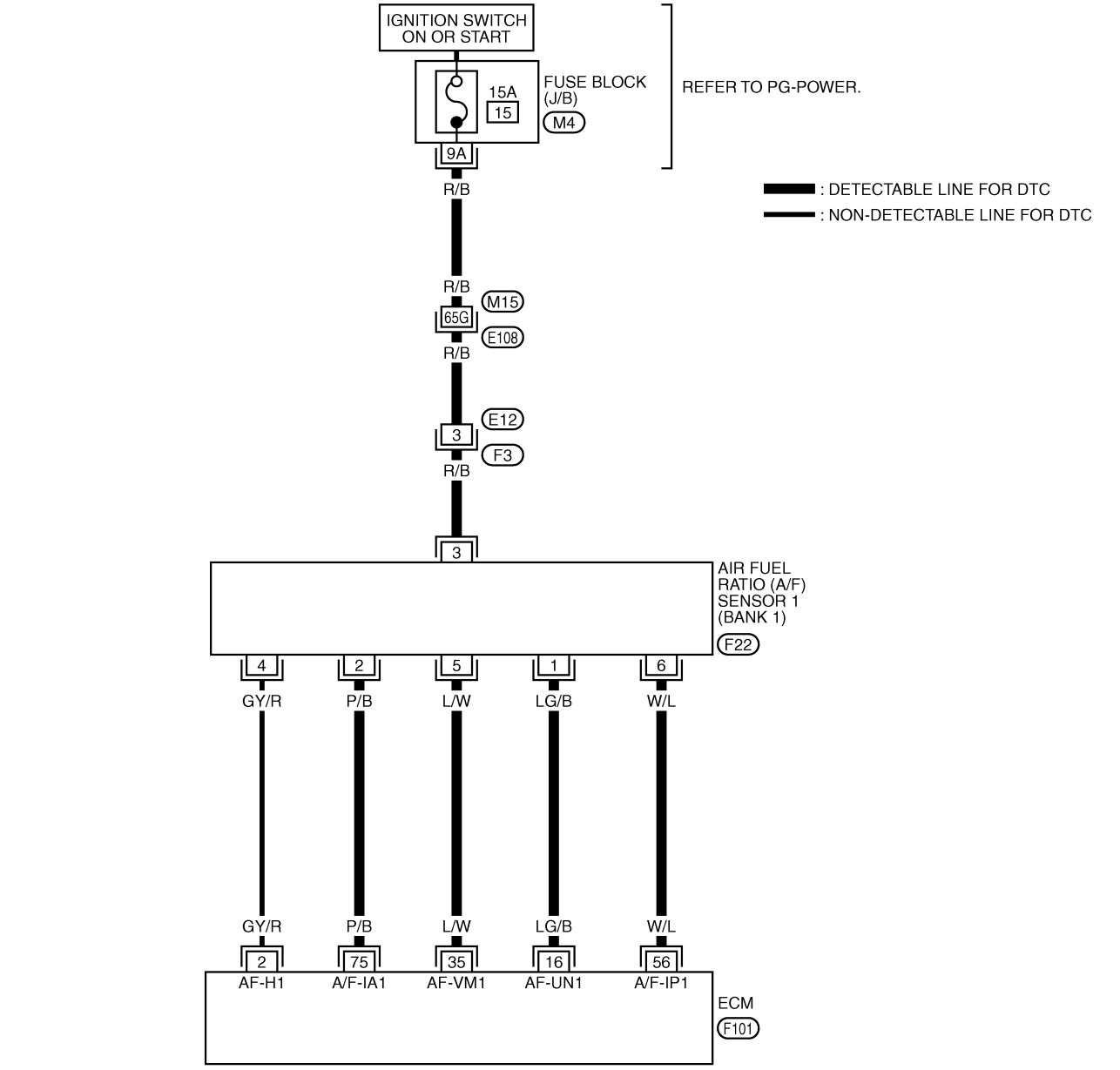
- Intake air leaks
- Exhaust gas leaks
- Incorrect fuel pressure
- Lack of fuel
- Fuel injector
- Incorrect PCV hose connection
- PCV valve
- Mass air flow sensor

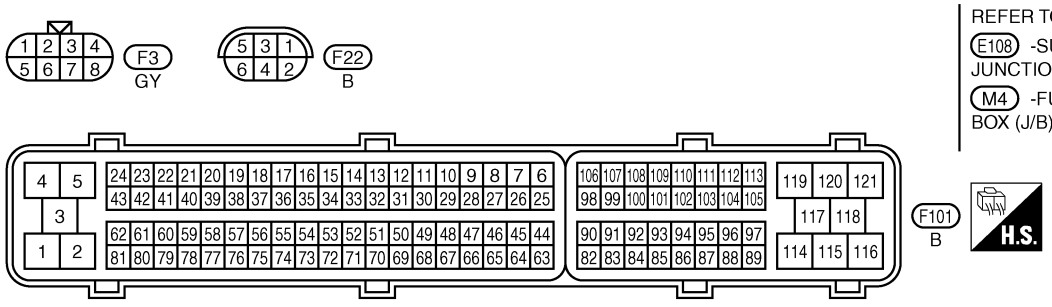
4. Turn ignition switch OFF and wait at least 10 seconds.
5. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1minute under no load.
6. Let engine idle for 1 minute.
7. Increase the engine speed up to 4,000 to 5,000 rpm and keep it for 10 seconds.
8. Fully release accelerator pedal and then let engine idle for about 1 minute.
9. Select “MODE 7” with GST.
   If 1st trip DTC is detected, go to EC-523, "Diagnostic Procedure" .

Wiring Diagram
BANK 1

ABS00A9I

EC-AF1B1-01





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT0706E

Specification data are reference values and are measured between each terminal and ground.

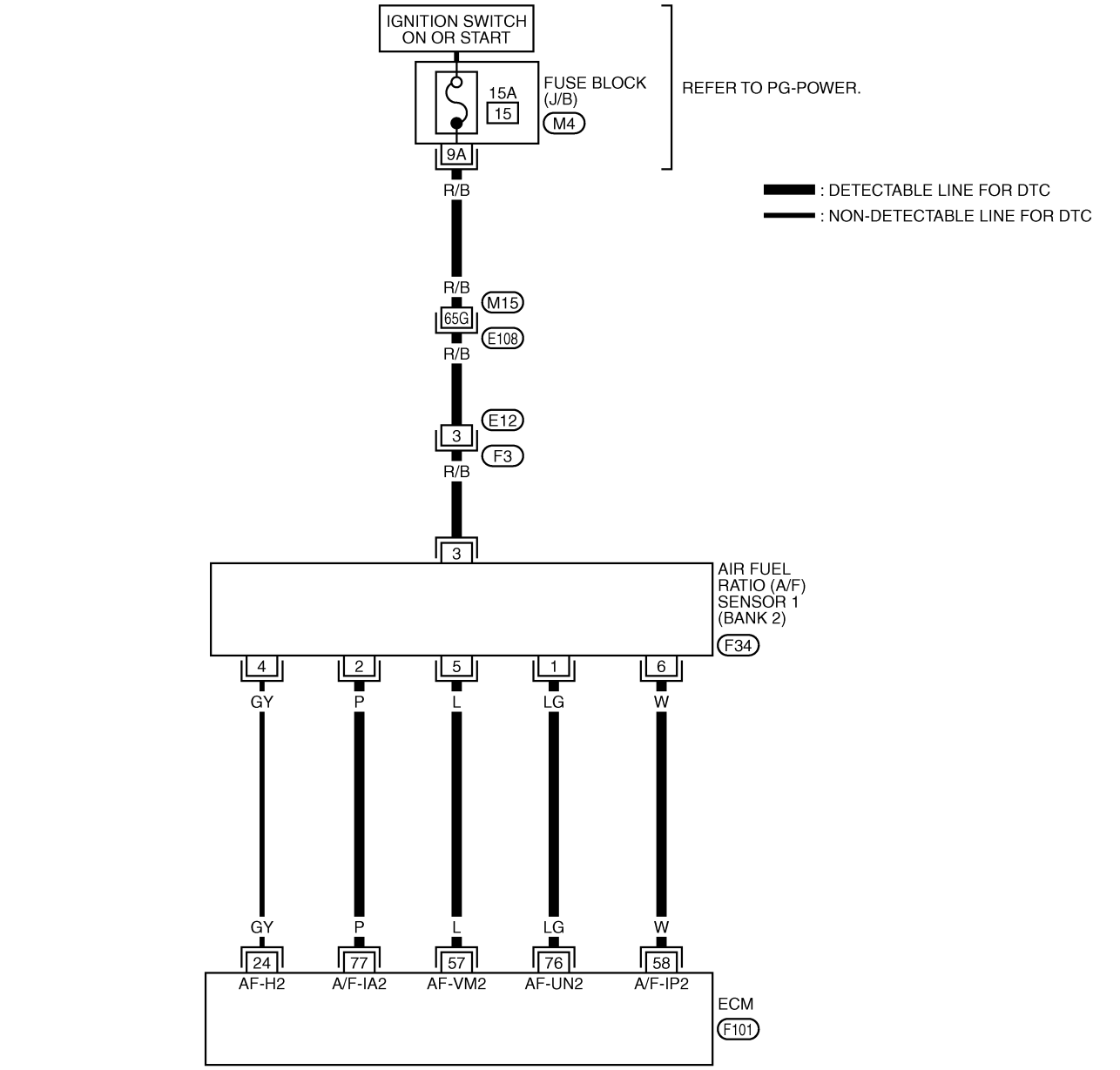
CAUTION:

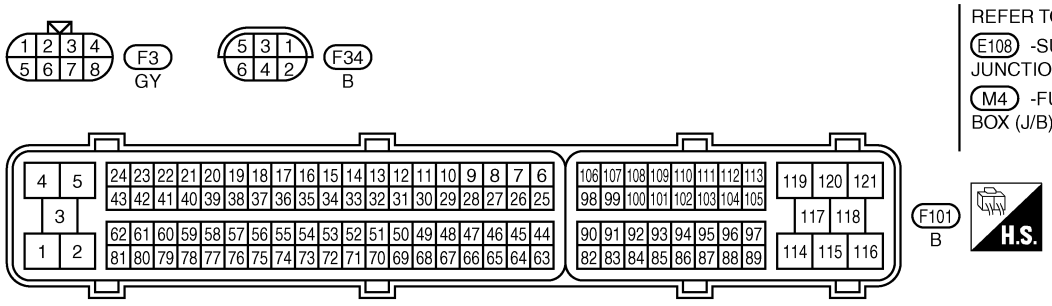
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
16	LG/B	A/F sensor 1 (Bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 3.1V
35	L/W			Approximately 2.6V
56	W/L			Approximately 2.3V
75	P/B			Approximately 2.3V

BANK 2

EC-AF1B2-01





TBWT0707E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

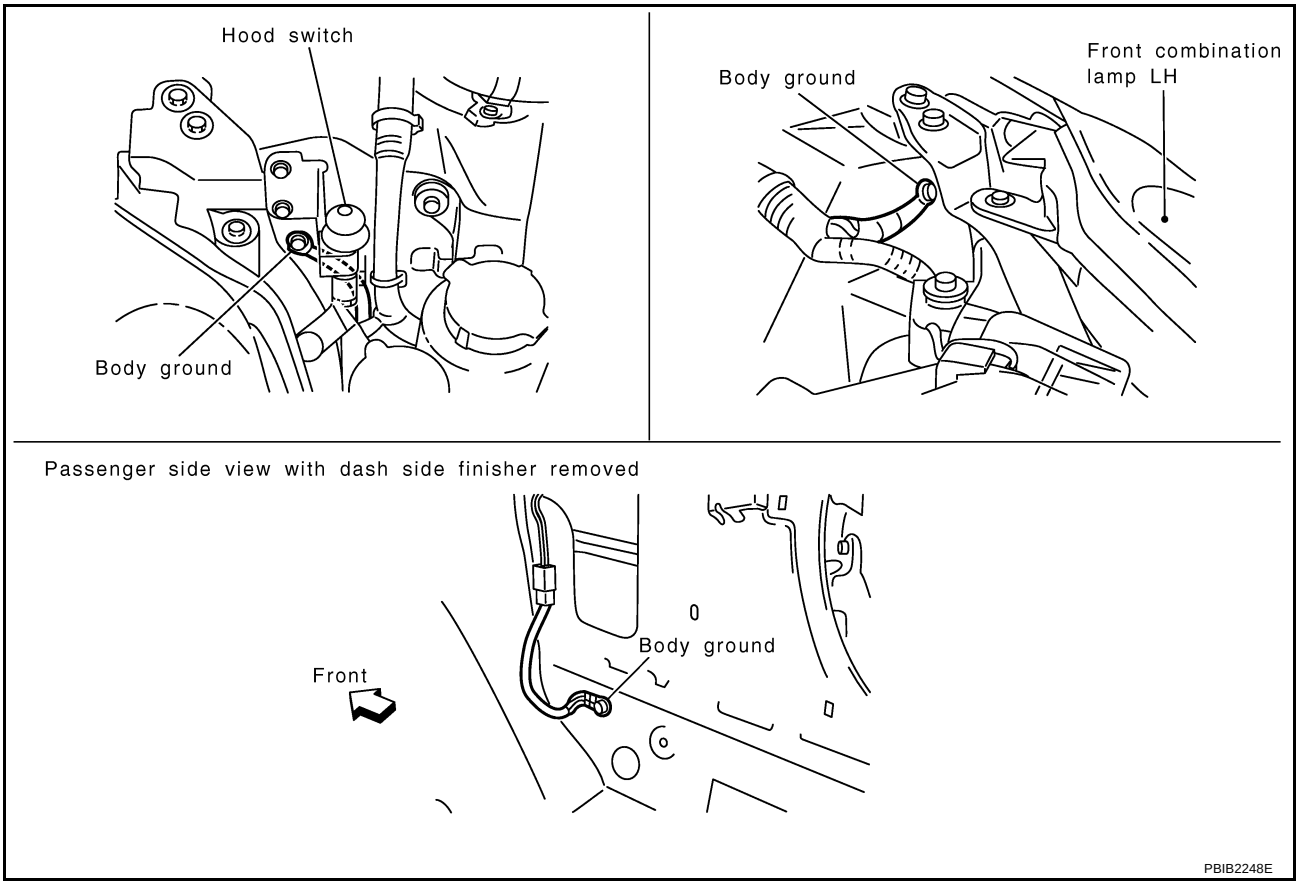
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
57	L	A/F sensor 1 (Bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 2.6V
58	W			Approximately 2.3V
76	LG			Approximately 3.1V
77	P			Approximately 2.3V

Diagnostic Procedure

ABS00A9J

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

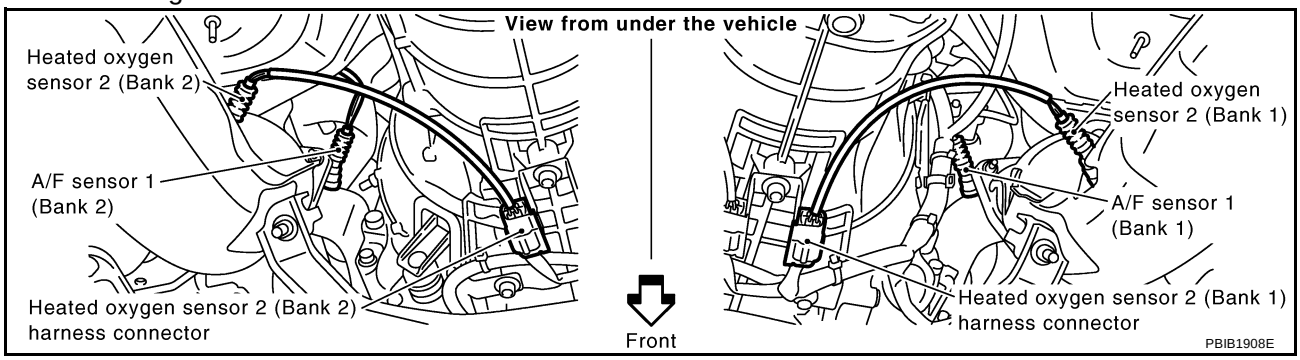


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. RETIGHTEN A/F SENSOR 1

Loosen and retighten the A/F sensor 1.

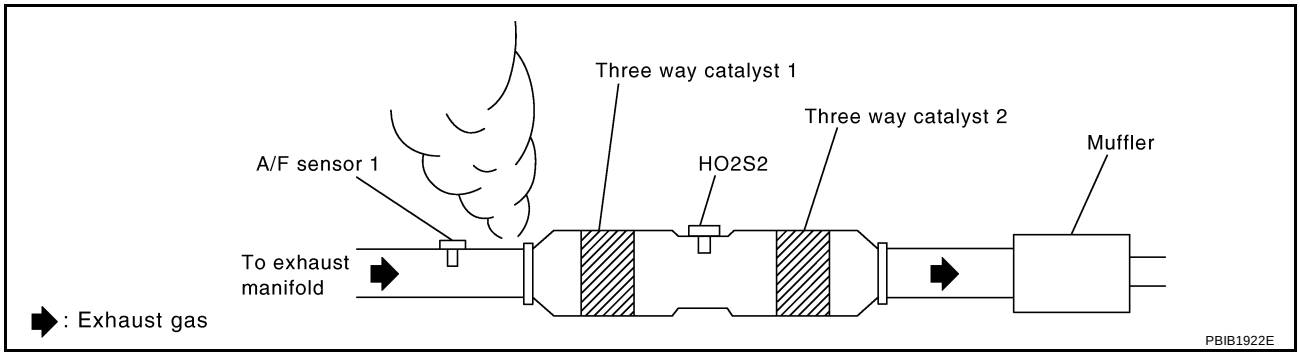


Tightening torque: 40 - 60 N-m (4.1 - 6.1 kg-m, 30 - 44 ft-lb)

>> GO TO 3.

3. CHECK EXHAUST GAS LEAK

1. Start engine and run it at idle.
2. Listen for an exhaust gas leak before three way catalyst 1.



OK or NG

OK >> GO TO 4.
NG >> Repair or replace.

4. CHECK FOR INTAKE AIR LEAK

Listen for an intake air leak after the mass air flow sensor.

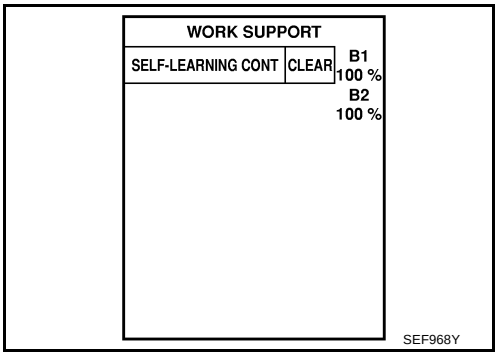
OK or NG

OK >> GO TO 5.
NG >> Repair or replace.

5. CLEAR THE SELF-LEARNING DATA

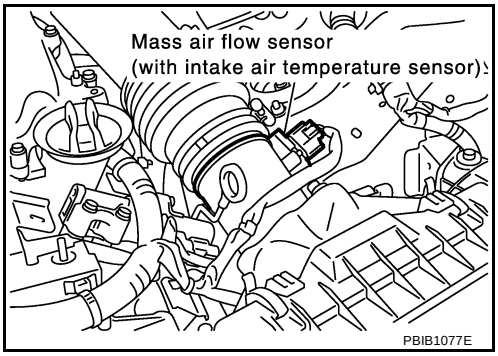
With CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-II.
3. Clear the self-learning control coefficient by touching “CLEAR” or “START”.
4. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171, P172, P0174 or P0175 detected?
   Is it difficult to start engine?



Without CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF.
3. Disconnect mass air flow sensor harness connector.
4. Restart engine and let it idle for at least 5 seconds.
5. Stop engine and reconnect mass air flow sensor harness connector.
6. Make sure DTC P0102 is displayed.
7. Erase the DTC memory. Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .
8. Make sure DTC P0000 is displayed.
9. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171, P0172, P0174 or P0175 detected?
   Is it difficult to start engine?

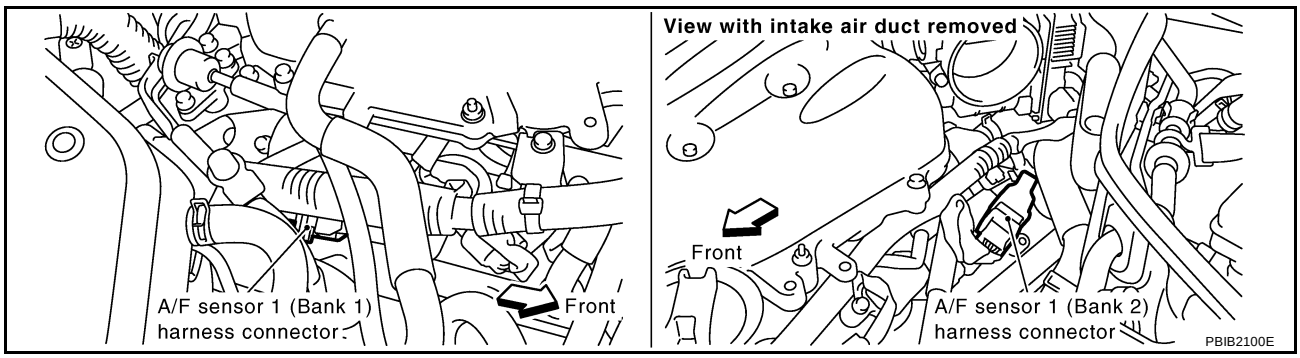


Yes or No

Yes >> Perform trouble diagnosis for DTC P0171, P0174 or P0172, P0175. Refer to EC-219 or EC-228 .
No >> GO TO 6.

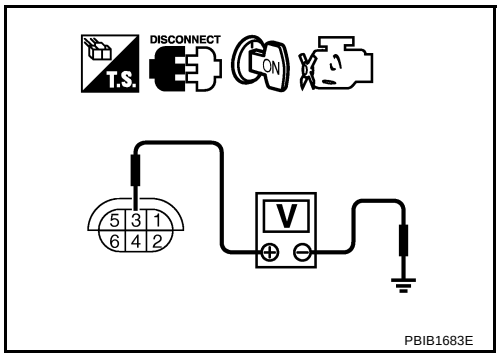
6. CHECK A/F SENSOR 1 POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect A/F sensor 1 harness connector.



3. Turn ignition switch ON.
4. Check voltage between A/F sensor 1 terminal 3 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M15, E108
- Harness connectors E12, F3
- Fuse block (J/B) connector M4
- 15A fuse
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

8. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between the following terminals.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	16	1	76
2	75	2	77
5	35	5	57
6	56	6	58

Continuity should exist.

4. Check harness continuity between the following terminals and ground.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	16	1	76
2	75	2	77
5	35	5	57
6	56	6	58

Continuity should not exist.

5. Also check harness for short to power.

OK or NG

OK >> GO TO 9.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK AIR FUEL RATIO (A/F) SENSOR 1 HEATER

Refer to EC-384, "Component Inspection" .

OK or NG

OK >> GO TO 10.
NG >> Replace A/F sensor 1.

10. CHECK MASS AIR FLOW SENSOR

Refer to EC-161, "Component Inspection" .

OK or NG

OK >> GO TO 11.
NG >> Replace mass air flow sensor.

11. CHECK PCV VALVE

Refer to EC-685, "POSITIVE CRANKCASE VENTILATION" .

OK or NG

OK >> GO TO 12.
NG >> Repair or replace PCV valve.

12. CHECK INTERMITTENT INCIDENT

Perform EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace A/F sensor 1.
NG >> Repair or replace.

Removal and Installation

ABS00A9K

AIR FUEL RATIO (A/F) SENSOR 1

Refer to EM-23, "EXHAUST MANIFOLD AND THREE WAY CATALYST"

DTC P1444 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

PFP:14920

Description

ABS009M6

SYSTEM DESCRIPTION

Sensor	Input Signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed*1	EVAP canister purge flow control	EVAP canister purge volume control solenoid valve
Mass air flow sensor	Amount of intake air		
Engine coolant temperature sensor	Engine coolant temperature		
Battery	Battery voltage*1		
Throttle position sensor	Throttle position		
Accelerator pedal position sensor	Accelerator pedal position		
Air fuel ratio (A/F) sensor 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)		
Fuel tank temperature sensor	Fuel temperature in fuel tank		
Wheel sensor*2	Vehicle speed		

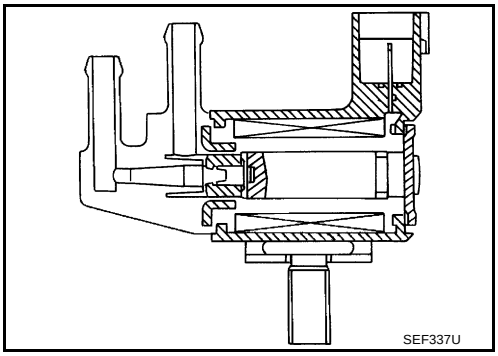
*1: ECM determines the start signal status by the signals of engine speed and battery voltage.

*2: This signal is sent to the ECM through CAN communication line.

This system controls flow rate of fuel vapor from the EVAP canister. The opening of the vapor by-pass passage in the EVAP canister purge volume control solenoid valve changes to control the flow rate. The EVAP canister purge volume control solenoid valve repeats ON/OFF operation according to the signal sent from the ECM. The opening of the valve varies for optimum engine control. The optimum value stored in the ECM is determined by considering various engine conditions. When the engine is operating, the flow rate of fuel vapor from the EVAP canister is regulated as the air flow changes.

COMPONENT DESCRIPTION

The EVAP canister purge volume control solenoid valve uses a ON/OFF duty to control the flow rate of fuel vapor from the EVAP canister. The EVAP canister purge volume control solenoid valve is moved by ON/OFF pulses from the ECM. The longer the ON pulse, the greater the amount of fuel vapor that will flow through the valve.



CONSULT-II Reference Value in Data Monitor Mode

ABS009M7

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
PURG VOL C/V	● Engine: After warming up ● Shift lever: N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No-load	Idle	0%
		2,000 rpm	—

On Board Diagnosis Logic

ABS009M8

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1444 1444	EVAP canister purge volume control solenoid valve	The canister purge flow is detected during the specified driving conditions, even when EVAP canister purge volume control solenoid valve is completely closed.	● EVAP control system pressure sensor ● EVAP canister purge volume control solenoid valve (The valve is stuck open.) ● EVAP canister vent control valve ● EVAP canister ● Hoses (Hoses are connected incorrectly or clogged.)

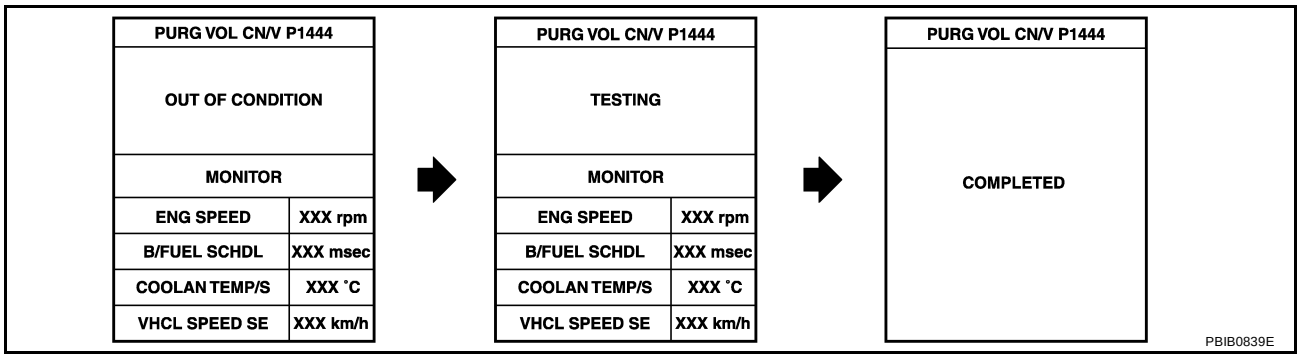
DTC Confirmation Procedure

ABS009M9

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Always perform test at a temperature of 5°C (41°F) or more.

WITH CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON.
4. Select “PURG VOL CN/V P1444” of “EVAPORATIVE SYSTEM” in “DTC WORK SUPPORT” mode with CONSULT-II.
5. Touch “START”.



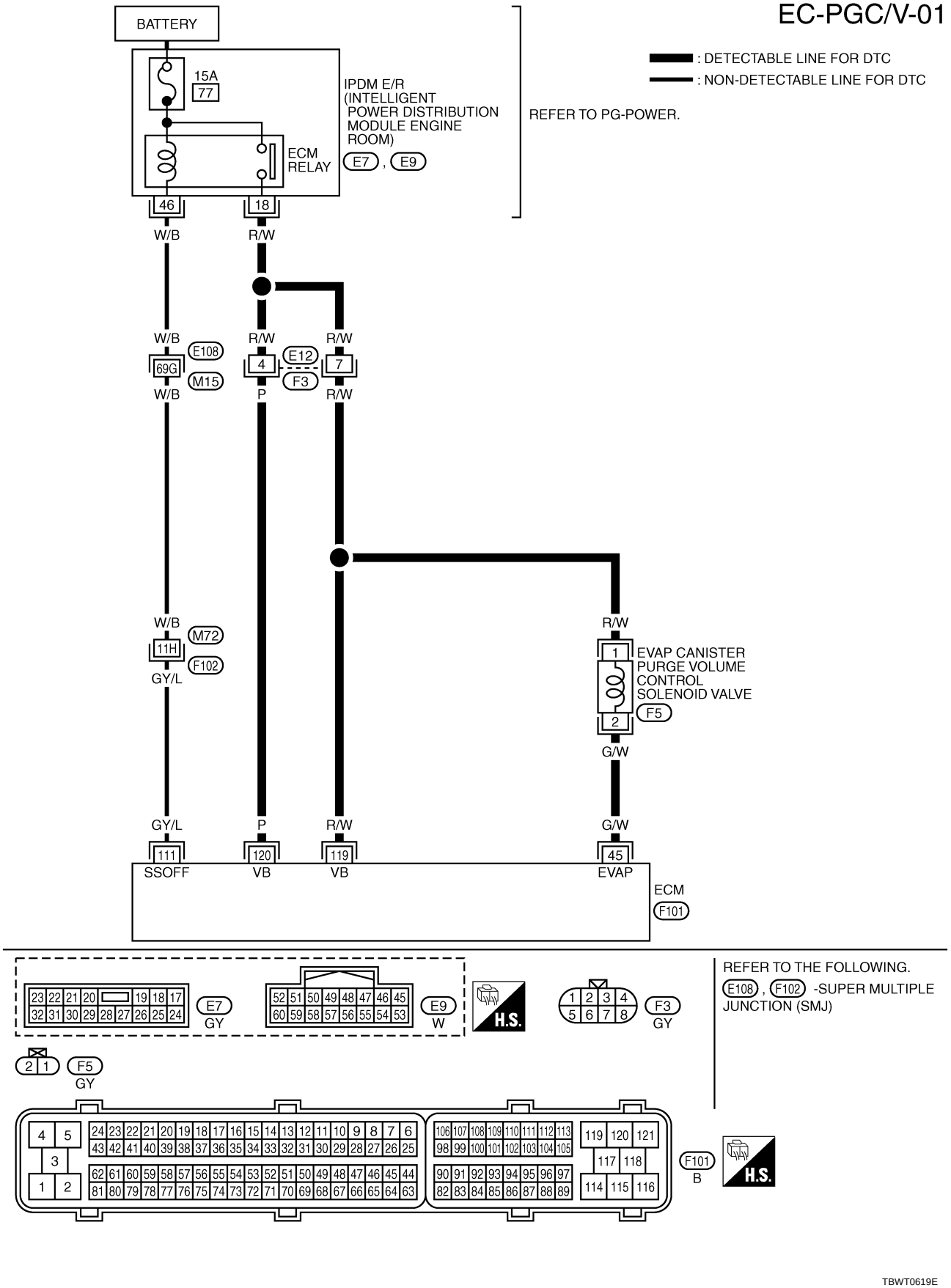
6. Start engine and let it idle until “TESTING” on CONSULT-II changes to “COMPLETED”. (It will take approximately 10 seconds.)
   If “TESTING” is not displayed after 5 minutes, retry from step 2.
7. Make sure that “OK” is displayed after touching “SELF-DIAG RESULTS”. If “NG” is displayed, refer to EC-533, "Diagnostic Procedure" .

WITH GST

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and let it idle for at least 20 seconds.
4. Select “MODE 7” with GST.
5. If 1st trip DTC is detected, go to EC-533, "Diagnostic Procedure" .

Wiring Diagram

ABS009MA

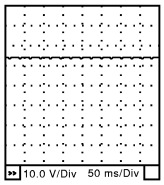
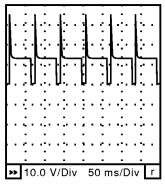


TBWT0619E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-II.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
45	G/W	EVAP canister purge volume control solenoid valve	**[Engine is running]** ● Idle speed	BATTERY VOLTAGE (11 - 14V)★  SEC990C
			[Engine is running] ● Engine speed is about 2,000 rpm (More than 100 seconds after starting engine).	BATTERY VOLTAGE (11 - 14V)★  SEC991C
111	GY/L	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
119 120	R/W P	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

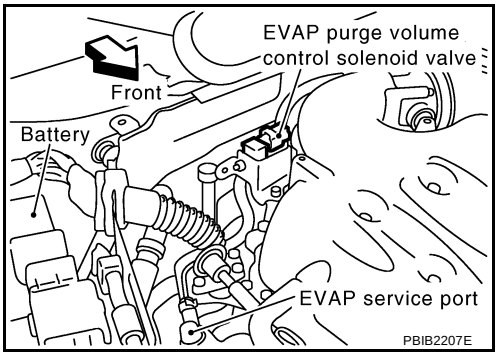
★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

ABS009MB

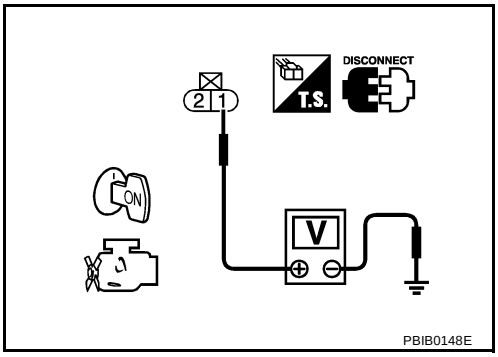
1. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect EVAP canister purge volume control solenoid valve harness connector.
3. Turn ignition switch ON.



4. Check voltage between EVAP canister purge volume control solenoid valve terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- IPDM E/R harness connector E7
- 15A fuse
- Harness for open or short between EVAP canister purge volume control solenoid valve and IPDM E/R
- Harness for open or short between EVAP canister purge volume control solenoid valve and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 45 and EVAP canister purge volume control solenoid valve terminal 2. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR

1. Disconnect EVAP control system pressure sensor harness connector.
2. Check connectors for water.

Water should not exist.

OK or NG

OK >> GO TO 5.
NG >> Replace EVAP control system pressure sensor.

5. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-328, "Component Inspection" .

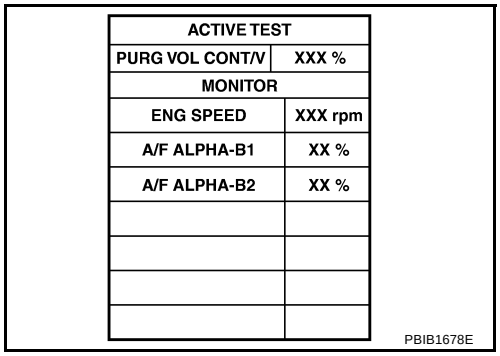
OK or NG

OK (With CONSULT-II)>>GO TO 6.
OK (Without CONSULT-II)>>GO TO 7.
NG >> Replace EVAP control system pressure sensor.

6. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

With CONSULT-II

1. Turn ignition switch OFF.
2. Reconnect harness connectors disconnected.
3. Start engine.
4. Perform “PURG VOL CONT/V” in “ACTIVE TEST” mode with CONSULT-II. Check that engine speed varies according to the valve opening.



OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

7. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-536, "Component Inspection" .

OK or NG

OK >> GO TO 8.
NG >> Replace EVAP canister purge volume control solenoid valve.

8. CHECK RUBBER TUBE FOR CLOGGING

1. Disconnect rubber tube connected to EVAP canister vent control valve.
2. Check the rubber tube for clogging.

OK or NG

OK >> GO TO 9.
NG >> Clean the rubber tube using an air blower.

9. CHECK EVAP CANISTER VENT CONTROL VALVE

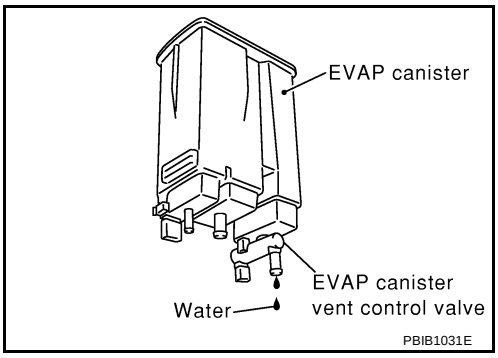
Refer to EC-315, "Component Inspection" .

OK or NG

OK >> GO TO 10.
NG >> Replace EVAP canister vent control valve.

10. CHECK IF EVAP CANISTER SATURATED WITH WATER

1. Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
2. Check if water will drain from the EVAP canister.



OK or NG

OK >> GO TO 11.
NG >> GO TO 13.

11. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.2 kg (4.9 lb).

OK or NG

OK >> GO TO 13.
NG >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister.

13. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

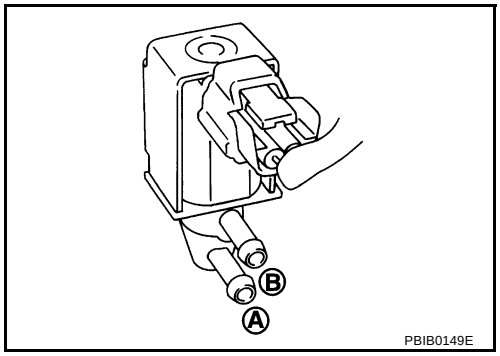
ABS009MC

EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

With CONSULT-II

Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

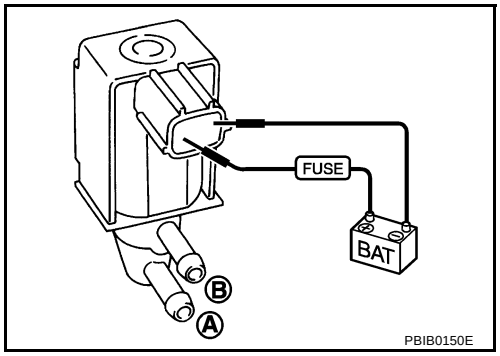
Condition (PURG VOL CONT/V value)	Air passage continuity between A and B
100%	Yes
0%	No



Without CONSULT-II

Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

Condition	Air passage continuity between A and B
12V direct current supply between terminals 1 and 2	Yes
No supply	No



Removal and Installation

ABS009MD

EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .

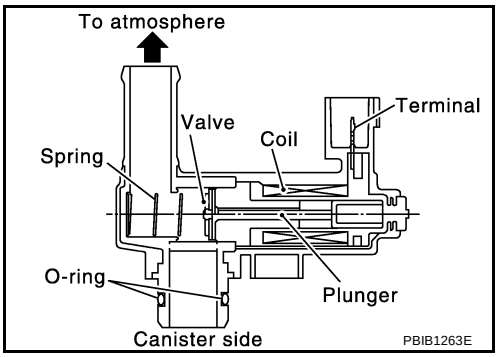
DTC P1446 EVAP CANISTER VENT CONTROL VALVE

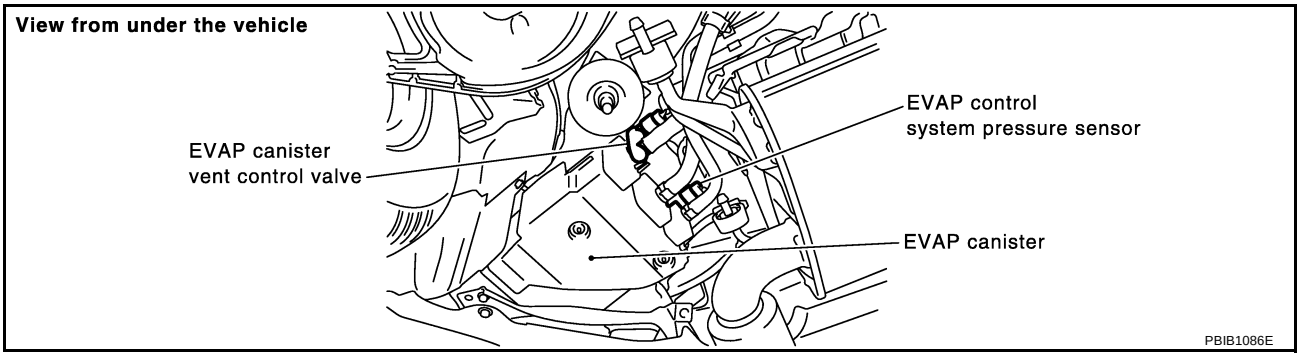
PFP:14935

Component Description

ABS009ME

The EVAP canister vent control valve is located on the EVAP canister and is used to seal the canister vent.
This solenoid valve responds to signals from the ECM. When the ECM sends an ON signal, the coil in the solenoid valve is energized. A plunger will then move to seal the canister vent. The ability to seal the vent is necessary for the on board diagnosis of other evaporative emission control system components.
This solenoid valve is used only for diagnosis, and usually remains opened.
When the vent is closed, under normal purge conditions, the evaporative emission control system is depressurized and allows “EVAP Control System” diagnosis.





CONSULT-II Reference Value in Data Monitor Mode

ABS009MF

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
VENT CONT/V	● Ignition switch: ON	OFF

On Board Diagnosis Logic

ABS009MG

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1446 1446	EVAP canister vent control valve close	EVAP canister vent control valve remains closed under specified driving conditions.	● EVAP canister vent control valve ● EVAP control system pressure sensor and the circuit ● Blocked rubber tube to EVAP canister vent control valve ● EVAP canister is saturated with water

DTC Confirmation Procedure

ABS009MH

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-II

1. Turn ignition switch ON and wait at least 5 seconds.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-II.
4. Start engine and let it idle for at least 1 minute.
5. Repeat next procedures 3 times.

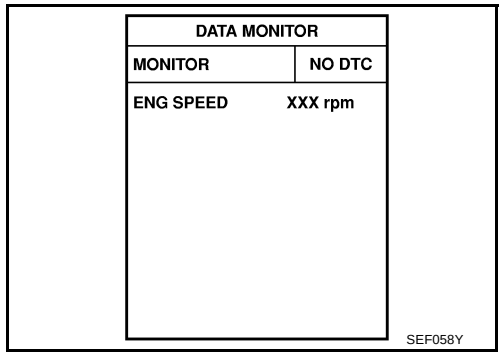
a. Increase the engine speed up to 3,000 to 3,500 rpm and keep it for 2 minutes and 50 seconds to 3 minutes.
Never exceed 3 minutes.

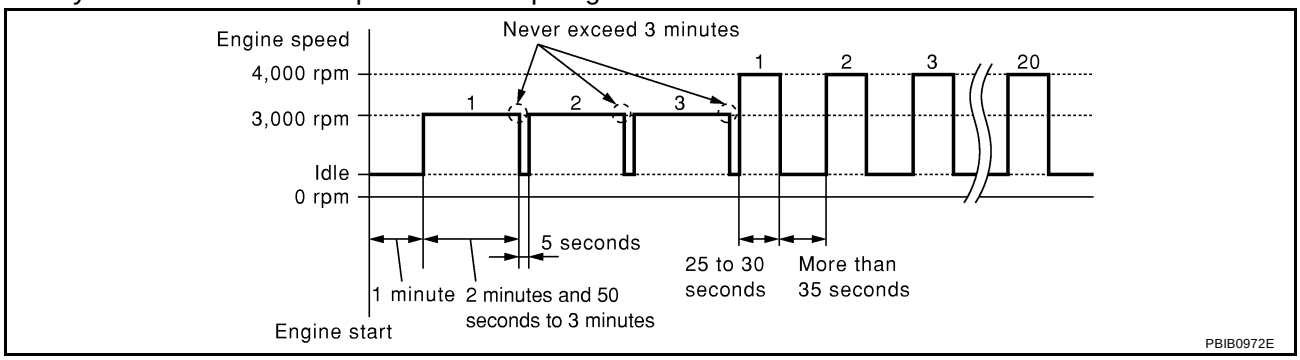
b. Fully released accelerator pedal and keep engine idle for about 5 seconds.

6. If 1st trip DTC is detected, go to EC-542, "Diagnostic Procedure" .
If 1st trip DTC is not detected, go to the next step.
7. Repeat next procedure 20 times.

a. Quickly increase the engine speed up to 4,000 to 4,500 rpm or more and keep it for 25 to 30 seconds.

b. Fully released accelerator pedal and keep engine idle for at least 35 seconds.





8. If 1st trip DTC is detected, go to EC-542, "Diagnostic Procedure" .

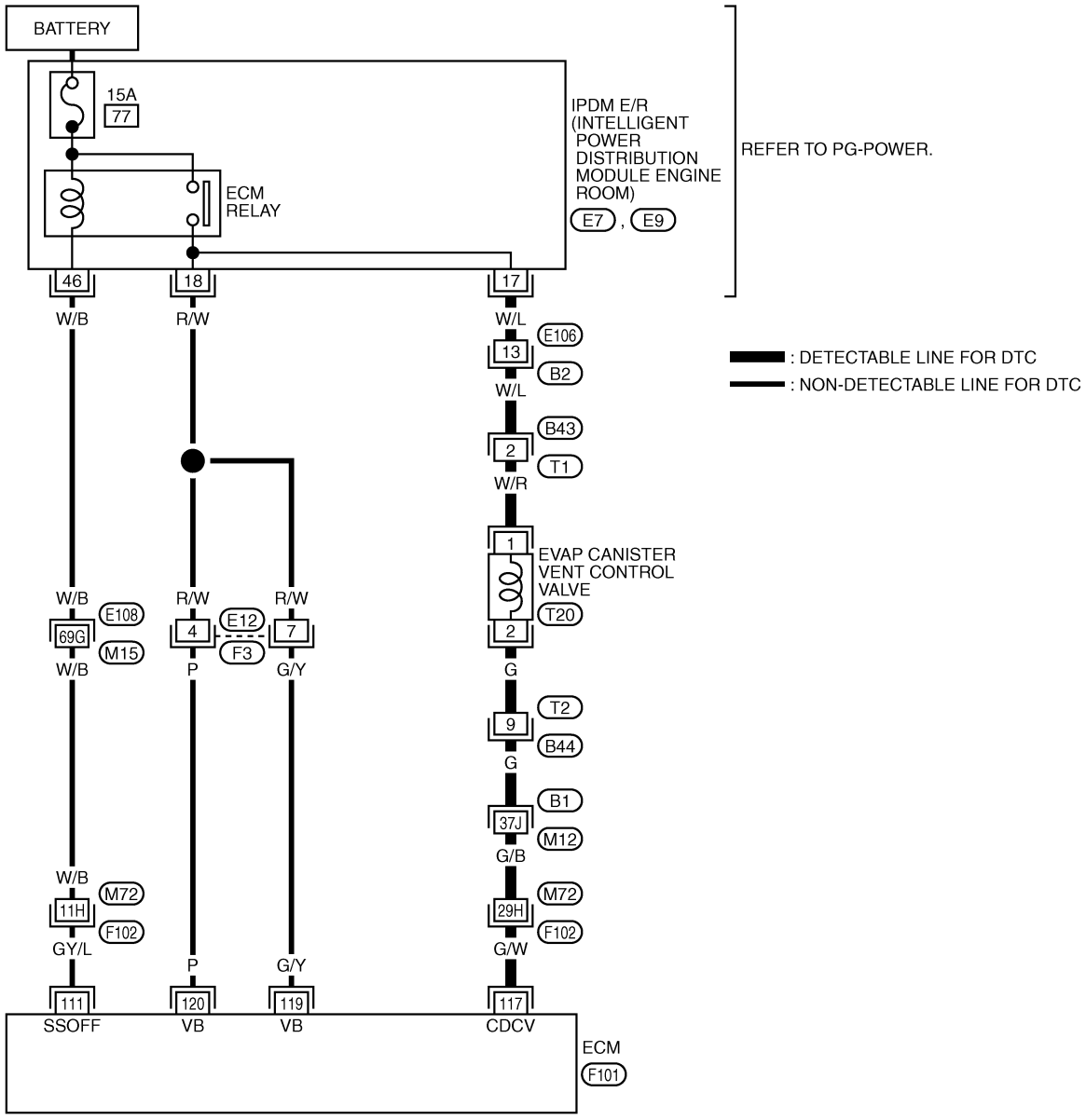
WITH GST

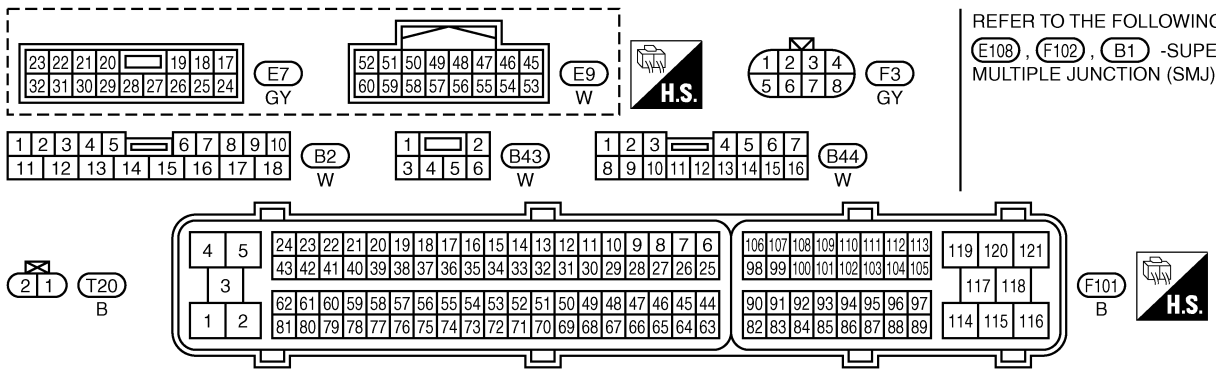
Follow the procedure “WITH CONSULT-II” above.

Wiring Diagram
COUPE MODELS

ABS009MI

EC-VENT/V-01





TBWT0620E

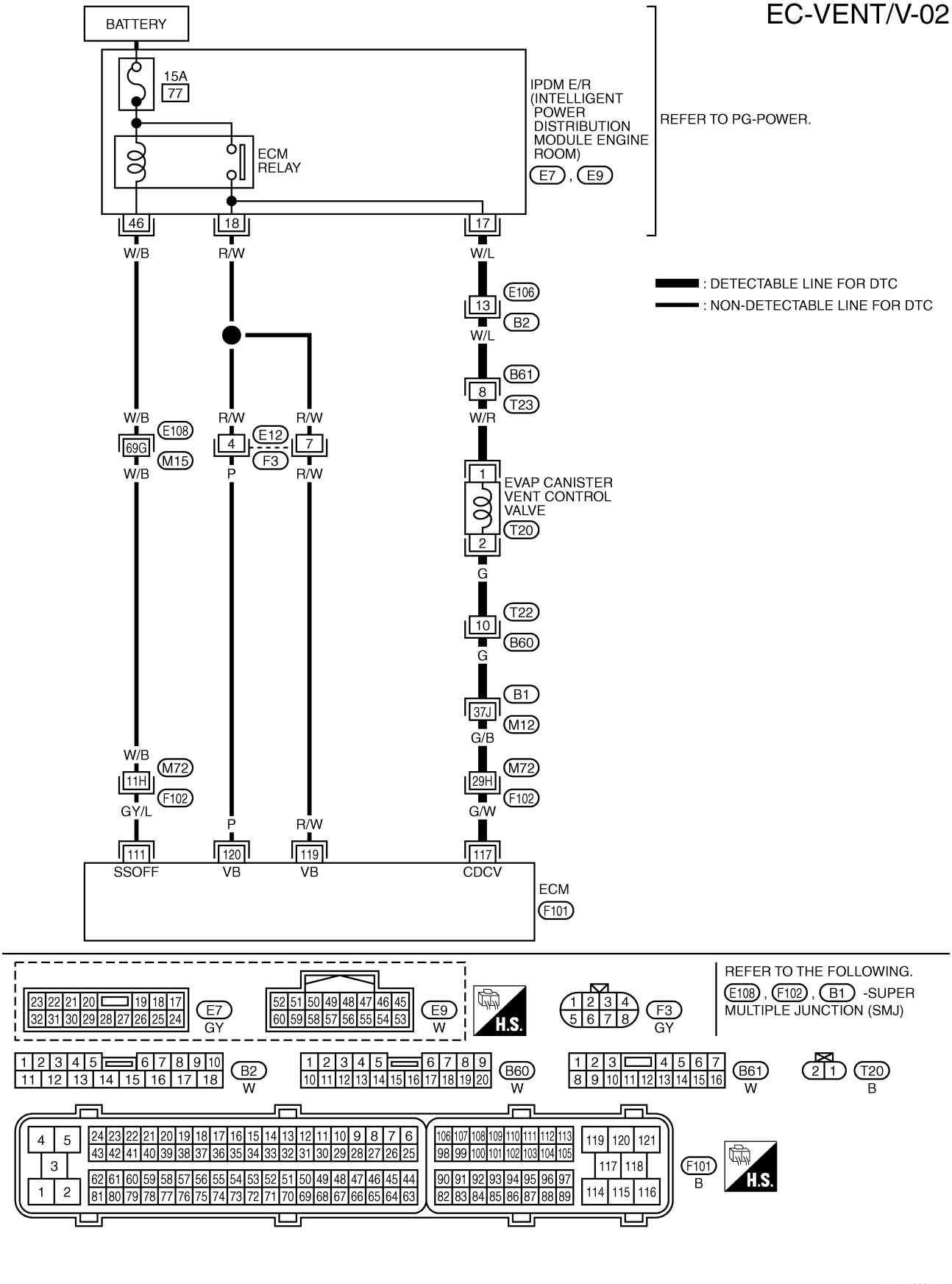
Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
111	GY/L	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
117	G/W	EVAP canister vent control valve	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
119 120	R/W P	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

ROADSTER MODELS



TBWT0621E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

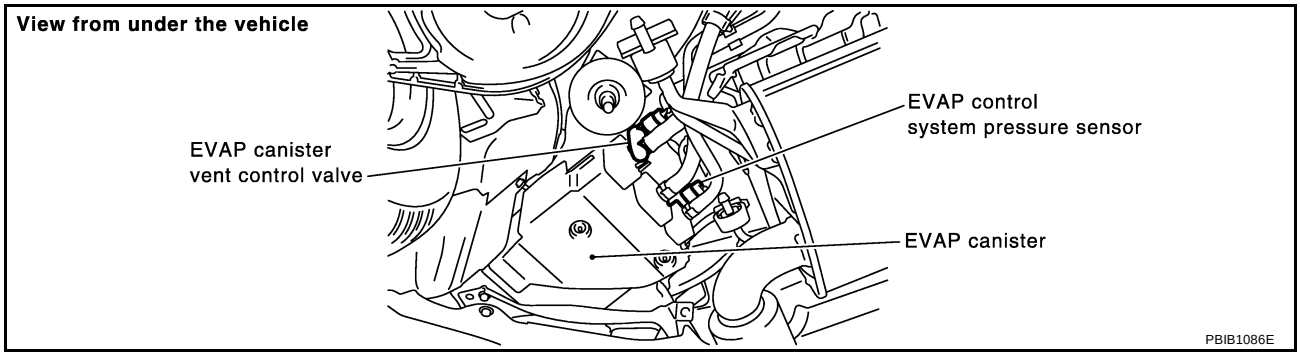
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
111	GY/L	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
117	G/W	EVAP canister vent control valve	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
119 120	R/W P	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

ABS009MJ

1. CHECK RUBBER TUBE

1. Turn ignition switch OFF.
2. Disconnect rubber tube connected to EVAP canister vent control valve.



3. Check the rubber tube for clogging.

OK or NG

OK >> GO TO 2.
NG >> Clean rubber tube using an air blower.

2. CHECK EVAP CANISTER VENT CONTROL VALVE

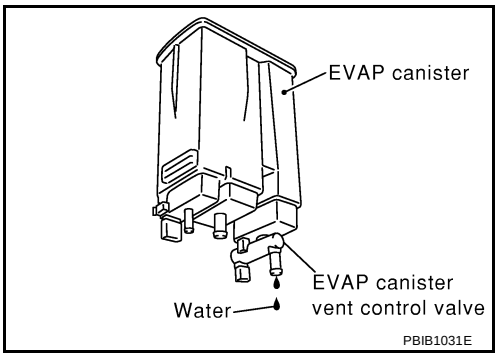
Refer to EC-544, "EVAP CANISTER VENT CONTROL VALVE" .

OK or NG

OK >> GO TO 3.
NG >> Replace EVAP canister vent control valve.

3. CHECK IF EVAP CANISTER SATURATED WITH WATER

1. Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
2. Check if water will drain from the EVAP canister.



OK or NG

OK >> GO TO 4.
NG >> GO TO 6.

4. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.2 kg (4.9 lb).

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister.

6. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR

1. Disconnect EVAP control system pressure sensor harness connector.
2. Check connectors for water.

Water should not exist.

OK or NG

OK >> GO TO 7.
NG >> Replace EVAP control system pressure sensor.

7. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-328, "Component Inspection" .

OK or NG

OK >> GO TO 8.
NG >> Replace EVAP control system pressure sensor.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

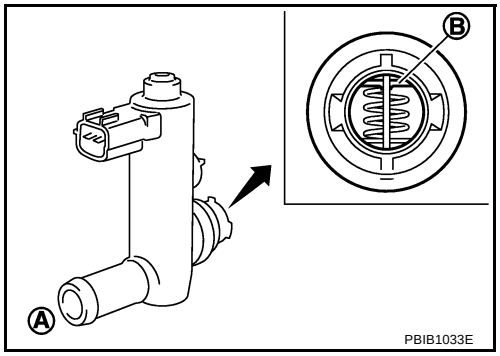
Component Inspection

ABS009MK

EVAP CANISTER VENT CONTROL VALVE

With CONSULT-II

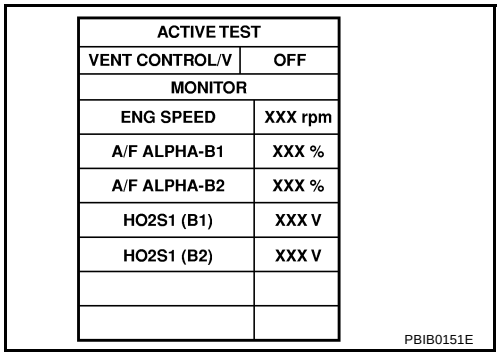
1. Remove EVAP canister vent control valve from EVAP canister.
2. Check portion **B** of EVAP canister vent control valve for being rusted.
   If NG, replace EVAP canister vent control valve.
   If OK, go to next step.
3. Reconnect harness connectors disconnected.
4. Turn ignition switch ON.



5. Perform “VENT CONTROL/V” in “ACTIVE TEST” mode.
6. Check air passage continuity and operation delay time.
   Make sure new O-ring is installed properly.

Condition VENT CONTROL/V	Air passage continuity between A and B
ON	No
OFF	Yes

Operation takes less than 1 second.

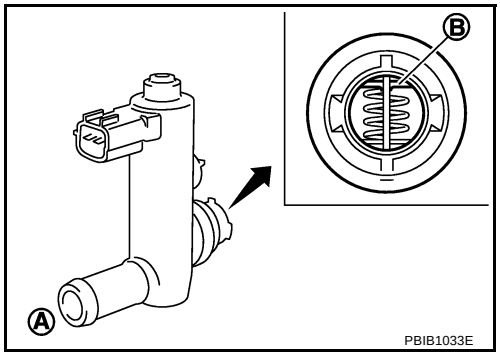


If NG, replace EVAP canister vent control valve.
If OK, go to next step.

7. Clean the air passage (Portion **A** to **B**) of EVAP canister vent control valve using an air blower.
8. Perform step 6 again.

Without CONSULT-II

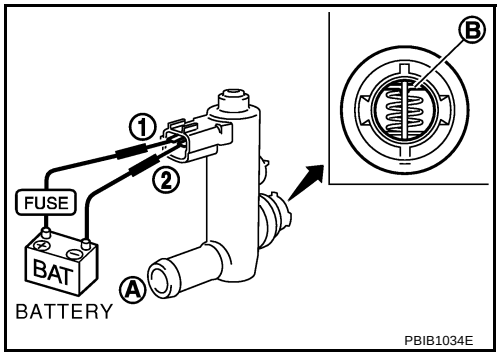
1. Remove EVAP canister vent control valve from EVAP canister.
2. Check portion **B** of EVAP canister vent control valve for being rusted.



3. Check air passage continuity and operation delay time under the following conditions.
   Make sure new O-ring is installed properly.

Condition	Air passage continuity between A and B
12V direct current supply between terminals 1 and 2	No
OFF	Yes

Operation takes less than 1 second.



If NG, replace EVAP canister vent control valve.
If OK, go to next step.

4. Clean the air passage (Portion **A** to **B**) of EVAP canister vent control valve using an air blower.

5. Perform step 3 again.

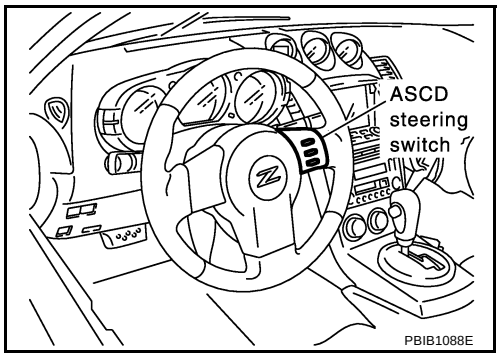
DTC P1564 ASCD STEERING SWITCH

PFP:25551

Component Description

ABS009ML

ASCD steering switch has variant values of electrical resistance for each button. ECM reads voltage variation of switch, and determines which button is operated.
Refer to EC-687, "AUTOMATIC SPEED CONTROL DEVICE (ASCD)" for the ASCD function.



CONSULT-II Reference Value in Data Monitor Mode

ABS009MM

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
MAIN SW	● Ignition switch: ON	ON/OFF (MAIN) switch: Pressed	ON
		ON/OFF (MAIN) switch: Released	OFF
CANCEL SW	● Ignition switch: ON	CANCEL switch: Pressed	ON
		CANCEL switch: Released	OFF
RESUME/ACC SW	● Ignition switch: ON	ACCEL/RESUME switch: Pressed	ON
		ACCEL/RESUME switch: Released	OFF
SET SW	● Ignition switch: ON	COAST/SET switch: Pressed	ON
		COAST/SET switch: Released	OFF

On Board Diagnosis Logic

ABS009MN

This self-diagnosis has the one trip detection logic.
The MIL will not light up for this diagnosis.

NOTE:
If DTC P1564 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to EC-375.

DTC No.	Trouble Diagnosis Name	DTC Detecting Condition	Possible Cause
P1564 1564	ASCD steering switch	● An excessively high voltage signal from the ASCD steering switch is sent to ECM. ● ECM detects that input signal from the ASCD steering switch is out of the specified range. ● ECM detects that the ASCD steering switch is stuck ON.	● Harness or connectors (The switch circuit is open or shorted.) ● ASCD steering switch ● ECM

DTC Confirmation Procedure

ABS009MO

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Wait at least 10 seconds.
4. Press ON/OFF (MAIN) switch for at least 10 seconds, then release it and wait at least 10 seconds.
5. Press ACCEL/RESUME switch for at least 10 seconds, then release it and wait at least 10 seconds.
6. Press COAST/SET switch for at least 10 seconds, then release it and wait at least 10 seconds.
7. Press CANCEL switch for at least 10 seconds, then release it and wait at least 10 seconds.
8. If DTC is detected, go to EC-550, "Diagnostic Procedure" .

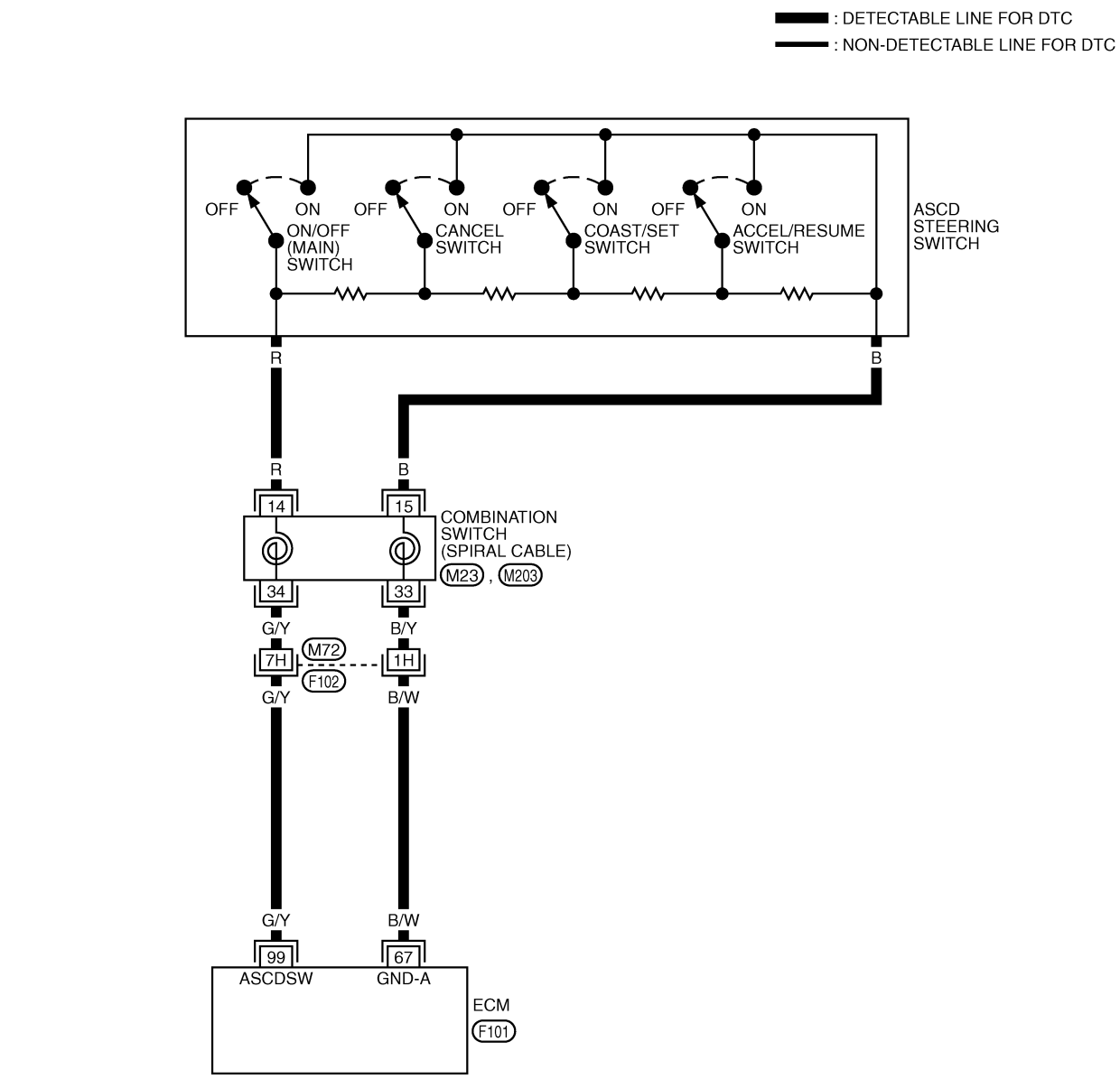
WITH GST

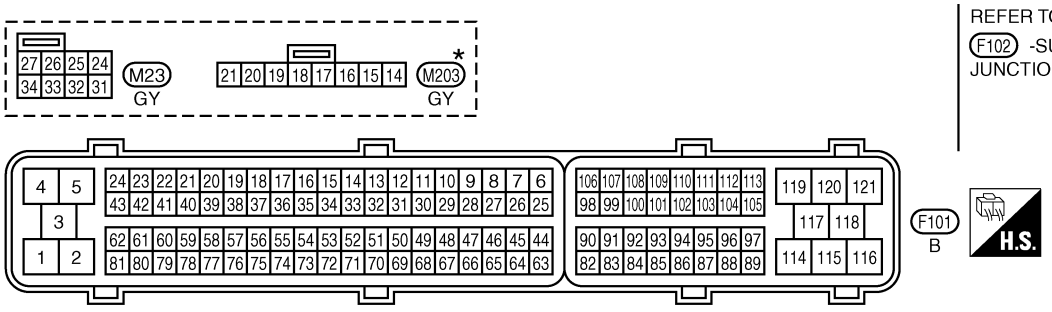
Follow the procedure “WITH CONSULT-II” above.

Wiring Diagram

ABS009MP

EC-ASC/SW-01





REFER TO THE FOLLOWING.
F102 -SUPER MULTIPLE JUNCTION (SMJ)

*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TBWT0501E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

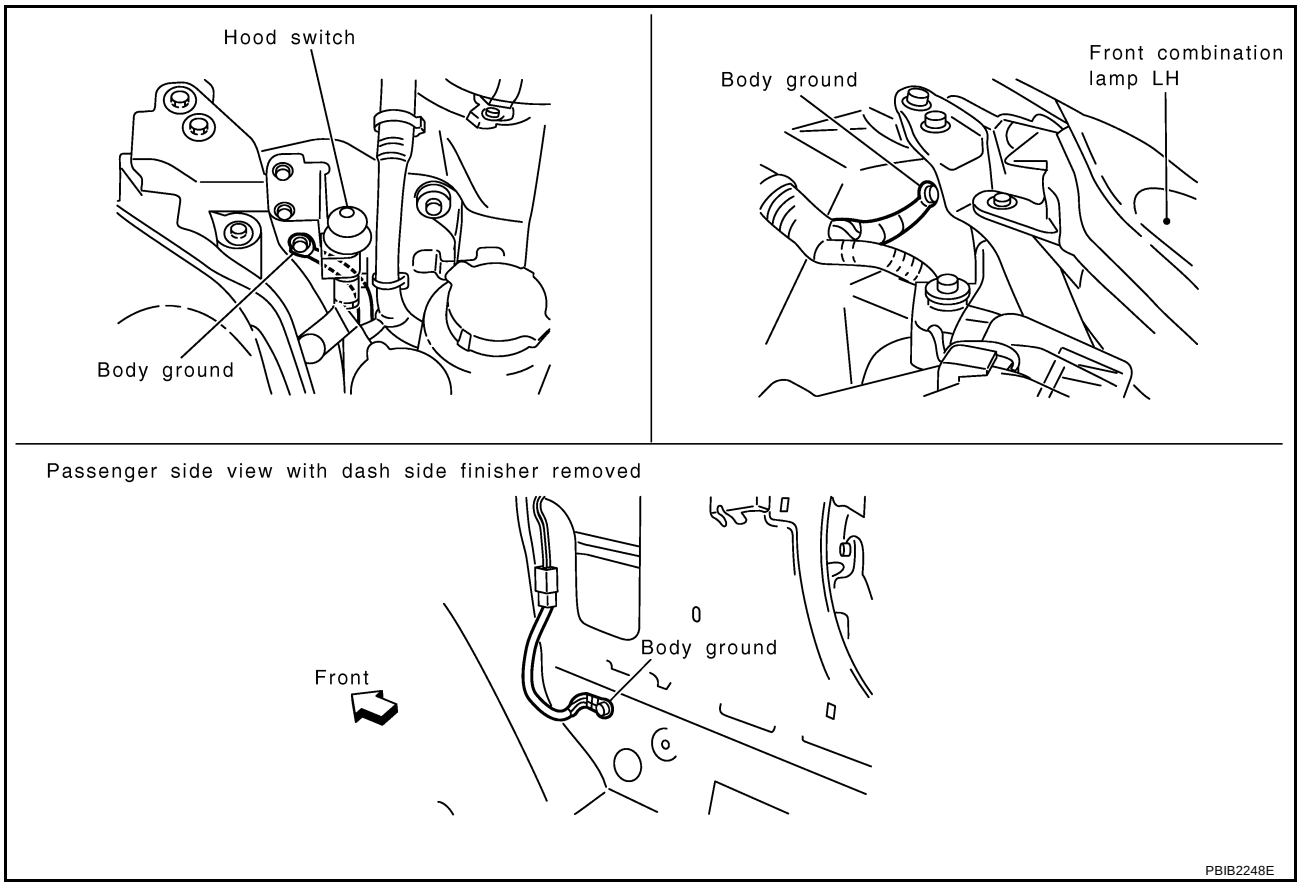
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
67	B/W	Sensor ground (Mass air flow sensor / IAT sensor / Power steering pressure sensor / EVAP control system pressure sensor / ASCD steering switch / Refrigerant pressure sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V
99	G/Y	ASCD steering switch	**[Ignition switch: ON]** ● ASCD steering switch: OFF	Approximately 4V
			[Ignition switch: ON] ● ON/OFF (MAIN) switch: Pressed	Approximately 0V
			[Ignition switch: ON] ● CANCEL switch: Pressed	Approximately 1V
			[Ignition switch: ON] ● COAST/SET switch: Pressed	Approximately 2V
			[Ignition switch: ON] ● ACCEL/RESUME switch: Pressed	Approximately 3V

Diagnostic Procedure

ABS009MQ

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .



OK or NG

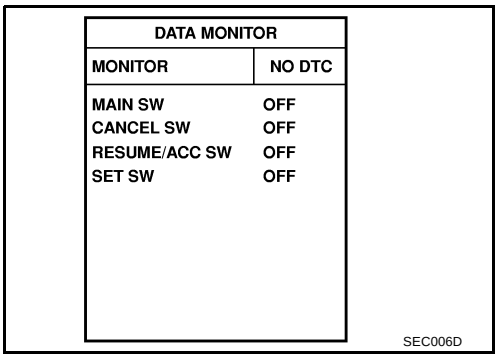
OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK ASCD STEERING SWITCH CIRCUIT

With CONSULT-II

1. Turn ignition switch ON.
2. Select “MAIN SW”, “RESUME/ACC SW”, “SET SW” and “CANCEL SW” in “DATA MONITOR” mode with CONSULT-II.
3. Check each item indication under the following conditions.

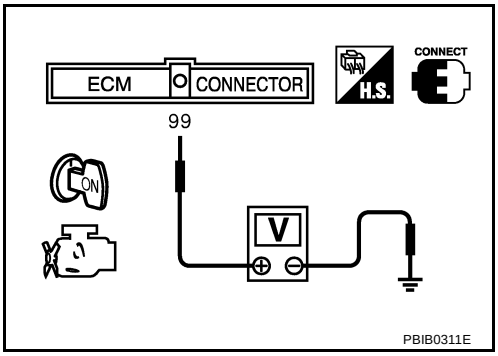
Switch	Monitor item	Condition	Indication
ON/OFF (MAIN) switch	MAIN SW	Pressed	ON
		Released	OFF
COAST/SET switch	SET SW	Pressed	ON
		Released	OFF
ACCEL/RESUME switch	RESUME/ACC SW	Pressed	ON
		Released	OFF
CANCEL switch	CANCEL SW	Pressed	ON
		Released	OFF



Without CONSULT-II

1. Turn ignition switch ON.
2. Check voltage between ECM terminal 99 and ground with pressing each button.

Switch	Condition	Voltage [V]
ON/OFF (MAIN) switch	Pressed	Approx. 0
	Released	Approx. 4
COAST/SET switch	Pressed	Approx. 2
	Released	Approx. 4
ACCEL/RESUME switch	Pressed	Approx. 3
	Released	Approx. 4
CANCEL switch	Pressed	Approx. 1
	Released	Approx. 4



OK or NG

OK >> GO TO 8.
NG >> GO TO 3.

3. CHECK ASCD STEERING SWITCH GROUND CIRCUIT FOR OPEN AND SHORT

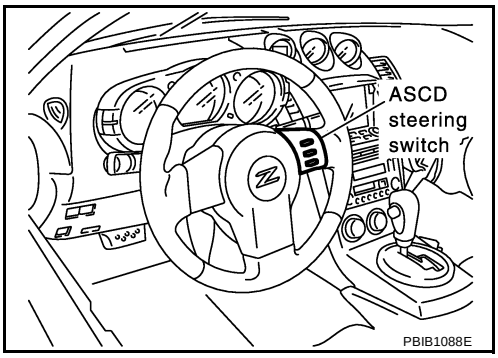
1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Disconnect combination switch harness connector M203.
4. Check harness continuity between combination switch terminal 15 and ECM terminal 67. Refer to Wiring Diagram.

Continuity should exist.

5. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.



4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M72, F102
- Combination switch (spiral cable)
- Harness for open and short between ECM and combination switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK ASCD STEERING SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 99 and combination switch terminal 14.
   Refer to Wiring Diagram.

   Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M72, F102
- Combination switch (spiral cable)
- Harness for open and short between ECM and combination switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK ASCD STEERING SWITCH

Refer to EC-553, "Component Inspection" .

OK or NG

OK >> GO TO 8.
NG >> Replace steering wheel.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

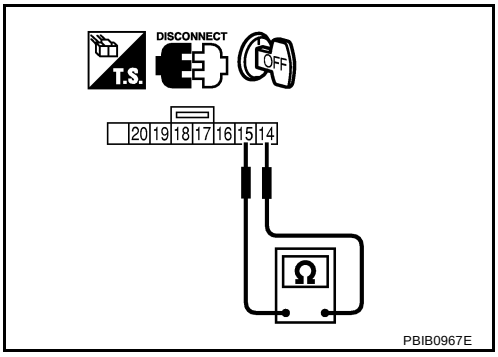
Component Inspection

ABS009MR

ASCD STEERING SWITCH

1. Disconnect combination switch (spiral cable).
2. Check continuity between combination switch (spiral cable) terminals 14 and 15 with pushing each switch.

Switch	Condition	Resistance [Ω]
ON/OFF (MAIN) switch	Pressed	Approx. 0
	Released	Approx. 4,000
COAST/SET switch	Pressed	Approx. 660
	Released	Approx. 4,000
ACCEL/RESUME switch	Pressed	Approx. 1,480
	Released	Approx. 4,000
CANCEL switch	Pressed	Approx. 250
	Released	Approx. 4,000



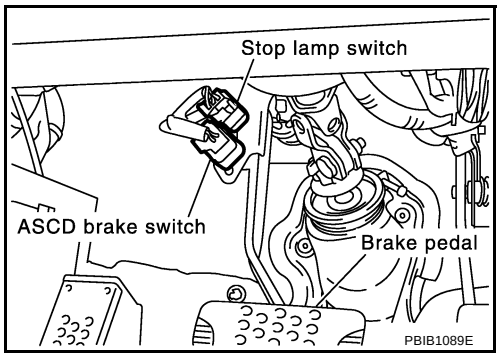
DTC P1572 ASCD BRAKE SWITCH

PFP:25320

Component Description

ABS009MS

When the brake pedal is depressed, ASCD brake switch is turned OFF and stop lamp switch is turned ON. ECM detects the state of the brake pedal by this input of two kinds (ON/OFF signal).
Refer to EC-687, "AUTOMATIC SPEED CONTROL DEVICE (ASCD)" for the ASCD function.



CONSULT-II Reference Value in Data Monitor Mode

ABS009MT

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
BRAKE SW 1 (ASCD brake switch)	● Ignition switch: ON	● Clutch pedal (M/T) and brake pedal: Fully released	ON
		● Clutch pedal (M/T) and/or brake pedal: Slightly depressed	OFF
BRAKE SW 2 (stop lamp switch)	● Ignition switch: ON	● Brake pedal: Fully released	OFF
		● Brake pedal: Slightly depressed	ON

On Board Diagnosis Logic

ABS009MU

This self-diagnosis has the one trip detection logic.
The MIL will not light up for this diagnosis.

NOTE:
If DTC P 1572 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to EC-375

DTC No.	Trouble Diagnosis Name	DTC Detecting Condition	Possible Cause
P1572 1572	ASCD brake switch	When the vehicle speed is above 30 km/h (19 MPH), ON signals from the stop lamp switch and the ASCD brake switch are sent to the ECM at the same time.	● Harness or connectors (The stop lamp switch circuit is open or shorted.) ● Harness or connectors (The ASCD brake switch circuit is open or shorted.) ● Stop lamp switch ● ASCD brake switch ● Incorrect stop lamp switch installation ● Incorrect ASCD brake switch installation ● ASCD clutch switch (M/T models) ● Incorrect ASCD clutch switch installation (M/T models) ● ECM

DTC Confirmation Procedure

ABS009MV

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Steps 3 and 4 may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

WITH CONSULT-II

1. Start engine (VDC switch or TCS switch OFF).
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Drive the vehicle for at least 5 consecutive seconds under the following condition.

VHCL SPEED SE	More than 30 km/h (19 MPH)
Shift lever	Suitable position

If DTC is detected, go to EC-559, "Diagnostic Procedure" .
If DTC is not detected, go to the following step.

4. Drive the vehicle for at least 5 consecutive seconds under the following condition.

VHCL SPEED SE	More than 30 km/h (19 MPH)
Shift lever	Suitable position
Driving location	Depress the brake pedal for more than 5 seconds so as not to come off from the above-mentioned condition.

5. If DTC is detected, go to EC-559, "Diagnostic Procedure" .

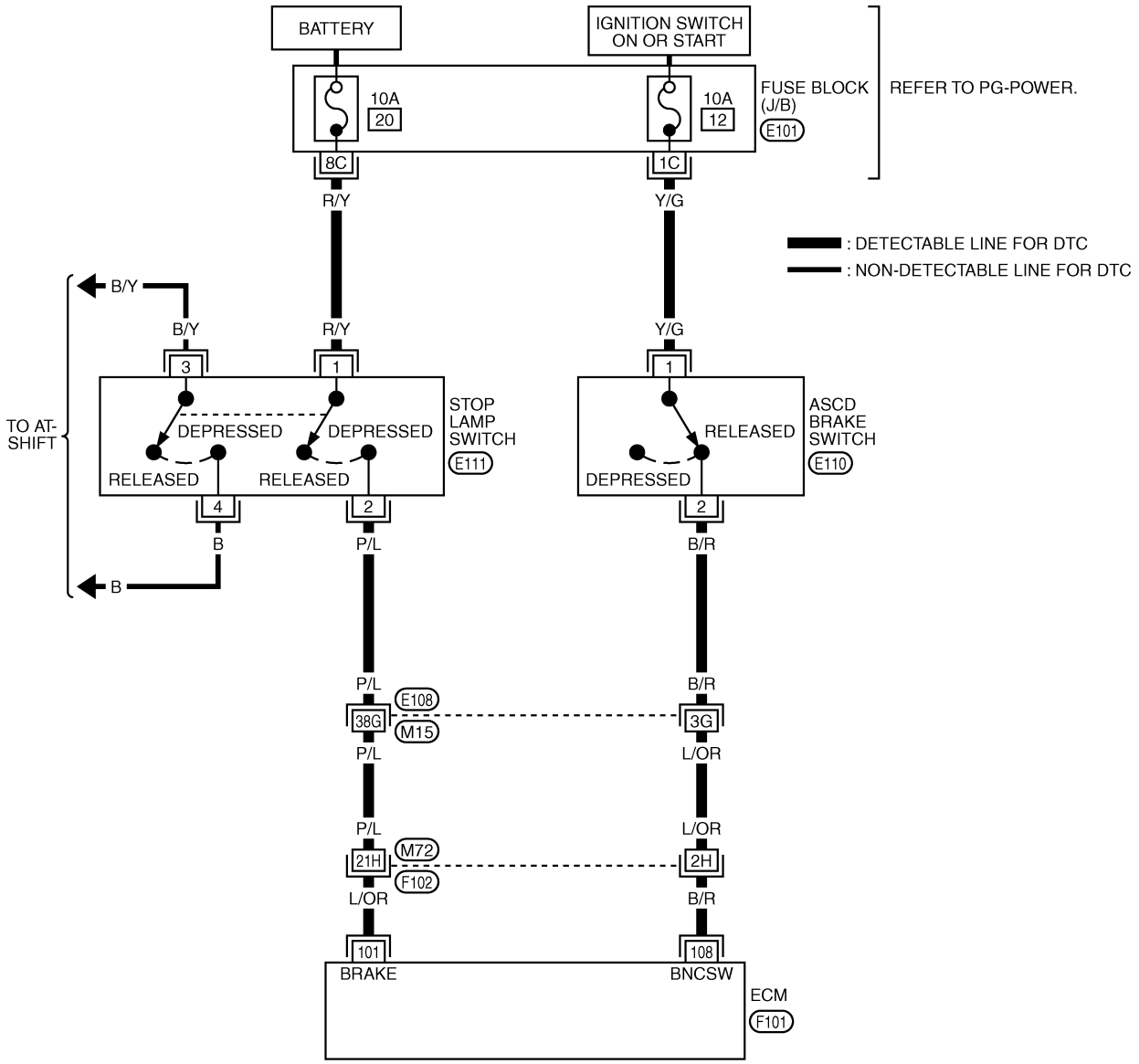
WITH GST

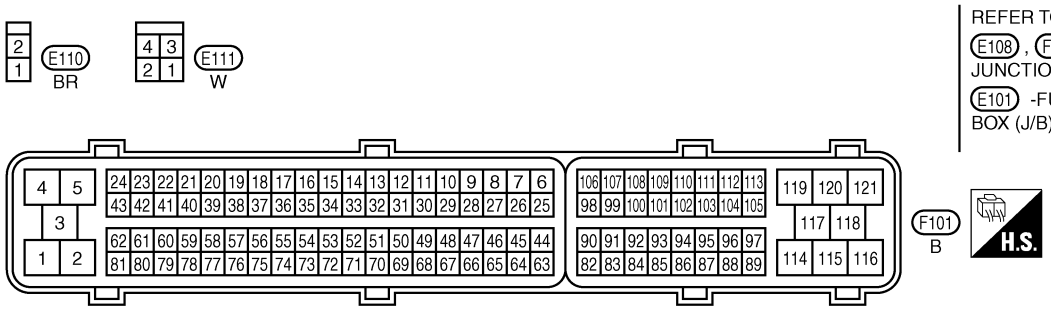
Follow the procedure “WITH CONSULT-II” above.

Wiring Diagram
A/T MODELS

ABS009MW

EC-ASC/BS-01





REFER TO THE FOLLOWING.
E108 , F102 -SUPER MULTIPLE JUNCTION (SMJ)
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT0502E

Specification data are reference values and are measured between each terminal and ground.

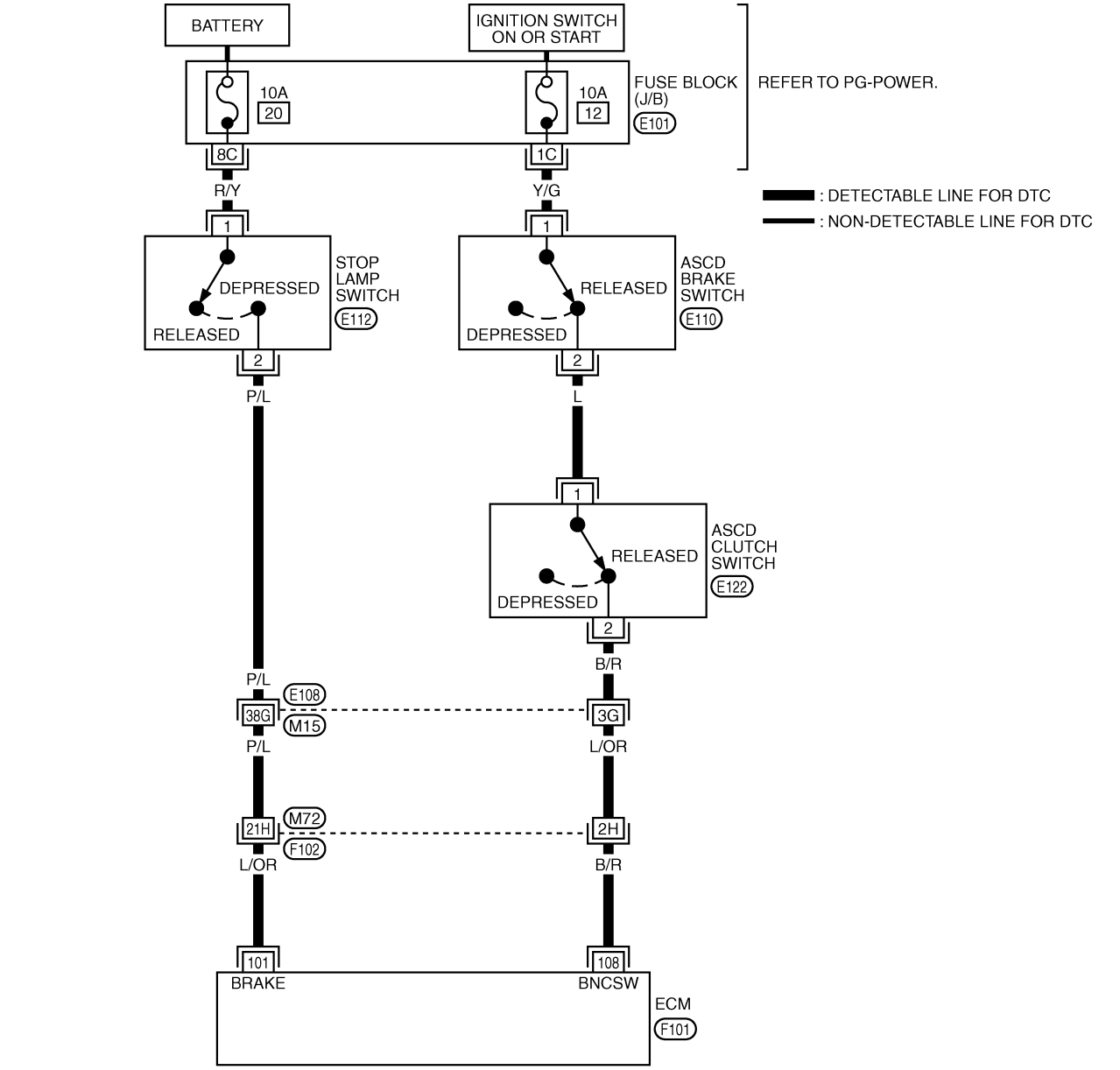
CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
101	L/OR	Stop lamp switch	**[Ignition switch: OFF]** ● Brake pedal is fully released	Approximately 0V
			[Ignition switch: OFF] ● Brake pedal is slightly depressed	BATTERY VOLTAGE (11 - 14V)
108	B/R	ASCD brake switch	**[Ignition switch: ON]** ● Brake pedal is slightly depressed	Approximately 0V
			[Ignition switch: ON] ● Brake pedal is fully released	BATTERY VOLTAGE (11 - 14V)

M/T MODELS

EC-ASC/BS-02



TBWT0503E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
101	L/OR	Stop lamp switch	**[Ignition switch: OFF]** ● Brake pedal is fully released	Approximately 0V
			[Ignition switch: OFF] ● Brake pedal is slightly depressed	BATTERY VOLTAGE (11 - 14V)
108	B/R	ASCD brake switch	**[Ignition switch: ON]** ● Brake pedal and/or clutch pedal are slightly depressed	Approximately 0V
			[Ignition switch: ON] ● Brake pedal and clutch pedal are fully released	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

ABS009MX

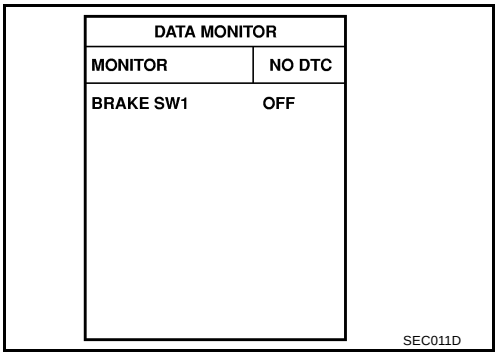
A/T MODELS

1. CHECK OVERALL FUNCTION-I

With CONSULT-II

1. Turn ignition switch ON.
2. Select “BRAKE SW1” in “DATA MONITOR” mode with CONSULT-II.
3. Check “BRAKE SW1” indication under the following conditions.

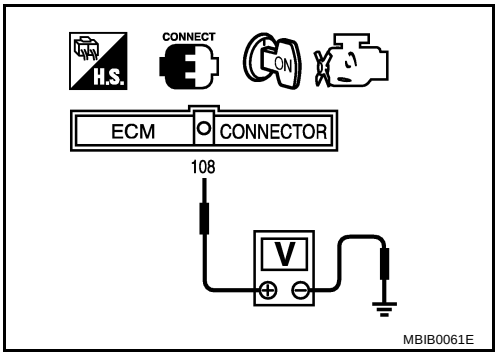
CONDITION	INDICATION
When brake pedal is slightly depressed	OFF
When brake pedal is fully released	ON



Without CONSULT-II

1. Turn ignition switch ON.
2. Check voltage between ECM terminal 108 and ground under the following conditions.

CONDITION	VOLTAGE
When brake pedal is slightly depressed	Approximately 0V
When brake pedal is fully released	Battery voltage



OK or NG

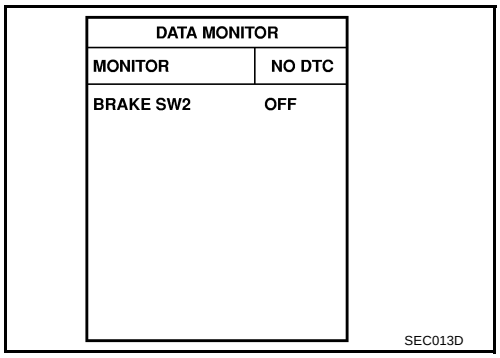
OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK OVERALL FUNCTION-II

With CONSULT-II

Check “BRAKE SW2” indication in “DATA MONITOR” mode.

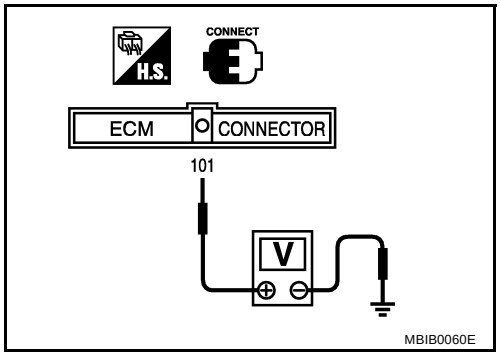
CONDITION	INDICATION
When brake pedal is released	OFF
When brake pedal is slightly depressed	ON



Without CONSULT-II

Check voltage between ECM terminal 101 and ground under the following conditions.

CONDITION	VOLTAGE
When brake pedal is released	Approximately 0V
When brake pedal is slightly depressed	Battery voltage

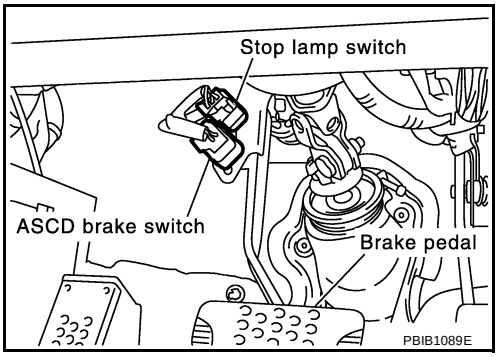


OK or NG

OK >> GO TO 13.
NG >> GO TO 8.

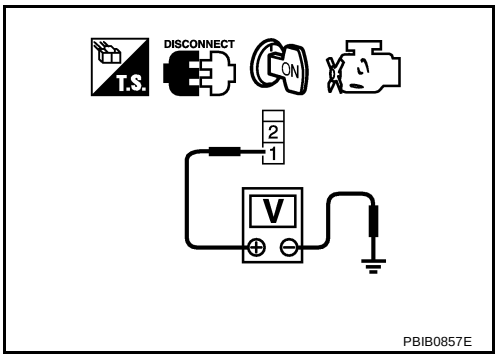
3. CHECK ASCD BRAKE SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ASCD brake switch harness connector.
3. Turn ignition switch ON.



4. Check voltage between ASCD brake switch terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between ASCD brake switch and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK ASCD BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 108 and ASCD brake switch terminal 2. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Harness for open or short between ECM and ASCD brake switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK ASCD BRAKE SWITCH

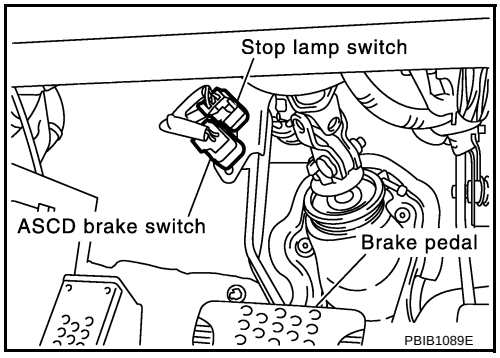
Refer to EC-569, "Component Inspection"

OK or NG

OK >> GO TO 13.
NG >> Replace ASCD brake switch.

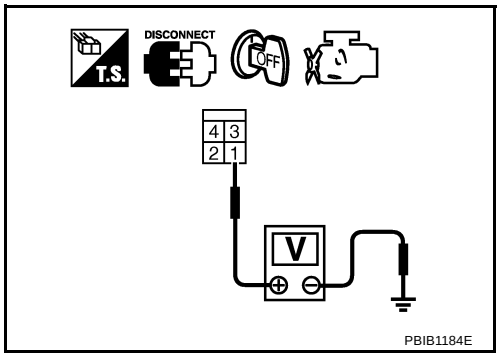
8. CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect stop lamp switch harness connector.



3. Check voltage between stop lamp switch terminal 1 and ground with CONSULT -II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 10.
NG >> GO TO 9.

9. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between stop lamp switch and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

10. CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminal 101 and stop lamp switch terminal 2. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 12.
NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Harness for open or short between ECM and stop lamp switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

12. CHECK STOP LAMP SWITCH

Refer to EC-569, "Component Inspection"

OK or NG

OK >> GO TO 13.
NG >> Replace stop lamp switch.

13. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

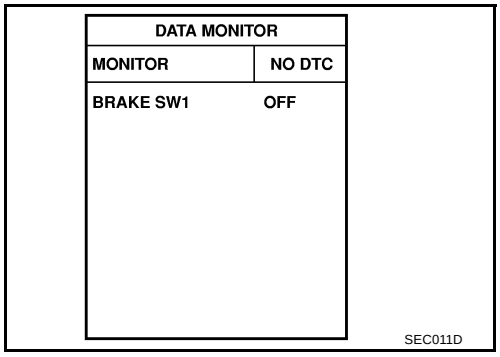
M/T MODELS

1. CHECK OVERALL FUNCTION-I

With CONSULT-II

1. Turn ignition switch ON.
2. Select “BRAKE SW1” in “DATA MONITOR” mode with CONSULT-II.
3. Check “BRAKE SW1” indication under the following conditions.

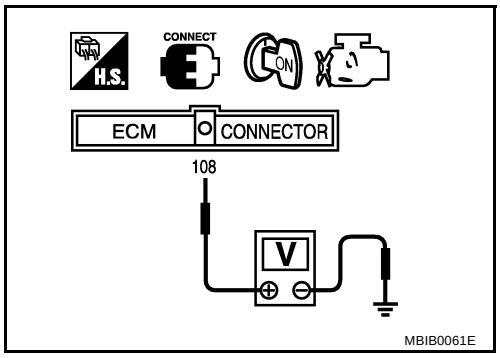
CONDITION	INDICATION
When brake pedal and/or clutch pedal are slightly depressed	OFF
When brake pedal and clutch pedal are fully released	ON



Without CONSULT-II

1. Turn ignition switch ON.
2. Check voltage between ECM terminal 108 and ground under the following conditions.

CONDITION	VOLTAGE
When brake pedal and/or clutch pedal are slightly depressed	Approximately 0V
When brake pedal and clutch pedal are fully released	Battery voltage



OK or NG

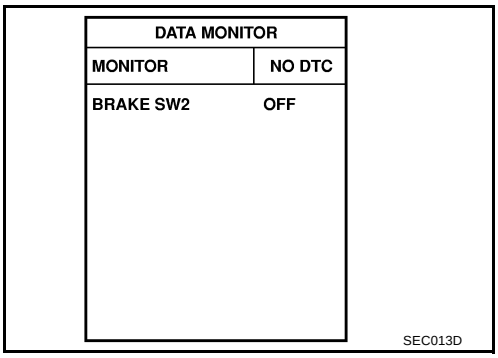
OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK OVERALL FUNCTION-II

With CONSULT-II

Check “BRAKE SW2” indication in “DATA MONITOR” mode.

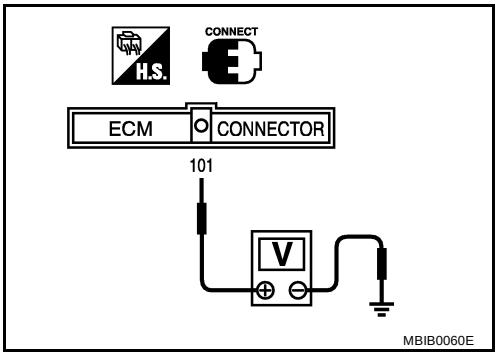
CONDITION	INDICATION
When brake pedal is released	OFF
When brake pedal is slightly depressed	ON



Without CONSULT-II

Check voltage between ECM terminal 101 and ground under the following conditions.

CONDITION	VOLTAGE
When brake pedal is released	Approximately 0V
When brake pedal is slightly depressed	Battery voltage

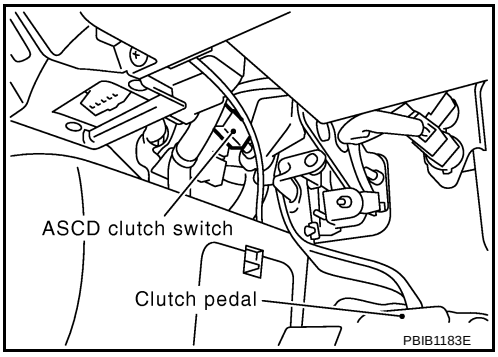


OK or NG

OK >> GO TO 16.
NG >> GO TO 11.

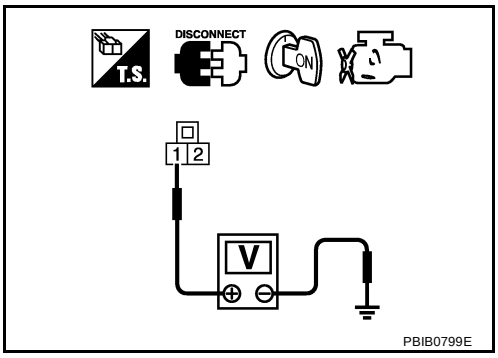
3. CHECK ASCD BRAKE SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ASCD clutch switch harness connector.
3. Turn ignition switch ON.



4. Check voltage between ASCD clutch switch terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

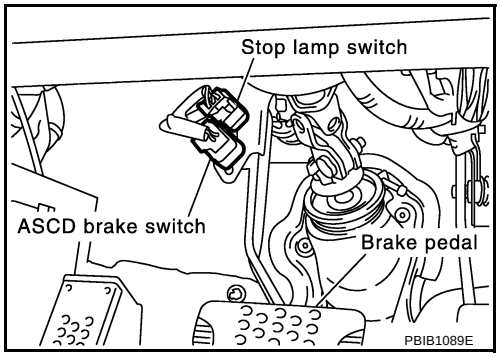


OK or NG

OK >> GO TO 8.
NG >> GO TO 4.

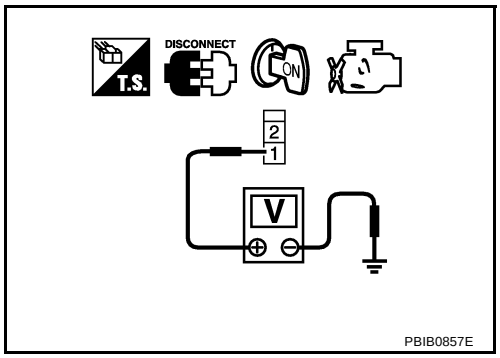
4. CHECK ASCD BRAKE SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ASCD brake switch harness connector.
3. Turn ignition switch ON.



4. Check voltage between ASCD brake switch terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between ASCD brake switch and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK ASCD BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Check harness continuity between ASCD brake switch terminal 2 and ASCD clutch switch terminal 1. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK ASCD BRAKE SWITCH

Refer to EC-569, "Component Inspection"

OK or NG

OK >> GO TO 16.
NG >> Replace ASCD brake switch.

8. CHECK ASCD CLUTCH SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ASCD clutch switch terminal 2 and ECM terminal 108. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 10.
NG >> GO TO 9.

9. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Harness for open or short between ECM and ASCD clutch switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

10. CHECK ASCD CLUTCH SWITCH

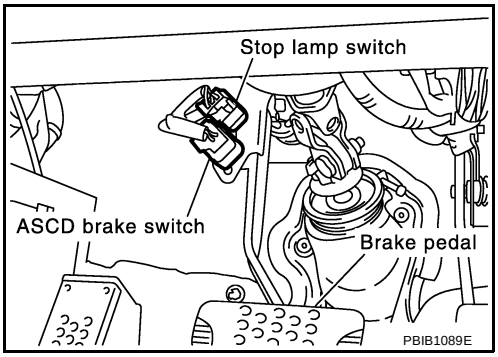
Refer to EC-569, "Component Inspection" .

OK or NG

OK >> GO TO 16.
NG >> Replace ASCD clutch switch.

11. CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect stop lamp switch harness connector.

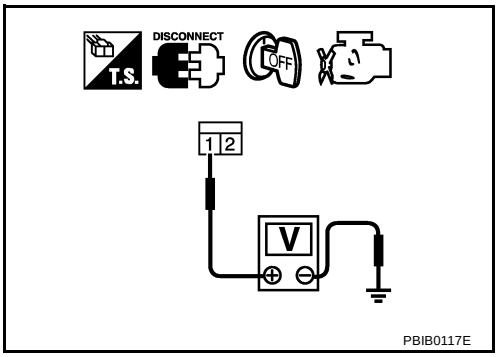


3. Check voltage between stop lamp switch terminal 1 and ground with CONSULT -II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 13.
NG >> GO TO 12.



12. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between stop lamp switch and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

13. CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminal 101 and stop lamp switch terminal 2. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 15.
NG >> GO TO 14.

14. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Harness for open or short between ECM and stop lamp switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

15. CHECK STOP LAMP SWITCH

Refer to EC-569, "Component Inspection"

OK or NG

OK >> GO TO 16.
NG >> Replace stop lamp switch.

16. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

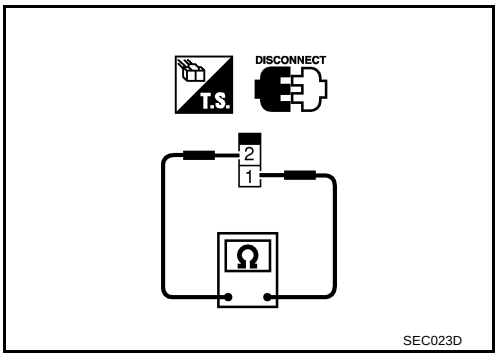
ABS009MY

ASCD BRAKE SWITCH

1. Turn ignition switch OFF.
2. Disconnect ASCD brake switch harness connector.
3. Check harness continuity between ASCD brake switch terminals 1 and 2 under the following conditions.

Condition	Continuity
When brake pedal is fully released.	Should exist.
When brake pedal is slightly depressed.	Should not exist.

If NG, adjust ASCD brake switch installation, refer to BR-6, "BRAKE PEDAL" , and perform step 3 again.

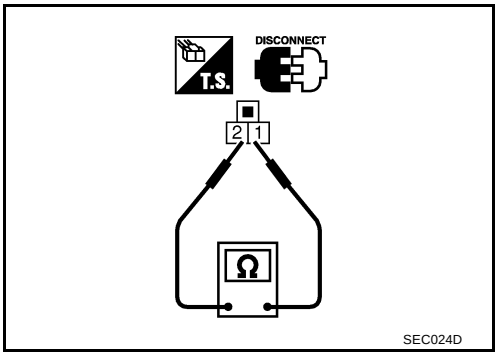


ASCD CLUTCH SWITCH

1. Turn ignition switch OFF.
2. Disconnect ASCD clutch switch harness connector.
3. Check harness continuity between ASCD clutch switch terminals 1 and 2 under the following conditions.

Condition	Continuity
When clutch pedal is fully released.	Should exist.
When clutch pedal is slightly depressed.	Should not exist.

If NG, adjust ASCD clutch switch installation, refer to CL-5, "CLUTCH PEDAL" , and perform step 3 again.

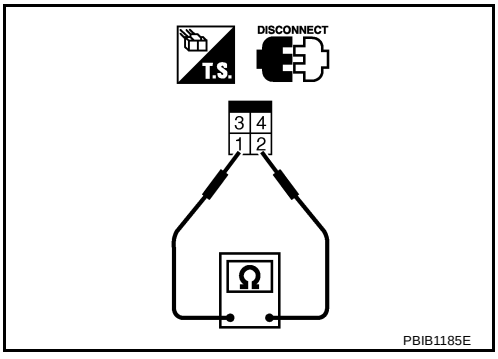


STOP LAMP SWITCH (FOR A/T MODELS)

1. Turn ignition switch OFF.
2. Disconnect stop lamp switch harness connector.
3. Check harness continuity between stop lamp switch terminals 1 and 2 under the following conditions.

Condition	Continuity
When brake pedal is fully released.	Should not exist.
When brake pedal is slightly depressed.	Should exist.

If NG, adjust stop lamp switch installation, refer to BR-6, "BRAKE PEDAL" , and perform step 3 again.

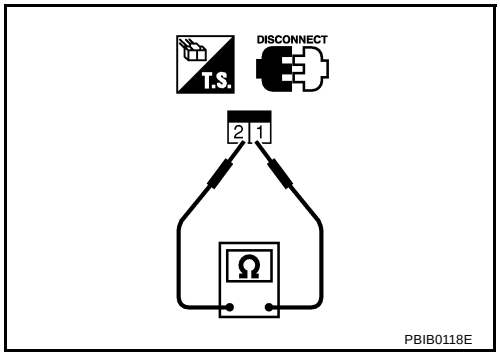


STOP LAMP SWITCH (FOR M/T MODELS)

1. Turn ignition switch OFF.
2. Disconnect stop lamp switch harness connector.
3. Check harness continuity between stop lamp switch terminals 1 and 2 under the following conditions.

Condition	Continuity
When brake pedal is fully released.	Should not exist.
When brake pedal is slightly depressed.	Should exist.

If NG, adjust stop lamp switch installation, refer to BR-6, "BRAKE PEDAL" , and perform step 3 again.



DTC P1574 ASCD VEHICLE SPEED SENSOR

PFP:31036

Component Description

ABS009MZ

The ECM receives two vehicle speed sensor signals via CAN communication line. One is sent from “unified meter and A/C amp.”, and the other is from TCM (Transmission control module). The ECM uses these signals for ASCD control. Refer to EC-687, "AUTOMATIC SPEED CONTROL DEVICE (ASCD)" for ASCD functions.

On Board Diagnosis Logic

ABS009N0

This self-diagnosis has the one trip detection logic.
The MIL will not light up for this diagnosis.

NOTE:

- **If DTC P1574 is displayed with DTC U1000, U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-138, "DTC U1000, U1001 CAN COMMUNICATION LINE" .**
- **If DTC P1574 is displayed with DTC P0500, first perform the trouble diagnosis for DTC P0500. Refer to EC-363, "DTC P0500 VSS"**
- **If DTC P1574 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to EC-375, "DTC P0605 ECM"**

DTC No.	Trouble Diagnosis Name	DTC Detecting Condition	Possible Cause
P1574 1574	ASCD vehicle speed sensor	ECM detects a difference between two vehicle speed signals is out of the specified range.	● Harness or connectors (The CAN communication line is open or shorted.) ● Unified meter and A/C amp. ● VDC/TCS/ABS control unit (models with VDC) ● ABS actuator and electric unit (control unit) (models without VDC) ● Wheel sensor ● TCM(A/T models) ● ECM

DTC Confirmation Procedure

ABS009N1

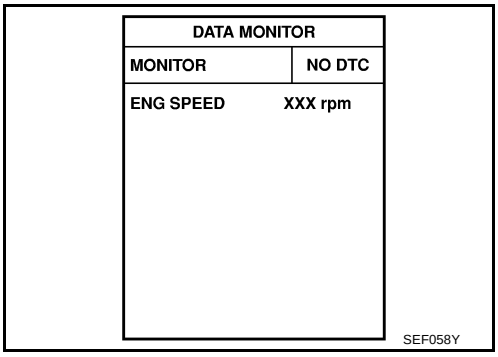
CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Step 3 may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

WITH CONSULT-II

1. Start engine (VDC switch or TCS switch OFF).
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Drive the vehicle at more than 40 km/h (25 MPH).
4. If DTC is detected, go to EC-572, "Diagnostic Procedure" .



WITH GST

Follow the procedure “WITH CONSULT-II” above.

Diagnostic Procedure

ABS009N2

1. CHECK DTC WITH TCM

Check DTC with TCM. Refer to AT-37 .

OK or NG

OK >> GO TO 2.
NG >> Perform trouble shooting relevant to DTC indicated.

2. CHECK DTC WITH “VDC/TSC/ABS CONTROL UNIT (MODELS WITH VDC)” OR “ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) (MODELS WITHOUT VDC)”

Refer to BRC-94, "TROUBLE DIAGNOSIS" or refer to BRC-46, "TROUBLE DIAGNOSIS" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace.

3. CHECK DTC WITH “UNIFIED METER AND A/C AMP.”

Refer to DI-4, "COMBINATION METERS" .

>> **INSPECTION END**

DTC P1706 PNP SWITCH

PFP:32006

Component Description

ABS009N3

When the gear position is P or N (A/T), Neutral (M/T), park/neutral position (PNP) switch is ON.
ECM detects the position because the continuity of the line (the ON signal) exists.

CONSULT-II Reference Value in Data Monitor Mode

ABS009N4

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
P/N POSI SW	● Ignition switch: ON	Shift lever: P or N (A/T), Neutral (M/T)	ON
		Shift lever: Except above	OFF

On Board Diagnosis Logic

ABS009N5

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1706 1706	Park/neutral position switch	The signal of the park/neutral position (PNP) switch is not changed in the process of engine starting and driving.	● Harness or connectors [The park/neutral position (PNP) switch circuit is open or shorted.] ● Park/neutral position (PNP) switch ● Unified meter and A/C amp. (A/T models) ● TCM (A/T models)

DTC Confirmation Procedure

ABS009N6

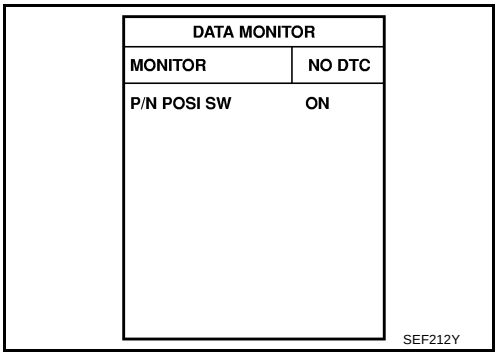
CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “P/N POSI SW” in “DATA MONITOR” mode with CONSULT-II. Then check the “P/N POSI SW” signal under the following conditions.

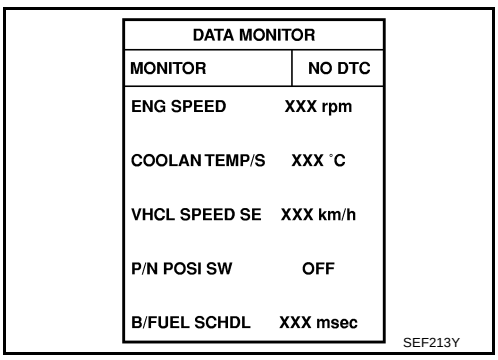
Position (Shift lever)	Known-good signal
N or P position (A/T) Neutral position (M/T)	ON
Except above position	OFF



If NG, go to EC-578, "Diagnostic Procedure" .
If OK, go to following step.

3. Select “DATA MONITOR” mode with CONSULT-II.
4. Start engine and warm it up to normal operating temperature.
5. Maintain the following conditions for at least 60 consecutive seconds.

ENG SPEED	1,400 - 6375 rpm
COOLAN TEMP/S	More than 70°C (158°F)
B/FUEL SCHDL	2.0 - 31.8 msec
VHCL SPEED SE	More than 64 km/h (40 MPH)
Shift lever	Suitable position



6. If 1st trip DTC is detected, go to EC-578, "Diagnostic Procedure" .

Overall Function Check

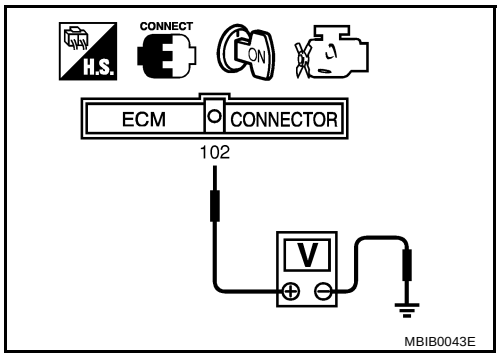
ABS009N7

Use this procedure to check the overall function of the park/neutral position (PNP) switch circuit. During this check, a 1st trip DTC might not be confirmed.

WITH GST

1. Turn ignition switch ON.
2. Check voltage between ECM terminal 102 (PNP switch signal) and ground under the following conditions.

Condition (Gear position)	Voltage V (Known good data)
P or N position (A/T) Neutral position (M/T)	Approx. 0
Except above position	BATTERY VOLTAGE (11 - 14V)

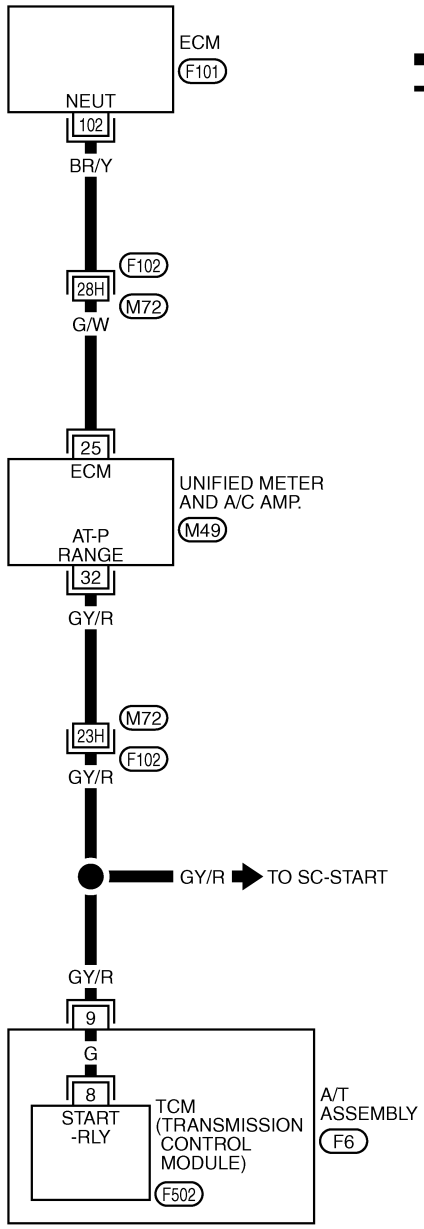


3. If NG, go to EC-578, "Diagnostic Procedure" .

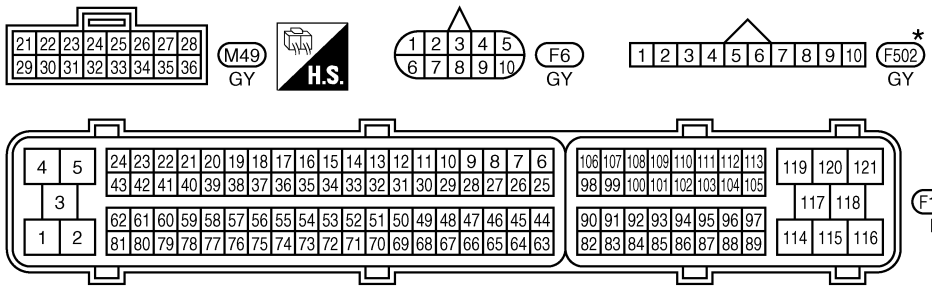
Wiring Diagram
A/T MODELS

ABS009N8

EC-PNP/SW-01



: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC



REFER TO THE FOLLOWING.
F102 -SUPER MULTIPLE JUNCTION (SMJ)

*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TBWM0525E

Specification data are reference values and are measured between each terminal and ground.

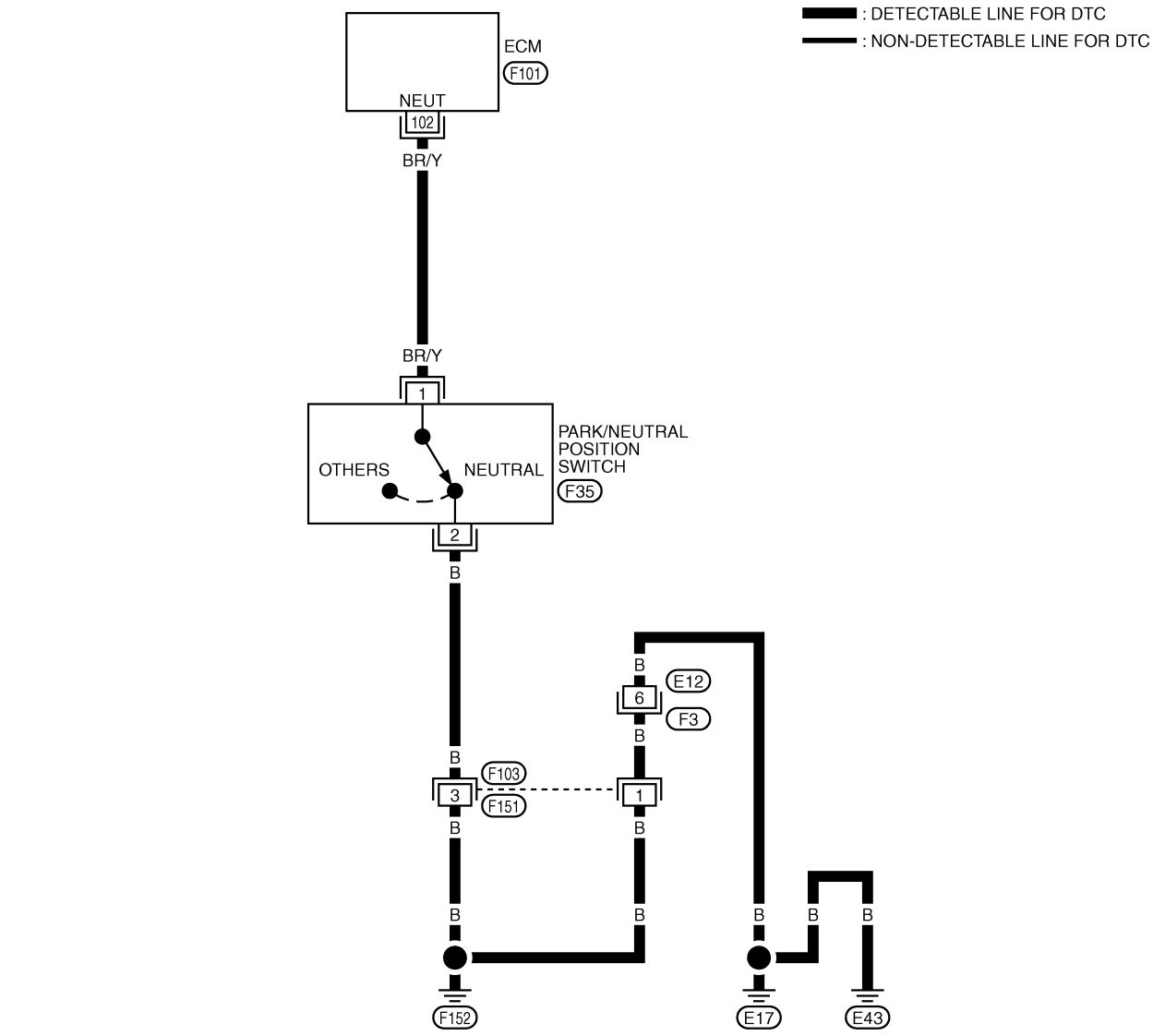
CAUTION:

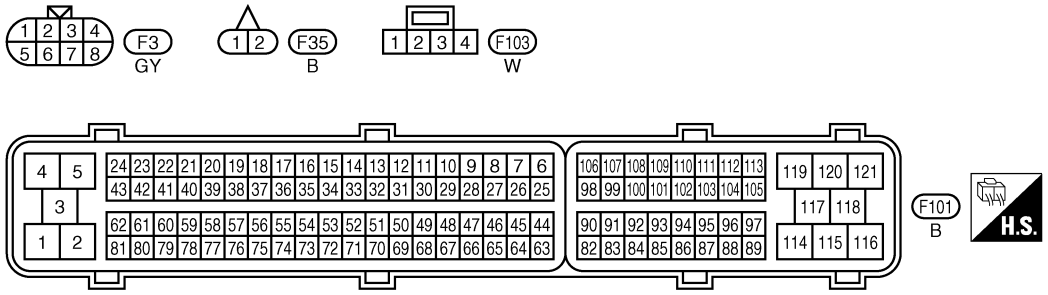
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
102	BR/Y	PNP switch	**[Ignition switch: ON]** ● Shift lever: P or N	Approximately 0V
			[Ignition switch: ON] ● Except above position	BATTERY VOLTAGE (11 - 14V)

M/T MODELS

EC-PNP/SW-02





TBWT0505E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
102	BR/Y	PNP switch	**[Ignition switch: ON]** ● Shift lever: Neutral	Approximately 0V
			[Ignition switch: ON] ● Except above position	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

ABS009N9

A/T MODELS

1. CHECK DTC WITH TCM

Refer to AT-37, "OBD-II Diagnostic Trouble Code (DTC)" .

OK or NG

OK >> GO TO 2.
NG >> Repair or replace.

2. CHECK STARTING SYSTEM

Turn ignition switch OFF, then turn it to START.

Does starter motor operate?

Yes or No

Yes >> GO TO 3.
No >> Refer to SC-10, "STARTING SYSTEM" .

3. CHECK PNP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-I

1. Turn ignition switch OFF.
2. Disconnect A/T assembly harness connector.
3. Disconnect “unified meter and A/C amp.” harness connector.
4. Check harness continuity between A/T assembly terminal 9 and “unified meter and A/C amp.” terminal 32. Refer to Wiring Diagram.

Continuity should exist.

5. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F102, M72
- Harness for open or short between A/T assembly and “unified meter and A/C amp.”

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK PNP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-II

1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminal 102 and “unified meter and A/C amp.” terminal 25. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F102, M72
- Harness for open or short between ECM and “unified meter and A/C amp.”.

>> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK PNP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-III

1. Check harness continuity between A/T assembly terminal 9 and TCM terminal 8. Refer to AT-103, "DTC P0615 START SIGNAL CIRCUIT" .

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 8.
NG >> Repair open circuit or short to ground or short to power in harness connectors.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> GO TO 9.
NG >> Repair or replace.

9. REPLACE “UNIFIED METER AND A/C AMP.”

Refer to DI-54, "UNIFIED METER AND A/C AMP" .

>> **INSPECTION END**

M/T MODELS

1. CHECK PNP SWITCH GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect PNP switch harness connector.
3. Check harness continuity between PNP switch terminal 2 and ground.
   Refer to Wiring Diagram.

   Continuity should exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 3
NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F103, F151
- Harness connector E12, F3
- Harness for open or short between PNP switch and ground

>> Repair open circuit or short to power in harness or connectors.

3. CHECK PNP SWITCH INPUT SIGNAL CIRCUIT

1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminal 102 and PNP switch terminal 1.
   Refer to Wiring Diagram.

   Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK PNP SWITCH

Refer to MT-12, "NEUTRAL POSITION SWITCH" .

OK or NG

OK >> GO TO 5.
NG >> Replace PNP switch.

5. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

DTC P1805 BRAKE SWITCH

PFP:25320

Description

ABS009NA

Brake switch signal is applied to the ECM through the stop lamp switch when the brake pedal is depressed. This signal is used mainly to decrease the engine speed when the vehicle is driving.

CONSULT-II Reference Value in Data Monitor Mode

ABS009NB

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
BRAKE SW	● Ignition switch: ON	Brake pedal: Fully released	OFF
		Brake pedal: Slightly depressed	ON

On Board Diagnosis Logic

ABS009NC

The MIL will not light up for this diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1805 1805	Brake switch	A brake switch signal is not sent to ECM for an extremely long time while the vehicle is driving.	● Harness or connectors (Stop lamp switch circuit is open or shorted.) ● Stop lamp switch

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode.

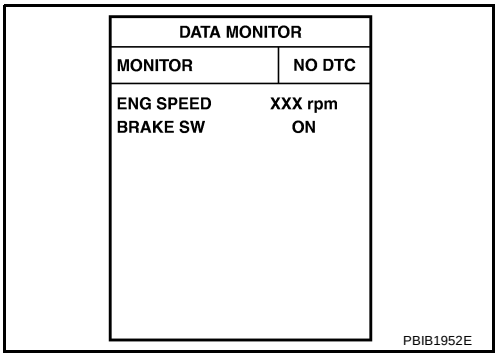
Engine operating condition in fail-safe mode	
ECM controls the electric throttle control actuator by regulating the throttle opening to a small range. Therefore, acceleration will be poor.	
Vehicle condition	Driving condition
When engine is idling	Normal
When accelerating	Poor acceleration

DTC Confirmation Procedure

ABS009ND

WITH CONSULT-II

1. Turn ignition switch ON.
2. Fully depress the brake pedal for at least 5 seconds.
3. Erase the DTC with CONSULT-II.
4. Select “DATA MONITOR” mode with CONSULT-II.
5. If 1st trip DTC is detected, go to EC-583, "Diagnostic Procedure" .



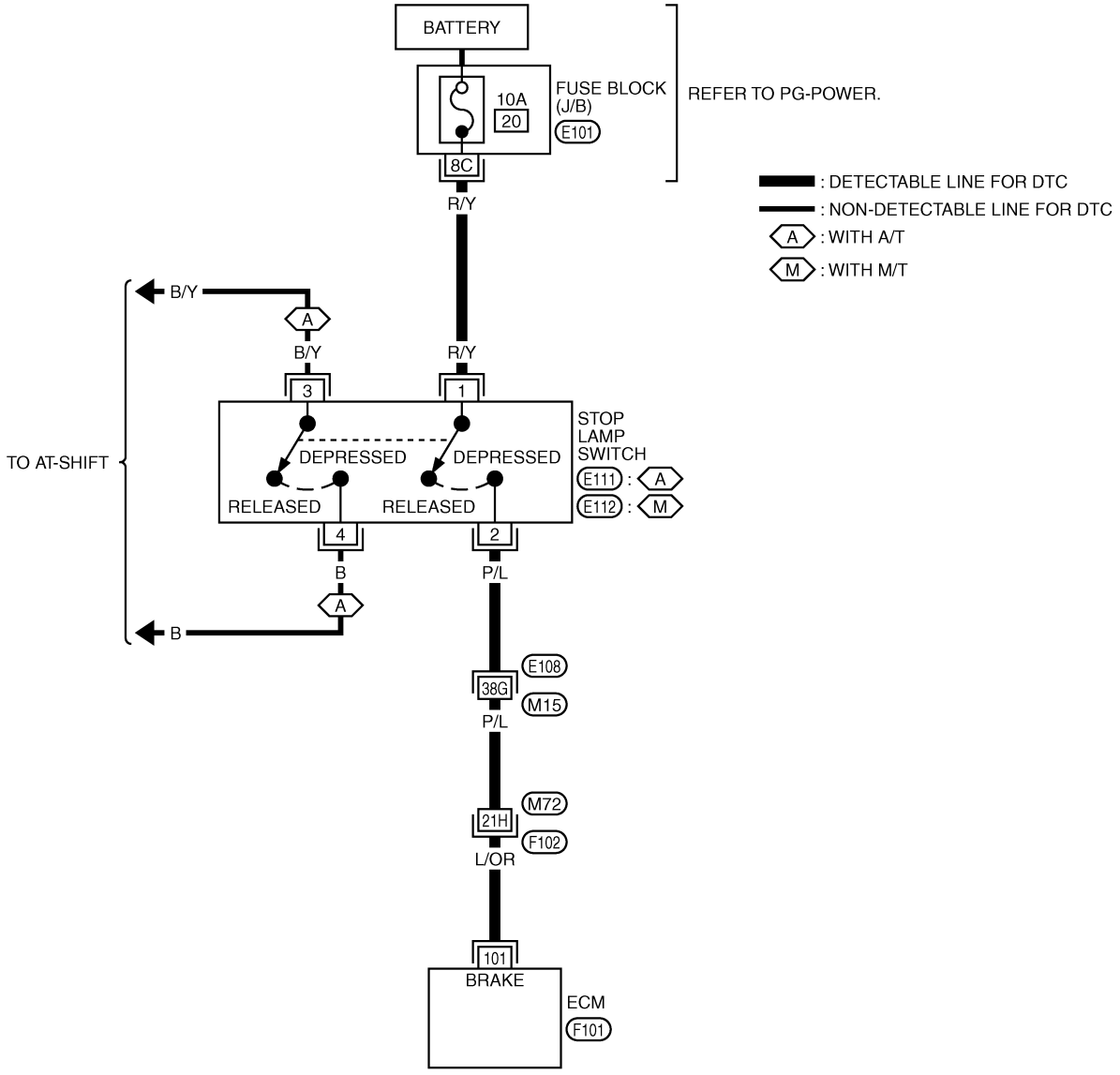
WITH GST

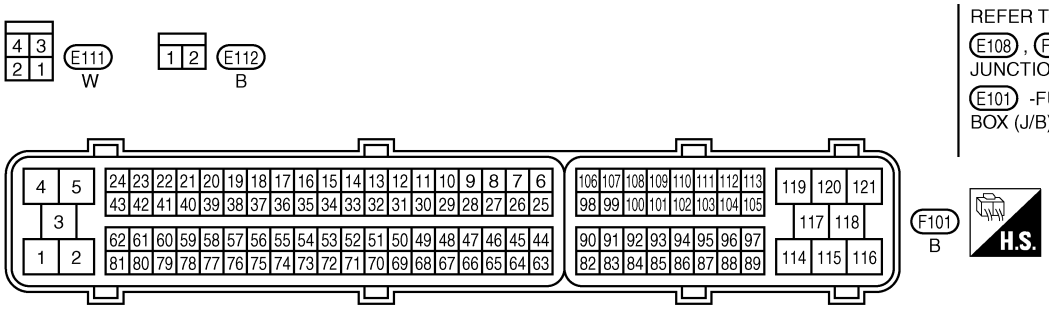
Follow the procedure “WITH CONSULT-II” above.

Wiring Diagram

ABS009NE

EC-BRK/SW-01





REFER TO THE FOLLOWING.
E108 , F102 -SUPER MULTIPLE JUNCTION (SMJ)
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT0506E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
101	L/OR	Stop lamp switch	**[Ignition switch: OFF]** ● Brake pedal is fully released	Approximately 0V
			[Ignition switch: OFF] ● Brake pedal is slightly depressed	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

ABS009NF

1. CHECK STOP LAMP SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Check the stop lamp when depressing and releasing the brake pedal.

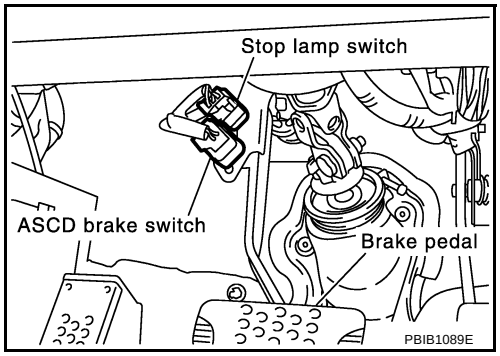
Brake pedal	Stop lamp
Fully released	Not illuminated
slightly depressed	Illuminated

OK or NG

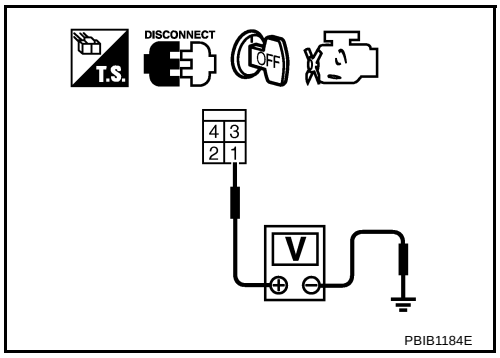
OK >> GO TO 4.
NG >> GO TO 2.

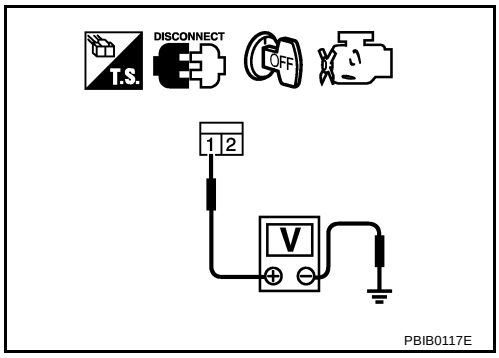
2. CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

1. Disconnect stop lamp switch harness connector.



2. Check voltage between stop lamp switch terminal 1 and ground with CONSULT-II or tester.





Voltage: Battery voltage

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- 10A fuse
- Fuse block (J/B) connector E101
- Harness for open and short between stop lamp switch and fuse

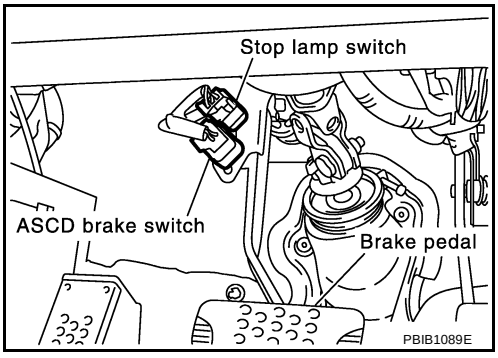
>> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Disconnect stop lamp switch harness connector.
4. Check harness continuity between ECM terminal 101 and stop lamp switch terminal 2.
   Refer to Wiring Diagram.

   Continuity should exist.

5. Also check harness for short to ground and short to power.



OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Harness for open or short between ECM and stop lamp switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK STOP LAMP SWITCH

Refer to EC-586, "Component Inspection" .

OK or NG

OK >> GO TO 7.
NG >> Replace stop lamp switch.

7. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

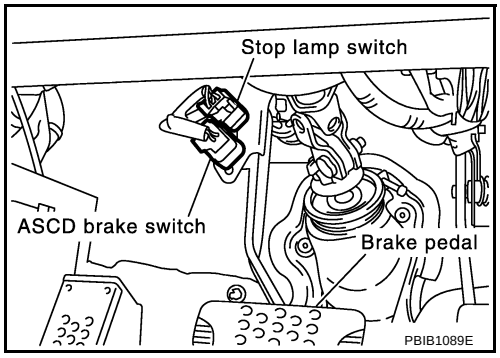
>> **INSPECTION END**

Component Inspection

ABS009NG

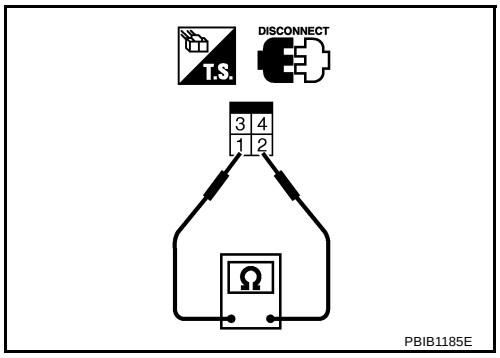
STOP LAMP SWITCH

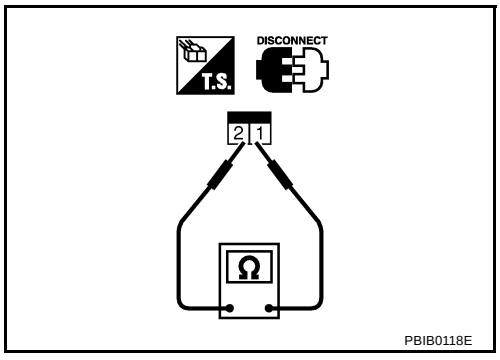
1. Disconnect stop lamp switch harness connector.



2. Check continuity between stop lamp switch terminals 1 and 2 under the following conditions.

Conditions	Continuity
Brake pedal fully released	Should not exist.
Brake pedal slightly depressed	Should exist.





3. If NG, adjust stop lamp switch installation, refer to BR-6, "BRAKE PEDAL" , and perform step 2 again.

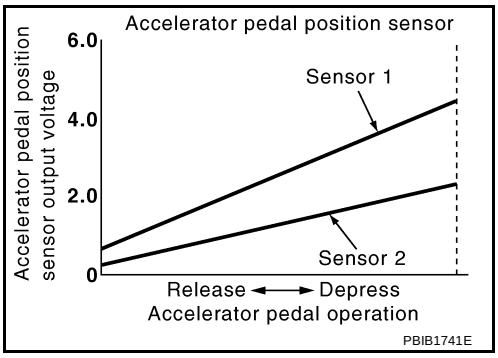
DTC P2122, P2123 APP SENSOR

PFP:18002

Component Description

ABS009NH

The accelerator pedal position sensor is installed on the upper end of the accelerator pedal assembly. The sensor detects the accelerator position and sends a signal to the ECM.
Accelerator pedal position sensor has two sensors. These sensors are a kind of potentiometers which transform the accelerator pedal position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the accelerator pedal and feed the voltage signals to the ECM. The ECM judges the current opening angle of the accelerator pedal from these signals and controls the throttle control motor based on these signals.
Idle position of the accelerator pedal is determined by the ECM receiving the signal from the accelerator pedal position sensor. The ECM uses this signal for the engine operation such as fuel cut.



CONSULT-II Reference Value in Data Monitor Mode

ABS009NI

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
ACCEL SEN1	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.5 - 1.0V
		Accelerator pedal: Fully depressed	4.0 - 4.8V
ACCEL SEN2*	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.3 - 1.2V
		Accelerator pedal: Fully depressed	3.9 - 4.8V
CLSD THL POS	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	ON
		Accelerator pedal: Slightly depressed	OFF

*: Accelerator pedal position sensor 2 signal is converted by ECM internally. Thus, it differ from ECM terminal voltage.

On Board Diagnosis Logic

ABS009NJ

These self-diagnoses have the one trip detection logic.

NOTE:
If DTC P2122 or P2123 is displayed with DTC P1229, first perform the trouble diagnosis for DTC P1229. Refer to EC-457 .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2122 2122	Accelerator pedal position sensor 1 circuit low input	An excessively low voltage from the APP sensor 1 is sent to ECM.	● Harness or connectors (The APP sensor 1 circuit is open or shorted.) ● Accelerator pedal position sensor (Accelerator pedal position sensor 1)
P2123 2123	Accelerator pedal position sensor 1 circuit high input	An excessively high voltage from the APP sensor 1 is sent to ECM.	

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode
The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

DTC Confirmation Procedure

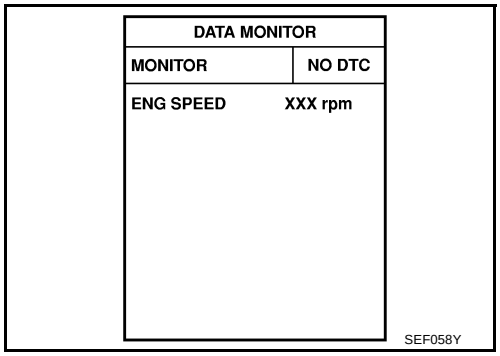
ABS009NK

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Start engine and let it idle for 1 second.
4. If DTC is detected, go to EC-591, "Diagnostic Procedure" .



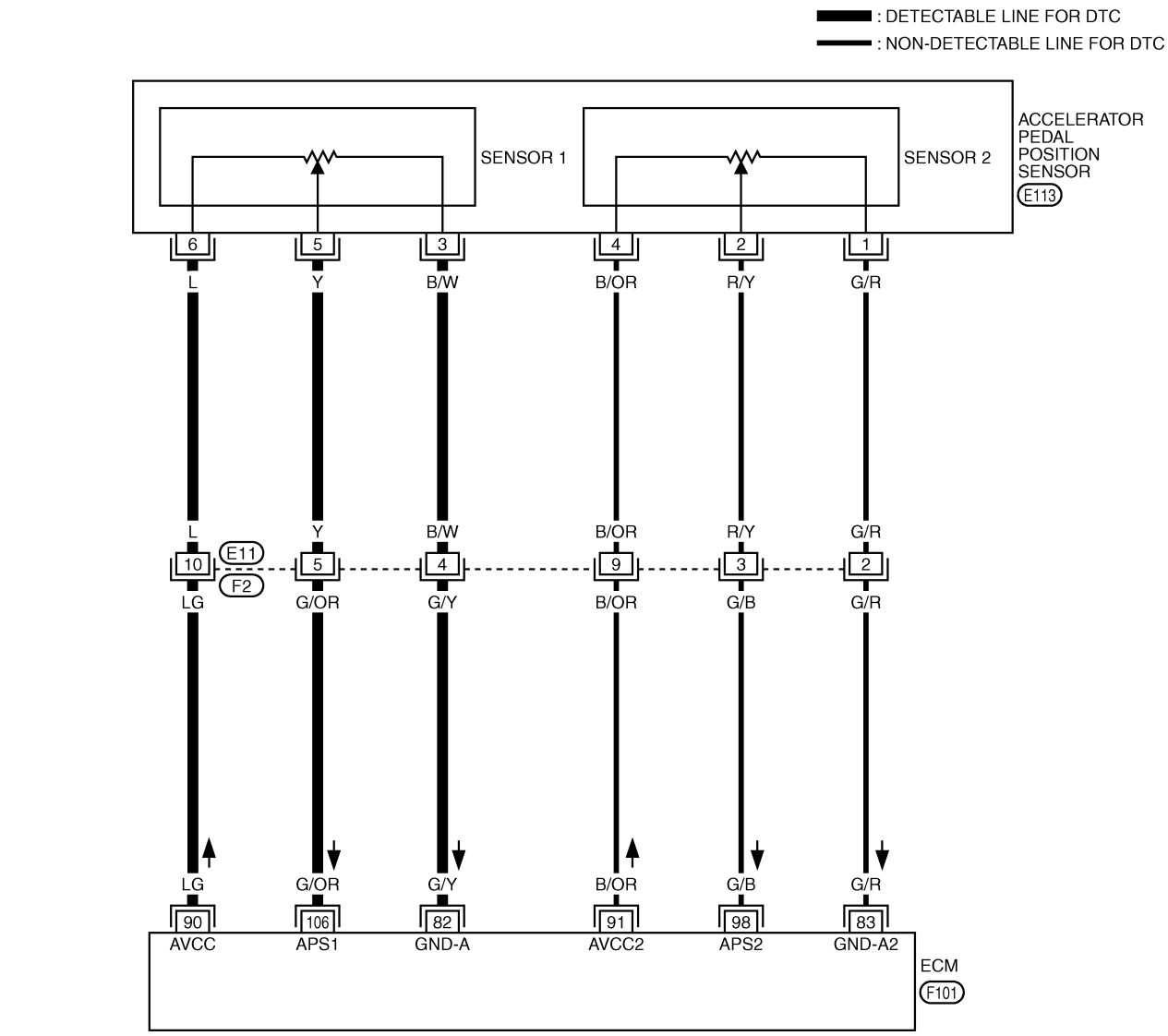
WITH GST

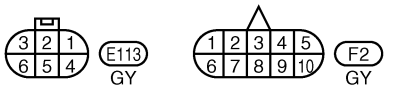
Follow the procedure “WITH CONSULT-II” above.

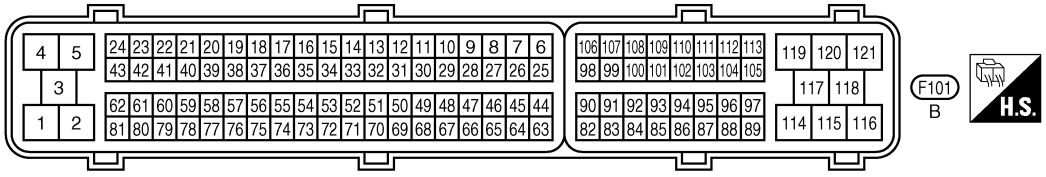
Wiring Diagram

ABS009NL

EC-APPS1-01







TBWT0507E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

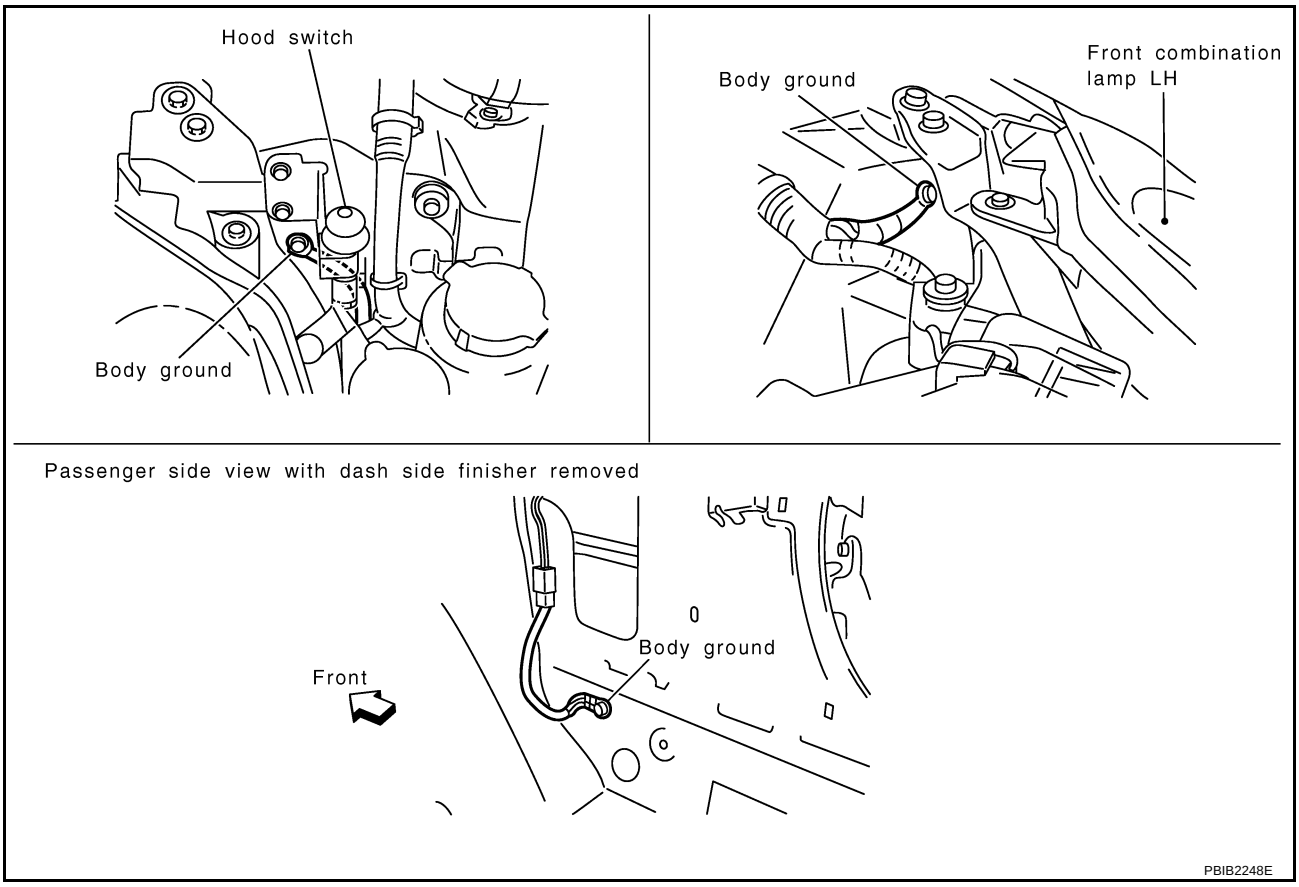
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
82	G/Y	Sensor ground (APP sensor 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V
83	G/R	Sensor ground (APP sensor 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V
90	LG	Sensor power supply (APP sensor 1)	**[Ignition switch: ON]**	Approximately 5V
91	B/OR	Sensor power supply (APP sensor 2)	**[Ignition switch: ON]**	Approximately 5V
98	G/B	Accelerator pedal position sensor 2	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal is fully released	0.15 - 0.60V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal is fully depressed	1.95 - 2.40V
106	G/OR	Accelerator pedal position sensor 1	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal is fully released	0.5 - 1.0V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal is fully depressed	3.9 - 4.7V

Diagnostic Procedure

ABS009NM

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

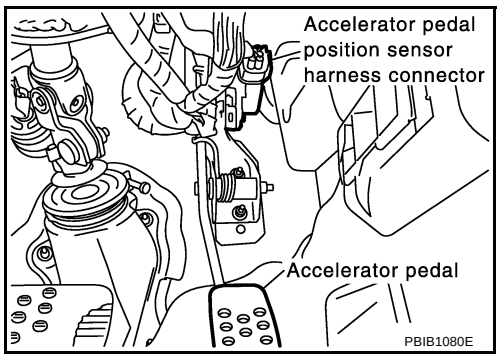


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

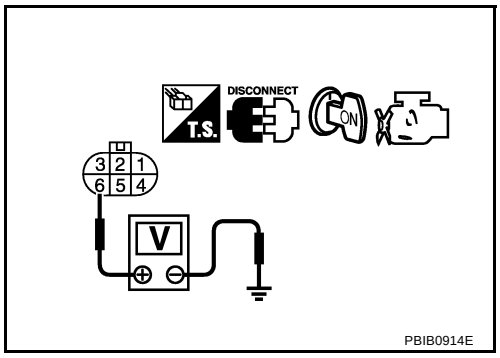
2. CHECK APP SENSOR 1 POWER SUPPLY CIRCUIT

1. Disconnect accelerator pedal position (APP) sensor harness connector.
2. Turn ignition switch ON.



3. Check voltage between APP sensor terminal 6 and ground with CONSULT-II or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E11, F2
- Harness for open or short between ECM and accelerator pedal position sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK APP SENSOR 1 GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between APP sensor terminal 3 and ECM terminal 82. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E11, F2
- Harness for open or short between ECM and accelerator pedal position sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK APP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 106 and APP sensor terminal 5. Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E11, F2
- Harness for open or short between ECM and accelerator pedal position sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK APP SENSOR

Refer to EC-619, "Component Inspection" .

OK or NG

OK >> GO TO 10.
NG >> GO TO 9.

9. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-42, "Accelerator Pedal Released Position Learning" .
3. Perform EC-42, "Throttle Valve Closed Position Learning" .
4. Perform EC-43, "Idle Air Volume Learning" .

>> **INSPECTION END**

10. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

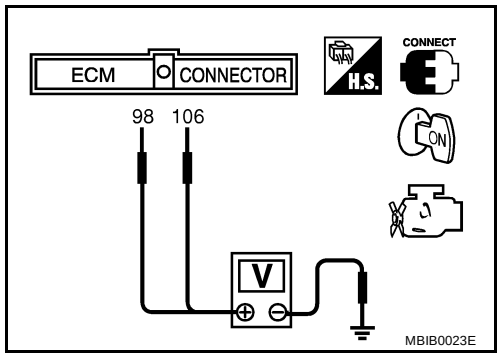
Component Inspection

ABS009NN

ACCELERATOR PEDAL POSITION SENSOR

1. Reconnect all harness connectors disconnected.
2. Turn ignition switch ON.
3. Check voltage between ECM terminals 106 (APP sensor 1 signal), 98 (APP sensor 2 signal) and ground under the following conditions.

Terminal	Accelerator pedal	Voltage
106 (Accelerator pedal position sensor 1)	Fully released	0.5 - 1.0V
	Fully depressed	3.9 - 4.7V
98 (Accelerator pedal position sensor 2)	Fully released	0.15 - 0.60V
	Fully depressed	1.95 - 2.40V



4. If NG, replace accelerator pedal assembly and go to next step.
5. Perform EC-42, "Accelerator Pedal Released Position Learning" .
6. Perform EC-42, "Throttle Valve Closed Position Learning" .
7. Perform EC-43, "Idle Air Volume Learning" .

Removal and Installation

ABS009NO

ACCELERATOR PEDAL

Refer to ACC-3, "ACCELERATOR CONTROL SYSTEM" .

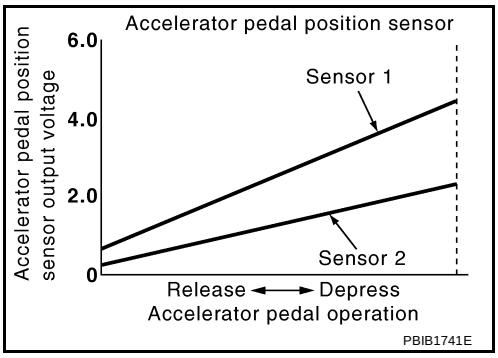
DTC P2127, P2128 APP SENSOR

PFP:18002

Component Description

ABS009NP

The accelerator pedal position sensor is installed on the upper end of the accelerator pedal assembly. The sensor detects the accelerator position and sends a signal to the ECM.
Accelerator pedal position sensor has two sensors. These sensors are a kind of potentiometers which transform the accelerator pedal position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the accelerator pedal and feed the voltage signals to the ECM. The ECM judges the current opening angle of the accelerator pedal from these signals and controls the throttle control motor based on these signals.
Idle position of the accelerator pedal is determined by the ECM receiving the signal from the accelerator pedal position sensor. The ECM uses this signal for the engine operation such as fuel cut.



CONSULT-II Reference Value in Data Monitor Mode

ABS009NQ

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
ACCEL SEN1	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.5 - 1.0V
		Accelerator pedal: Fully depressed	4.0 - 4.8V
ACCEL SEN2*	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.3 - 1.2V
		Accelerator pedal: Fully depressed	3.9 - 4.8V
CLSD THL POS	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	ON
		Accelerator pedal: Slightly depressed	OFF

*: Accelerator pedal position sensor 2 signal is converted by ECM internally. Thus, it differ from ECM terminal voltage.

On Board Diagnosis Logic

ABS009NR

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2127 2127	Accelerator pedal position sensor 2 circuit low input	An excessively low voltage from the APP sensor 2 is sent to ECM.	● Harness or connectors (The APP sensor 2 circuit is open or shorted.) (TP sensor circuit is shorted.) ● Accelerator pedal position sensor (Accelerator pedal position sensor 2) ● Electric throttle control actuator (TP sensor 1 and 2)
P2128 2128	Accelerator pedal position sensor 2 circuit high input	An excessively high voltage from the APP sensor 2 is sent to ECM.	

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode
The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

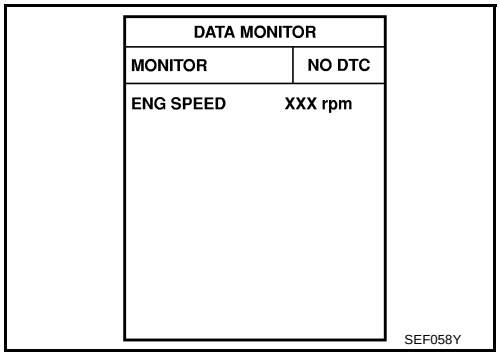
DTC Confirmation Procedure

ABS009NS

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Start engine and let it idle for 1 second.
4. If DTC is detected, go to EC-599, "Diagnostic Procedure" .



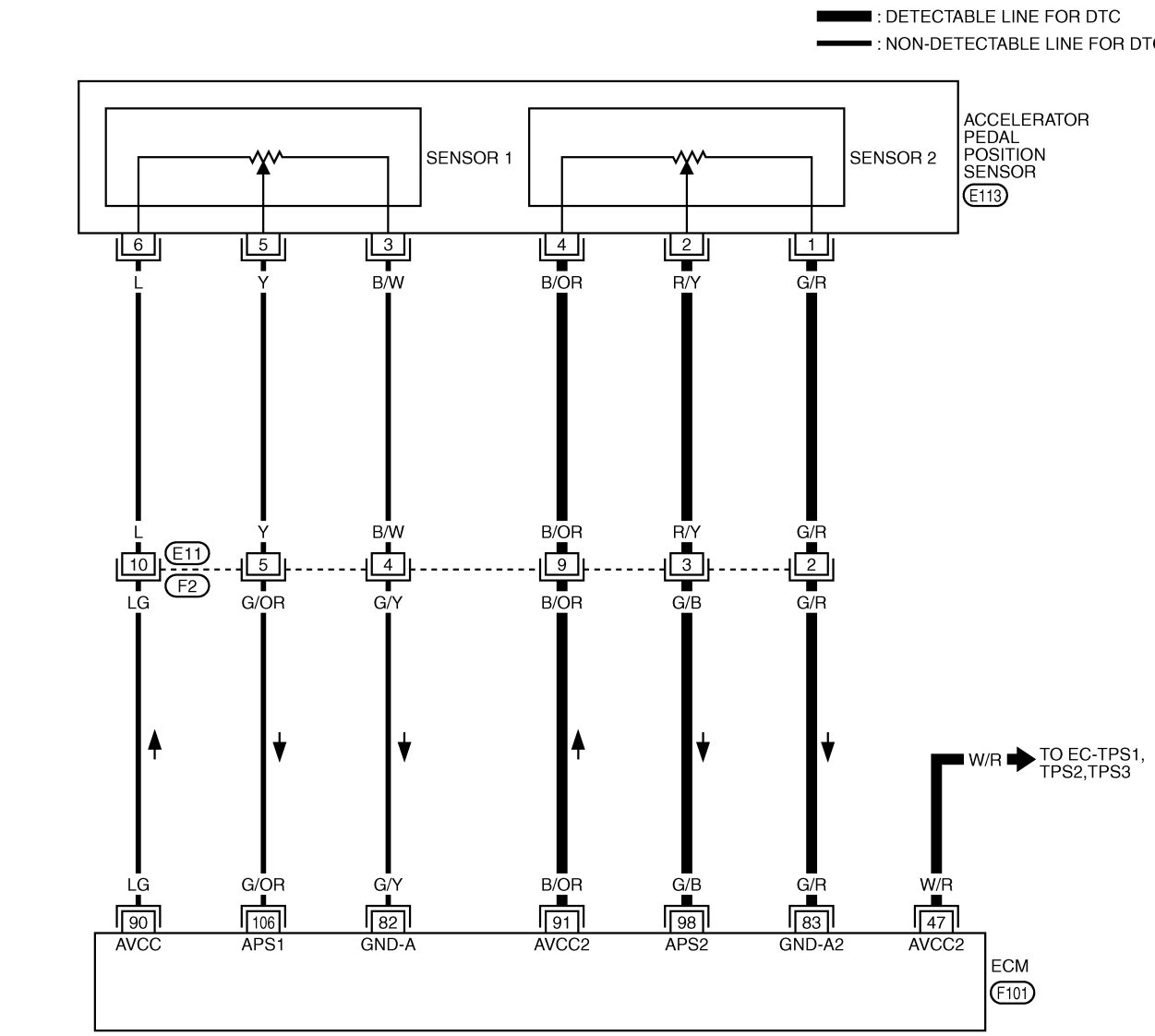
WITH GST

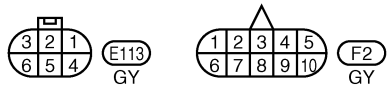
Follow the procedure “WITH CONSULT-II” above.

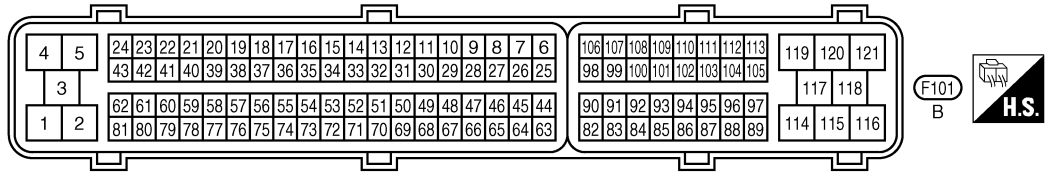
Wiring Diagram

ABS009NT

EC-APPS2-01







TBWT0784E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

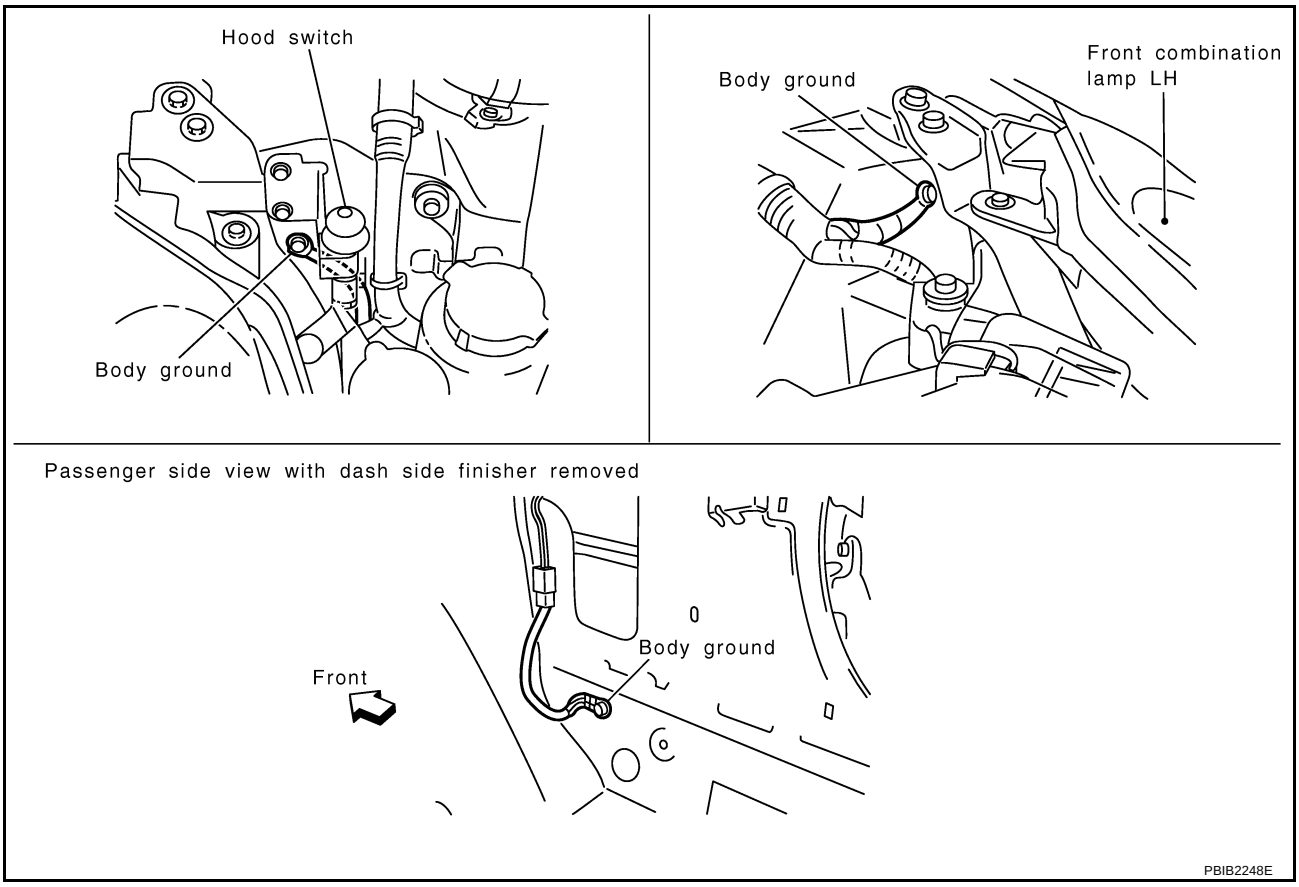
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
47	W/R	Sensor power supply (Throttle position sensor)	**[Ignition switch: ON]**	Approximately 0V
82	G/Y	Sensor ground (APP sensor 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V
83	G/R	Sensor ground (APP sensor 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V
90	LG	Sensor power supply (APP sensor 1)	**[Ignition switch: ON]**	Approximately 5V
91	B/OR	Sensor power supply (APP sensor 2)	**[Ignition switch: ON]**	Approximately 5V
98	G/B	Accelerator pedal position sensor 2	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal is fully released	0.15 - 0.60V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal is fully depressed	1.95 - 2.40V
106	G/OR	Accelerator pedal position sensor 1	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal is fully released	0.5 - 1.0V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal is fully depressed	3.9 - 4.7V

Diagnostic Procedure

ABS009NU

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

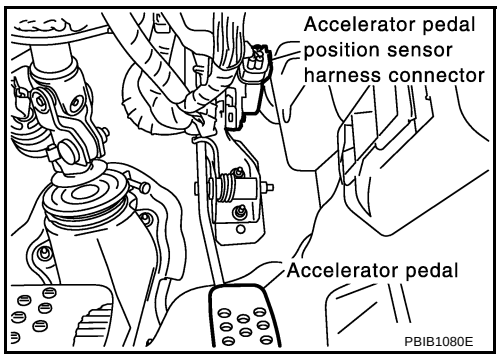


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

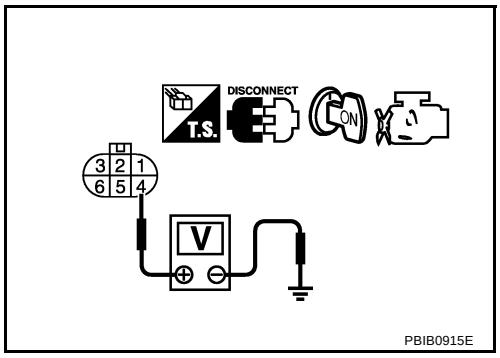
2. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT- I

1. Disconnect accelerator pedal position (APP) sensor harness connector.
2. Turn ignition switch ON.



3. Check voltage between APP sensor terminal 4 and ground with CONSULT-II or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 8.
NG >> GO TO 3.

3. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between APP sensor terminal 4 and ECM terminal 91. Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E11, F2
- Harness for open between ECM and accelerator pedal position sensor

>> Repair or replace open circuit.

5. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
91	APP sensor terminal 4	EC-597
47	Electric throttle control actuator terminal 1	EC-605

OK or NG

OK >> GO TO 6.
NG >> Repair short to ground or short to power in harness or connectors.

6. CHECK THROTTLE POSITION SENSOR

Refer to EC-610, "Component Inspection" .

OK or NG

OK >> GO TO 14.
NG >> GO TO 7.

7. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace the electric throttle control actuator.
2. Perform EC-42, "Throttle Valve Closed Position Learning" .
3. Perform EC-43, "Idle Air Volume Learning" .

>> **INSPECTION END**

8. CHECK APP SENSOR 2 GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between APP sensor terminal 1 and ECM terminal 83.
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 10.
NG >> GO TO 9.

9. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E11, F2
- Harness for open or short between ECM and accelerator pedal position sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

10. CHECK APP SENSOR 2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 98 and APP sensor terminal 2.
   Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 12.
NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E11, F2
- Harness for open or short between ECM and accelerator pedal position sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

12. CHECK APP SENSOR

Refer to EC-619, "Component Inspection" .

OK or NG

OK >> GO TO 13.
NG >> GO TO 14.

13. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-42, "Accelerator Pedal Released Position Learning" .
3. Perform EC-42, "Throttle Valve Closed Position Learning" .
4. Perform EC-43, "Idle Air Volume Learning" .

>> **INSPECTION END**

14. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

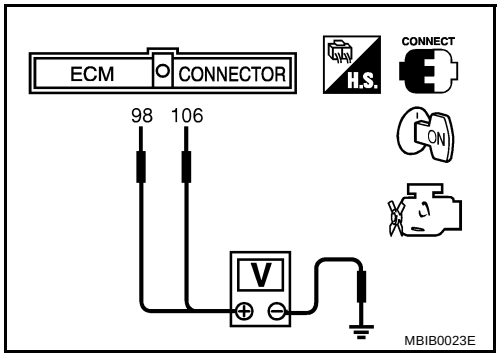
Component Inspection

ABS009NV

ACCELERATOR PEDAL POSITION SENSOR

1. Reconnect all harness connectors disconnected.
2. Turn ignition switch ON.
3. Check voltage between ECM terminals 106 (APP sensor 1 signal), 98 (APP sensor 2 signal) and ground under the following conditions.

Terminal	Accelerator pedal	Voltage
106 (Accelerator pedal position sensor 1)	Fully released	0.5 - 1.0V
	Fully depressed	3.9 - 4.7V
98 (Accelerator pedal position sensor 2)	Fully released	0.15 - 0.60V
	Fully depressed	1.95 - 2.40V



4. If NG, replace accelerator pedal assembly and go to next step.
5. Perform EC-42, "Accelerator Pedal Released Position Learning" .
6. Perform EC-42, "Throttle Valve Closed Position Learning" .
7. Perform EC-43, "Idle Air Volume Learning" .

Removal and Installation

ABS009NW

ACCELERATOR PEDAL

Refer to ACC-3, "ACCELERATOR CONTROL SYSTEM" .

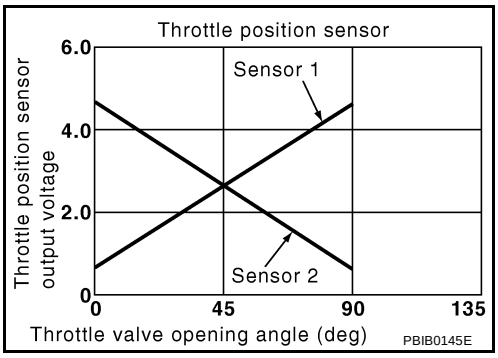
DTC P2135 TP SENSOR

PFP:16119

Component Description

ABS009NX

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc. The throttle position sensor responds to the throttle valve movement.
The throttle position sensor has the two sensors. These sensors are a kind of potentiometers which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the throttle valve and feed the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and the ECM controls the throttle control motor to make the throttle valve opening angle properly in response to driving condition.



CONSULT-II Reference Value in Data Monitor Mode

ABS009NY

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
THRTL SEN1 THRTL SEN2*	● Ignition switch: ON (Engine stopped) ● Shift lever: D (A/T), 1st (M/T)	Accelerator pedal: Fully released	More than 0.36V
		Accelerator pedal: Fully depressed	Less than 4.75V

*: Throttle position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.

On Board Diagnosis Logic

ABS009NZ

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2135 2135	Throttle position sensor circuit range/performance problem	Rationally incorrect voltage is sent to ECM compared with the signals from TP sensor 1 and TP sensor 2.	● Harness or connector (The TP sensor 1 and 2 circuit is open or shorted.) (APP sensor 2 circuit is shorted.) ● Electric throttle control actuator (TP sensor 1 and 2) ● Accelerator pedal position sensor (APP sensor 2)

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode and the MIL lights up.

Engine operation condition in fail-safe mode
The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

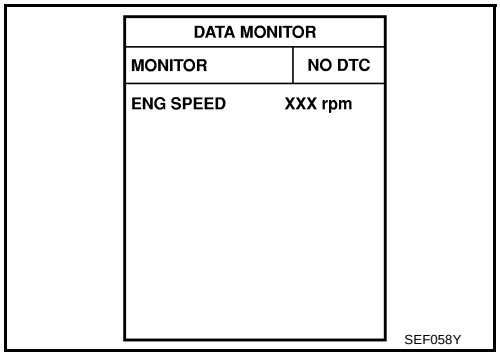
DTC Confirmation Procedure

ABS009O0

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Start engine and let it idle for 1 second.
4. If DTC is detected, go to EC-607, "Diagnostic Procedure" .

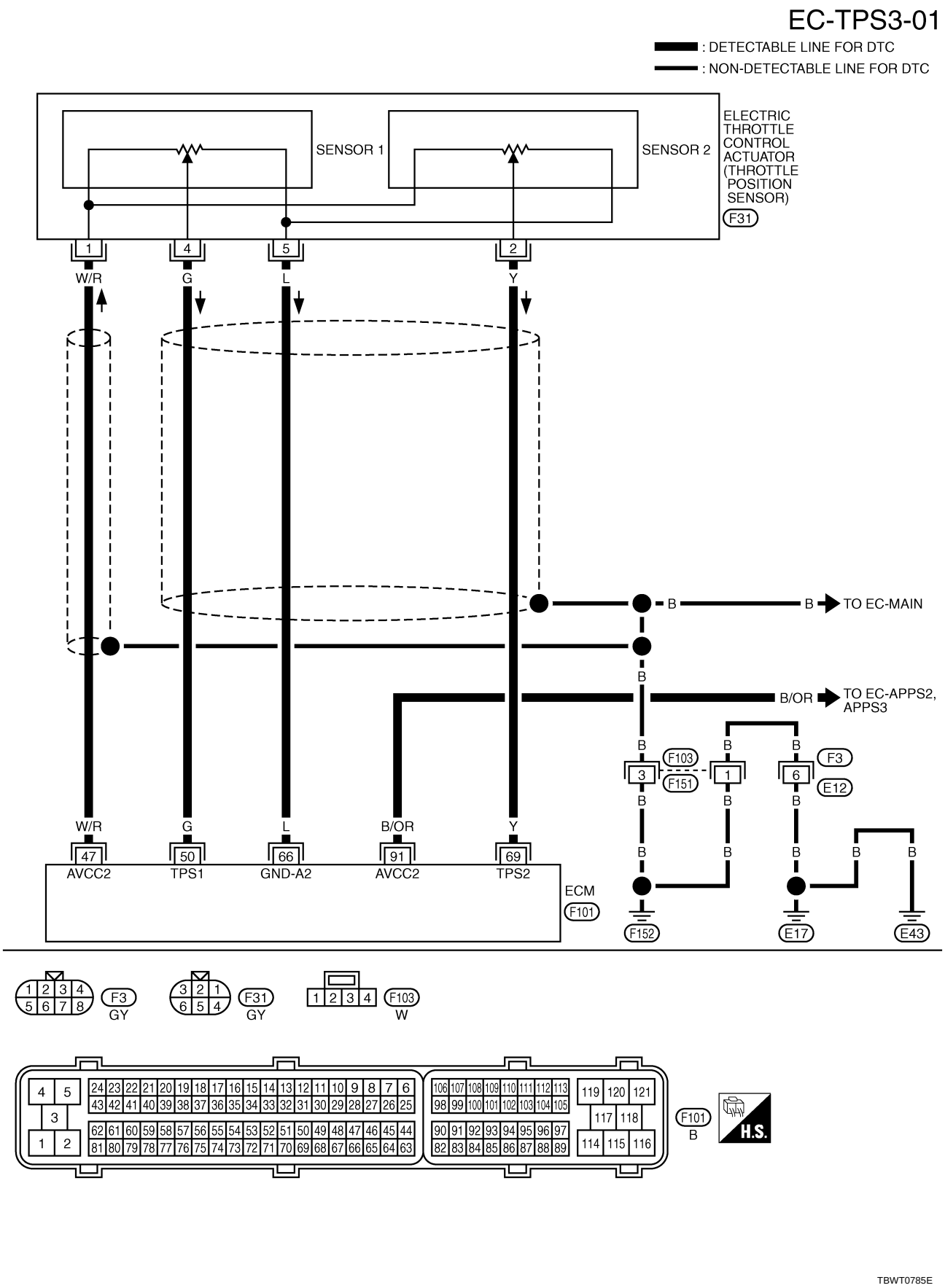


WITH GST

Follow the procedure “WITH CONSULT-II” above.

Wiring Diagram

ABS009O1



Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

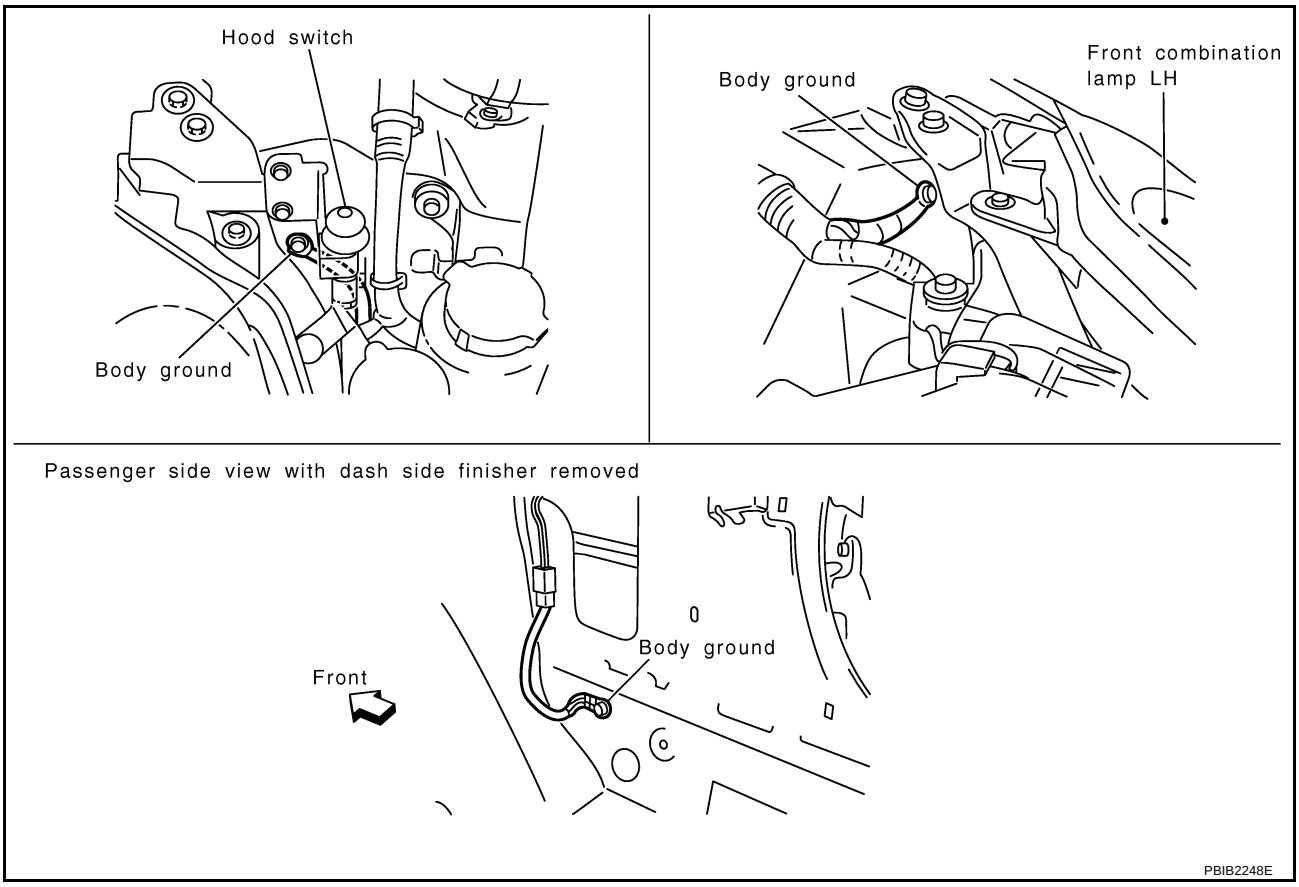
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
47	W/R	Sensor power supply (Throttle position sensor)	**[Ignition switch: ON]**	Approximately 5V
50	G	Throttle position sensor 1	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal is fully released	More than 0.36V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal is fully depressed	Less than 4.75V
66	L	Sensor ground (Throttle position sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V
69	Y	Throttle position sensor 2	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal is fully released	Less than 4.75V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal is fully depressed	More than 0.36V
91	B/OR	Sensor power supply (APP sensor 2)	**[Ignition switch: ON]**	Approximately 5V

Diagnostic Procedure

ABS009O2

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

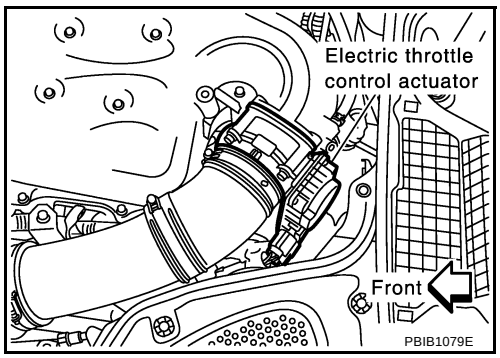


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

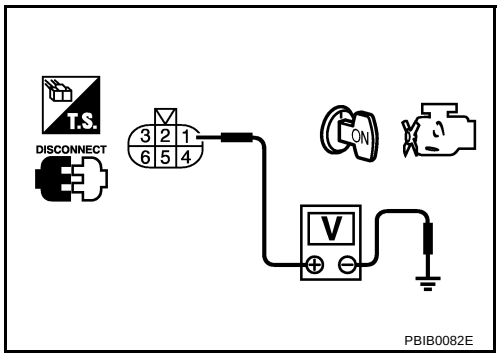
2. CHECK THROTTLE POSITION SENSOR POWER SUPPLY CIRCUIT-I

1. Disconnect electric throttle control actuator harness connector.
2. Turn ignition switch ON.



3. Check voltage between electric throttle control actuator terminal 1 and ground with CONSULT-II or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK THROTTLE POSITION SENSOR POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between electric throttle control actuator terminal 1 and ECM terminal 47. Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace open circuit.

4. CHECK THROTTLE POSITION SENSOR POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
47	Electric throttle control actuator terminal 1	EC-605
91	APP sensor terminal 4	EC-597

OK or NG

OK >> GO TO 5.
NG >> Repair short to ground or short to power in harness or connectors.

5. CHECK APP SENSOR

Refer to EC-602, "Component Inspection" .

OK or NG

OK >> GO TO 11.
NG >> GO TO 6.

6. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-42, "Accelerator Pedal Released Position Learning" .
3. Perform EC-42, "Throttle Valve Closed Position Learning" .
4. Perform EC-43, "Idle Air Volume Learning" .

>> **INSPECTION END**

7. CHECK THROTTLE POSITION SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between electric throttle control actuator terminal 5 and ECM terminal 66. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 8.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK THROTTLE POSITION SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 50 and electric throttle control actuator terminal 4, ECM terminal 69 and electric throttle control actuator terminal 2. Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 9.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK THROTTLE POSITION SENSOR

Refer to EC-610, "Component Inspection" .

OK or NG

OK >> GO TO 11.
NG >> GO TO 10.

10. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace the electric throttle control actuator.
2. Perform EC-42, "Throttle Valve Closed Position Learning" .
3. Perform EC-43, "Idle Air Volume Learning" .

>> **INSPECTION END**

11. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

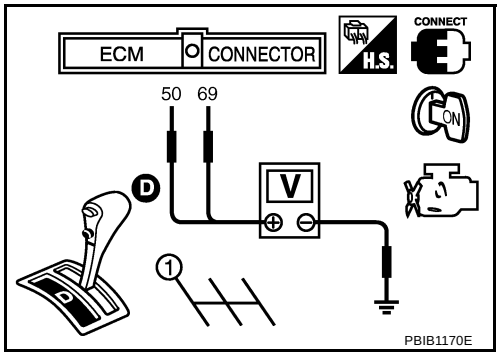
Component Inspection

ABS009O3

THROTTLE POSITION SENSOR

1. Reconnect all harness connectors disconnected.
2. Perform EC-42, "Throttle Valve Closed Position Learning" .
3. Turn ignition switch ON.
4. Set shift lever to D (A/T) or 1st (M/T) position.
5. Check voltage between ECM terminals 50 (TP sensor 1 signal), 69 (TP sensor 2 signal) and ground under the following conditions.

Terminal	Accelerator pedal	Voltage
50 (Throttle position sensor 1)	Fully released	More than 0.36V
	Fully depressed	Less than 4.75V
69 (Throttle position sensor 2)	Fully released	Less than 4.75V
	Fully depressed	More than 0.36V



6. If NG, replace electric throttle control actuator and go to the next step.
7. Perform EC-42, "Throttle Valve Closed Position Learning" .
8. Perform EC-43, "Idle Air Volume Learning" .

Removal and Installation

ABS009O4

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .

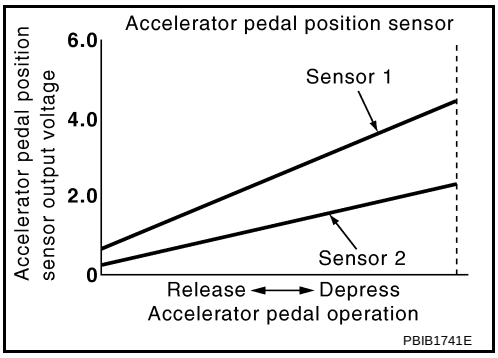
DTC P2138 APP SENSOR

PFP:18002

Component Description

ABS009O5

The accelerator pedal position sensor is installed on the upper end of the accelerator pedal assembly. The sensor detects the accelerator position and sends a signal to the ECM.
Accelerator pedal position sensor has two sensors. These sensors are a kind of potentiometers which transform the accelerator pedal position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the accelerator pedal and feed the voltage signals to the ECM. The ECM judges the current opening angle of the accelerator pedal from these signals and controls the throttle control motor based on these signals.



Idle position of the accelerator pedal is determined by the ECM receiving the signal from the accelerator pedal position sensor. The ECM uses this signal for the engine operation such as fuel cut.

CONSULT-II Reference Value in Data Monitor Mode

ABS009O6

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
ACCEL SEN1	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.5 - 1.0V
		Accelerator pedal: Fully depressed	4.0 - 4.8V
ACCEL SEN2*	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.3 - 1.2V
		Accelerator pedal: Fully depressed	3.9 - 4.8V
CLSD THL POS	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	ON
		Accelerator pedal: Slightly depressed	OFF

*: Accelerator pedal position sensor 2 signal is converted by ECM internally. Thus, it differ from ECM terminal voltage.

On Board Diagnosis Logic

ABS009O7

This self-diagnosis has the one trip detection logic.

NOTE:
If DTC P2138 is displayed with DTC P1229, first perform the trouble diagnosis for DTC P1229.
Refer to EC-457 .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2138 2138	Accelerator pedal position sensor circuit range/performance problem	Rationally incorrect voltage is sent to ECM compared with the signals from APP sensor 1 and APP sensor 2.	● Harness or connector (The APP sensor 1 and 2 circuit is open or shorted.) (TP sensor circuit is shorted.) ● Accelerator pedal position sensor 1 and 2 ● Electric throttle control actuator (TP sensor 1 and 2)

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode
The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

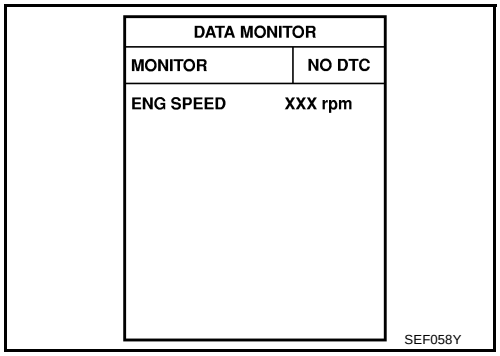
DTC Confirmation Procedure

ABS009O8

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Start engine and let it idle for 1 second.
4. If DTC is detected, go to EC-615, "Diagnostic Procedure" .



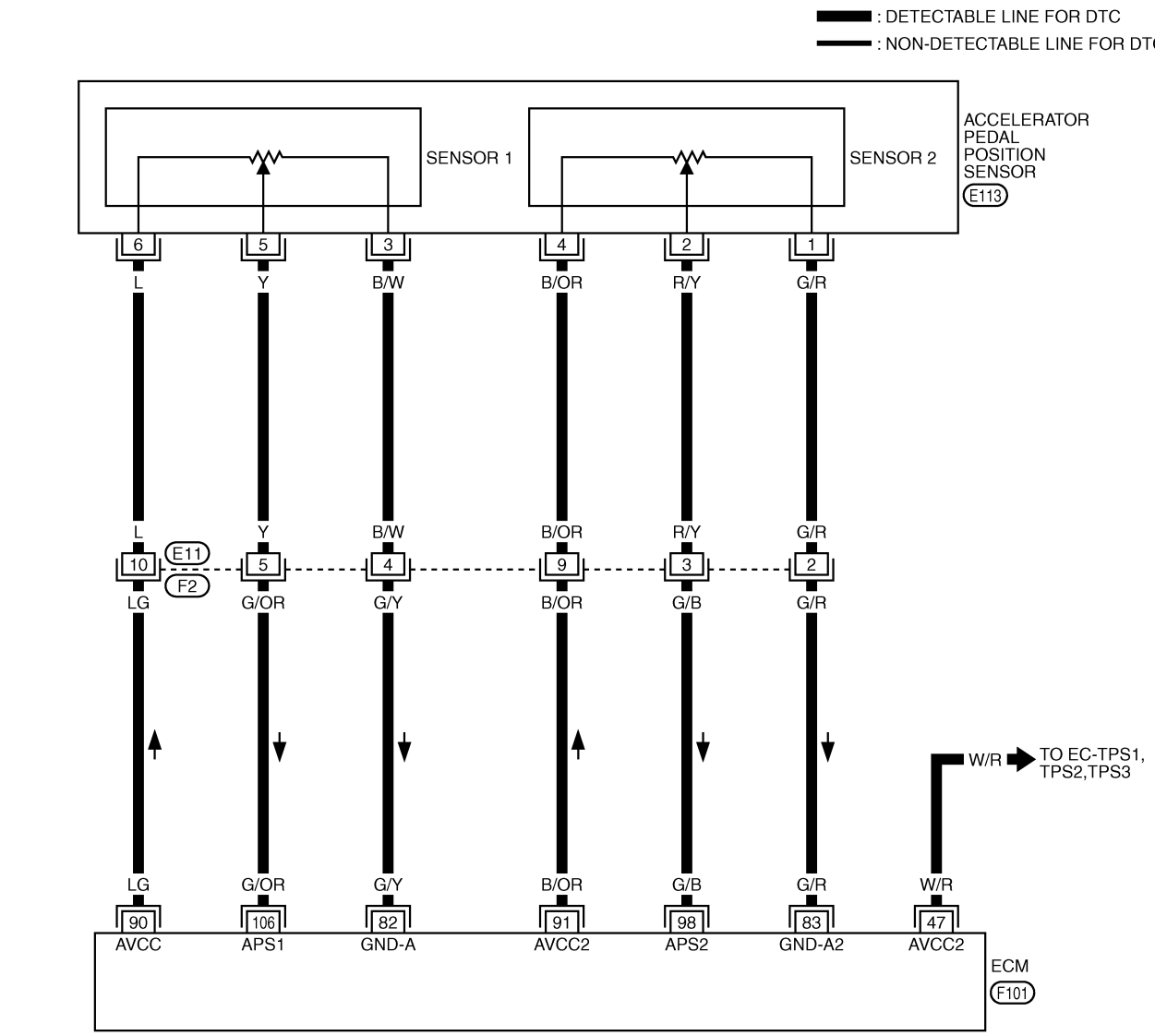
WITH GST

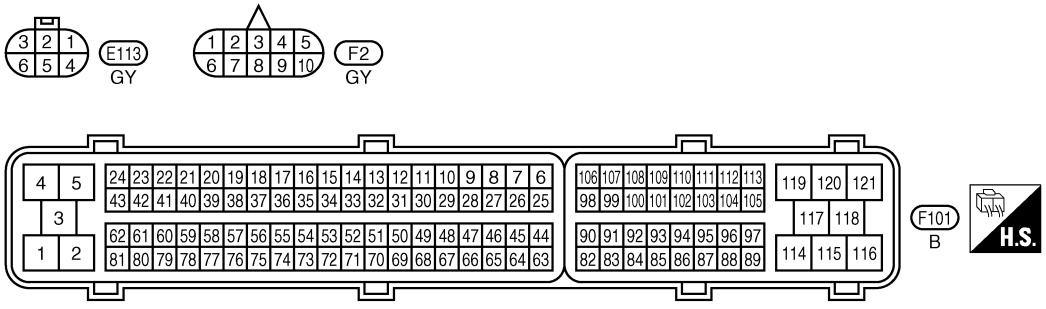
Follow the procedure “WITH CONSULT-II” above.

Wiring Diagram

ABS009O9

EC-APPS3-01





TBWT0786E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

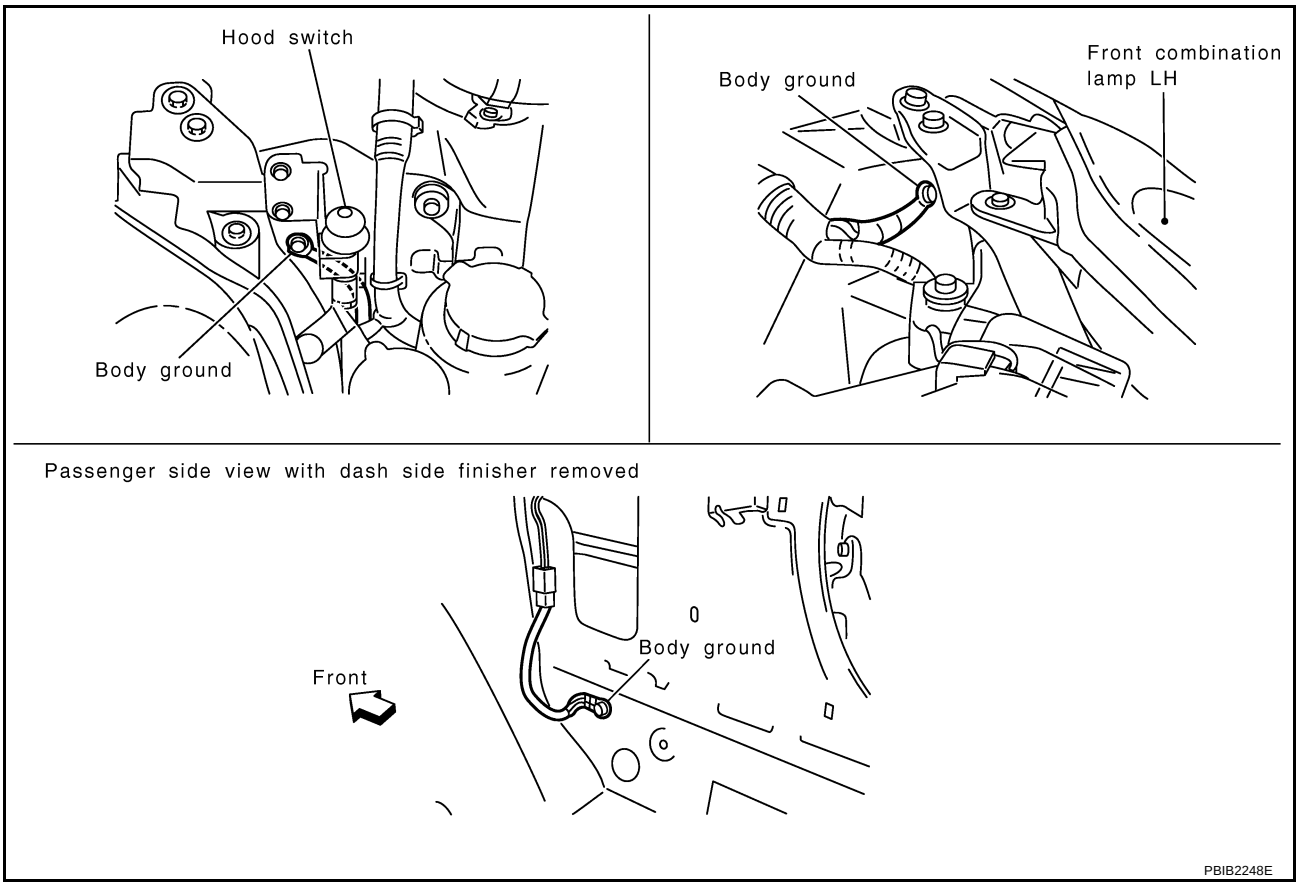
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
47	W/R	Sensor power supply (Throttle position sensor)	**[Ignition switch: ON]**	Approximately 5V
82	G/Y	Sensor ground (APP sensor 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V
83	G/R	Sensor ground (APP sensor 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V
90	LG	Sensor power supply (APP sensor 1)	**[Ignition switch: ON]**	Approximately 5V
91	B/OR	Sensor power supply (APP sensor 2)	**[Ignition switch: ON]**	Approximately 5V
98	G/B	Accelerator pedal position sensor 2	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal is fully released	0.15 - 0.60V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal is fully depressed	1.95 - 2.40V
106	G/OR	Accelerator pedal position sensor 1	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal is fully released	0.5 - 1.0V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal is fully depressed	3.9 - 4.7V

Diagnostic Procedure

ABS009OA

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

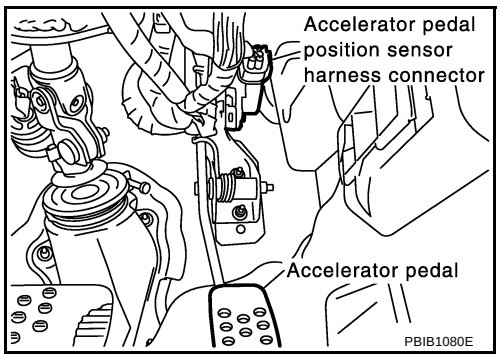


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

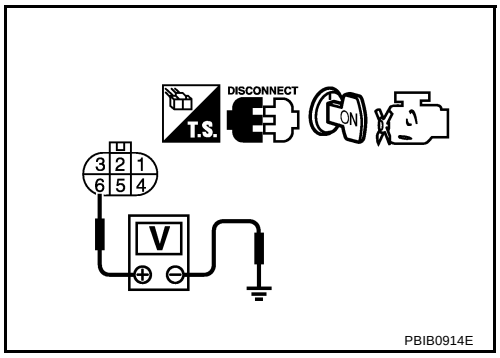
2. CHECK APP SENSOR POWER 1 SUPPLY CIRCUIT

1. Disconnect accelerator pedal position (APP) sensor harness connector.
2. Turn ignition switch ON.



3. Check voltage between APP sensor terminal 6 and ground with CONSULT-II or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

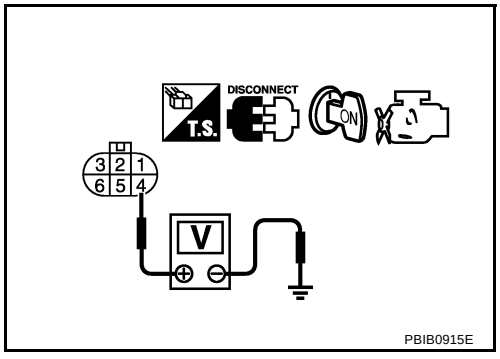
- Harness connectors E11, F2
- Harness for open or short between ECM and accelerator pedal position sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-I

Check voltage between APP sensor terminal 4 and ground with CONSULT-II or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 10.
NG >> GO TO 5.

5. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between APP sensor terminal 4 and ECM terminal 91.
   Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E11, F2
- Harness for open between ECM and accelerator pedal position sensor

>> Repair or replace open circuit.

7. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
91	APP sensor terminal 4	EC-613
47	Electric throttle control actuator terminal 1	EC-605

OK or NG

OK >> GO TO 8.
NG >> Repair short to ground or short to power in harness or connectors.

8. CHECK THROTTLE POSITION SENSOR

Refer to EC-610, "Component Inspection" .

OK or NG

OK >> GO TO 16.
NG >> GO TO 9.

9. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace the electric throttle control actuator.
2. Perform EC-42, "Throttle Valve Closed Position Learning" .
3. Perform EC-43, "Idle Air Volume Learning" .

>> **INSPECTION END**

10. CHECK APP SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between APP sensor terminal 1 and ECM terminal 83, APP sensor terminal 3 and ECM terminal 82.
   Refer to Wiring Diagram.

   Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 12.
NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E11, F2
- Harness for open or short between ECM and accelerator pedal position sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

12. CHECK APP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 106 and APP sensor terminal 5, ECM terminal 98 and APP sensor terminal 2.
   Refer to Wiring Diagram.

   Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 14.
NG >> GO TO 13.

13. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E11, F2
- Harness for open or short between ECM and accelerator pedal position sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

14. CHECK APP SENSOR

Refer to EC-619, "Component Inspection" .

OK or NG

OK >> GO TO 16.
NG >> GO TO 15.

15. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-42, "Accelerator Pedal Released Position Learning" .
3. Perform EC-42, "Throttle Valve Closed Position Learning" .
4. Perform EC-43, "Idle Air Volume Learning" .

>> **INSPECTION END**

16. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

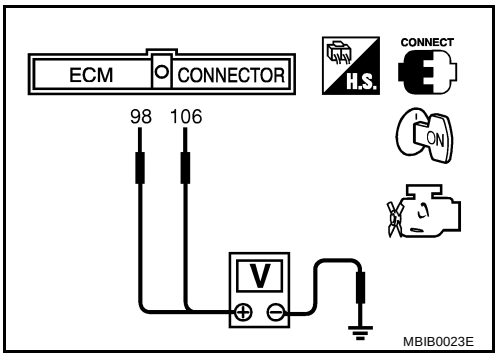
Component Inspection

ABS009OB

ACCELERATOR PEDAL POSITION SENSOR

1. Reconnect all harness connectors disconnected.
2. Turn ignition switch ON.
3. Check voltage between ECM terminals 106 (APP sensor 1 signal), 98 (APP sensor 2 signal) and ground under the following conditions.

Terminal	Accelerator pedal	Voltage
106 (Accelerator pedal position sensor 1)	Fully released	0.5 - 1.0V
	Fully depressed	3.9 - 4.7V
98 (Accelerator pedal position sensor 2)	Fully released	0.15 - 0.60V
	Fully depressed	1.95 - 2.40V



4. If NG, replace accelerator pedal assembly and go to next step.
5. Perform EC-42, "Accelerator Pedal Released Position Learning" .
6. Perform EC-42, "Throttle Valve Closed Position Learning" .
7. Perform EC-43, "Idle Air Volume Learning" .

Removal and Installation

ABS009OC

ACCELERATOR PEDAL

Refer to ACC-3, "ACCELERATOR CONTROL SYSTEM" .

IGNITION SIGNAL

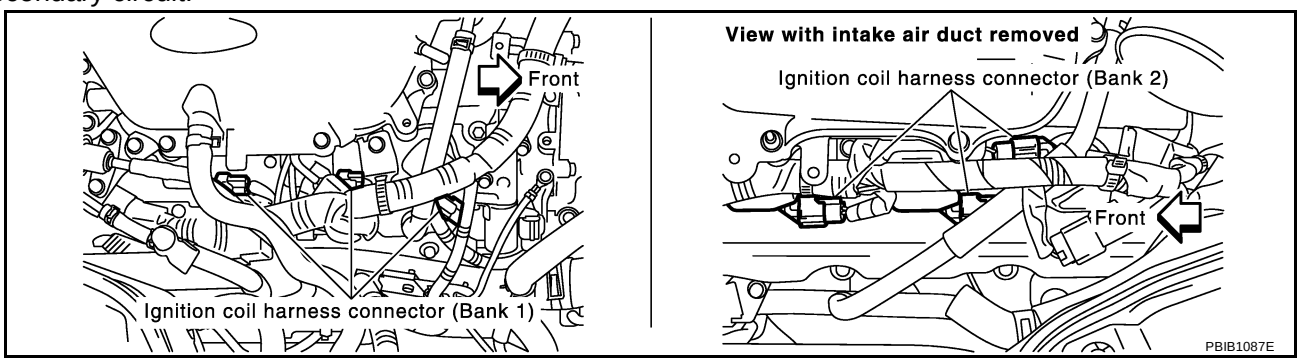
PFP:22448

Component Description

ABS009OD

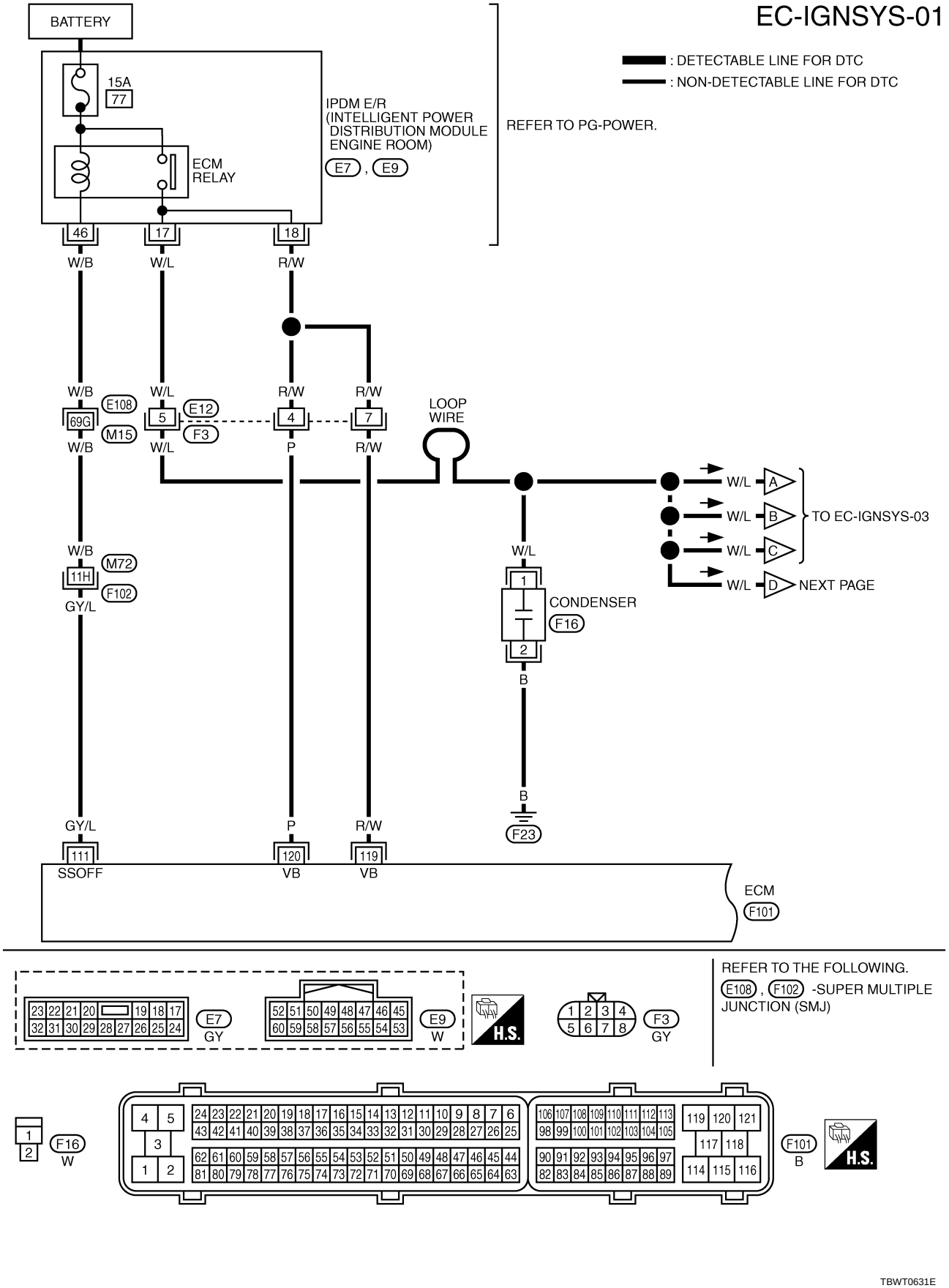
IGNITION COIL & POWER TRANSISTOR

The ignition signal from the ECM is sent to and amplified by the power transistor. The power transistor turns ON and OFF the ignition coil primary circuit. This ON/OFF operation induces the proper high voltage in the coil secondary circuit.



Wiring Diagram

ABS009OE



TBWT0631E

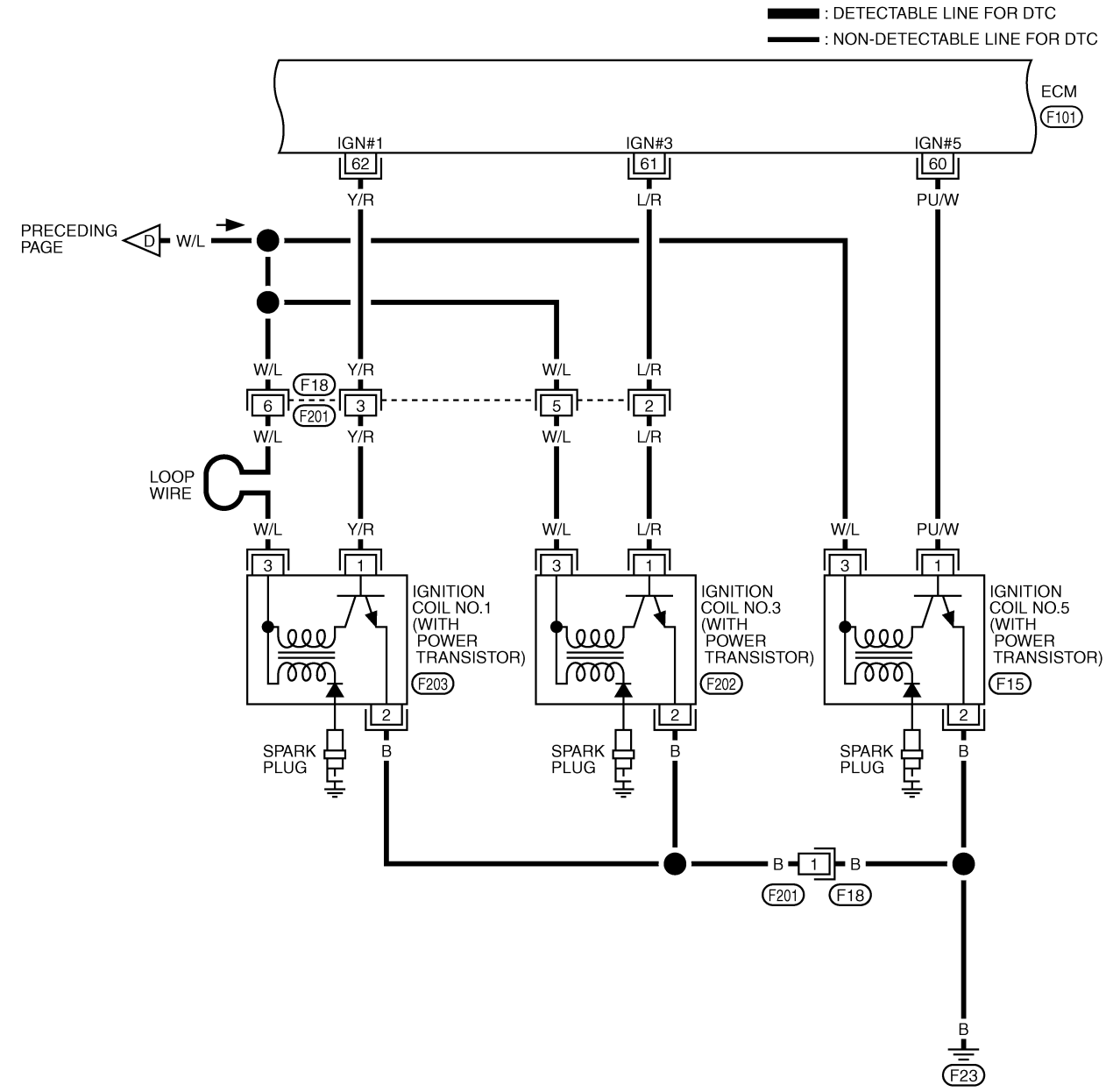
Specification data are reference values and are measured between each terminal and ground.

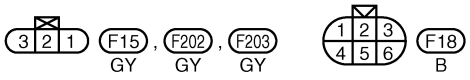
CAUTION:

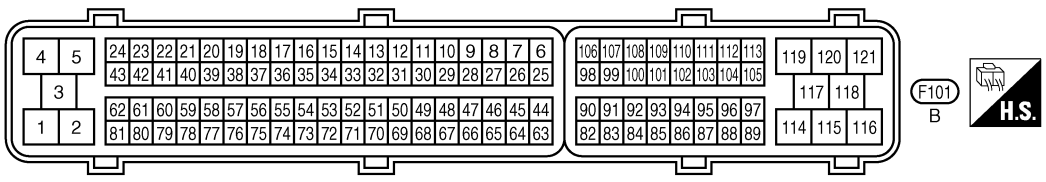
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
111	GY/L	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
119 120	R/W P	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

EC-IGNSYS-02





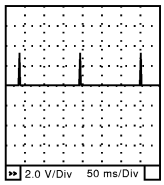
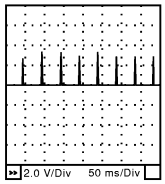


TBWT0518E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-II.

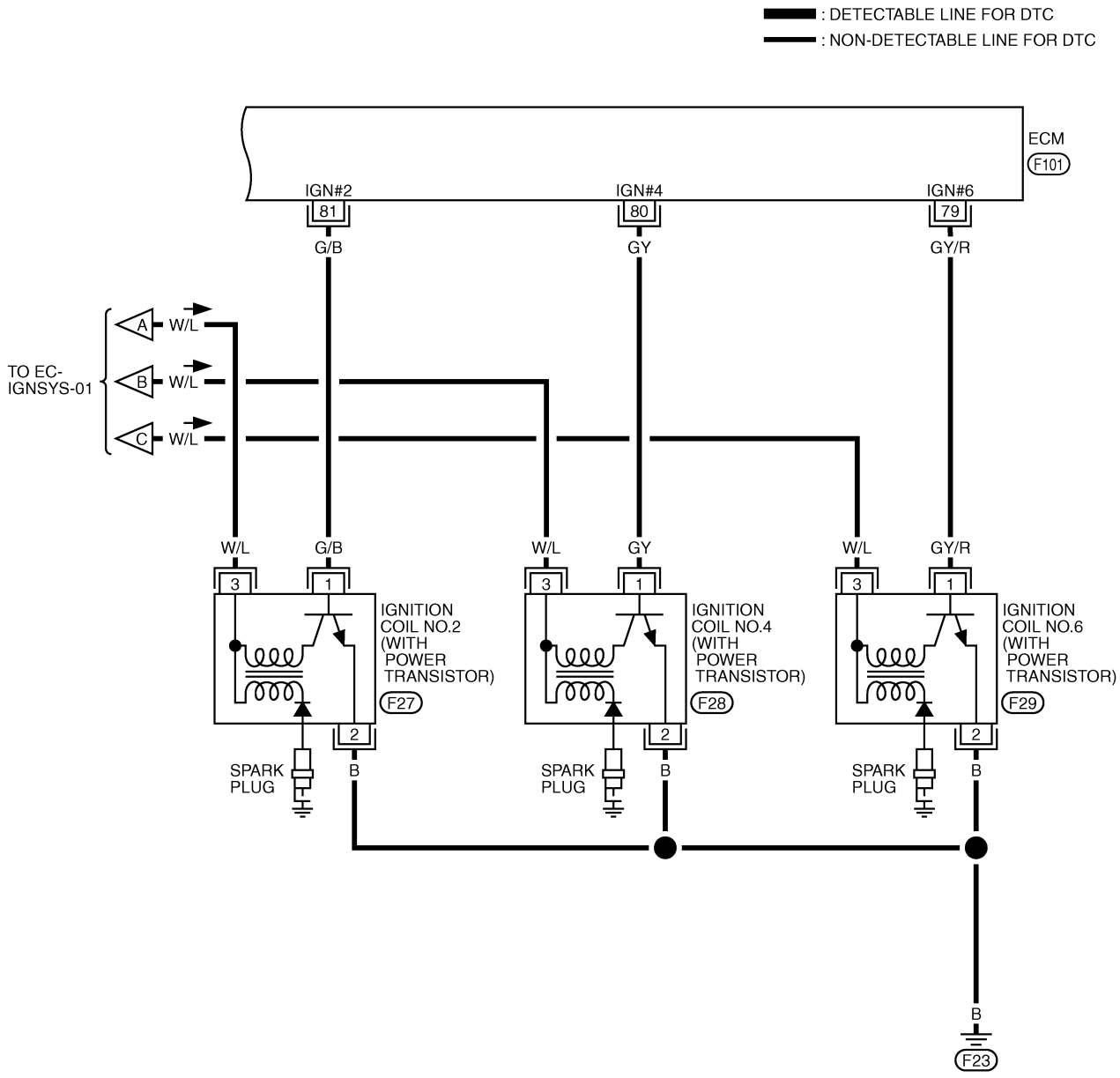
CAUTION:

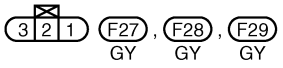
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

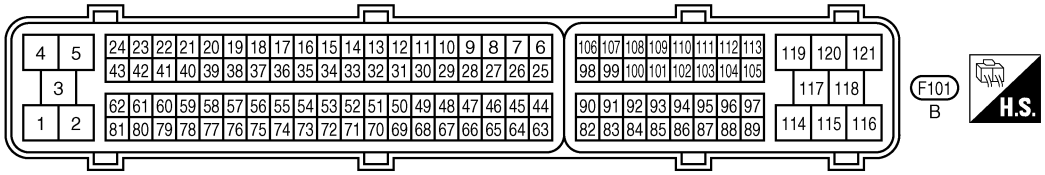
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
60 61 62	PU/W L/R Y/R	Ignition signal No. 5 Ignition signal No. 3 Ignition signal No. 1	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	0 - 0.2V★  SEC986C
			[Engine is running] ● **Warm-up condition** ● Engine speed is 2,500 rpm.	0.1 - 0.4V★  SEC987C

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

EC-IGNSYS-03





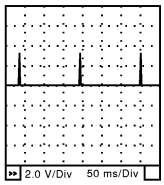
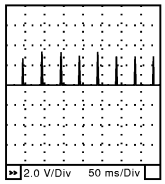


TBWT0240E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-II.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
79 80 81	GY/R GY G/B	Ignition signal No. 6 Ignition signal No. 4 Ignition signal No. 2	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	0 - 0.2V★  SEC986C
			[Engine is running] ● **Warm-up condition** ● Engine speed is 2,500 rpm.	0.1 - 0.4V★  SEC987C

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

ABS009OF

1. CHECK ENGINE START

Turn ignition switch OFF, and restart engine.
Is engine running?

Yes or No

Yes (With CONSULT-II)>>GO TO 2.
Yes (Without CONSULT-II)>>GO TO 3.
No >> GO TO 4.

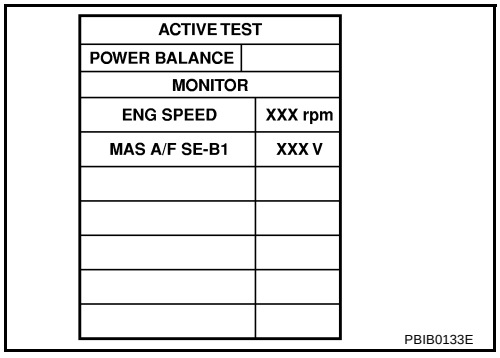
2. CHECK OVERALL FUNCTION

With CONSULT-II

1. Perform “POWER BALANCE” in “ACTIVE TEST” mode with CONSULT-II.
2. Make sure that each circuit produces a momentary engine speed drop.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 10.

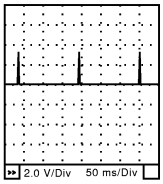


3. CHECK OVERALL FUNCTION

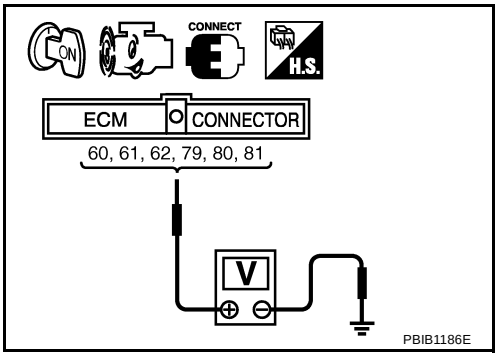
Without CONSULT-II

1. Let engine idle.
2. Read the voltage signal between ECM terminals 60, 61, 62, 79, 80, 81 and ground with an oscilloscope.
3. Verify that the oscilloscope screen shows the signal wave as shown below.

NOTE:
The pulse cycle changes depending on rpm at idle.



SEC986C



PBIB1186E

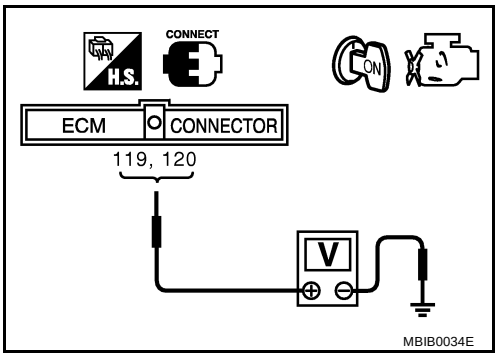
OK or NG

OK >> **INSPECTION END**
NG >> GO TO 10.

4. CHECK IGNITION COIL POWER SUPPLY CIRCUIT-I

1. Turn ignition switch OFF, wait at least 10 seconds and then turn ON.
2. Check voltage between ECM terminals 119, 120 and ground with CONSULT-II or tester.

Voltage: Battery voltage



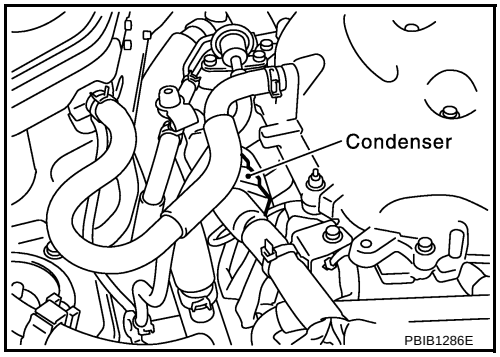
MBIB0034E

OK or NG

OK >> GO TO 5.
NG >> Go to EC-129, "POWER SUPPLY AND GROUND CIRCUIT" .

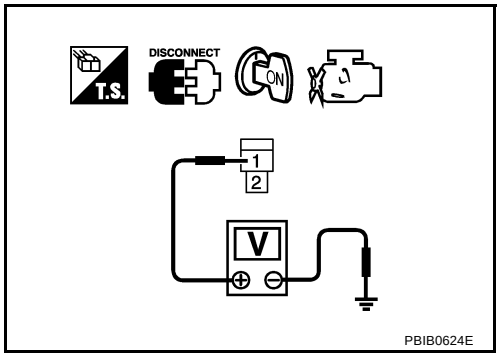
5. CHECK IGNITION COIL POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect condenser harness connector.
3. Turn ignition switch ON.



4. Check voltage between condenser terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 8.
NG >> GO TO 6.

6. CHECK IGNITION COIL POWER SUPPLY CIRCUIT-III

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R harness connector E7.
3. Check harness continuity between IPDM E/R terminal 17 and condenser terminal 1. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 17.
NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness for open and short between IPDM E/R and condenser

>> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK CONDENSER GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Check harness continuity between condenser terminal 2 and ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 9.
NG >> Repair open circuit or short to power in harness or connectors.

9. CHECK CONDENSER

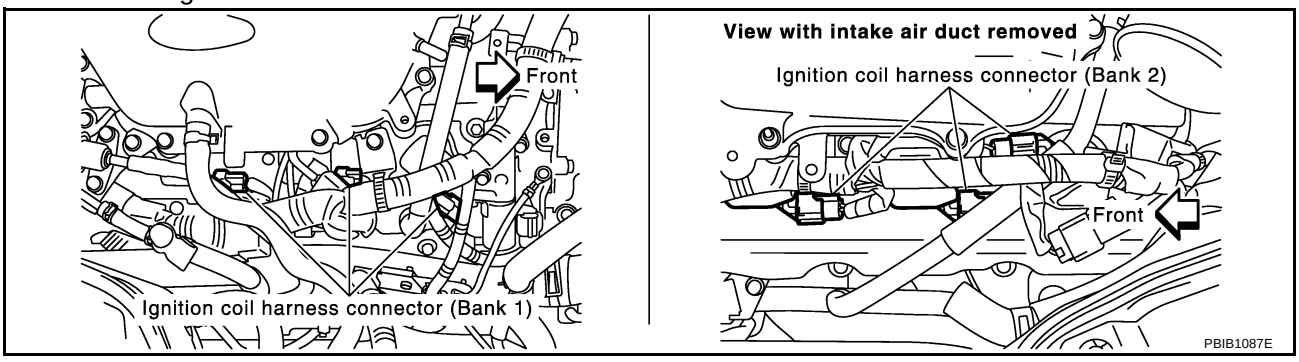
Refer to EC-631, "Component Inspection" .

OK or NG

OK >> GO TO 10.
NG >> Replace condenser.

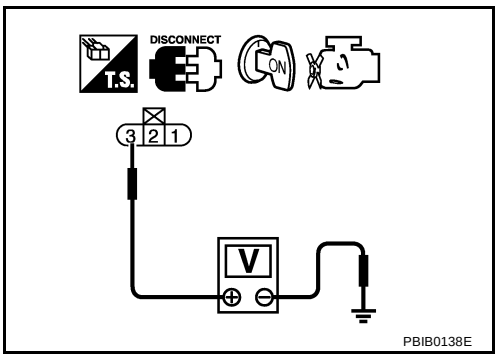
10. CHECK IGNITION COIL POWER SUPPLY CIRCUIT-IV

1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Disconnect ignition coil harness connector.



4. Turn ignition switch ON.
5. Check voltage between ignition coil terminal 3 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 12.
NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F18, F201
- Harness for open or short between ignition coil and harness connector F3

>> Repair or replace harness or connectors.

12. CHECK IGNITION COIL GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Check harness continuity between ignition coil terminal 2 and ground.
   Refer to Wiring Diagram.

   Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 14.
NG >> GO TO 13.

13. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F18, F201
- Harness for open or short between ignition coil and ground

>> Repair open circuit or short to power in harness or connectors.

14. CHECK IGNITION COIL OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminals 60, 61, 62, 79, 80, 81 and ignition coil terminal 1.
   Refer to Wiring Diagram.

   Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 16.
NG >> GO TO 15.

15. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F18, F201
- Harness for open or short between ignition coil and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

16. CHECK IGNITION COIL WITH POWER TRANSISTOR

Refer to EC-631, "Component Inspection" .

OK or NG

OK >> GO TO 17.
NG >> Replace ignition coil with power transistor.

17. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace IPDM E/R. Refer to PG-17, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)" .
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

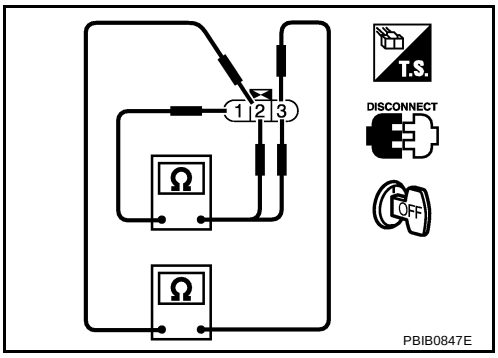
Component Inspection

ABS009OG

IGNITION COIL WITH POWER TRANSISTOR

1. Turn ignition switch OFF.
2. Disconnect ignition coil harness connector.
3. Check resistance between ignition coil terminals as follows.

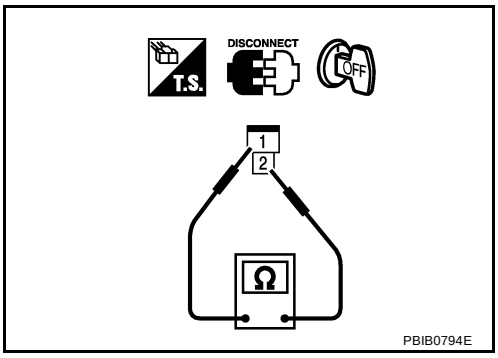
Terminal No. (Polarity)	Resistance Ω [at 25°C (77°F)]
1 and 2	Except 0 or ∞
1 and 3	Except 0
2 and 3	



CONDENSER

1. Turn ignition switch OFF.
2. Disconnect condenser harness connector.
3. Check resistance between condenser terminals 1 and 2.

Resistance	Above 1 MΩ [at 25°C (77°F)]



Removal and Installation

ABS009OH

IGNITION COIL WITH POWER TRANSISTOR

Refer to EM-33, "IGNITION COIL" .

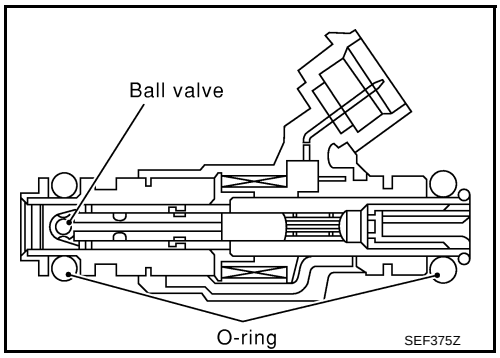
INJECTOR CIRCUIT

PFP:16600

Component Description

ABS009OI

The fuel injector is a small, precise solenoid valve. When the ECM supplies a ground to the injector circuit, the coil in the injector is energized. The energized coil pulls the needle valve back and allows fuel to flow through the injector into the intake manifold. The amount of fuel injected depends upon the injection pulse duration. Pulse duration is the length of time the injector remains open. The ECM controls the injection pulse duration based on engine fuel needs.



CONSULT-II Reference Value in Data Monitor Mode

ABS009OJ

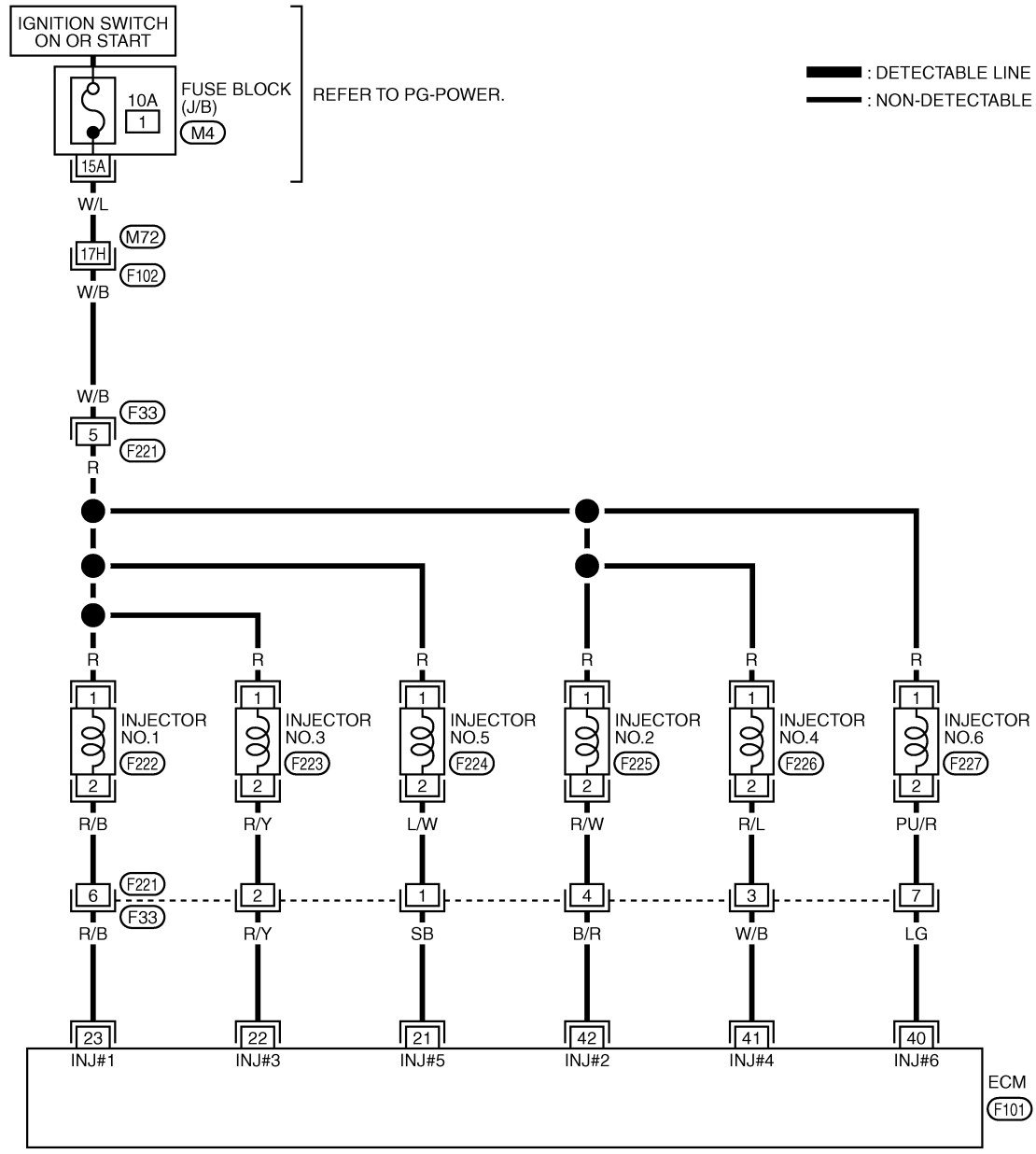
Specification data are reference values.

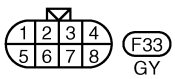
MONITOR ITEM	CONDITION		SPECIFICATION
B/FUEL SCHDL	● Engine: After warming up ● Shift lever: N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No-load	Idle	2.5 - 3.5 msec
		2,000 rpm	2.5 - 3.5 msec
INJ PULSE-B1 INJ PULSE-B2	● Engine: After warming up ● Shift lever: N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No-load	Idle	2.0 - 3.0 msec
		2,000 rpm	1.9 - 2.9 msec

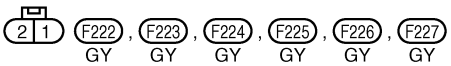
Wiring Diagram

ABS009OK

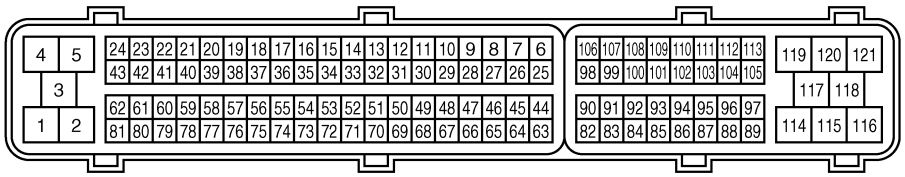
EC-INJECT-01







REFER TO THE FOLLOWING.
F102 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)



F101
B

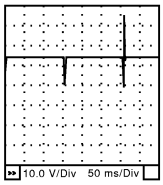
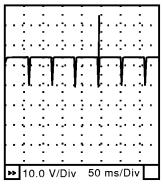
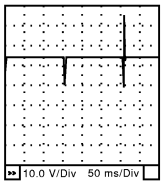
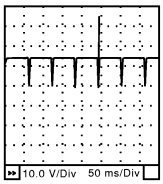
H.S.

TBWT0632E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-II.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
21 22 23	SB R/Y R/B	Injector No. 5 Injector No. 3 Injector No. 1	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	BATTERY VOLTAGE (11 - 14V)★  SEC984C
			[Engine is running] ● **Warm-up condition** ● Engine speed is 2,000 rpm	BATTERY VOLTAGE (11 - 14V)★  SEC985C
40 41 42	LG W/B B/R	Injector No. 6 Injector No. 4 Injector No. 2	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	BATTERY VOLTAGE (11 - 14V)★  SEC984C
			[Engine is running] ● **Warm-up condition** ● Engine speed is 2,000 rpm	BATTERY VOLTAGE (11 - 14V)★  SEC985C

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

ABS009OL

1. INSPECTION START

Turn ignition switch to START.

Is any cylinder ignited?

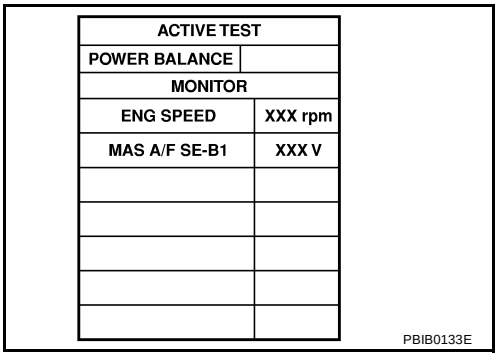
Yes or No

Yes >> GO TO 2.
No >> GO TO 3.

2. CHECK OVERALL FUNCTION

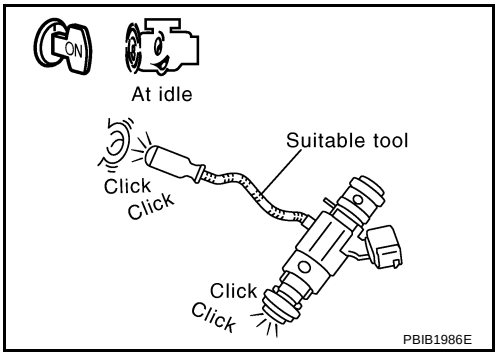
With CONSULT-II

1. Start engine.
2. Perform “POWER BALANCE” in “ACTIVE TEST” mode with CONSULT-II.
3. Make sure that each circuit produces a momentary engine speed drop.



Without CONSULT-II

1. Start engine.
2. Listen to each injector operating sound.
   Clicking noise should be heard.

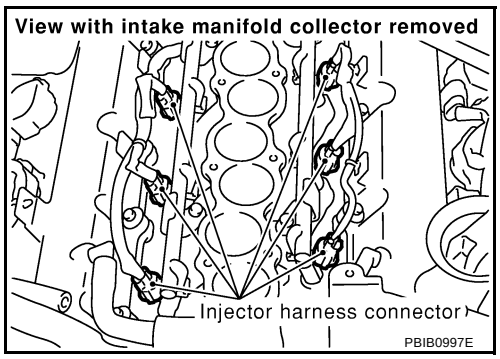


OK or NG

OK >> **INSPECTION END**
NG >> GO TO 3.

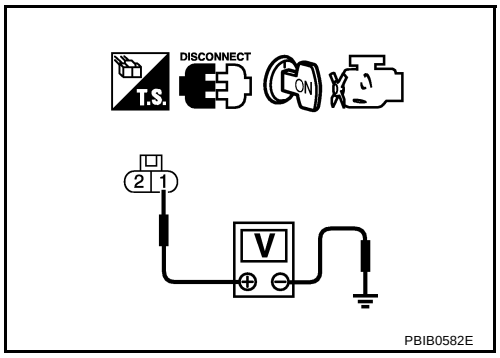
3. CHECK INJECTOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect injector harness connector.
3. Turn ignition switch ON.



4. Check voltage between injector terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M72, F102
- Harness connectors F33, F221
- Fuse block (J/B) connector M4
- 10A fuse
- Harness for open or short between injector and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK INJECTOR OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between injector terminal 2 and ECM terminals 21, 22, 23, 40, 41, 42. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F33, F221
- Harness for open or short between injector and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK INJECTOR

Refer to EC-637, "Component Inspection" .

OK or NG

OK >> GO TO 8.
NG >> Replace injector.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

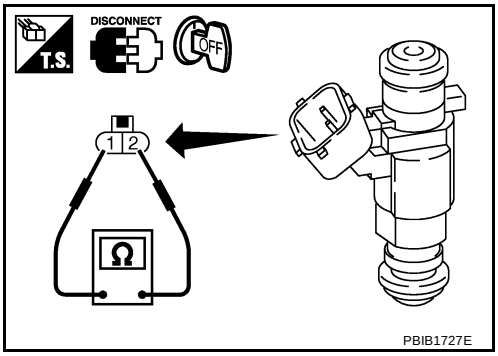
Component Inspection

ABS009OM

INJECTOR

1. Disconnect injector harness connector.
2. Check resistance between terminals as shown in the figure.

Resistance: 11.1 - 14.5Ω [at 10 - 60°C (50 - 140°F)]



Removal and Installation

ABS009ON

INJECTOR

Refer to EM-36, "FUEL INJECTOR AND FUEL TUBE" .

FUEL PUMP CIRCUIT

PFP:17042

Description

ABS009OO

SYSTEM DESCRIPTION

Sensor	Input Signal to ECM	ECM Function	Actuator
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed*	Fuel pump control	Fuel pump relay
Battery	Battery voltage*		

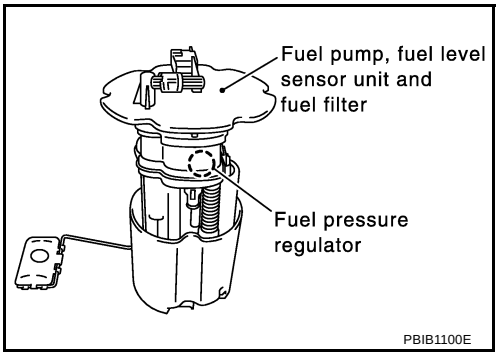
*: ECM determines the start signal status by the signals of engine speed and battery voltage.

The ECM activates the fuel pump for several seconds after the ignition switch is turned ON to improve engine startability. If the ECM receives a engine speed signal from the camshaft position sensor (PHASE), it knows that the engine is rotating, and causes the pump to operate. If the engine speed signal is not received when the ignition switch is ON, the engine stalls. The ECM stops pump operation and prevents battery discharging, thereby improving safety. The ECM does not directly drive the fuel pump. It controls the ON/OFF fuel pump relay, which in turn controls the fuel pump.

Condition	Fuel pump operation
Ignition switch is turned to ON.	Operates for 1 second.
Engine running and cranking	Operates.
When engine is stopped	Stops in 1.5 seconds.
Except as shown above	Stops.

COMPONENT DESCRIPTION

A turbine type design fuel pump is used in the fuel tank.



CONSULT-II Reference Value in Data Monitor Mode

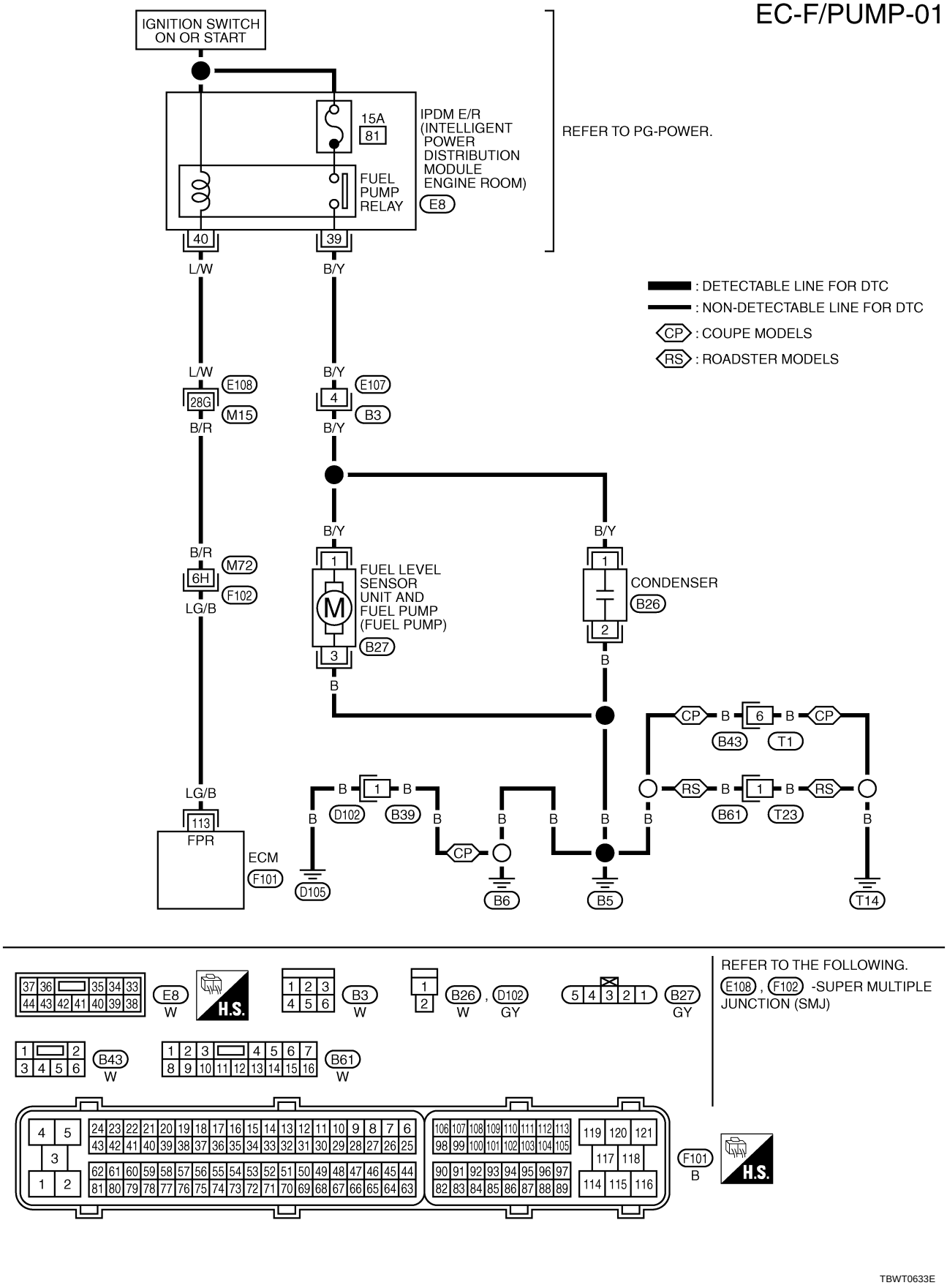
ABS009OP

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
FUEL PUMP RLY	● For 1 second after turning ignition switch ON ● Engine running or cranking	ON
	● Except above conditions	OFF

Wiring Diagram

ABS009OQ



TBWT0633E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

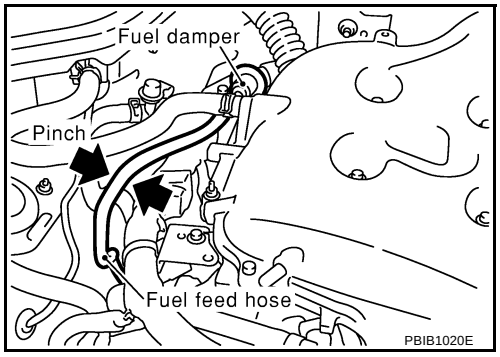
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
113	LG/B	Fuel pump relay	**[Ignition switch: ON]** ● For 1 second after turning ignition switch ON **[Engine is running]**	0 - 1.5V
			[Ignition switch: ON] ● More than 1 second after turning ignition switch ON.	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

ABS009OR

1. CHECK OVERALL FUNCTION

1. Turn ignition switch ON.
2. Pinch fuel feed hose with two fingers.
   Fuel pressure pulsation should be felt on the fuel feed hose for 1 second after ignition switch is turned ON.



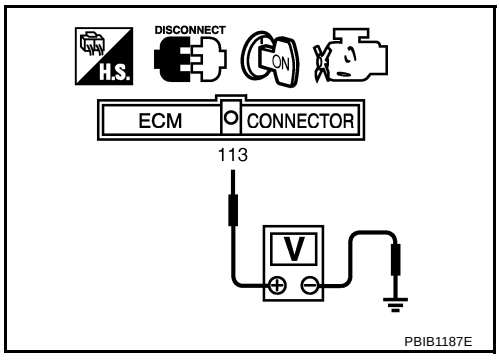
OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

2. CHECK FUEL PUMP POWER SUPPLY CIRCUIT-I

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Turn ignition switch ON.
4. Check voltage between ECM terminal 113 and ground with CONSULT-II or tester.

Voltage: Battery voltage



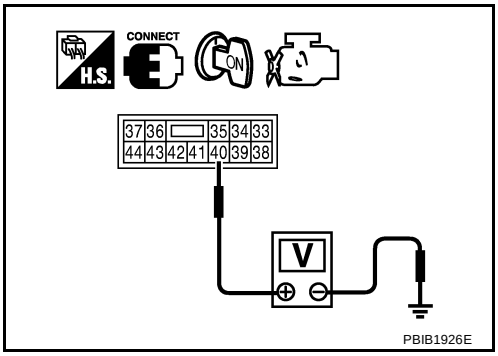
OK or NG

OK >> GO TO 5.
NG >> GO TO 3.

3. CHECK FUEL PUMP POWER SUPPLY CIRCUIT-I

Check voltage between IPDM E/R terminal 40 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 4.
NG >> GO TO 15.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Harness for open or short between IPDM E/R and ECM

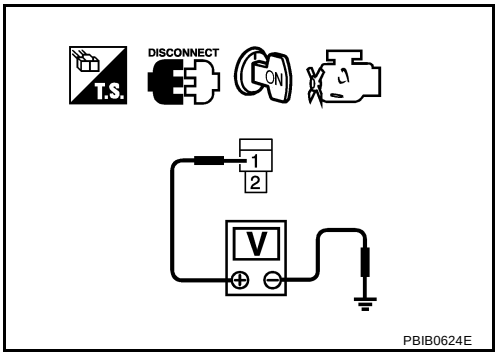
>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK CONDENSER POWER SUPPLY CIRCUIT-I

1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Disconnect condenser harness connector.
4. Turn ignition switch ON.
5. Check voltage between condenser terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage should exist for 1 second after ignition switch is turned ON.

6. Also check harness for short to ground and short to power.



OK or NG

OK >> GO TO 9.
NG >> GO TO 6.

6. CHECK 15A FUSE

1. Turn ignition switch OFF.
2. Disconnect 15A fuse.
3. Check 15A fuse.

OK or NG

OK >> GO TO 7.
NG >> Replace fuse.

7. CHECK CONDENSER POWER SUPPLY CIRCUIT-II

1. Disconnect IPDM E/R harness connector E8.
2. Check harness continuity between IPDM E/R terminal 39 and condenser terminal 1.
   Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 15.
NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E107, B3
- Harness for open or short between IPDM E/R and condenser

>> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK CONDENSER GROUND CIRCUIT

1. Check harness continuity between condenser terminal 2 and ground.
   Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to power.

OK or NG

OK >> GO TO 11.
NG >> GO TO 10

10. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B43, T1 (Coupe models)
- Harness connectors B39, D102 (Coupe models)
- Harness connectors B61, T23 (Roadster models)
- Harness for open or short between condenser and ground

>> Repair open circuit or short to power in harness or connectors.

11. CHECK CONDENSER

Refer to EC-643, "Component Inspection" .

OK or NG

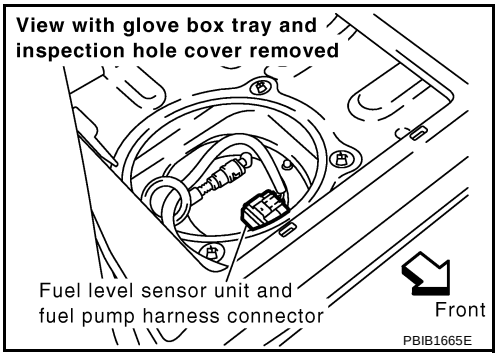
OK >> GO TO 12.
NG >> Replace condenser.

12. CHECK FUEL PUMP POWER SUPPLY AND GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect “fuel level sensor unit and fuel pump” harness connector.
3. Check harness continuity between “fuel level sensor unit and fuel pump” terminal 1 and harness connector B3 terminal 4, “fuel level sensor unit and fuel pump” terminal 3 and ground.
   Refer to Wiring Diagram.

   Continuity should exist.

4. Also check harness for short to ground and short to power.



OK or NG

OK >> GO TO 14.
NG >> GO TO 13.

13. DETECT MALFUNCTIONING PART

Check the following.

- Harness connector B3
- Harness connectors B43, T1 (Coupe models)
- Harness connectors B39, D102 (Coupe models)
- Harness connectors B61, T23 (Roadster models)
- Harness for open or short between fuel pump and harness connector B3
- Harness for open or short between fuel pump and ground

>> Repair open circuit or short to ground or short to power in harness or connectors.

14. CHECK FUEL PUMP

Refer to EC-643, "Component Inspection" .

OK or NG

OK >> GO TO 15.
NG >> Replace fuel pump.

15. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace IPDM E/R.
NG >> Repair or replace harness or connectors.

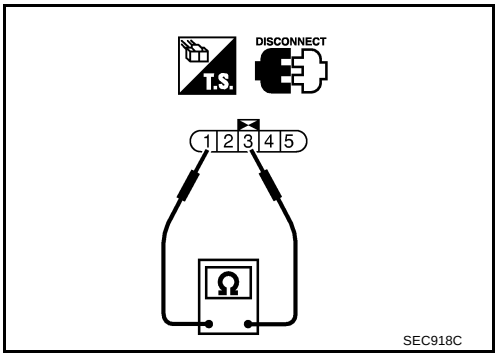
Component Inspection

ABS009OS

FUEL PUMP

1. Disconnect fuel level sensor unit and fuel pump harness connector.
2. Check resistance between fuel level sensor unit and fuel pump terminals 1 and 3.

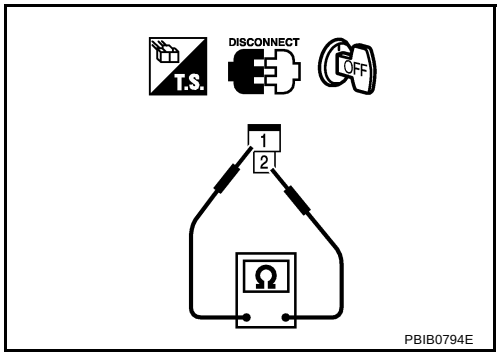
   Resistance: 0.2 - 5.0Ω [at 25°C (77°F)]



CONDENSER

1. Turn ignition switch OFF.
2. Disconnect condenser harness connector.
3. Check resistance between condenser terminals 1 and 2.

Resistance	Above 1 MΩ [at 25°C (77°F)]



Removal and Installation

ABS009OT

FUEL PUMP

Refer to FL-4, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY" .

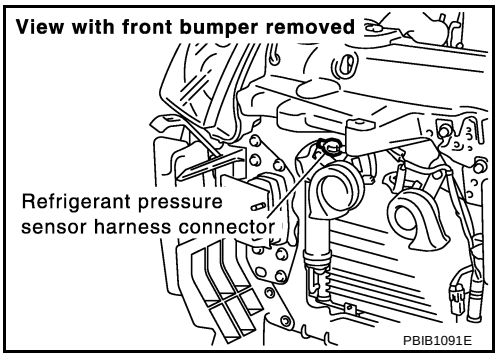
REFRIGERANT PRESSURE SENSOR

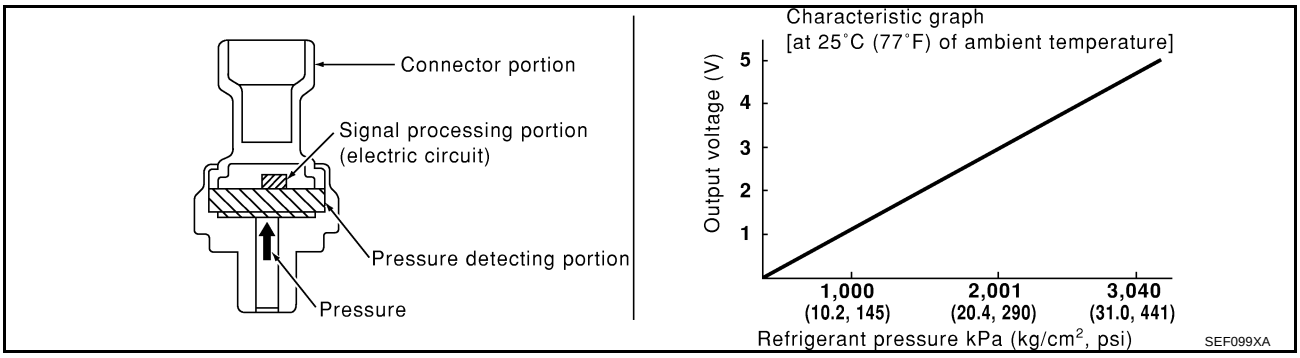
PFP:92136

Component Description

ABS009OU

The refrigerant pressure sensor is installed at the liquid tank of the air conditioner system. The sensor uses an electrostatic volume pressure transducer to convert refrigerant pressure to voltage. The voltage signal is sent to ECM, and ECM controls cooling fan system.

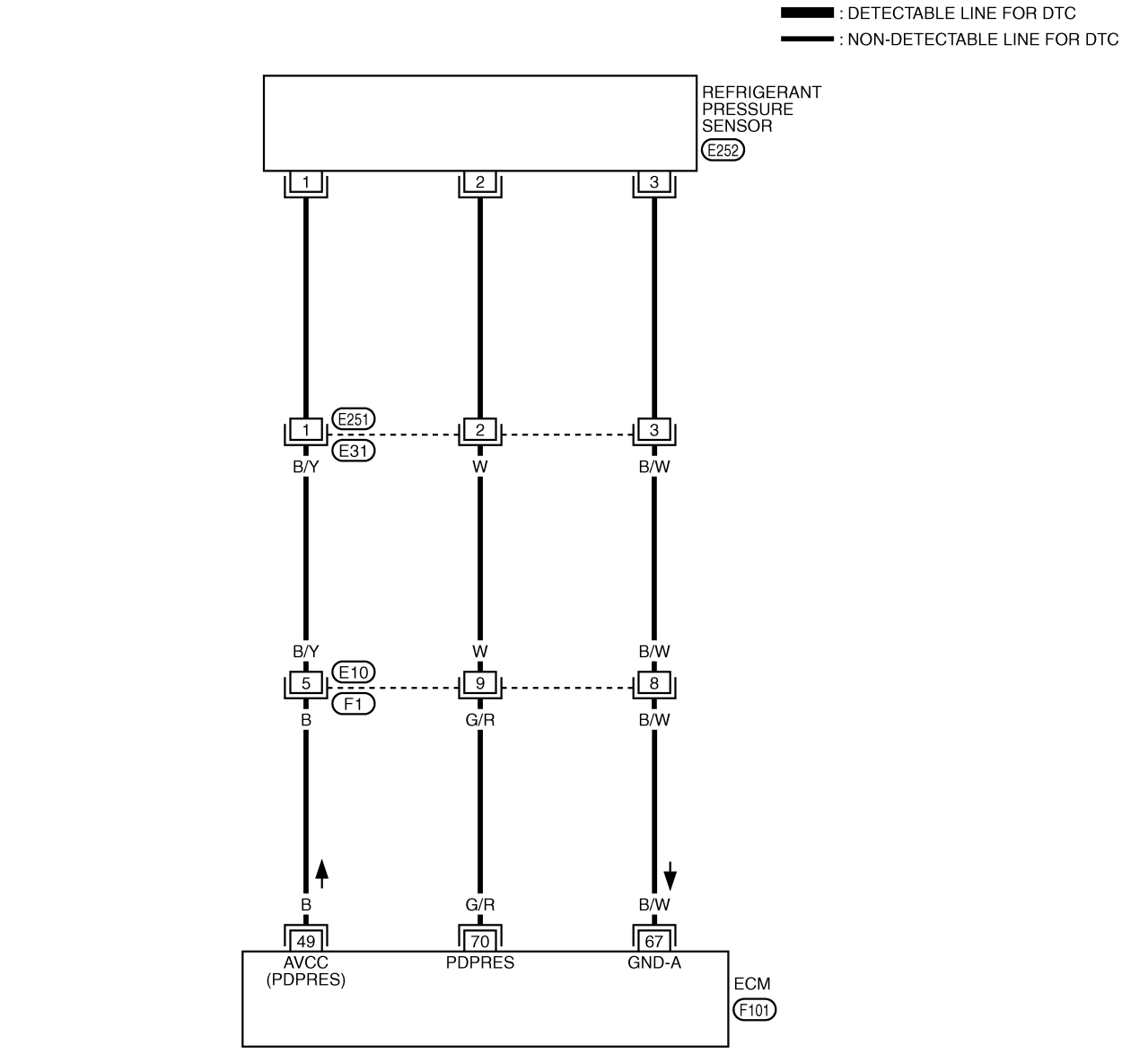


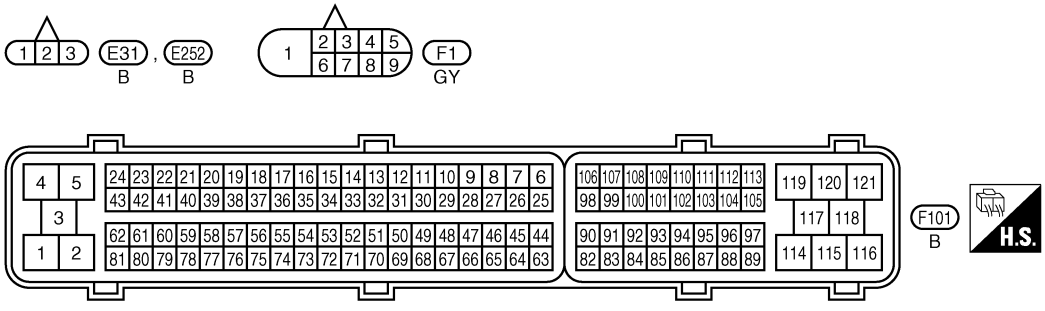


Wiring Diagram

ABS009OV

EC-RP/SEN-01





TBWT0514E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
49	B	Sensor power supply (Refrigerant pressure sensor)	**[Ignition switch: ON]**	Approximately 5V
67	B/W	Sensor ground (Mass air flow sensor / IAT sensor / Power steering pressure sensor / EVAP control system pressure sensor / ASCD steering switch / Refrigerant pressure sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V
70	G/R	Refrigerant pressure sensor	**[Engine is running]** ● **Warm-up condition** ● Both A/C switch and blower switch are ON. (Compressor operates.)	1.0 - 4.0V

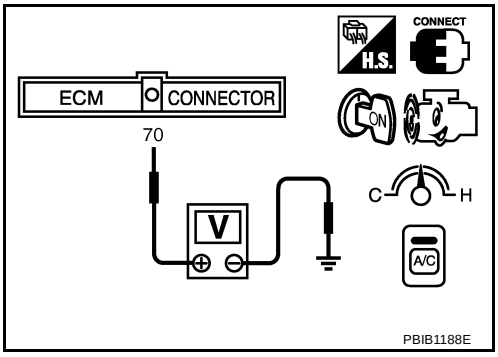
Diagnostic Procedure

ABS009OW

1. CHECK REFRIGERANT PRESSURE SENSOR OVERALL FUNCTION

1. Start engine and warm it up to normal operating temperature.
2. Turn A/C switch and blower switch ON.
3. Check voltage between ECM terminal 70 and ground with CONSULT-II or tester.

Voltage: 1.0 - 4.0V

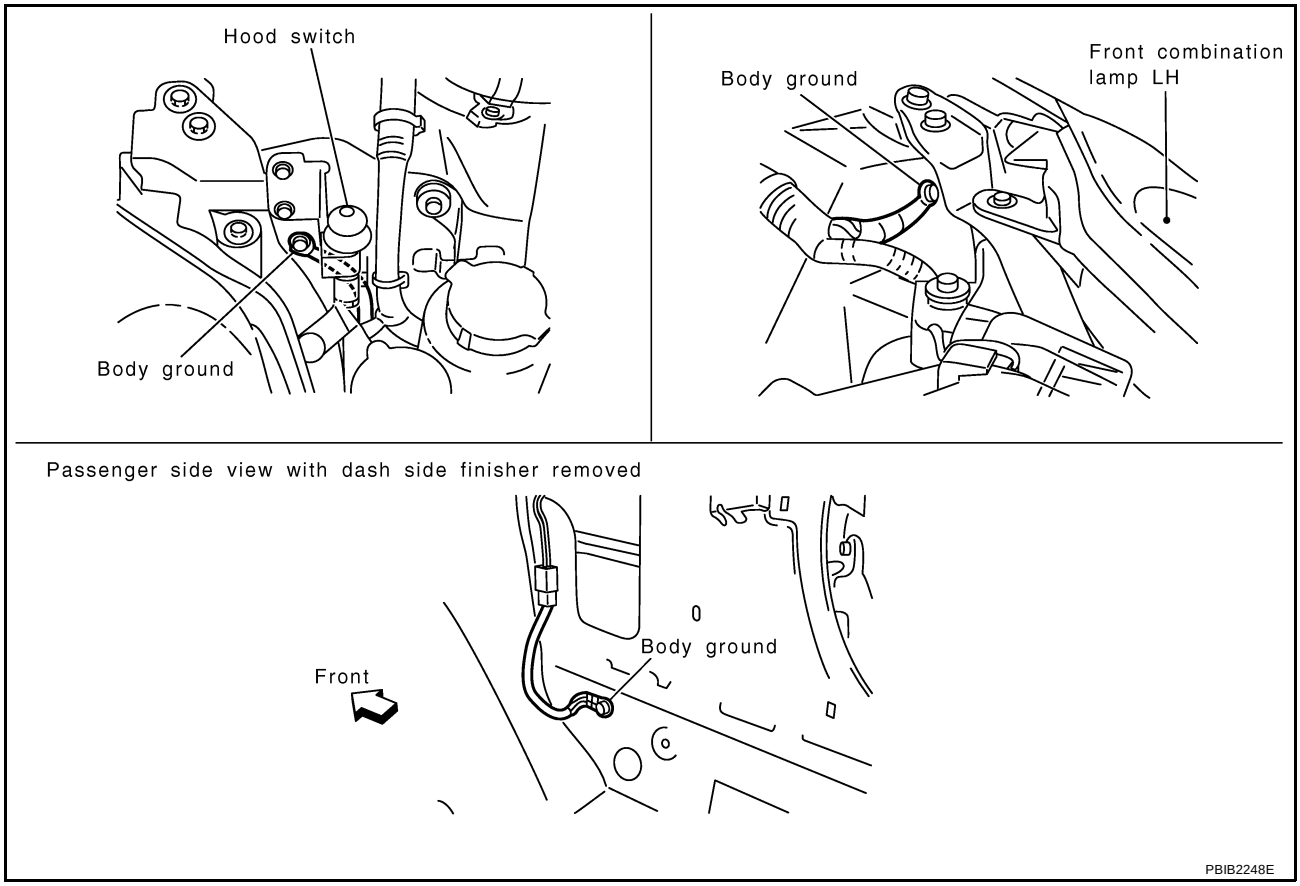


OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

2. CHECK GROUND CONNECTIONS

1. Turn A/C switch and blower switch OFF.
2. Stop engine.
3. Turn ignition switch OFF.
4. Loosen and retighten three ground screws on the body. Refer to EC-137, "Ground Inspection" .

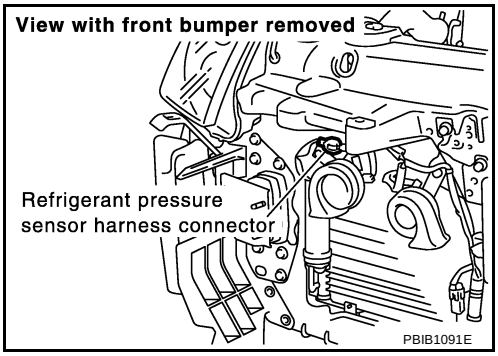


OK or NG

OK >> GO TO 3.
NG >> Repair or replace ground connections.

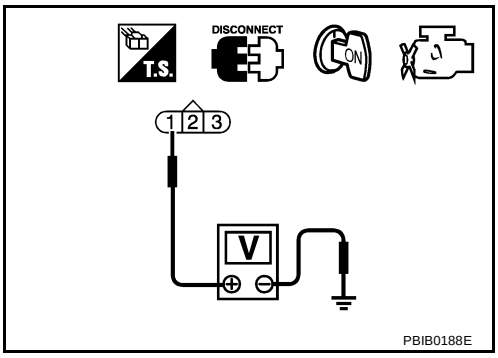
3. CHECK REFRIGERANT PRESSURE SENSOR POWER SUPPLY CIRCUIT

1. Disconnect refrigerant pressure sensor harness connector.
2. Turn ignition switch ON.



3. Check voltage between refrigerant pressure sensor terminal 1 and ground with CONSULT-II or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E251, E31
- Harness connectors E10, F1
- Harness for open or short between ECM and refrigerant pressure sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK REFRIGERANT PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between refrigerant pressure sensor terminal 3 and ECM terminal 67. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E251, E31
- Harness connectors E10, F1
- Harness for open or short between ECM and refrigerant pressure sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK REFRIGERANT PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 70 and refrigerant pressure sensor terminal 2. Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 9.
NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E251, E31
- Harness connectors E10, F1
- Harness for open or short between ECM and refrigerant pressure sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace refrigerant pressure sensor.
NG >> Repair or replace.

Removal and Installation

ABS009OX

REFRIGERANT PRESSURE SENSOR

Refer to ATC-143, "Removal and Installation of Refrigerant Pressure Sensor" .

ELECTRICAL LOAD SIGNAL

PFP:25350

Description

ABS009OY

The electrical load signal (Headlamp switch signal, rear window defogger switch signal, etc.) is transferred through the CAN communication line from BCM to ECM via IPDM E/R.

CONSULT-II Reference Value in Data Monitor Mode

ABS009OZ

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
LOAD SIGNAL	● Ignition switch: ON	Rear window defogger switch is ON and/or lighting switch is in 2nd.	ON
		Rear window defogger switch is OFF and lighting switch is OFF.	OFF

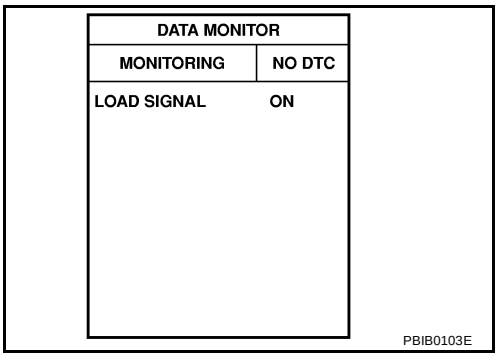
Diagnostic Procedure

ABS009P0

1. CHECK LOAD SIGNAL CIRCUIT OVERALL FUNCTION-I

1. Turn ignition switch ON.
2. Connect CONSULT-II and select “DATA MONITOR” mode.
3. Select “LOAD SIGNAL” and check indication under the following conditions.

Condition	Indication
Rear window defogger switch ON	ON
Rear window defogger switch OFF	OFF



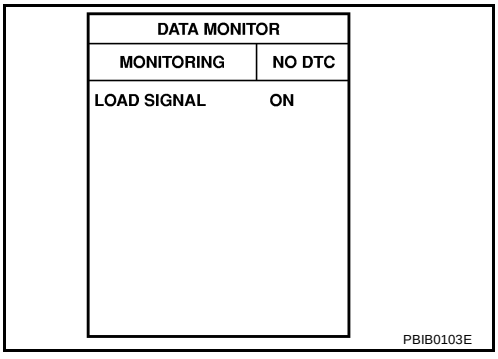
OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK LOAD SIGNAL CIRCUIT OVERALL FUNCTION-II

Check “LOAD SIGNAL” indication under the following conditions.

Condition	Indication
Lighting switch ON at 2nd position	ON
Lighting switch OFF	OFF



OK or NG

OK >> **INSPECTION END**
NG >> GO TO 4.

3. CHECK REAR WINDOW DEFOGGER SYSTEM

Refer to GW-56, "REAR WINDOW DEFOGGER" .

>> **INSPECTION END**

4. CHECK HEADLAMP SYSTEM

Refer to LT-7, "HEADLAMP (FOR USA) - XENON TYPE -" , LT-38, "HEADLAMP (FOR USA) - CONVENTIONAL TYPE -" , LT-68, "HEADLAMP (FOR CANADA) - XENON TYPE -" or LT-105, "HEADLAMP (FOR CANADA) - CONVENTIONAL TYPE -" .

>> **INSPECTION END**

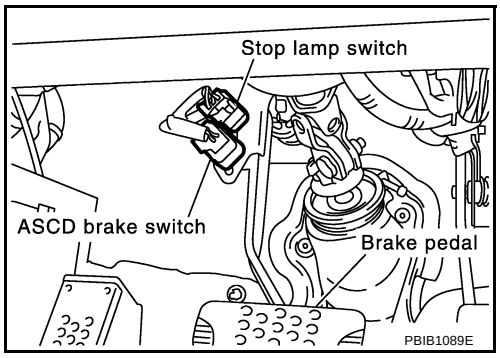
ASCD BRAKE SWITCH

PFP:25320

Component Description

ABS009P1

When the brake pedal is depressed, ASCD brake switch is turned OFF and stop lamp switch is turned ON. ECM detects the state of the brake pedal by this input of two kinds (ON/OFF signal).
Refer to EC-687, "AUTOMATIC SPEED CONTROL DEVICE (ASCD)" for the ASCD function.



CONSULT-II Reference Value in Data Monitor Mode

ABS009P2

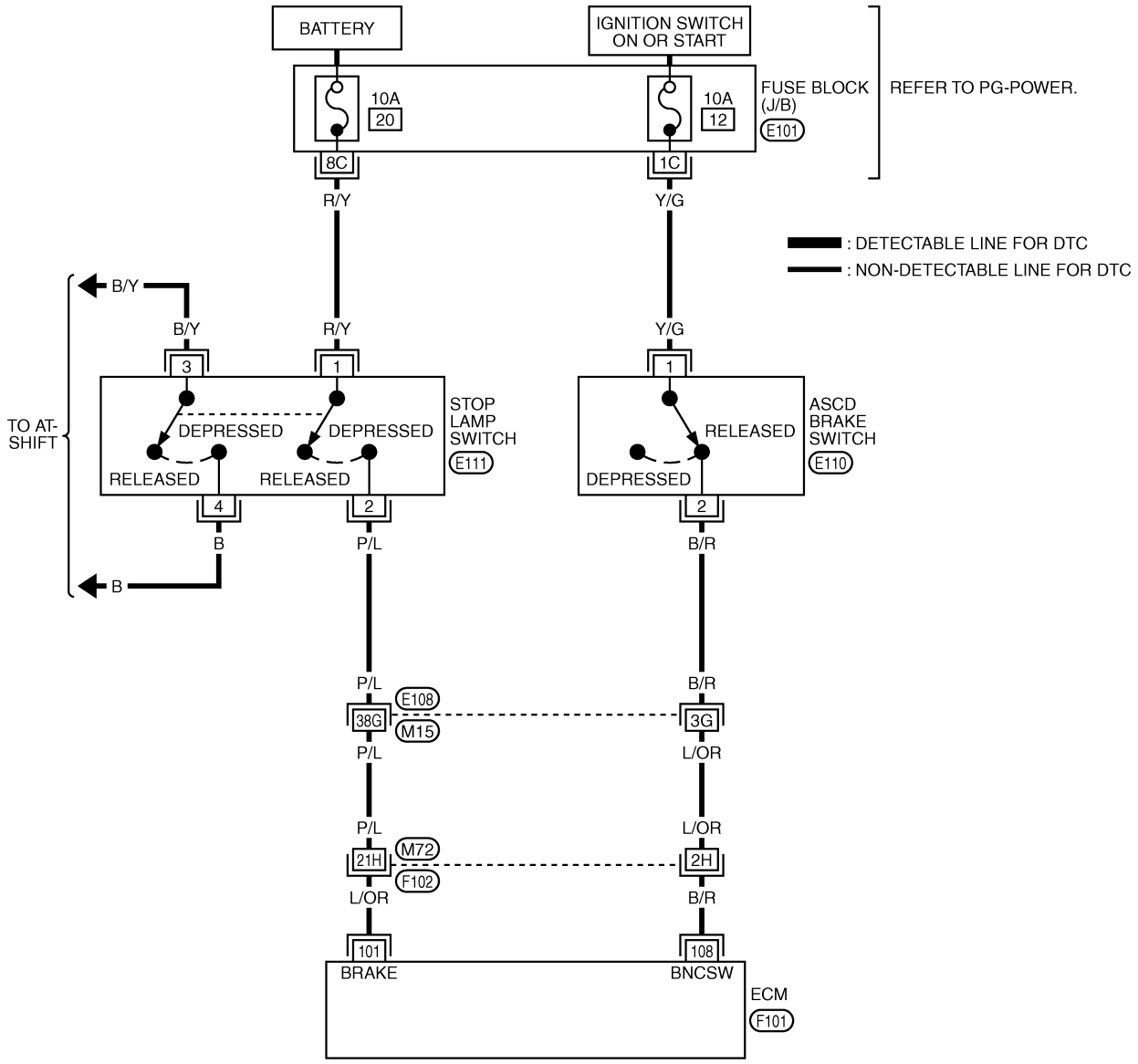
Specification data are reference values.

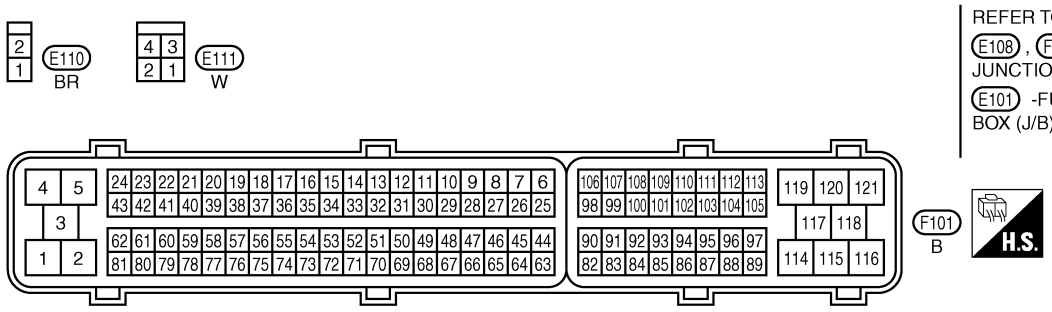
MONITOR ITEM	CONDITION		SPECIFICATION
BRAKE SW 1 (ASCD brake switch)	● Ignition switch: ON	● Clutch pedal (M/T) and brake pedal: Fully released	ON
		● Clutch pedal (M/T) and/or brake pedal: Slightly depressed	OFF
BRAKE SW 2 (stop lamp switch)	● Ignition switch: ON	● Brake pedal: Fully released	OFF
		● Brake pedal: Slightly depressed	ON

Wiring Diagram
A/T MODELS

ABS009P3

EC-ASCBOF-01





REFER TO THE FOLLOWING.
E108 , F102 -SUPER MULTIPLE JUNCTION (SMJ)
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT0515E

Specification data are reference values and are measured between each terminal and ground.

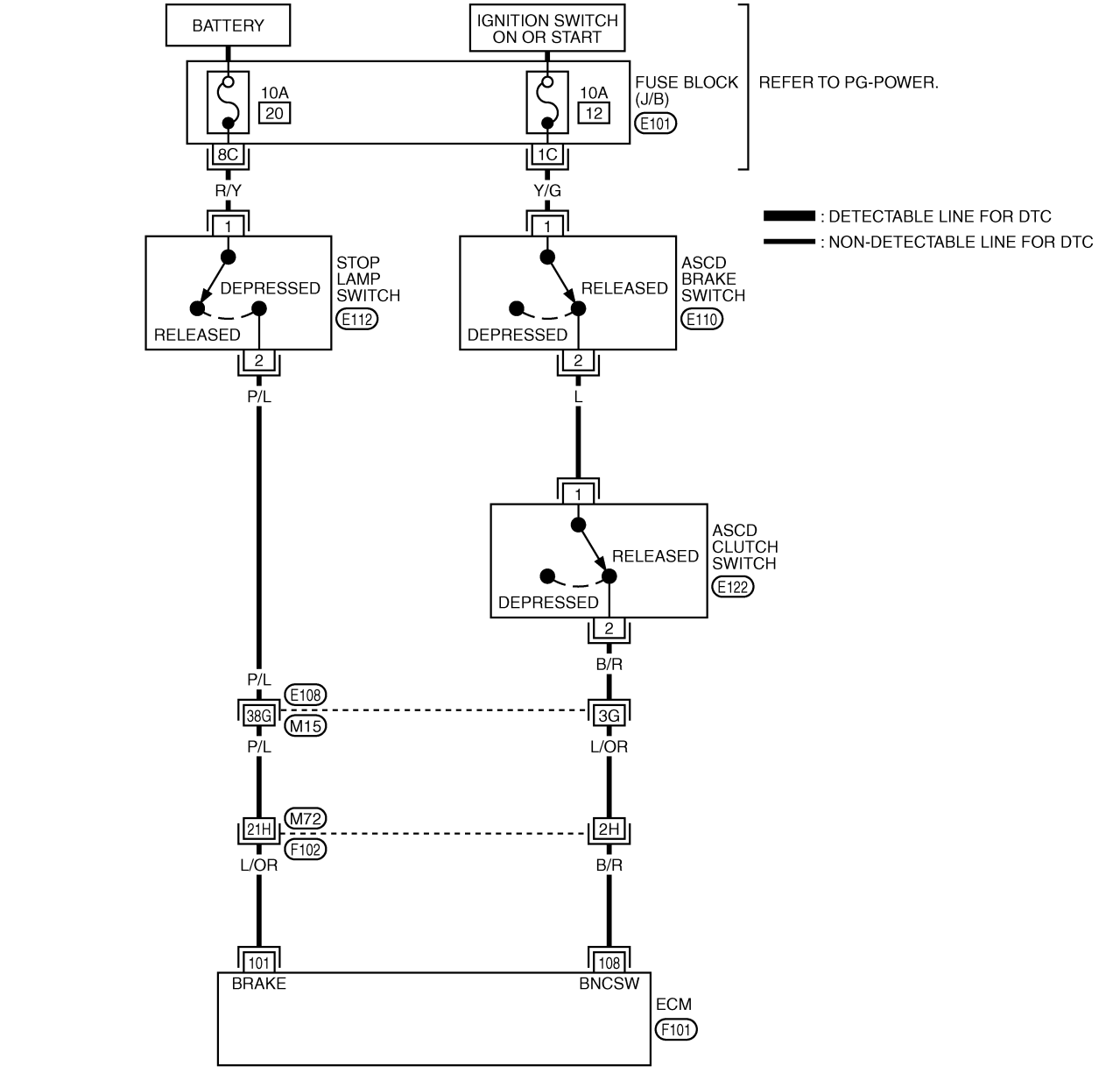
CAUTION:

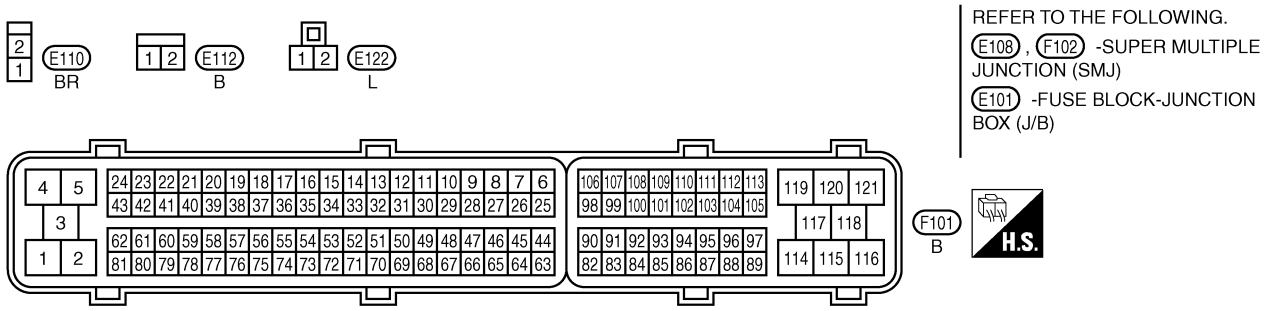
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
101	L/OR	Stop lamp switch	**[Ignition switch: OFF]** ● Brake pedal is fully released	Approximately 0V
			[Ignition switch: OFF] ● Brake pedal is slightly depressed	BATTERY VOLTAGE (11 - 14V)
108	B/R	ASCD brake switch	**[Ignition switch: ON]** ● Brake pedal is slightly depressed	Approximately 0V
			[Ignition switch: ON] ● Brake pedal is fully released	BATTERY VOLTAGE (11 - 14V)

M/T MODELS

EC-ASCBOF-02





TBWT0516E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
101	L/OR	Stop lamp switch	**[Ignition switch: OFF]** ● Brake pedal is fully released	Approximately 0V
			[Ignition switch: OFF] ● Brake pedal is slightly depressed	BATTERY VOLTAGE (11 - 14V)
108	B/R	ASCD brake switch	**[Ignition switch: ON]** ● Brake pedal and/or clutch pedal are slightly depressed	Approximately 0V
			[Ignition switch: ON] ● Brake pedal and clutch pedal are fully released	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

ABS009P4

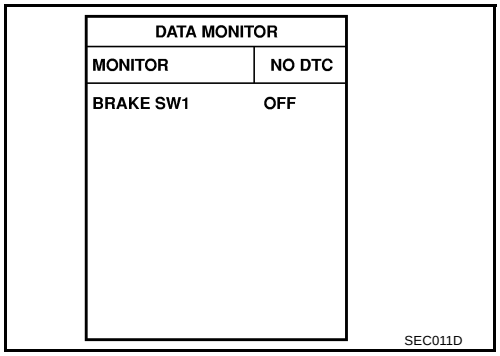
A/T MODELS

1. CHECK OVERALL FUNCTION-I

With CONSULT-II

1. Turn ignition switch ON.
2. Select “BRAKE SW1” in “DATA MONITOR” mode with CONSULT-II.
3. Check “BRAKE SW1” indication under the following conditions.

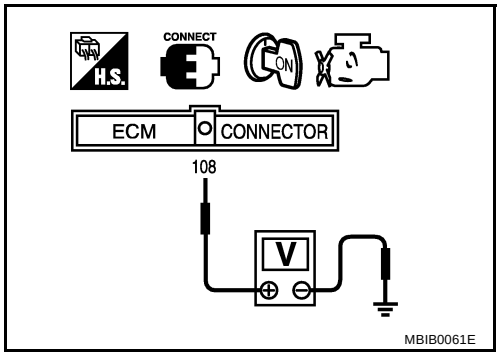
CONDITION	INDICATION
When brake pedal is slightly depressed	OFF
When brake pedal is fully released	ON



Without CONSULT-II

1. Turn ignition switch ON.
2. Check voltage between ECM terminal 108 and ground under the following conditions.

CONDITION	VOLTAGE
When brake pedal is slightly depressed	Approximately 0V
When brake pedal is fully released	Battery voltage



OK or NG

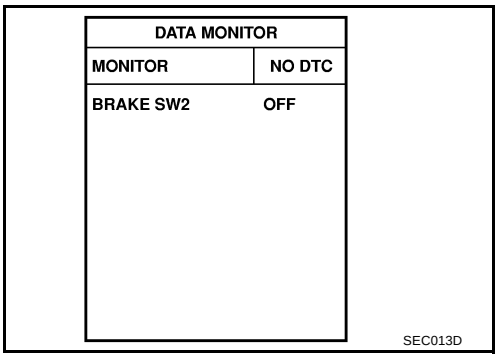
OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK OVERALL FUNCTION-II

With CONSULT-II

Check “BRAKE SW2” indication in “DATA MONITOR” mode.

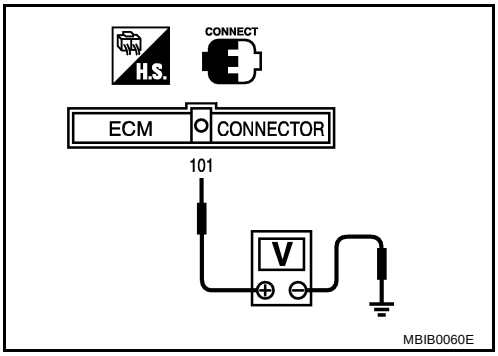
CONDITION	INDICATION
When brake pedal is fully released	OFF
When brake pedal is slightly depressed	ON



Without CONSULT-II

Check voltage between ECM terminal 101 and ground under the following conditions.

CONDITION	VOLTAGE
When brake pedal is fully released	Approximately 0V
When brake pedal is slightly depressed	Battery voltage

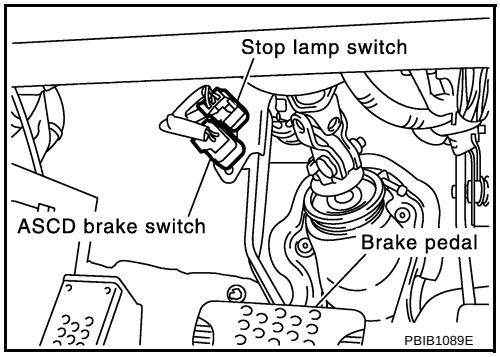


OK or NG

OK >> **INSPECTION END**
NG >> GO TO 8.

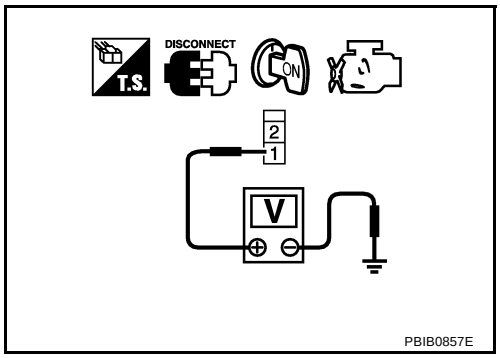
3. CHECK ASCD BRAKE SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ASCD brake switch harness connector.
3. Turn ignition switch ON.



4. Check voltage between ASCD brake switch terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between ASCD brake switch and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK ASCD BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 108 and ASCD brake switch terminal 2. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Harness for open or short between ECM and ASCD brake switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK ASCD BRAKE SWITCH

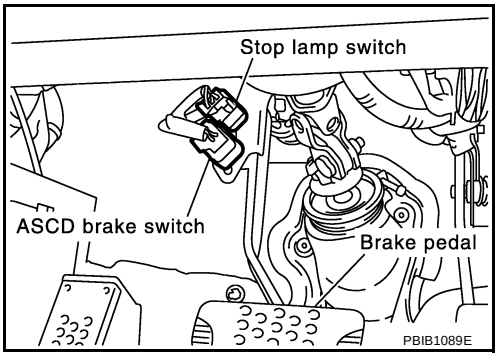
Refer to EC-569, "Component Inspection"

OK or NG

OK >> GO TO 13.
NG >> Replace ASCD brake switch.

8. CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect stop lamp switch harness connector.

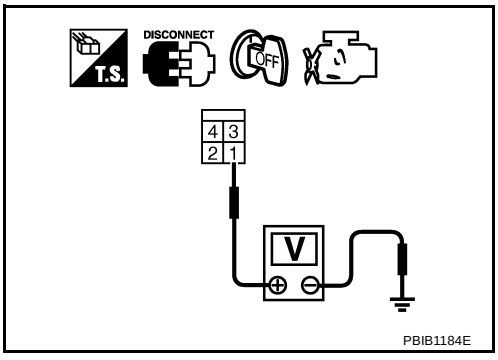


3. Check voltage between stop lamp switch terminal 1 and ground with CONSULT -II or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 10.
NG >> GO TO 9.



9. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between stop lamp switch and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

10. CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminal 101 and stop lamp switch terminal 2. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 12.
NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Harness for open or short between ECM and stop lamp switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

12. CHECK STOP LAMP SWITCH

Refer to EC-569, "Component Inspection"

OK or NG

OK >> GO TO 13.
NG >> Replace stop lamp switch.

13. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

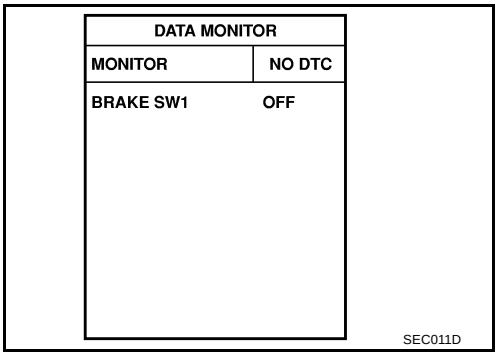
M/T MODELS

1. CHECK OVERALL FUNCTION-I

With CONSULT-II

1. Turn ignition switch ON.
2. Select “BRAKE SW1” in “DATA MONITOR” mode with CONSULT-II.
3. Check “BRAKE SW1” indication under the following conditions.

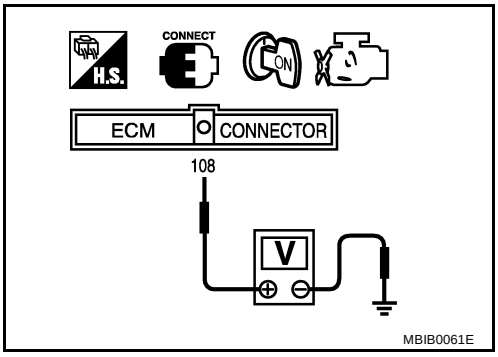
CONDITION	INDICATION
When brake pedal and/or clutch pedal are slightly depressed	OFF
When brake pedal and clutch pedal are fully released	ON



Without CONSULT-II

1. Turn ignition switch ON.
2. Check voltage between ECM terminal 108 and ground under the following conditions.

CONDITION	VOLTAGE
When brake pedal and/or clutch pedal are slightly depressed	Approximately 0V
When brake pedal and clutch pedal are fully released	Battery voltage



OK or NG

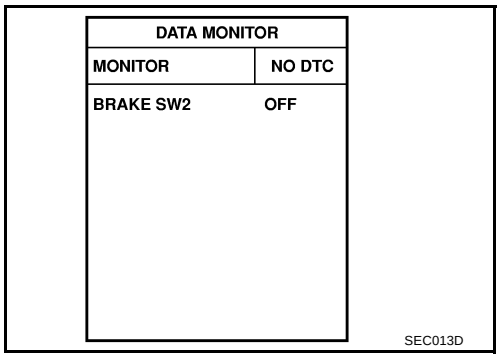
OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK OVERALL FUNCTION-II

With CONSULT-II

Check “BRAKE SW2” indication in “DATA MONITOR” mode.

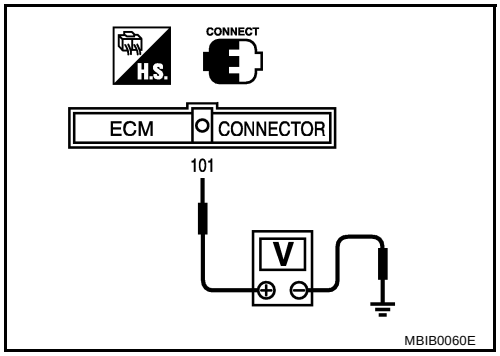
CONDITION	INDICATION
When brake pedal is fully released	OFF
When brake pedal is slightly depressed	ON



Without CONSULT-II

Check voltage between ECM terminal 101 and ground under the following conditions.

CONDITION	VOLTAGE
When brake pedal is fully released	Approximately 0V
When brake pedal is slightly depressed	Battery voltage

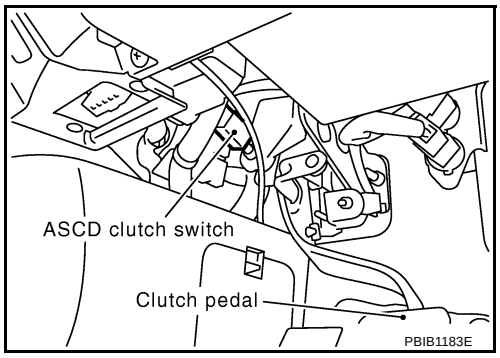


OK or NG

OK >> **INSPECTION END**
NG >> GO TO 11.

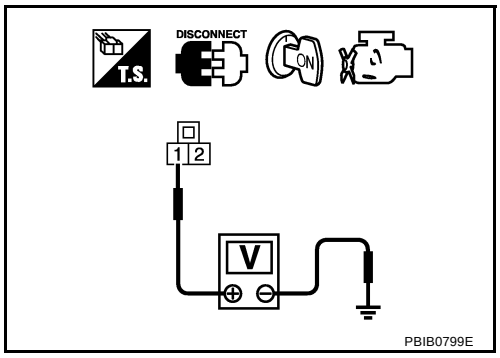
3. CHECK ASCD BRAKE SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ASCD clutch switch harness connector.
3. Turn ignition switch ON.



4. Check voltage between ASCD clutch switch terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage

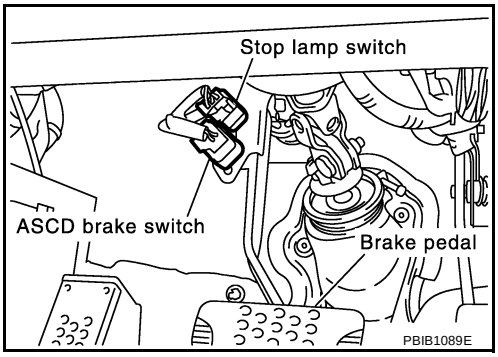


OK or NG

OK >> GO TO 8.
NG >> GO TO 4.

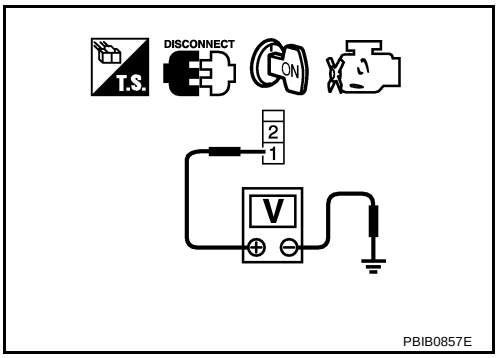
4. CHECK ASCD BRAKE SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ASCD brake switch harness connector.
3. Turn ignition switch ON.



4. Check voltage between ASCD brake switch terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between ASCD brake switch and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK ASCD BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Check harness continuity between ASCD brake switch terminal 2 and ASCD clutch switch terminal 1. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK ASCD BRAKE SWITCH

Refer to EC-569, "Component Inspection"

OK or NG

OK >> GO TO 16.
NG >> Replace ASCD brake switch.

8. CHECK ASCD CLUTCH SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ASCD clutch switch terminal 2 and ECM terminal 108. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 10.
NG >> GO TO 9.

9. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Harness for open or short between ECM and ASCD clutch switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

10. CHECK ASCD CLUTCH SWITCH

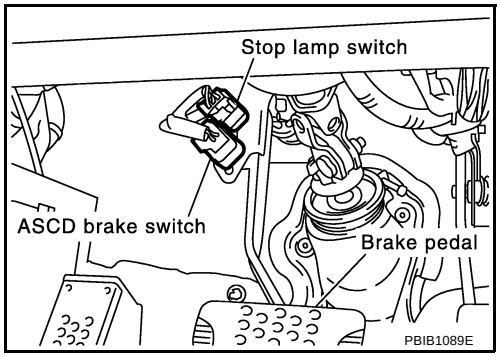
Refer to EC-569, "Component Inspection" .

OK or NG

OK >> GO TO 16.
NG >> Replace ASCD clutch switch.

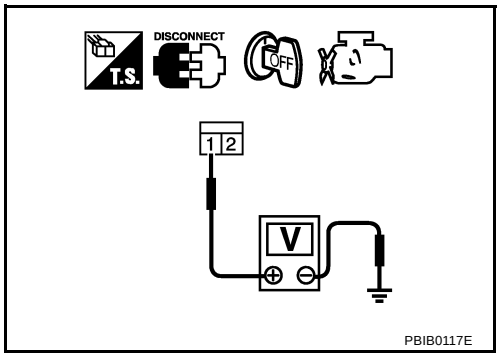
11. CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect stop lamp switch harness connector.



3. Check voltage between stop lamp switch terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 13.
NG >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between stop lamp switch and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

13. CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminal 101 and stop lamp switch terminal 2. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 15.
NG >> GO TO 14.

14. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Harness for open or short between ECM and stop lamp switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

15. CHECK STOP LAMP SWITCH

Refer to EC-569, "Component Inspection"

OK or NG

OK >> GO TO 16.
NG >> Replace stop lamp switch.

16. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

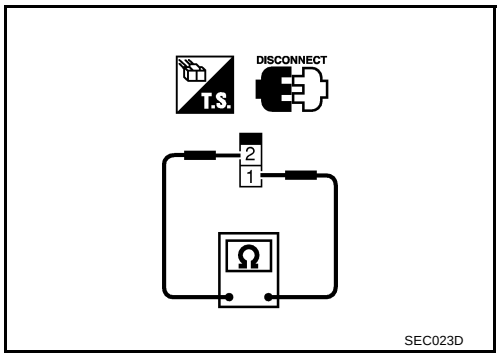
ABS009P5

ASCD BRAKE SWITCH

1. Turn ignition switch OFF.
2. Disconnect ASCD brake switch harness connector.
3. Check harness continuity between ASCD brake switch terminals 1 and 2 under the following conditions.

Condition	Continuity
When brake pedal is fully released.	Should exist.
When brake pedal is slightly depressed.	Should not exist.

If NG, adjust ASCD brake switch installation, refer to BR-6, "BRAKE PEDAL" , and perform step 3 again.

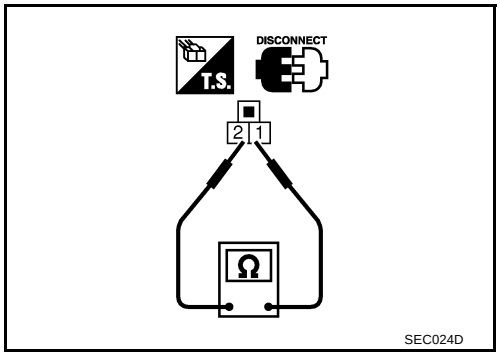


ASCD CLUTCH SWITCH

1. Turn ignition switch OFF.
2. Disconnect ASCD clutch switch harness connector.
3. Check harness continuity between ASCD clutch switch terminals 1 and 2 under the following conditions.

Condition	Continuity
When clutch pedal is fully released.	Should exist.
When clutch pedal is slightly depressed.	Should not exist.

If NG, adjust ASCD clutch switch installation, refer to CL-5, "CLUTCH PEDAL" , and perform step 3 again.

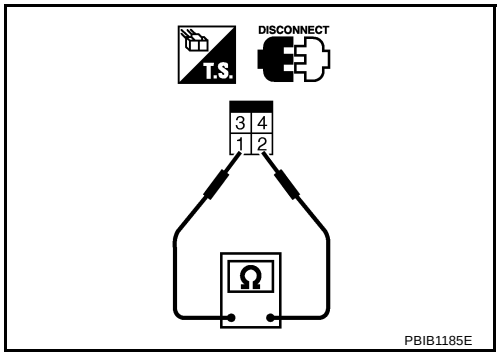


STOP LAMP SWITCH (FOR A/T MODELS)

1. Turn ignition switch OFF.
2. Disconnect stop lamp switch harness connector.
3. Check harness continuity between stop lamp switch terminals 1 and 2 under the following conditions.

Condition	Continuity
When brake pedal is fully released.	Should not exist.
When brake pedal is slightly depressed.	Should exist.

If NG, adjust stop lamp switch installation, refer to BR-6, "BRAKE PEDAL" , and perform step 3 again.



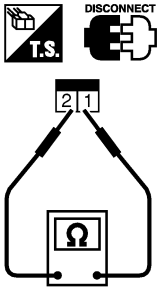
STOP LAMP SWITCH (FOR M/T MODELS)

1. Turn ignition switch OFF.
2. Disconnect stop lamp switch harness connector.

3. Check harness continuity between stop lamp switch terminals 1 and 2 under the following conditions.

Condition	Continuity
When brake pedal is fully released.	Should not exist.
When brake pedal is slightly depressed.	Should exist.

If NG, adjust stop lamp switch installation, refer to BR-6, "BRAKE PEDAL" , and perform step 3 again.



PBIB0118E

ASCD INDICATOR

PFP:24814

Component Description

ABS009P6

ASCD indicator lamp illuminates to indicate ASCD operation status. Lamp has two indicators, CRUISE and SET, and is integrated in combination meter.
CRUISE indicator illuminates when ON/OFF (MAIN) switch on ASCD steering switch is turned ON to indicated that ASCD system is ready for operation.
SET indicator illuminates when following conditions are met.

- CRUISE indicator is illuminated.
- SET switch on ASCD steering switch is turned ON while vehicle speed is within the range of ASCD setting.

SET indicator remains lit during ASCD control.
Refer to EC-687, "AUTOMATIC SPEED CONTROL DEVICE (ASCD)" for the ASCD function.

CONSULT-II Reference Value in Data Monitor Mode

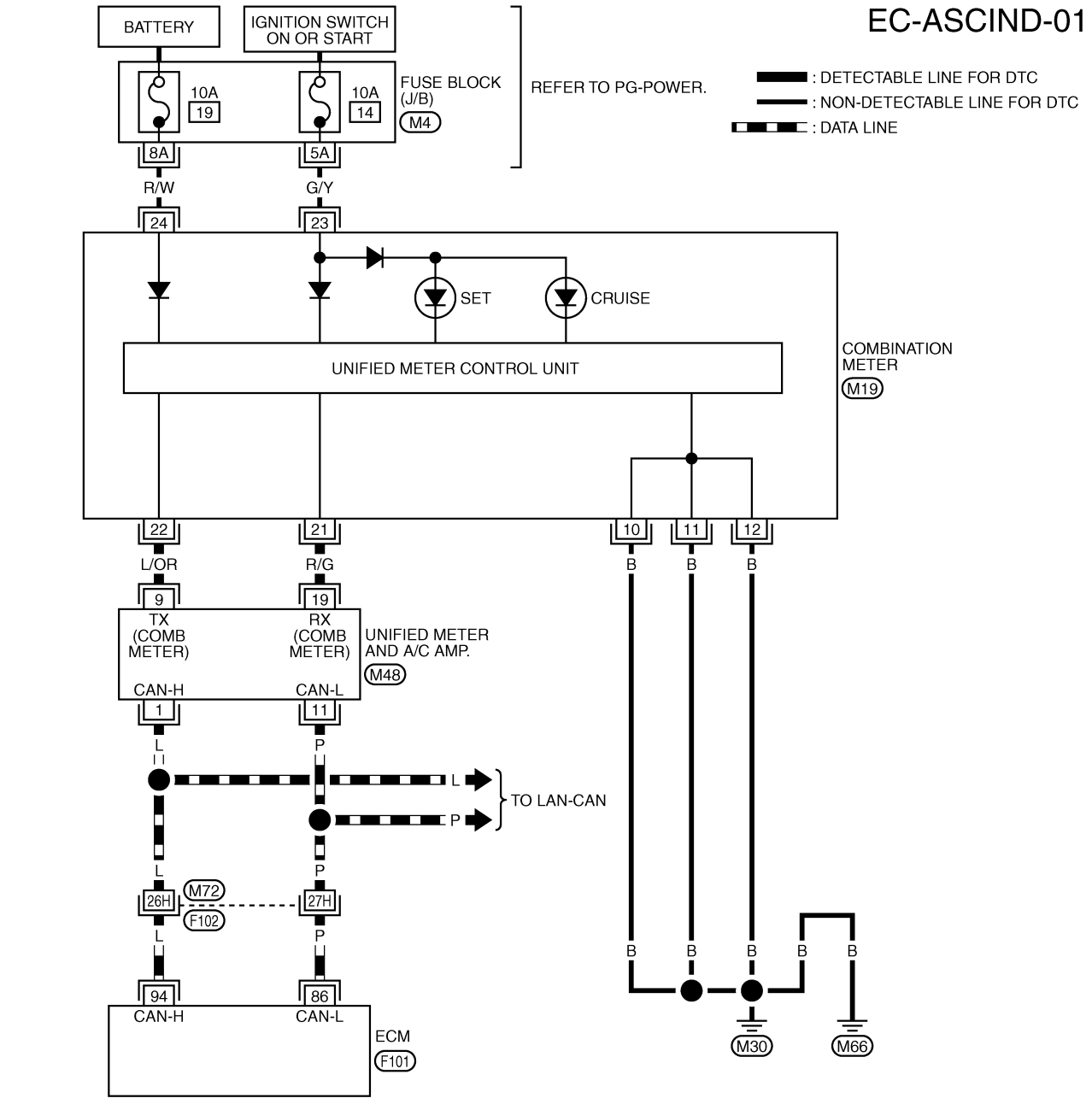
ABS009P7

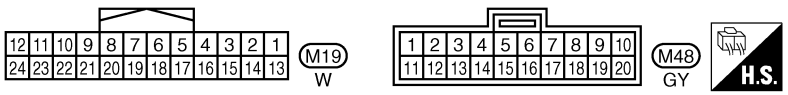
Specification data are reference value.

MONITOR ITEM	CONDITION		SPECIFICATION
CRUISE LAMP	● Ignition switch: ON	● ON/OFF (MAIN) switch: Pressed at the 1st time → at the 2nd time	ON → OFF
SET LAMP	● ON/OFF (MAIN) switch: ON ● When vehicle speed is between 40 km/h (25 MPH) and 144 km/h (89 MPH)	● COAST/SET switch: Pressed	ON
		● COAST/SET switch: Released	OFF

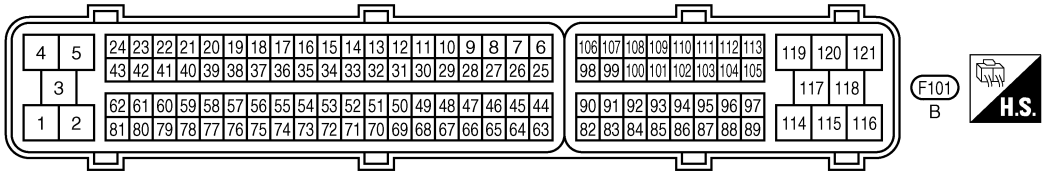
Wiring Diagram

ABS009P8





REFER TO THE FOLLOWING.
F102 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)



TBWT0699E

Diagnostic Procedure

ABS009P9

1. CHECK OVERALL FUNCTION

Check ASCD indicator under the following conditions.

ASCD INDICATOR	CONDITION		SPECIFICATION
CRUISE LAMP	● Ignition switch: ON	● ON/OFF (MAIN) switch: Pressed at the 1st time → at the 2nd time	ON → OFF
SET LAMP	● ON/OFF (MAIN) switch: ON ● When vehicle speed is between 40 km/h (25 MPH) and 144 km/h (89 MPH)	● COAST/SET switch: Pressed	ON
		● COAST/SET switch: Released	OFF

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

2. CHECK DTC

Check that DTC U1000 or U1001 is not displayed.

OK or NG

OK >> GO TO 3.
NG >> Perform trouble diagnoses for DTC U1000, U1001. Refer to EC-138, "DTC U1000, U1001 CAN COMMUNICATION LINE" .

3. CHECK DTC WITH “UNIFIED METER AND A/C AMP.”

Refer to DI-59, "SELF-DIAGNOSIS RESULTS" .

OK or NG

OK >> GO TO 4.
NG >> Go to DI-23, "Communication Line Inspection" .

4. CHECK INTERMITTENT INCIDENT

Refer to EC-128, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

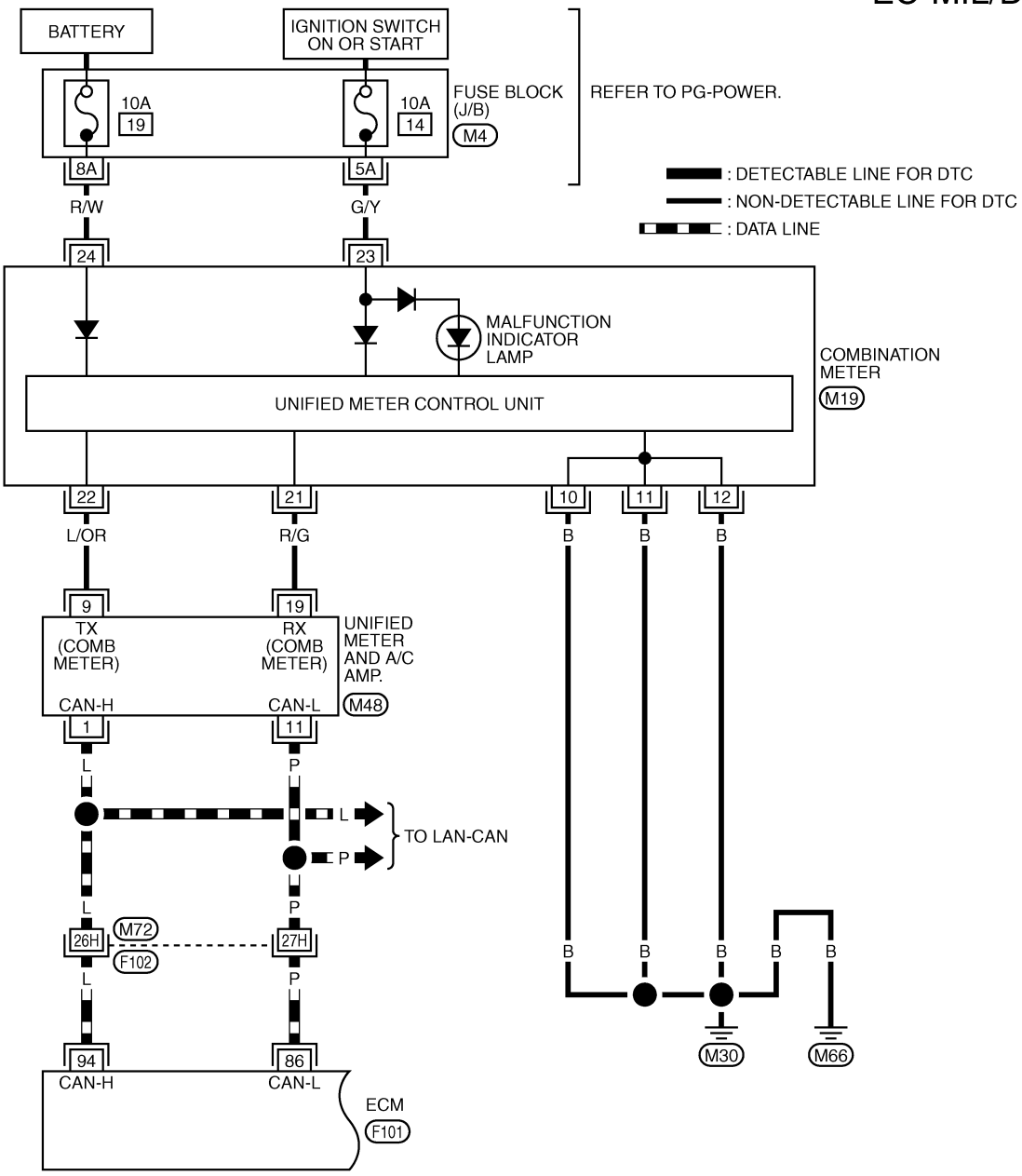
MIL AND DATA LINK CONNECTOR

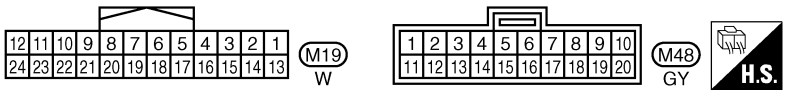
PFP:24814

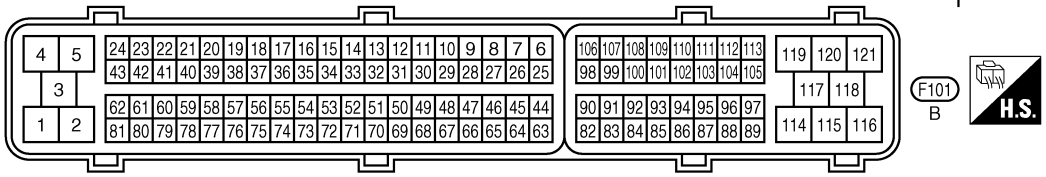
Wiring Diagram

ABS009PA

EC-MIL/DL-01



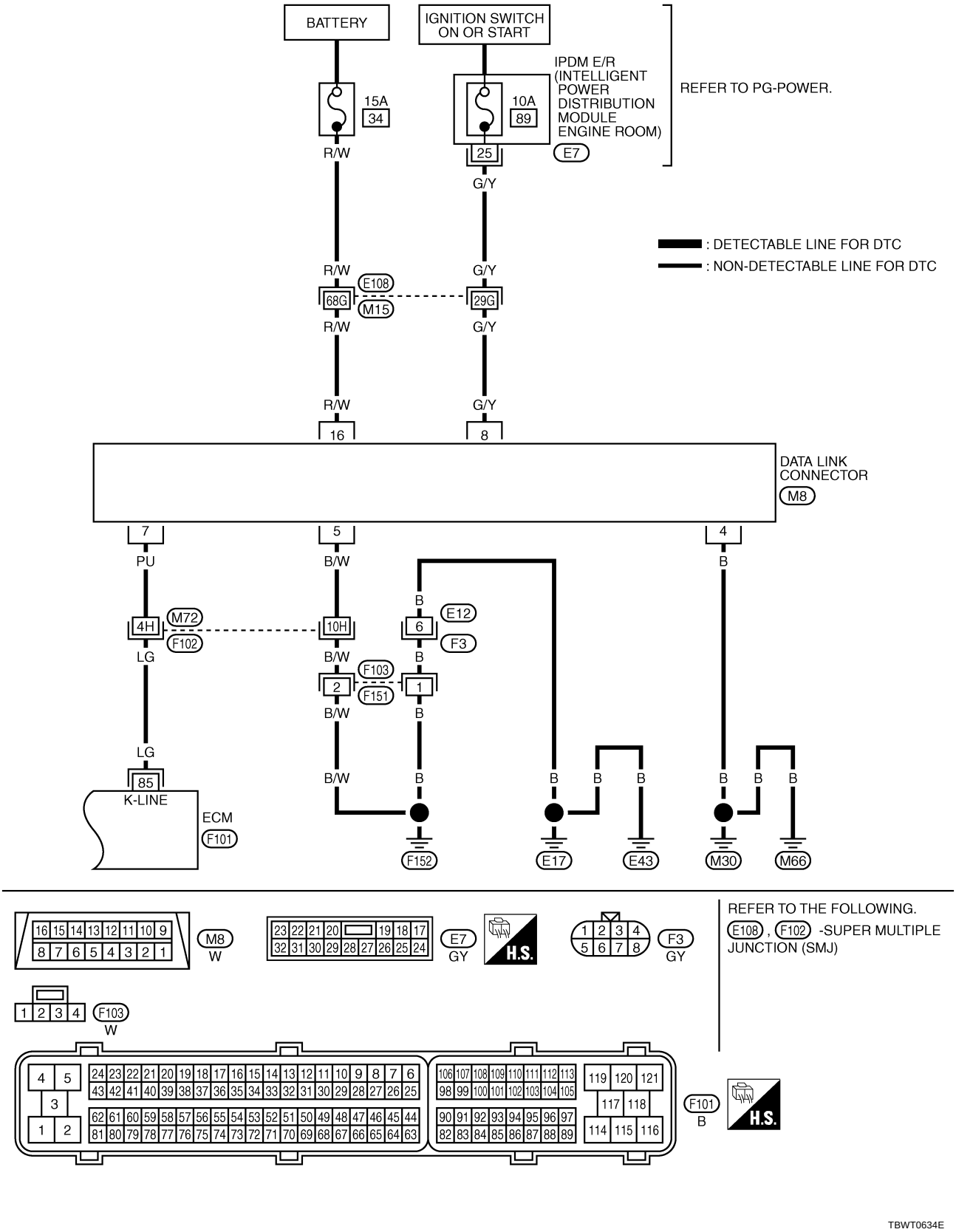




REFER TO THE FOLLOWING.
F102 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT0700E

EC-MIL/DL-02



TBWT0634E

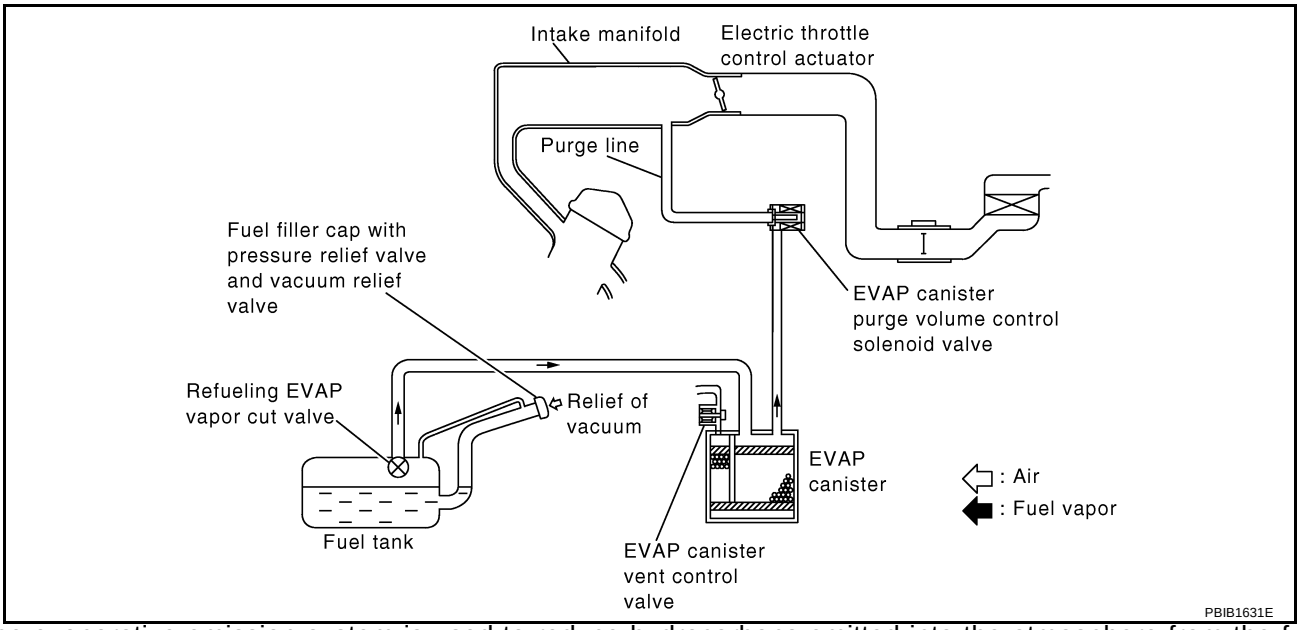
EVAPORATIVE EMISSION SYSTEM

PFP:14950

Description

ABS009PB

SYSTEM DESCRIPTION



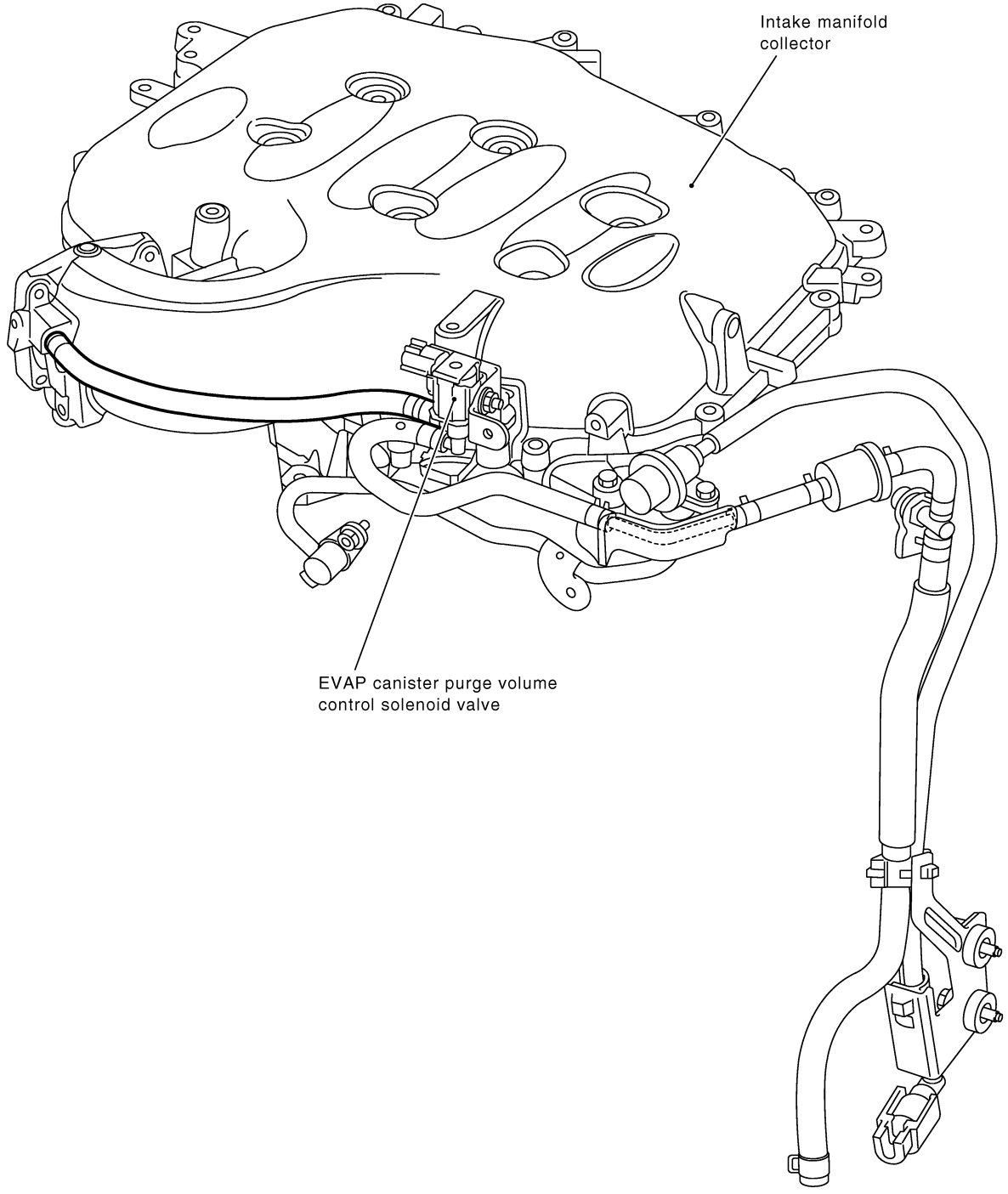
The evaporative emission system is used to reduce hydrocarbons emitted into the atmosphere from the fuel system. This reduction of hydrocarbons is accomplished by activated charcoals in the EVAP canister.

The fuel vapor in the sealed fuel tank is led into the EVAP canister which contains activated carbon and the vapor is stored there when the engine is not operating or when refueling to the fuel tank.

The vapor in the EVAP canister is purged by the air through the purge line to the intake manifold when the engine is operating. EVAP canister purge volume control solenoid valve is controlled by ECM. When the engine operates, the flow rate of vapor controlled by EVAP canister purge volume control solenoid valve is proportionally regulated as the air flow increases.

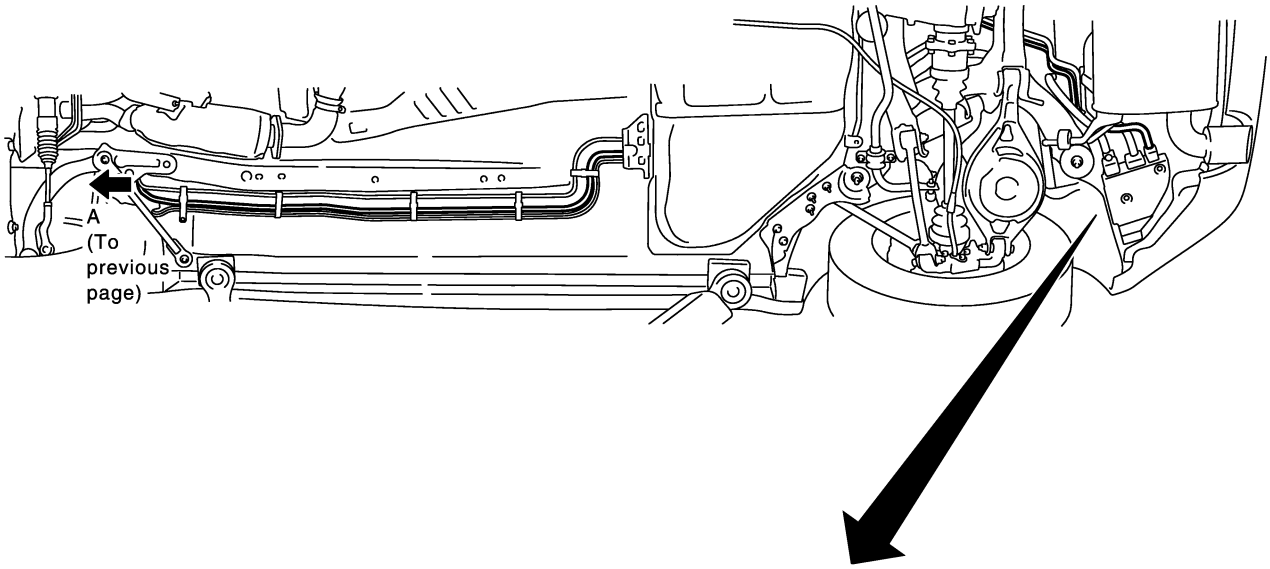
EVAP canister purge volume control solenoid valve also shuts off the vapor purge line during decelerating and idling.

EVAPORATIVE EMISSION LINE DRAWING

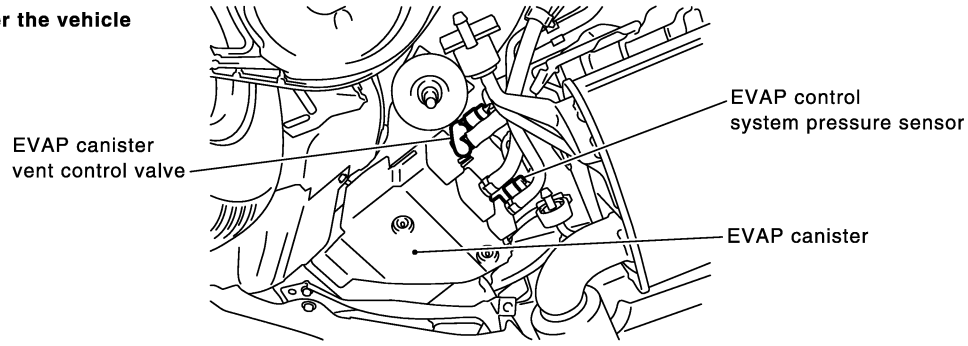


NOTE: Do not use soapy water or any type of solvent while installing vacuum hose or purge hoses.

PBIB2095E



View from under the vehicle



PBIB1066E

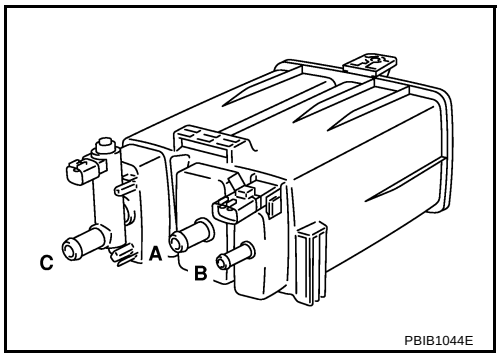
Component Inspection

ABS009PC

EVAP CANISTER

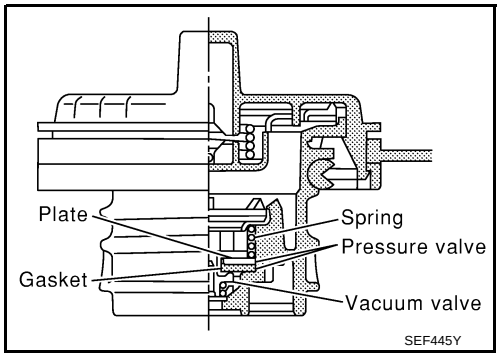
Check EVAP canister as follows:

1. Block port **B** .
2. Blow air into port **A** and check that it flows freely out of port **C** .
3. Release blocked port **B** .
4. Apply vacuum pressure to port **B** and check that vacuum pressure exists at the ports **A** and **C** .
5. Block port **A** and **B** .
6. Apply pressure to port **C** and check that there is no leakage.



FUEL TANK VACUUM RELIEF VALVE (BUILT INTO FUEL FULLER CAP)

1. Wipe clean valve housing.

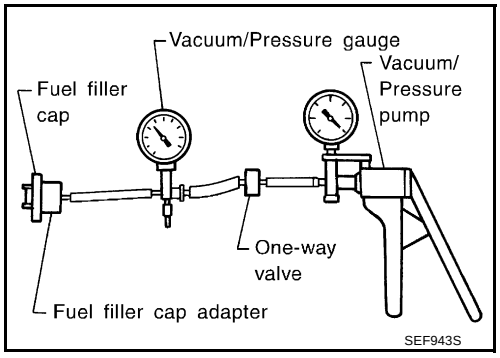


2. Check valve opening pressure and vacuum.

Pressure: **15.3 - 20.0 kPa (0.156 - 0.204 kg/cm^2 , 2.22 - 2.90 psi)**

Vacuum: **–6.0 to –3.3 kPa (–0.061 to –0.034 kg/cm^2 , –0.87 to –0.48 psi)**

3. If out of specification, replace fuel filler cap as an assembly.



CAUTION:

Use only a genuine fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may come on.

EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-306 .

FUEL TANK TEMPERATURE SENSOR

Refer to EC-246 .

EVAP CANISTER VENT CONTROL VALVE

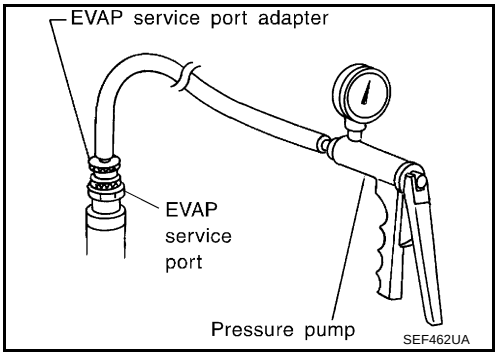
Refer to EC-315 .

EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-328 .

EVAP SERVICE PORT

Positive pressure is delivered to the EVAP system through the EVAP service port. If fuel vapor leakage in the EVAP system occurs, use a leak detector to locate the leak.

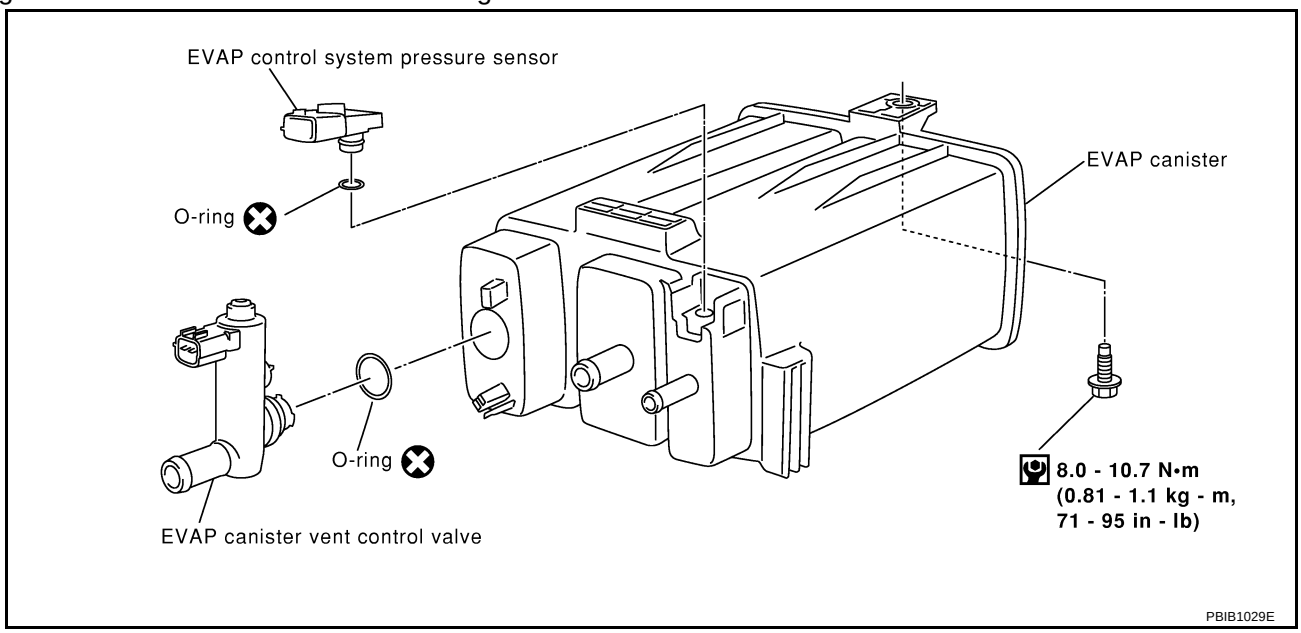


Removal and Installation

ABS009PD

EVAP CANISTER

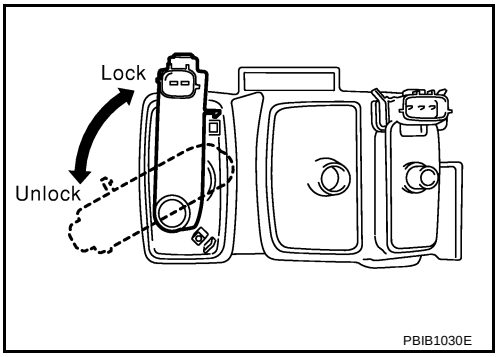
Tighten EVAP canister as shown in the figure.



EVAP CANISTER VENT CONTROL VALVE

1. Turn EVAP canister vent control valve counterclockwise.
2. Remove the EVAP canister vent control valve.

Do not reuse the O-ring, replace it with a new one.



How to Detect Fuel Vapor Leakage

ABS009PE

CAUTION:

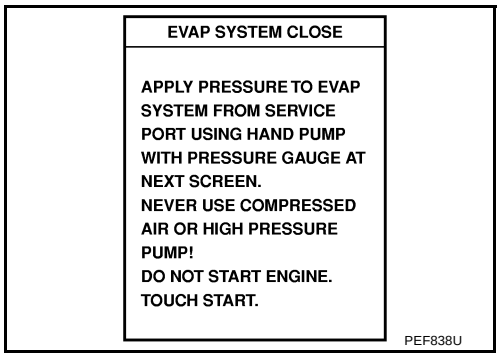
- **Never use compressed air or a high pressure pump.**
- **Do not exceed 4.12 kPa (0.042 kg/cm^2 , 0.6 psi) of pressure in EVAP system.**

NOTE:

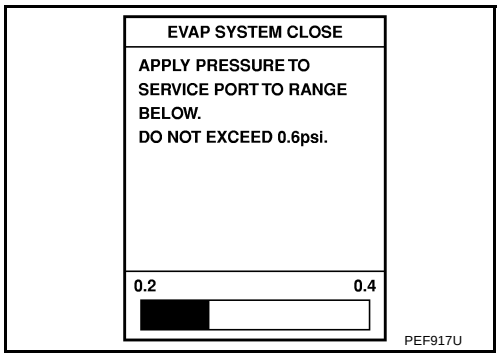
- Do not start engine.
- Improper installation of EVAP service port adapter to the EVAP service port may cause a leak.

WITH CONSULT-II

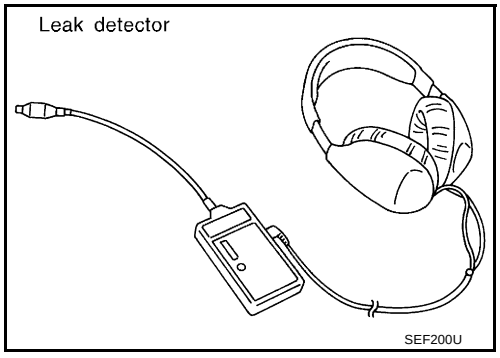
1. Attach the EVAP service port adapter securely to the EVAP service port.
2. Also attach the pressure pump and hose to the EVAP service port adapter.
3. Turn ignition switch ON.
4. Select the “EVAP SYSTEM CLOSE” of “WORK SUPPORT MODE” with CONSULT-II.
5. Touch “START”. A bar graph (Pressure indicating display) will appear on the screen.



6. Apply positive pressure to the EVAP system until the pressure indicator reaches the middle of the bar graph.
7. Remove EVAP service port adapter and hose with pressure pump.

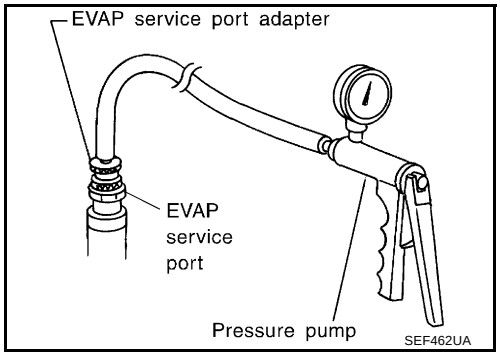


8. Locate the leak using a leak detector. Refer to EC-674, "EVAPORATIVE EMISSION LINE DRAWING" .

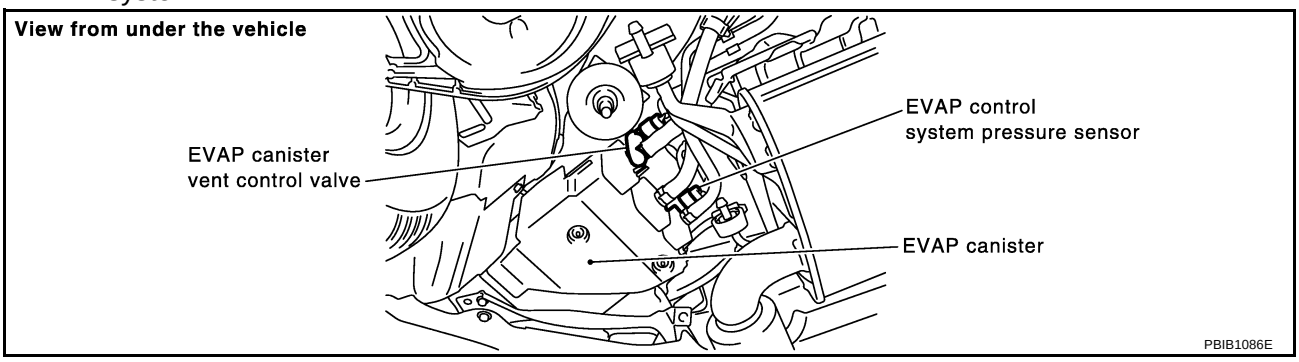


WITHOUT CONSULT-II

1. Attach the EVAP service port adapter securely to the EVAP service port.
2. Also attach the pressure pump with pressure gauge to the EVAP service port adapter.



3. Apply battery voltage to between the terminals of EVAP canister vent control valve to make a closed EVAP system.



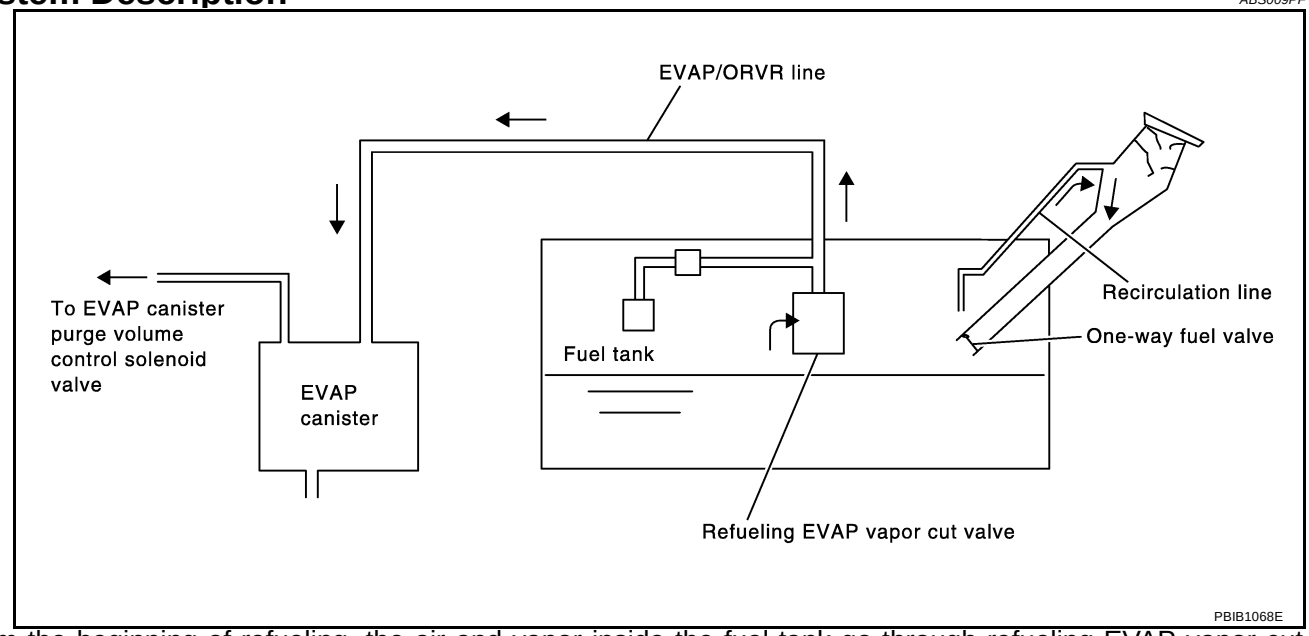
4. To locate the leak, deliver positive pressure to the EVAP system until pressure gauge points reach 1.38 to 2.76 kPa (0.014 to 0.028 kg/cm^2 , 0.2 to 0.4 psi).
5. Remove EVAP service port adapter and hose with pressure pump.
6. Locate the leak using a leak detector. Refer to EC-674, "EVAPORATIVE EMISSION LINE DRAWING" .

ON BOARD REFUELING VAPOR RECOVERY (ORVR)

PFP:00032

System Description

ABS009PF



From the beginning of refueling, the air and vapor inside the fuel tank go through refueling EVAP vapor cut valve and EVAP/ORVR line to the EVAP canister. The vapor is absorbed by the EVAP canister and the air is released to the atmosphere.

When the refueling has reached the full level of the fuel tank, the refueling EVAP vapor cut valve is closed and refueling is stopped because of auto shut-off. The vapor which was absorbed by the EVAP canister is purged during driving.

WARNING:

When conducting inspections below, be sure to observe the following:

- **Put a “CAUTION: INFLAMMABLE” sign in workshop.**
- **Do not smoke while servicing fuel system. Keep open flames and sparks away from work area.**
- **Be sure to furnish the workshop with a CO_2 fire extinguisher.**

CAUTION:

- **Before removing fuel line parts, carry out the following procedures:**
  - **Put drained fuel in an explosion-proof container and put lid on securely.**
  - **Release fuel pressure from fuel line. Refer to EC-45, "FUEL PRESSURE RELEASE" .**
  - **Disconnect battery ground cable.**
- **Always replace O-ring when the fuel gauge retainer is removed.**
- **Do not kink or twist hose and tube when they are installed.**
- **Do not tighten hose and clamps excessively to avoid damaging hoses.**
- **After installation, run engine and check for fuel leaks at connection.**
- **Do not attempt to top off the fuel tank after the fuel pump nozzle shuts off automatically. Continued refueling may cause fuel overflow, resulting in fuel spray and possibly a fire.**

Diagnostic Procedure

ABS009PG

SYMPTOM: FUEL ODOR FROM EVAP CANISTER IS STRONG.

1. CHECK EVAP CANISTER

1. Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
2. Weigh the EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
   The weight should be less than 2.2 kg (4.9 lb).

OK or NG

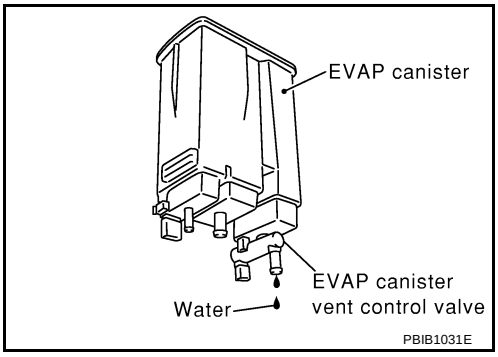
OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK IF EVAP CANISTER SATURATED WITH WATER

Does water drain from the EVAP canister?

Yes or No

Yes >> GO TO 3.
No >> GO TO 5.



3. REPLACE EVAP CANISTER

Replace EVAP canister with a new one.

>> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the EVAP hose between EVAP canister and vehicle frame for clogging or poor connection.

>> Repair or replace EVAP hose.

5. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-683, "Component Inspection" .

OK or NG

OK >> **INSPECTION END**
NG >> Replace refueling EVAP vapor cut valve with fuel tank.

SYMPTOM: CANNOT REFUEL/FUEL ODOR FROM THE FUEL FILLER OPENING IS STRONG WHILE REFUELING.

1. CHECK EVAP CANISTER

1. Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
2. Weigh the EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
   The weight should be less than 2.2 kg (4.9 lb).

OK or NG

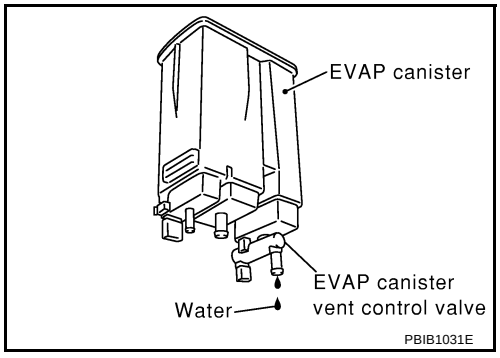
OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK IF EVAP CANISTER SATURATED WITH WATER

Does water drain from the EVAP canister?

Yes or No

Yes >> GO TO 3.
No >> GO TO 5.



3. REPLACE EVAP CANISTER

Replace EVAP canister with a new one.

>> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the EVAP hose between EVAP canister and vehicle frame for clogging or poor connection.

>> Repair or replace EVAP hose.

5. CHECK VENT HOSES AND VENT TUBES

Check hoses and tubes between EVAP canister and refueling control valve for clogging, kink, looseness and improper connection.

OK or NG

OK >> GO TO 6.
NG >> Repair or replace hoses and tubes.

6. CHECK FILLER NECK TUBE

Check recirculation line for clogging, dents and cracks.

OK or NG

OK >> GO TO 7.
NG >> Replace filler neck tube.

7. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-683, "Component Inspection" .

OK or NG

OK >> GO TO 8.
NG >> Replace refueling EVAP vapor cut valve with fuel tank.

8. CHECK FUEL FILLER TUBE

Check filler neck tube and hose connected to the fuel tank for clogging, dents and cracks.

OK or NG

OK >> GO TO 9.
NG >> Replace fuel filler tube.

9. CHECK ONE-WAY FUEL VALVE-I

Check one-way valve for clogging.

OK or NG

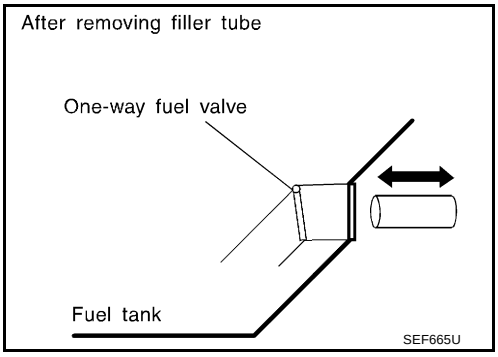
OK >> GO TO 10.
NG >> Repair or replace one-way fuel valve with fuel tank.

10. CHECK ONE-WAY FUEL VALVE-II

1. Make sure that fuel is drained from the tank.
2. Remove fuel filler tube and hose.
3. Check one-way fuel valve for operation as follows.
   When a stick is inserted, the valve should open, when removing stick it should close.
   Do not drop any material into the tank.

OK or NG

OK >> **INSPECTION END**
NG >> Replace fuel filler tube or replace one-way fuel valve with fuel tank.



ABS009PH

Component Inspection

REFUELING EVAP VAPOR CUT VALVE

With CONSULT-II

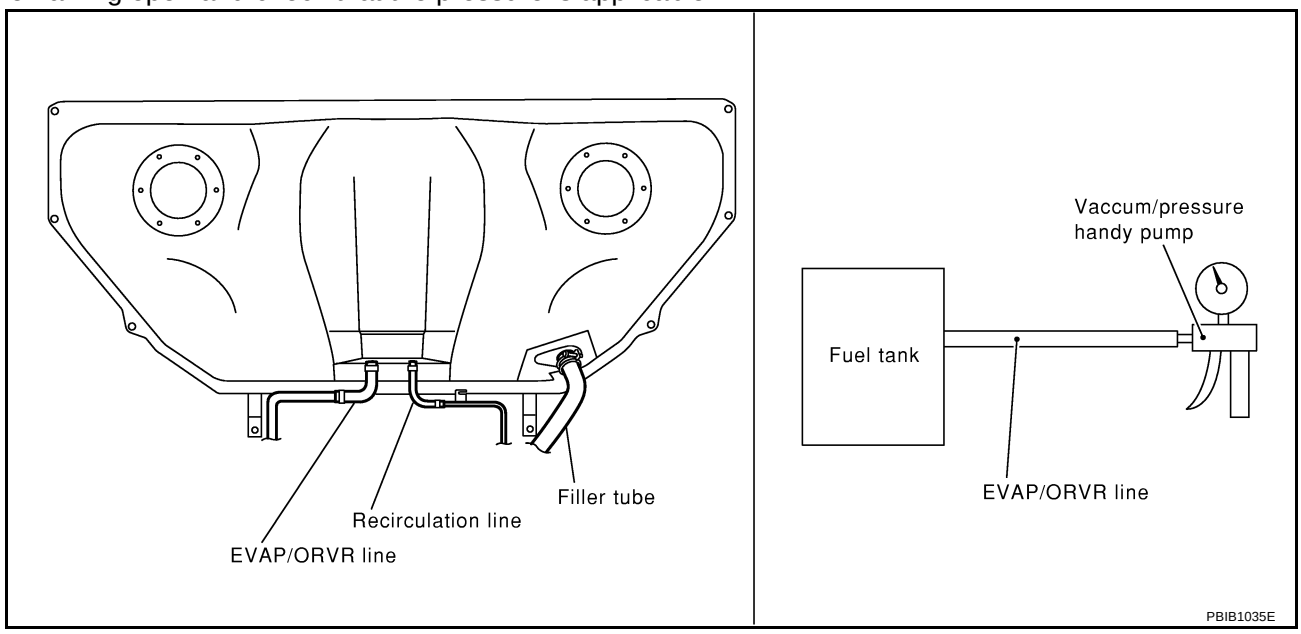
1. Remove fuel tank. Refer to FL-10, "FUEL TANK" .
2. Drain fuel from the tank as follows:

a. Remove fuel feed hose located on the fuel gauge retainer.
b. Connect a spare fuel hose, one side to fuel gauge retainer where the hose was removed and the other side to a fuel container.
c. Drain fuel using “FUEL PUMP RELAY” in “ACTIVE TEST” mode with CONSULT-II.

3. Check refueling EVAP vapor cut valve for being stuck to close as follows.
   Blow air into the refueling EVAP vapor cut valve (from the end of EVAP/ORVR line hose), and check that the air flows freely into the tank.
4. Check refueling EVAP vapor cut valve for being stuck to open as follows.

a. Connect vacuum pump to hose end.
b. Remove fuel gauge retainer with fuel gauge unit.
   Always replace O-ring with new one.
c. Put fuel tank upside down.

d. Apply vacuum pressure to hose end [–13.3 kPa (–100 mmHg, –3.94 inHg)] with fuel gauge retainer remaining open and check that the pressure is applicable.



Without CONSULT-II

1. Remove fuel tank. Refer to FL-10, "FUEL TANK" .
2. Drain fuel from the tank as follows:

a. Remove fuel gauge retainer.

b. Drain fuel from the tank using a handy pump into a fuel container.

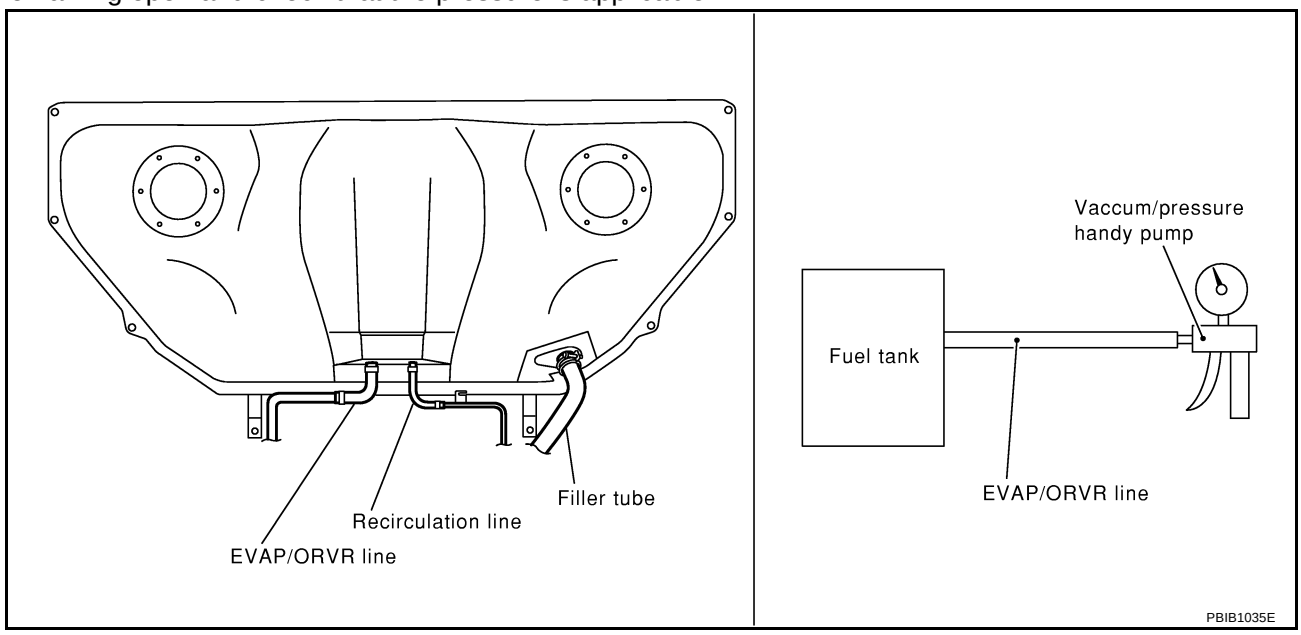
3. Check refueling EVAP vapor cut valve for being stuck to close as follows.
   Blow air into the refueling EVAP vapor cut valve (from the end of EVAP/ORVR line hose), and check that the air flows freely into the tank.
4. Check refueling EVAP vapor cut valve for being stuck to open as follows.

a. Connect vacuum pump to hose end.

b. Remove fuel gauge retainer with fuel gauge unit.
   Always replace O-ring with new one.

c. Put fuel tank upside down.

d. Apply vacuum pressure to hose end [–13.3 kPa (–100 mmHg, –3.94 inHg)] with fuel gauge retainer remaining open and check that the pressure is applicable.



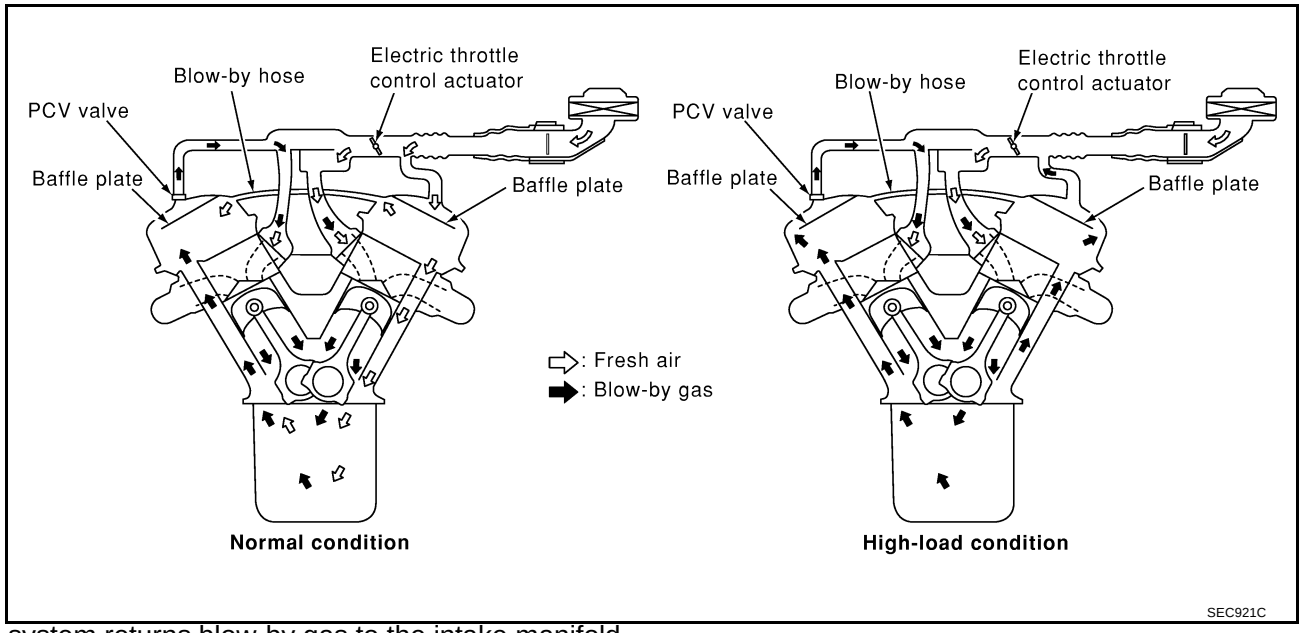
POSITIVE CRANKCASE VENTILATION

PFP:11810

Description

ABS009PI

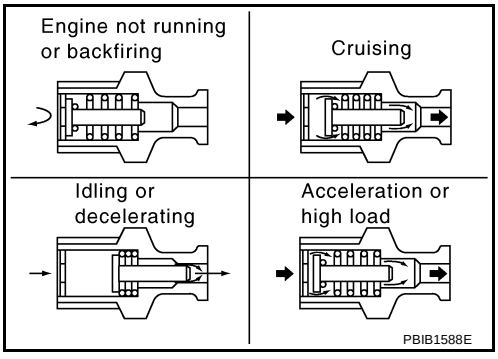
SYSTEM DESCRIPTION



This system returns blow-by gas to the intake manifold.

The positive crankcase ventilation (PCV) valve is provided to conduct crankcase blow-by gas to the intake manifold. During partial throttle operation of the engine, the intake manifold sucks the blow-by gas through the PCV valve. Normally, the capacity of the valve is sufficient to handle any blow-by and a small amount of ventilating air. The ventilating air is then drawn from the air inlet tubes into the crankcase. In this process the air passes through the hose connecting air inlet tubes to rocker cover. Under full-throttle condition, the manifold vacuum is insufficient to draw the blow-by flow through the valve. The flow goes through the hose connection in the reverse direction.

On vehicles with an excessively high blow-by, the valve does not meet the requirement. This is because some of the flow will go through the hose connection to the air inlet tubes under all conditions.

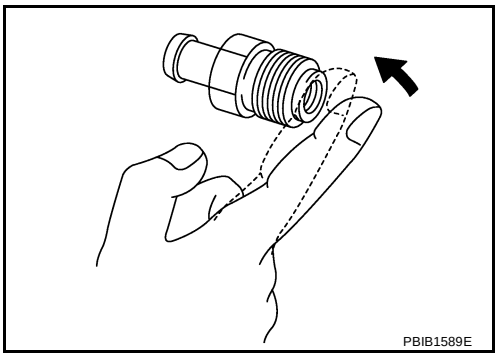


Component Inspection

ABS009PJ

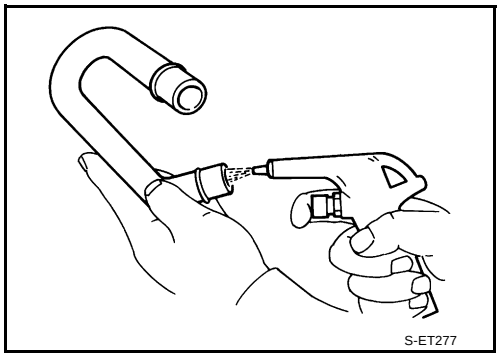
PCV (POSITIVE CRANKCASE VENTILATION) VALVE

With engine running at idle, remove PCV valve from rocker cover. A properly working valve makes a hissing noise as air passes through it. A strong vacuum should be felt immediately when a finger is placed over valve inlet.



PCV VALVE VENTILATION HOSE

1. Check hoses and hose connections for leaks.
2. Disconnect all hoses and clean with compressed air. If any hose cannot be freed of obstructions, replace.



AUTOMATIC SPEED CONTROL DEVICE (ASCD)

PFP:18930

System Description

ABS009PK

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to ECM	ECM function	Actuator
ASCD brake switch	Brake pedal operation	ASCD vehicle speed control	Electric throttle control actuator
Stop lamp switch	Brake pedal operation		
ASCD clutch switch	Clutch pedal operation		
ASCD steering switch	ASCD steering switch operation		
Park/Neutral position (PNP) switch	Gear position		
Unified meter and A/C amp.*	Vehicle speed		
TCM*	Powertrain revolution		

*: This signal is sent to the ECM through CAN communication line.

BASIC ASCD SYSTEM

Refer to Owner's Manual for ASCD operating instructions.
Automatic Speed Control Device (ASCD) allows a driver to keep vehicle at predetermined constant speed without depressing accelerator pedal. Driver can set vehicle speed in advance between approximately 40 km/h (25 MPH) and 144 km/h (89 MPH).
ECM controls throttle angle of electric throttle control actuator to regulate engine speed.
Operation status of ASCD is indicated by CRUISE indicator and SET indicator in combination meter. If any malfunction occurs in ASCD system, it automatically deactivates control.

NOTE:
Always drive vehicle in safe manner according to traffic conditions and obey all traffic laws.

SET OPERATION

Press ON/OFF (MAIN) switch. (The CRUISE indicator in combination meter illuminates.)
When vehicle speed reaches a desired speed between approximately 40 km/h (25 MPH) and 144 km/h (89 MPH), press COAST/SET switch. (Then SET indicator in combination meter illuminates.)

ACCEL OPERATION

If the ACCEL/RESUME switch is pressed during cruise control driving, increase the vehicle speed until the switch is released or vehicle speed reaches maximum speed controlled by the system.
And then ASCD will keep the new set speed.

CANCEL OPERATION

When any of following conditions exist, cruise operation will be canceled.

- CANCEL switch is pressed
- More than 2 switches at ASCD steering switch are pressed at the same time (Set speed will be cleared)
- Brake pedal is depressed
- Clutch pedal is depressed or gear position is changed to the neutral position (M/T models)
- Selector lever is changed to N, P, R position (A/T models)
- Vehicle speed decreased to 13 km/h (8 MPH) lower than the set speed
- VDC/TCS system is operated

When the ECM detects any of the following conditions, the ECM will cancel the cruise operation and inform the driver by blinking indicator lamp.

- Engine coolant temperature is slightly higher than the normal operating temperature, CRUISE lamp may blink slowly.
  When the engine coolant temperature decreases to the normal operating temperature, CRUISE lamp will stop blinking and the cruise operation will be able to work by pressing COAST/SET switch or ACCEL/RESUME switch.
- Malfunction for some self-diagnoses regarding ASCD control: SET lamp will blink quickly.

If ON/OFF (MAIN) switch is turned to OFF during ASCD is activated, all of ASCD operations will be canceled and vehicle speed memory will be erased.

COAST OPERATION

When the COAST/SET switch is pressed during cruise control driving, decrease vehicle set speed until the switch is released. And then ASCD will keep the new set speed.

RESUME OPERATION

When the ACCEL/RESUME switch is pressed after cancel operation other than pressing ON/OFF (MAIN) switch is performed, vehicle speed will return to last set speed. To resume vehicle set speed, vehicle condition must meet following conditions.

- Brake pedal is released
- Clutch pedal is released (M/T models)
- A/T selector lever is in other than P and N positions (A/T models)
- Vehicle speed is greater than 40 km/h (25 MPH) and less than 144 km/h (89 MPH)

Component Description

ABS009PL

ASCD STEERING SWITCH

Refer to EC-546 .

ASCD BRAKE SWITCH

Refer to EC-554 , and EC-652 .

ASCD CLUTCH SWITCH

Refer to EC-554 .

STOP LAMP SWITCH

Refer to EC-554 , EC-581 and EC-652 .

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EC-396 , EC-398 , EC-405 and EC-410 .

ASCD INDICATOR

Refer to EC-668 .

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Fuel Pressure

ABS009PM

Fuel pressure at idling kPa (kg/cm^2 , psi)	Approximately 350 (3.57, 51)

Idle Speed and Ignition Timing

ABS009PN

Target idle speed		A/T	No-load* (in P or N position)	650±50 rpm
		M/T	No-load* (in Neutral position)	
Air conditioner: ON	Coupe	A/T	In P or N position	775 or more
		M/T	In Neutral position	
	Roadster	A/T	In P or N position	700 rpm or more
		M/T	In Neutral position	
Ignition timing		A/T	In P or N position	15° ± 5° BTDC
		M/T	In Neutral position	

*: Under the following conditions:

- Air conditioner switch: OFF
- Electric load: OFF (Lights, heater fan & rear window defogger)
- Steering wheel: Kept in straight-ahead position

Calculated Load Value

ABS009PO

Conditions	Calculated load value % (Using CONSULT-II or GST)
At idle	5 - 35
At 2,500 rpm	5 - 35

Mass Air Flow Sensor

ABS009PP

Supply voltage	Battery voltage (11 - 14V)
Output voltage at idle	0.9 - 1.2V*
Mass air flow (Using CONSULT-II or GST)	2.0 - 6.0 g·m/sec at idle* 7.0 - 20.0 g·m/sec at 2,500 rpm*

*: Engine is warmed up to normal operating temperature and running under no-load.

Intake Air Temperature Sensor

ABS009PQ

Temperature °C (°F)	Resistance kΩ
25 (77)	1.94 - 2.06
80 (176)	0.295 - 0.349

Engine Coolant Temperature Sensor

ABS009PR

Temperature °C (°F)	Resistance kΩ
20 (68)	2.1 - 2.9
50 (122)	0.68 - 1.00
90 (194)	0.236 - 0.260

Air Fuel Ratio (A/F) Sensor 1 Heater

ABS009PS

Resistance [at 25°C (77°F)]	2.3 - 4.3Ω

Heated Oxygen sensor 2 Heater

ABS009PT

Resistance [at 25°C (77°F)]	5.0 - 7.0Ω

Crankshaft Position Sensor (POS)

ABS009PU

Refer to EC-273, "Component Inspection" .

Camshaft Position Sensor (PHASE)

ABS009PV

Refer to EC-282, "Component Inspection" .

Throttle Control Motor

ABS009PW

Resistance [at 25°C (77°F)]	Approximately 1 - 15Ω

Injector

ABS009PX

Resistance [at 10 - 60°C (50 - 140°F)]	11.1 - 14.5Ω

Fuel Pump

ABS009PY

Resistance [at 25°C (77°F)]	0.2 - 5.0Ω

SECTION FL
FUEL SYSTEM

CONTENTS

PRECAUTIONS 2
Precautions for Battery Service 2
FUEL SYSTEM 3
Checking Fuel Lines 3
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PRECAUTIONS

PFP:00001

Precautions for Battery Service

ABS00A3D

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

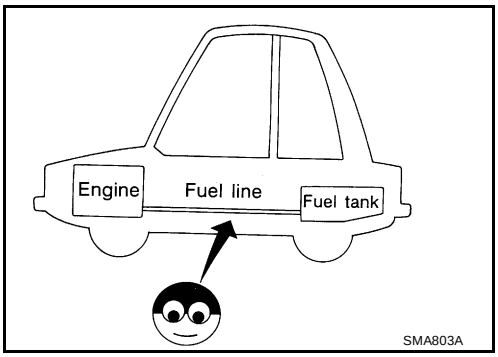
FUEL SYSTEM

PFP:17503

Checking Fuel Lines

ABS009QM

Inspect fuel lines, filler cap and tank for improper attachment, leaks, cracks, damage, loose connections, chafing or deterioration.
If necessary, repair or replace damaged parts.



General Precautions

ABS009QN

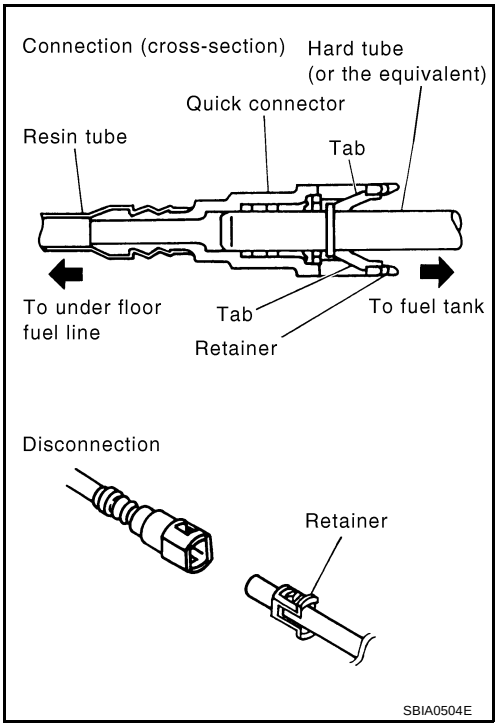
WARNING:

When replacing fuel line parts, be sure to observe the following.

- **Put a “CAUTION: INFLAMMABLE” sign in the workshop.**
- **Be sure to work in a well ventilated area and furnish workshop with a CO_2 fire extinguisher.**
- **Do not smoke while servicing fuel system. Keep open flames and sparks away from the work area.**
- **Put drained fuel in an explosion-proof container and put the lid on securely. Keep the container in safe area.**

CAUTION:

- **Before removing fuel line parts, perform the following procedures:**
  - **Release fuel pressure from the fuel lines. Refer to EC-45, "FUEL PRESSURE RELEASE" .**
  - **Disconnect negative battery terminal.**
- **Always replace O-rings and clamps with new ones.**
- **Do not kink or twist tubes when they are being installed.**
- **Do not tighten hose clamps excessively to avoid damaging hoses.**
- **After connecting fuel tube quick connectors, make sure quick connectors are secure.**
  Ensure that connector and resin tube do not contact any adjacent parts.
- **After installing tubes, make sure there is no fuel leakage at connections in the following steps.**
  - **Apply fuel pressure to fuel lines with turning ignition switch “ON” (with engine stopped). Then check for fuel leaks at connections.**
  - **Start engine and rev it up and check for fuel leaks at connections.**
- **Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the “MIL” may come on.**
- **For servicing “Evaporative Emission System” parts, refer to EC-673, "EVAPORATIVE EMISSION SYSTEM" .**

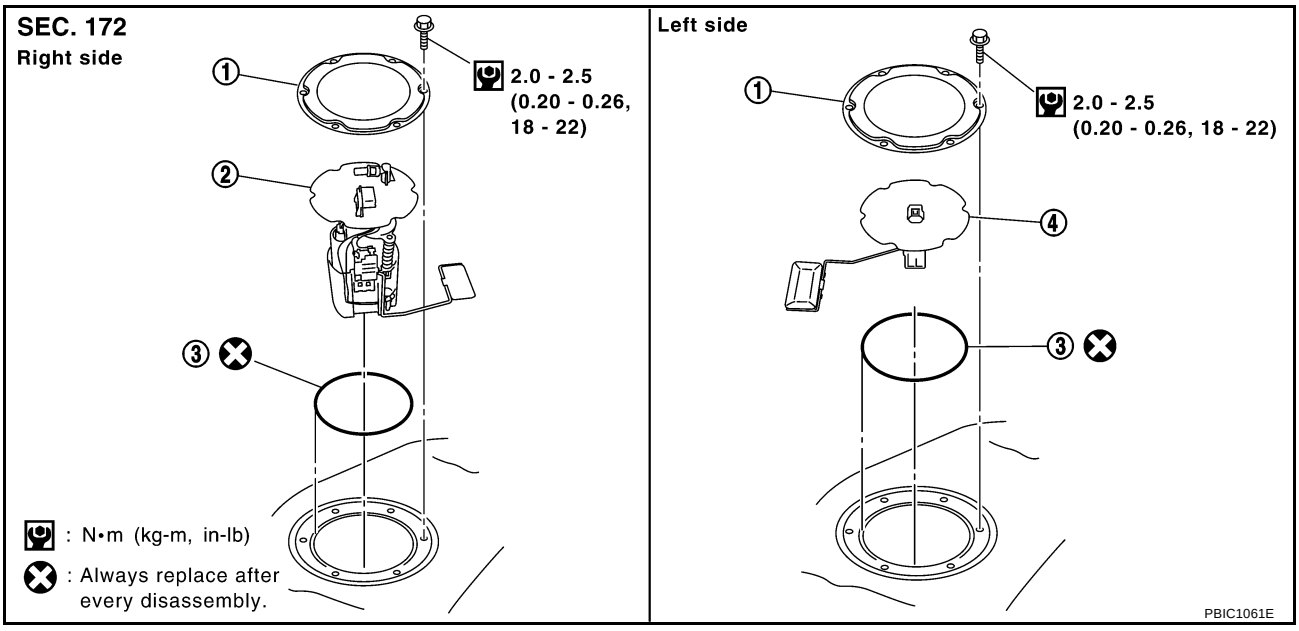


FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY

PFP:17042

Removal and Installation

ABS009QO



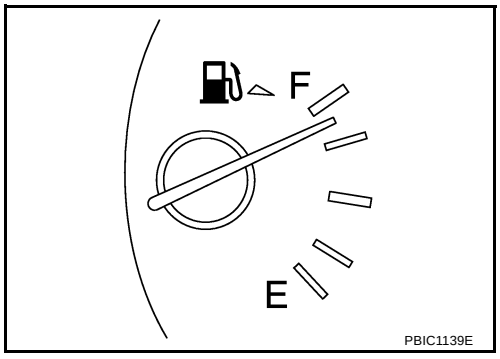
1. Retainer
2. Main fuel level sensor unit, fuel filter - and fuel pump assembly
3. O - ring
4. Sub fuel level sensor unit

REMOVAL

WARNING:

Be sure to read “General Precautions” when working on the fuel system. Refer to FL-3, "General Precautions" .

1. Check fuel level on fuel gauge. If fuel gauge indicates more than the level as shown in the figure (full or almost full), drain fuel from fuel tank until gauge indicates level as shown in the figure or below.



NOTE:

Because fuel will be spilled when removing main and sub fuel level sensor units for the top of the fuel is above the main and sub fuel level sensor units installation surface.

- As a guide, fuel level becomes the position as shown in the figure or below when approximately 20 ℓ (5-1/4 US gal, 4-3/8 Imp gal) of fuel are drained from fuel tank.
- In a case that fuel pump does not operate, perform the following procedure.

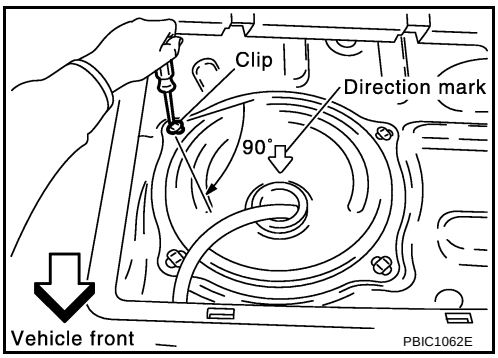
a. Insert hose of less than 25 mm (0.98 in) in diameter into fuel filler tube through fuel filler opening to draw fuel from fuel filler tube.

b. Disconnect fuel filler hose from fuel filler tube. Refer to FL-10, "FUEL TANK" .

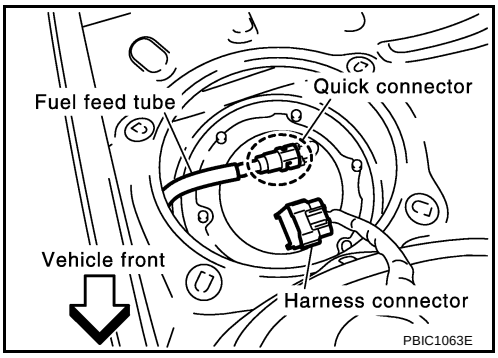
c. Insert hose into fuel tank through fuel filler hose to draw fuel from fuel tank.

2. Release the fuel pressure from the fuel lines. Refer to EC-45, "FUEL PRESSURE RELEASE" .
3. Open fuel filler lid.
4. Open filler cap and release the pressure inside fuel tank.
5. Remove woofer or rear floor box mat and rear floor box. Refer to AV-43, "Removal and Installation of Woofer and Woofer Amp. (BOSE System)" or EI-39, "LUGGAGE FLOOR TRIM" .

6. Remove inspection hole cover for main and sub fuel level sensor units by turning clips clockwise by 90 degrees.

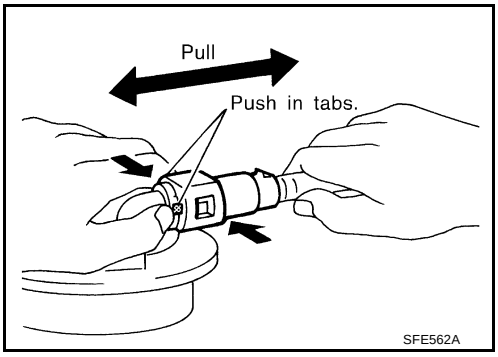


7. Disconnect harness connector and quick connector.



Disconnect quick connector as follows:

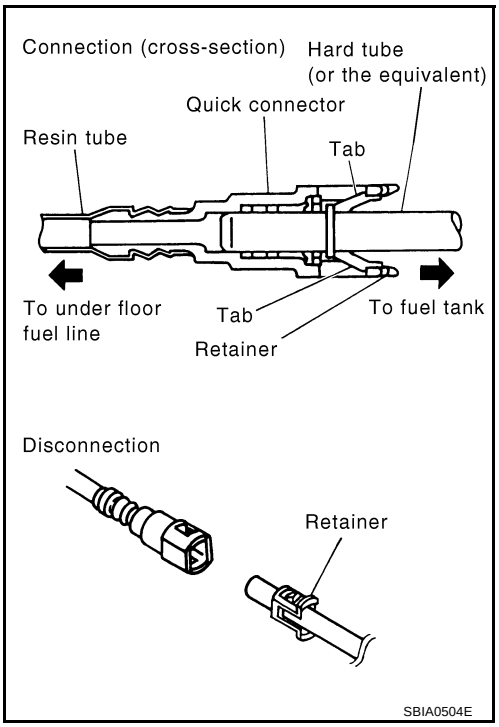
- Hold the sides of connector, push in tabs and pull out fuel feed tube.
- If quick connector sticks to tube of fuel level sensor unit, push and pull quick connector several times until it start to move.Then disconnect quick connector by pulling.



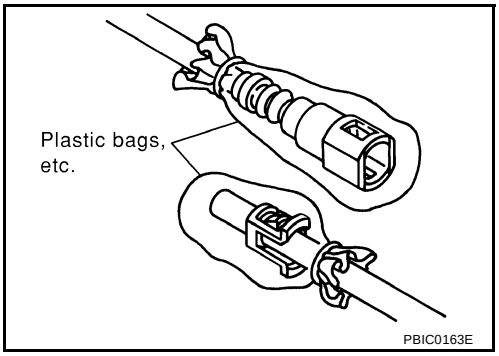
CAUTION:

- **Quick connector can be disconnected when the tabs are completely depressed. Do not twist it more than necessary.**
- **Do not use any tools to disconnect quick connector.**
- **Keep resin tube away from heat. Be especially careful when welding near the resin tube.**
- **Prevent acid liquid such as battery electrolyte, etc. from getting on resin tube.**
- **Do not bend or twist resin tube during installation and disconnection.**
- **Do not remove the remaining retainer on hard tube (or equivalent) except when resin tube or retainer is replaced.**
- **When resin tube or hard tube (or equivalent) is replaced, also replace retainer with new one.**
- **Replace same color retainer as before replacing.**

Retainer color: White



- **To keep the connecting portion clean and to avoid damage and foreign materials, cover them completely with plastic bags or something similar.**



8. Remove main fuel level sensor unit, fuel filter and fuel pump assembly, and sub fuel level sensor unit as follows.

CAUTION:

- **Do not bend float arm during removal.**
- **Avoid polluting the inside by residue fuel. Draw out with avoiding inclination by supporting with a cloth.**
- **Avoid impacts such as falling when handling components.**

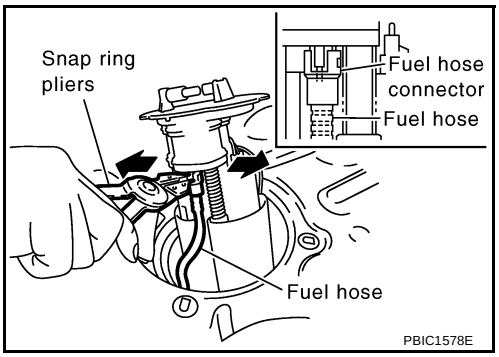
a. Removal of main fuel level sensor unit, fuel filter and fuel pump assembly:

i. Remove retainer.

ii. Raise main fuel level sensor unit, fuel filter and fuel pump assembly, and using snap ring pliers, remove fuel hose connector.

CAUTION:

Be careful not to damage fuel hose connector by expanding them excessively.



b. Removal of sub fuel level sensor unit:

i. Remove retainer.

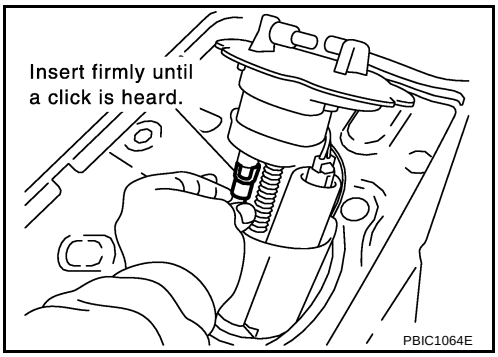
ii. Raise and release sub fuel level sensor unit to remove.

INSTALLATION

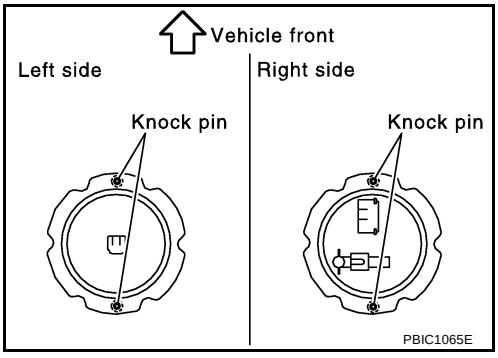
Note the following, and install in the reverse order of removal.

Main and Sub Fuel Level Sensor Unit

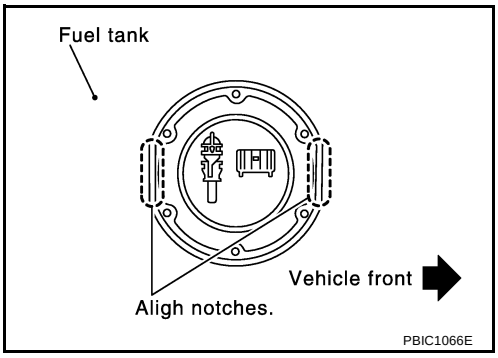
- When installing fuel hose connector insert them fully until a click sound of full stopper engagement is heard.



- Face main and sub fuel level sensor units as shown in the figure, and install them with the knock pin on back aligned with pin hole on fuel tank.



- Install retainer so that its notch becomes parallel with the notch on fuel tank.



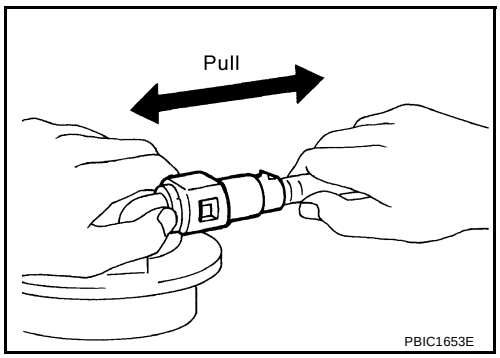
- Tighten retainer mounting bolts evenly.

Quick Connector

Connect quick connector of fuel feed hose as follows:

1. Check the connection for damage or any foreign materials.
2. Align the connector with the tube, then insert the connector straight into the tube until a click sound is heard.
3. After connecting, make sure that the connection is secure by following method.
   - Visually confirm that the two tabs are connected to the connector.

- Pull the tube and the connector to make sure they are securely connected.



Inspection Hole Cover

1. Install inspection hole cover with direction mark (arrow) facing front of vehicle.
2. Lock clips by turning counter-clockwise.

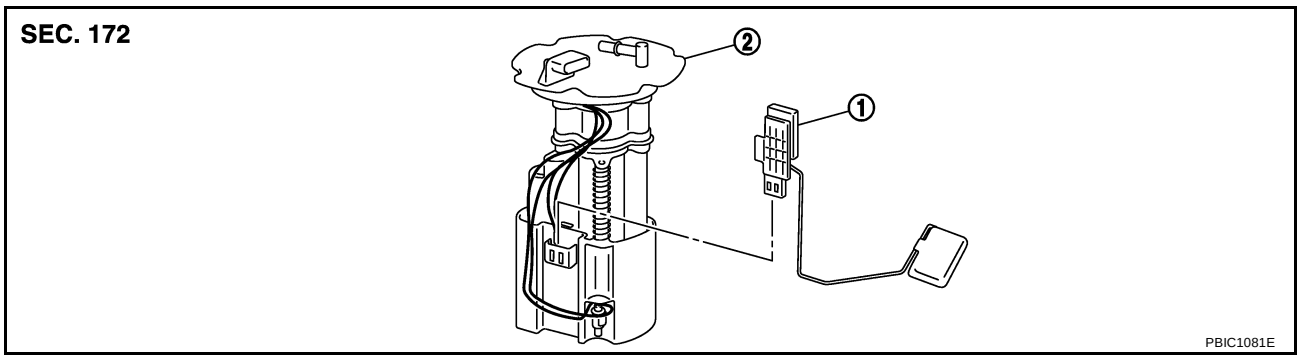
INSPECTION AFTER INSTALLATION

Use the following procedure to check for fuel leaks.

1. Turn ignition switch “ON” (with engine stopped), then check connections for leaks by applying fuel pressure to fuel piping.
2. Start engine and rev it up and make sure there are no fuel leaks at the fuel system connections.

Disassembly and Assembly

ABS009QP



1. Fuel level sensor unit
2. Fuel filter and fuel pump assembly

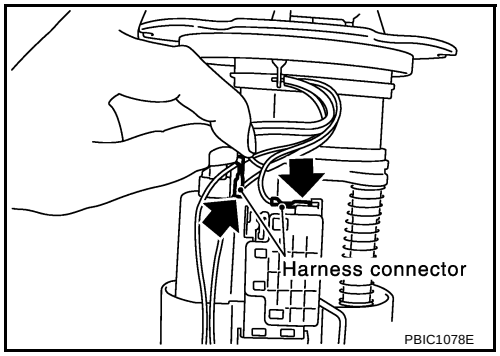
CAUTION:

Sub fuel level sensor unit cannot be disassembled and should be replaced as a unit.

DISASSEMBLY

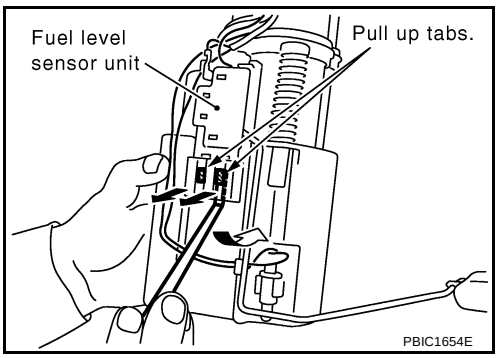
Remove fuel level sensor unit as follows.

1. Disconnect harness connector.
   - Hold connector by fingers and pull it out, because there is no stopper release tab.



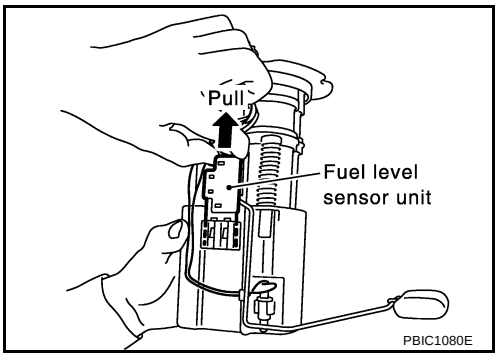
2. Using suitable tool, pull up tabs points as shown in the figure (two points) to release the lock.

CAUTION:
Be careful not to damage it.



3. After fixing tabs are disengaged, slide fuel level sensor unit out in direction shown by the arrow.

CAUTION:
Do not disassemble fuel filter and fuel pump assembly.



ASSEMBLY

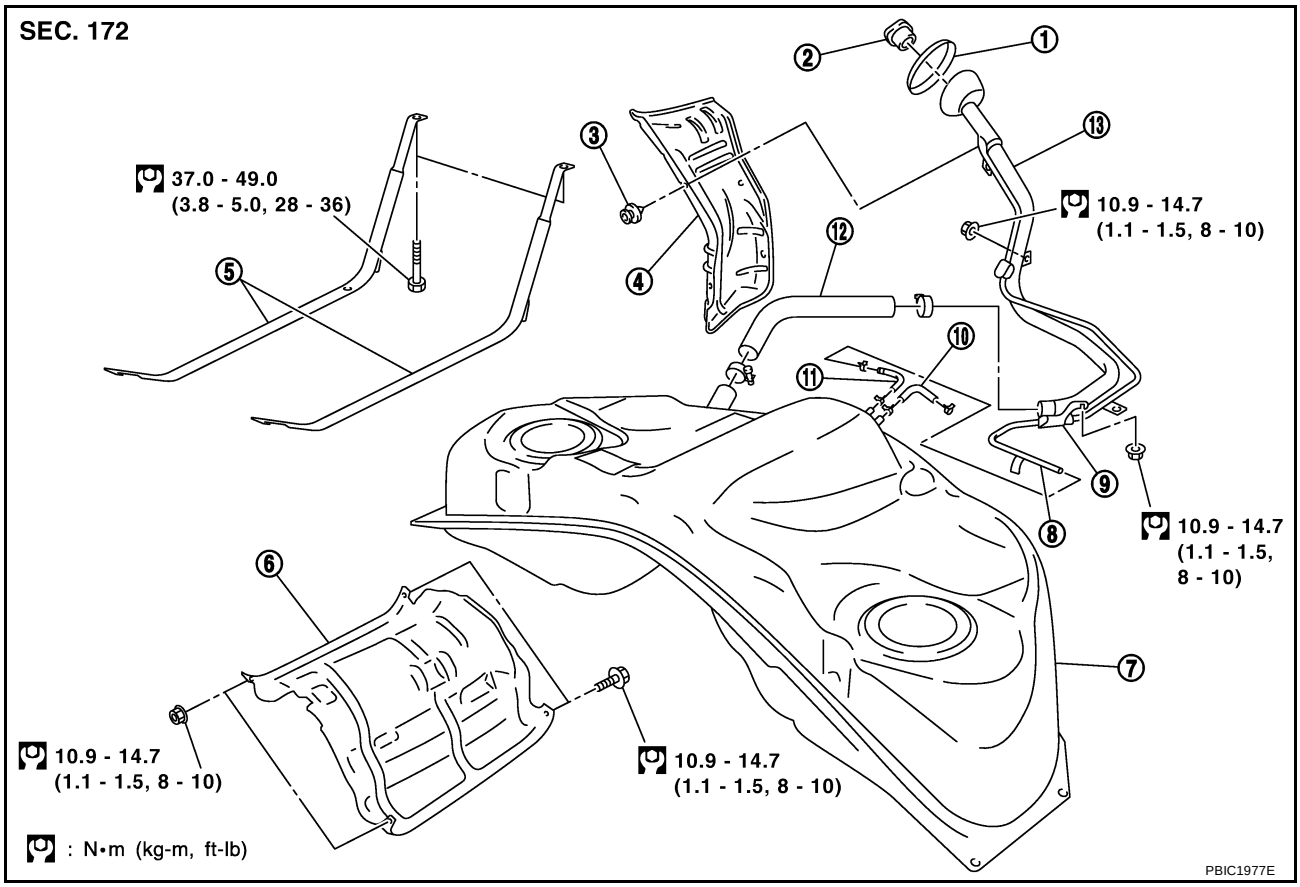
1. Check for damage of fuel level sensor unit installation position on the side of fuel filter and fuel pump assembly.
2. Slide fuel level sensor unit until it aligns to installation groove, then insert it until stop.
   - Insert until you hear a “click” sound and actually feel the engagement.
   - After inserting, apply force in reverse direction (removal direction) to ensure it cannot be pulled out.
3. Connect harness connector.
   - Securely insert harness connector until it stops.

FUEL TANK

PFP:17202

Removal and Installation

ABS009QQ



1. Grommet
2. Fuel filler cap
3. Clip
4. Fuel filler tube protector
5. Fuel tank mounting band
6. Fuel tank protector
7. Fuel tank
8. Vent tube
9. Vent hose
10. EVAP hose
11. Vent hose
12. Fuel filler hose
13. Fuel filler tube

REMOVAL

WARNING:

Be sure to read “General Precautions” before working on the fuel system. Refer to FL-3, "General Precautions" .

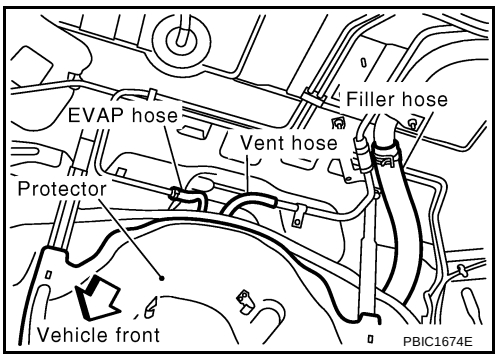
- Drain fuel from fuel tank if necessary. Refer to FL-4, "REMOVAL" .
- Perform work on level place.

1. Perform steps 2 to 7 of “REMOVAL” in “ FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY” on main and sub fuel level sensor units. Refer to FL-4, "REMOVAL" .
2. Remove tunnel stay. Refer to RSU-5, "REAR SUSPENSION ASSEMBLY" .
3. Remove exhaust front tube, center muffler and main muffler. Refer to EX-3, "EXHAUST SYSTEM" .
4. Remove propeller shaft. Refer to PR-5, "REAR PROPELLER SHAFT" .

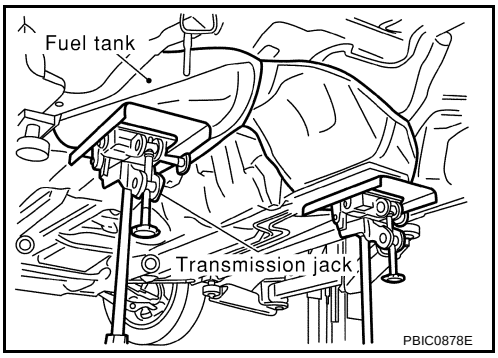
   CAUTION:

   Do not impact or damage propeller shaft tube.
5. Remove parking rear brake cables. Refer to PB-3, "PARKING BRAKE CONTROL" .
6. Remove rear suspension assembly. Refer to RSU-5, "REAR SUSPENSION ASSEMBLY" .
7. Remove fuel tank protector.

8. Disconnect fuel filler hose, vent hose and EVAP hoses at fuel tank side.



9. Remove fuel tank mounting band bolts while supporting fuel tank.



10. Supporting with hands, descend transmission jack carefully, and remove fuel tank.

CAUTION:

- **Make sure that all connection points have been disconnected.**
- **Confirm there is no interference with vehicle.**

11. Remove fuel filler tube, if necessary.

INSTALLATION

Note the following, and install in the reverse order of removal.

- Surely clamp fuel hoses and insert hose to the length below.

Fuel filler hose	**: 35 mm (1.38 in)**
The other hoses	**: 25 mm (0.98 in)**

- Be sure hose clamp is not placed on swelled area of fuel tube.
- Tighten fuel hose clamp so that the distance between its lugs becomes to the following.

Fuel tank side	**: 8 - 12 mm (0.31 - 0.47 in)**
Fuel filler tube side	**: 5.7 - 9.7 mm (0.224 - 0.382 in)**

- To connect quick connector, refer to FL-7, "Quick Connector" .

INSPECTION AFTER INSTALLATION

Use the following procedure to check for fuel leaks.

1. Turn ignition switch “ON” (with engine stopped), and check connections for leakage by applying fuel pressure to fuel piping.
2. Start engine and rev it up and make sure there are no fuel leaks at the fuel system connections.

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Standard and Limit

ABS009QR

Fuel tank capacity	Approx. 76 ℓ (20-1/8 US gal, 16-3/4 Imp gal)

Tightening Torque

ABS009QS

Unit : N·m (kg-m, ft- lb)
N·m (kg-m, in- lb)*

Main fuel level sensor unit, fuel filter and fuel pump assembly	2.0 - 2.5 (0.20 - 0.26, 18 - 22)*
Sub fuel level sensor unit	2.0 - 2.5 (0.20 - 0.26, 18 - 22)*
Fuel tank mounting band	37.0 - 49.0 (3.8 - 5.0, 28 - 36)
Fuel filler tube	10.9 - 14.7 (1.1 - 1.5, 8 - 10)
Fuel tank protector	10.9 - 14.7 (1.1 - 1.5, 8 - 10)

SECTION EX

EXHAUST SYSTEM

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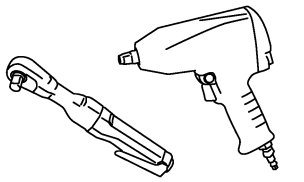
PREPARATION

PFP:00002

Commercial Service Tools

ABS009R1

(Kent-Moore No.) Tool name	Description
Power tool  PBIC0190E	Loosening nuts and bolts

EXHAUST SYSTEM

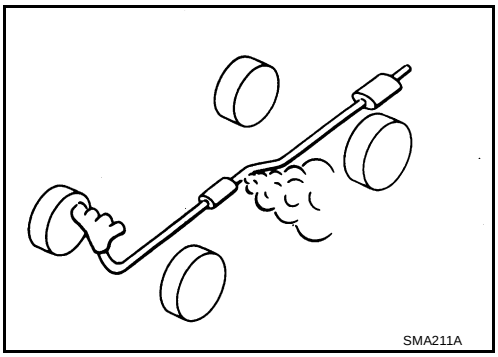
PFP:20100

Checking Exhaust System

ABS009QT

Check exhaust pipes, muffler and mounting for improper attachment, leaks, cracks, damage or deterioration.

- If anything is found, repair or replace damaged parts.

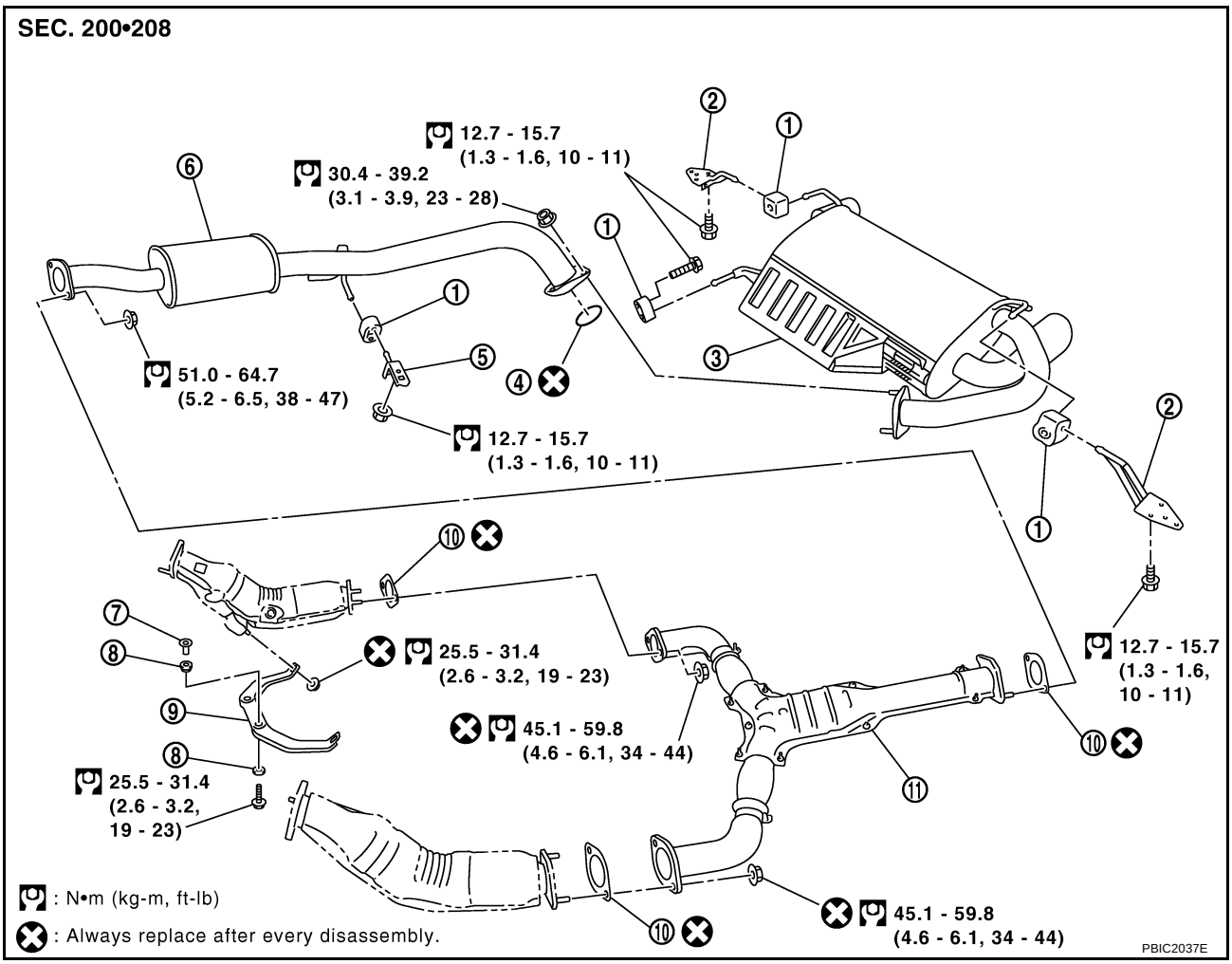


Removal and Installation

ABS009QU

CAUTION:

- **Be sure to use genuine exhaust system parts or equivalents which are specially designed for heat resistance, corrosion resistance, and shape.**
- **Perform the operation with the exhaust system fully cooled down because the system will be hot just after engine stops.**
- **Be careful not to cut your hand on the insulator edge.**



1. Mounting rubber
2. Main muffler mounting bracket
3. Main muffler
4. Ring gasket
5. Mounting bracket
6. Center muffler
7. Collar
8. Grommet
9. Exhaust mounting bracket
10. Gasket
11. Exhaust front tube

REMOVAL

- Disconnect each joint and mounting with power tool.
- When removing main muffler, remove main muffler mounting bracket bolts.
- For removing and installing parts around propeller shaft, be careful of the following caution.

CAUTION:

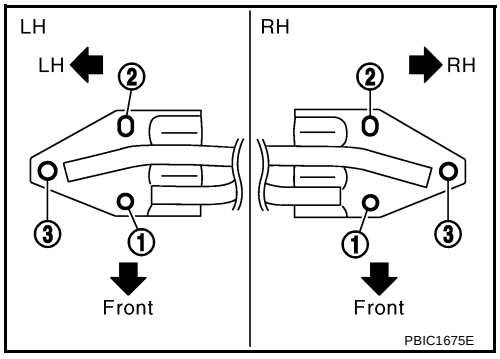
Be sure to prevent propeller shaft from interfering parts and tools. If necessary, install protector to propeller shaft to prevent damage.

For propeller shaft protector, refer to PR-5, "REAR PROPELLER SHAFT" .

INSTALLATION

Note the following, and install in the reverse order of removal.

- Tighten main muffler mounting bracket bolts in numerical order as shown in the figure.

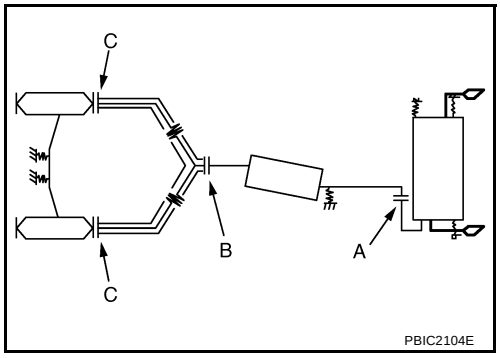


When reassembling main muffler only.

1. Temporarily tighten connecting flange (A).
2. Move main muffler front / rear / left / right so that clearance between tail tube and bumper is even.
3. Tighten connecting flange (A) to the specified torque.

When reassembling center muffler.

1. Temporarily tighten connecting flanges in order of (A) and (B).
2. Move main muffler front / rear / left / right so that clearance between tail tube and bumper is even.
3. Tighten connecting flanges in order of (A) and (B) to the specified torque.



When reassembling exhaust front tube.

1. Temporarily tighten connecting flanges of center muffler in order of (B) and (C).
2. Move main muffler front / rear / left / right so that clearance between tail tube and bumper is even.
3. Tighten connecting flanges in order of (B) and (C) to the specified torque.

CAUTION:

- **Always replace exhaust tube gaskets with new ones when reassembling.**
- **If heat insulator is badly deformed, repair or replace it. If deposits such as mud pile up on heat insulator, remove them.**
- **When installing heat insulator avoid large gaps or interference between heat insulator and each exhaust pipe.**
- **Remove deposits from the sealing surface of each connection. Connect them securely to avoid gas leakage.**
- **Temporarily tighten mounting nuts on the exhaust manifold side and mounting bolts on the vehicle side. Check each part for unusual interference, and then tighten them to the specified torque.**
- **When installing each mounting rubber, avoid twisting or unusual extension in up/down and right/left directions.**

INSPECTION AFTER INSTALLATION

- Make sure that clearance between tail tube and bumper is even.
- With engine running, check exhaust tube joints for gas leakage and unusual noises.
- Make sure that mounting brackets and mounting rubbers are installed properly and free from undue stress. Improper installation could result in excessive noise and vibration.

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Tightening Torque

ABS009QW

Unit: N·m (kg-m, ft-lb)

Exhaust system connections	
Between three way catalyst and exhaust front tube	45.1 - 59.8 (4.6 - 6.1, 34 - 44)
Between exhaust front tube and center muffler	51.0 - 64.7 (5.2 - 6.5, 38 - 47)
Between center muffler and main muffler	30.4 - 39.2 (3.1 - 3.9, 23 - 28)
Exhaust mounting bracket	25.5 - 31.4 (2.6 - 3.2, 19 - 23)
Center muffler mounting bracket	12.7 - 15.7 (1.3 - 1.6, 10 - 11)
Main muffler mounting bracket	12.7 - 15.7 (1.3 - 1.6, 10 - 11)

SECTION ACC
ACCELERATOR CONTROL SYSTEM

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

ABS009R2

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

ABS009QX

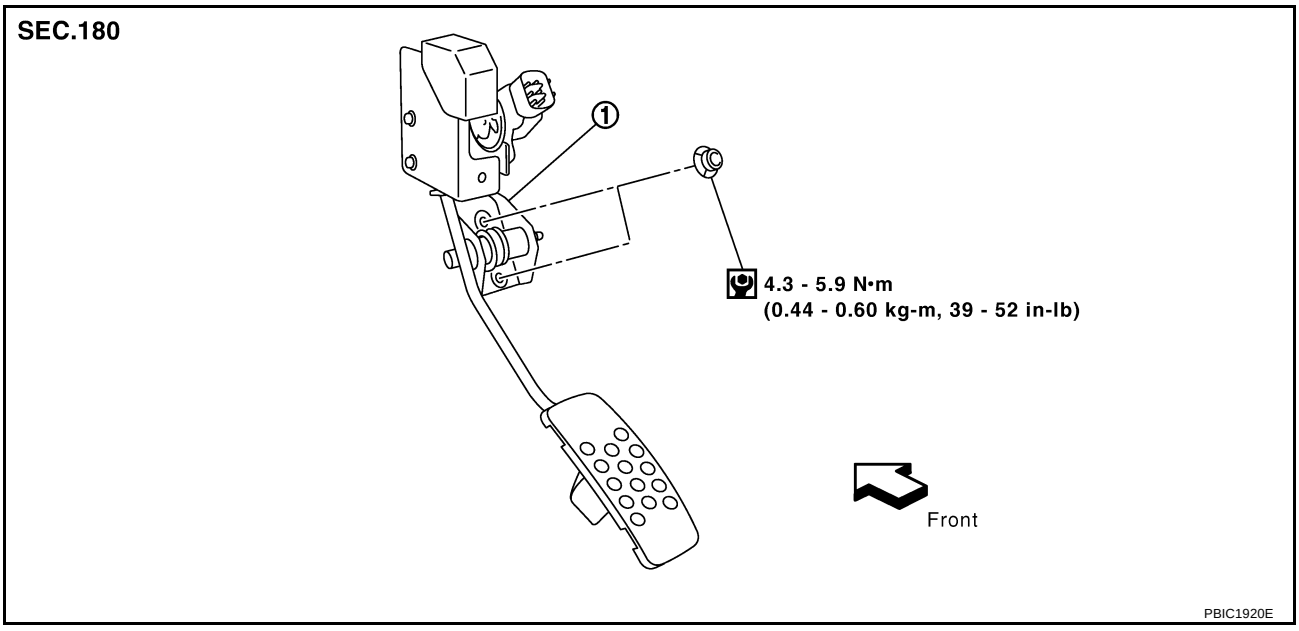
Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

ACCELERATOR CONTROL SYSTEM

PFP:18005

Removal and Installation

ABS009QZ



1. Accelerator pedal assembly

REMOVAL

1. Disconnect accelerator pedal position sensor harness connector.
2. Loosen nuts, and remove accelerator pedal assembly.

CAUTION:

- **Do not disassemble accelerator pedal assembly. Do not remove accelerator pedal position sensor from accelerator pedal assembly.**
- **Avoid impact from dropping etc. during handling.**
- **Be careful to keep accelerator pedal assembly away from water.**

INSTALLATION

Install in the reverse order of removal.

INSPECTION AFTER INSTALLATION

- Make sure that accelerator pedal moves smoothly within the whole operation range.
- Make sure that accelerator pedal securely returns to the original position.
- For the electrical inspection of accelerator pedal assembly, refer to EC-587, "DTC P2122, P2123 APP SENSOR" , EC-595, "DTC P2127, P2128 APP SENSOR" and EC-611, "DTC P2138 APP SENSOR" .

CAUTION:

When harness connector of accelerator pedal position sensor is disconnected, perform "Accelerator Pedal Released Position Learning". Refer to EC-42, "Accelerator Pedal Released Position Learning" .

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Tightening Torque

ABS009R0

Unit: N·m (kg-m, in-lb)

Accelerator pedal assembly	4.3 - 5.9 (0.44 - 0.60, 39 - 52)

SECTION CL
CLUTCH

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PRECAUTIONS

PFP:00001

Precautions for Battery Service

ACS006FW

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

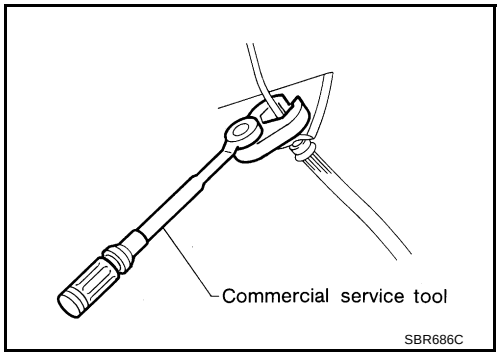
Caution

ACS004MV

- **Recommended fluid is brake fluid “DOT 3”.**
- **Never reuse drained brake fluid.**
- **Be careful not to splash brake fluid on painted areas.**
- **When removing and installing clutch piping, use Tool.**
- **Use new brake fluid to clean or wash all parts of master cylinder and operating cylinder.**
- **Never use mineral oils such as gasoline or kerosene. It will ruin the rubber parts of the hydraulic system.**

WARNING:

After cleaning clutch disc, wipe it with a dust collector. Do not use compressed air.



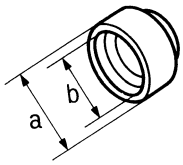
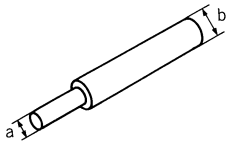
PREPARATION

PFP:00002

Special Service Tools

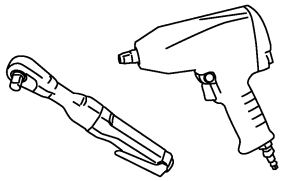
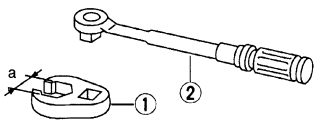
ACS004MW

The actual shapes of Kent-Moore tool may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
KV30101400 (—) a: 51 mm (2.01 in) dia. b: 44 mm (1.73 in) dia. Drift  ZZA0838D	Installing release bearing
ST20050240 (—) Diaphragm adjusting wrench ZZA0508D	Adjusting unevenness of diaphragm spring of clutch cover
ST20670000 (—) a: 15 mm (0.59 in) dia. b: 23 mm (0.91 in) dia. Clutch aligning bar  ZZA1178D	Installing clutch disc

Commercial Service Tools

ACS004MX

Tool name	Description
Pin punch Tip diameter: 4.5 mm (0.177 in) dia. ZZA0515D	Removing and installing master cylinder spring pin
Power tool  PBIC0190E	Loosening bolts and nuts
1. Flare nut crowfoot 2. Torque wrench a: 10 mm (0.39 in)  S-NT360	Removing and installing clutch piping

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

ACS004MY

Use the chart below to help you find the cause of the symptom. The numbers indicate the order of the inspection. If necessary, repair or replace these parts.

CLUTCH

Reference page		CL-5	CL-7	CL-9	CL-11	EM-105	CL-13	CL-15	CL-15	CL-15	CL-15	CL-15	CL-15	CL-15	CL-15	CL-15	CL-15	CL-15	EM-139
SUSPECTED PARTS (Possible cause)		CLUTCH PEDAL (Free play out of adjustment)	CLUTCH LINE (Air in line)	MASTER CYLINDER PISTON CUP (Damaged)	OPERATING CYLINDER PISTON CUP (Damaged)	ENGINE MOUNTING (Loose)	RELEASE BEARING (Worn, dirty or damaged)	CLUTCH DISC (Out of true)	CLUTCH DISC (Runout is excessive)	CLUTCH DISC (Lining broken)	CLUTCH DISC (Dirty or burned)	CLUTCH DISC (Oily)	CLUTCH DISC (Worn out)	CLUTCH DISC (Hardened)	CLUTCH DISC (Lack of spline grease)	DIAPHRAGM SPRING (Damaged)	DIAPHRAGM SPRING (Out of tip alignment)	PRESSURE PLATE (Distortion)	FLYWHEEL (Distortion)
Symptom	Clutch grabs/chatters					1			2			2	2	2			2		
	Clutch pedal spongy		1	2	2														
	Clutch noisy						1												
	Clutch slips	1										2	2			3		4	5
	Clutch does not disengage	1	2	3	4			5	5	5	5	5			5	6	6	7	

CLUTCH PEDAL

PFP:46540

On-Vehicle Inspection and Adjustment

ACS004MZ

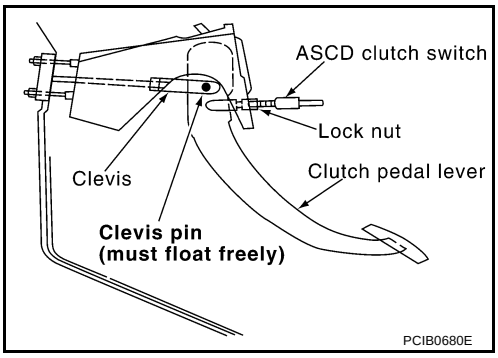
1. Check to see if the clevis pin floats freely in the bore of the clutch pedal. It should not be bound by the clevis or clutch pedal.

a. If the clevis pin is not free, check that the ASCD clutch switch is not applying pressure to the clutch pedal causing the clevis pin to bind. To adjust, loosen lock nut and turn ASCD clutch switch.

b. Tighten the lock nut.

c. Verify that the clevis pin floats in the bore of the clutch pedal. It should not be bound by the clutch pedal.

d. If the clevis pin is still not free, remove the clevis pin and check for deformation or damage. Replace clevis pin if necessary. Leave pin removed for step 2.



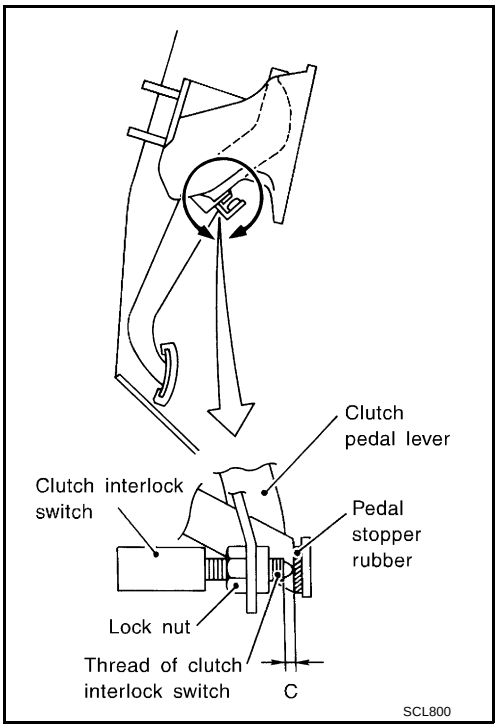
2. Check clutch pedal stroke for free range of movement.

a. With the clevis pin removed, manually move the clutch pedal up and down to determine if it moves freely.

b. If any sticking is noted, replace the related parts (clutch pedal bracket, assist spring, bushing etc.). Re-assemble the clutch pedal and re-verify that the clevis pin floats freely in the bore of the clutch pedal.

3. Adjust clearance “C” while depressing clutch pedal fully.(With clutch interlock switch)

Clearance C : 0.1 - 1.0mm (0.004 - 0.039 in)



4. Check clutch hydraulic and system components (clutch master cylinder, clutch operating cylinder, clutch withdrawal lever, clutch release bearing, etc.) for sticking or binding.

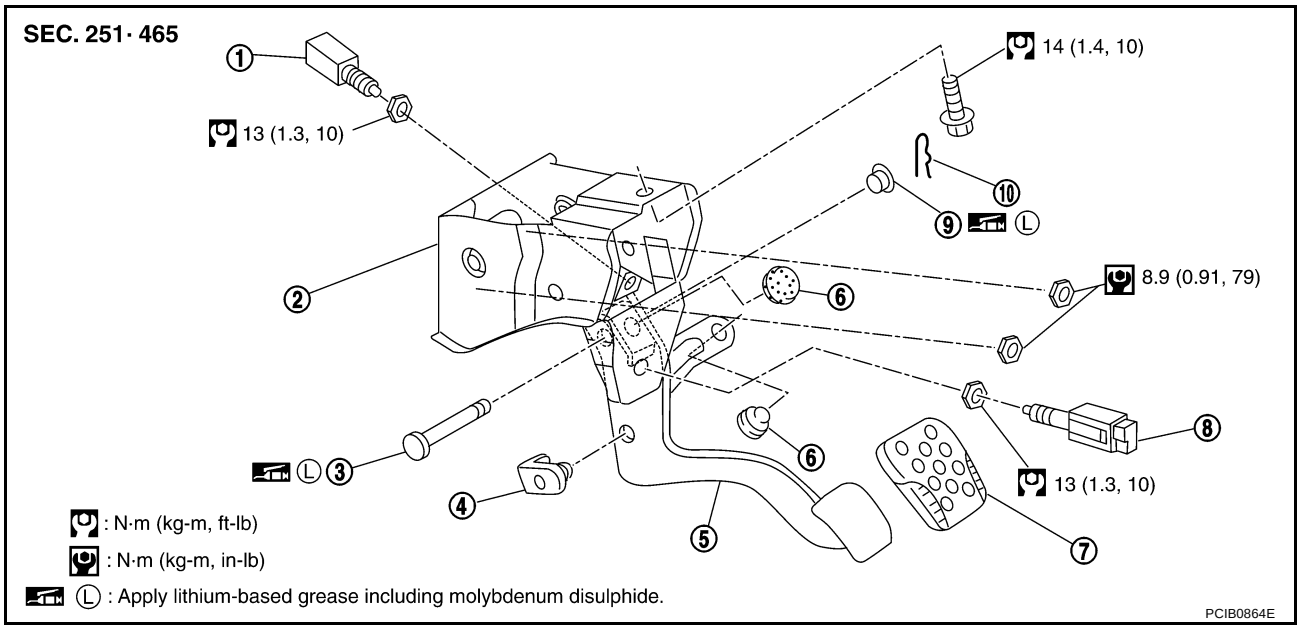
a. If any sticking or binding noted, repair or replace related parts as necessary.

b. If hydraulic system repair was necessary, bleed the clutch hydraulic system. Refer to CL-7, "Bleeding" .

NOTE:
Do not use a vacuum assist or any other type of power bleeder on this system. Use of a vacuum assist or power bleeder will not purge all the air from the system.

Removal and Installation

ACS004N0



1. Clutch interlock switch
2. Bracket
3. Clevis pin
4. Pedal stopper rubber
5. Clutch pedal
6. Stopper rubber
7. Pedal pad
8. ASCD clutch switch
9. Bushing
10. Snap pin

REMOVAL

1. Remove kicking plate. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
2. Remove footrest. Refer to EI-43, "Removal and Installation" .
3. Remove dash side finisher (LH). Refer to IP-11, "Removal and Installation" .
4. Remove instrument driver panel lower. Refer to IP-11, "Removal and Installation" .
5. Remove VDC/TCS/ABS control unit. (VDC/TCS/ABS model) Refer to BRC-144, "Removal and Installation" .
6. Remove the clutch interlock switch and ASCD clutch switch connector and harness.
7. Remove the snap pin and clevis pin.
8. Remove the pedal bracket mounting bolt and nuts and then remove the clutch pedal assembly.

INSPECTION AFTER REMOVAL

- Check clutch pedal for bend, damage, or a cracked weld. If bend, damage, or a cracked weld is found, replace the clutch pedal assembly.

INSTALLATION

To install, reverse the removal procedure, following the cautions below:

- Install clutch pedal assembly and adjust the pedal height. Tighten ASCD clutch switch lock nut to the specified torque.
- After installing the clutch interlock switch, adjust the switch position.

NOTE:
Tighten the ASCD clutch switch lock nut to the specified torque after installing the clutch pedal assembly in the vehicle and adjusting the pedal height.

CLUTCH FLUID

PFP:00017

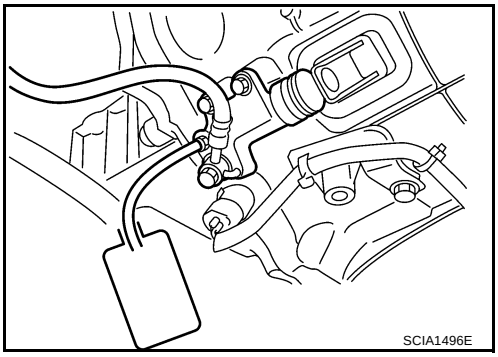
Bleeding

ACS004N1

CAUTION:

- **Monitor fluid level in the reservoir tank to make sure it does not empty.**
- **Do not spill clutch fluid onto painted surfaces. If it spills, wipe up immediately and wash the affected area with water.**

1. Fill the master cylinder reservoir tank with new clutch fluid.
2. Connect a transparent vinyl hose to the air bleeder.
3. Depress the clutch pedal quickly and fully a few times and hold it.
4. With clutch pedal depressed, open air bleeder.
5. Close air bleeder.
6. Release clutch pedal and wait for 5 seconds.
7. Repeat steps 3 to 6 until no bubbles can be observed in the brake fluid.
8. Tighten air bleeder to the specified torque. Refer to CL-11, "Removal and Installation" .

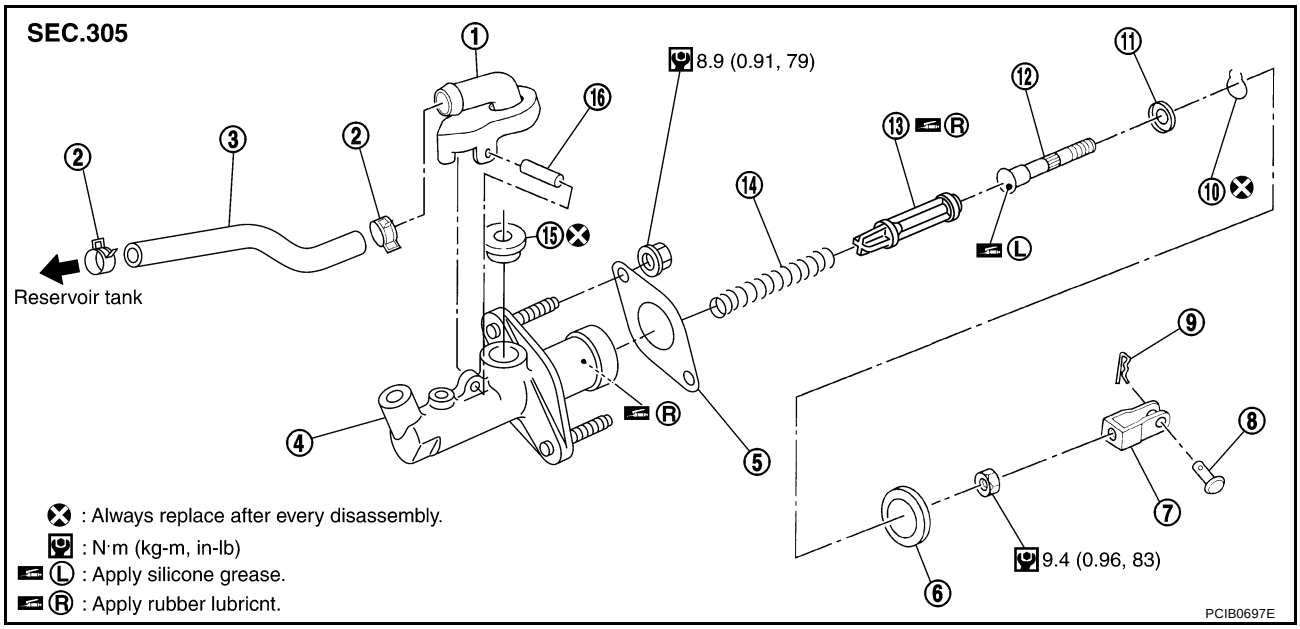


CLUTCH MASTER CYLINDER

PFP:30610

Removal and Installation

ACS004N2



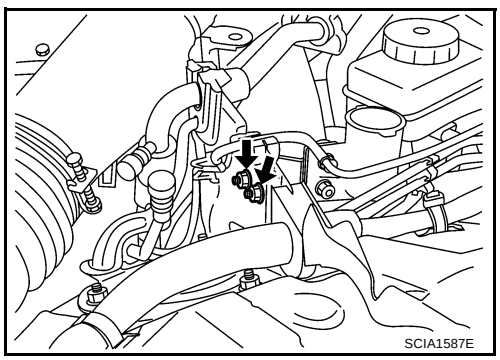
1. Nipple	2. Clamp	3. Reservoir hose
4. Cylinder body	5. Packing	6. Seat
7. Clevis	8. Clevis pin	9. Snap pin
10. Stopper ring	11. Stopper	12. Push rod
13. Piston assembly	14. Return spring	15. Reservoir seal
16. Spring pin		

REMOVAL

1. Remove kicking plate. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
2. Remove footrest.Refer to EI-43, "Removal and Installation" .
3. Remove dash side finisher. Refer to IP-11, "Removal and Installation" .
4. Remove instrument driver panel lower. Refer to IP-11, "Removal and Installation" .
5. Remove VDC/TCS/ABS control unit. (VDC/TCS/ABS model) Refer to BRC-144, "Removal and Installation" .
6. Remove snap pin and clevis pin from the clevis, and separate it from clutch pedal.
7. Remove clips, and remove hoodledge cover.
8. Drain clutch fluid in the reservoir tank and remove reservoir hose from nipple.

   CAUTION:
   Do not spill clutch fluid onto painted surfaces. If it spills, wipe up immediately and wash the affected area with water.

9. Remove the reservoir tank mounting nuts and then remove the reservoir tank.
10. Using a flare nut wrench, remove clutch tube.
11. First remove nuts on master cylinder assembly, and then master cylinder assembly from the vehicle.

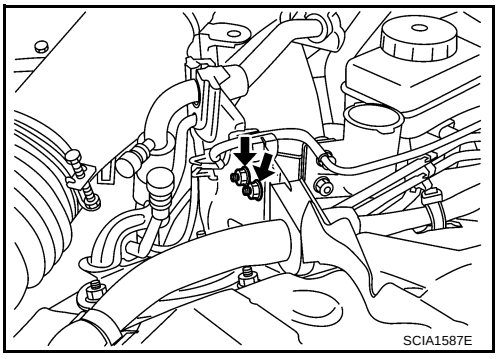


INSTALLATION

1. Connect clutch tube to master cylinder assembly and temporarily tighten flare nut.

2. Install master cylinder assembly and tighten mounting nuts to the specified torque. Refer to CL-8, "Removal and Installation" .
3. Using a flare nut torque wrench, tighten clutch tube flare nut to the specified torque. Refer to CL-12, "Removal and Installation" .
4. Install clevis to the clutch pedal, and fix clevis with clevis pin.
5. Install snap pin to the clevis pin.
6. Install reservoir hose to the nipple. Install the reservoir tank to the vehicle, and then tighten mounting nuts to the specified torque.

   : 5.8 N·m (0.59 Kg-m, 51 in-lb)



7. After completing this procedure, inspect and adjust pedal height and then bleed the clutch tube. Refer to CL-5, "On-Vehicle Inspection and Adjustment" and CL-7, "Bleeding" .
8. Install hoodledge cover.
9. Install instrument driver panel lower. Refer to IP-11, "Removal and Installation" .
10. Install dash side finisher. Refer to IP-11, "Removal and Installation" .
11. Install footrest.Refer to EI-43, "FLOOR TRIM" .
12. Install kicking plate. Refer to EI-37, "Removal and Installation (for Roadster Models)" .

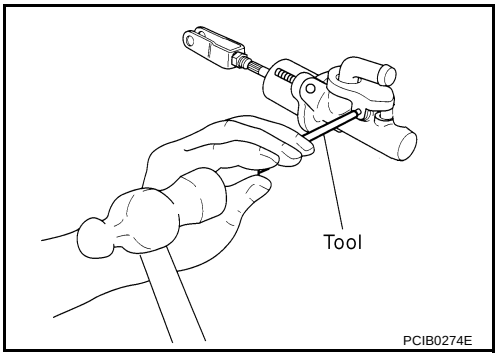
Disassembly and Assembly

ACS004N3

DISASSEMBLY

1. Using a pin punch, remove spring pin, nipple and reservoir seal from the cylinder body.

   Tool number : Commercial service tool



2. Loosen push rod lock nut. Remove clevis and lock nut.
3. Remove the seat from the cylinder body.
4. Remove the stopper ring and stopper, and then remove the push rod, piston assembly, and return spring from the cylinder body.

   CAUTION:
   Restrain the push rod while doing this because there is a danger the piston assembly will fly out of the cylinder body.

INSPECTION AFTER DISASSEMBLY

Check for any of the conditions shown below. If any malfunction is found, replace the part concerned.

- Damaged cylinder internal wall, foreign matter, wear, corrosion, or pin hole
- Damaged or deformed nipple or reservoir tank
- Settling of the spring
- Cracked and deformed seat

ASSEMBLY

1. Apply rubber lubricant to internal surface of the cylinder body, sliding surface of piston assembly, and the piston cup. Insert return spring and piston assembly to the cylinder body.
2. Apply silicone grease to the push rod and install the stopper before installing the stopper ring.

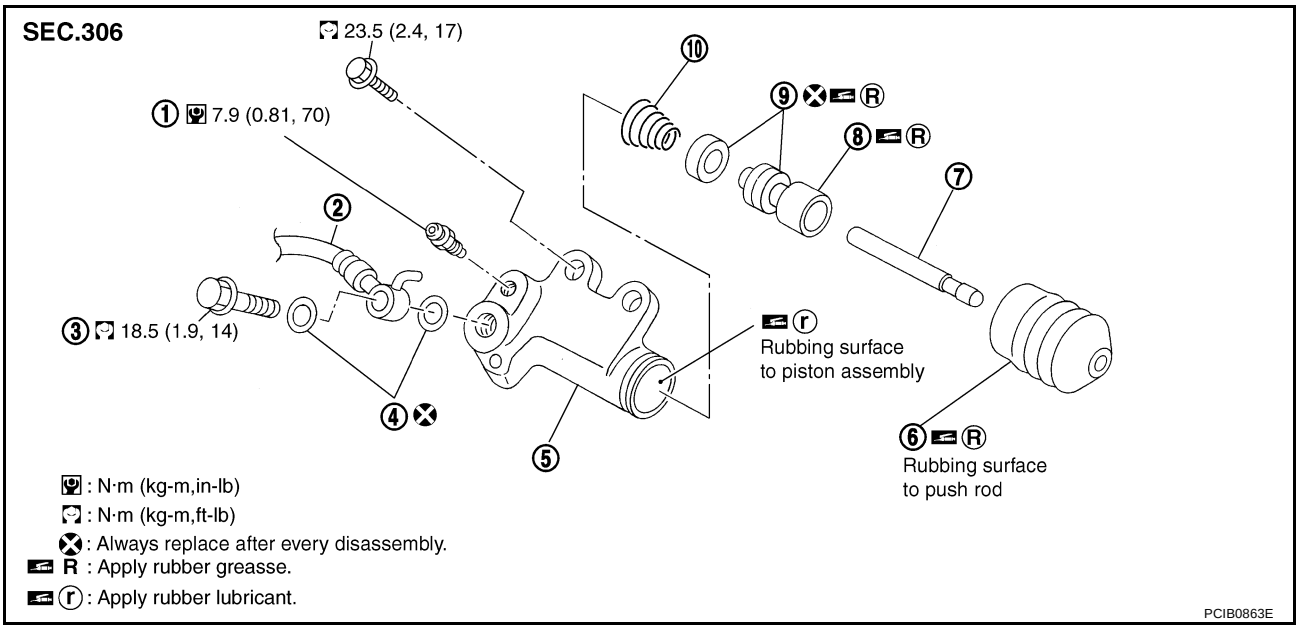
   CAUTION:
   Restrain the push rod while doing this because there is a danger the piston assembly will fly out of the master cylinder.
3. Install seat to the cylinder body.
4. Install clevis to the push rod and tighten lock nut to the specified torque. Refer to CL-8, "Removal and Installation" .
5. Install reservoir seal and nipple to the cylinder body. Using a pin punch, install spring pin.

OPERATING CYLINDER

PFP:30620

Removal and Installation

ACS004N4



1. Air bleeder
2. Clutch hose
3. Union bolt
4. Copper washer
5. Cylinder body
6. Dust cover
7. Push rod
8. Piston
9. Piston cup
10. Piston spring

REMOVAL

1. Drain clutch fluid.

   CAUTION:
   Do not spill clutch fluid onto painted surfaces. If it spills, wipe up immediately and wash the affected area with water.
2. Remove clutch hose from the operating cylinder.
3. Remove operating cylinder mounting bolt and then remove heat insulator and operating cylinder from the vehicle.

INSTALLATION

To install, reverse the removal procedure, following the cautions below:

- Install hose with care so that it will not be bent or twisted. Refer to CL-12, "Removal and Installation" .
- After completing the procedure, bleed the clutch tube. Refer to CL-7, "Bleeding" .

Disassembly and Assembly

ACS004N5

DISASSEMBLY

- Remove dust cover and push rod. Remove piston, piston cup, and piston spring from inside the cylinder body.

INSPECTION AFTER DISASSEMBLY

Check for any of the conditions shown below. If any malfunction is found, replace the part concerned.

- Damage to cylinder inner surface or piston sliding surface. Foreign matter, wear, corrosion, or pin hole
- Settling of the spring
- Cracked or deformed dust cover

ASSEMBLY

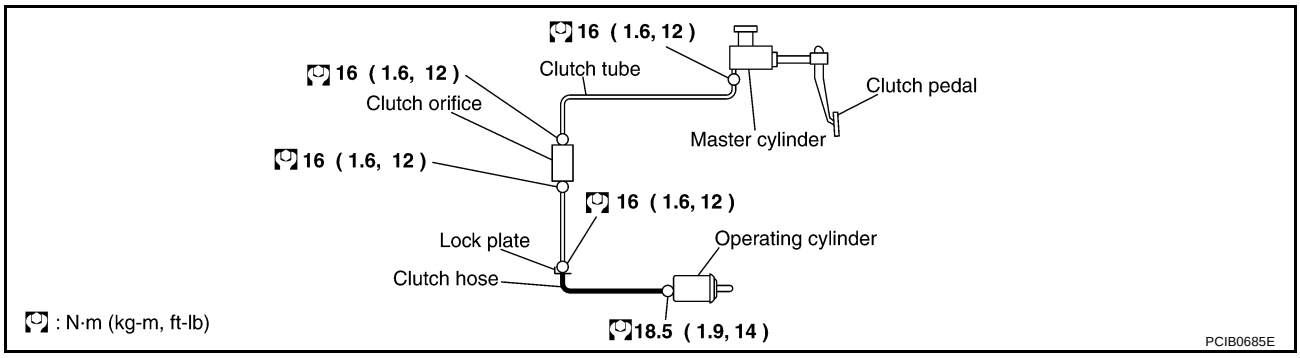
1. Apply rubber lubricant to cylinder body inner surface and rubber grease to the piston cup and piston. Insert piston assembly and piston spring into the cylinder body.
2. Apply rubber grease to dust cover and install push rod and dust cover.

CLUTCH PIPING

PFP:30650

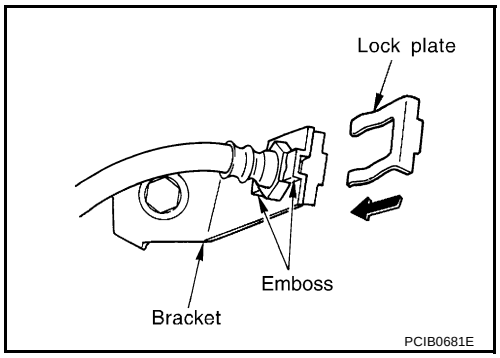
Removal and Installation

ACS004N6



Carefully observe the following steps during clutch tube removal and installation.

- Do not spill clutch fluid onto painted surfaces. If it spills, wipe up immediately and wash the affected area with water.
- When fixing clutch hose to bracket, align clutch hose metal fittings with bracket positioning emboss and lock plate to secure. At this time, prevent twisting or damage of clutch hose. In addition, be careful not to damage clutch hose.



- Tighten clutch tube flare nut to the specified torque.

  CAUTION:
  Be careful not to damage flare nut and clutch tube.
- Tighten the union bolt to the specified torque. Refer to CL-11, "Removal and Installation" .

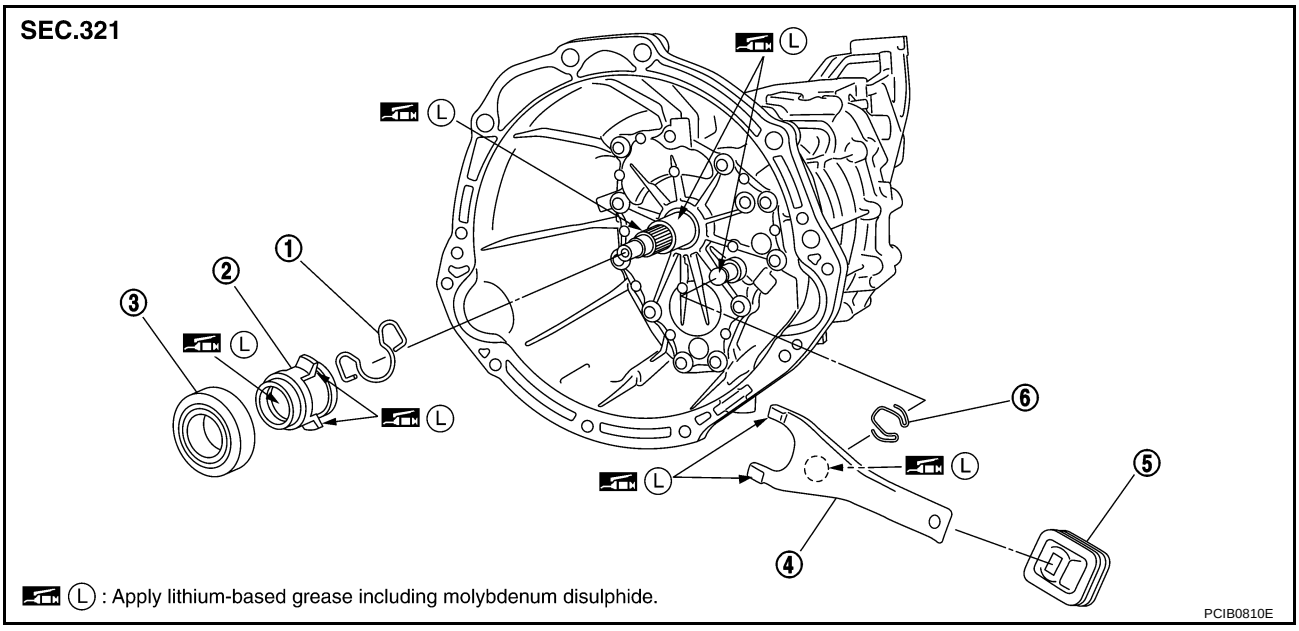
  CAUTION:
  Do not reuse the copper washer.
- After installation, bleed the clutch tube. Refer to CL-7, "Bleeding" .

CLUTCH RELEASE MECHANISM

PFP:30502

Removal and Installation

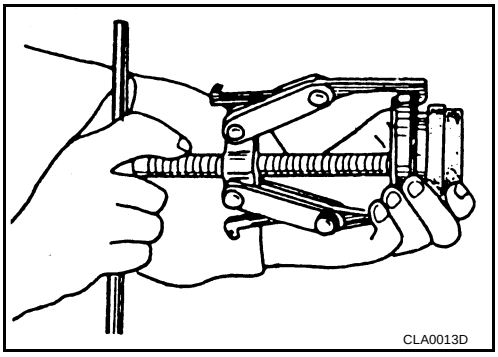
ACS004N7



1. Holder spring
2. Release bearing sleeve
3. Release bearing
4. Withdrawal lever
5. Dust cover
6. Snap spring

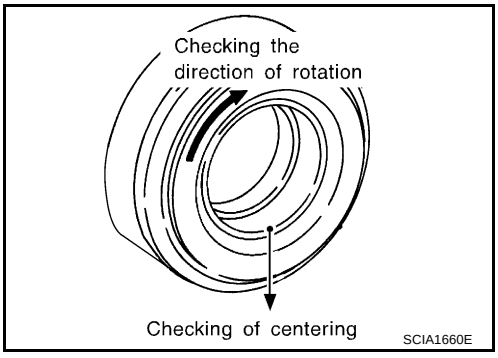
REMOVAL

1. Remove manual transmission from the vehicle. Refer to MT-19, "Removal and Installation from Vehicle" .
2. Remove release bearing sleeve assembly, holder spring, and withdrawal lever from inside the clutch housing.
3. Remove dust cover.
4. Remove snap spring from withdrawal lever.
5. Using a puller as shown in the figure, remove release bearing from release bearing sleeve.



INSPECTION AFTER REMOVAL

- If release bearing is seized, damaged, not properly centered or does not rotate smoothly, replace it.
- If contact surface of withdrawal lever is excessively worn out, replace it.
- If dust cover is cracked or deformed, replace it.



INSTALLATION

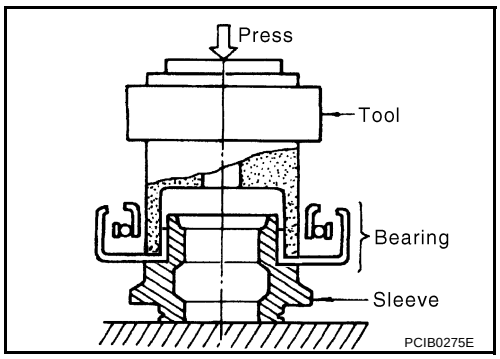
CAUTION:

- **Be sure to apply grease to the points specified. Otherwise, noise, poor disengagement, or damage to the clutch may result. Excessive grease may cause slip or quiver. Wipe off any grease oozing from the parts.**
- **Be careful not to bring any grease into contact with the clutch disc facing, pressure plate surface, or flywheel surface.**

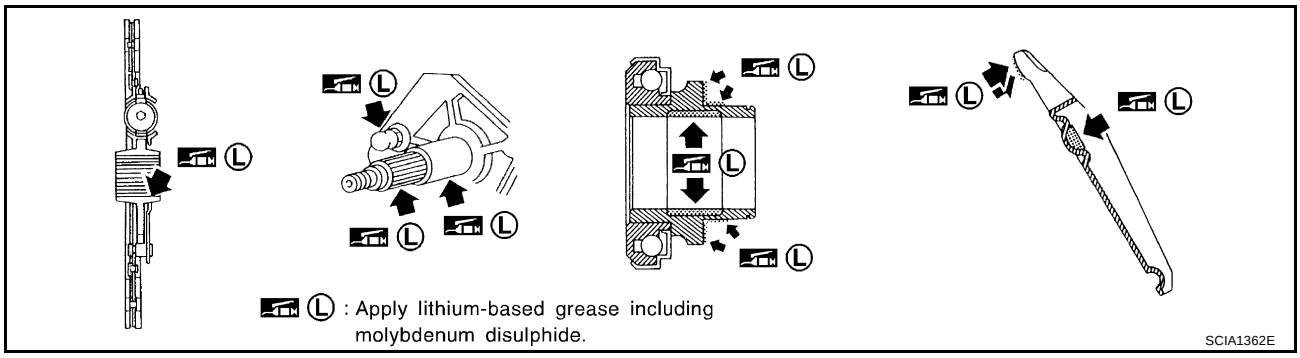
1. Using a drift, install release bearing to release bearing sleeve.

   Tool number : KV 30101400 (—)

   CAUTION:
   Press bearing inner race by pushing with a drift.



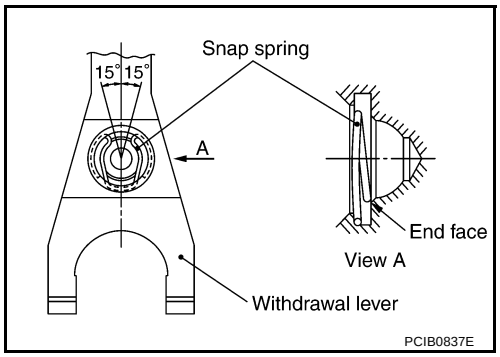
2. Following the instructions below, apply grease to the specified points.



   CAUTION:
   Wipe off any old grease, debris, or powdery residue left on the surfaces.
   - Evenly apply a 1 mm thick coating of recommended grease to withdrawal lever and release bearing sleeve or holder spring sliding surface.
   - Apply recommended grease to ball pin contact surface of the withdrawal lever and inner slots of the release bearing. The grease surface should be level with the surrounding area.
   - Evenly apply a thin coat of recommended grease to the release bearing sliding surface. Install release bearing. Wipe off any excess grease that oozes from the parts and then remove release bearing.

3. To install, reverse the removal procedure, following the cautions below.

   CAUTION:
   - **Before installing manual transmission to the vehicle, check that each sliding surface slides smoothly by operating withdrawal lever.**
   - **When assembling, make sure that both ends of snap spring touch the end face of withdrawal lever.**
   - **Be careful with the orientation of installation.**

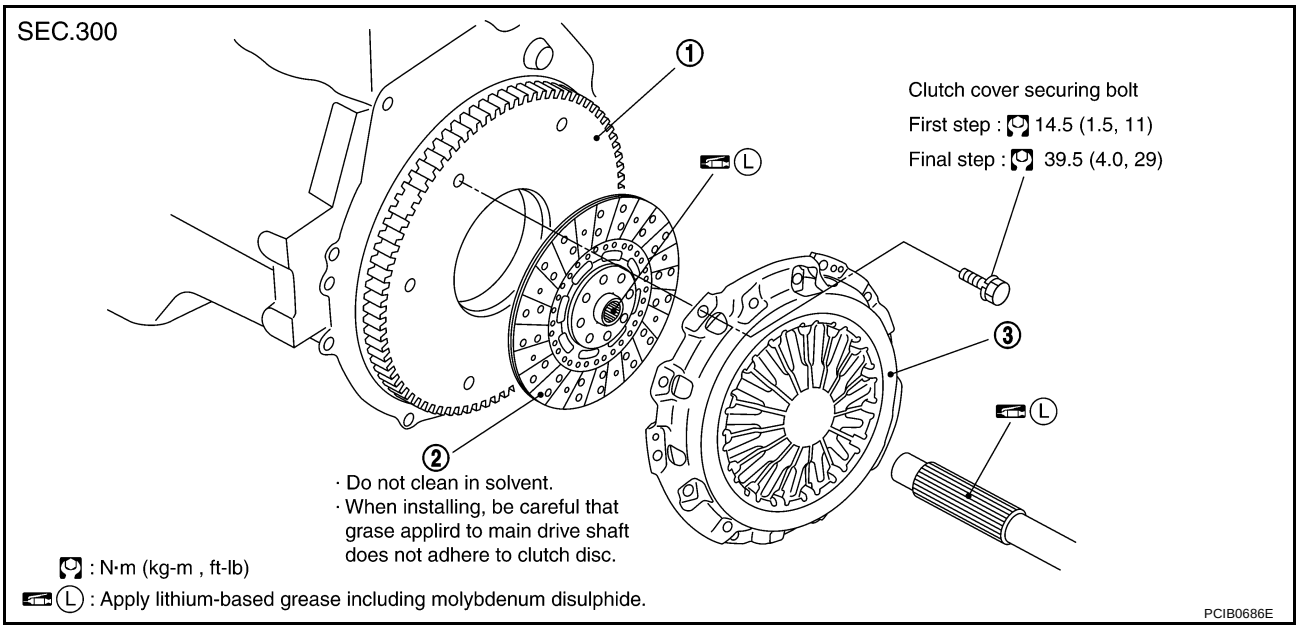


CLUTCH DISC, CLUTCH COVER

PFP:30100

Removal and Installation

ACS004N8



1. Flywheel
2. Clutch disc
3. Clutch cover

CAUTION:

Be careful not to bring any grease into contact with the clutch disc facing, pressure plate surface, or flywheel surface.

REMOVAL

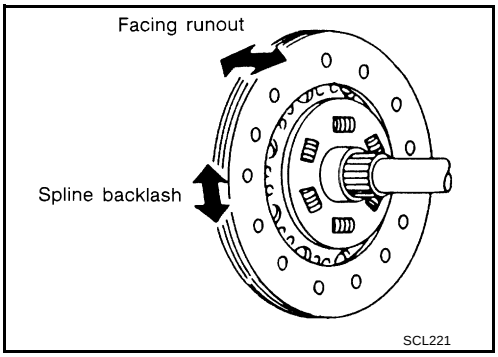
1. Remove manual transmission from the vehicle. Refer to MT-19, "Removal and Installation from Vehicle" .
2. Loosen clutch cover mounting bolts with power tool. Remove clutch cover and clutch disc.

INSPECTION AND ADJUSTMENT AFTER REMOVAL

Clutch Disc

- Measure circumference runout relative to the clutch disc center spline. If it is outside the specification, replace the clutch disc.

  Runout limit/diameter of the area to be measured:
  0.7 mm (0.028 in) or less/240 mm (9.45 in) dia.

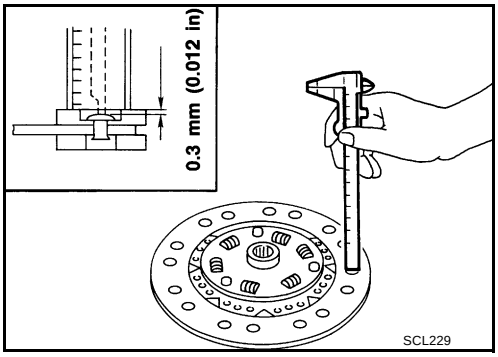


- Measure backlash for clutch disc spline and main drive shaft spline at the circumference of the disc. If it is outside the specified range, replace the clutch disc.

  Maximum backlash of spline:
  1.0 mm (0.039 in)

- Using calipers, measure the depth to the clutch disc facing rivet heads. If it exceeds the allowable wear limit, replace the clutch disc.

  Facing wear limit (depth to the rivet head):
  0.3 mm (0.012 in)

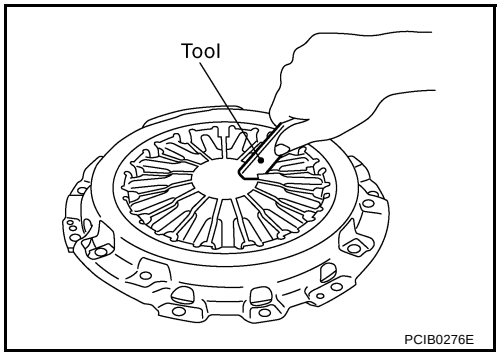


Clutch Cover

Check diaphragm spring lever claws for unevenness with the lever still on the vehicle. If they exceed the tolerance, adjust lever height using a diaphragm adjusting wrench.

Tool number : ST 20050240

Tolerance for diaphragm spring lever unevenness: 0.5mm (0.020 in)



- Check clutch cover thrust ring for wear or breakage. If wear or breakage is found, replace clutch cover assembly.

  NOTE:
  - Worn thrust ring will generate a beating noise when tapped at the rivet with a hammer.
  - Broken thrust ring will make a clinking sound when cover is shaken up and down.
- If a trace of burn or discoloration is found on the clutch cover pressure plate to clutch disc contact surface, repair the surface with sandpaper. If surface is damaged or distorted, replace the assembly.

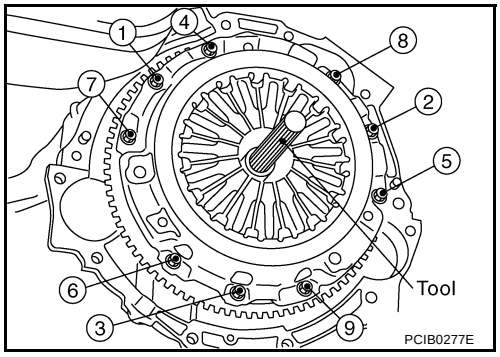
INSTALLATION

1. Apply recommended grease to clutch disc and main drive shaft spline.

   CAUTION:

   Be sure to apply grease to the points specified. Otherwise, noise, poor disengagement, or damage to the clutch may result. Excessive grease may cause slip or quiver. Wipe off any grease oozing from the parts.
2. Install clutch disc and clutch cover. Pre-tighten mounting bolts and install clutch aligning bar.

   Tool number : ST 20670000



3. Tighten clutch cover attaching bolts evenly in two steps in the order shown in the figure. Refer to CL-15, "Removal and Installation" .
4. Install manual transmission. Refer to MT-19, "Removal and Installation from Vehicle" .

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Clutch Control System

ACS004N9

Type of clutch control	Hydraulic

Clutch Master Cylinder

ACS004NA

Unit: mm (in)

Inner diameter	15.87 (5/8)

Clutch Operating Cylinder

ACS004NB

Unit: mm (in)

Inner diameter	19.05 (3/4)

Clutch Disc

ACS004NC

Unit: mm (in)

Engine model	VQ35DE
Model	250
Facing size (Outer dia. × inner dia. × thickness)	250 × 170 × 3.2 (9.84 × 6.69 × 0.126)
Wear limit (depth to the rivet head)	0.3 (0.012)
Runout limit/diameter of the area to be measured	0.7 (0.028) or less/240 (9.45) dia.
Maximum backlash of spline (at outer edge disc)	1.0 (0.039)

Clutch Cover

ACS004ND

Unit: mm (in)

Engine model	VQ35DE
Model	250
Set-load	8,630 N (880 kg)
Diaphragm spring lever height	39.5 - 41.5 (1.555 - 1.634)
Uneven limit of diaphragm spring toe height	0.5 (0.020)

Clutch Pedal

ACS004NE

Unit: mm (in)

Clearance ″C″ between pedal stopper rubber and clutch interlock switch threaded while clutch pedal is fully depressed.	0.1 - 1.0 (0.004 - 0.039)

SECTION MT
MANUAL TRANSMISSION

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PRECAUTIONS

PFP:00001

Precautions for Battery Service

ACS004NG

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Caution

ACS004NF

- Do not reuse transmission oil, once it has been drained.
- Check oil level or replace oil with vehicle on level ground.
- During removal or installation, keep inside of transmission clear of dust or dirt.
- Check for the correct installation status prior to removal or disassembly. If mating marks are required, be certain they do not interfere with the function of the parts they are applied to.
- In principle, tighten bolts or nuts gradually in several steps working diagonally from inside to outside. If tightening sequence is specified, observe it.
- Be careful not to damage sliding surfaces and mating surfaces.

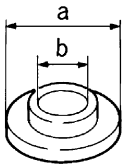
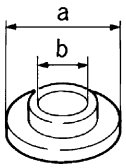
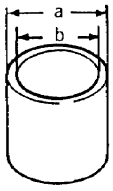
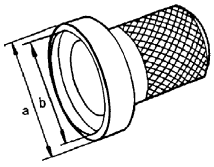
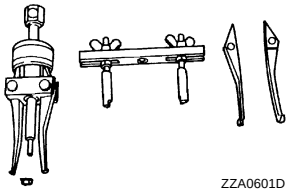
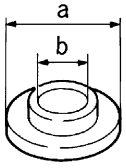
PREPARATION

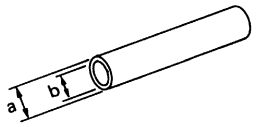
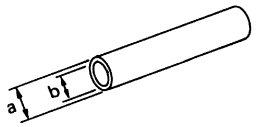
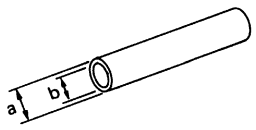
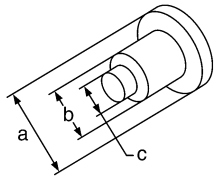
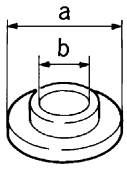
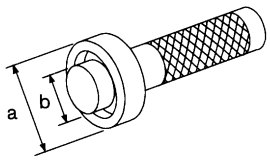
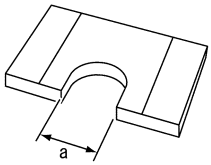
PFP:00002

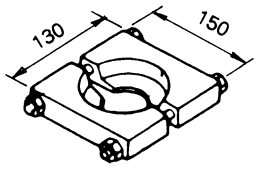
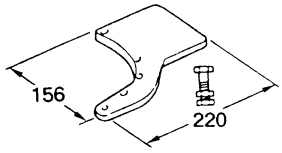
Special Service Tools

ACS004NH

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

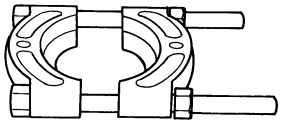
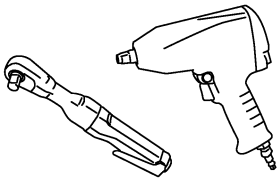
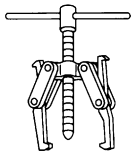
Tool number (Kent-Moore No.) Tool name		Description
ST30911000 (—) a: 98 mm (3.86 in) dia. b: 40 mm (1.57 in) dia. Inserter	 ZZA0920D	● Main shaft bearing installation ● 5th-6th synchronizer assembly installation ● Reverse main gear bushing installation ● 3rd gear bushing installation ● 3rd-4th synchronizer assembly installation
ST30022000 (—) a: 110 mm (4.33 in) dia. b: 46 mm (1.81 in) dia. Inserter	 ZZA0920D	● 3rd main gear installation ● 4th main gear installation
ST27861000 (—) a: 62 mm (2.44 in) dia. b: 52 mm (2.05 in) dia. Support ring	 ZZA0832D	● 1st-2nd synchronizer assembly installation ● 1st gear bushing installation
ST33400001 (J26082) a: 60 mm (2.36 in) dia. b: 47 mm (1.85 in) dia. Drift	 ZZA0814D	Rear oil seal installation
KV381054S0 (—) Oil seal puller	 ZZA0601D	Remove rear oil seal
ST30032000 (J26010-01) a: 80 mm (3.15 in) dia. b: 31 mm (1.22 in) dia. Inserter	 ZZA0920D	Counter rear bearing inner race installation

Tool number (Kent-Moore No.) Tool name	Description
KV32102700 (—) a: 48 mm (1.89 in) dia. b: 41 mm (1.61 in) dia. Drift  ZZA0534D	Main drive gear bearing installation
ST23860000 (—) a: 38 mm (1.50 in) dia. b: 33 mm (1.30 in) dia. Drift  ZZA0534D	Reverse counter gear installation
ST01530000 (—) a: 50 mm (1.97 in) dia. b: 41 mm (1.61 in) dia. Drift  ZZA0534D	Reverse synchronizer assembly installation
ST35291000 (—) a: 40 mm (1.57 in) dia. b: 29.5 mm (1.161 in) dia. c: 22.5 mm (0.886 in) dia. Drift  SCIA1575E	Striking rod oil seal installation
KV40100630 (J26092) a: 67 mm (2.64 in) dia. b: 38 mm (1.50 in) dia. Inserter  ZZA0920D	4th counter gear thrust washer installation
KV38102100 (J25803-01) a: 44 mm (2.36 in) dia. b: 28 mm (1.10 in) dia. Drift  NT084	Front cover oil seal installation
KV32103300 (J46529) Press plate  PCIB0165J	Reverse synchronizer assembly installation

Tool number (Kent-Moore No.) Tool name	Description
ST30031000 (J22912-01) Puller  ZZC0499D	Inner baulk ring support
ST224490000 (—) Adapter setting plate  ZZC0465D	Hold a adapter plate

Commercial Service Tools

ACS004NI

Tool name	Description
Puller  ZZB0823D	Each bearing, gear and bushing removal
Pin punch Tip diameter: 6.0 mm (0.24 in) dia. ZZA0815D	Each retaining pin removal and installation
Power tool  PBIC0190E	Loosening bolts and nuts
Puller  NT077	Reverse synchronizer assembly removal Reverse counter gear removal Reverse main gear removal

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

ACS004NJ

Use the chart below to help you find the cause of the symptom. The numbers indicate the order of the inspection. If necessary, repair or replace these parts.

MANUAL TRANSMISSION

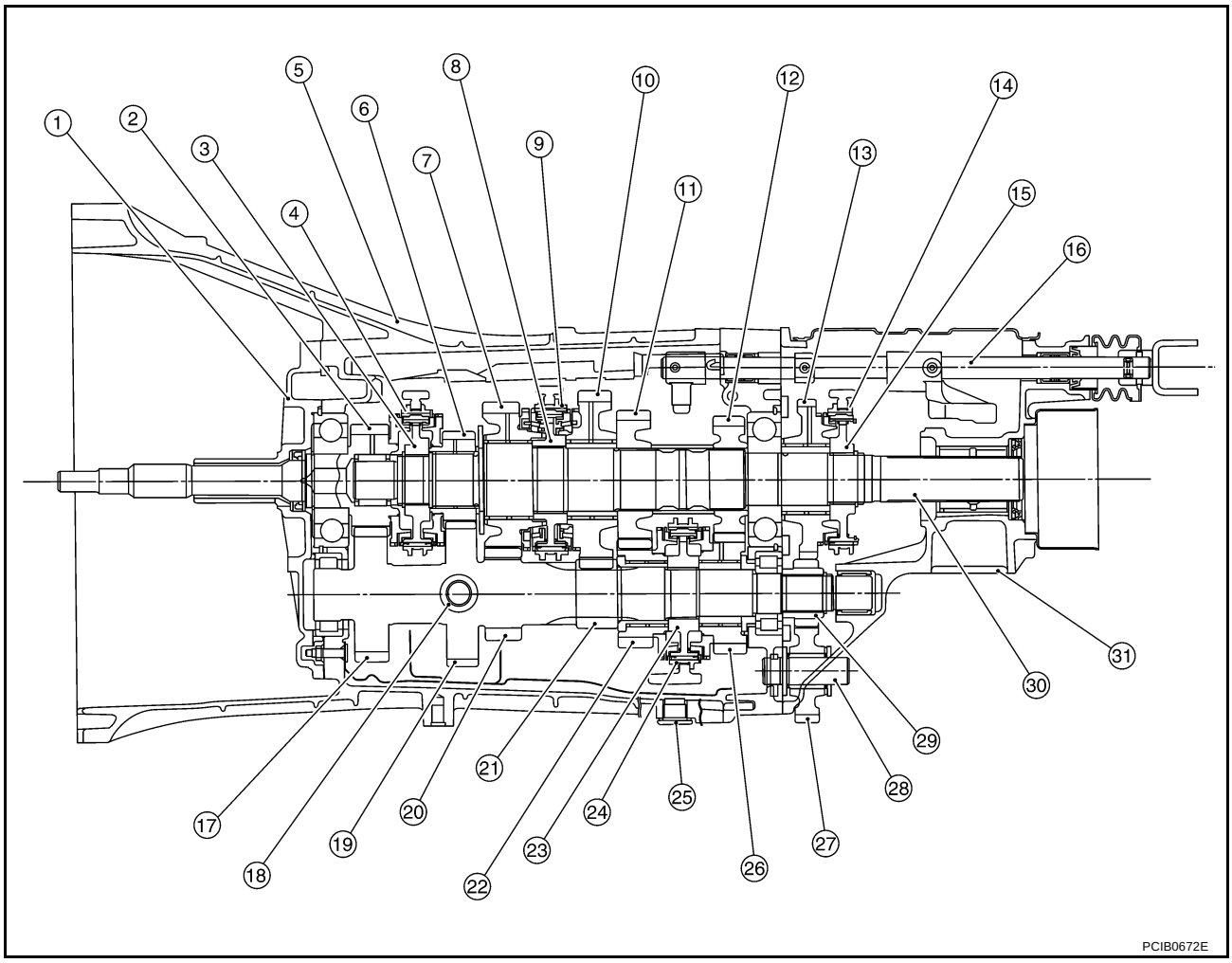
Reference page		MT-10	MT-10	MT-10	MT-22	MT-22	MT-13	MT-25	MT-25	MT-25	MT-25	MT-25	MT-25
SUSPECTED PARTS (Possible cause)		OIL (Oil level is low.)	OIL (Wrong oil.)	OIL (Oil level is high.)	GASKET (Damaged)	OIL SEAL (Worn or damaged)	SHIFT CONTROL LINKAGE (Worn)	CHECK PLUG RETURN SPRING AND CHECK BALL (Worn or damaged)	SHIFT FORK (Worn)	GEAR (Worn or damaged)	BEARING (Worn or damaged)	BAULK RING (Worn or damaged)	INSERT SPRING (Damaged)
Symptoms	Noise	1	2							3	3		
	Oil leakage		3	1	2	2							
	Hard to shift or will not shift		1	1			2					2	2
	Jumps out of gear						1	1	2	2			

DESCRIPTION

PFP:00000

Cross-Sectional View

ACS004NK



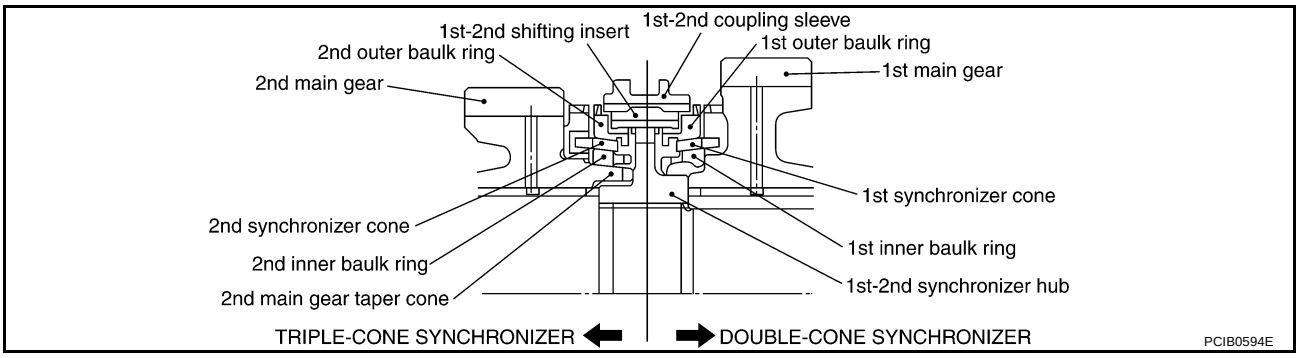
1. Front cover
2. Main drive gear
3. 5th-6th synchronizer hub
4. 5th-6th coupling sleeve
5. Transmission case
6. 6th main gear
7. 2nd main gear
8. 1st-2nd synchronizer hub
9. 1st-2nd coupling sleeve
10. 1st main gear
11. 3rd main gear
12. 4th main gear
13. Reverse main gear
14. Reverse coupling sleeve
15. Reverse synchronizer hub
16. Striking rod
17. Counter shaft
18. Filler plug
19. 6th counter gear
20. 2nd counter gear
21. 1st counter gear
22. 3rd counter gear
23. 3rd-4th synchronizer hub
24. 3rd-4th coupling sleeve
25. Drain plug
26. 4th counter gear
27. Reverse idler gear
28. Reverse idler shaft
29. Reverse counter gear
30. Main shaft
31. Rear extension

DOUBLE-CONE SYNCHRONIZER

The 1st and 3rd, 4th gears is equipped with a double-cone synchronizer to reduce the operating force of the shift lever as shown.

TRIPLE-CONE SYNCHRONIZER

The 2nd gear is equipped with a triple-cone synchronizer to reduce the operating force of the shift lever as shown.



M/T OIL

PFP:KLD20

Replacement

ACS004NL

DRAINING

1. Start the engine and warm up the transmission unit sufficiently.
2. After stopping engine, remove filler plug and drain plug and then drain fluid.
3. After replace a new gasket on drain plug, screw drain plug into transmission body and tighten to the specified torque. Refer to MT-22, "CASE COMPONENTS" .

   CAUTION:
   Gaskets are not reusable. Never reuse them.

FILLING

1. Remove filler plug. Fill new oil into the transmission to the level of the filler plug mounting hole.

   Oil grade: **API GL-4**
   Viscosity: **Refer to MA-12, "Fluids and Lubricants" .**
   Oil capacity: **Approx. 2.9 ℓ (3-1/8 US qt, 2-1/2 Imp qt)**

2. After filling, check fluid level, replace a new gasket on filler plug, screw filler plug into transmission body, and tighten to the specified torque. Refer to MT-22, "CASE COMPONENTS" .

   CAUTION:
   Gaskets are not reusable. Never reuse them.

Checking

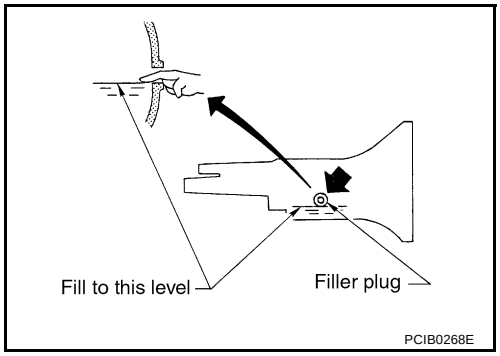
ACS004NM

OIL LEAKAGE AND OIL LEVEL

- Check if oil is leaking from transmission or around it.
- Check oil level from filler plug mounting hole as shown in the figure.

  CAUTION:
  Never start engine while checking oil level.
- When screwing in filler plug with a new gasket, first screw into the transmission by hand, then tighten to the specified torque. Refer to MT-22, "CASE COMPONENTS" .

  CAUTION:
  Gaskets are not reusable. Never reuse them.



REAR OIL SEAL

PFP:33140

Removal and Installation

ACS004NN

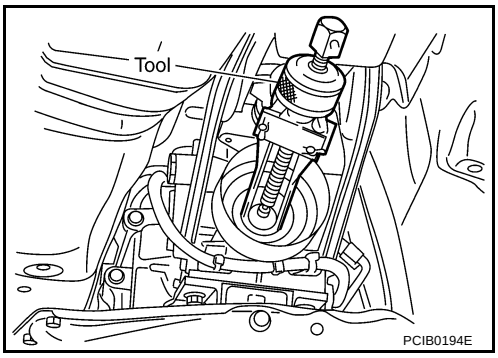
REMOVAL

1. Remove propeller shaft. Refer to PR-7, "REMOVAL" .

   CAUTION:
   Do not impact or damage propeller shaft tube.

2. Using oil seal puller, remove rear oil seal.

   Tool number : KV381054S0 (—)

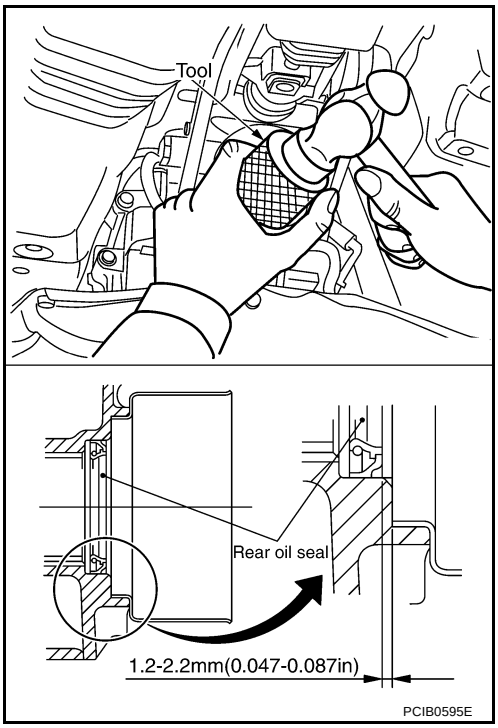


INSTALLATION

1. Apply multi-purpose grease to rear oil seal lip. Using a drift, drive in rear oil seal until the edge is approximately 1.2 - 2.2 mm (0.047 - 0.087 in) above the boss edge.

   Tool number : ST33400001 (J26082)

   CAUTION:
   - **Rear oil seals are not reusable. Never reuse them.**
   - **When installing, do not incline the rear oil seal.**



2. Install propeller shaft. Refer to PR-8, "INSTALLATION" .

   CAUTION:
   - **Do not impact or damage propeller shaft tube.**
   - **If lubricant leak has occurred, after finishing work, check oil level. Refer to MT-10, "Checking" .**

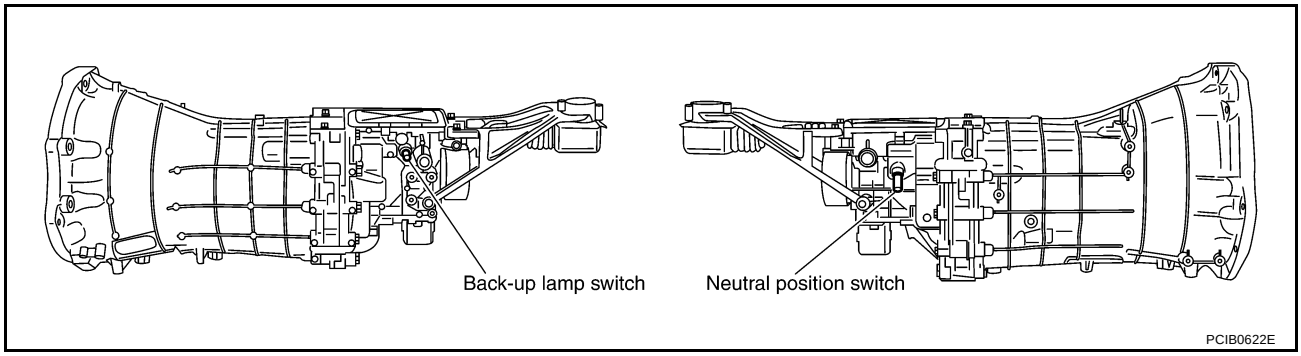
POSITION SWITCH

PFP:32005

Checking

ACS004NO

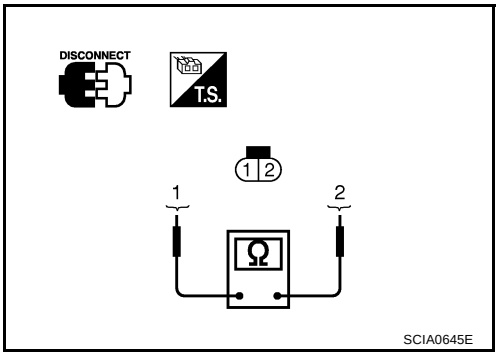
COMPONENT LOCATION



BACK-UP LAMP SWITCH

- Check continuity.

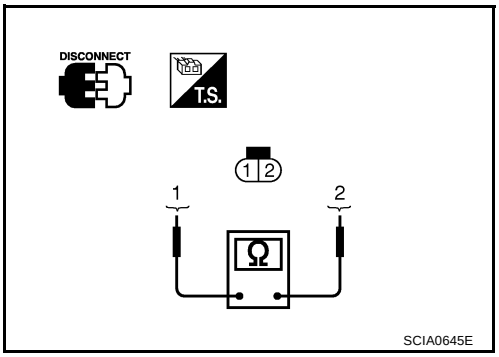
Gear position	Continuity
Reverse	Yes
Except reverse	No



NEUTRAL POSITION SWITCH

- Check continuity.

Gear position	Continuity
Neutral	Yes
Except neutral	No

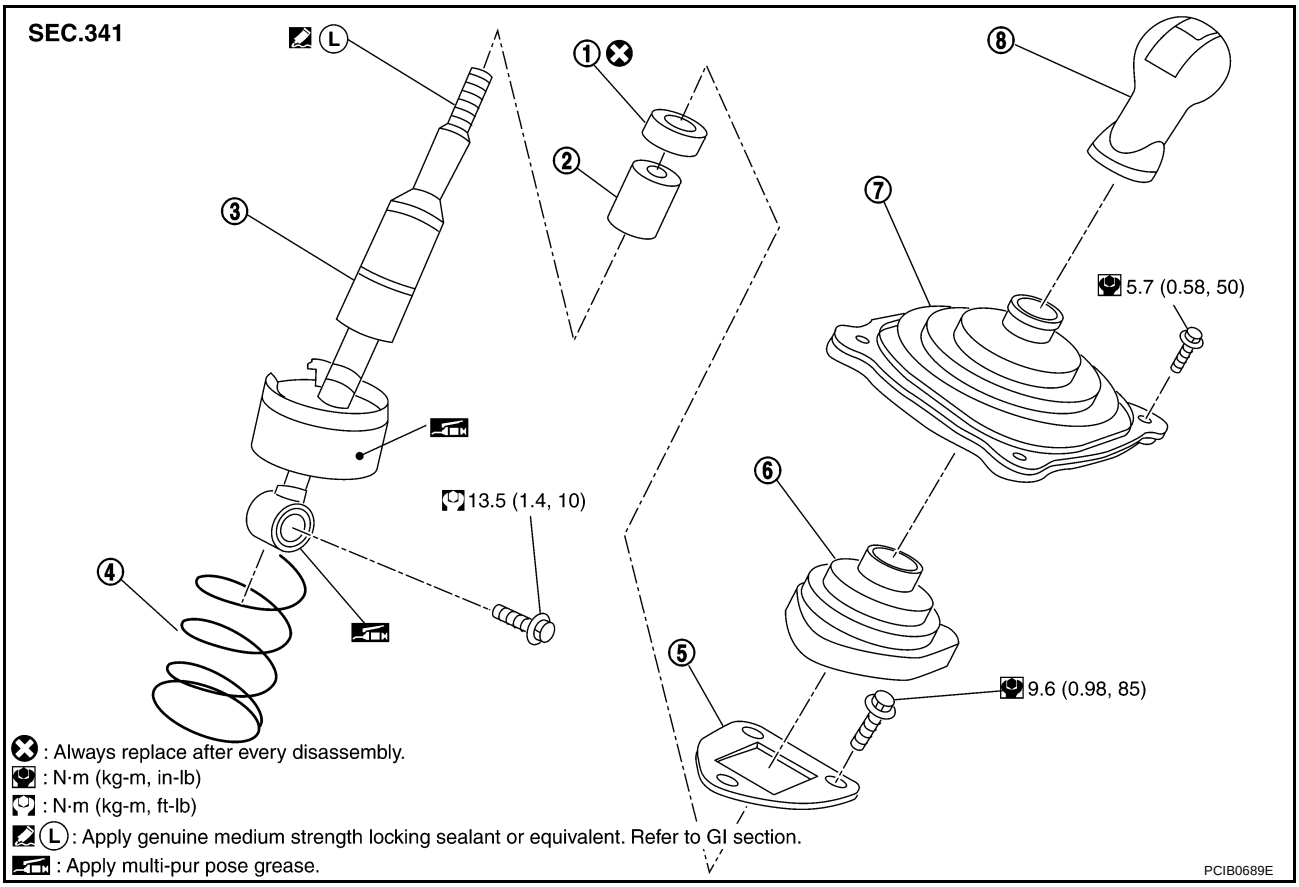


SHIFT CONTROL

PFP:34103

Removal and Installation

ACS004NP

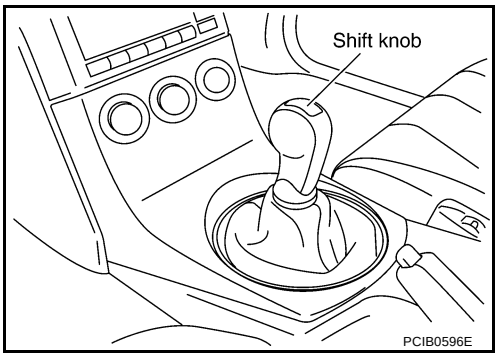


1.	Insulator	2.	Seat	3.	Control lever
4.	Control lever spring	5.	Guide plate	6.	Control lever boot
7.	Hole cover	8.	Shift knob		

REMOVAL

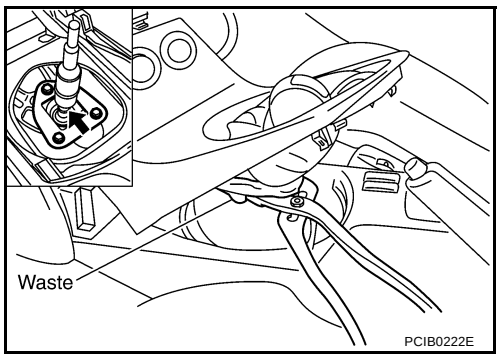
1. Remove the shift knob with the following procedure.

a. Disconnect console boot from center console. Refer to IP-11, "Removal and Installation" .



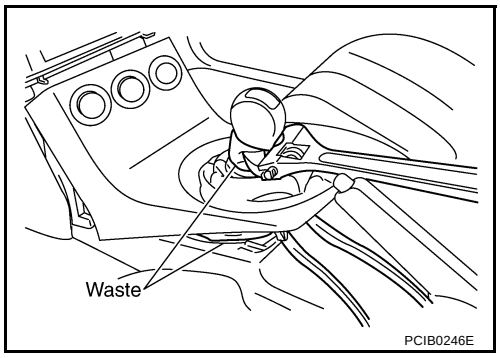
b. Lift console boot, and push down hole cover. Set water pump plier and others to control lever assembly.

CAUTION:
Put waste cloth between water pump plier and control lever assembly to avoid damaging control lever assembly.



c. Set monkey wrench to shift knob.

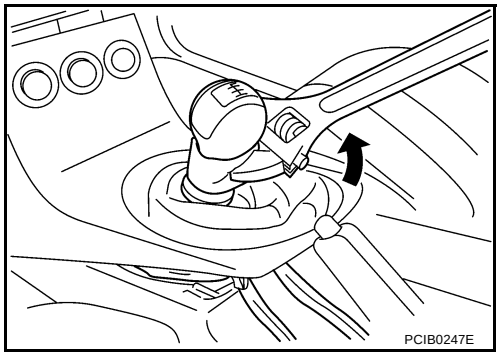
CAUTION:
Put waste cloth between shift knob and suitable plier to avoid damaging shift knob.



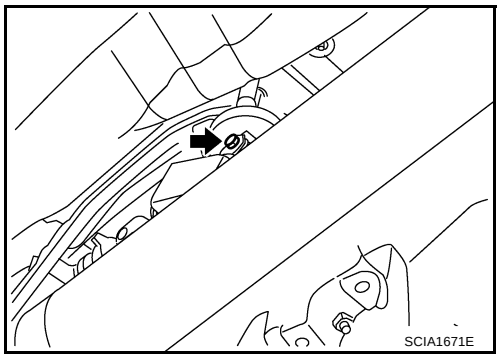
d. Turn monkey wrench with water pump plier and others fixed. Loosen shift knob, and remove shift knob from control lever assembly.

NOTE:
Remove shift knob from control assembly with water pump plier and others fixed. Because a certain power to turn shift knob is necessary even after adhesive is peeled.

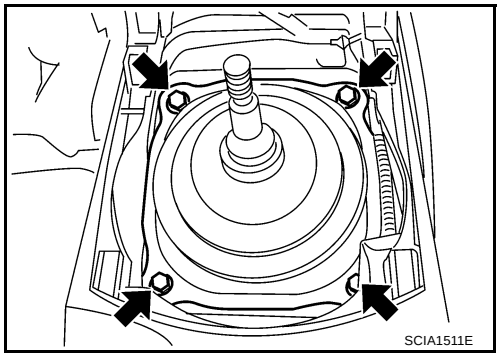
2. Loosen the shift knob to remove the control lever.
3. Remove console boot. Refer to IP-11, "Removal and Installation" .



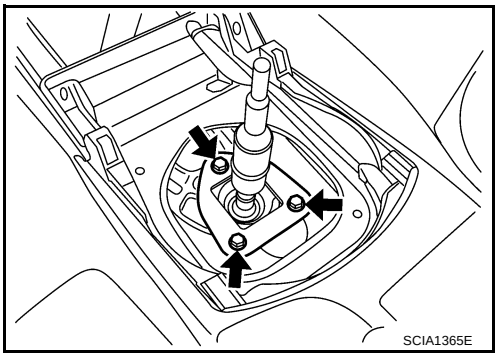
4. Push back the boot, remove control lever assembly mounting bolt, and separate control lever and control rod assembly.



5. Remove the mounting bolts to remove the hole cover.
6. Remove the control lever boot.

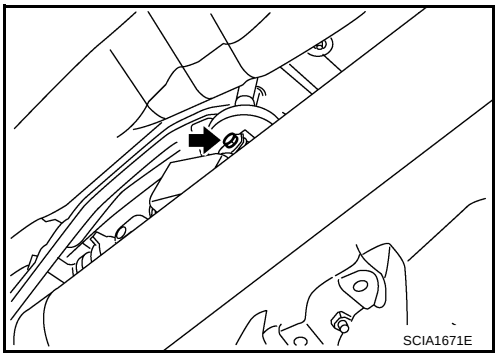


7. Remove guide plate mounting bolts, and then remove control lever assembly and control lever spring.

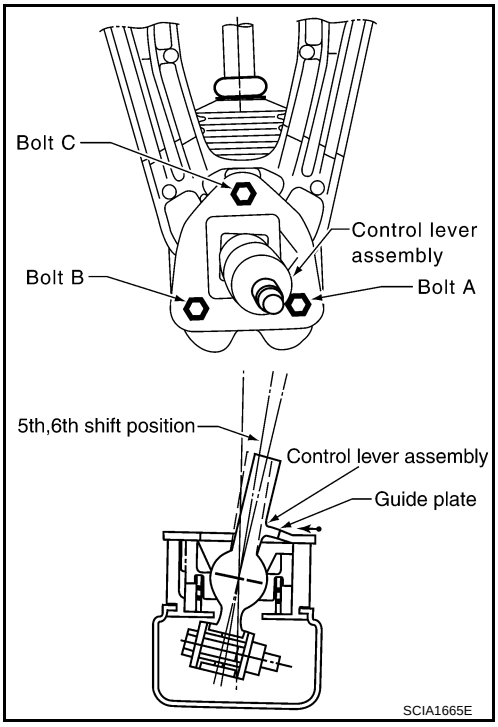


INSTALLATION

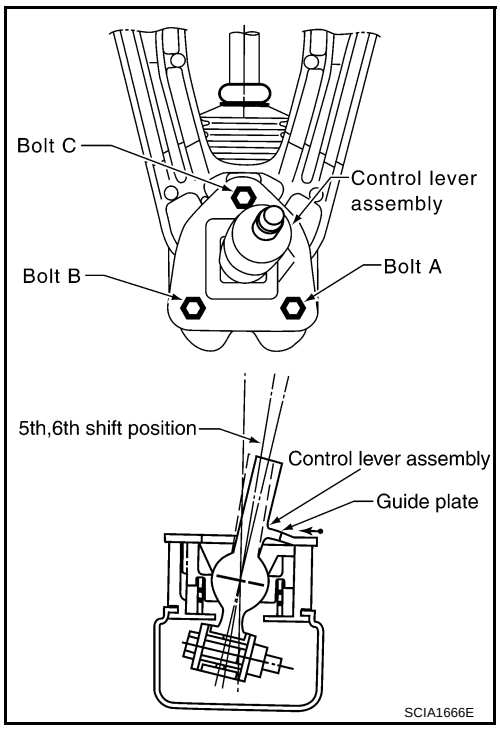
1. Set control lever assembly and control lever spring in the control lever housing assembly and loosely mount the guide plate.
2. After installing control lever assembly in the control rod assembly, tighten bolts to the specified torque. Refer to MT-13, "Removal and Installation" .



3. Shifting control lever assembly to 6th gear, the control lever assembly is light pressed to the reverse side.
4. At the point where the control lever assembly stops, bring the guide plate closer until guide plate stopper contacts control lever assembly claw, and then loosely tighten mounting bolt A.



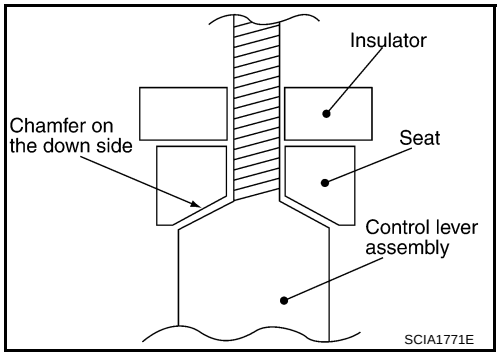
5. Shifting control lever assembly to 5th gear, the control lever assembly light pressed to the reverse side.
6. At the point where control lever assembly stops, bring guide plate closer until the guide plate stopper contacts control lever assembly claw, and then loosely tighten mounting bolt C. Refer to MT-13, "Removal and Installation" .
7. Tighten guide plate bolts A and B to the specified torque. Refer to MT-13, "Removal and Installation" .
8. Install control lever boot.
9. Install hole cover and tighten bolt to the specified torque. Refer to MT-13, "Removal and Installation" .
10. Install console boot. Refer to IP-11, "Removal and Installation" .



11. As shown in the figure, assemble seat and insulator to control lever assembly.

    CAUTION:
    Do not reuse the insulator.
12. Apply locking sealant to control lever threads, install shift knob.

    CAUTION:
    Remove the remaining adhesive on control lever and shift knob threads.



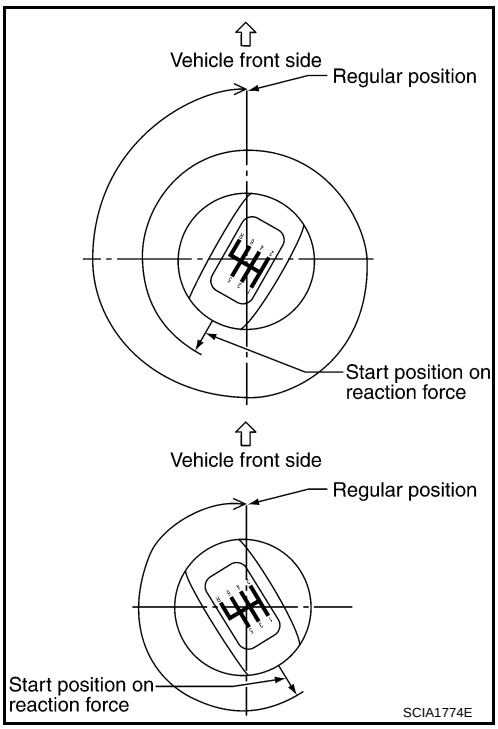
13. Put the shift knob in the correct position as the following indicates.

a. When tightening shift knob, if shift knob position is the correct position a less than 1/2 rotation from starting resistance, tighten 1 more rotation and set the correct position again.

b. If shift knob position is the correct position more than 1/2 rotation from starting resistance, tighten and set the correct position.

CAUTION:

- **Do not adjust the knob with loosing.**
- **After adjusting to regular position, until 30 minute passes since a locking sealant because stiff. Do not operate the shift intensely such as screwing or turning the shift knob to opposite direction.**



INSPECTION AFTER INSTALLATION

After installing, confirm the following items:

- When control lever assembly is shifted to each position, make sure there is no binding or disconnection in each boot.
- When shifted to each position, make sure there is no noise, bending, and backlash. Especially when control lever assembly is shifted to 5th, 6th without pressing downward, check for bending.
- When control lever assembly is shifted to 1st, 2nd side and 5th, 6th side, confirm control lever assembly returns to neutral position smoothly.
- In any position other than reverse, confirm that control lever assembly can be pressed downward.
- With control lever assembly pressed downward, confirm that it can be shifted to reverse.
- When shifted from reverse to neutral position, confirm control lever assembly returns to neutral position smoothly with spring power.
- Without control lever assembly pressed downward, confirm that it cannot be shifted to reverse.

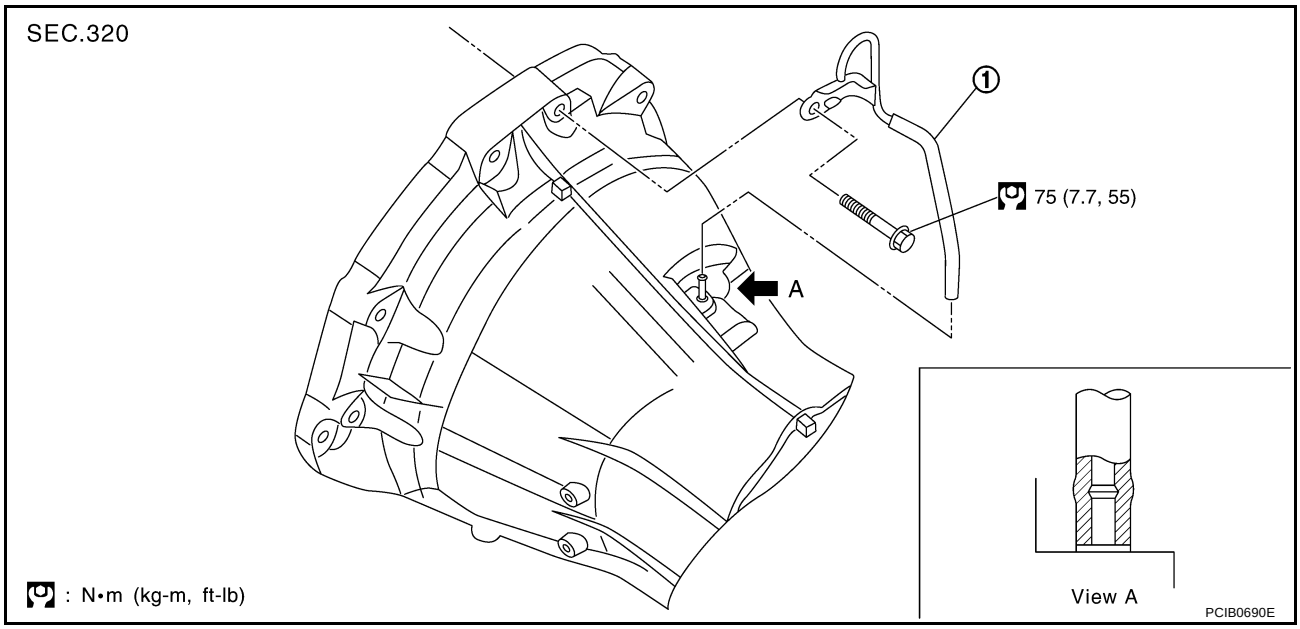
AIR BREATHER HOSE

PFP:31098

Removal and Installation

ACS004NQ

Refer to the figure for air breather hose removal and installation information.



1. Air breather hose

CAUTION:

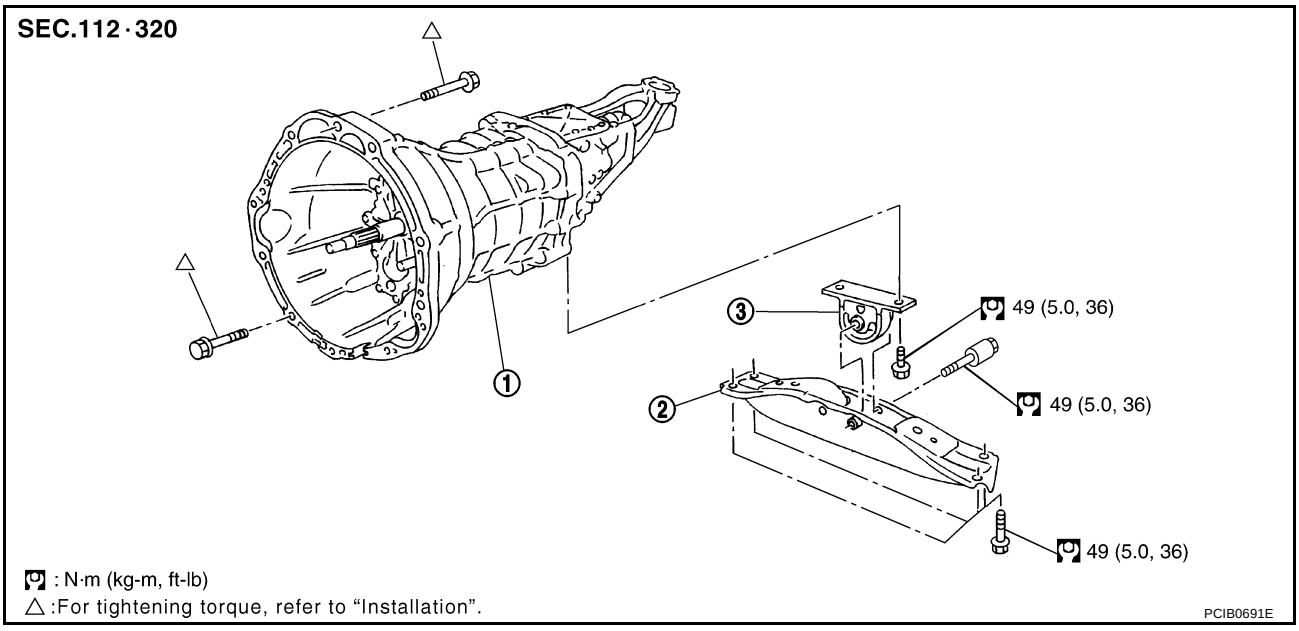
- **Make sure there are no pinched or blocked areas on the air breather hose caused by bending or winding when installing it.**
- **Insert overlap width of air breather hose as far as it will go.**

TRANSMISSION ASSEMBLY

PFP:32010

Removal and Installation from Vehicle

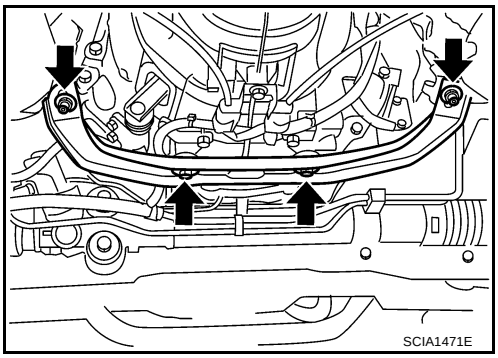
ACS004NR



1. Transmission case
2. Rear engine mounting member
3. Insulator

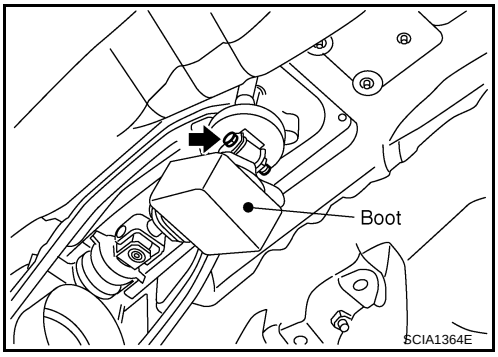
REMOVAL

1. Disconnect battery negative cable.
2. Remove tower bar.
3. Remove front cross bar with power tool. Refer to FSU-9, "REMOVAL" .
4. Remove catalytic converter stay mounting nuts and bolts, and then remove catalytic converter bracket. Refer to EX-3, "Removal and Installation" .

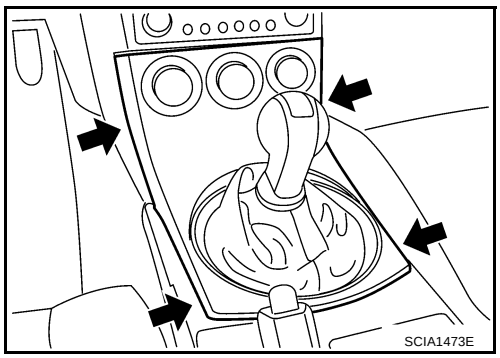


5. Remove nut connecting catalytic converter to exhaust manifold, and then remove catalytic converter and exhaust front tube as one unit.
6. Remove propeller shaft. Refer to PR-7, "Removal and Installation" .

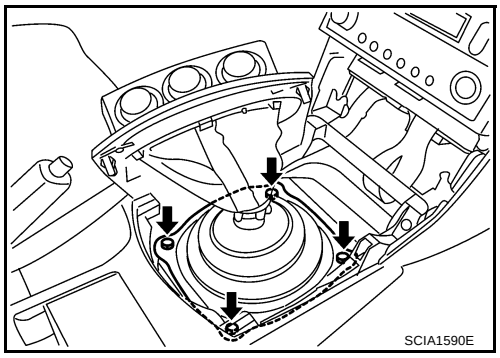
   CAUTION:
   Do not impact or damage propeller shaft tube.
7. Remove control rod mounting bolts and then separate shift lever assembly from the control rod assembly.



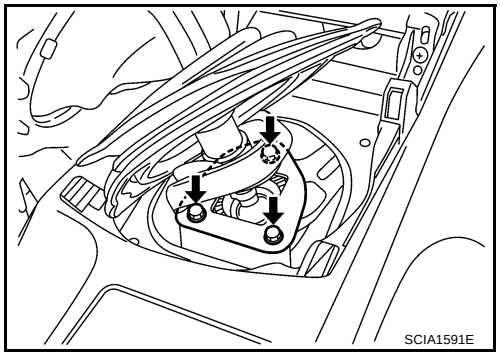
8. Using a screwdriver wrapped in tape to remove claw and then separate console boot from the center console. Refer to IP-11, "Removal and Installation" .



9. Remove hole cover mounting bolts and then separate hole cover from the floor panel.
10. Separate control lever boot from the guide plate.



11. Remove guide plate mounting bolts and then separate shift lever assembly from the shift lever housing assembly.

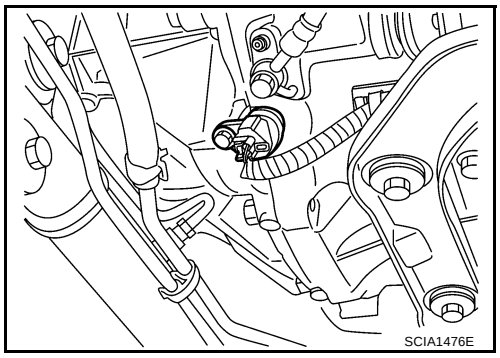


12. Remove clutch operating cylinder mounting bolts and then separate heat insulator and clutch operating cylinder from the transmission case. Refer to CL-11, "Removal and Installation" .

13. Remove crankshaft position sensor (POS).

CAUTION:

- **Do not subject it to impact by dropping or hitting.**
- **Do not disassemble.**
- **Do not allow metal filings, etc., to get on the sensor's front edge magnetic area.**
- **Do not place in an area affected by magnetism.**

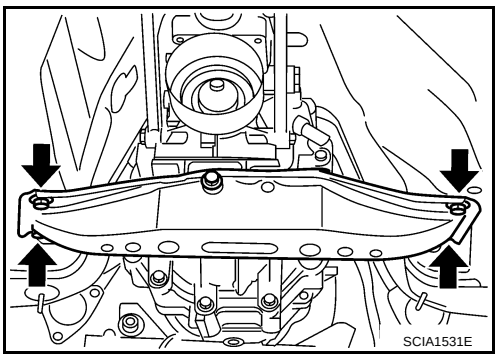


14. Disconnect neutral position switch and back-up lamp switch.
15. Separate heated oxygen sensor 2 wire harness, crankshaft position sensor (POS), wire harness, back-up lamp switch wire harness and PNP switch wire harness from the transmission.
16. Remove starter motor. Refer to SC-19, "Removal and Installation" .
17. Remove rear cover plate. Refer to EM-27, "Removal and Installation" .
18. Set transmission jack to the transmission.

CAUTION:

When setting transmission jack, be careful not to contact with the switch.

19. Remove rear engine mounting member. Refer to EM-105, "Removal and Installation" .
20. Remove engine and transmission mounting bolts with power tool.
21. Remove transmission from the vehicle.



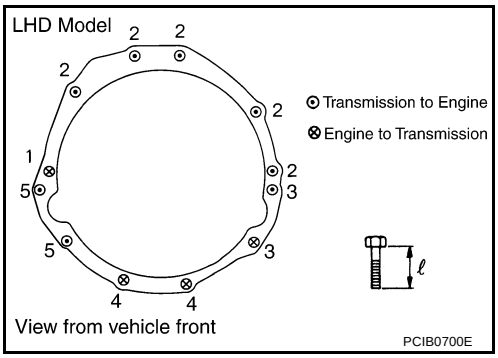
INSTALLATION

Install in the revers order of removal procedure, following the cautions below:

- When installing transmission to the engine, install mounting bolts in accordance with the standards below.

LHD Model

Bolt No.	1	2	3	4	5
Quantity	1	5	2	2	2
" ℓ " mm (in)	55 (2.17)	65 (2.56)	50 (1.97)	35 (1.38)	65 (2.56)
Tightening torque N·m (kg-m, ft-lb)	75 (7.7, 55)		55.4 (5.7, 41)	46.6 (4.8, 34)	55.4 (5.7,41)



CAUTION:

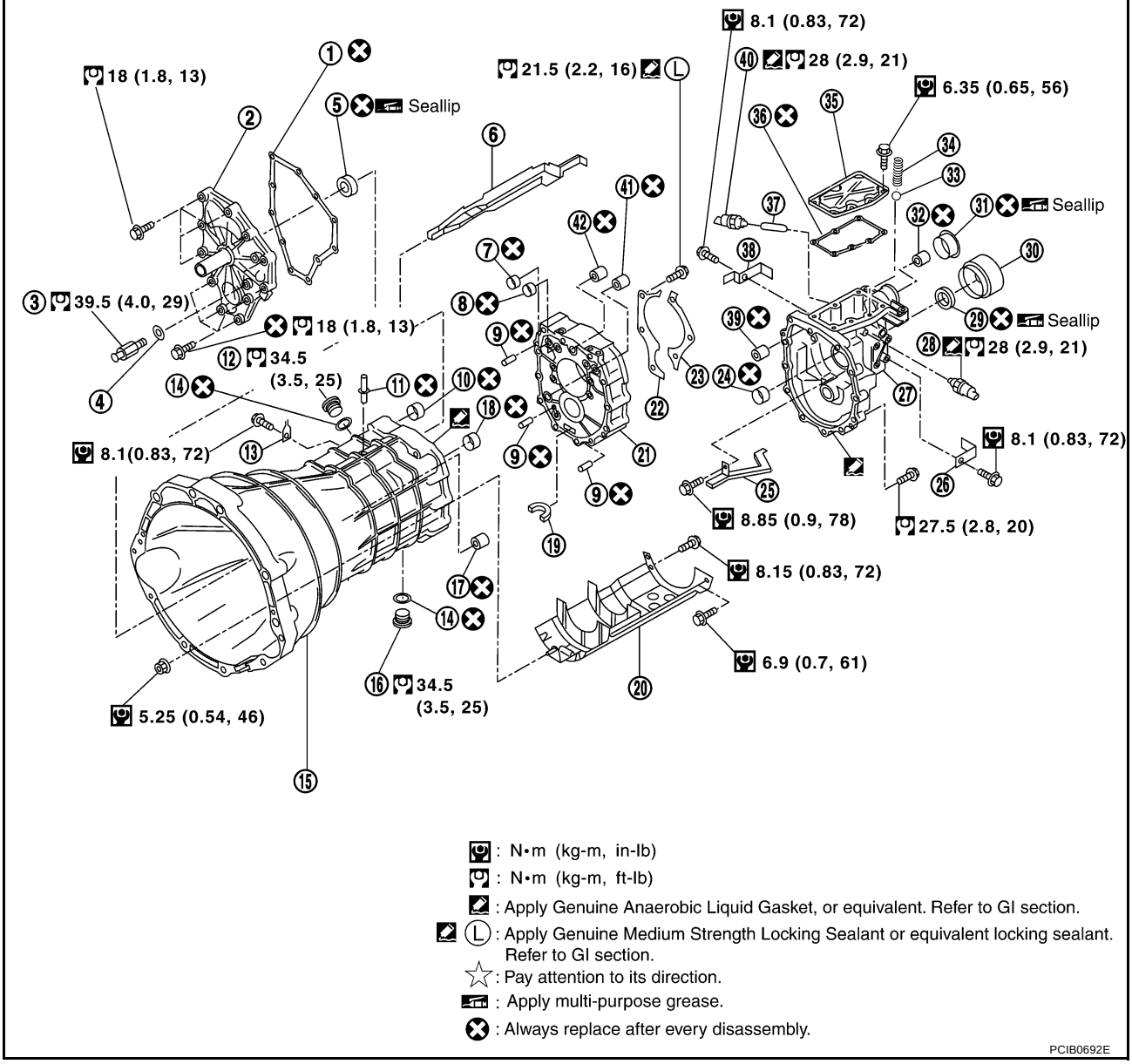
- **When installing, be careful to avoid interference between transmission main drive shaft and clutch cover.**
- **Do not impact or damage propeller shaft tube.**
- **Refer to MT-15, "INSTALLATION"MT-17, "INSPECTION AFTER INSTALLATION" for control lever installation information.**
- **After installation, check oil level, and oil leaks and loose mechanisms.**

Component Parts Drawing

ACS004NS

CASE COMPONENTS

SEC.321

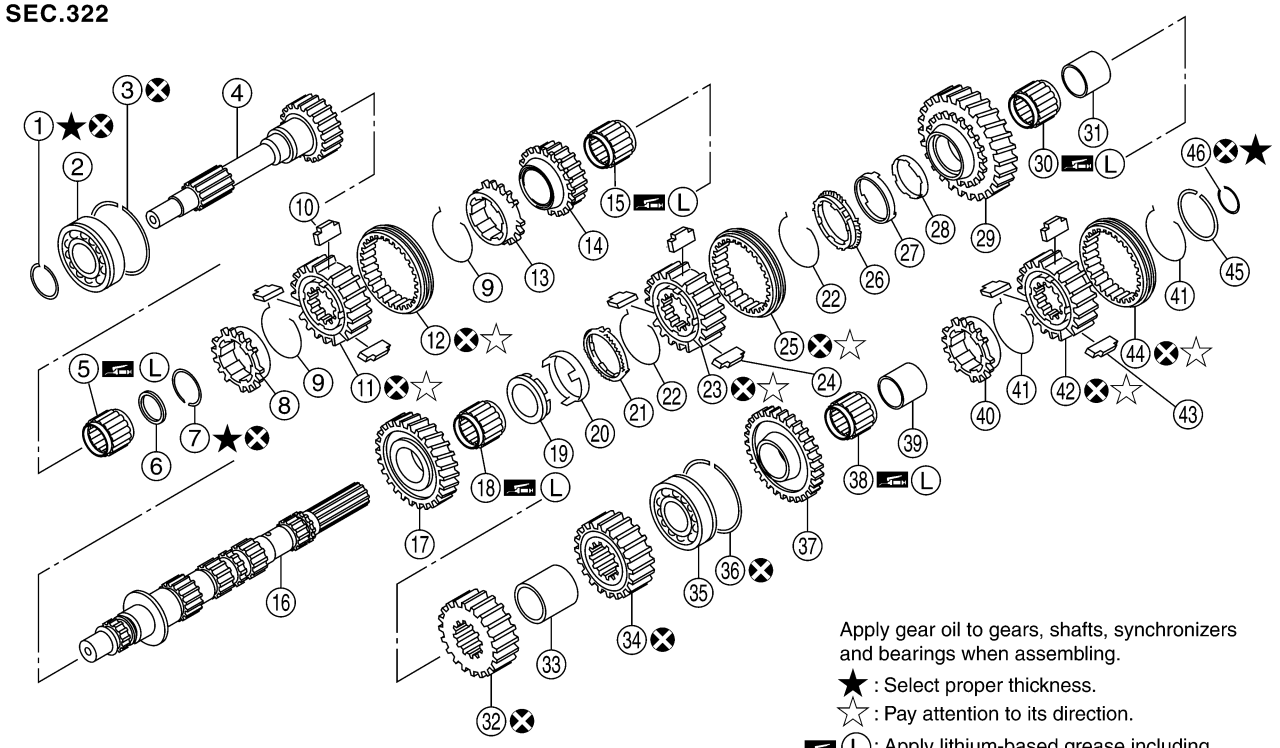


1. Front cover gasket
2. Front cover
3. Withdrawal lever ball pin
4. Washer
5. Front cover oil seal
6. Oil gutter
7. Bushing
8. Bushing
9. Dowel pin
10. Bushing
11. Breather
12. Filler plug
13. Bracket
14. Gasket
15. Transmission case
16. Drain plug
17. Sliding ball bearing
18. Bushing
19. Magnet
20. Baffle plate
21. Adapter plate
22. Main shaft bearing retainer
23. Main shaft bearing retainer
24. Bushing
25. Rear extension oil gutter
26. Bracket
27. Rear extension
28. Back-up lamp switch
29. Rear oil seal
30. Rear extension dust cover
31. Striking rod oil seal
32. Sliding ball bearing
33. Check ball

34. Check select spring
35. Rear extension upper cover
36. Rear extension upper cover gasket
37. Plunger
38. Bracket
39. Sliding ball bearing
40. Neutral position switch
41. Sliding ball bearing
42. Sliding ball bearing

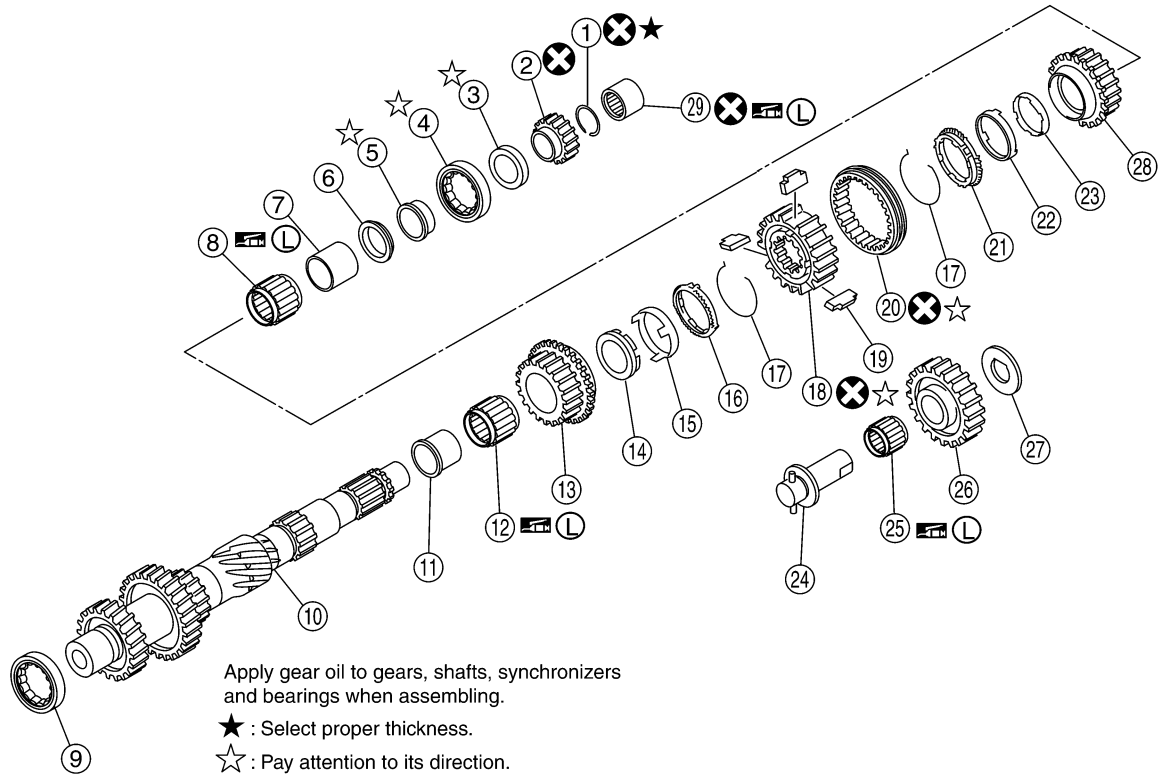
GEAR COMPONENTS

SEC.322



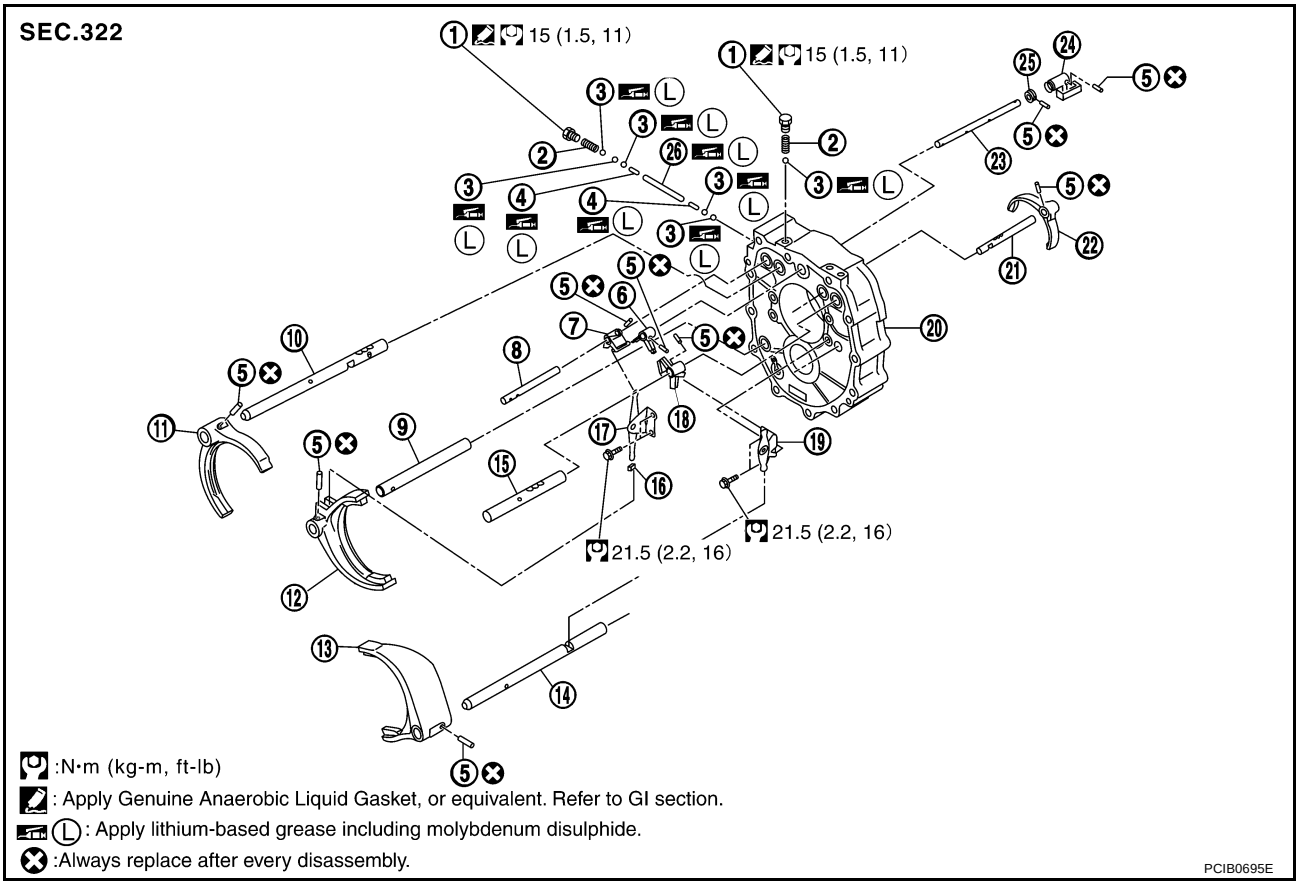
1. Snap ring
2. Main drive gear bearing
3. Snap ring
4. Main drive gear
5. Main pilot bearing
6. Pilot bearing spacer
7. Snap ring
8. 5th baulk ring
9. 5th - 6th spread spring
10. 5th-6th shifting insert
11. 5th-6th synchronizer hub
12. 5th - 6th coupling sleeve
13. 6th baulk ring
14. 6th main gear
15. 6th needle bearing
16. Main shaft
17. 2nd main gear
18. 2nd needle bearing
19. 2nd inner baulk ring
20. 2nd synchronizer cone
21. 2nd outer baulk ring
22. 1st-2nd spread spring
23. 1st - 2nd synchronizer hub
24. 1st - 2nd shifting insert
25. 1st - 2nd coupling sleeve
26. 1st outer baulk ring
27. 1st synchronizer cone
28. 1st inner baulk ring
29. 1st main gear
30. 1st needle bearing
31. 1st gear bushing
32. 3rd main gear
33. 3rd - 4th main spacer
34. 4th main gear
35. Main shaft bearing
36. Snap ring
37. Reverse main gear
38. Reverse main needle bearing
39. Reverse main gear bushing
40. Reverse baulk ring
41. Reverse spread spring
42. Reverse synchronizer hub
43. Reverse shifting insert
44. Reverse coupling sleeve
45. Snap ring
46. Snap ring

SEC.322

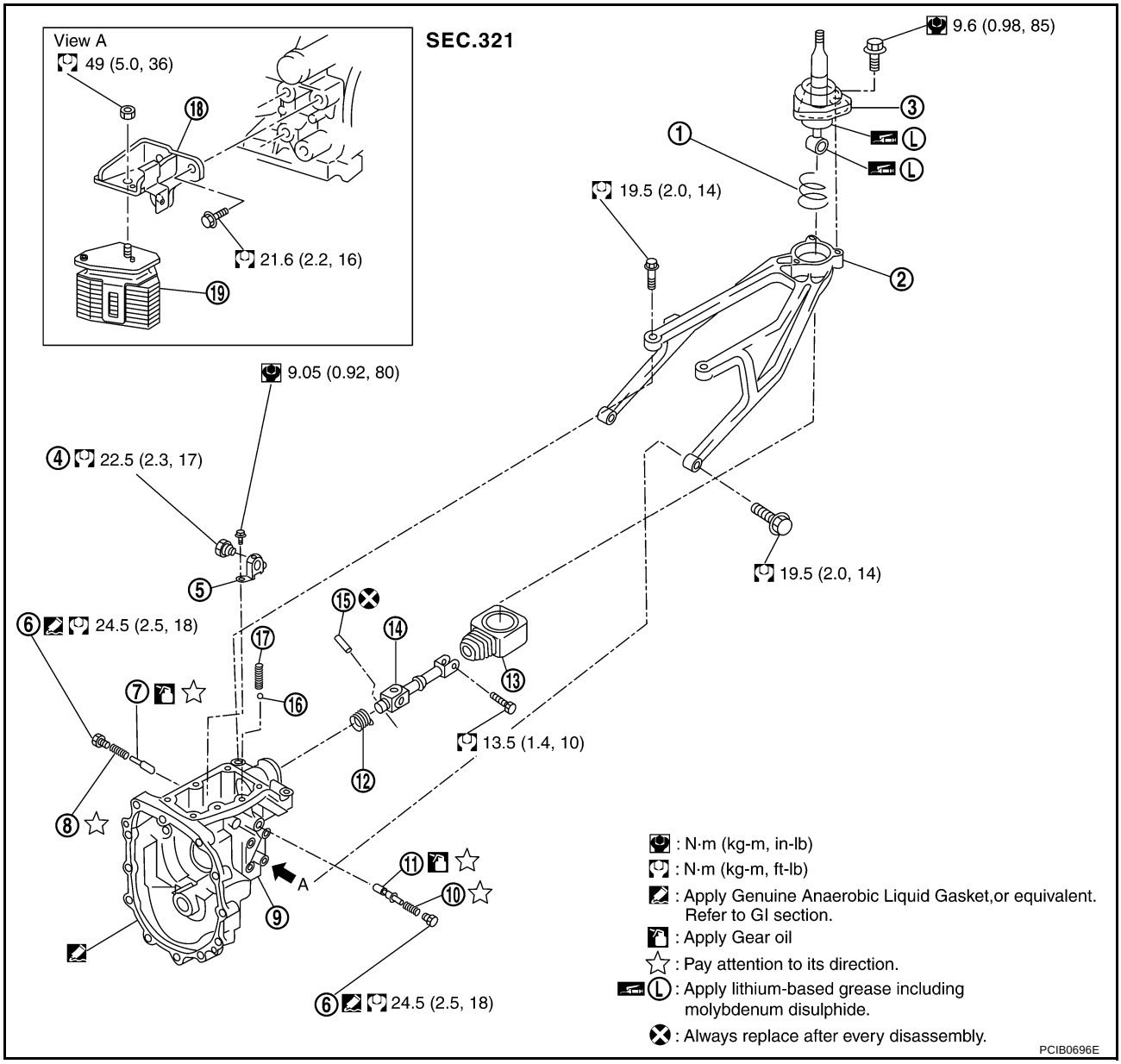


1. Snap ring
2. Reverse counter gear
3. Counter rear bearing spacer
4. Counter rear bearing
5. Counter rear bearing inner race
6. 4th counter gear thrust washer
7. 4th gear bushing
8. 4th needle bearing
9. Counter front bearing
10. Counter shaft
11. 3rd gear bushing
12. 3rd needle bearing
13. 3rd counter gear
14. 3rd inner baulk ring
15. 3rd synchronizer cone
16. 3rd outer baulk ring
17. 3rd - 4th spread spring
18. 3rd - 4th synchronizer hub
19. 3rd - 4th shifting insert
20. 3rd - 4th coupling sleeve
21. 4th outer baulk ring
22. 4th synchronizer cone
23. 4th inner baulk ring
24. Reverse idler shaft
25. Reverse idler needle bearing
26. Reverse idler gear
27. Reverse idler thrust washer
28. 4th counter gear
29. Counter end bearing

SHIFT CONTROL COMPONENTS



1. Check ball plug
2. Check ball spring
3. Check ball
4. Interlock pin
5. Retaining pin
6. Striking lever
7. 3rd-4th fork rod bracket
8. 3rd-4th fork rod
9. 3rd - 4th fork rod (reversal side)
10. 1st-2nd fork rod
11. 1st-2nd shift fork
12. 3rd-4th shift fork
13. 5th-6th shift fork
14. 5th-6th fork rod (reversal side)
15. 5th-6th fork rod
16. Shifter cap
17. 3rd-4th control lever
18. 5th-6th fork rod bracket
19. 5th-6th control lever
20. Adapter plate
21. Reverse fork rod
22. Reverse shift fork
23. Striking rod
24. Low/high control lever
25. Stopper ring
26. Interlock plunger



1. Control lever spring
2. Control lever housing
3. Control lever
4. Check shift pin
5. Control bracket
6. Return spring plug
7. Return spring plunger
8. Return spring
9. Rear extension
10. Return spring
11. Return spring plunger
12. Boot
13. Boot
14. Control rod
15. Retaining pin
16. Check ball
17. Check select spring
18. Dynamic damper bracket
19. Dynamic damper

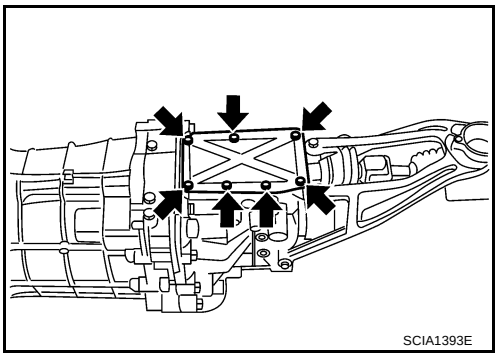
Disassembly and Assembly

ACS004NT

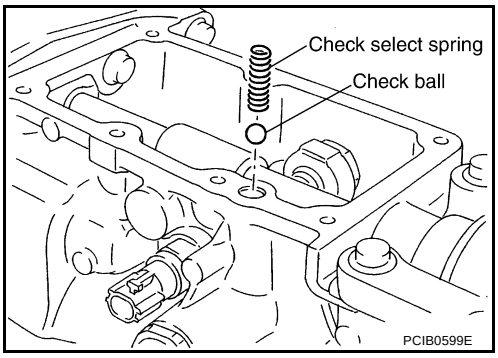
DISASSEMBLY

Case Components

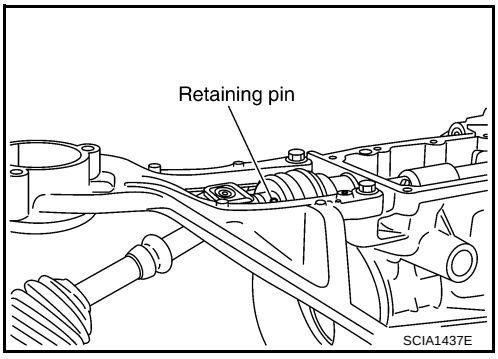
1. Remove rear extension upper cover mounting bolts.
2. Remove rear extension upper cover and rear extension upper cover gasket from the rear extension.



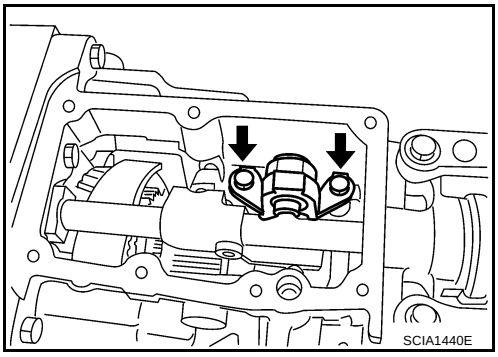
3. Remove check select spring and check ball from the rear extension.



4. Remove retaining pin using a pin punch [6 mm (0.24 in) dia.], and remove control rod.
5. Remove neutral position switch, plunger and back-up lamp switch from the rear extension.



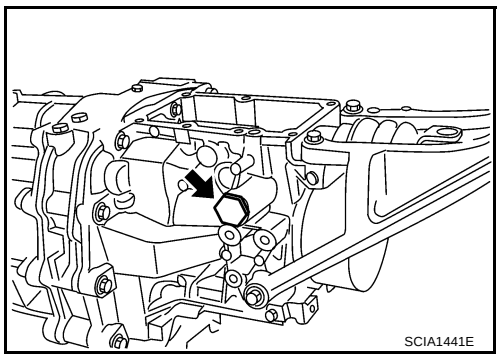
6. Remove control bracket mounting bolts. Then remove check shift pin and control bracket as one unit from the rear extension.



7. Remove right and left return spring plug. Then remove return spring and return spring plunger from the rear extension.

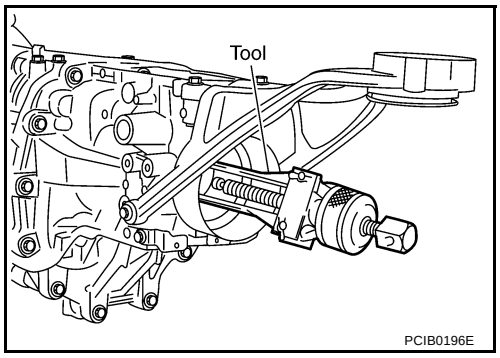
CAUTION:

Return spring and return spring plunger have different lengths for right and left sides. Identify right and left side and then store.

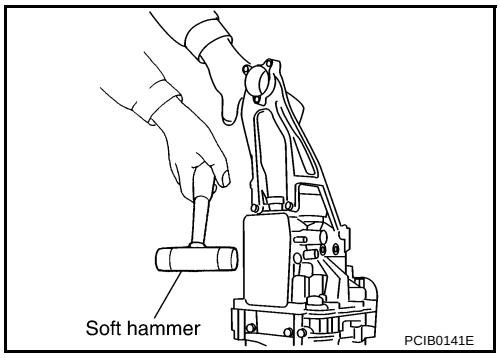


8. Remove rear oil seal from the rear extension using an oil seal puller.

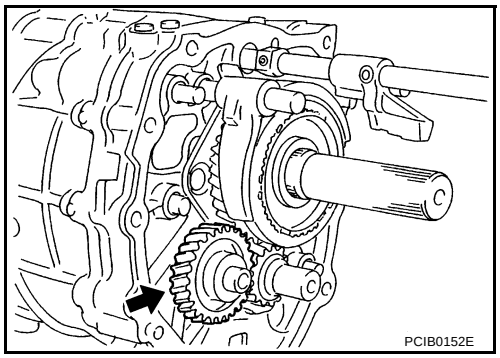
Tool number : KV381054S0 (–)



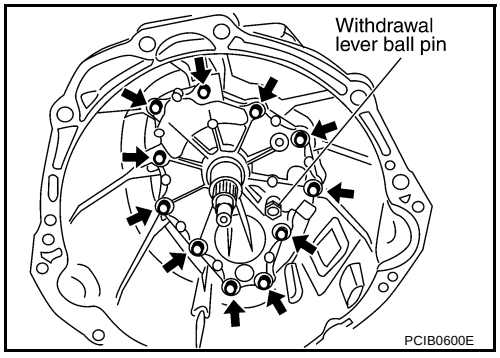
9. Remove rear extension mounting bolts. Using a soft hammer, tap rear extension assembly to remove.
10. Remove control lever housing mounting bolts, and remove control lever housing from the rear extension.
11. Remove striking rod oil seal from the rear extension. Refer to MT-22, "CASE COMPONENTS" .
12. Remove rear extension oil gutter from the rear extension. Refer to MT-22, "CASE COMPONENTS" .



13. Remove reverse idler thrust washer, revers idler gear, and reverse idler needle bearing from the reverse idler shaft.
14. Remove reverse idler shaft from the adapter plate.

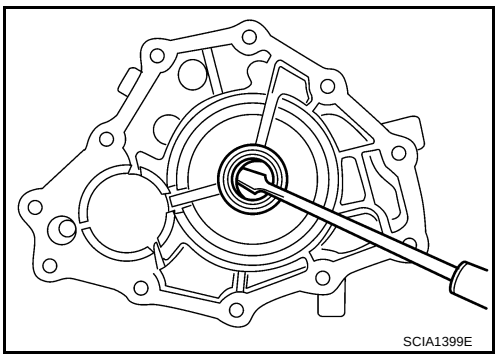


15. Remove withdrawal lever ball pin and washer from the front cover.
16. Remove front cover mounting bolts, then remove front cover assembly and front cover gasket from the transmission case.

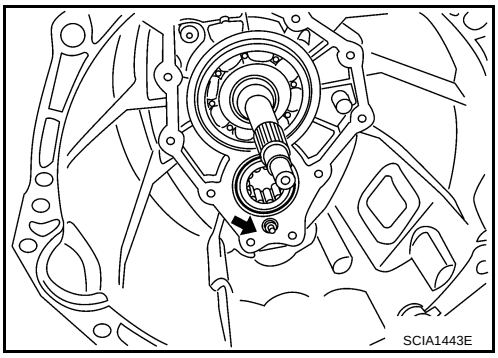


17. Remove front cover oil seal from the front cover assembly, using a flat-bladed screwdriver.

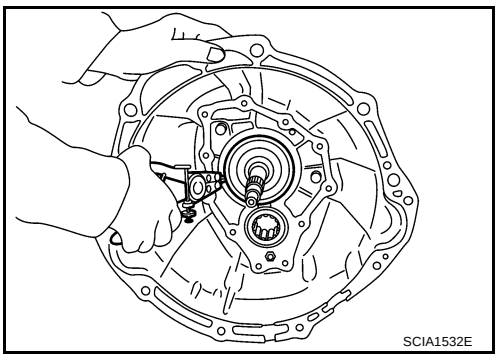
CAUTION:
Be careful not to damage front cover mating surface.


SCIA1399E

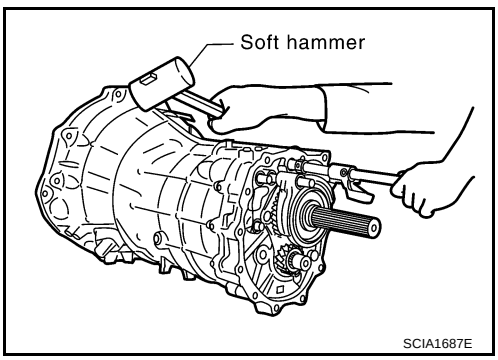
18. Remove baffle plate mounting nut from the transmission case.


SCIA1443E

19. Remove snap ring from the main drive gear bearing, using snap ring pliers.

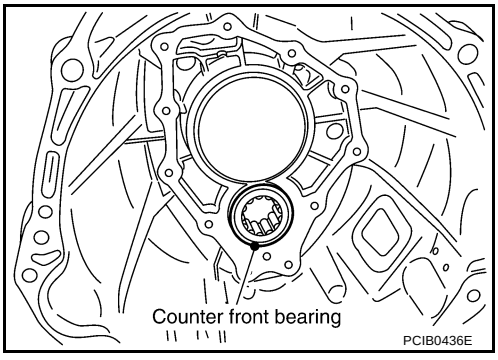

SCIA1532E

20. Using a soft hammer to carefully tap main shaft and counter shaft from the transmission case side, and then separate adapter plate and transmission case.



SCIA1687E

21. Remove counter front bearing from the transmission case.
22. Remove oil gutter from the transmission case.



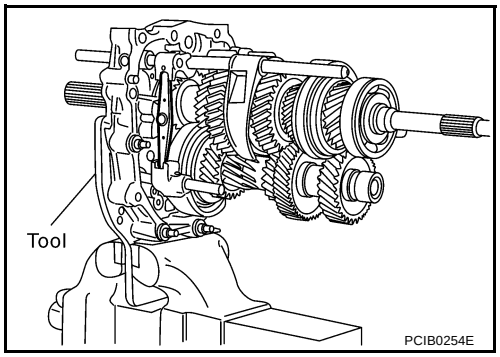
PCIB0436E

Shift Control Components

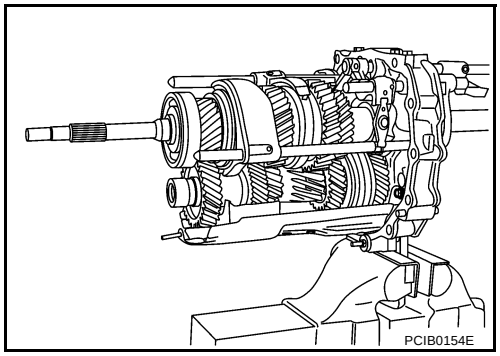
1. Install adapter setting plate to the adapter plate and then fixing in adapter setting plate using a vise.

   Tool number : ST224490000 (–)

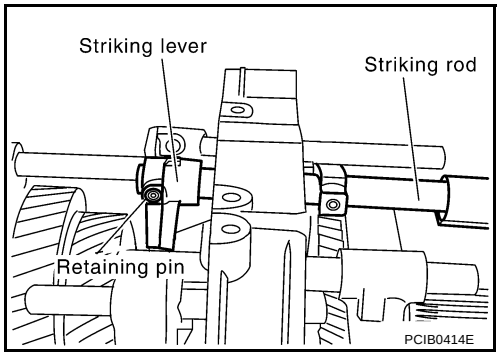
   CAUTION:
   Do not directly secure the surface in a vise.



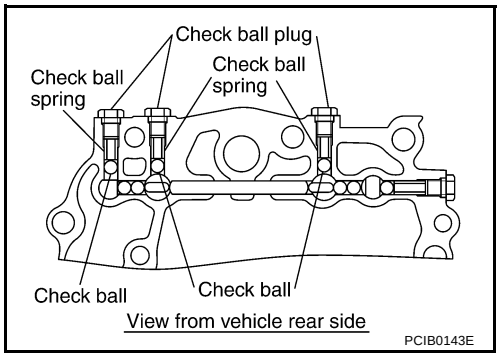
2. Remove baffle plate mounting bolts, and remove baffle plate from the adapter plate.



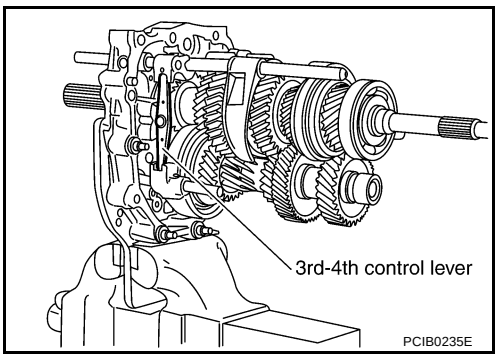
3. Remove magnet from the adapter plate.
4. Remove retaining pin using a pin punch [6 mm (0.24 in) dia.], and remove striking lever and striking rod.



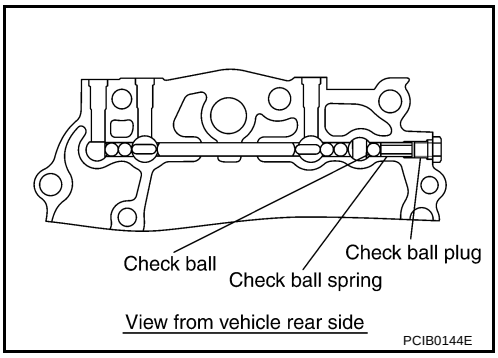
5. Remove check ball plug and then remove check ball spring and check ball from the adapter plate.



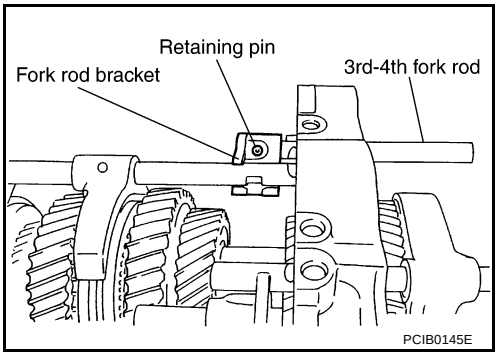
6. Remove 3rd - 4th control lever mounting bolts and then remove 3rd - 4th control lever and shifter cap.



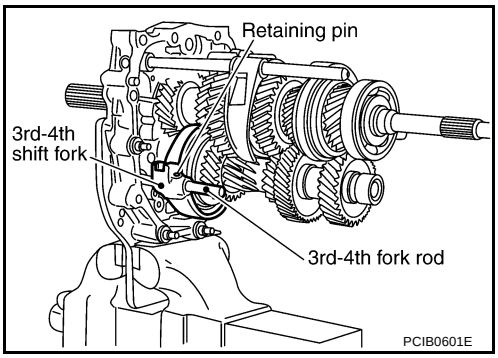
7. Remove check ball plug and then remove check ball spring and check ball from the adapter plate.



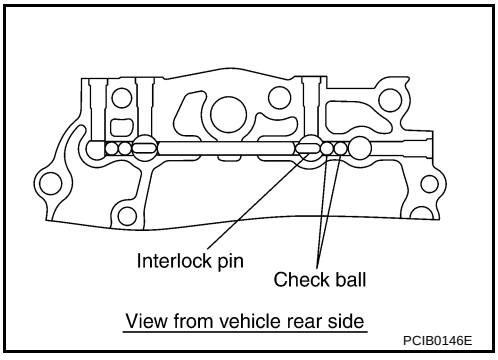
8. Using a pin punch [6 mm (0.24 in) dia.] to knock out retaining pin, and then remove 3rd - 4th fork rod bracket and 3rd - 4th fork rod.



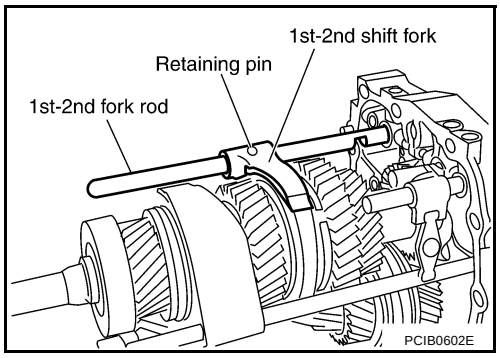
9. Using a pin punch [6 mm (0.24 in) dia.] to knock out retaining pin, and then remove 3rd - 4th shift fork and 3rd - 4th fork rod (reversal side).



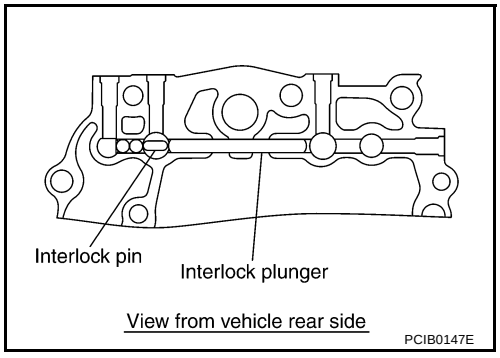
10. Remove check ball and interlock pin from the adapter plate.



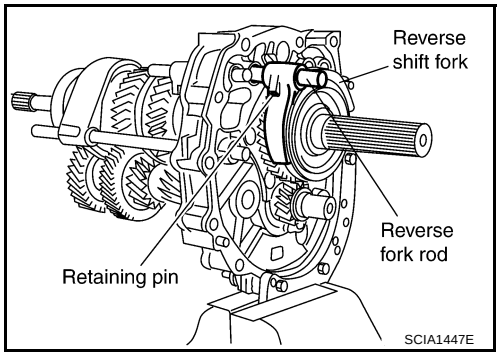
11. Using a pin punch [6 mm (0.24 in) dia.] to knock out retaining pin, and then remove 1st - 2nd shift fork and 1st - 2nd fork rod.



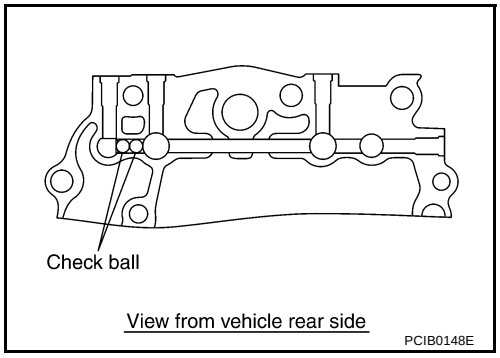
12. Remove interlock plunger and interlock pin from the adapter plate.



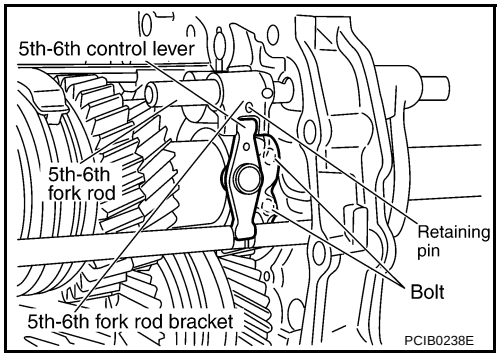
13. Using a pin punch [6 mm (0.24 in) dia.] to knock out retaining pin, and then remove reverse shift fork and reverse fork rod.



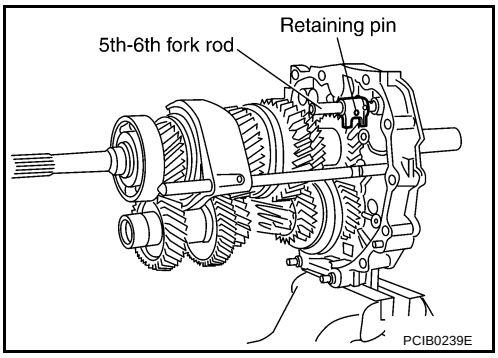
14. Remove check ball from the adapter plate.



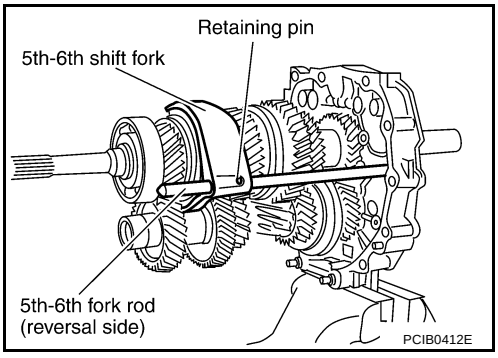
15. Remove 5th - 6th control lever mounting bolts and then remove 5th - 6th control lever from the adapter plate.



16. Using a pin punch [6 mm (0.24 in) dia.] to knock out retaining pin, and then remove 5th - 6th fork rod bracket and 5th - 6th fork rod.



17. Using a pin punch [6 mm (0.24 in) dia.] to knock out retaining pin, and then remove 5th - 6th fork rod (reversal side) and 5th - 6th shift fork.

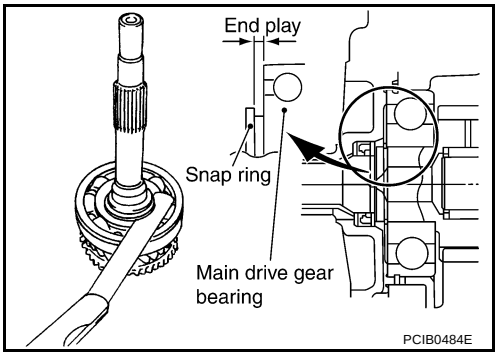


Gear Components

- Before disassembly, measure end play for each position. If the end play is outside the standards, disassemble and inspect.

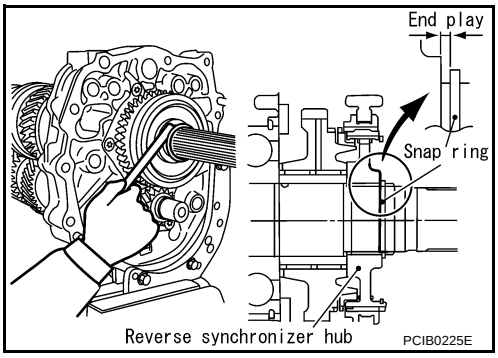
– Main drive gear

End play : 0 - 0.10mm (0 - 0.004in)



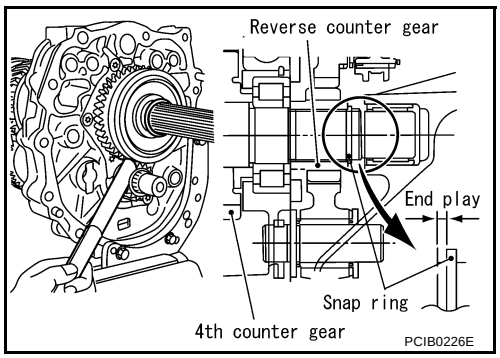
– Main shaft

End play : 0 - 0.10mm (0 - 0.004in)

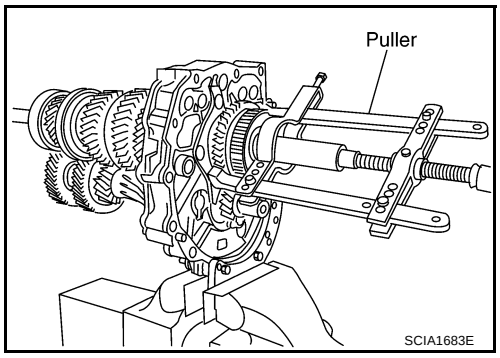


– Counter shaft

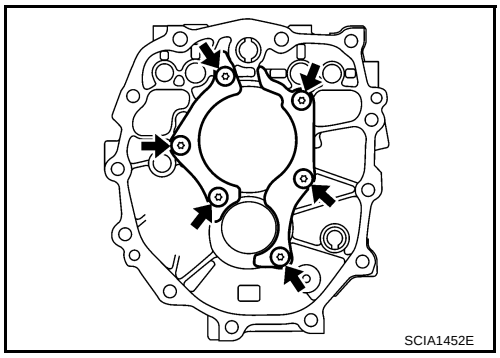
End play : 0 - 0.10mm (0 - 0.004in)



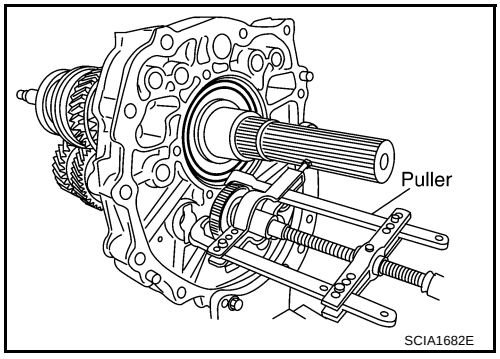
1. After removing snap ring and reverse coupling snap ring, using puller to remove reverse main gear and reverse synchronizer assembly.
2. Remove reverse main needle bearing.



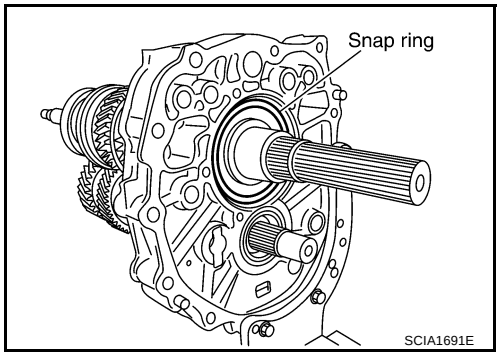
3. Remove main shaft bearing retainer mounting bolts and then remove main shaft bearing retainer.



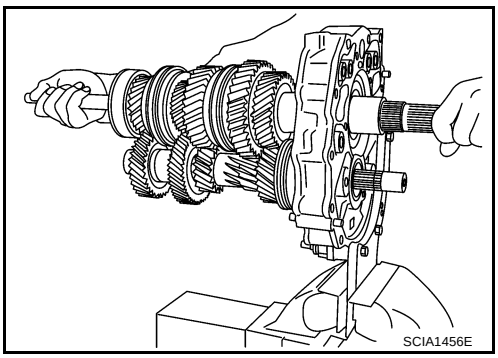
4. After removing snap ring, using the puller to remove reverse counter gear and counter rear bearing spacer.



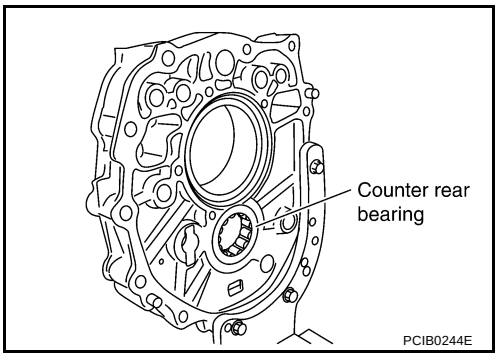
5. Remove snap ring from the main shaft bearing.



6. Carefully tap main shaft with a plastic hammer and then remove main shaft, main drive gear, and counter shaft from adapter plate.
7. Remove pilot bearing spacer and main pilot bearing.

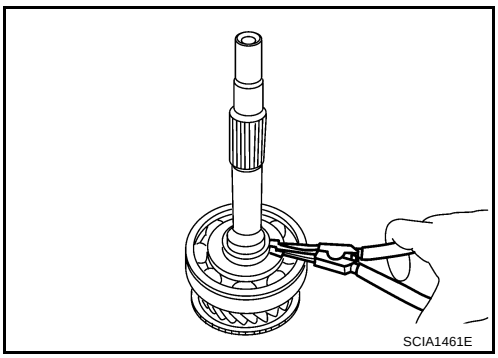

SCIA1456E

8. Remove counter rear bearing from the adapter plate.

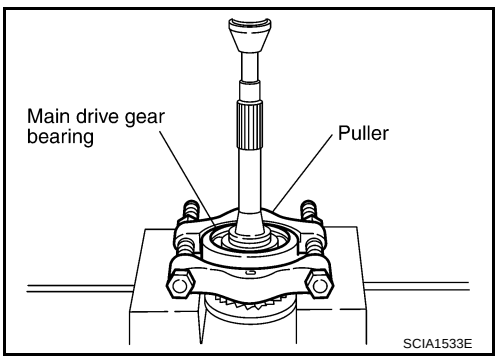


PCIB0244E

9. Remove snap ring from the main drive gear using snap ring pliers.

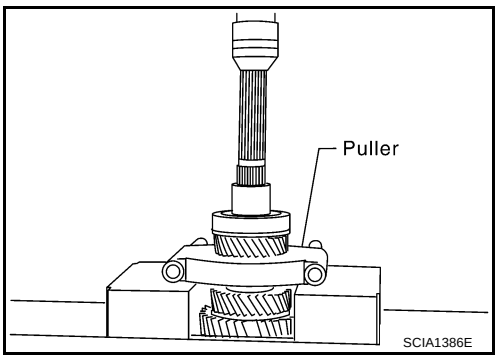

SCIA1461E

10. Set the suitable puller on the main drive gear and then using a press to remove main drive gear bearing from the main drive gear.



SCIA1533E

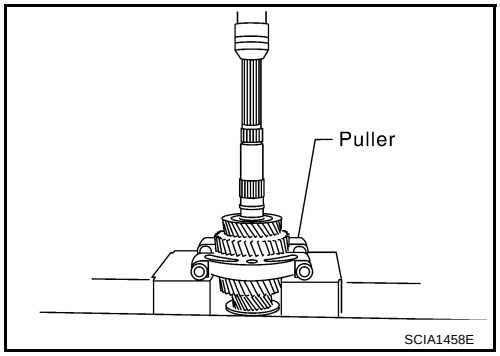
11. Using a press to remove the reverse main gear bushing, main shaft bearing and 4th main gear.



SCIA1386E

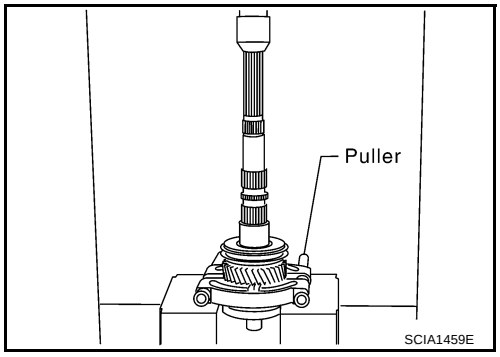
12. Remove 3rd - 4th main spacer.
13. Using a press to remove 1st main gear and 3rd main gear.

    CAUTION:
    Be careful not to damage the baulk ring.
14. Remove 1st needle bearing.

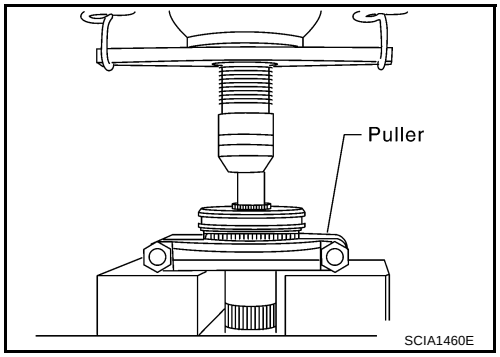


15. Using a press to remove 1st gear bushing, 1st - 2nd synchronizer assembly, and 2nd main gear.

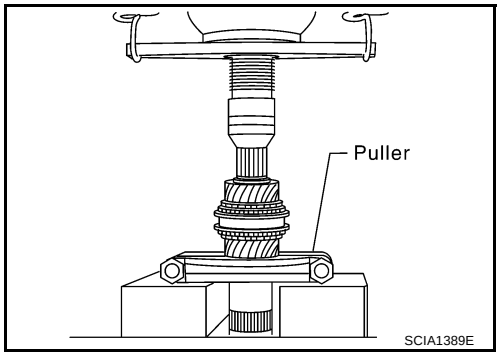
    CAUTION:
    Be aware that when using the press, if the main shaft gear positioner catches on the V-block, etc., the main shaft could be damaged.
16. Remove 2nd needle bearing.



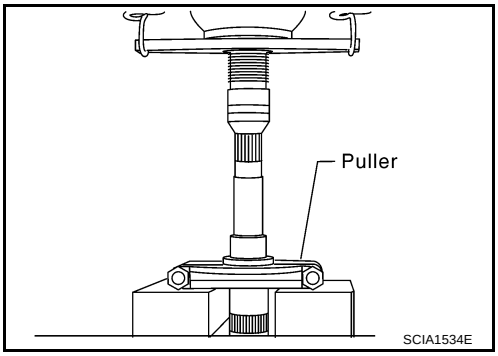
17. After removing snap ring, using a press to remove 6th main gear and 5th - 6th synchronizer assembly.
18. Remove 6th needle bearing.



19. Using a press to remove the 3rd counter gear, 3rd - 4th synchronizer assembly, 4th counter gear, 4th needle bearing, 4th gear bushing, 4th counter gear thrust washer, and counter rear bearing inner race.
20. Remove 3rd needle bearing.



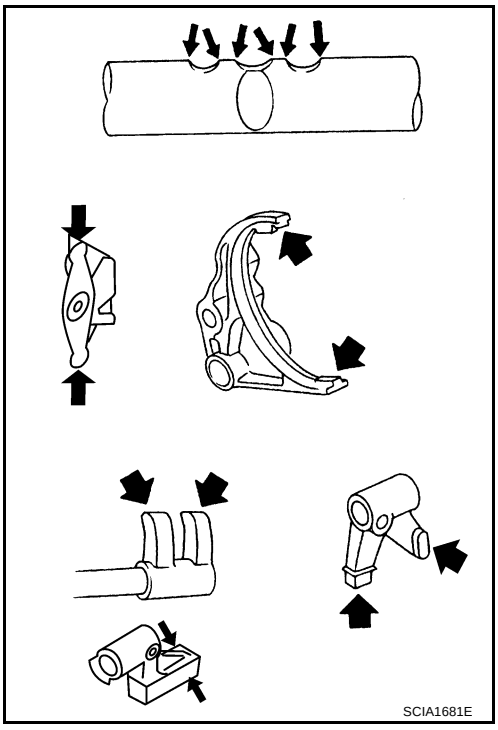
21. Using a press to remove the 3rd gear bushing.



INSPECTION AFTER DISASSEMBLY

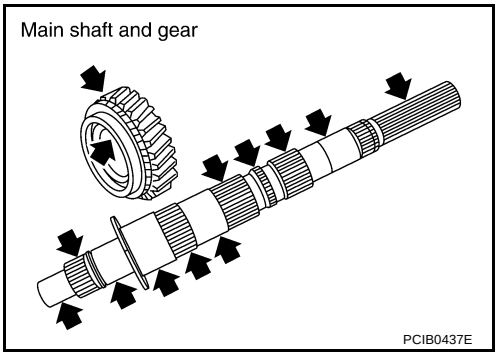
Shift Control

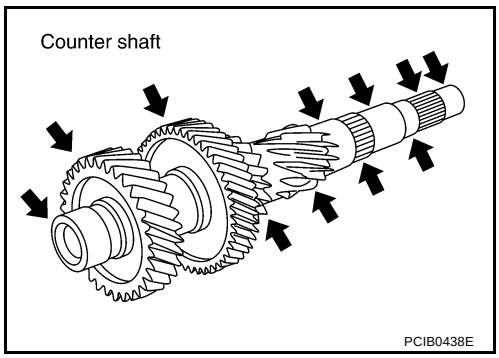
If the contact surface on striking lever, fork rod, shift fork, etc. has excessive wear, abrasion, bend, or any other damage, replace the components.



Gear and Shaft

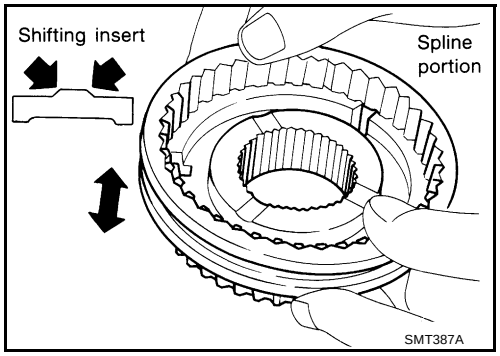
If the contact surface on each gear, main shaft, main drive gear, and counter shaft, etc. has damage, peeling, abrasion, dent, bent, or any other damage, replace the components.



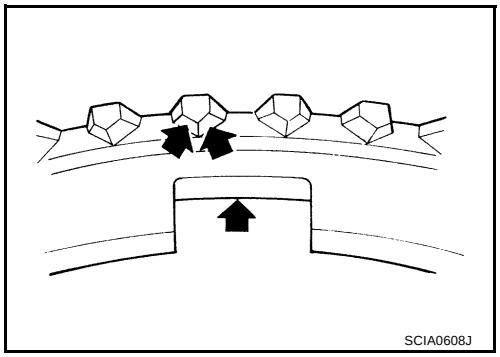


Synchronizer

- If the contact surface on coupling sleeve, synchronizer hub, and shifting insert has damage or abrasion, replace the components.
- Coupling sleeve and synchronizer hub shall move smoothly.



- If the cam surface on baulk ring or contact surface on insert has damage or excessive wear, replace with a new one.
- If spread spring damaged, replace with a new one.



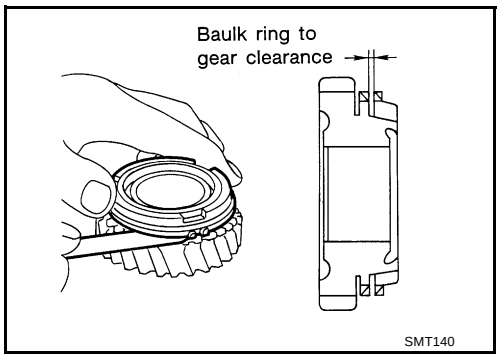
Baulk Ring Clearance

- Single Cone Synchronizer (5th & 6th)
  Push baulk ring on the cone and measure baulk ring back surface clearance at two locations or more on opposite sides, find the average value, and replace it if it is outside the limit value.

  Clearance

  Standard : 0.70 - 1.25 mm (0.028 - 0.049 in)

  Limit value : 0.5 mm (0.020 in) or less

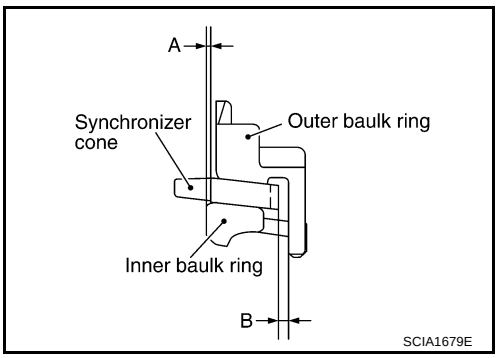


- Double Cone Synchronizer (1st & 3rd & 4th)

Follow the instructions below and inspect the clearance of the outer baulk ring, synchronizer cone, inner baulk ring.

CAUTION:

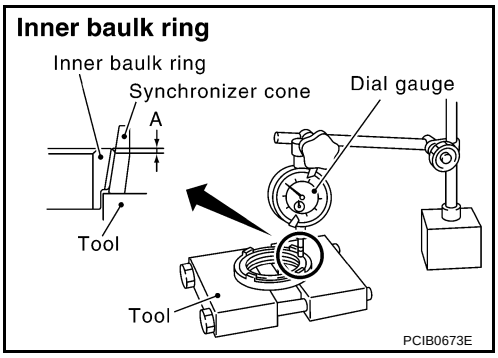
Clearances “A” and “B” of the outer baulk ring, synchronizer cone, and inner baulk ring are controlled as a set, so if the clearance is outside the limit value, replace the synchronizer assembly.



1. Using a dial gauge, measure clearance A at 2 or more points diagonally opposite, and calculate mean value.

Clearance A

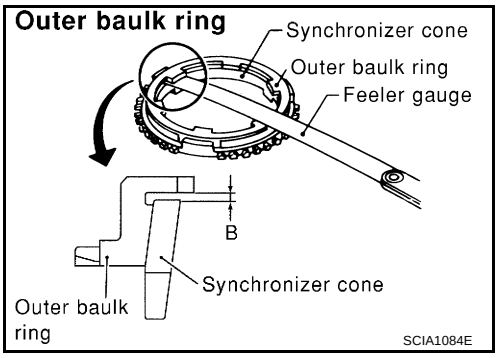
Standard	**: 0.5 - 0.7 mm (0.020 - 0.028 in)**
Limit value	**: 0.3 mm (0.012 in) or less**
Tool number	**: ST30031000 (J22912 - 01)**



2. Using a feeler gauge, measure clearance B at 2 or more points diagonally opposite, and calculate mean value.

Clearance B

Standard(1st)	**: 1.0 - 1.5mm(0.039 - 0.059 in)**
Standard(3rd,4th)	**: 0.85 - 1.35mm (0.033 - 0.053 in)**
Limit value	**: 0.7mm(0.028 in) or less**

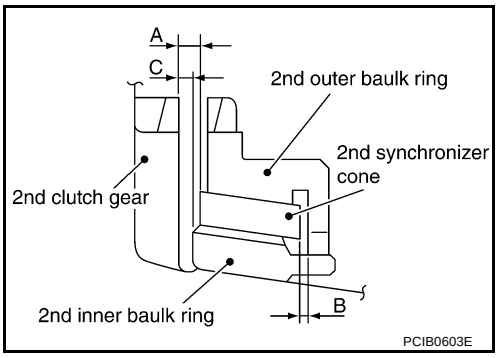


- Triple cone synchronizer (2nd)

Check clearance for 2nd outer baulk ring, 2nd synchronizer cone, and 2nd inner baulk ring of triple cone synchronizer following the direction.

NOTE:

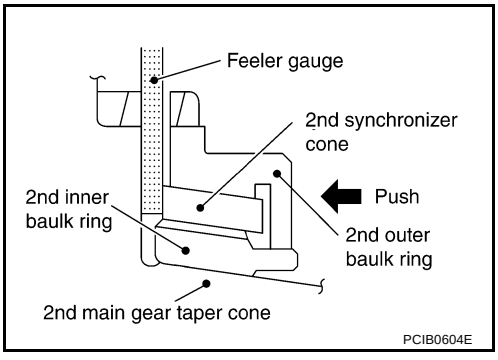
2nd outer baulk ring, 2nd synchronize cone, and 2nd inner baulk ring, three control“clearance A, B and C” as a three-piece suite.If the value exceeds the limit value, replace them as a three-piece suite.



1. Using feeler gauge put and press baulk ring on 2nd main gear taper cone, and then measure “clearance A” at more then 2 diagonal points, and calculate the average.

Clearance A

Reference value	**: 0.6-1.3 mm (0.024 - 0.051in)**
Limit value	**: 0.3mm (0.012 in) or less**

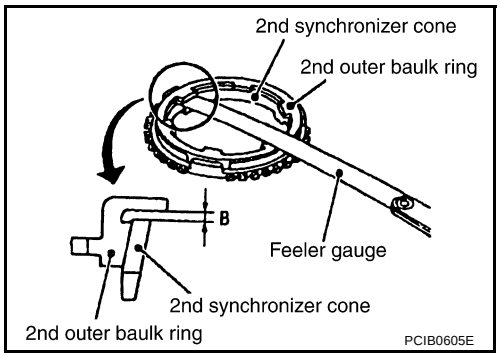


2. Using feeler gauge measure “clearance B” at more than 2 diagonal positions, and calculate the average.

Clearance B

Reference value : 0.85 - 1.35 mm (0.033 - 0.053in)

Limit value : 0.7mm (0.028 in) or less

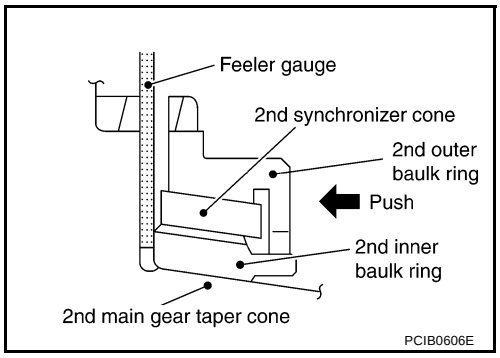


3. Using filler gauge put and press baulk ring on 2nd main gear taper cone, and then measure “clearance C” at more then 2 diagonal points, and calculate the average.

Clearance C

Reference value : 0.7-1.25 mm (0.028 - 0.049in)

Limit value : 0.3mm (0.012 in) or less

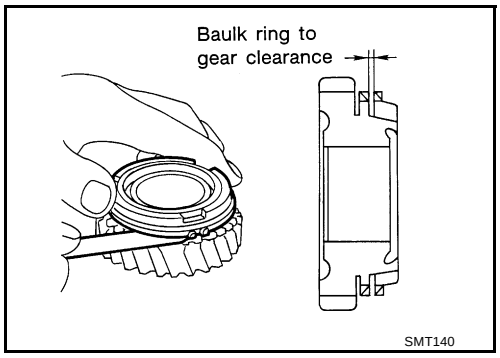


- Reverse Synchronizer
  Push baulk ring on the cone and measure baulk ring back surface clearance at two locations or more on opposite sides, find the average value, and replace if it is outside the limit value.

Clearance

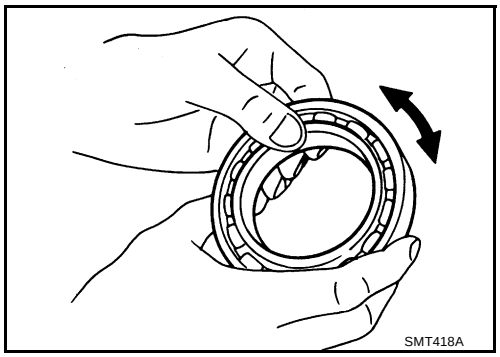
Standard : 0.75-1.2 mm (0.030 - 0.047 in)

Limit value : 0.5 mm (0.020 in) or less



Bearing

If the bearing does not rotate smoothly or the contact surface on ball or race is damaged or peeled, replace with new ones.



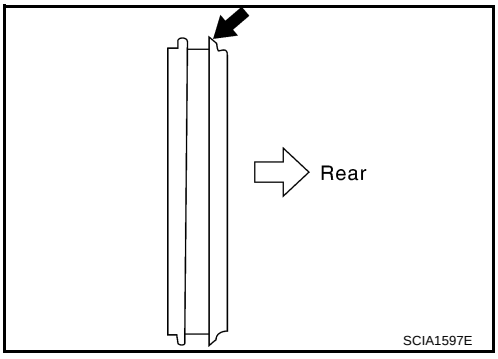
ASSEMBLY

Gear Components

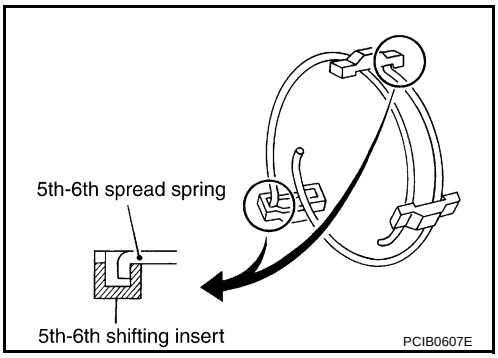
1. Install 5th - 6th coupling sleeve and 5th - 6th shifting insert in the 5th - 6th synchronizer hub.

CAUTION:

Install 5th - 6th coupling sleeve with the larger chamfer on the rear side.

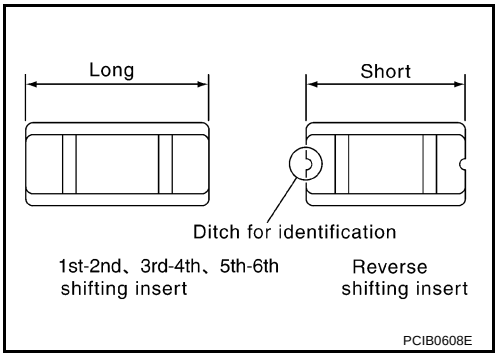


2. Install 5th - 6th spread spring in the 5th - 6th shifting insert.



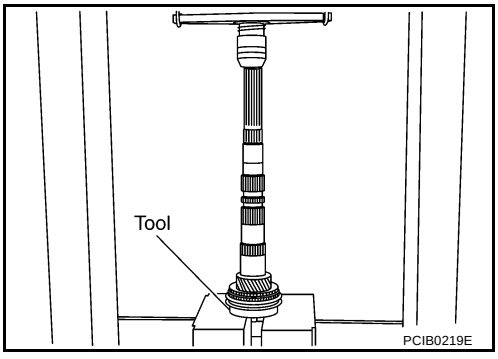
CAUTION:

- **Do not install 5th - 6th spread spring hook onto the same 5th - 6th shifting insert.**
- **Be careful with the shape of reserve shifting insert to avoid misassembly.**



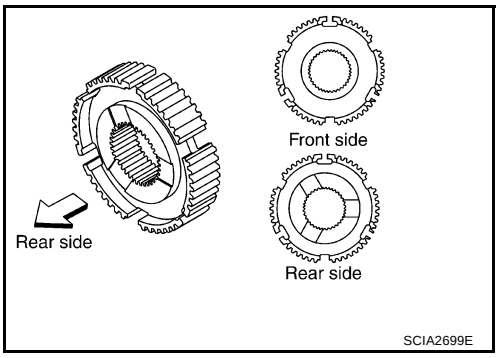
3. Install 6th needle bearing, 6th main gear and 6th baulk ring on the main shaft and then using an inserter and a press to press fit the 5th - 6th synchronizer assembly.

Tool number : ST30911000 (—)



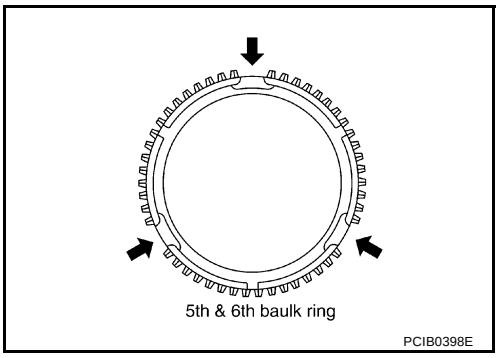
CAUTION:

- **The 5th - 6th synchronizer hub is not reusable. Never reuse it.**
- **When press fitting, install with the side having the three boss edge oil grooves facing the rear side.**



NOTE:

5th and 6th baulk rings have three spaces that two gear teeth are missing as shown in the figure.

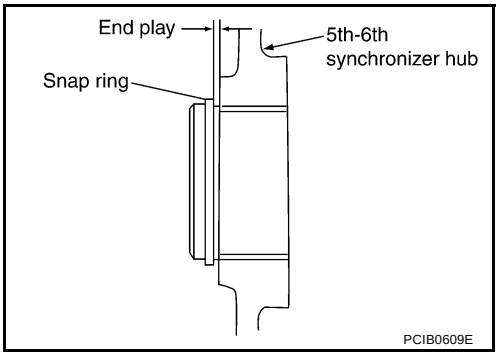


4. Select and install a snap ring so that the end play comes within the standard value. Refer to MT-59, "Snap Rings" .

   End play : 0 - 0.10 mm (0 - 0.004 in)

   CAUTION:

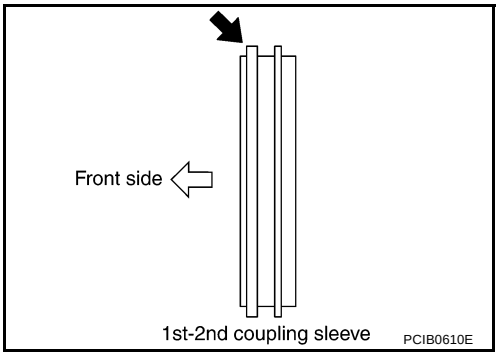
   Snap rings are not reusable. Never reuse them.



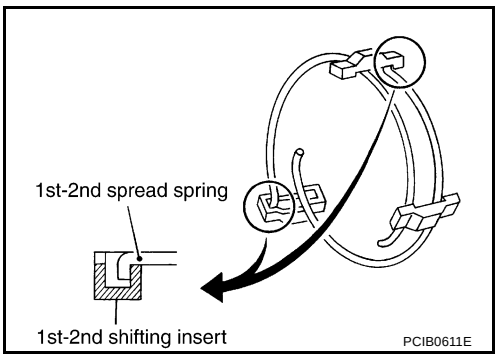
5. Install 1st - 2nd coupling sleeve and 1st - 2nd shifting insert into the 1st - 2nd synchronizer hub.

   CAUTION:

   Install 1st - 2nd coupling sleeve with the thicker flange faced the front side.

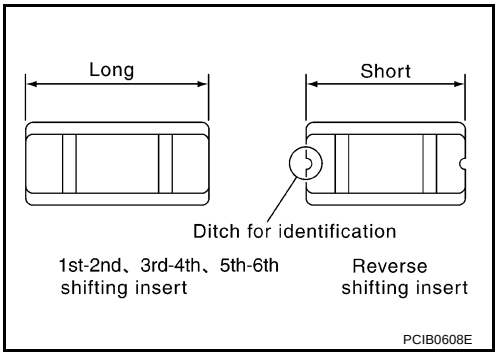


6. Install 1st - 2nd spread spring in the 1st - 2nd shifting insert.



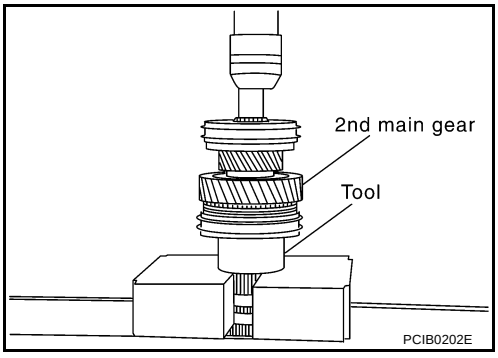
CAUTION:

- **Do not install 1st - 2nd spread spring hook onto the same 1st - 2nd shifting insert.**
- **Be careful with the shape of reverse shifting insert to avoid misassembly.**



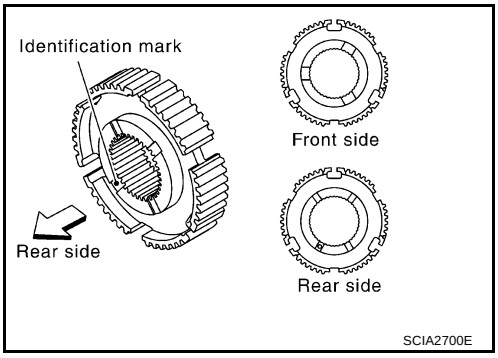
7. Install 2nd main gear, 2nd needle bearing, 2nd inner baulk ring, 2nd synchronizer cone, 2nd outer baulk ring on the main shaft and then using a support ring and a press to press fit the 1st - 2nd synchronizer assembly.

Tool number : ST27861000 (—)

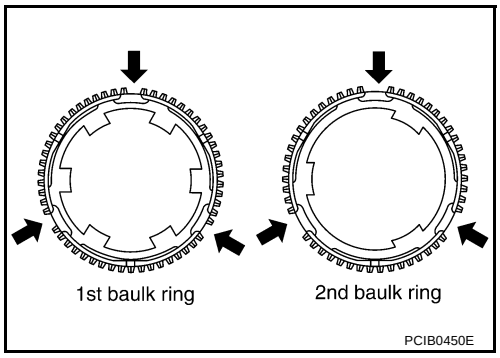


CAUTION:

- **The 1st - 2nd synchronizer hub is not reusable. Never reuse it.**
- **When press fitting, install with the side having the three boss edge oil grooves facing the front side.**

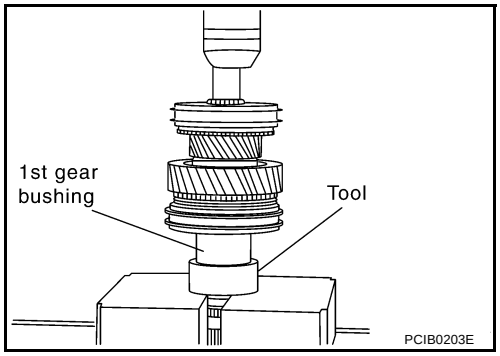


NOTE:
1st baulk ring has three spaces that one gear tooth is missing and 2nd baulk ring has three spaces that two gear teeth are missing.



8. Using a support ring and a press to press fit the 1st gear bushing.

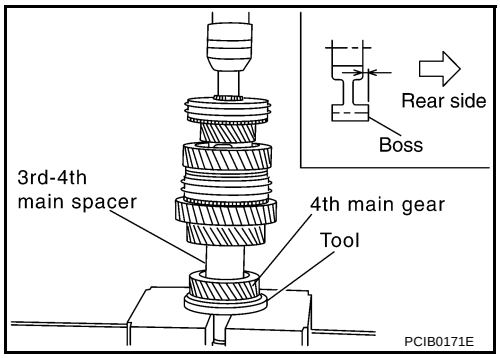
   Tool number : ST27861000 (—)



9. Install 1st outer baulk ring, 1st synchronizer cone, 1st inner baulk ring, 1st needle bearing, and 1st main gear on the main shaft and then using the inserter and a press to press fit the 3rd main gear.

   Tool number : ST30022000 (—)

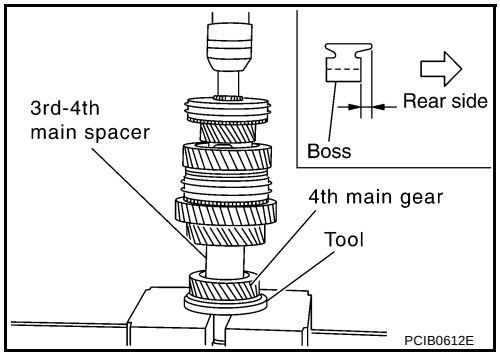
   CAUTION:
   3rd main gear is not reusable. Never reuse it.



10. Install 3rd - 4th main spacer on the main shaft and then using the inserter and a press to press fit the 4th main gear.

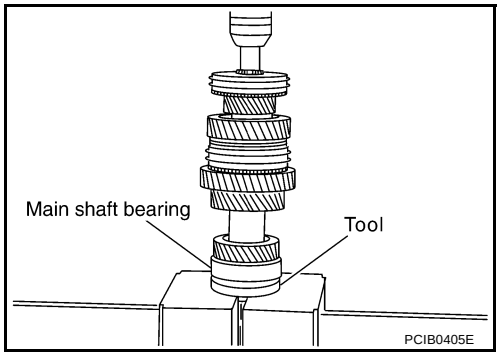
    Tool number : ST30022000 (—)

    CAUTION:
    - **4th main gear is not reusable. Never reuse it.**
    - **When installing, set boss to rear side.**



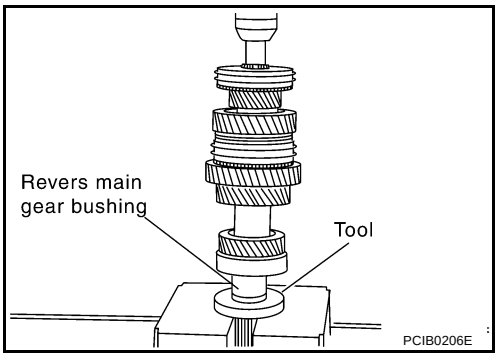
11. Using the inserter and a press to press fit the main shaft bearing onto the main shaft.

    Tool number : ST30911000 (—)



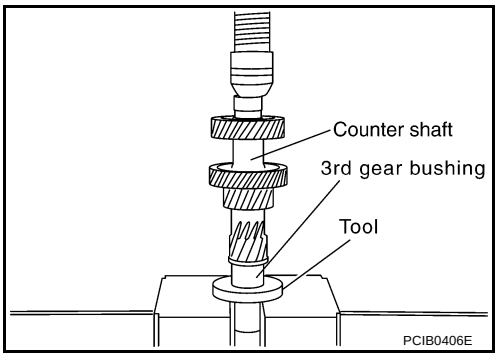
12. Using the inserter and a press to press fit the reverse main gear bushing onto the main shaft.

    Tool number : ST30911000 (—)



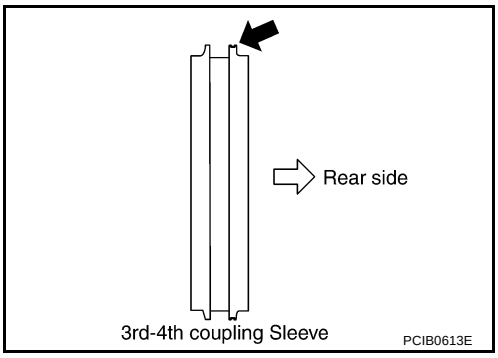
13. Using the inserter and a press to press fit the 3rd gear bushing onto the counter shaft.

    Tool number : ST30911000 (—)

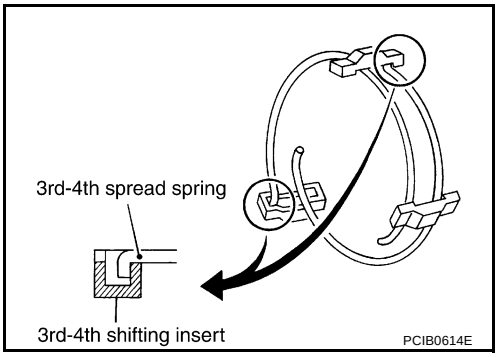


14. Install 3rd - 4th coupling sleeve and 3rd - 4th shifting insert into the 3rd - 4th synchronizer hub.

    CAUTION:
    Install 3rd - 4th coupling sleeve with the thicker flange faced the front side.

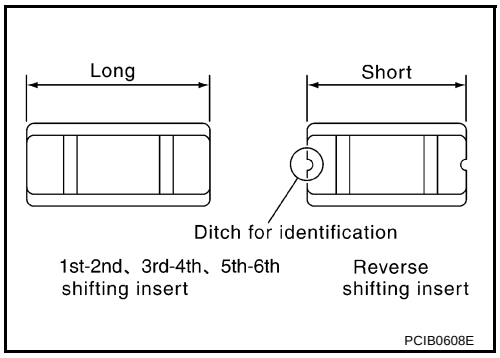


15. Install 3rd - 4th spread spring in the 3rd - 4th shifting insert.



CAUTION:

- **Do not install 3rd- 4th spread spring hook onto the same 3rd- 4th shifting insert.**
- **Be careful with the shape of reverse shifting insert to avoid misassembly.**

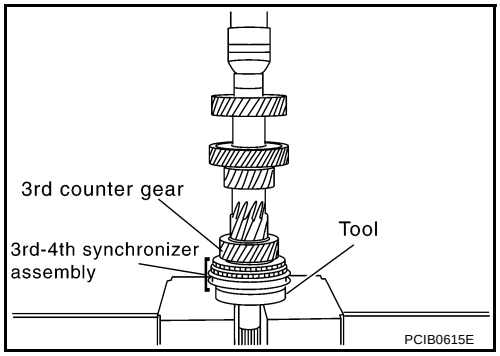


16. Install 3rd needle bearing,3rd counter gear,3rd inner baulk ring,3rd synchronizer cone, and 3rd outer baulk ring on the counter shaft and then using the inserter and a press to press fit the 3rd - 4th synchronizer assembly.

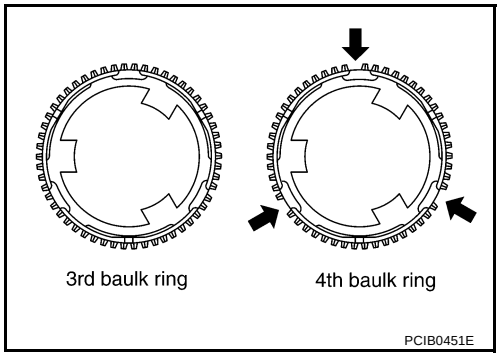
    Tool number : ST30911000 (—)

CAUTION:

- **The 3rd - 4th synchronizer hub is not reusable. Never reuse it.**

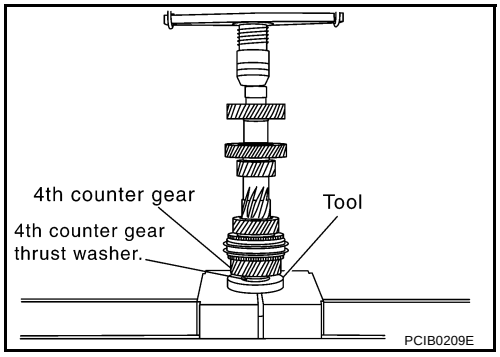


NOTE:
4th baulk ring has three spaces that one gear tooth is missing but 3rd baulk ring doesn't.



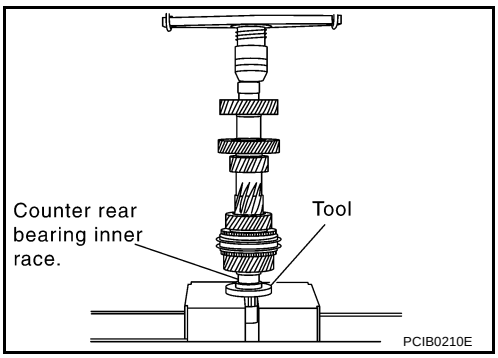
17. Install 4th outer baulk ring,4th synchronizer cone,4th inner baulk ring,4th needle bearing, and 4th counter gear onto the counter shaft and then using the inserter and a press to press fit the 4th gear bushing and 4th counter gear thrust washer.

    Tool number : KV40100630 (J26092)



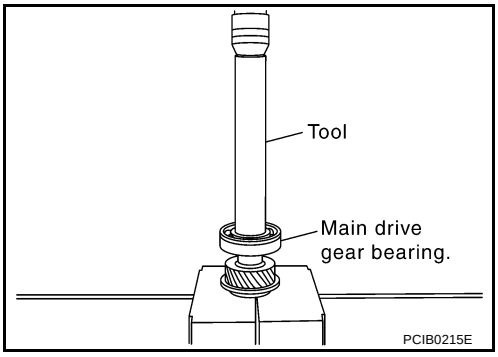
18. Using the inserter and a press to press fit the counter rear bearing inner race onto the counter shaft.

Tool number : ST30032000 (J26010-01)



19. Using the drift and a press to press fit the main drive gear bearing onto the main drive gear.

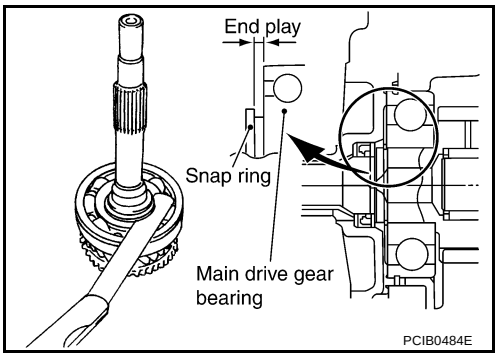
Tool number : KV32102700 (—)



20. Select and install a snap ring to the main drive gear bearing so that the end play comes within the standard value. Refer to MT-59, "Snap Rings" .

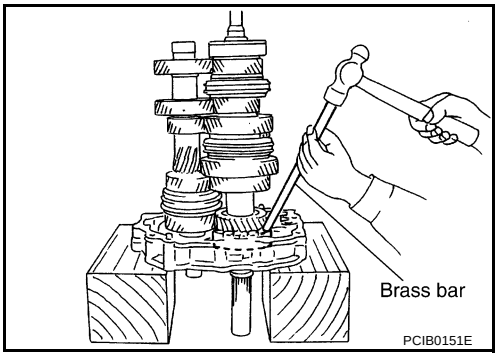
End play : 0 - 0.10 mm (0 - 0.004 in)

CAUTION:
Snap rings are not reusable. Never reuse them.

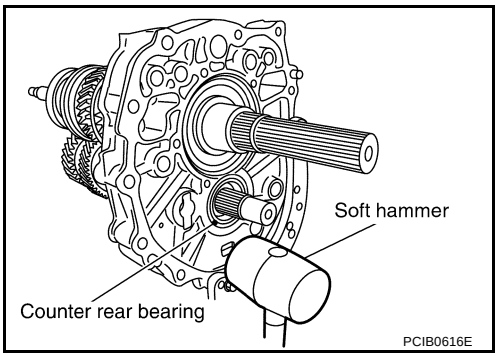


21. Install main shaft and counter shaft combined in one unit to adapter plate, and fix bearing with snap ring.

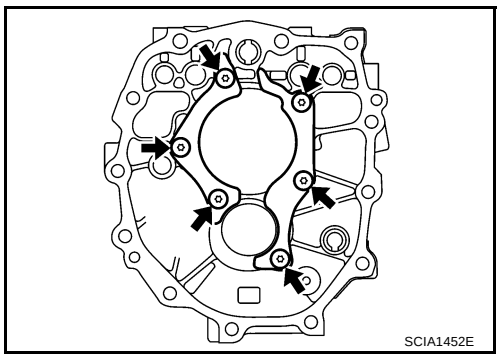
CAUTION:
Snap rings are not reusable. Never reuse them.



22. Install counter rear bearing onto the adapter plate using soft hammer or the equivalent.

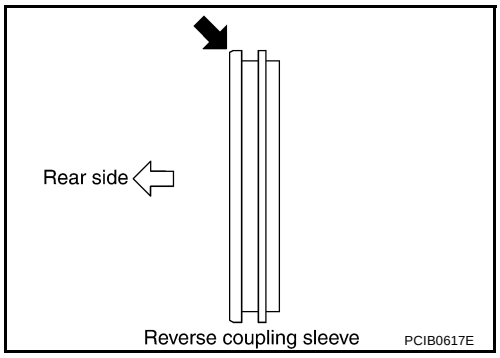


23. Apply genuine medium strength locking sealant or equivalent refer to GI section to the end of the bolt (first 3 to 4 threads), screw the bolt into the main shaft bearing retainer, and tighten it to the specified torque. Refer to MT-22, "CASE COMPONENTS" .



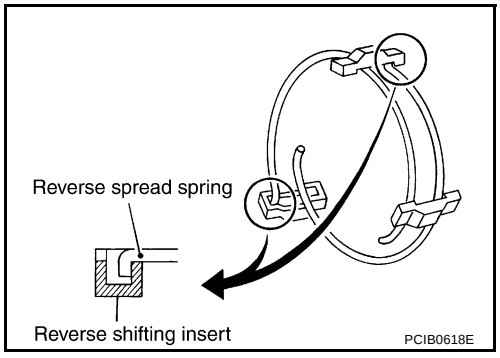
24. Install reverse coupling sleeve and reverse shifting insert into the reverse synchronizer hub.

CAUTION:
Install reverse coupling sleeve with the flat flange on the rear side.



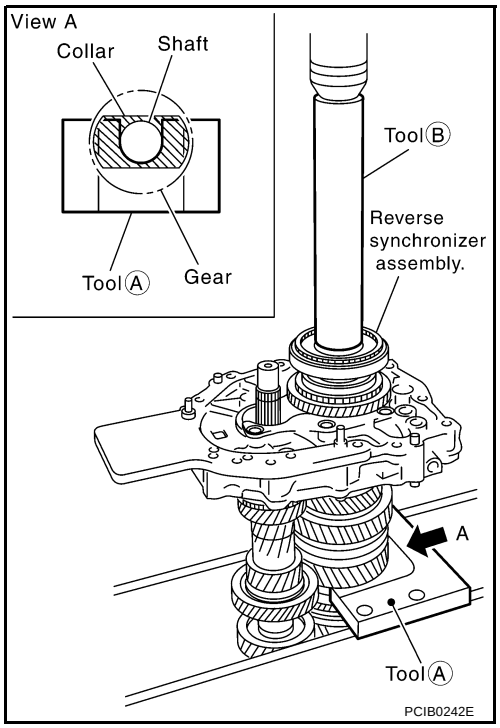
25. Install reverse spread spring in the reverse shifting insert.

CAUTION:
Do not install reverse spread spring hook onto the same reverse shifting insert.



26. After installing reverse main gear bushing, reverse main needle bearing, reverse main gear, and reverse baulk ring onto the main shaft, using the drift and press plate and a press to press fit the reverse synchronizer assembly.

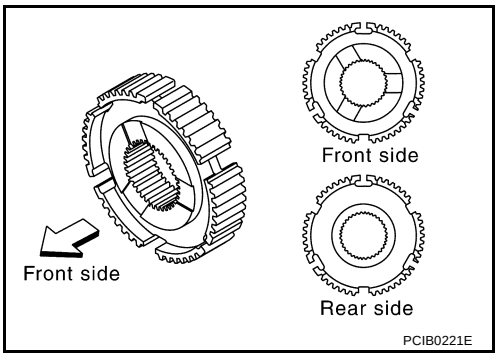
Tool number (A) : KV32103300 (J46529)
Tool number (B) : ST01530000 (—)



CAUTION:

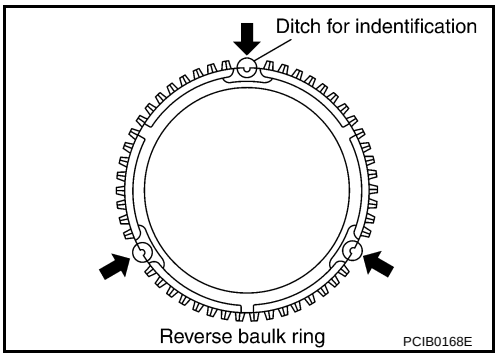
- **The reverse synchronizer hub is not reusable. Never reuse it.**
- **When installing, face the side with three ditches to the front side.**

27. Install reverse coupling snap ring.



NOTE:

Reverse baulk ring has three spaces that two gear teeth are missing, and each space has small ditch for identification as shown in the figure.

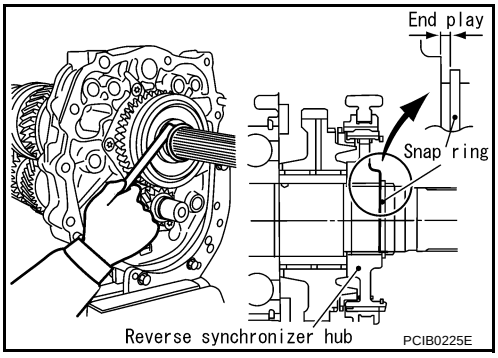


28. Select and install a snap ring so that the end play comes within the standard value. Refer to MT-59, "Snap Rings" .

End play : 0 - 0.10 mm (0 - 0.004 in)

CAUTION:

Snap rings are not reusable. Never reuse them.

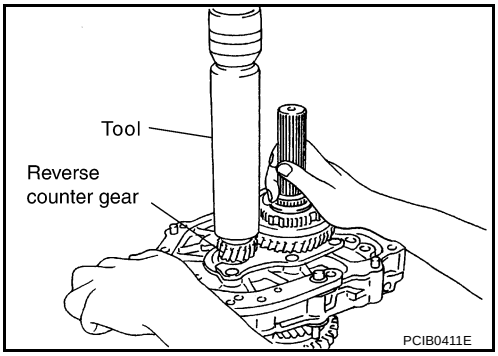


29. After installing counter rear bearing spacer, press and fit reverse counter gear onto counter shaft with drift and press.

Tool number : ST23860000 (—)

CAUTION:

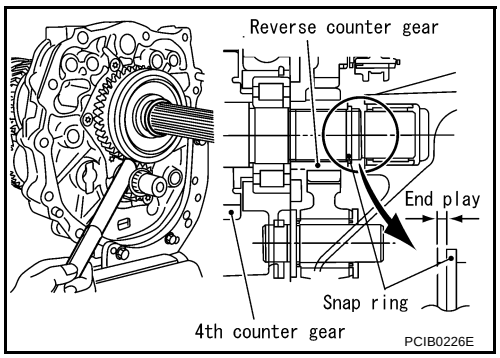
- **Reverse counter gear is not reusable. Never reuse it.**
- **When installing counter rear bearing spacer, maker's stamp should face to the rear**



30. Select and install a snap ring so that the end play comes within the standard value. Refer to MT-59, "Snap Rings" .

End play : 0 - 0.10 mm (0 - 0.004 in)

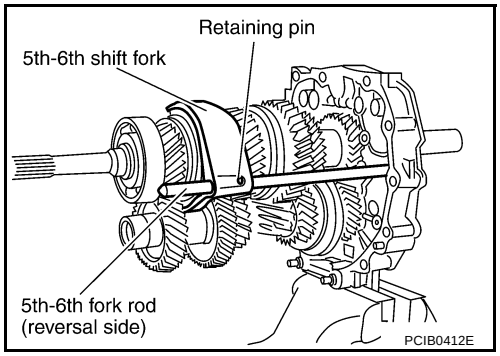
CAUTION:
Snap rings are not reusable. Never reuse them.



Shift Control Components

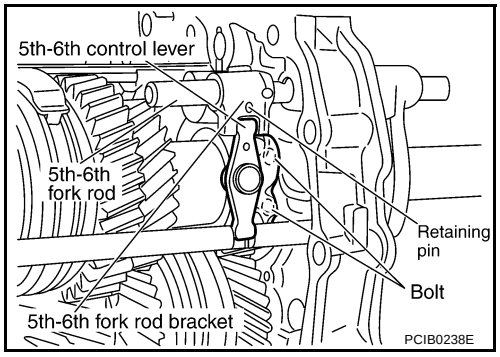
1. Install 5th-6th shift fork to the 5th - 6th coupling sleeve.
2. Install 5th-6th fork rod (reversal side) to the 5th - 6th shift fork.
3. Using a pin punch [6 mm (0.24in) dia.] to tap the retaining pin into the 5th - 6th shift fork.

CAUTION:
Retaining pins are not reusable. Never reuse them.



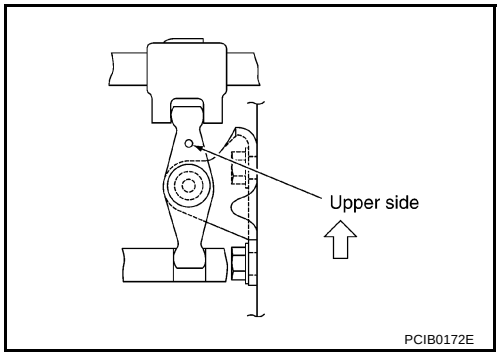
4. Install 5th - 6th fork rod to the adapter plate.
5. Install 5th - 6th fork rod bracket to the 5th - 6th fork rod.
6. Using a pin punch [6 mm (0.24in) dia.] to tap the retaining pin into the 5th - 6th fork rod bracket.

CAUTION:
Retaining pins are not reusable. Never reuse them.

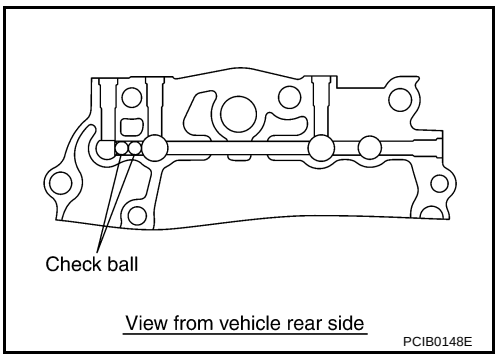


7. Install 5th - 6th control lever to the adapter plate and then tighten mounting bolts to the specified torque. Refer to MT-25, "SHIFT CONTROL COMPONENTS" .

CAUTION:
Set the projection upward.

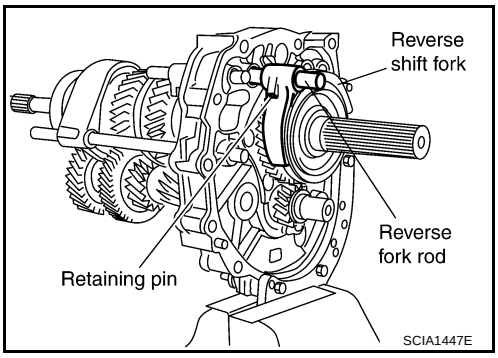


8. Install check ball to the adapter plate.

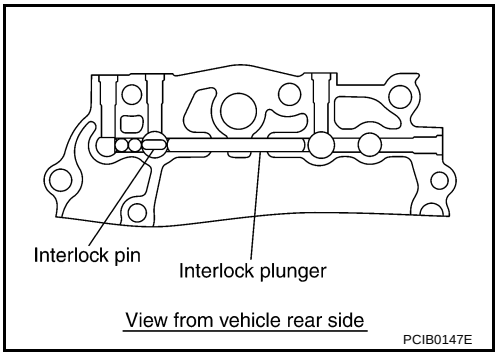


9. Install reverse shift fork to the reverse coupling sleeve.
10. Install reverse fork rod to the reverse shift fork.
11. Using a pin punch [6 mm (0.24 in) dia.] to tap the retaining pin into the reverse shift fork.

CAUTION:
Retaining pins are not reusable. Never reuse them.

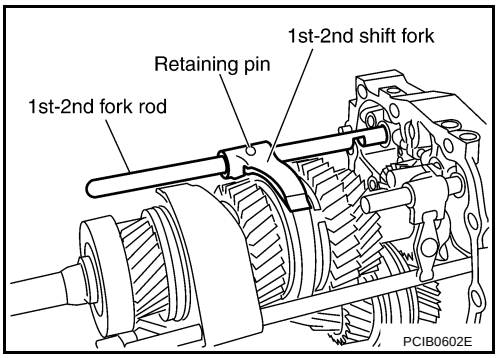


12. Install interlock pin and interlock plunger to the adapter plate.



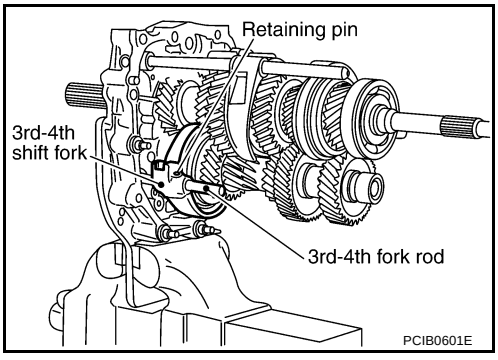
13. Install 1st-2nd shift fork to the 1st - 2nd coupling sleeve.
14. Install 1st-2nd fork rod to the 1st - 2nd shift fork.
15. Using a pin punch [6 mm (0.24 in) dia.] to tap the retaining pin into the 1st - 2nd shift fork.

CAUTION:
Retaining pins are not reusable. Never reuse them.

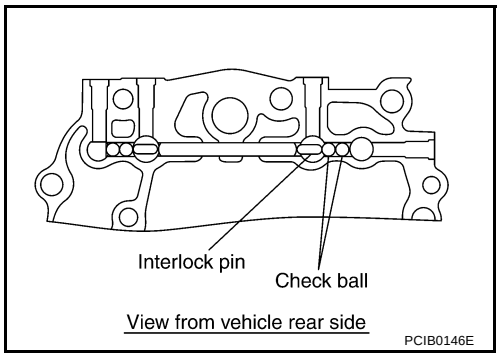


16. Install 3rd-4th shift fork to the 3rd - 4th coupling sleeve.
17. Install 3rd-4th fork rod (reversal side) to the 3rd - 4th shift fork.
18. Using a pin punch [6 mm (0.24 in) dia.] to tap the retaining pin into the 3rd - 4th shift fork (reversal side).

CAUTION:
Retaining pins are not reusable. Never reuse them.

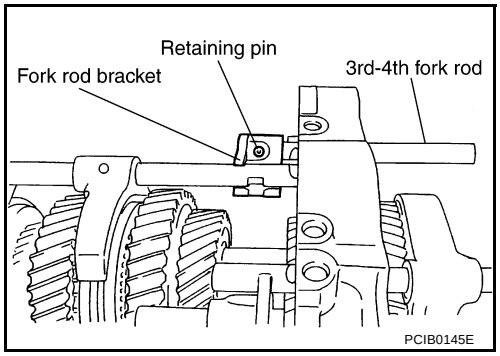


19. Install interlock pin and check ball to the adapter plate.

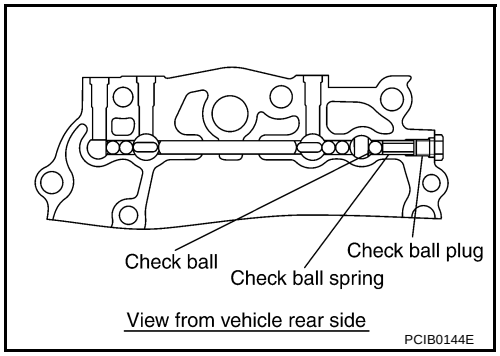


20. Install 3rd-4th fork rod to the adapter plate.
21. Install 3rd-4th fork rod bracket to the 3rd - 4th fork rod.
22. Using a pin punch [6 mm (0.24 in) dia.] to tap the retaining pin into the 3rd - 4th fork rod bracket.

CAUTION:
Retaining pins are not reusable. Never reuse them.

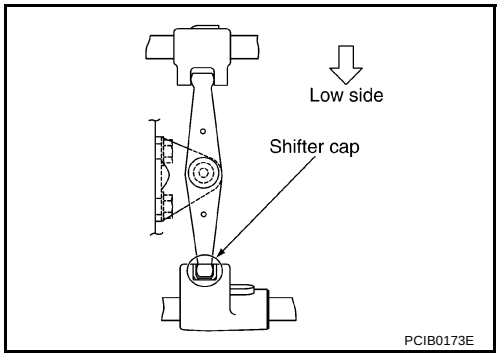


23. Install check ball, check ball spring into the adapter plate, apply genuine anaerobic liquid gasket or equivalent refer to GI section to the check ball plug threads, and tighten check ball plug to the specified torque. Refer to MT-25, "SHIFT CONTROL COMPONENTS" .

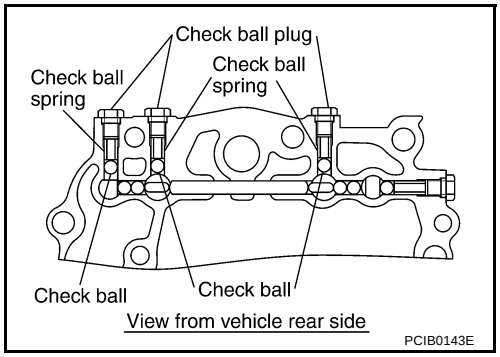


24. Install 3rd - 4th control lever to the adapter plate, and then tighten mounting bolts to the specified torque. Refer to MT-25, "SHIFT CONTROL COMPONENTS" .

CAUTION:
Make sure the top and bottom are oriented correctly.

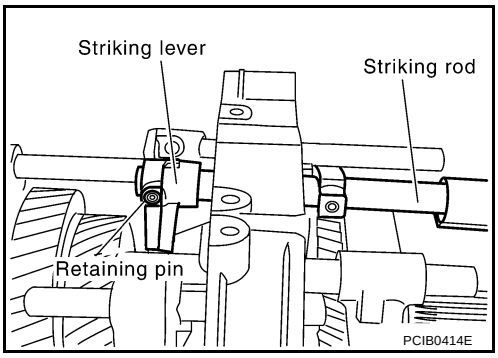


25. Install check ball, check ball spring into the adapter plate, apply genuine anaerobic liquid gasket or equivalent refer to GI section to the check ball plug threads, and tighten check ball plug to the specified torque. Refer to MT-25, "SHIFT CONTROL COMPONENTS" .

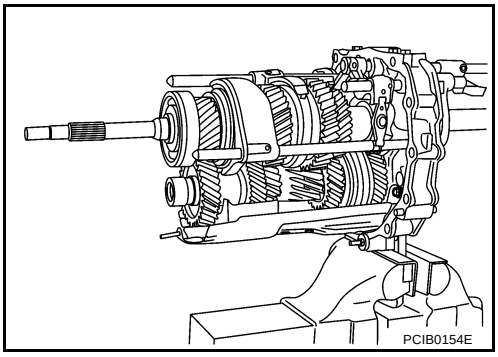


26. Install striking rod to the adapter plate.
27. Install striking lever to the striking rod.
28. Using a pin punch [6 mm (0.24 in) dia.] to tap the retaining pin into the striking lever.

CAUTION:
Retaining pins are not reusable. Never reuse them.

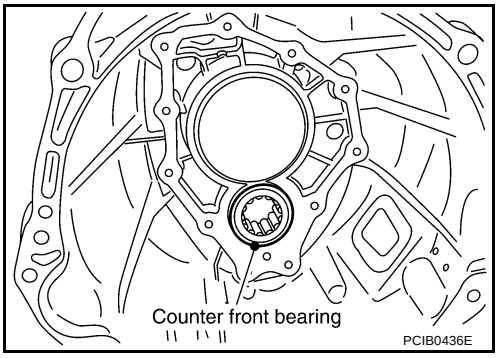


29. Install magnet to the adapter plate.
30. Install baffle plate to the adapter plate, and then tighten mounting bolts to the specified torque.



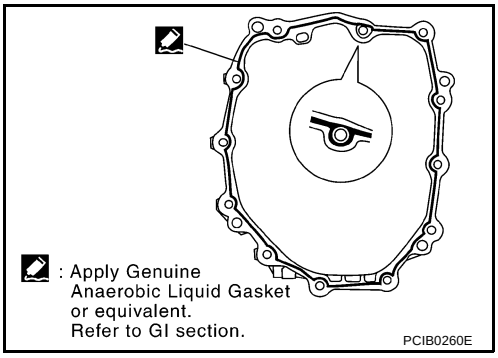
Case Components

1. Install counter front bearing to the transmission case.
2. Install oil gutter to transmission case.

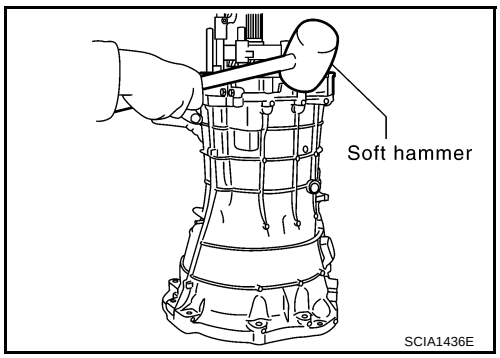


3. Apply genuine anaerobic liquid gasket or equivalent refer to GI section to the transmission case adapter plate mounting surface as shown in the figure.

CAUTION:
Complete remove all moisture and oil, etc., from the transmission case and adapter plate mounting surfaces.

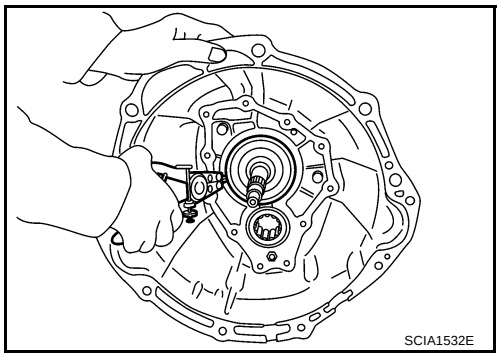


4. Place the adapter plate in the transmission case, using soft hammer to tap the adapter plate to install it into the transmission case.

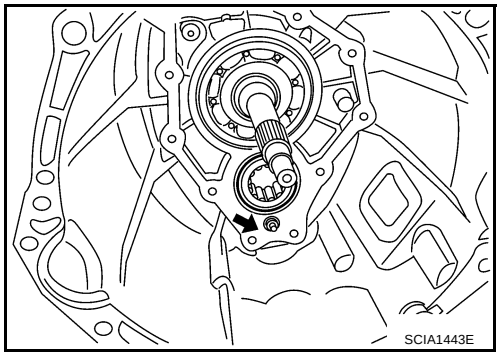


5. Install snap ring to main drive gear bearing, using snap ring pliers.

CAUTION:
Snap rings are not reusable. Never reuse them.



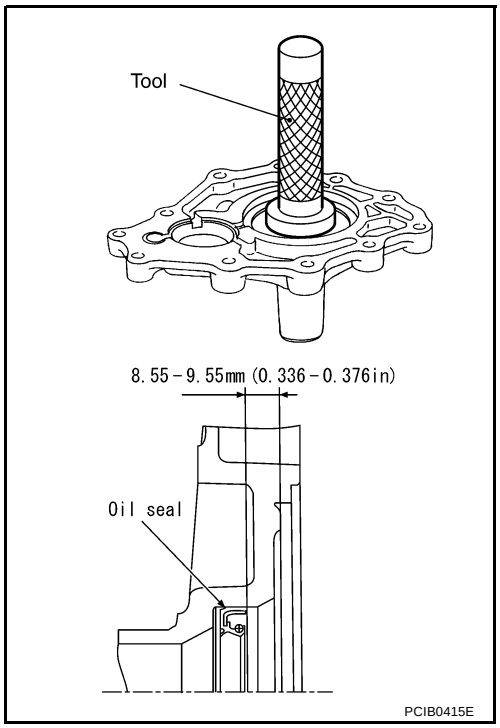
6. Tighten baffle plate mounting nut to the specified torque. Refer to MT-22, "CASE COMPONENTS" .



7. Apply multi-purpose grease to the lip of the front cover oil seal. Using a drift, to install oil seal approx. 8.55-9.55 mm (0.336-0.376 in) above from the front cover edge surface.

Tool number : KV38102100 (J25803-01)

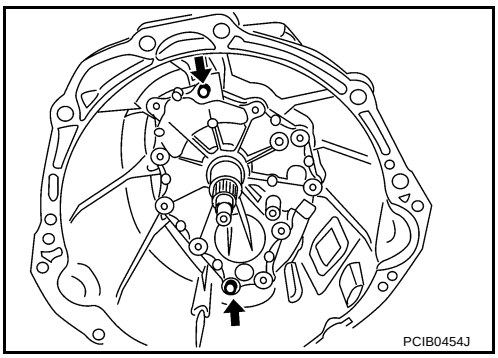
CAUTION:
- **Front cover oil seals are not reusable. Never reuse them.**
- **When installing, do not incline the front cover oil seal.**



8. Install front cover gasket and front cover to the transmission case.

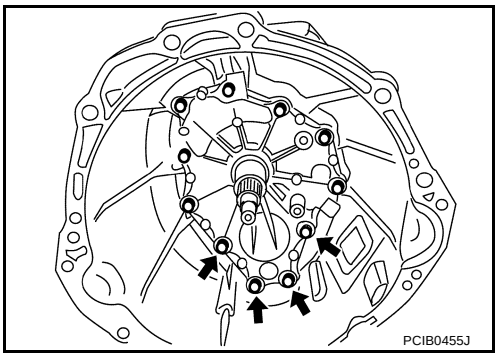
CAUTION:
Gasket is not reusable, Never reuse them.

9. Temporary tightening 2 bolts in the positions shown in the figure.

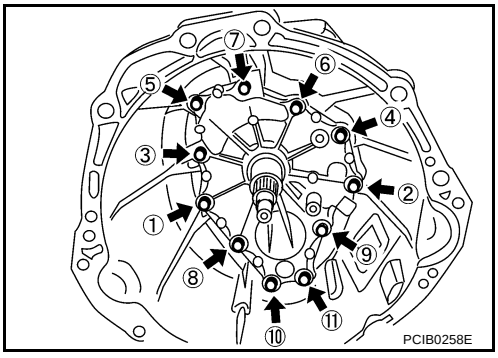


10. Temporary tightening remaining 9 bolts, tighten bolts to the specified torque. Refer to MT-22, "CASE COMPONENTS" .

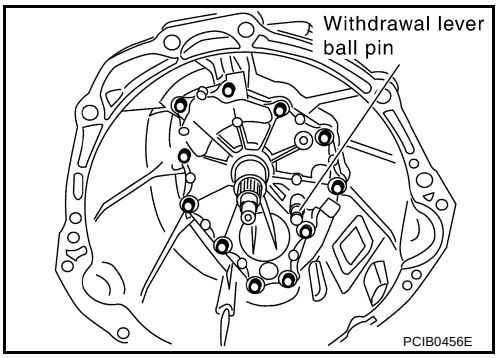
CAUTION:
Four bolts pointed by arrows in the figure are not reusable.



11. Tighten bolts to the specified torque in order as shown on the figure.



12. Install washer to the withdrawal lever ball pin and then install it to front cover. Tighten withdrawal lever ball pin to the specified torque. Refer to MT-22, "CASE COMPONENTS" .



13. Install rear extension oil gutter to rear extension, and then tighten bolt to specified torque. Refer to MT-22, "CASE COMPONENTS" .

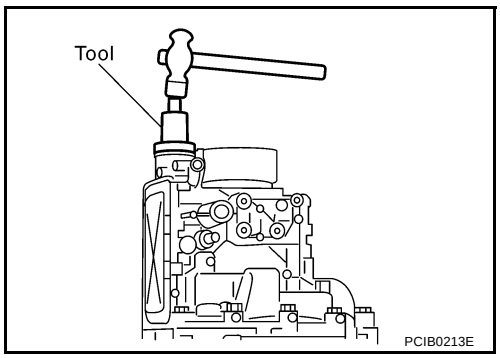
14. Install reverse idler shaft, reverse idler needle bearing, reverse idler gear, and reverse idler thrust washer to the adapter plate.

15. Apply multi -purpose grease to the striking rod oil seal lip, and then using the drift to install striking rod oil seal.

Tool number : ST35291000 (—)

CAUTION:

- **Striking rod oil seal are not reusable. Never reuse them.**
- **When installing, do not incline the striking rod oil seal.**

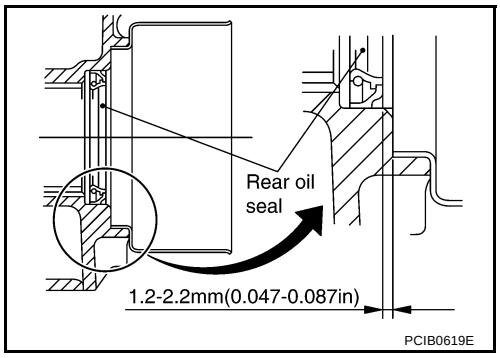


16. Apply multi - purpose grease to the lip of the rear oil seal. Using a drift to install rear oil seal. 1.2-2.2 mm (0.047-0.87 in) above from the rear extension edge surface.

Tool number : ST33400001 (J26082)

CAUTION:

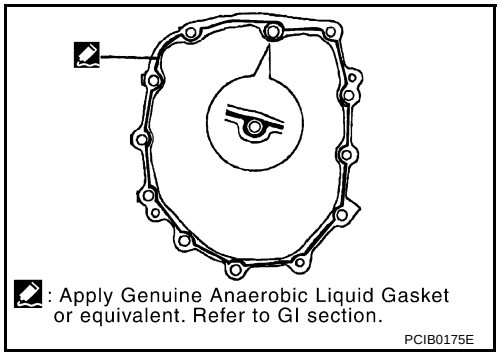
- **Rear oil seal are not reusable. Never reuse them.**
- **When installing, do not incline the rear oil seal.**



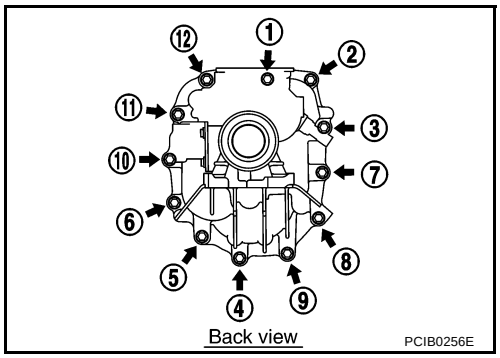
17. Apply genuine anaerobic liquid gasket or equivalent refer to GI section to the adapter plate rear extension mounting surface as shown in the figure.

CAUTION:

Completely remove all moisture, oil, etc., from the adapter plate and rear extension mounting surfaces.

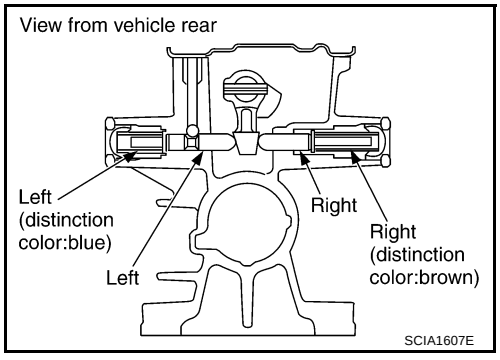


18. Install rear extension to the adapter plate and then tighten mounting bolts to the specified torque in order as shown on the figure. Refer to MT-22, "CASE COMPONENTS" .
19. Install control lever housing to the rear extension and then tighten mounting bolts to the specified torque. Refer to MT-25, "SHIFT CONTROL COMPONENTS" .



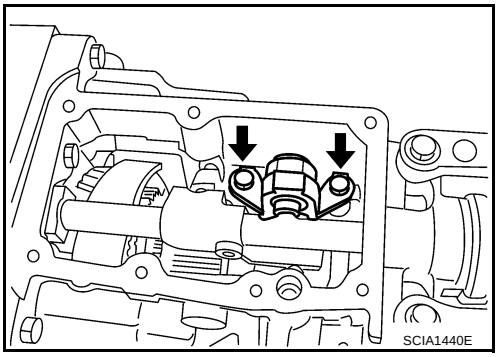
20. Install return spring plunger and return spring into the rear extension, apply genuine anaerobic liquid gasket or equivalent refer to GI section to the return spring plug threads, and then tighten return spring plug to the specified torque. Refer to MT-25, "SHIFT CONTROL COMPONENTS" .

	Return spring identification mark	Plunger notch
RH	Brown	No
LH	Blue	Yes



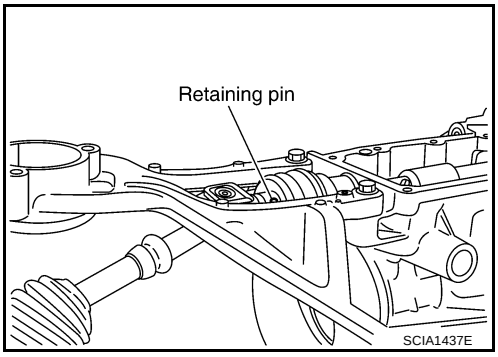
CAUTION:
The right and left return springs and return spring plungers are different, so make sure they are installed correctly.

21. Install shift check pin as a one unit with the control bracket to rear extension and then tighten mounting bolts to the specified torque. Refer to MT-25, "SHIFT CONTROL COMPONENTS" .
22. Install plunger to the rear extension, and then screwing neutral position switch and back-up lamp switch to the rear extension with 1-2 pitches. Apply genuine anaerobic liquid gasket or equivalent refer to GI section to the switch threads, and tighten switch to the specified torque. Refer to MT-22, "CASE COMPONENTS" .

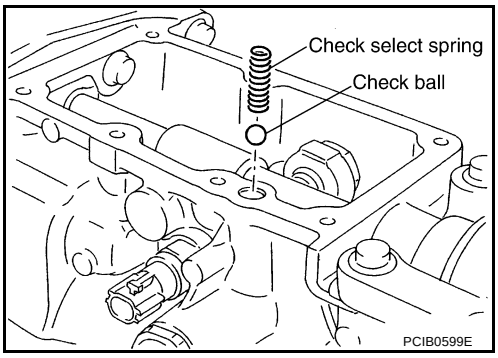


23. Install retaining pin into the control rod, using a pin punch [6 mm (0.24 in) dia.].

CAUTION:
Retaining pins are not reusable. Never reuse them.



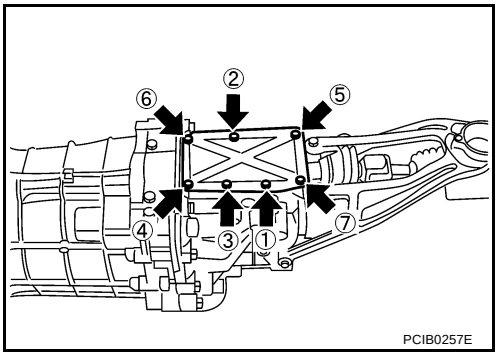
24. Install check ball and check select spring into the rear extension.



25. Install rear extension upper cover gasket and rear extension upper cover to rear extension.

CAUTION:
- **Rear extension upper cover gaskets are not reusable. Never reuse them.**
- **Avoid tangling check select spring.**

26. Tighten rear extension upper cover bolts to the specified torque in order as shown on the figure. Refer to MT-22, "CASE COMPONENTS" .

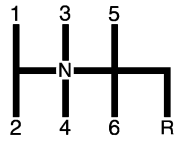


SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

ACS004NU

Applied model		VQ35DE
Transmission		FS6R31A
Number of speed		6
Shift pattern		 SCIA0955E
Synchromesh type		Warner
Gear ratio	1st	3.794
	2nd	2.324
	3rd	1.624
	4th	1.271
	5th	1.000
	6th	0.794
	Reverse	3.446
Main gear (Number of teeth)	Drive	26
	1st	37
	2nd	34
	3rd	33
	4th	31
	6th	31
	Reverse	42
Counter gear (Number of teeth)	Drive	32
	1st	12
	2nd	18
	3rd	25
	4th	30
	6th	48
	Reverse	15
Reverse idler gear (Number of teeth)		26
Oil capacity ℓ (Imp pt)		Approx. 2.9 (3-1/8US qt, 2-1/2 Imp qt)
Remarks	Reverse synchronizer	Installed
	Double cone synchronizer	1st & 3rd & 4th
	Triple cone synchronizer	2nd

End Play

ACS004NV

Unit: mm (in)

Item	Standard
Counter gear	0 - 0.10 (0 - 0.004)
Main drive gear	0 - 0.10 (0 - 0.004)
Main shaft	0 - 0.10 (0 - 0.004)

Snap Rings

ACS004NW

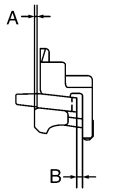
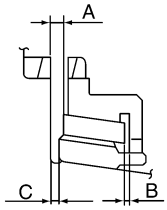
Unit: mm (in)

Selective parts		Thickness	Part No.
Main drive gear		1.89 (0.0744) 1.95 (0.0768) 1.99 (0.0783) 2.03 (0.0799) 2.07 (0.0815) 2.11 (0.0831)	32204 01G60 32204 01G61 32204 01G62 32204 01G63 32204 01G64 32204 01G65
Counter shaft		1.96 (0.0772) 2.02 (0.0795) 2.08 (0.0819) 2.14 (0.0843) 2.20 (0.0866) 2.26 (0.0890) 2.32 (0.0913) 2.38 (0.0937) 2.44 (0.0961) 2.50 (0.0984) 2.56 (0.1008) 2.62 (0.1031)	32236 CD000 32236 CD001 32236 CD002 32236 CD003 32236 CD004 32236 CD005 32236 CD006 32236 CD007 32236 CD008 32236 CD009 32236 CD010 32236 CD011
Main shaft	Front side	2.08 (0.0819) 2.14 (0.0843) 2.20 (0.0866) 2.26 (0.0890)	32204 CD000 32204 CD001 32204 CD002 32204 CD003
	Shaft rear end	2.08 (0.0819) 2.14 (0.0843) 2.20 (0.0866) 2.26 (0.0890) 2.32 (0.0913) 2.38 (0.0937) 2.44 (0.0961) 2.50 (0.0984) 2.56 (0.1008) 2.62 (0.1031) 2.68 (0.1055) 2.74 (0.1079) 2.80 (0.1102) 2.86 (0.1126) 2.92 (0.1150) 2.98 (0.1173)	32204 CD000 32204 CD001 32204 CD002 32204 CD003 32204 CD004 32204 CD005 32204 CD006 32204 CD007 32204 CD008 32204 CD009 32204 CD010 32204 CD011 32204 CD012 32204 CD013 32204 CD014 32204 CD015

Baulk Ring Clearance

ACS004NX

Unit: mm (in)

Measurement point		Standard	Limit value
1st & 3rd & 4th (Double - cone synchronizer)	● Clearance between synchronizer cone and inner baulk ring end face “A” ● Clearance between outer baulk ring pawl and synchronizer cone “B”  PCIB0249E	A: 0.50 - 0.70(0.020 - 0.028) B(1st): 1.00 - 1.50(0.039 - 0.059) B(3rd,4th):0.85 - 1.35(0.033 - 0.053)	0.3(0.012) 0.7(0.028) 0.7(0.028)
2nd (Triple - cone sychronizer)	● Clearance between synchronizer and clutch gear end face “A” ● Clearance between outer baulk ring pawl and synchronizer cone “B” ● Clearance between inner baulk ring and clutch gear end face “C”  PCIB0835J	A: 0.60 - 1.30 (0.024 - 0.051) B: 0.85 - 1.35 (0.033 - 0.053) C: 0.70 - 1.25 (0.028 - 0.049)	0.3 (0.012) 0.7 (0.028) 0.3 (0.012)
5th & 6th		0.70 - 1.25 (0.028 - 0.049)	0.5 (0.020)
Reverse		0.75 - 1.20 (0.030 - 0.047)	0.5 (0.020)

SECTION AT
AUTOMATIC TRANSMISSION

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INDEX FOR DTC

PFP:00024

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ACS000GR

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	OBD-II	Except OBD-II	
	CONSULT-II GST*1	CONSULT-II only “A/T”	
A/T 1ST E/BRAKING	—	P1731	AT-142
ATF PRES SW 1/CIRC	—	P1841	AT-170
ATF PRES SW 3/CIRC	—	P1843	AT-172
ATF PRES SW 5/CIRC	—	P1845	AT-174
ATF PRES SW 6/CIRC	—	P1846	AT-176
A/T INTERLOCK	P1730	P1730	AT-139
A/T TCC S/V FNCTN	P0744	P0744	AT-121
ATF TEMP SEN/CIRC	P0710	P1710	AT-130
CAN COMM CIRCUIT	U1000	U1000	AT-100
D/C SOLENOID/CIRC	P1762	P1762	AT-152
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HLR/C SOL/CIRC	P1767	P1767	AT-156
HLR/C SOL FNCTN	P1769	P1769	AT-158
I/C SOLENOID/CIRC	P1752	P1752	AT-144
I/C SOLENOID FNCTN	P1754	P1754	AT-146
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LC/B SOLENOID/CIRC	P1772	P1772	AT-160
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TCC SOLENOID/CIRC	P0740	P0740	AT-119
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TCM·ROM	—	P1703	AT-126
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VEH SPD SE/CIR·MTR	—	P1721	AT-137
VEH SPD SEN/CIR AT	P0720	P0720	AT-112

*1: These numbers are prescribed by SAE J2012.

DTC No. Index

ACS000GS

NOTE:
If DTC U1000 is displayed with other DTC, first perform the trouble diagnosis for DTC U1000. Refer to AT-100 .

DTC		Items (CONSULT-II screen terms)	Reference page
OBD-II	Except OBD-II		
CONSULT-II GST*1	CONSULT-II only “A/T”		
—	P0615	STARTER RELAY/CIRC	AT-103
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P0705	P0705	PNP SW/CIRC	AT-108
P0710	P1710	ATF TEMP SEN/CIRC	AT-130
P0720	P0720	VEH SPD SEN/CIR AT	AT-112
P0725	P0725	ENGINE SPEED SIG	AT-117
P0740	P0740	TCC SOLENOID/CIRC	AT-119
P0744	P0744	A/T TCC S/V FNCTN	AT-121
P0745	P0745	L/PRESS SOL/CIRC	AT-123
—	P1702	TCM·RAM	AT-125
—	P1703	TCM·ROM	AT-126
P1705	P1705	TP SEN/CIRC A/T	AT-127
P1716	P1716	TURBINE REV S/CIRC	AT-135
—	P1721	VEH SPD SE/CIR·MTR	AT-137
P1730	P1730	A/T INTERLOCK	AT-139
—	P1731	A/T 1ST E/BRAKING	AT-142
P1752	P1752	I/C SOLENOID/CIRC	AT-144
P1754	P1754	I/C SOLENOID FNCTN	AT-146
P1757	P1757	FR/B SOLENOID/CIRC	AT-148
P1759	P1759	FR/B SOLENOID FNCT	AT-150
P1762	P1762	D/C SOLENOID/CIRC	AT-152
P1764	P1764	D/C SOLENOID FNCTN	AT-154
P1767	P1767	HLR/C SOL/CIRC	AT-156
P1769	P1769	HLR/C SOL FNCTN	AT-158
P1772	P1772	LC/B SOLENOID/CIRC	AT-160
P1774	P1774	LC/B SOLENOID FNCT	AT-162
—	P1815	MANU MODE SW/CIRC	AT-164
—	P1841	ATF PRES SW 1/CIRC	AT-170
—	P1843	ATF PRES SW 3/CIRC	AT-172
—	P1845	ATF PRES SW 5/CIRC	AT-174
—	P1846	ATF PRES SW 6/CIRC	AT-176
U1000	U1000	CAN COMM CIRCUIT	AT-100

*1: These numbers are prescribed by SAE J2012.

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

ACS006FV

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

ACS001NN

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for On Board Diagnostic (OBD) System of A/T and Engine

ACS000GU

The ECM has an on board diagnostic system. It will light up the malfunction indicator lamp (MIL) to warn the driver of a malfunction causing emission deterioration.

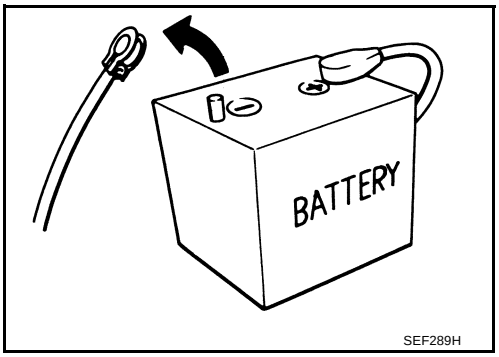
CAUTION:

- **Be sure to turn the ignition switch “OFF” and disconnect the negative battery cable before any repair or inspection work. The open/short circuit of related switches, sensors, solenoid valves, etc. Will cause the MIL to light up.**
- **Be sure to connect and lock the connectors securely after work. A loose (unlocked) connector will cause the MIL to light up due to an open circuit. (Be sure the connector is free from water, grease, dirt, bent terminals, etc.)**
- **Be sure to route and secure the harnesses properly after work. Interference of the harness with a bracket, etc. May cause the MIL to light up due to a short circuit.**
- **Be sure to connect rubber tubes properly after work. A misconnected or disconnected rubber tube may cause the MIL to light up due to a malfunction of the EGR system or fuel injection system, etc.**
- **Be sure to erase the unnecessary malfunction information (repairs completed) from the TCM and ECM before returning the vehicle to the customer.**

Precautions

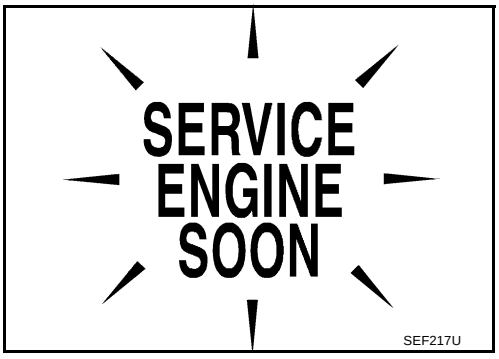
ACS000GW

- **Before connecting or disconnecting the A/T assembly harness connector, turn ignition switch “OFF” and disconnect negative battery cable. Because battery voltage is applied to TCM even if ignition switch is turned “OFF”.**



SEF289H

- **After performing each TROUBLE DIAGNOSIS, perform “DTC (Diagnostic Trouble Code) Confirmation Procedure”. If the repair is completed the DTC should not be displayed in the “DTC Confirmation Procedure”.**



SEF217U

- Always use the specified brand of A/T fluid. Refer to MA-12, "Fluids and Lubricants" .
- Use paper rags not cloth rags during work.
- After replacing the A/T fluid, dispose of the waste oil using the methods prescribed by law, ordinance, etc.
- Before proceeding with disassembly, thoroughly clean the outside of the transmission. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.
- Disassembly should be done in a clean work area.
- Use lint-free cloth or towels for wiping parts clean. Common shop rags can leave fibers that could interfere with the operation of the transmission.
- Place disassembled parts in order for easier and proper assembly.
- All parts should be carefully cleaned with a general purpose, non-flammable solvent before inspection or reassembly.
- Gaskets, seals and O-rings should be replaced any time the transmission is disassembled.
- It is very important to perform functional tests whenever they are indicated.
- The valve body contains precision parts and requires extreme care when parts are removed and serviced. Place disassembled valve body parts in order for easier and proper assembly. Care will also prevent springs and small parts from becoming scattered or lost.
- Properly installed valves, sleeves, plugs, etc. will slide along bores in valve body under their own weight.
- Before assembly, apply a coat of recommended ATF to all parts. Apply petroleum jelly to protect O-rings and seals, or hold bearings and washers in place during assembly. Do not use grease.
- Extreme care should be taken to avoid damage to O-rings, seals and gaskets when assembling.
- After overhaul, refill the transmission with new ATF.
- When the A/T drain plug is removed, only some of the fluid is drained. Old A/T fluid will remain in torque converter and ATF cooling system.
  Always follow the procedures under “Changing A/T Fluid” in the AT section when changing A/T fluid. Refer to AT-12, "Changing A/T Fluid" , AT-12, "Checking A/T Fluid" .

Service Notice or Precautions

ACS000GX

ATF COOLER SERVICE

If A/T fluid contains frictional material (clutches, bands, etc.), or if an A/T is repaired, overhauled, or replaced, inspect and clean the A/T fluid cooler mounted in the radiator or replace the radiator. Flush cooler lines using cleaning solvent and compressed air after repair. For A/T fluid cooler cleaning procedure, refer to AT-14, "A/T Fluid Cooler Cleaning" . For radiator replacement, refer to CO-12, "RADIATOR" .

OBD-II SELF-DIAGNOSIS

- A/T self-diagnosis is performed by the TCM in combination with the ECM. The results can be read through the blinking pattern of the A/T CHECK indicator or the malfunction indicator lamp (MIL). Refer to the table on AT-88, "SELF-DIAGNOSTIC RESULT MODE" for the indicator used to display each self-diagnostic result.
- The self-diagnostic results indicated by the MIL are automatically stored in both the ECM and TCM memories.
  Always perform the procedure on AT-38, "HOW TO ERASE DTC" to complete the repair and avoid unnecessary blinking of the MIL.

For details of OBD-II, refer to EC-47, "ON BOARD DIAGNOSTIC (OBD) SYSTEM" .

- **Certain systems and components, especially those related to OBD, may use the new style slide-locking type harness connector. For description and how to disconnect, refer to PG-80, "HARNESS CONNECTOR" .**

Wiring Diagrams and Trouble Diagnosis

ACS000GY

When you read wiring diagrams, refer to the following:

- GI-15, "How to Read Wiring Diagrams".
- PG-4, "POWER SUPPLY ROUTING CIRCUIT" for power distribution circuit.

When you perform trouble diagnosis, refer to the following:

- GI-11, "How to Follow Trouble Diagnoses".
- GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident".

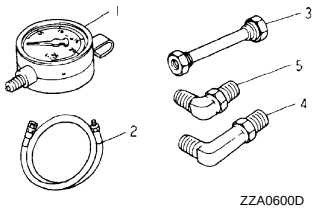
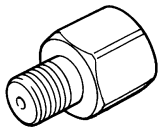
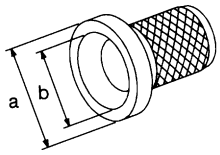
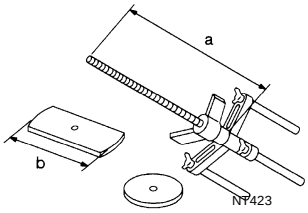
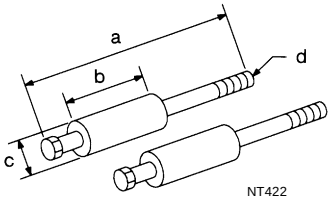
PREPARATION

PFP:00002

Special Service Tools

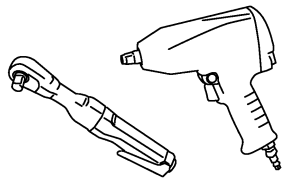
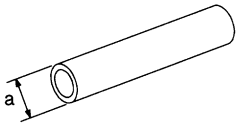
ACS000GZ

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
ST2505S001 (J-34301-C) Oil pressure gauge set 1 ST25051001 (—) Oil pressure gauge 2 ST25052000 (—) Hose 3 ST25053000 (—) Joint pipe 4 ST25054000 (—) Adapter 5 ST25055000 (—) Adapter  ZZA0600D	Measuring line pressure
KV31103600 (J-45674) Joint pipe adapter (With ST25054000)  ZZA1227D	Measuring line pressure
ST33400001 (J-26082) Drift a: 60 mm (2.36 in) dia. b: 47 mm (1.85 in) dia.  NT086	● Installing rear oil seal ● Installing oil pump housing oil seal
KV31102400 (J-34285 and J-34285-87) Clutch spring compressor a: 320 mm (12.60 in) b: 174 mm (6.85 in)  NT423	Installing reverse brake return spring retainer
ST25850000 (J-25721-A) Sliding hammer a: 179 mm (7.05 in) b: 70 mm (2.76 in) c: 40 mm (1.57 in) d: M12X1.75P  NT422	Remove oil pump assembly

Commercial Service Tools

ACS000H0

Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts
Drift a: 22mm (0.87 in) dia.  NT083	Installing manual shaft oil seals

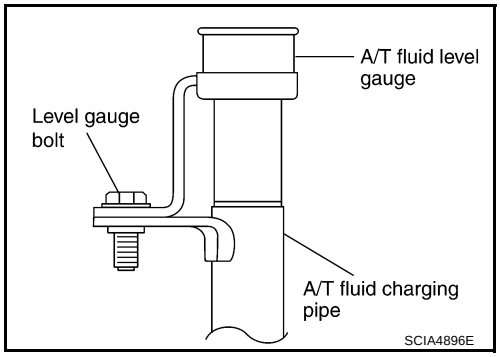
A/T FLUID

PFP:KLE40

Changing A/T Fluid

ACS003S7

1. Warm up ATF.
2. Stop engine.
3. Loosen the level gauge bolt.
4. Drain ATF from drain plug and refill with new ATF. Always refill same volume with drained fluid.
   - To replace the ATF, pour in new fluid at the charging pipe with the engine idling and at the same time drain the old fluid from the radiator cooler hose return side.
   - When the color of the fluid coming out is about the same as the color of the new fluid, the replacement is complete. The amount of new transmission fluid to use should be 30 to 50% increase of the stipulated amount.



A/T fluid: Genuine Nissan Matic J ATF

Fluid capacity: 10.3 ℓ (10-7/8 US qt, 9-1/8 Imp qt)

CAUTION:

- **Use only Genuine Nissan Matic J ATF. Do not mix with other fluid.**
- **Using automatic transmission fluid other than Genuine Nissan Matic J ATF will cause deterioration in driveability and automatic transmission durability, and may damage the automatic transmission, which is not covered by the warranty.**
- **When filling ATF, take care not to splash heat generating parts such as exhaust with ATF.**
- **Do not reuse drain plug gasket.**

Drain plug:

: 34 N·m (3.5 kg-m, 25 ft-lb)

5. Run engine at idle speed for 5 minutes.
6. Check fluid level and condition. Refer to AT-12, "Checking A/T Fluid" . If fluid is still dirty, repeat step 2. through 5.
7. Install the removed A/T fluid level gauge in the A/T fluid charging pipe.
8. Tighten the level gauge bolt.

Level gauge bolt:

: 5.1 N·m (0.52 kg-m, 45 in-lb)

Checking A/T Fluid

ACS003S8

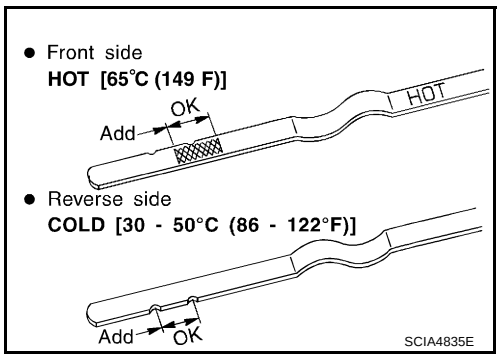
1. Warm up engine.
2. Check for fluid leakage.
3. Loosen the level gauge bolt.
4. Before driving, fluid level can be checked at fluid temperatures of 30 to 50°C (86 to 122°F) using “COLD” range on A/T fluid level gauge as follows.

a. Park vehicle on level surface and set parking brake.

b. Start engine and move selector lever through each gear position. Leave selector lever in “P” position.

c. Check fluid level with engine idling.

d. Remove A/T fluid level gauge and wipe clean with lint-free paper.



CAUTION:

When wiping away the A/T fluid level gauge, always use lint-free paper, not a cloth one.

e. Re-insert A/T fluid level gauge into A/T fluid charging pipe as far as it will go.

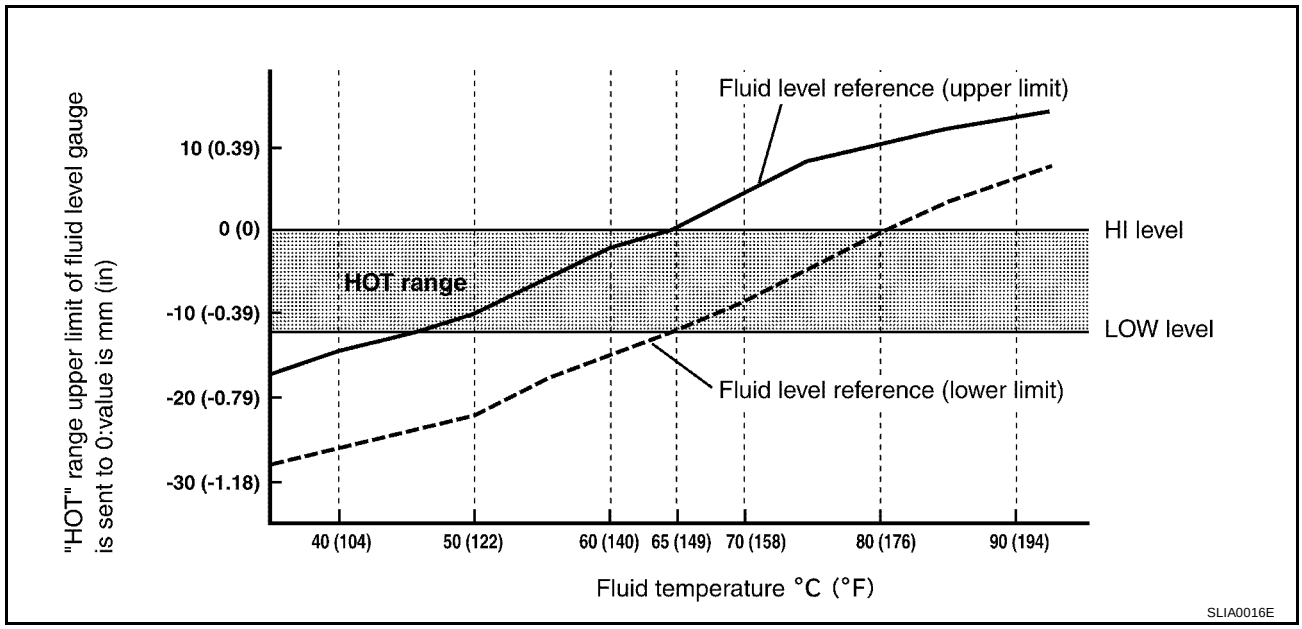
CAUTION:
To check fluid level, insert the A/T fluid level gauge until the cap contacts the end of the A/T fluid charging pipe, with the A/T fluid level gauge reversed from the normal attachment conditions.

f. Remove A/T fluid level gauge and note reading. If reading is at low side of range, add fluid to the A/T fluid charging pipe.

CAUTION:
Do not overfill.

5. Drive vehicle for approximately 5 minutes in urban areas.
6. Make the fluid temperature approximately 65°C (149°F).

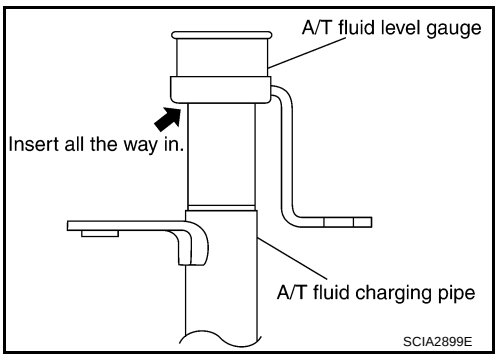
NOTE:
Fluid level will be greatly affected by temperature as shown in the figure. Therefore, be certain to perform level check operation checking warm up condition with CONSULT-II.



a. Connect CONSULT-II to data link connector.
b. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
c. Read out the value of “ATF TEMP 1”.

7. Re-check fluid level at fluid temperatures of approximately 65°C (149°F) using “HOT” range on A/T fluid level gauge.

CAUTION:
- **When wiping away the A/T fluid level gauge, always use lint-free paper, not a cloth one.**
- **To check fluid level, insert the A/T fluid level gauge until the cap contacts the end of the A/T fluid charging pipe, with the gauge rotated from the normal attachment conditions as shown.**

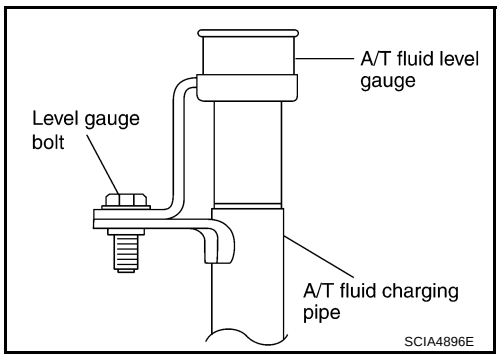


8. Check fluid condition.
   - If fluid is very dark or smells burned, refer to check operation of A/T. Flush cooling system after repair of A/T.
   - If ATF contains frictional material (clutches, bands, etc.), replace radiator and flush cooler line using cleaning solvent and compressed air after repair of A/T. Refer to CO-12, "RADIATOR" and AT-14, "A/T Fluid Cooler Cleaning" .
9. Install the removed A/T fluid level gauge in the A/T fluid charging pipe.

10. Tighten the level gauge bolt.

Level gauge bolt:

: 5.1N·m (0.52 kg-m, 45 in-lb)



A/T Fluid Cooler Cleaning

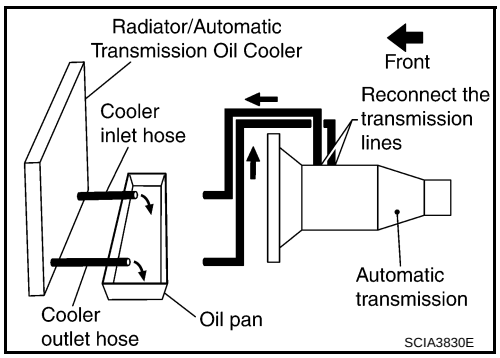
ACS004LL

Whenever an automatic transmission is replaced, the A/T fluid cooler mounted in the radiator must be inspected and cleaned.
Metal debris and friction material, if present, can become trapped in the A/T fluid cooler. This debris can contaminate the newly serviced A/T or, in severe cases, can block or restrict the flow of A/T fluid. In either case, malfunction of the newly serviced A/T may result.
Debris, if present, may build up as A/T fluid enters the cooler inlet. It will be necessary to back flush the cooler through the cooler outlet in order to flush out any built up debris.

A/T FLUID COOLER CLEANING PROCEDURE

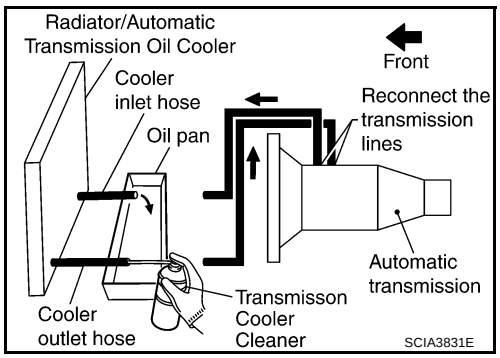
1. Position an oil pan under the automatic transmission's inlet and outlet cooler hoses.
2. Identify the inlet and outlet fluid cooler hoses.
3. Disconnect the fluid cooler inlet and outlet rubber hoses from the steel cooler tubes or bypass valve.

   NOTE:
   Replace the cooler hoses if rubber material from the hose remains on the tube fitting.
4. Allow any A/T fluid that remains in the cooler hoses to drain into the oil pan.

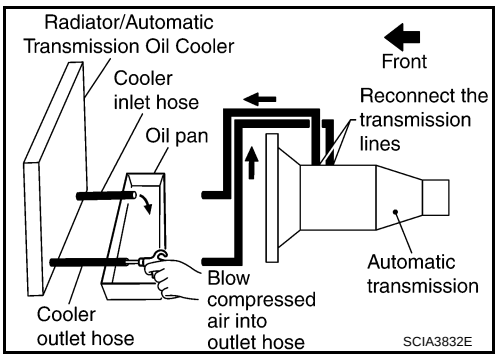


5. Insert the extension adapter hose of a can of Transmission Cooler Cleaner (Nissan P/N 999MP-AM006) into the cooler outlet hose.

   CAUTION:
   - **Wear safety glasses and rubber gloves when spraying the Transmission Cooler Cleaner.**
   - **Spray cooler cleaner only with adequate ventilation.**
   - **Avoid contact with eyes and skin.**
   - **Do not breath vapors or spray mist.**
6. Hold the hose and can as high as possible and spray Transmission Cooler Cleaner in a continuous stream into the cooler outlet hose until fluid flows out of the cooler inlet hose for 5 seconds.



7. Insert the tip of an air gun into the end of the cooler outlet hose.
8. Wrap a shop rag around the air gun tip and of the cooler outlet hose.



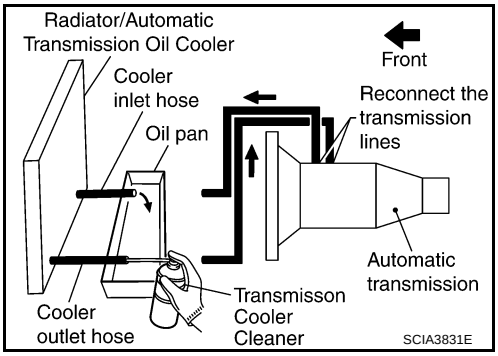
9. Blow compressed air regulated to 5 - 9 kg/cm^2 (70 - 130 psi) through the cooler outlet hose for 10 seconds to force out any remaining fluid.
10. Repeat steps 5 through 9 three additional times.
11. Position an oil pan under the banjo bolts that connect the fluid cooler steel lines to the transmission.
12. Remove the banjo bolts.
13. Flush each steel line from the cooler side back toward the transmission by spraying Transmission Cooler Cleaner in a continuous stream for 5 seconds.
14. Blow compressed air regulated to 5 - 9 kg/cm^2 (70 - 130 psi) through each steel line from the cooler side back toward the transmission for 10 seconds to force out any remaining fluid.
15. Ensure all debris is removed from the steel cooler lines.
16. Ensure all debris is removed from the banjo bolts and fittings.
17. Perform AT-15, "A/T FLUID COOLER DIAGNOSIS PROCEDURE" .

A/T FLUID COOLER DIAGNOSIS PROCEDURE

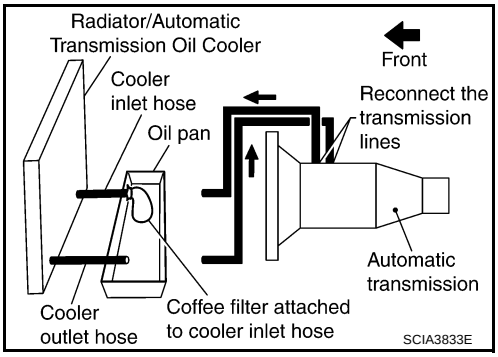
NOTE:
Insufficient cleaning of the cooler inlet hose exterior may lead to inaccurate debris identification.

1. Position an oil pan under the automatic transmission's inlet and outlet cooler hoses.
2. Clean the exterior and tip of the cooler inlet hose.
3. Insert the extension adapter hose of a can of Transmission Cooler Cleaner (Nissan P/N 999MP-AM006) into the cooler outlet hose.

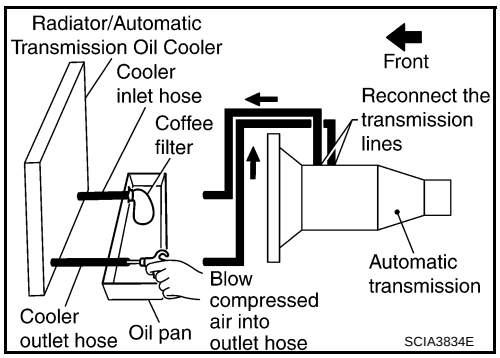
   CAUTION:
   - **Wear safety glasses and rubber gloves when spraying the Transmission Cooler Cleaner.**
   - **Spray cooler cleaner only with adequate ventilation.**
   - **Avoid contact with eyes and skin.**
   - **Do not breath vapors or spray mist.**
4. Hold the hose and can as high as possible and spray Transmission Cooler Cleaner in a continuous stream into the cooler outlet hose until fluid flows out of the cooler inlet hose for 5 seconds.



5. Tie a common white, basket-type coffee filter to the end of the cooler inlet hose.



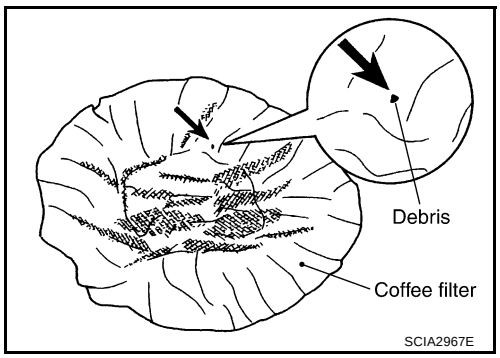
6. Insert the tip of an air gun into the end of the cooler outlet hose.
7. Wrap a shop rag around the air gun tip and end of cooler outlet hose.
8. Blow compressed air regulated to 5 - 9 kg/cm^2 (70 - 130 psi) through the cooler outlet hose to force any remaining A/T fluid into the coffee filter.
9. Remove the coffee filter from the end of the cooler inlet hose.
10. Perform AT-16, "A/T FLUID COOLER INSPECTION PROCEDURE" .



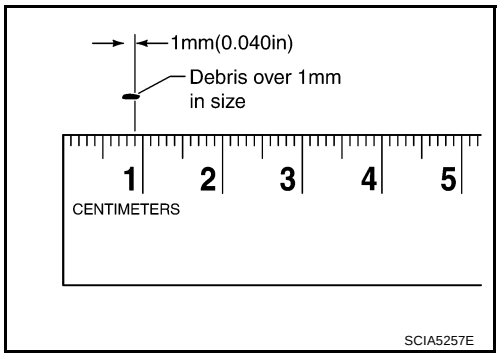
A/T FLUID COOLER INSPECTION PROCEDURE

1. Inspect the coffee filter for debris.

a. If small metal debris less than 1 mm (0.040 in) in size or metal powder is found in the coffee filter, this is normal. If normal debris is found, the A/T fluid cooler/radiator can be re-used and the procedure is ended.



b. If one or more pieces of debris are found that are over 1 mm (0.040 in) in size and/or peeled clutch facing material is found in the coffee filter, the fluid cooler is not serviceable. The A/T fluid cooler/radiator must be replaced and the inspection procedure is ended. Refer to CO-12, "RADIATOR" and CO-15, "RADIATOR (ALUMINUM TYPE)" .



A/T FLUID COOLER FINAL INSPECTION

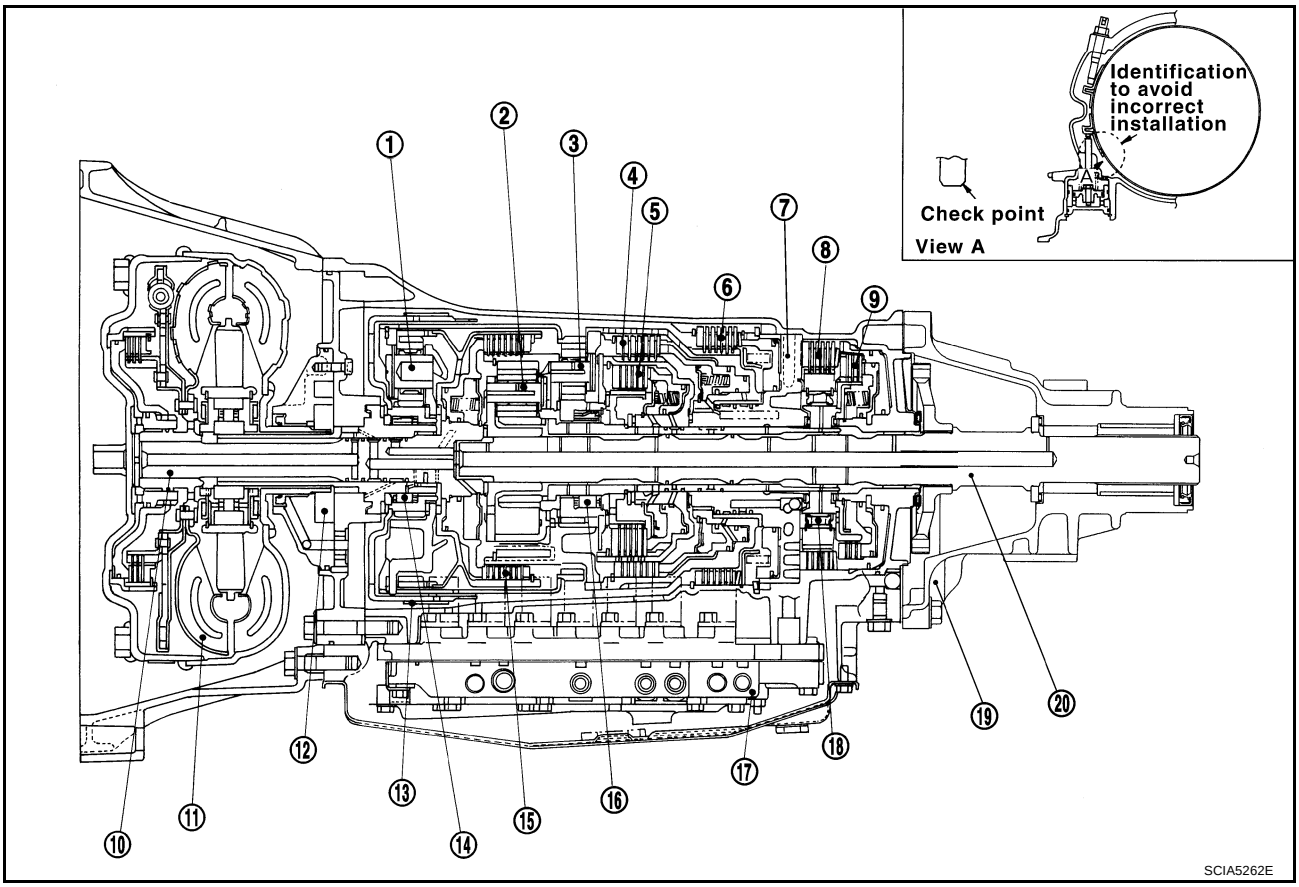
After performing all procedures, ensure that all remaining oil is cleaned from all components.

A/T CONTROL SYSTEM

PFP:31036

Cross-Sectional View

ACS000H3



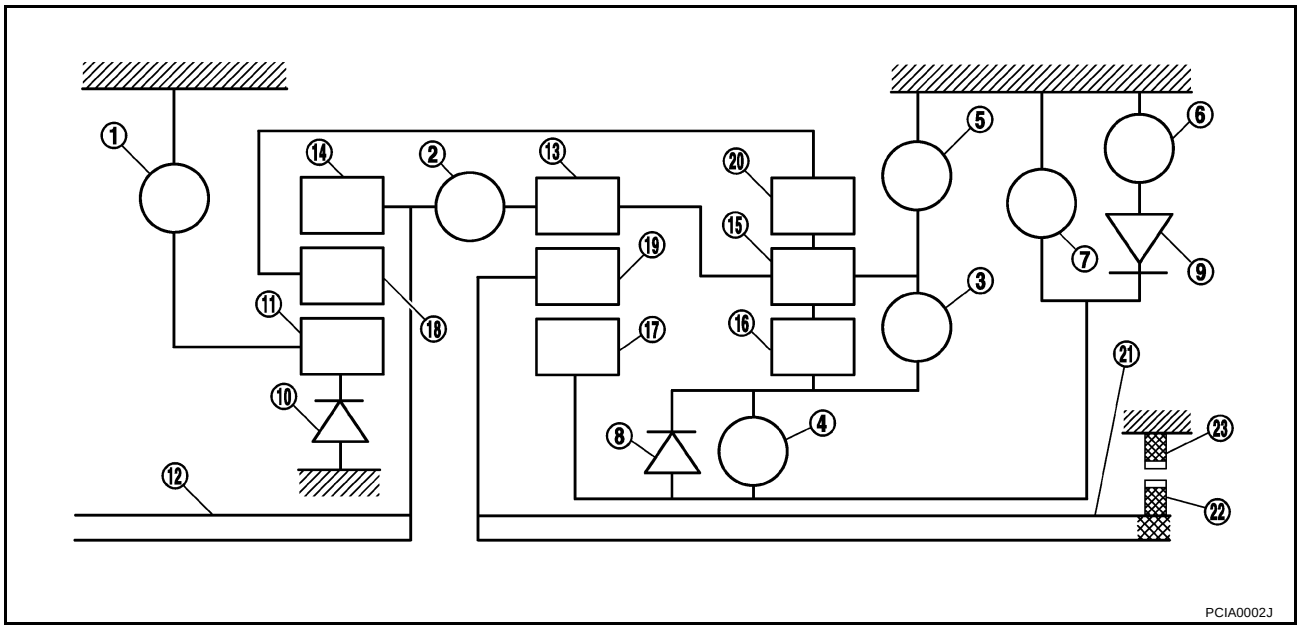
1. Front planetary gear	2. Mid planetary gear	3. Rear planetary gear
4. Direct clutch	5. High and low reverse clutch	6. Reverse brake
7. Drum support	8. Forward brake	9. Low coast brake
10. Input shaft	11. Torque converter	12. Oil pump
13. Front brake	14. 3rd one-way clutch	15. Input clutch
16. 1st one-way clutch	17. Control valve with TCM	18. Forward one-way clutch
19. Rear extension	20. Output shaft	

Shift Mechanism

ACS000H4

The automatic transmission uses compact dual planetary gear systems to improve power-transmission efficiency, simplify construction and reduce weight.
It also employs an optimum shift control and super wide gear ratios. They improve starting performance and acceleration during medium and high-speed operation.

CONSTRUCTION



1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier
16. Rear sun gear
17. Mid sun gear
18. Front carrier
19. Mid carrier
20. Rear internal gear
21. Output shaft
22. Parking gear
23. Parking pawl

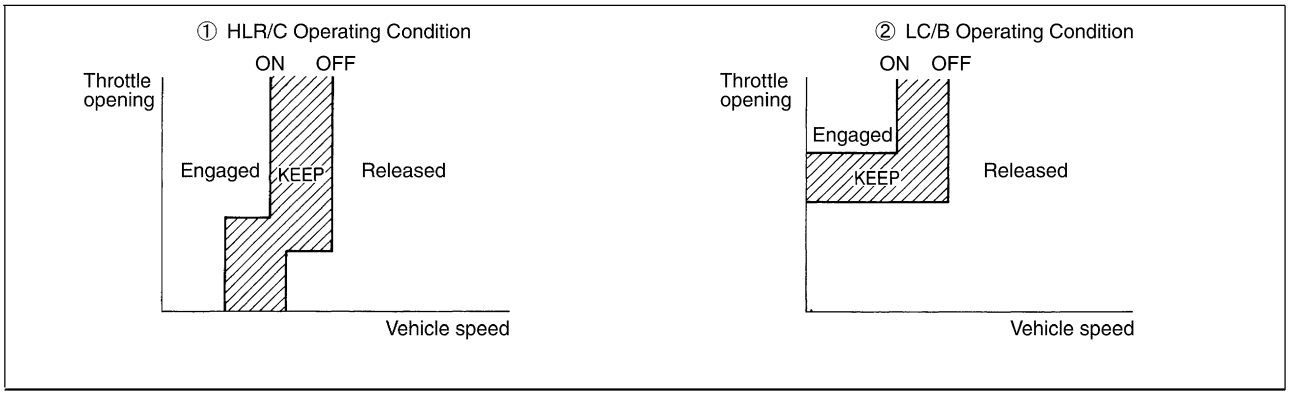
FUNCTION OF CLUTCH AND BRAKE

Name of the Part	Abbreviation	Function
Front brake (1)	FR/B	Fastens the front sun gear (11).
Input clutch (2)	I/C	Connects the input shaft (12), the front internal gear (14) and the mid internal gear (13).
Direct clutch (3)	D/C	Connects the rear carrier (15) and the rear sun gear (16).
High and low reverse clutch (4)	HLR/C	Connects the mid sun gear (17) and the rear sun gear (16).
Reverse brake (5)	R/B	Fastens the rear carrier (15).
Forward brake (6)	Fwd/B	Fastens the mid sun gear (17).
Low coast brake (7)	LC/B	Fastens the mid sun gear (17).
1st one-way clutch (8)	1st/OWC	Allows the rear sun gear (16) to turn freely forward relative to the mid sun gear (17) but fastens it for reverse rotation.
Forward one-way clutch (9)	Fwd/OWC	Allows the mid sun gear (17) to turn freely in the forward direction but fastens it for reverse rotation.
3rd one-way clutch (10)	3rd/OWC	Allows the front sun gear (11) to turn freely in the forward direction but fastens it for reverse rotation.

CLUTCH AND BAND CHART

Shift position		I/C	HLR/C	D/C	R/B	FR/B	LC/B	Fwd/B	1st OWC	Fwd OWC	3rd OWC	Remarks
P			△			△						PARK POSITION
R			○		○	○			◎		◎	REVERSE POSITION
N			△			△						NEUTRAL POSITION
D	1st		△ *			△	△ **	○	◎	◎	◎	Automatic shift 1↔2↔3↔4↔5
	2nd			○		△		○		◎	◎	
	3rd		○	○		○		△	◇		◎	
	4th	○	○	○				△	◇			
	5th	○	○			○		△	◇		◇	
M5	5th	○	○			○		△	◇		◇	Locks (held stationary) in 5th gear
M4	4th	○	○	○				△	◇			Locks (held stationary) in 4th gear
M3	3rd		○	○		○		△	◇		◎	Locks (held stationary) in 3th gear
M2	2nd			○		○	○	○		◎	◎	Locks (held stationary) in 2th gear
M1	1st		○			○	○	○	◎	◎	◎	Locks (held stationary) in 1th gear

○ — Operates
◎ — Operates during "progressive" acceleration.
◇ — Operates and affects power transmission while coasting.
△ — Line pressure is applied but does not affect power transmission.
△ * — Operates under conditions shown in illustration ①.
△ ** — Operates under conditions shown in illustration ②. Delay control is applied during D (4,3,2,1) → N shift.



SCIA4998E

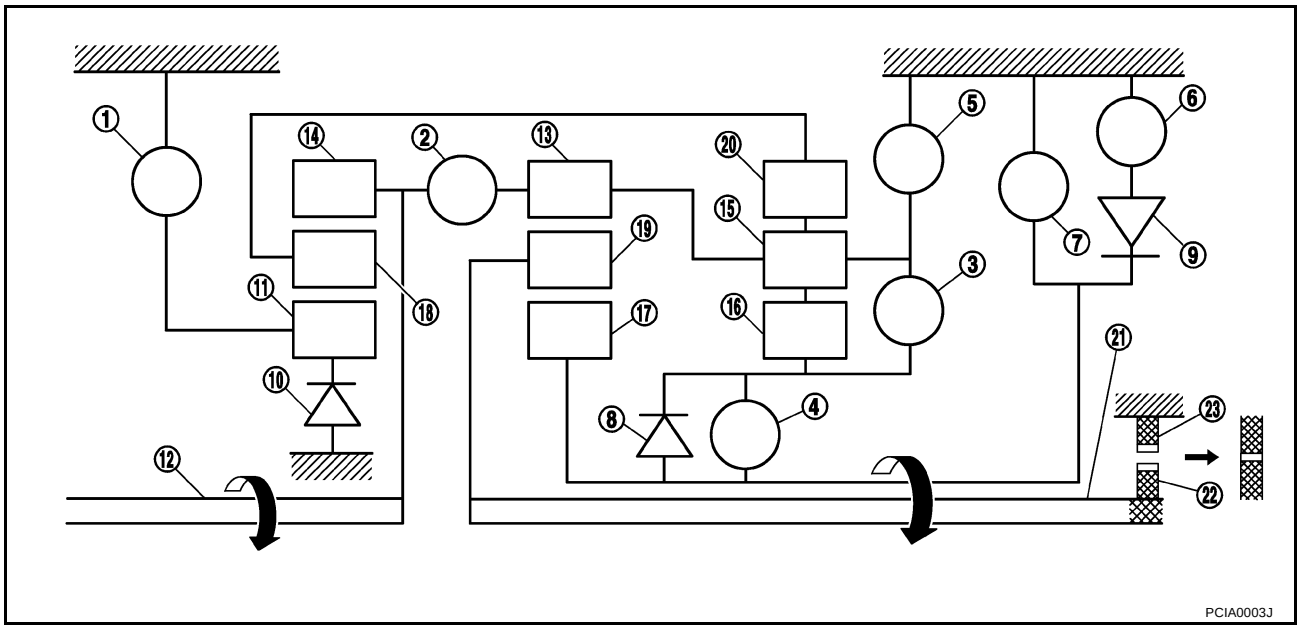
POWER TRANSMISSION

“N” Position

Since both the forward brake and the reverse brake are released, torque from the input shaft drive is not transmitted to the output shaft.

“P” Position

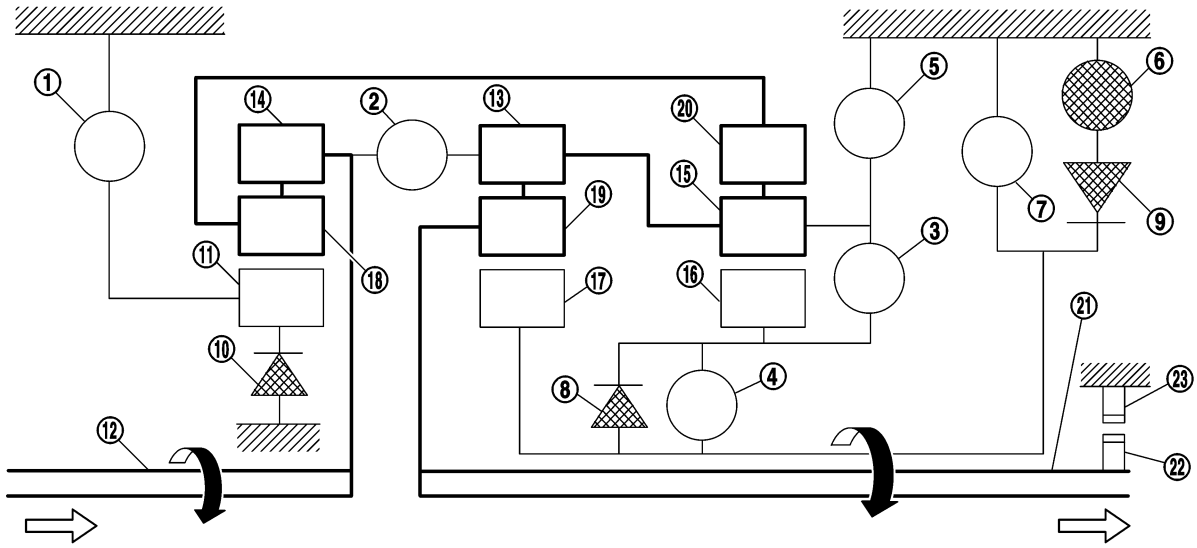
- The same as for the “N” position, both the forward brake and the reverse brake are released, so torque from the input shaft drive is not transmitted to the output shaft.
- The parking pawl linked with the selector lever meshes with the parking gear and fastens the output shaft mechanically.



1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier
16. Rear sun gear
17. Mid sun gear
18. Front carrier
19. Mid carrier
20. Rear internal gear
21. Output shaft
22. Parking gear
23. Parking pawl

“D1 ” Position

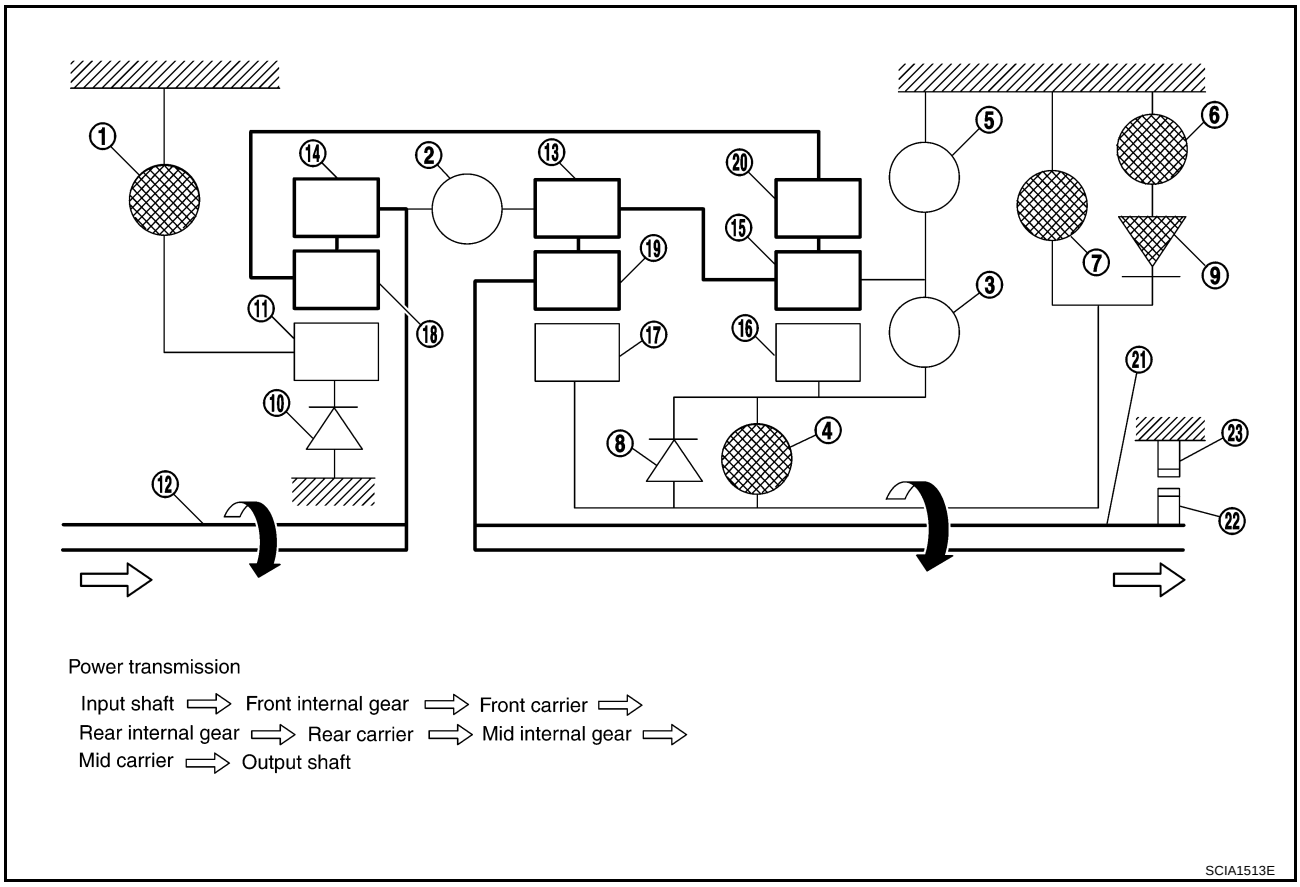
- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- The 1st one-way clutch regulates reverse rotation of the rear sun gear.
- The 3rd one-way clutch regulates reverse rotation of the front sun gear.
- During deceleration, the mid sun gear turns forward, so the forward one-way clutch idles and the engine brake is not activated.



1.	Front brake	2.	Input clutch	3.	Direct clutch
4.	High and low reverse clutch	5.	Reverse brake	6.	Forward brake
7.	Low coast brake	8.	1st one-way clutch	9.	Forward one-way clutch
10.	3rd one-way clutch	11.	Front sun gear	12.	Input shaft
13.	Mid internal gear	14.	Front internal gear	15.	Rear carrier
16.	Rear sun gear	17.	Mid sun gear	18.	Front carrier
19.	Mid carrier	20.	Rear internal gear	21.	Output shaft
22.	Parking gear	23.	Parking pawl		

“M1” Position

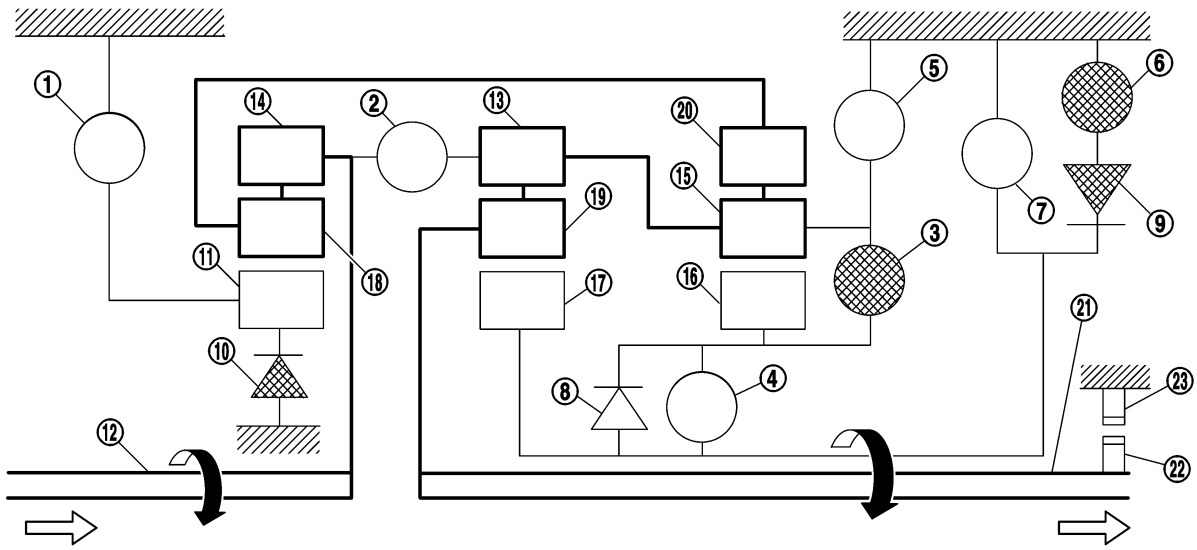
- The front brake fastens the front sun gear.
- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- High and low reverse clutch connects the rear sun gear and the mid sun gear.
- The low coast brake fastens the mid sun gear.
- During deceleration, the low coast brake regulates forward rotation of the mid sun gear and the engine brake functions.



1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier
16. Rear sun gear
17. Mid sun gear
18. Front carrier
19. Mid carrier
20. Rear internal gear
21. Output shaft
22. Parking gear
23. Parking pawl

"D2 " Position

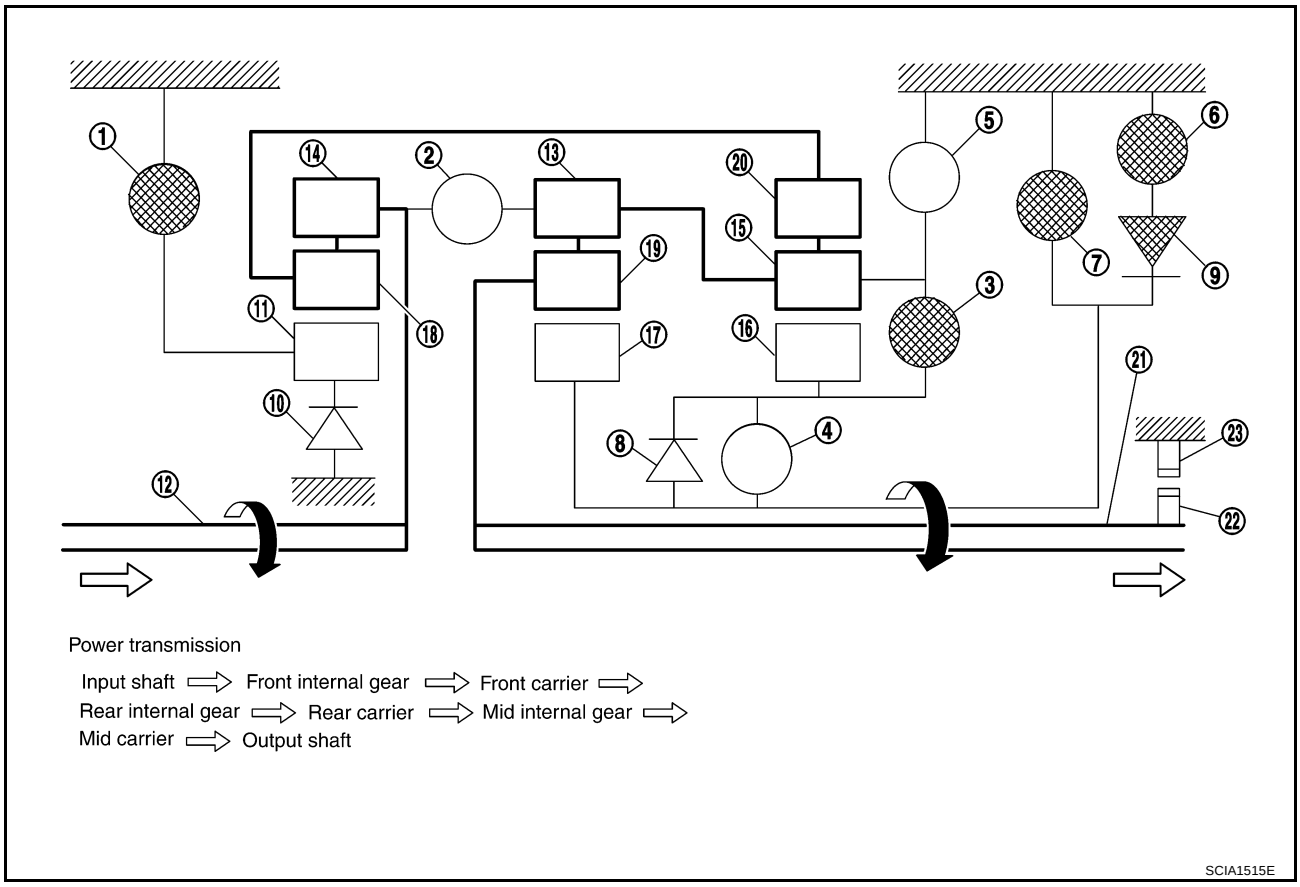
- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- The 3rd one-way clutch regulates reverse rotation of the front sun gear.
- The direct clutch is coupled, and the rear carrier and rear sun gear are connected.
- During deceleration, the mid sun gear turns forward, so the forward one-way clutch idles and engine brake is not activated.



1. Front brake	2. Input clutch	3. Direct clutch
4. High and low reverse clutch	5. Reverse brake	6. Forward brake
7. Low coast brake	8. 1st one-way clutch	9. Forward one-way clutch
10. 3rd one-way clutch	11. Front sun gear	12. Input shaft
13. Mid internal gear	14. Front internal gear	15. Rear carrier
16. Rear sun gear	17. Mid sun gear	18. Front carrier
19. Mid carrier	20. Rear internal gear	21. Output shaft
22. Parking gear	23. Parking pawl	

“M2” Position

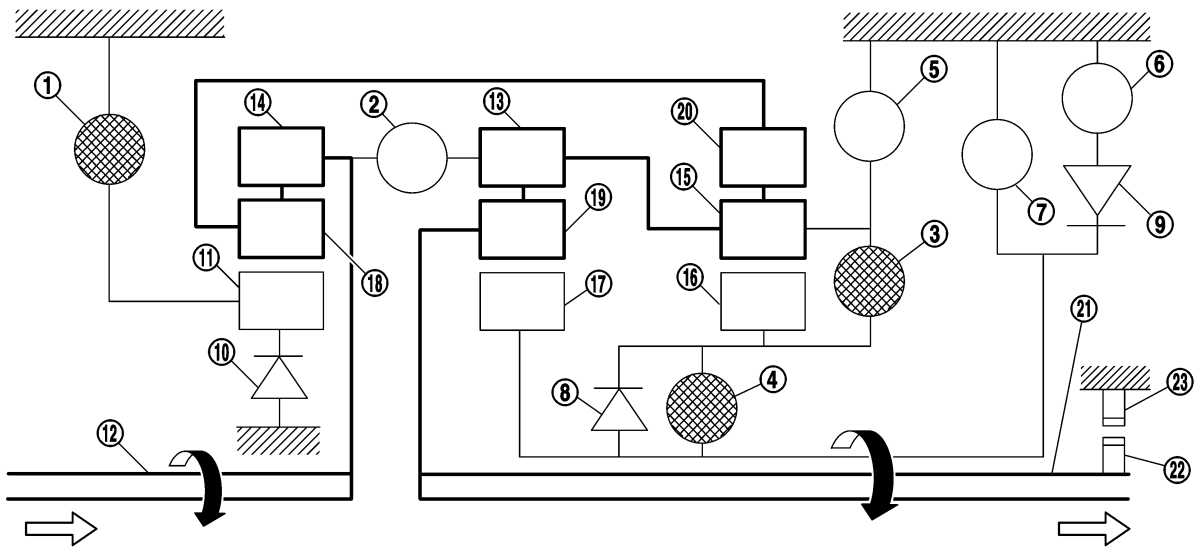
- The front brake fastens the front sun gear.
- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- The direct clutch is coupled, and the rear carrier and rear sun gear are connected.
- The low coast brake fastens the mid sun gear.
- During deceleration, the low coast brake regulates forward rotation of the mid sun gear and the engine brake functions.



1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier
16. Rear sun gear
17. Mid sun gear
18. Front carrier
19. Mid carrier
20. Rear internal gear
21. Output shaft
22. Parking gear
23. Parking pawl

“D3 ” and “M3” Positions

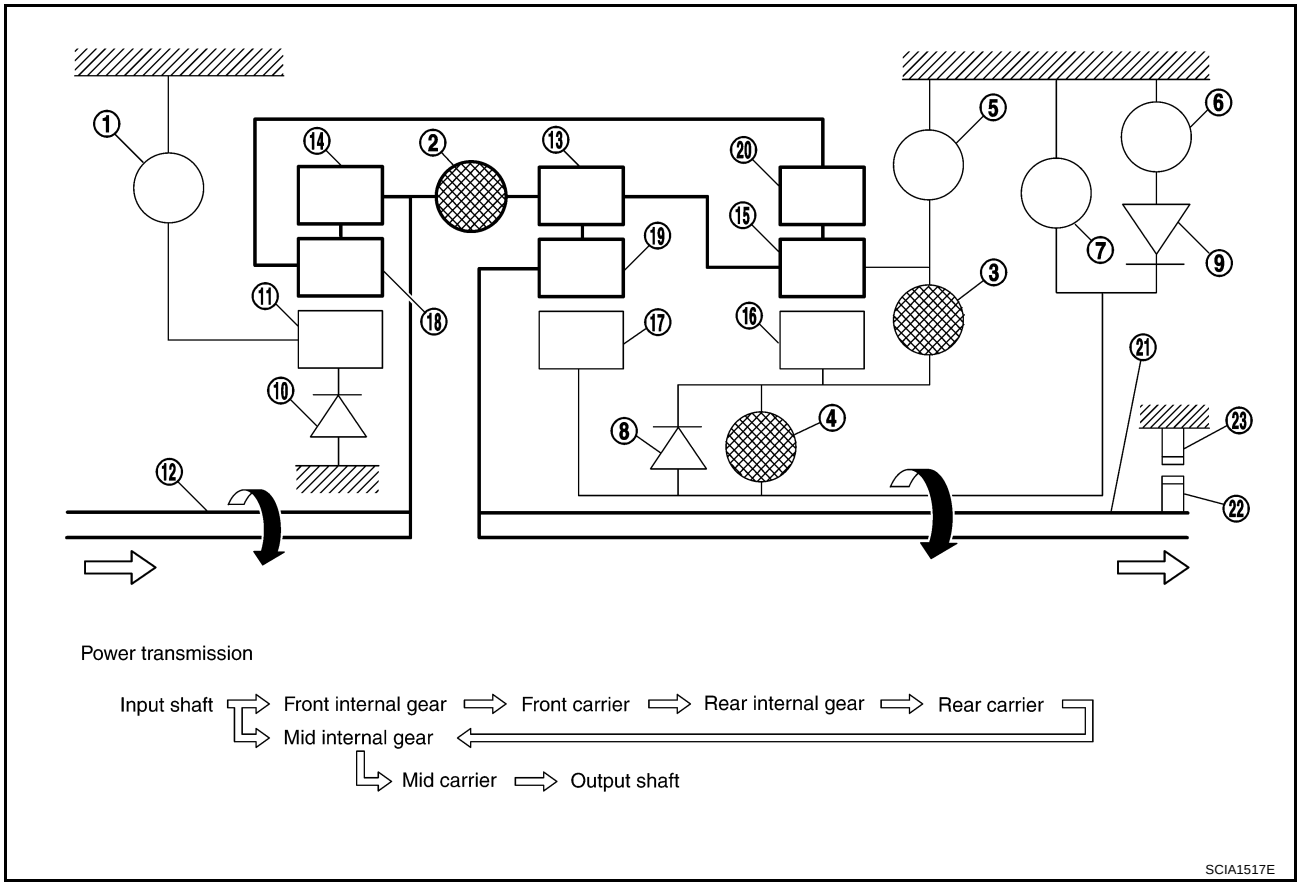
- The front brake fastens the front sun gear.
- The direct clutch is coupled, and the rear carrier and rear sun gear are connected.
- The high and low reverse clutch is coupled, and the mid sun gear and rear sun gear are connected.



1. Front brake	2. Input clutch	3. Direct clutch
4. High and low reverse clutch	5. Reverse brake	6. Forward brake
7. Low coast brake	8. 1st one-way clutch	9. Forward one-way clutch
10. 3rd one-way clutch	11. Front sun gear	12. Input shaft
13. Mid internal gear	14. Front internal gear	15. Rear carrier
16. Rear sun gear	17. Mid sun gear	18. Front carrier
19. Mid carrier	20. Rear internal gear	21. Output shaft
22. Parking gear	23. Parking pawl	

"D4 " and "M4" Positions

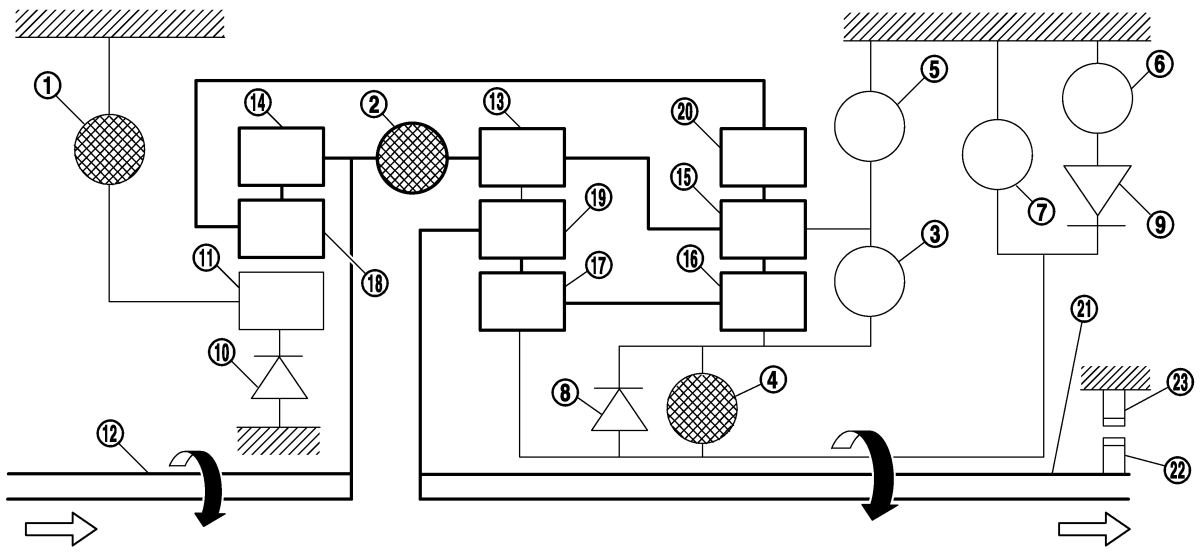
- The direct clutch is coupled, and the rear carrier and rear sun gear are connected.
- The high and low reverse clutch is coupled, and the mid sun gear and rear sun gear are connected.
- The input clutch is coupled, and the front internal gear and mid internal gear are connected.
- The drive power is conveyed to the front internal gear, mid internal gear, and rear carrier and the three planetary gears rotate forward as one unit.



1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier
16. Rear sun gear
17. Mid sun gear
18. Front carrier
19. Mid carrier
20. Rear internal gear
21. Output shaft
22. Parking gear
23. Parking pawl

“D5 ” and “M5” Positions

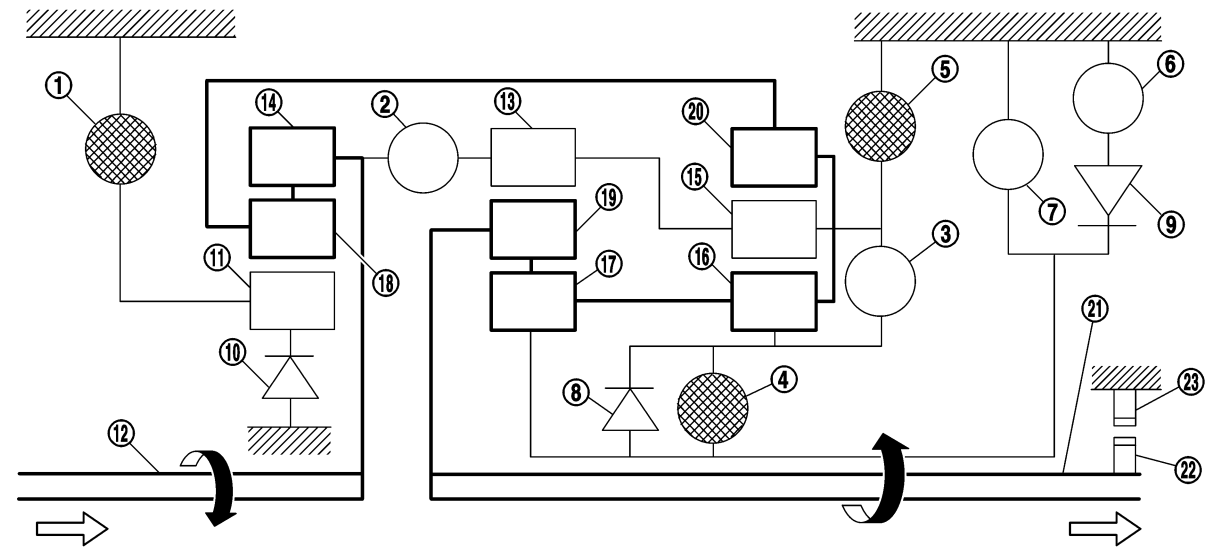
- The front brake fastens the front sun gear.
- The input clutch is coupled, and the front internal gear and mid internal gear are connected.
- The high and low reverse clutch is coupled, and the mid sun gear and rear sun gear are connected.



1. Front brake	2. Input clutch	3. Direct clutch
4. High and low reverse clutch	5. Reverse brake	6. Forward brake
7. Low coast brake	8. 1st one-way clutch	9. Forward one-way clutch
10. 3rd one-way clutch	11. Front sun gear	12. Input shaft
13. Mid internal gear	14. Front internal gear	15. Rear carrier
16. Rear sun gear	17. Mid sun gear	18. Front carrier
19. Mid carrier	20. Rear internal gear	21. Output shaft
22. Parking gear	23. Parking pawl	

“R” Position

- The front brake fastens the front sun gear.
- The high and low reverse clutch is coupled, and the mid sun gear and rear sun gear are connected.
- The reverse brake fastens the rear carrier.



1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier
16. Rear sun gear
17. Mid sun gear
18. Front carrier
19. Mid carrier
20. Rear internal gear
21. Output shaft
22. Parking gear
23. Parking pawl

TCM Function

ACS000H5

The function of the TCM is to:

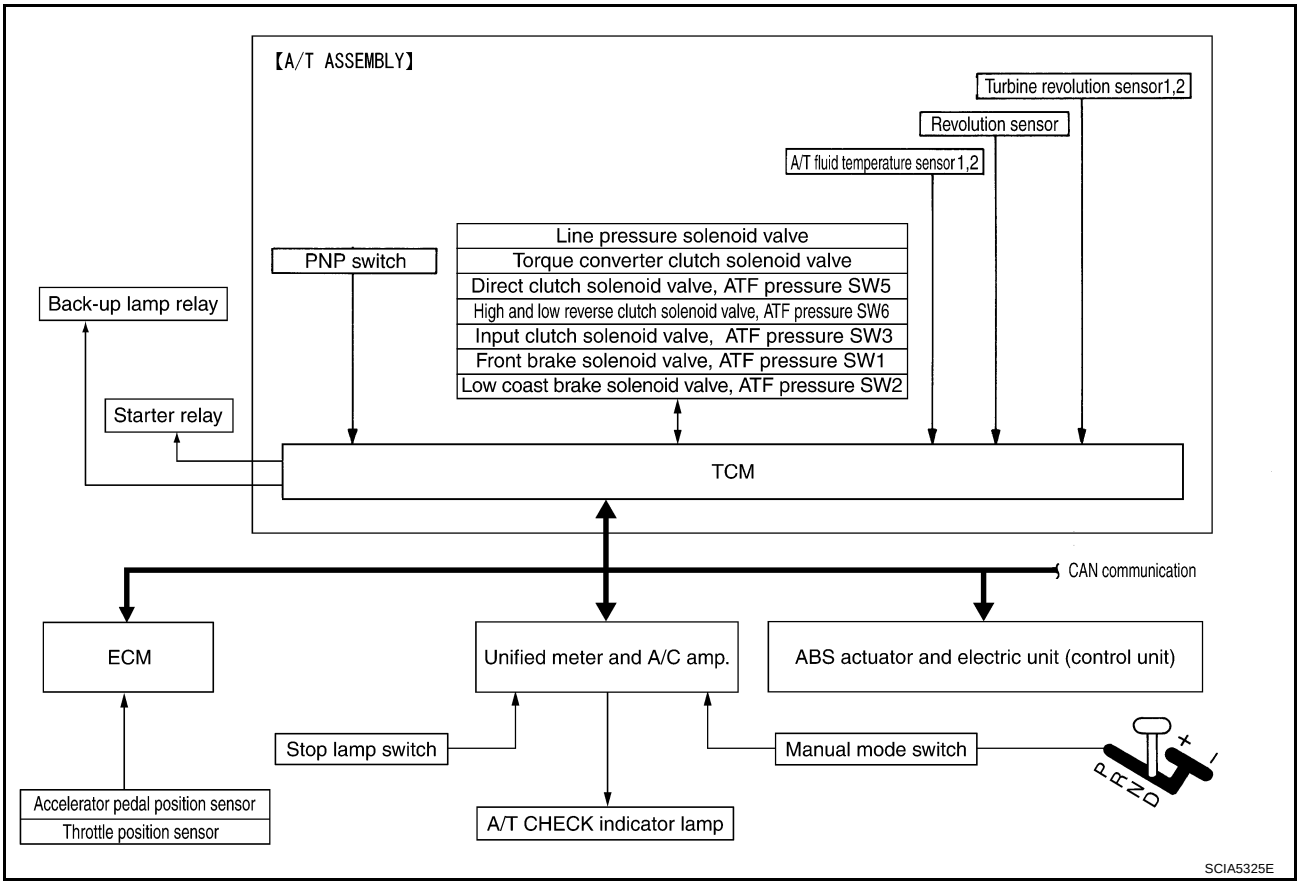
- Receive input signals sent from various switches and sensors.
- Determine required line pressure, shifting point, lock-up operation, and engine brake operation.
- Send required output signals to the respective solenoids.

CONTROL SYSTEM OUTLINE

The automatic transmission senses vehicle operating conditions through various sensors or signals. It always controls the optimum shift position and reduces shifting and lock-up shocks.

SENSORS (or SIGNALS)		TCM		ACTUATORS
PNP switch Accelerator pedal position signal Closed throttle position signal Wide open throttle position signal Engine speed signal A/T fluid temperature sensor Revolution sensor Vehicle speed signal Manual mode switch signal Stop lamp switch signal Turbine revolution sensor ATF pressure SW	⇒	Shift control Line pressure control Lock-up control Engine brake control Timing control Fail-safe control Self-diagnosis CONSULT-II communication line Duet-EA control CAN system	⇒	Input clutch solenoid valve Direct clutch solenoid valve Front brake solenoid valve High and low reverse clutch solenoid valve Low coast brake solenoid valve Torque converter clutch solenoid valve Line pressure solenoid valve A/T CHECK indicator lamp Starter relay Back-up lamp relay

CONTROL SYSTEM DIAGRAM



CAN Communication

ACS000H6

SYSTEM DESCRIPTION

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. For details, refer to LAN-5, "CAN Communication Unit" .

Input/Output Signal of TCM

ACS000H7

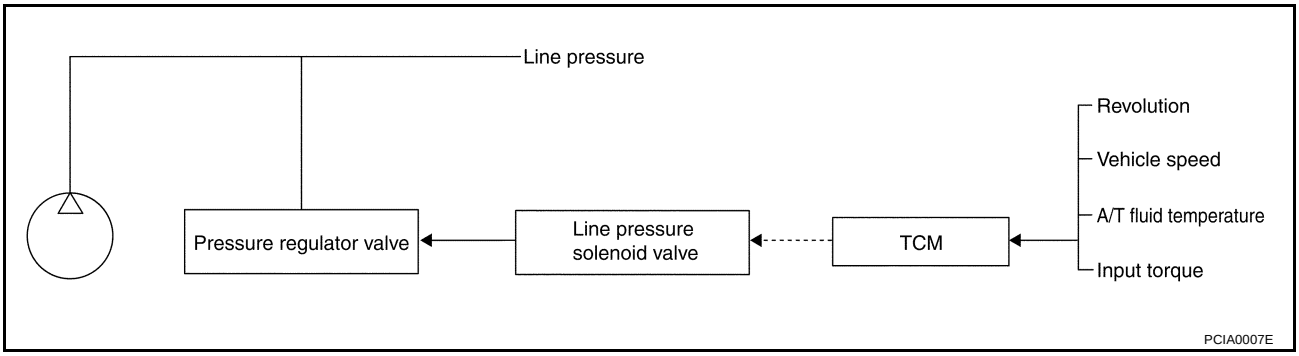
Control item			Line pressure control	Vehicle speed control	Shift control	Lock-up control	Engine brake control	Fail-safe function (*3)	Self-diagnostics function
Input	Accelerator pedal position signal (*5)		X	X	X	X	X	X	X
	Vehicle speed sensor A/T (revolution sensor)		X	X	X	X		X	X
	Vehicle speed sensor MTR(*1) (*5)		X	X	X	X			X
	Closed throttle position signal(*5)		(*2) X	(*2) X		X	(*2) X		(*4) X
	Wide open throttle position signal(*5)		(*2) X	(*2) X			(*2) X		(*4) X
	Turbine revolution sensor 1		X	X		X		X	X
	Turbine revolution sensor 2 (for 4th speed only)		X	X		X		X	X
	Engine speed signals(*5)					X			X
	PNP switch		X	X	X	X	X	X	(*4) X
	Stop lamp switch signal(*5)			X			X		(*4) X
	A/T fluid temperature sensors 1, 2		X	X	X	X	X	X	X
	ASCD	Operation signal(*5)		X	X	X	X		
		Overdrive cancel signal(*5)		X		X	X		
	TCM power supply voltage signal		X	X	X	X	X		X
Output	Direct clutch solenoid (ATF pressure switch 5)			X	X			X	X
	Input clutch solenoid (ATF pressure switch 3)			X	X			X	X
	High and low reverse clutch solenoid (ATF pressure switch 6)			X	X			X	X
	Front brake solenoid (ATF pressure switch 1)			X	X			X	X
	Low coast brake solenoid (ATF pressure switch 2)			X	X		X	X	X
	Line pressure solenoid		X	X	X	X	X	X	X
	TCC solenoid					X		X	X
	Self-diagnostics table(*5)								X
	Starter relay							X	X

*1: Spare for vehicle speed sensor·A/T (revolution sensor)
*2: Spare for accelerator pedal position signal
*3: If these input and output signals are different, the TCM triggers the fail-safe function.
*4: Used as a condition for starting self-diagnostics; if self-diagnostics are not started, it is judged that there is some kind of error.
*5: CAN communications

Line Pressure Control

ACS000H8

- When an input torque signal equivalent to the engine drive force is sent from the ECM to the TCM, the TCM controls the line pressure solenoid.
- This line pressure solenoid controls the pressure regulator valve as the signal pressure and adjusts the pressure of the operating oil discharged from the oil pump to the line pressure most appropriate to the driving state.

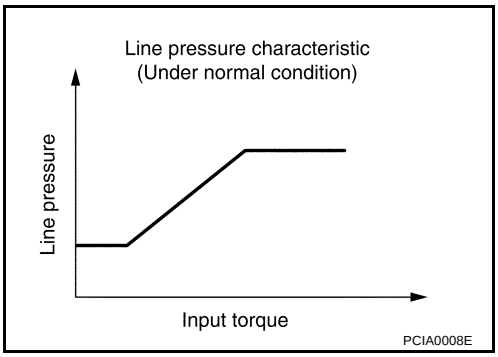


LINE PRESSURE CONTROL IS BASED ON THE TCM LINE PRESSURE CHARACTERISTIC PATTERN

- The TCM has stored in memory a number of patterns for the optimum line pressure characteristic for the driving state.
- In order to obtain the most appropriate line pressure characteristic to meet the current driving state, the TCM controls the line pressure solenoid current valve and thus controls the line pressure.

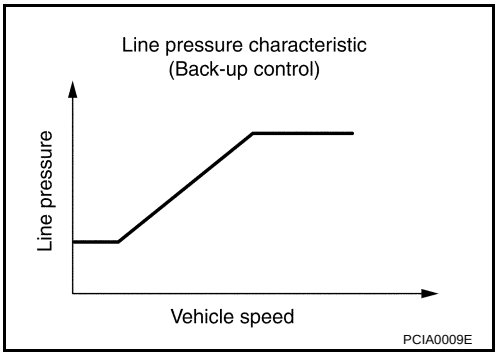
Normal Control

Each clutch is adjusted to the necessary pressure to match the engine drive force.



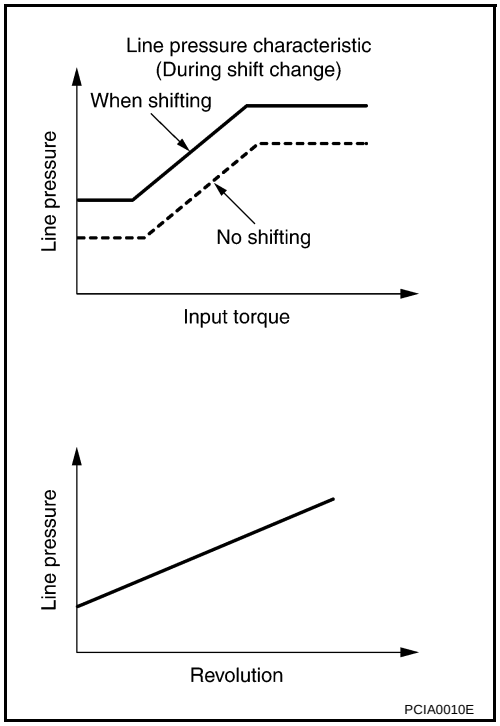
Back-up Control (Engine Brake)

When the select operation is executed during driving and the transmission is shifted down, the line pressure is set according to the vehicle speed.



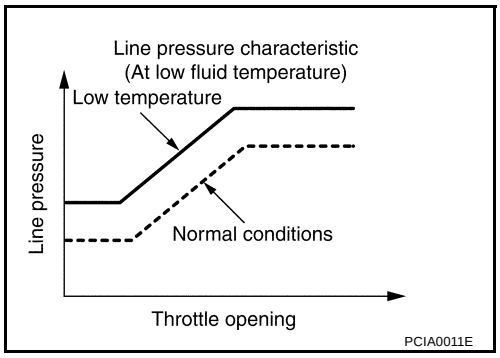
During Shift Change

The necessary and adequate line pressure for shift change is set. For this reason, line pressure pattern setting corresponds to input torque and gearshift selection. Also, line pressure characteristic is set according to engine speed, during engine brake operation.



At Low Fluid Temperature

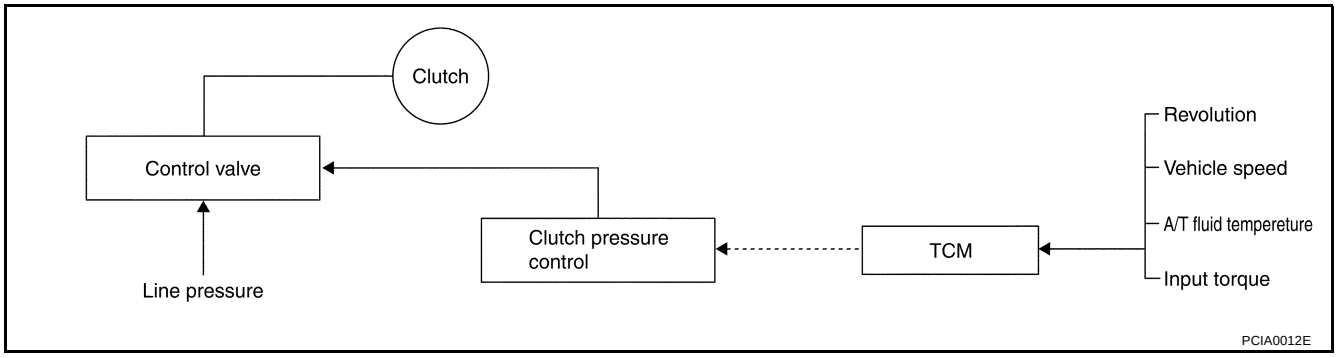
When the A/T fluid temperature drops below the prescribed temperature, in order to speed up the action of each friction element, the line pressure is set higher than the normal line pressure characteristic.



Shift Control

ACS000H9

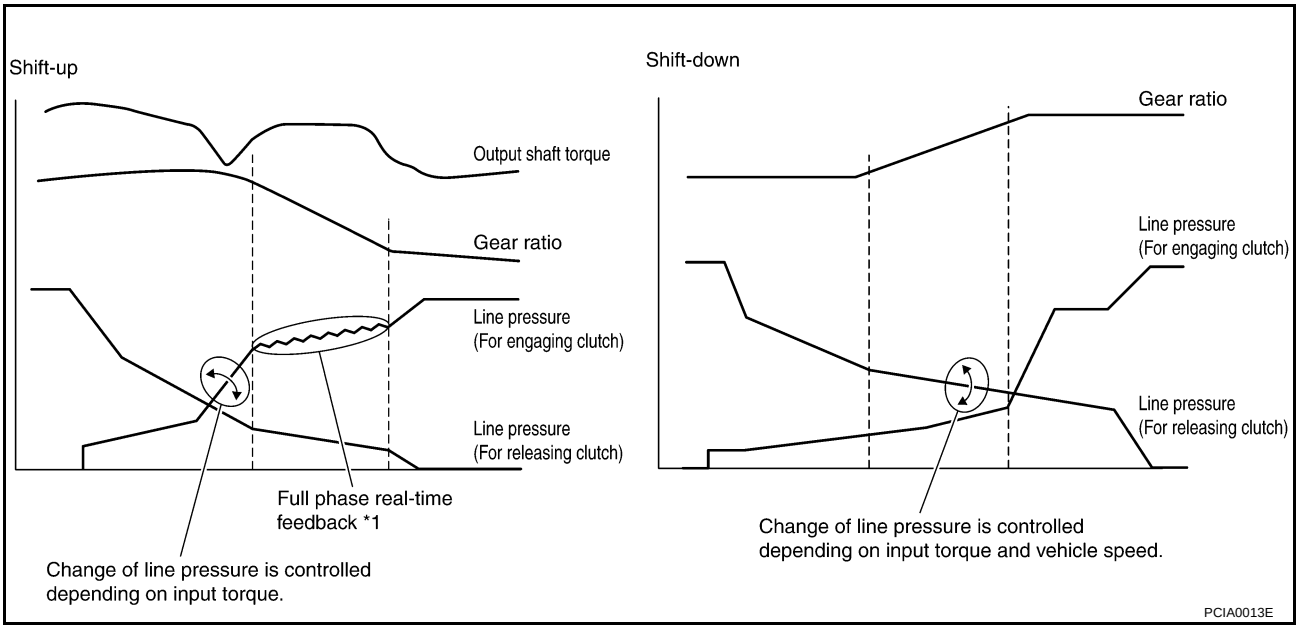
The clutch pressure control solenoid is controlled by the signals from the switches and sensors. Thus, the clutch pressure is adjusted to be appropriate to the engine load state and vehicle driving state. It becomes possible to finely control the clutch hydraulic pressure with high precision and a smoother shift change characteristic is attained.



SHIFT CHANGE

The clutch is controlled with the optimum timing and oil pressure by the engine speed, engine torque information, etc.

Shift Change System Diagram



*1: Full phase real-time feedback control monitors movement of gear ratio at gear change, and controls oil pressure at real-time to achieve the best gear ratio.

Lock-up Control

ACS000HA

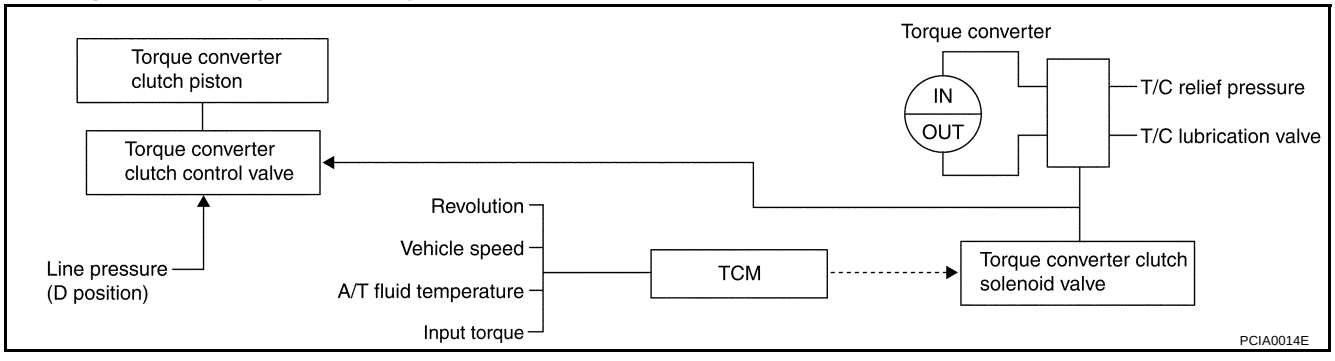
The torque converter clutch piston in the torque converter is engaged to eliminate torque converter slip to increase power transmission efficiency.
The torque converter clutch control valve operation is controlled by the torque converter clutch solenoid valve, which is controlled by a signal from TCM, and the torque converter clutch control valve engages or releases the torque converter clutch piston.

Lock-up Operation Condition Table

selector lever	D position		M5 position	M4 position	M3 position	M2 position
Gear position	5	4	5	4	3	2
Lock-up	×	–	×	×	×	×
Slip lock-up	×	×	–	–	–	–

TORQUE CONVERTER CLUTCH CONTROL VALVE CONTROL

Lock-up Control System Diagram



Lock-up Released

- In the lock-up released state, the torque converter clutch control valve is set into the unlocked state by the torque converter clutch solenoid and the lock-up apply pressure is drained.
  In this way, the torque converter clutch piston is not coupled.

Lock-up Applied

- In the lock-up applied state, the torque converter clutch control valve is set into the locked state by the torque converter clutch solenoid and lock-up apply pressure is generated.
  In this way, the torque converter clutch piston is pressed and coupled.

SMOOTH LOCK-UP CONTROL

When shifting from the lock-up released state to the lock-up applied state, the current output to the torque converter clutch solenoid is controlled with the TCM. In this way, when shifting to the lock-up applied state, the torque converter clutch is temporarily set to the half-clutched state to reduce the shock.

Half-clutched State

- The current output from the TCM to the torque converter clutch solenoid is varied to gradually increase the torque converter clutch solenoid pressure.
  In this way, the lock-up apply pressure gradually rises and while the torque converter clutch piston is put into half-clutched status, the torque converter clutch piston operating pressure is increased and the coupling is completed smoothly.

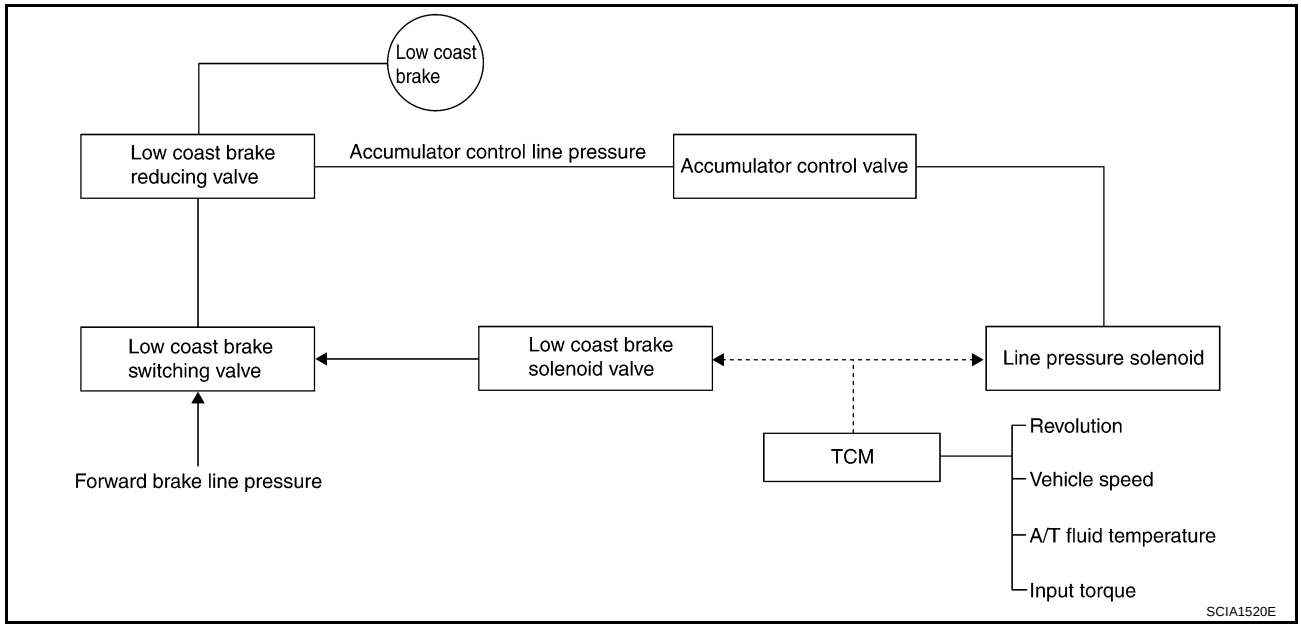
Slip Lock-up Control

- In the slip region, the torque converter clutch solenoid current is controlled with the TCM to put it into the half-clutched state. This absorbs the engine torque fluctuation and lock-up operates from low speed.
  This raises the fuel efficiency for 4th and 5th gears at both low speed and when the accelerator has a low degree of opening.

Engine Brake Control

ACS000HB

- The forward one-way clutch transmits the drive force from the engine to the rear wheels. But the reverse drive from the rear wheels is not transmitted to the engine because the one-way clutch is idling.
  Therefore, the low coast brake solenoid is operated to prevent the forward one-way clutch from idling and the engine brake is operated in the same manner as conventionally.



- The operation of the low coast brake solenoid switches the low coast brake switching valve and controls the coupling and releasing of the low coast brake.
  The low coast brake reducing valve controls the low coast brake coupling force.

Control Valve

ACS000HC

FUNCTION OF CONTROL VALVE

Name	Function
Torque converter regulator valve	In order to prevent the pressure supplied to the torque converter from being excessive, the line pressure is adjusted to the optimum pressure (torque converter operating pressure).
Pressure regulator valve Pressure regulator plug Pressure regulator sleeve	Adjusts the oil discharged from the oil pump to the optimum pressure (line pressure) for the driving state.
Front brake control valve	When the front brake is coupled, adjusts the line pressure to the optimum pressure (front brake pressure) and supplies it to the front brake. (In 1st, 2nd, 3rd, and 5th gears, adjusts the clutch pressure.)
Accumulator control valve	Adjusts the pressure (accumulator control pressure) acting on the accumulator piston and low coast reducing valve to the pressure appropriate to the driving state.
Pilot valve A	Adjusts the line pressure and produces the constant pressure (pilot pressure) required for line pressure control, shift change control, and lock-up control.
Pilot valve B	Adjusts the line pressure and produces the constant pressure (pilot pressure) required for shift change control.
Low coast brake switching valve	During engine braking, supplies the line pressure to the low coast brake reducing valve.
Low coast brake reducing valve	When the low coast brake is coupled, adjusts the line pressure to the optimum pressure (low coast brake pressure) and supplies it to the low coast brake.
N-R accumulator	Produces the stabilizing pressure for when N-R is selected.
Direct clutch piston switching valve	Operates in 4th gear and switches the direct clutch coupling capacity.
High and low reverse clutch control valve	When the high and low reverse clutch is coupled, adjusts the line pressure to the optimum pressure (high and low reverse clutch pressure) and supplies it to the high and low reverse clutch. (In 1st, 3rd, 4th and 5th gears, adjusts the clutch pressure.)
Input clutch control valve	When the input clutch is coupled, adjusts the line pressure to the optimum pressure (input clutch pressure) and supplies it to the input clutch. (In 4th and 5th gears, adjusts the clutch pressure.)
Direct clutch control valve	When the direct clutch is coupled, adjusts the line pressure to the optimum pressure (direct clutch pressure) and supplies it to the direct clutch. (In 2nd, 3rd, and 4th gears, adjusts the clutch pressure.)
TCC control valve TCC control plug TCC control sleeve	Switches the lock-up to operating or released. Also, by executing the lock-up operation transiently, lock-up smoothly.
Torque converter lubrication valve	Operates during lock-up to switch the torque converter, cooling, and lubrication system oil path.
Cool bypass valve	Allows excess oil to bypass cooler circuit without being fed into it.
Line pressure relief valve	Discharges excess oil from line pressure circuit.
N-D accumulator	Produces the stabilizing pressure for when N-D is selected.
Manual valve	Sends line pressure to each circuit according to the select position. The circuits to which the line pressure is not sent drain.

FUNCTION OF ATF PRESSURE SWITCH

Name	Function
ATF pressure switch 1 (FR/B)	Detects any malfunction in the front brake hydraulic pressure. When it detects any malfunction, it puts the system into fail-safe mode.
ATF pressure switch 2 (LC/B)	Detects any malfunction in the low coast brake hydraulic pressure. When it detects any malfunction, it puts the system into fail-safe mode.
ATF pressure switch 3 (I/C)	Detects any malfunction in the input clutch hydraulic pressure. When it detects any malfunction, it puts the system into fail-safe mode.

Name	Function
ATF pressure switch 5 (D/C)	Detects any malfunction in the direct clutch hydraulic pressure. When it detects any malfunction, it puts the system into fail-safe mode.
ATF pressure switch 6 (HLR/C)	Detects any malfunction in the high and low reverse clutch hydraulic pressure. When it detects any malfunction, it puts the system into fail-safe mode.

ON BOARD DIAGNOSTIC (OBD) SYSTEM

PFP:00028

Introduction

ACS000HD

The A/T system has two self-diagnostic systems.
The first is the emission-related on board diagnostic system (OBD-II) performed by the TCM in combination with the ECM. The malfunction is indicated by the MIL (malfunction indicator lamp) and is stored as a DTC in the ECM memory but not the TCM memory.
The second is the TCM original self-diagnosis indicated by the A/T CHECK indicator lamp. The malfunction is stored in the TCM memory. The detected items are overlapped with OBD-II self-diagnostic items. For detail, refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" .

OBD-II Function for A/T System

ACS000HE

The ECM provides emission-related on board diagnostic (OBD-II) functions for the A/T system. One function is to receive a signal from the TCM used with OBD-related parts of the A/T system. The signal is sent to the ECM when a malfunction occurs in the corresponding OBD-related part. The other function is to indicate a diagnostic result by means of the MIL (malfunction indicator lamp) on the instrument panel. Sensors, switches and solenoid valves are used as sensing elements.
The MIL automatically illuminates in One or Two Trip Detection Logic when a malfunction is sensed in relation to A/T system parts.

One or Two Trip Detection Logic of OBD-II

ACS000HF

ONE TRIP DETECTION LOGIC

If a malfunction is sensed during the first test drive, the MIL will illuminate and the malfunction will be stored in the ECM memory as a DTC. The TCM is not provided with such a memory function.

TWO TRIP DETECTION LOGIC

When a malfunction is sensed during the first test drive, it is stored in the ECM memory as a 1st trip DTC (diagnostic trouble code) or 1st trip freeze frame data. At this point, the MIL will not illuminate. — First Trip
If the same malfunction as that experienced during the first test drive is sensed during the second test drive, the MIL will illuminate. — Second Trip
The “trip” in the “One or Two Trip Detection Logic” means a driving mode in which self-diagnosis is performed during vehicle operation.

OBD-II Diagnostic Trouble Code (DTC)

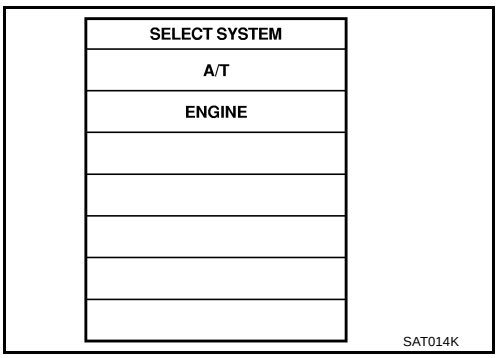
ACS000HG

HOW TO READ DTC AND 1ST TRIP DTC

DTC and 1st trip DTC can be read by the following methods.
(with CONSULT-II or GST GST) CONSULT-II or GST (Generic Scan Tool) Examples: P0705, P0720 etc. These DTC are prescribed by SAE J2012.
(CONSULT-II also displays the malfunctioning component or system.)

- **1st trip DTC No. is the same as DTC No.**
- **Output of the diagnostic trouble code indicates that the indicated circuit has a malfunction. However, in case of the Mode II and GST, they do not indicate whether the malfunction is still occurring or occurred in the past and returned to normal.**
  CONSULT-II can identify them as shown below, therefore, CONSULT-II (if available) is recommended.

A sample of CONSULT-II display for DTC and 1st trip DTC is shown on the next page. DTC or 1st trip DTC of a malfunction is displayed in SELF-DIAGNOSTIC RESULTS mode for “ENGINE” with CONSULT-II. Time data indicates how many times the vehicle was driven after the last detection of a DTC.



If the DTC is being detected currently, the time data will be “0”.

SELF-DIAG RESULTS	
DTC RESULTS	TIME
PNP SW/CIRC [P0705]	0

SAT015K

If a 1st trip DTC is stored in the ECM, the time data will be “1t”.

SELF-DIAG RESULTS	
DTC RESULTS	TIME
PNP SW/CIRC [P0705]	1 t

SAT016K

Freeze frame data and 1st trip freeze frame data

The ECM has a memory function, which stores the driving condition such as fuel system status, calculated load value, engine coolant temperature, short term fuel trim, long term fuel trim, engine speed and vehicle speed at the moment the ECM detects a malfunction.
Data which are stored in the ECM memory, along with the 1st trip DTC, are called 1st trip freeze frame data, and the data, stored together with the DTC data, are called freeze frame data and displayed on CONSULT-II or GST. The 1st trip freeze frame data can only be displayed on the CONSULT-II screen, not on the GST. For detail, refer to EC-104, "CONSULT-II Function" .
Only one set of freeze frame data (either 1st trip freeze frame data of freeze frame data) can be stored in the ECM. 1st trip freeze frame data is stored in the ECM memory along with the 1st trip DTC. There is no priority for 1st trip freeze frame data and it is updated each time a different 1st trip DTC is detected. However, once freeze frame data (2nd trip detection/MIL on) is stored in the ECM memory, 1st trip freeze frame data is no longer stored. Remember, only one set of freeze frame data can be stored in the ECM. The ECM has the following priorities to update the data.

Priority	Items	
1	Freeze frame data	Misfire — DTC: P0300 - P0306 Fuel Injection System Function — DTC: P0171, P0172, P0174, P0175
2		Except the above items (Includes A/T related items)
3	1st trip freeze frame data	

Both 1st trip freeze frame data and freeze frame data (along with the DTC) are cleared when the ECM memory is erased.

HOW TO ERASE DTC

The diagnostic trouble code can be erased by CONSULT-II, GST or ECM DIAGNOSTIC TEST MODE as described following.

- **If the battery cable is disconnected, the diagnostic trouble code will be lost within 24 hours.**
- **When you erase the DTC, using CONSULT-II or GST is easier and quicker than switching the mode selector on the ECM.**

The following emission-related diagnostic information is cleared from the ECM memory when erasing DTC related to OBD-II. For details, refer to EC-48, "Emission-related Diagnostic Information" .

- **Diagnostic trouble codes (DTC)**
- **1st trip diagnostic trouble codes (1st trip DTC)**
- **Freeze frame data**

- **1st trip freeze frame data**
- **System readiness test (SRT) codes**
- **Test values**

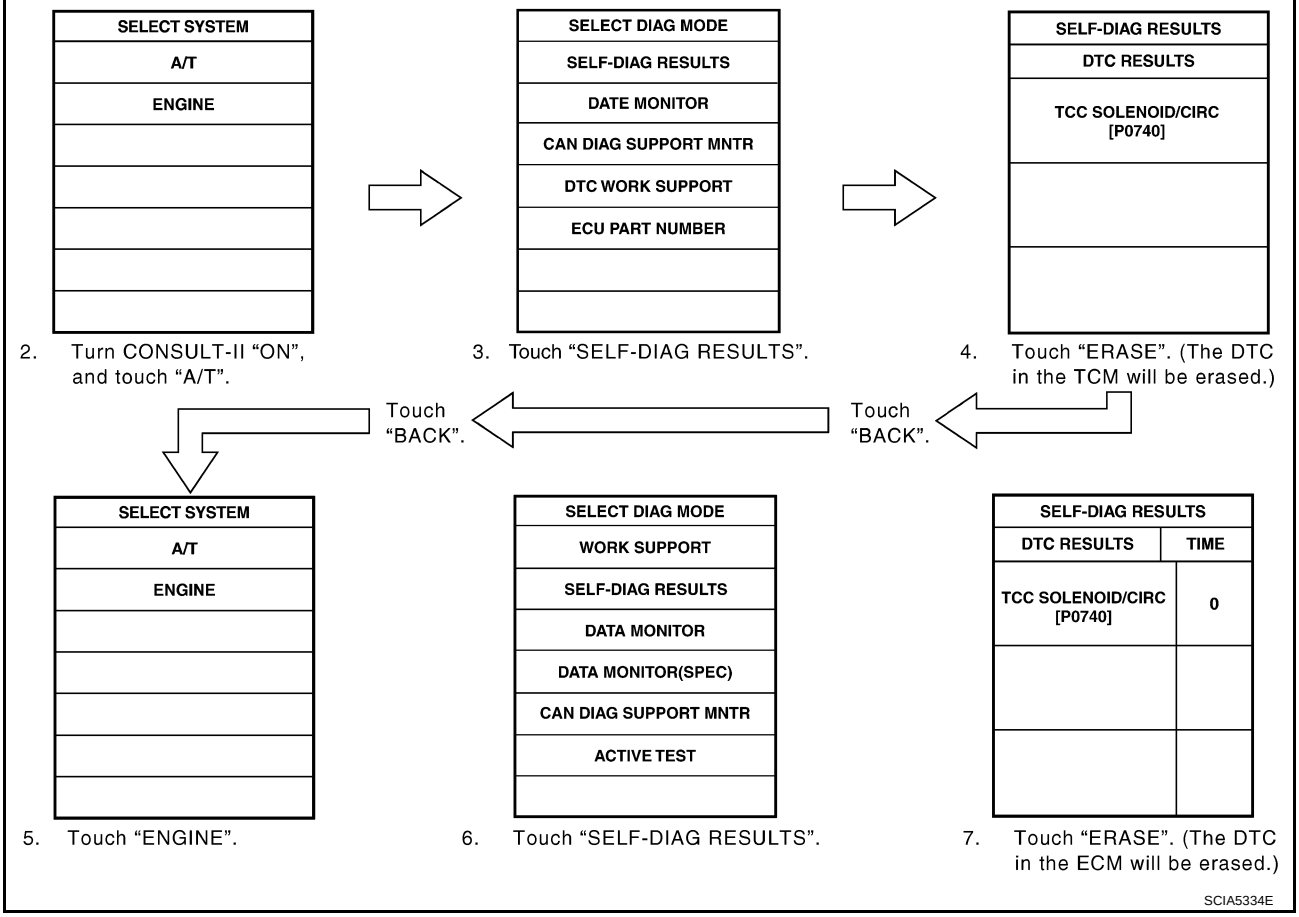
HOW TO ERASE DTC (WITH CONSULT-II)

- **If a DTC is displayed for both ECM and TCM, it is necessary to be erased for both ECM and TCM.**

1. If the ignition switch stays “ON” after repair work, be sure to turn ignition switch “OFF” once. Wait at least 10 seconds and then turn it “ON” (engine stopped) again.
2. Turn CONSULT-II “ON” and touch “A/T”.
3. Touch “SELF-DIAG RESULTS”.
4. Touch “ERASE”. (The DTC in the TCM will be erased.) Then touch “BACK” twice.
5. Touch “ENGINE”.
6. Touch “SELF-DIAG RESULTS”.
7. Touch “ERASE”. (The DTC in the ECM will be erased.)

How to erase DTC (With CONSULT-II)

1. If the ignition switch stays “ON” after repair work, be sure to turn ignition switch “OFF” once. Wait at least 10 seconds and then turn it “ON” (engine stopped) again.



HOW TO ERASE DTC (WITH GST)

1. If the ignition switch stays “ON” after repair work, be sure to turn ignition switch “OFF” once. Wait at least 10 seconds and then turn it “ON” (engine stopped) again.
2. Perform “TCM SELF-DIAGNOSTIC PROCEDURE (No Tools)”. Refer to AT-98, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" . (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)
3. Select Mode 4 with Generic Scan Tool (GST). For details, refer to EC-116, "Generic Scan Tool (GST) Function" .

HOW TO ERASE DTC (NO TOOLS)

The A/T CHECK indicator lamp is located on the instrument panel.

1. If the ignition switch stays “ON” after repair work, be sure to turn ignition switch “OFF” once. Wait at least 10 seconds and then turn it “ON” (engine stopped) again.
2. Perform “TCM SELF-DIAGNOSTIC PROCEDURE (No Tools)”. Refer to AT-98, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" . (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)
3. Perform “OBD-II SELF-DIAGNOSTIC PROCEDURE (No tools)”. Refer to EC-61, "How to Erase DTC" .

Malfunction Indicator Lamp (MIL)

ACS000HH

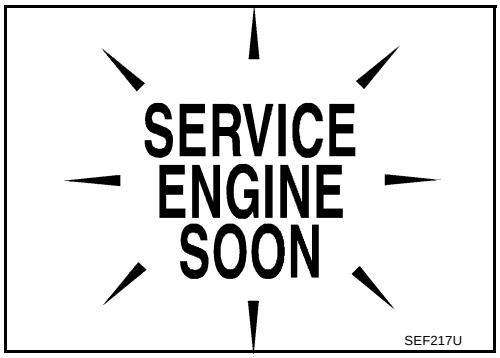
DESCRIPTION

The MIL is located on the instrument panel.

1. The MIL will light up when the ignition switch is turned “ON” without the engine running. This is a bulb check.

- If the MIL does not light up, refer to DI-62, "WARNING LAMPS" , or see EC-671, "MIL AND DATA LINK CONNECTOR" .

2. When the engine is started, the MIL should go off.
   If the MIL remains on, the on board diagnostic system has detected an engine system malfunction.



SEF217U

TROUBLE DIAGNOSIS

PFP:00004

DTC Inspection Priority Chart

ACS000HI

If some DTCs are displayed at the same time, perform inspections one by one based on the following priority chart.

NOTE:
If DTC U1000 is displayed with other DTCs, first perform the trouble diagnosis for DTC U1000. Refer to AT-100 .

Priority	Detected items (DTC)
1	U1000 CAN communication line
2	Except above

Fail-Safe

ACS000HJ

The TCM has an electrical fail-safe mode. This mode makes it possible to operate even if there is a an error in a main electronic control input/output signal circuit.
In fail-safe mode, even if the selector lever is “D” or “M” mode, the transmission is fixed in 2nd or 4th (depending on the breakdown position), so the customer should feel “slipping” or “poor acceleration”. When fail-safe mode is triggered, when the ignition switch is switched “ON”, the A/T CHECK indicator lamp flashes for about 8 seconds. (Refer to AT-98, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)").
Even when the electronic circuits are normal, under special conditions (for example, when slamming on the brake with the wheels spinning drastically and stopping the tire rotation), the transmission can go into fail-safe mode. If this happens, switch “OFF” the ignition switch for 10 seconds, then switch it “ON” again to return to the normal shift pattern. Also, the A/T CHECK indicator lamp flashes for about 8 seconds once, then is cleared. Therefore, the customer's vehicle has returned to normal, so handle according to the “diagnostics flow” (Refer to AT-44).

FAIL-SAFE FUNCTION

If any malfunction occurs in a sensor or solenoid, this function controls the A/T to mark driving possible.

Vehicle Speed Sensor A/T (Revolution Sensor)

- Signals are input from two systems - from vehicle speed sensor A/T (revolution sensor) installed on the transmission and from combination meter so normal driving is possible even if there is a malfunction in one of the systems. And if vehicle speed sensor A/T (revolution sensor) has unusual cases, 5th gear and manual mode are prohibited.

Accelerator Pedal Position Sensor

- If there is a malfunction in one of the systems, the accelerator opening angle is controlled by ECM according to a pre-determined accelerator angle to make driving possible. And if there are malfunctions in tow systems, the engine speed is fixed by ECM to a pre-determined engine speed to make driving possible.

Throttle Position Sensor

- If there is a malfunction in one of the systems, the accelerator opening angle is controlled by ECM according to a pre-determined accelerator angle to make driving possible. And if there are malfunctions in tow systems, the accelerator opening angle is controlled by the idle signal sent from the ECM which is based on input indicating either idle condition or off-idle condition (pre-determined accelerator opening) in order to make driving possible.

PNP Switch

- In the unlikely event that a malfunction signal enters the TCM, the position indicator is switched “OFF”, the starter relay is switched “OFF” (starter starting is disabled), the back-up lamp relay switched “OFF” (back-up lamp is OFF) and the position is fixed to the “D” range to make driving possible.

Starter Relay

- The starter relay is switched “OFF”. (Starter starting is disabled.)

A/T Interlock

- If there is an A/T interlock judgment malfunction, the transmission is fixed in 2nd gear to make driving possible.

  NOTE:
  When the vehicle is driven fixed in 2nd gear a turbine revolution sensor malfunction is displayed, but this is not a turbine revolution sensor malfunction.

- When the coupling pattern below is detected, the fail-safe action corresponding to the pattern is executed.

A/T INTERLOCK COUPLING PATTERN TABLE

●: NG X: OK

Gear position		ATF pressure switch output					Fail-safe function	Clutch pressure output pattern after fail-safe function					
		SW3 (I/C)	SW6 (HLR/C)	SW5 (D/C)	SW1 (FR/B)	SW2 (LC/B)		I/C	HLR/C	D/C	FR/B	LC/B	L/U
A/T interlock coupling pattern	3rd	–	X	X	–	●	Held in 2nd gear	OFF	OFF	ON	OFF	OFF	OFF
	4th	–	X	X	–	●	Held in 2nd gear	OFF	OFF	ON	OFF	OFF	OFF
	5th	X	X	–	X	●	Held in 2nd gear	OFF	OFF	ON	OFF	OFF	OFF

A/T 1st Engine Braking

- When there is an A/T first gear engine brake judgment malfunction, the low coast brake solenoid is switched “OFF” to avoid the engine brake operation.

Line Pressure Solenoid

- The solenoid is switched “OFF” and the line pressure is set to the maximum hydraulic pressure to make driving possible.

Torque Converter Clutch Solenoid

- The solenoid is switched “OFF” to release the lock-up.

Low Coast Brake Solenoid

- When a (electrical or functional) malfunction occurs, in order to make driving possible, if the solenoid is “ON”, the transmission is held in 2nd gear; if the solenoid is “OFF”, the transmission is held in 4th gear. (engine brake is not applied in 1st and 2nd gear.)

Input Clutch Solenoid

- If a (electrical or functional) malfunction occurs with the solenoid either “ON” or “OFF”, the transmission is held in 4th gear to make driving possible.

Direct Clutch Solenoid

- If a (electrical or functional) malfunction occurs with the solenoid either “ON” or “OFF”, the transmission is held in 4th gear to make driving possible.

Front Brake Solenoid

- If a (electrical or functional) malfunction occurs with the solenoid “ON”, in order to make driving possible, the A/T is held in 5th gear; if the solenoid is OFF, 4th gear.

High and Low Reverse Clutch Solenoid

- If a (electrical or functional) malfunction occurs with the solenoid either “ON” or “OFF”, the transmission is held in 4th gear to make driving possible.

Turbine Revolution Sensor 1 or 2

- The control is the same as if there were no turbine revolution sensors, 5th gear and manual mode are prohibited.

How To Perform Trouble Diagnosis For Quick and Accurate Repair

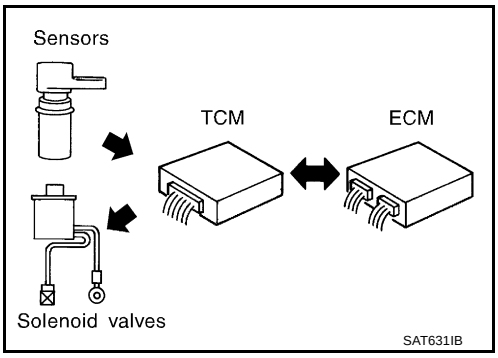
ACS000HK

INTRODUCTION

The TCM receives a signal from the vehicle speed sensor, accelerator pedal position sensor (throttle position sensor) or PNP switch and provides shift control or lock-up control via A/T solenoid valves.

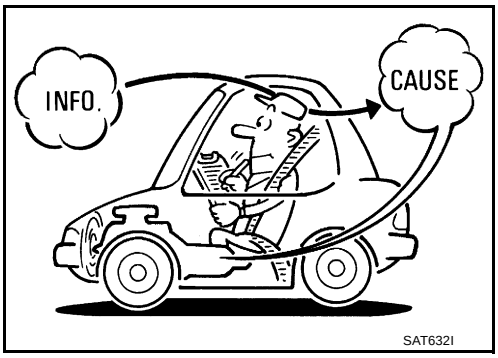
The TCM also communicates with the ECM by means of a signal sent from sensing elements used with the OBD-related parts of the A/T system for malfunction-diagnostic purposes. The TCM is capable of diagnosing malfunctioning parts while the ECM can store malfunctions in its memory.

Input and output signals must always be correct and stable in the operation of the A/T system. The A/T system must be in good operating condition and be free of valve seizure, solenoid valve malfunction, etc.



It is much more difficult to diagnose a error that occurs intermittently rather than continuously. Most intermittent errors are caused by poor electric connections or improper wiring. In this case, careful checking of suspected circuits may help prevent the replacement of good parts.

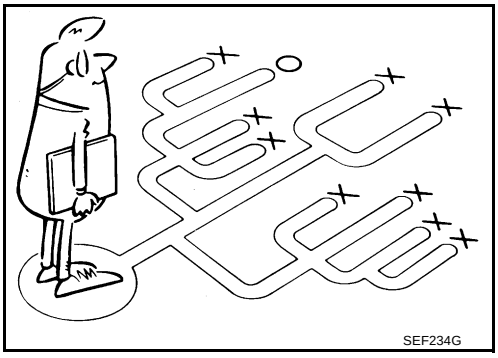
A visual check only may not find the cause of the errors. A road test with CONSULT-II (or GST) or a circuit tester connected should be performed. Follow the AT-44, "WORK FLOW" .



Before undertaking actual checks, take a few minutes to talk with a customer who approaches with a driveability complaint. The customer can supply good information about such errors, especially intermittent ones. Find out what symptoms are present and under what conditions they occur. A “DIAGNOSTIC WORKSHEET” as shown on the example (Refer to AT-45) should be used.

Start your diagnosis by looking for “conventional” errors first. This will help troubleshoot driveability errors on an electronically controlled engine vehicle.

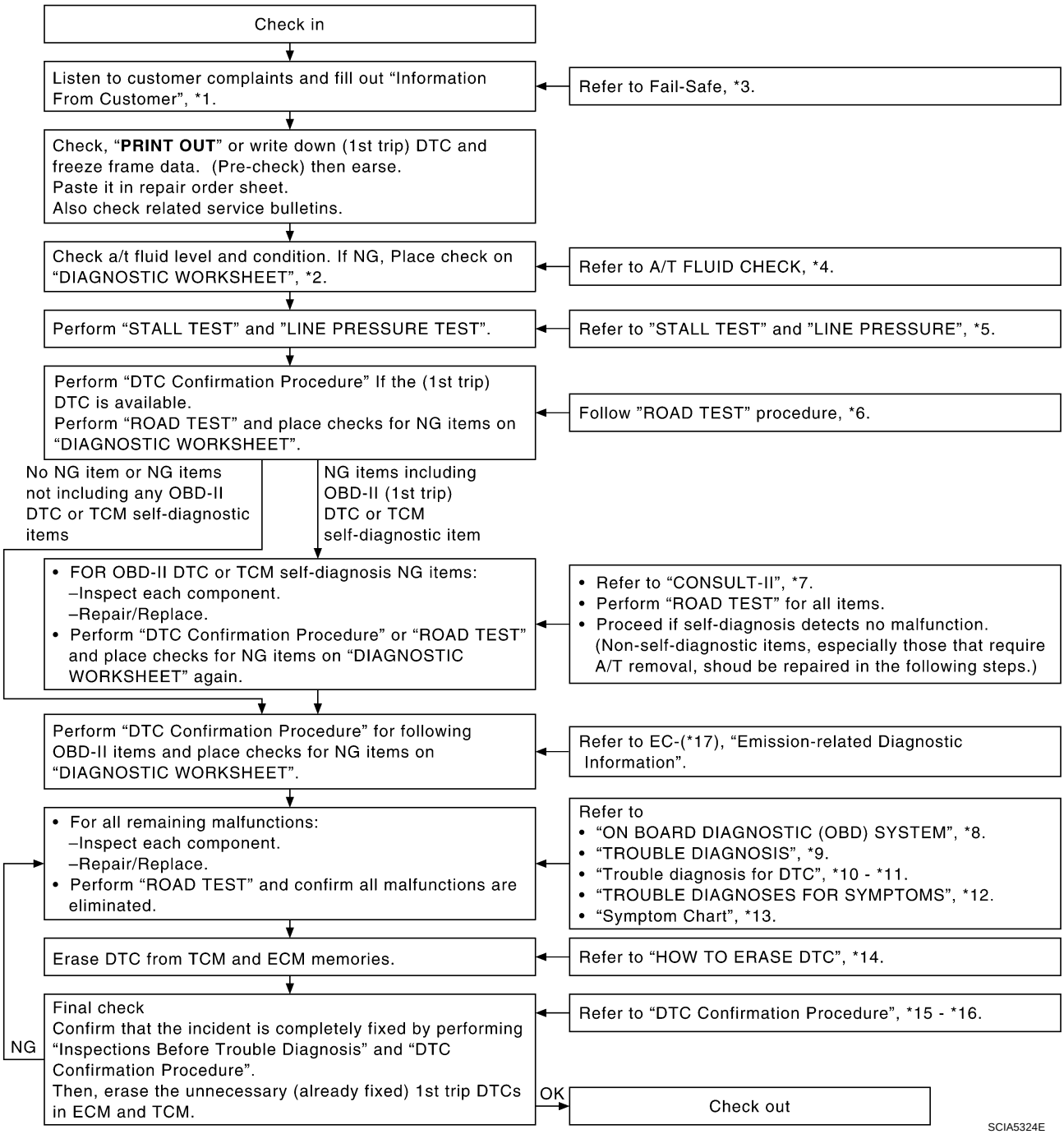
Also check related Service bulletins.



WORK FLOW

A good understanding of the malfunction conditions can make troubleshooting faster and more accurate.
In general, each customer feels differently about a malfunction. It is important to fully understand the symptoms or conditions for a customer complaint.
Make good use of the two sheets provided, “Information From Customer” (Refer to AT-45) and “Diagnostic Worksheet Chart” (Refer to AT-45), to perform the best troubleshooting possible.

Work Flow Chart



*1. AT-45 *2. AT-45 *3. AT-41
*4. AT-51 *5. AT-51, AT-52 *6. AT-54
*7. AT-88 *8. AT-37 *9. AT-41
*10. AT-100 *11. AT-176 *12. AT-184
*13. AT-61 *14. AT-38 *15. AT-100
*16. AT-176 *17. EC-48

DIAGNOSTIC WORKSHEET

Information From Customer

KEY POINTS

- **WHAT**..... Vehicle & A/T model
- **WHEN**..... Date, Frequencies
- **WHERE**..... Road conditions
- **HOW**..... Operating conditions, Symptoms

Customer name MR/MS	Model & Year	VIN
Trans. Model	Engine	Mileage
Incident Date	Manuf. Date	In Service Date
Frequency	❏ Continuous ❏ Intermittent (times a day)	
Symptoms	❏ Vehicle does not move. (❏ Any position ❏ Particular position)	
	❏ No up-shift (❏ 1st → 2nd ❏ 2nd → 3rd ❏ 3rd → 4th ❏ 4th → 5th)	
	❏ No down-shift (❏ 5th → 4th ❏ 4th → 3rd ❏ 3rd → 2nd ❏ 2nd → 1st)	
	❏ Lock-up malfunction	
	❏ Shift point too high or too low.	
	❏ Shift shock or slip (❏ N → D ❏ Lock-up ❏ Any drive position)	
	❏ Noise or vibration	
	❏ No kick down	
	❏ No pattern select	
	❏ Others ( )	
A/T CHECK indicator lamp	Blinks for about 8 seconds.	
	❏ Continuously lit	❏ Not lit
Malfunction indicator lamp (MIL)	❏ Continuously lit	❏ Not lit

Diagnostic Worksheet Chart

1	❏ Read the item on cautions concerning fail-safe and understand the customer's complaint.			AT-41
2	❏ A/T fluid inspection			
		❏ Leak (Repair leak location.) ❏ State ❏ Amount		AT-51
3	❏ Stall test and line pressure test			
	❏ Stall test			
		❏ Torque converter one-way clutch ❏ Front brake ❏ High and low reverse clutch ❏ Low coast brake ❏ Forward brake ❏ Reverse brake ❏ Forward one-way clutch	❏ 1st one-way clutch ❏ 3rd one-way clutch ❏ Engine ❏ Line pressure low ❏ Except for input clutch and direct clutch, clutches and brakes OK	AT-51, AT-52
	❏ Line pressure inspection - Suspected part:			

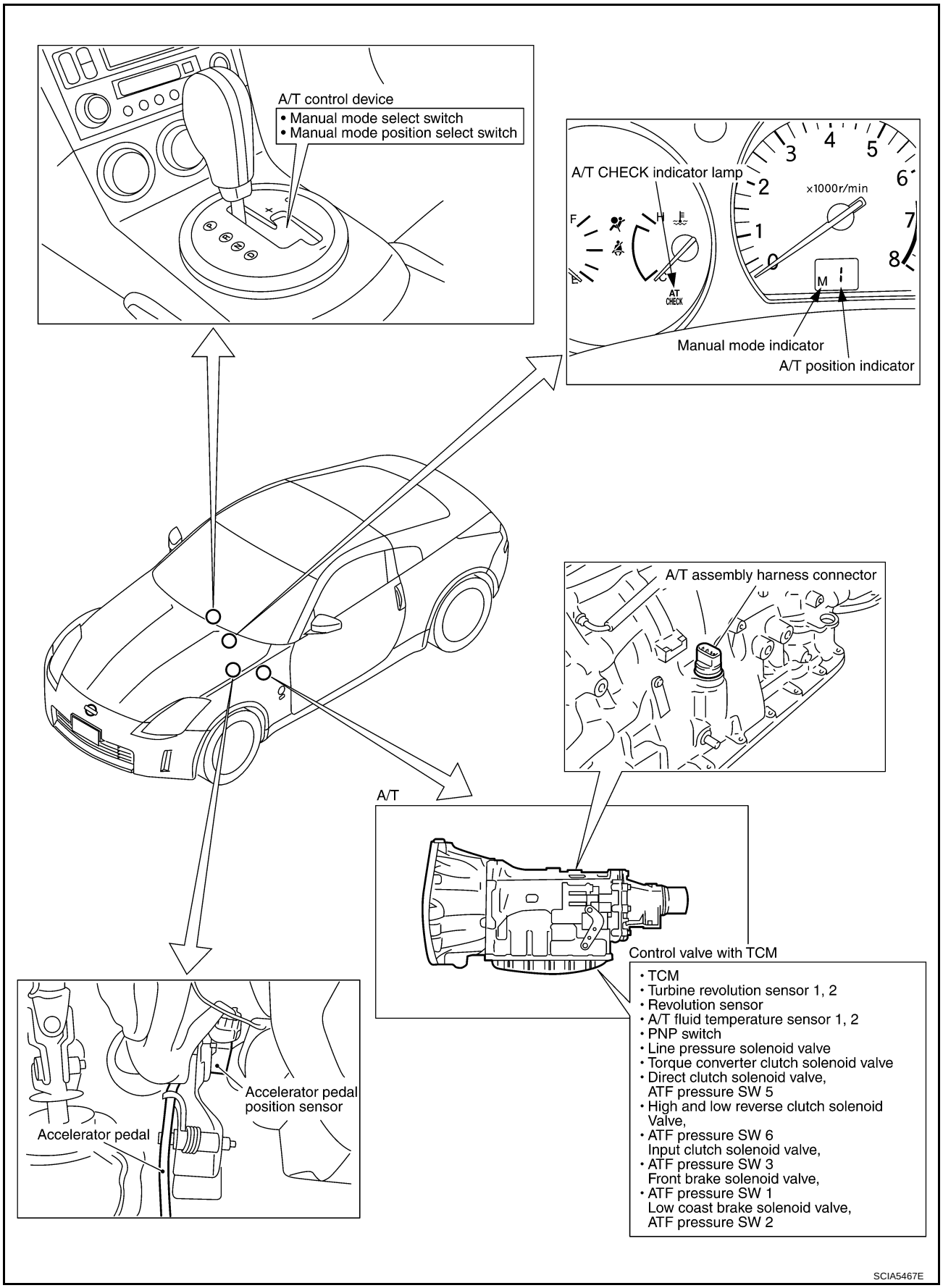
4	❏ Perform all road tests and enter checks in required inspection items.			AT-54
	4-1.	Check before engine is started		AT-54
		❏ AT-187, "A/T Check Indicator Lamp Does Not Come On" . ❏ Perform self-diagnostics. Enter checks for detected items. AT-88 , AT-98		
			❏ AT-100, "DTC U1000 CAN COMMUNICATION LINE" . ❏ AT-103, "DTC P0615 START SIGNAL CIRCUIT" . ❏ AT-107, "DTC P0700 TCM" . ❏ AT-108, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" . ❏ AT-112, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)" . ❏ AT-117, "DTC P0725 ENGINE SPEED SIGNAL" . ❏ AT-119, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE" . ❏ AT-121, "DTC P0744 A/T TCC S/V FUNCTION (LOCK-UP)" . ❏ AT-123, "DTC P0745 LINE PRESSURE SOLENOID VALVE" . ❏ AT-125, "DTC P1702 TRANSMISSION CONTROL MODULE (RAM)" . ❏ AT-126, "DTC P1703 TRANSMISSION CONTROL MODULE (ROM)" . ❏ AT-127, "DTC P1705 THROTTLE POSITION SENSOR" . ❏ AT-130, "DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT" . ❏ AT-135, "DTC P1716 TURBINE REVOLUTION SENSOR" . ❏ AT-137, "DTC P1721 VEHICLE SPEED SENSOR MTR" . ❏ AT-139, "DTC P1730 A/T INTERLOCK" . ❏ AT-142, "DTC P1731 A/T 1ST ENGINE BRAKING" . ❏ AT-144, "DTC P1752 INPUT CLUTCH SOLENOID VALVE" . ❏ AT-146, "DTC P1754 INPUT CLUTCH SOLENOID VALVE FUNCTION" . ❏ AT-148, "DTC P1757 FRONT BRAKE SOLENOID VALVE" . ❏ AT-150, "DTC P1759 FRONT BRAKE SOLENOID VALVE FUNCTION" . ❏ AT-152, "DTC P1762 DIRECT CLUTCH SOLENOID VALVE" . ❏ AT-154, "DTC P1764 DIRECT CLUTCH SOLENOID VALVE FUNCTION" . ❏ AT-156, "DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE" . ❏ AT-158, "DTC P1769 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE FUNCTION" . ❏ AT-160, "DTC P1772 LOW COAST BRAKE SOLENOID VALVE" . ❏ AT-162, "DTC P1774 LOW COAST BRAKE SOLENOID VALVE FUNCTION" . ❏ AT-164, "DTC P1815 MANUAL MODE SWITCH" . ❏ AT-170, "DTC P1841 ATF PRESSURE SWITCH 1" . ❏ AT-172, "DTC P1843 ATF PRESSURE SWITCH 3" . ❏ AT-174, "DTC P1845 ATF PRESSURE SWITCH 5" . ❏ AT-176, "DTC P1846 ATF PRESSURE SWITCH 6" .	
	4-2.	Check at Idle		AT-55
		❏ AT-187, "Engine Cannot Be Started In “P” or “N” Position" . ❏ AT-188, "In “P” Position, Vehicle Moves When Pushed" . ❏ AT-189, "In “N” Position, Vehicle Moves" . ❏ AT-190, "Large Shock (“N” to “D” Position)" . ❏ AT-193, "Vehicle Does Not Creep Backward In “R” Position" . ❏ AT-196, "Vehicle Does Not Creep Forward In “D” Position" .		
	4-3.	Cruise test		AT-56
		Part 1		
		❏ AT-198, "Vehicle Cannot Be Started From D_1" . ❏ AT-201, "A/T Does Not Shift: $D_1 \rightarrow D_2$" . ❏ AT-203, "A/T Does Not Shift: $D_2 \rightarrow D_3$" . ❏ AT-206, "A/T Does Not Shift: $D_3 \rightarrow D_4$" . ❏ AT-208, "A/T Does Not Shift: $D_4 \rightarrow D_5$" . ❏ AT-211, "A/T Does Not Perform Lock-up" ❏ AT-213, "A/T Does Not Hold Lock-up Condition" . ❏ AT-214, "Lock-up Is Not Released" . ❏ AT-215, "Engine Speed Does Not Return To Idle" .		

4	4-3	Part 2		AT-58
		❏ AT-198, "Vehicle Cannot Be Started From D1" . ❏ AT-201, "A/T Does Not Shift: D1 → D2" . ❏ AT-203, "A/T Does Not Shift: D2 → D3" . ❏ AT-206, "A/T Does Not Shift: D3 → D4" .		
		Part 3		AT-59
		❏ AT-216, "Cannot Be Changed to Manual Mode" . ❏ AT-217, "A/T Does Not Shift: 5th gear → 4th gear" . ❏ AT-219, "A/T Does Not Shift: 4th gear → 3rd gear" . ❏ AT-221, "A/T Does Not Shift: 3rd gear → 2nd gear" . ❏ AT-223, "A/T Does Not Shift: 2nd gear → 1st gear" . ❏ AT-225, "Vehicle Does Not Decelerate By Engine Brake" . ❏ Perform self-diagnostics. Enter checks for detected items. AT-88 , AT-98		
			❏ AT-100, "DTC U1000 CAN COMMUNICATION LINE" . ❏ AT-103, "DTC P0615 START SIGNAL CIRCUIT" . ❏ AT-107, "DTC P0700 TCM" . ❏ AT-108, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" . ❏ AT-112, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)" . ❏ AT-117, "DTC P0725 ENGINE SPEED SIGNAL" . ❏ AT-119, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE" . ❏ AT-121, "DTC P0744 A/T TCC S/V FUNCTION (LOCK-UP)" . ❏ AT-123, "DTC P0745 LINE PRESSURE SOLENOID VALVE" . ❏ AT-125, "DTC P1702 TRANSMISSION CONTROL MODULE (RAM)" . ❏ AT-126, "DTC P1703 TRANSMISSION CONTROL MODULE (ROM)" . ❏ AT-127, "DTC P1705 THROTTLE POSITION SENSOR" . ❏ AT-130, "DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT" . ❏ AT-135, "DTC P1716 TURBINE REVOLUTION SENSOR" . ❏ AT-137, "DTC P1721 VEHICLE SPEED SENSOR MTR" . ❏ AT-139, "DTC P1730 A/T INTERLOCK" . ❏ AT-142, "DTC P1731 A/T 1ST ENGINE BRAKING" . ❏ AT-144, "DTC P1752 INPUT CLUTCH SOLENOID VALVE" . ❏ AT-146, "DTC P1754 INPUT CLUTCH SOLENOID VALVE FUNCTION" . ❏ AT-148, "DTC P1757 FRONT BRAKE SOLENOID VALVE" . ❏ AT-150, "DTC P1759 FRONT BRAKE SOLENOID VALVE FUNCTION" . ❏ AT-152, "DTC P1762 DIRECT CLUTCH SOLENOID VALVE" . ❏ AT-154, "DTC P1764 DIRECT CLUTCH SOLENOID VALVE FUNCTION" . ❏ AT-156, "DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE" . ❏ AT-158, "DTC P1769 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE FUNCTION" . ❏ AT-160, "DTC P1772 LOW COAST BRAKE SOLENOID VALVE" . ❏ AT-162, "DTC P1774 LOW COAST BRAKE SOLENOID VALVE FUNCTION" . ❏ AT-164, "DTC P1815 MANUAL MODE SWITCH" . ❏ AT-170, "DTC P1841 ATF PRESSURE SWITCH 1" . ❏ AT-172, "DTC P1843 ATF PRESSURE SWITCH 3" . ❏ AT-174, "DTC P1845 ATF PRESSURE SWITCH 5" . ❏ AT-176, "DTC P1846 ATF PRESSURE SWITCH 6" .	
5	❏ Inspect each system for items found to be NG in the self-diagnostics and repair or replace the malfunction parts.			
6	❏ Perform all road tests and enter the checks again for the required items.			AT-54
7	❏ For any remaining NG items, execute the “diagnostics procedure” and repair or replace the malfunction parts. See the chart for diagnostics by symptoms. (This chart also contains other symptoms and inspection procedures.)			AT-61
8	❏ Erase the results of the self-diagnostics from the TCM.			AT-38, AT-99

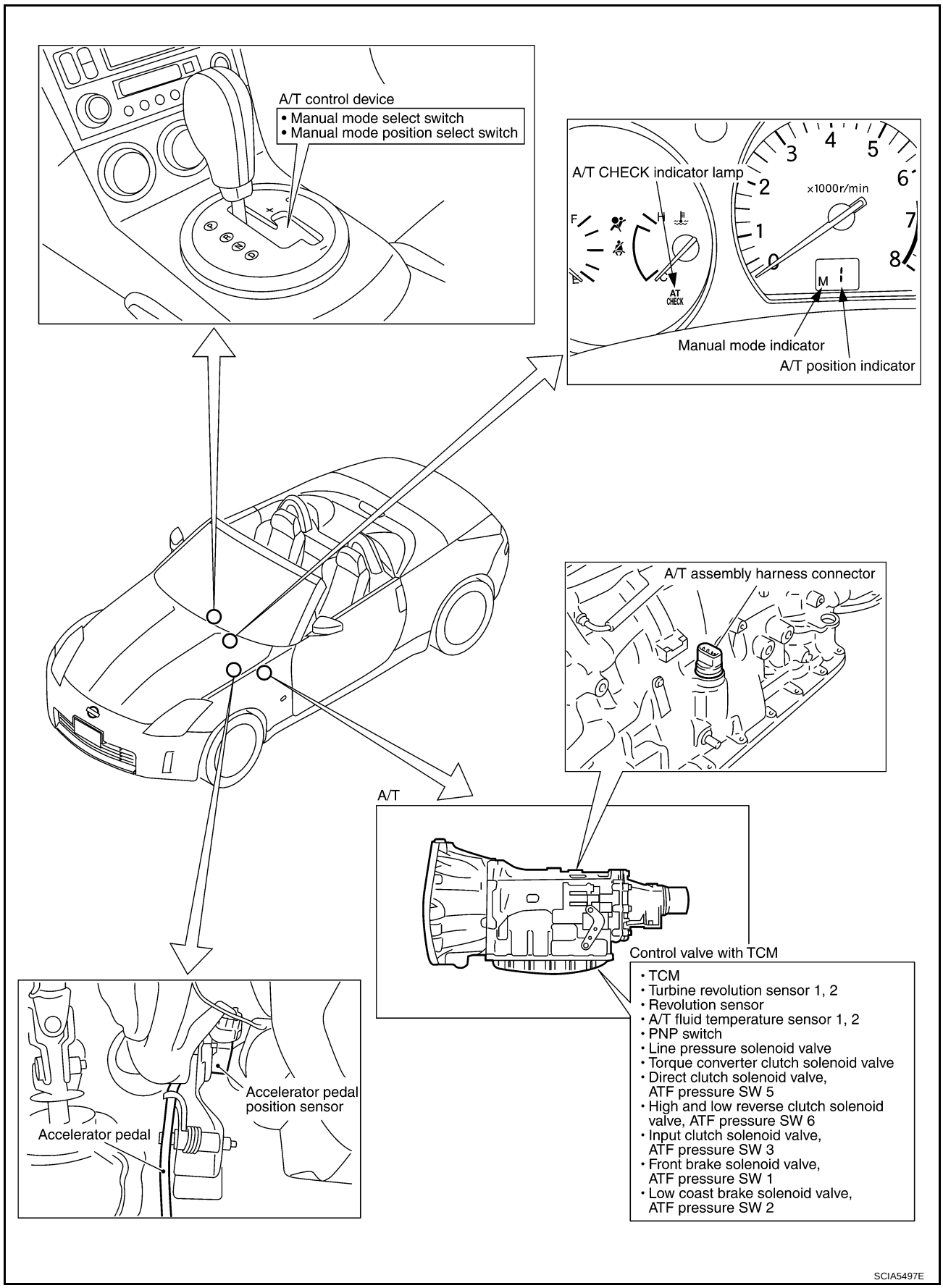
A/T Electrical Parts Location

ACS000HL

COUPE MODEL



ROADSTER MODEL



Circuit Diagram

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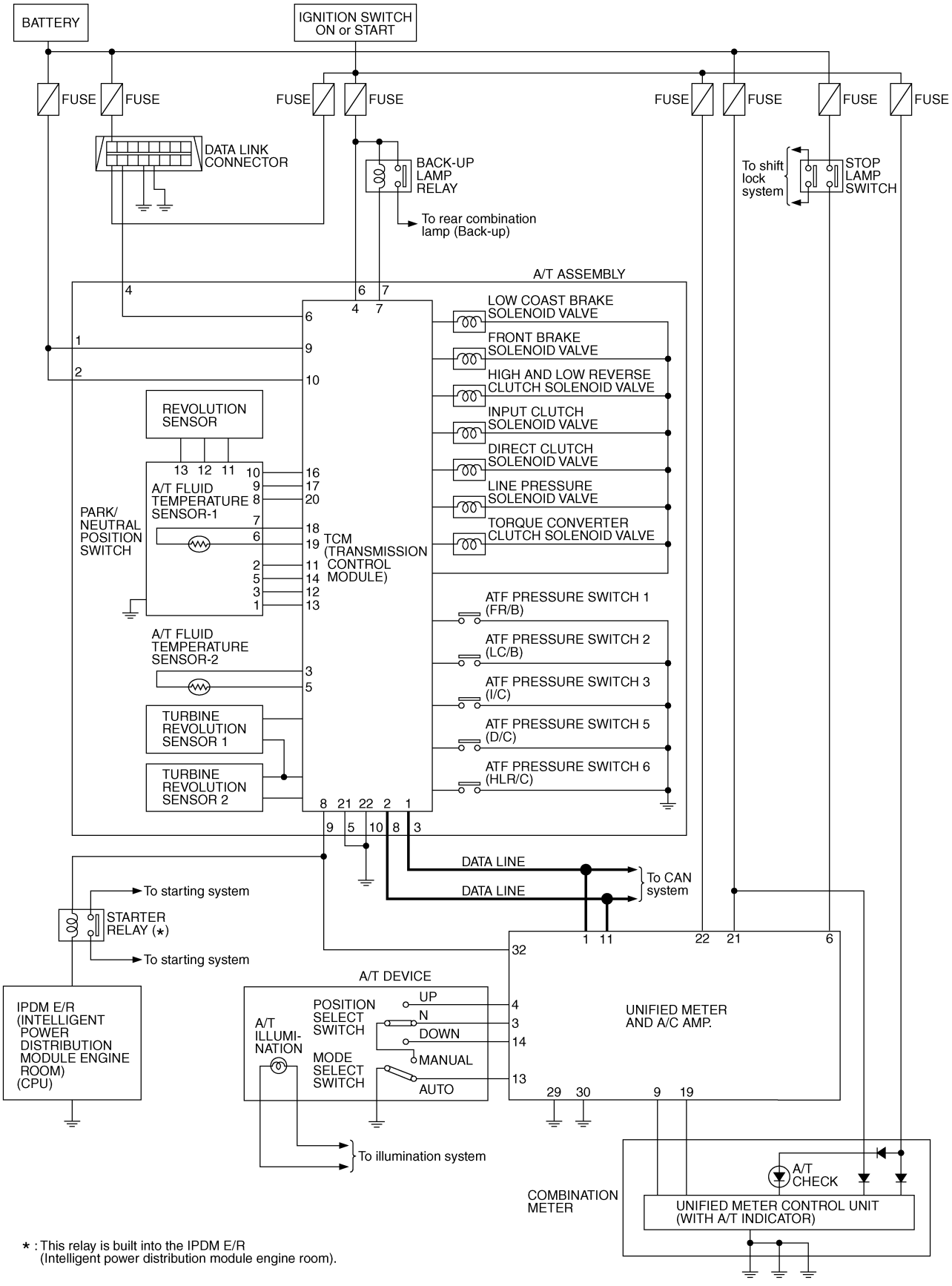


Inspections Before Trouble Diagnosis

ACS000HN

A/T FLUID CHECK

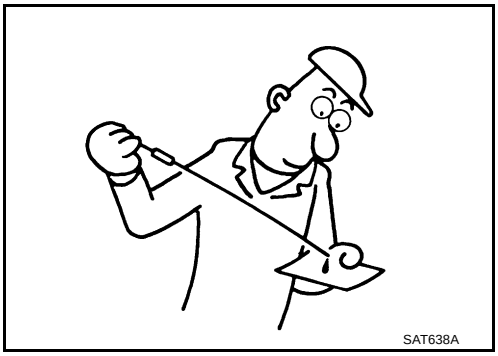
Fluid Leakage and Fluid Level Check

- Inspect for fluid leakage and check the fluid level. Refer to AT-12, "Checking A/T Fluid" .

Fluid Condition Check

Inspect the fluid condition.

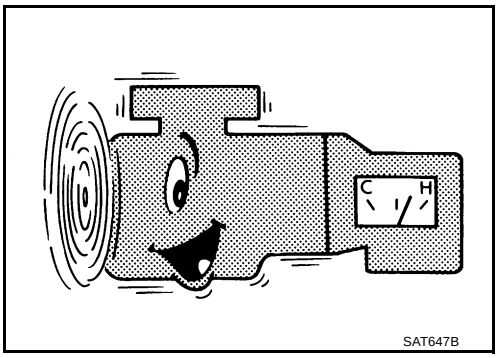
Fluid condition	Conceivable Cause	Required Operation
Varnished (viscous varnish state)	Clutch, brake scorched	Replace the A/T fluid and check the A/T main unit and the vehicle for malfunctions (wire harnesses, cooler pipes, etc.)
Milky white or cloudy	Water in the fluid	Replace the A/T fluid and check for places where water is getting in.
Large amount of metal powder mixed in	Unusual wear of sliding parts within A/T	Replace the A/T fluid and check for improper operation of the A/T.


SAT638A

STALL TEST

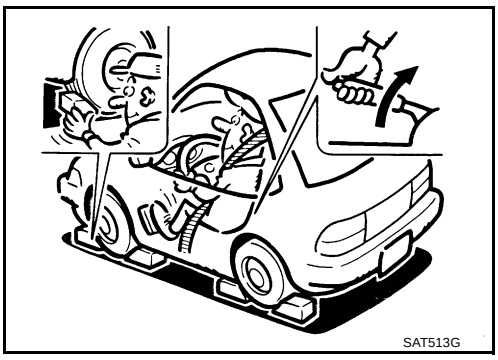
Stall Test Procedure

1. Inspect the amount of engine oil. Replenish the engine oil if necessary.
2. Drive for about 10 minutes to warm up the vehicle so that the A/T fluid temperature is 50 to 80°C (122 to 176°F). Inspect the amount of A/T fluid. Replenish if necessary.



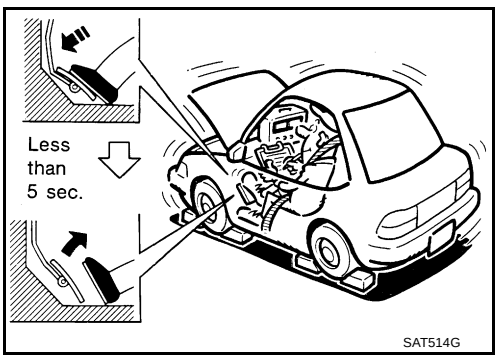
SAT647B

3. Securely engage the parking brake so that the tires do not turn.


SAT513G

4. Engine start, apply foot brake, and place selector lever in “D” position.
5. While holding down the foot brake, gradually press down the accelerator pedal.
6. Quickly read off the stall speed, then quickly remove your foot from the accelerator pedal.

   CAUTION:
   Do not hold down the accelerator pedal for more than 5 seconds during this test.
7. Move the selector lever to the “N” position.
8. Cool down the A/T fluid.



SAT514G

CAUTION:
Run the engine at idle for at least one minute.

Stall speed: 2,650 - 2,950 rpm

Judgement Stall Test

	Selector lever position		Expected problem location
	"D", "M"	"R"	
Stall speed	H	O	● Forward brake ● Forward one-way clutch ● 1st one-way clutch ● 3rd one-way clutch
	O	H	● Reverse brake
	L	L	● Engine and torque converter one-way clutch
	H	H	● Line pressure low

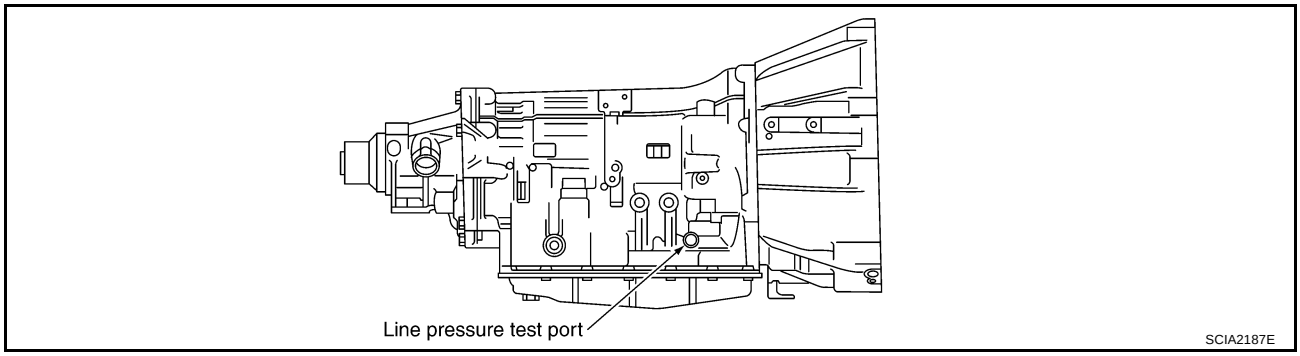
O: Stall speed within standard value position
H: Stall speed higher than standard value
L: Stall speed lower than standard value

Stall Test Standard Value Position

Does not shift up D, M position 1 → 2	Slipping in 2nd, 3rd, 4th gears	Direct clutch slippage
Does not shift up D, M position 2 → 3	Slipping in 3rd, 4th, 5th gears	High and low reverse clutch slippage
Does not shift up D, M position 3 → 4	Slipping in 4th, 5th gears	Input clutch slippage
Does not shift up D, M position 4 → 5	Slipping in 5th gear	Front brake slippage

LINE PRESSURE TEST

Line Pressure Test Port

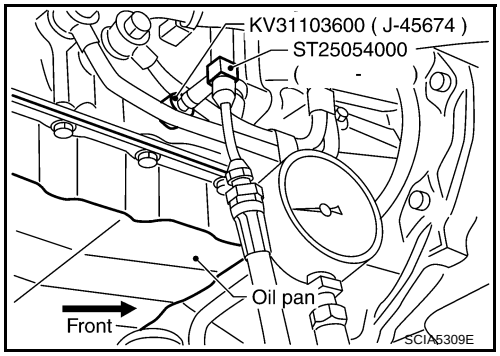


Line Pressure Test Procedure

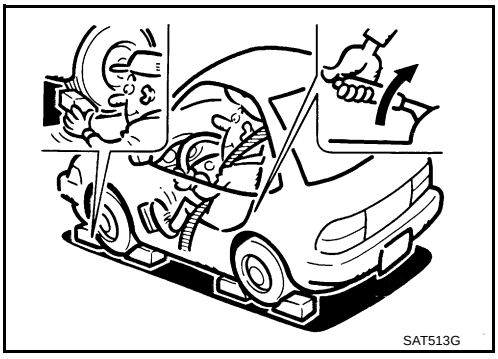
1. Inspect the amount of engine oil and replenish if necessary.
2. Drive the car for about 10 minutes to warm it up so that the A/T fluid reaches in range of 50 to 80°C (122 to 176°F), then inspect the amount of A/T fluid and replenish if necessary.

   NOTE:
   The A/T fluid temperature rises in range of 50 to 80°C (122 to 176°F) during 10 minutes of driving.
3. After warming up remove the oil pressure detection plug and install the oil pressure gauge.

   CAUTION:
   When using the oil pressure gauge, be sure to use the O-ring attached to the oil pressure detection plug.



4. Securely engage the parking brake so that the tires do not turn.



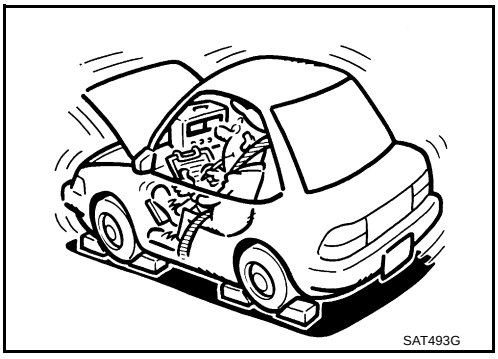
5. Start the engine, then measure the line pressure at both idle and the stall speed.

CAUTION:

- **Keep the brake pedal pressed all the way down during measurement.**
- **When measuring the line pressure at the stall speed, refer to AT-51, "STALL TEST" .**

6. After the measurements are complete, install the oil pressure detection plug and tighten to the regulation torque below.

: 7.3 N·m (0.74 kg-m, 65 in-lb)



CAUTION:

Do not reuse the O-ring.

Line Pressure

Engine speed	Line pressure [kPa (kg/cm^2 , psi)]	
	"R" position	"D", "M" positions
At idle speed	392 - 441 (4.0 - 4.5, 57 - 64)	373 - 422 (3.8 - 4.3, 54 - 61)
At stall speed	1,700 - 1,890 (17.3 - 19.3, 247 - 274)	1,310 - 1,500 (13.3 - 15.3, 190 - 218)

Judgement of Line Pressure Test

Judgement		Possible cause
Idle speed	Low for all positions (P, R, N, D, M)	Possible causes include malfunctions in the pressure supply system and low oil pump output. For example ● Oil pump wear ● Pressure regulator valve or plug sticking or spring fatigue ● Oil strainer ⇒ oil pump ⇒ pressure regulator valve passage oil leak ● Engine idle speed too low
	Only low for a specific position	Possible causes include an oil pressure leak in a passage or device related to the position after the pressure is distributed by the manual valve.
	High	Possible causes include a sensor malfunction or malfunction in the line pressure adjustment function. For example ● Accelerator pedal position signal malfunction ● ATF temperature sensor malfunction ● Line pressure solenoid malfunction (sticking in "OFF" state, filter clog, cut line) ● Pressure regulator valve or plug sticking

Judgement		Possible cause
Stall speed	Oil pressure does not rise higher than the oil pressure for idle.	Possible causes include a sensor malfunction or malfunction in the pressure adjustment function. For example ● Accelerator pedal position signal malfunction ● TCM breakdown ● Line pressure solenoid malfunction (shorting, sticking in “ON” state) ● Pressure regulator valve or plug sticking ● Pilot valve sticking or pilot filter clogged
	The pressure rises, but does not enter the standard position.	Possible causes include malfunctions in the pressure supply system and malfunction in the pressure adjustment function. For example ● Accelerator pedal position signal malfunction ● Line pressure solenoid malfunction (sticking, filter clog) ● Pressure regulator valve or plug sticking ● Pilot valve sticking or pilot filter clogged
	Only low for a specific position	Possible causes include an oil pressure leak in a passage or device related to the position after the pressure is distributed by the manual valve.

ROAD TEST

Description

- The road test inspects overall performance of the A/T and analyzes possible malfunction causes.
- The road test is carried out in the following three stages.

1. Check before engine is started. Refer to AT-54, "Check Before Engine is Started" .
2. Check at idle. Refer to AT-55, "Check at Idle" .
3. Cruise test
   - Inspect all the items from Part 1 to Part 3. Refer to AT-56, "Cruise Test - Part 1" , AT-58, "Cruise Test - Part 2" and AT-59, "Cruise Test - Part 3" .
   - Before beginning the road test, check the test procedure and inspection items.
   - Test all inspection items until the symptom is uncovered. Diagnose NG items when all road tests are complete.

Check Before Engine is Started

ACS000HO

1. CHECK A/T CHECK INDICATOR LAMP

1. Park vehicle on level surface.
2. Move selector lever to “P” position.
3. Turn ignition switch “OFF” and wait at least 10 seconds.
4. Turn ignition switch “ON”. (Do not start engine.)

Does A/T CHECK indicator lamp light up for about 2 seconds?

YES >> GO TO 2.
NO >> Stop the road test and go to AT-187, "A/T Check Indicator Lamp Does Not Come On" .

2. CHECK A/T CHECK INDICATOR LAMP

Does A/T CHECK indicator lamp flash for about 8 seconds?

YES >> For TCM fail-safe mode, perform self-diagnostics and record all NG items on the “DIAGNOSTICS WORKSHEET” (AT-45). Refer to AT-88 , AT-98 .
NO >> 1. Turn ignition switch “OFF”.
2. Perform self-diagnostics and record all NG items on the “DIAGNOSTICS WORKSHEET” (AT-45). Refer to AT-88 , AT-98 .
3. Go to AT-55, "Check at Idle" .

Check at Idle

ACS000HP

1. CHECK STARTING THE ENGINE

1. Park vehicle on level surface.
2. Move selector lever to “P” or “N” position.
3. Turn ignition switch “OFF”.
4. Start the engine.

Does the engine start?

YES >> GO TO 2.
NO >> Stop the road test and go to AT-187, "Engine Cannot Be Started In “P” or “N” Position" .

2. CHECK STARTING THE ENGINE

1. Turn ignition switch “ON”. (Do not start engine.)
2. Move selector lever in “D”, “M” or “R” position.
3. Start the engine.

Does the engine start in both positions?

YES >> Stop the road test and go to AT-187, "Engine Cannot Be Started In “P” or “N” Position" .
NO >> GO TO 3.

3. CHECK “P” POSITION FUNCTIONS

1. Move selector lever to “P” position.
2. Turn ignition switch “OFF”.
3. Release the parking brake.
4. Push the vehicle forward or backward.
5. Engage the parking brake.

When you push the vehicle with disengaging the parking brake, does it move?

YES >> Enter a check mark at “In “P” position, Vehicle Moves When Pushed” on the “DIAGNOSTICS WORKSHEET” (AT-45), then continue the road test.
NO >> GO TO 4.

4. CHECK “N” POSITION FUNCTIONS

1. Start the engine.
2. Move selector lever to “N” position.
3. Release the parking brake.

Does vehicle move forward or backward?

YES >> Enter a check mark at “In “N” position Vehicle Moves” on the “DIAGNOSTICS WORKSHEET” (AT-45), then continue the road test.
NO >> GO TO 5.

5. CHECK SHIFT SHOCK

1. Engage the brake.
2. Move selector lever to “D” position.

When the transmission is shifted from “N” to “D”, is there an excessive shock?

YES >> Enter a check mark at “Large Shock (“N” to “D” Position)” on the “DIAGNOSTICS WORKSHEET” (AT-45), then continue the road test.
NO >> GO TO 6.

6. CHECK “R” POSITION FUNCTIONS

1. Engage the brake.
2. Move selector lever to “R” position.
3. Release the brake for 4 to 5 seconds.

Does the vehicle creep backward?

YES >> GO TO 7.
NO >> Enter a check mark at “Vehicle Does Not Creep Backward In “R” Position” on the “DIAGNOSTICS WORKSHEET” (AT-45), then continue the road test.

7. CHECK “D” POSITION FUNCTIONS

Inspect whether the vehicle moves forward when the transmission is put into the “D” position.

Does the vehicle creep forward in the “D” positions?

YES >> Go to AT-56, "Cruise Test - Part 1" , AT-58, "Cruise Test - Part 2" and AT-59, "Cruise Test - Part 3" .
NO >> Enter a check mark at “Vehicle Does not Creep Forward In “D” Position” on the “DIAGNOSTICS WORKSHEET” (AT-45), then continue the road test. Go to AT-56, "Cruise Test - Part 1" , AT-58, "Cruise Test - Part 2" and AT-59, "Cruise Test - Part 3" .

Cruise Test - Part 1

ACS000HQ

1. CHECK STARTING OUT FROM D1

1. Drive the vehicle for about 10 minutes to warm up the engine oil and A/T fluid.
   Appropriate temperature for the A/T fluid: 50 - 80°C (122 - 176°F)
2. Park the vehicle on a level surface.
3. Move selector lever to “P” position.
4. Start the engine.
5. Move selector lever to “D” position.
6. Press the accelerator pedal about half way down to accelerate the vehicle.

With CONSULT-II

Read the gear positions. Refer to AT-92, "DATA MONITOR MODE" .

Starts from D1?

YES >> GO TO 2.
NO >> Enter a check mark at “Vehicle Cannot Be Started From D1” on the “DIAGNOSTICS WORKSHEET” (AT-45), then continue the road test.

2. CHECK SHIFT UP D1 → D2

Press down the accelerator pedal about half way and inspect if the vehicle shifts up (D1 → D2) at the appropriate speed.

- Refer to AT-60, "Vehicle Speed When Shifting Gears" .

With CONSULT-II

Read the gear position, throttle position, and vehicle speed. Refer to AT-92, "DATA MONITOR MODE" .

Does the A/T shift up D1 → D2 at the correct speed?

YES >> GO TO 3.
NO >> Enter a check mark at “A/T Does Not Shift:D1 → D2” on the “DIAGNOSTICS WORKSHEET” (AT-45), then continue the road test.

3. CHECK SHIFT UP D2 → D3

Press down the accelerator pedal about half way and inspect if the vehicle shifts up (D2 → D3) at the appropriate speed.

- Refer to AT-60, "Vehicle Speed When Shifting Gears" .

With CONSULT-II

Read the gear position, throttle position, and vehicle speed. Refer to AT-92, "DATA MONITOR MODE" .

Does the A/T shift up D2 → D3 at the correct speed?

YES >> GO TO 4.
NO >> Enter a check mark at “A/T Does Not Shift:D2 → D3” on the “DIAGNOSTICS WORKSHEET” (AT-45), then continue the road test.

4. CHECK SHIFT UP D3 → D4

Press down the accelerator pedal about half way and inspect if the vehicle shifts up (D3 → D4) at the appropriate speed.

- Refer to AT-60, "Vehicle Speed When Shifting Gears" .

With CONSULT-II

Read the gear position, throttle position, and vehicle speed. Refer to AT-92, "DATA MONITOR MODE" .

Does the A/T shift up D3 → D4 at the correct speed?

YES >> GO TO 5.
NO >> Enter a check mark at “A/T Does Not Shift:D3 → D4” on the “DIAGNOSTICS WORKSHEET” (AT-45), then continue the road test.

5. CHECK SHIFT UP D4 → D5

Press down the accelerator pedal about half way and inspect if the vehicle shifts up (D4 → D5) at the appropriate speed.

- Refer to AT-60, "Vehicle Speed When Shifting Gears" .

With CONSULT-II

Read the gear position, throttle position, and vehicle speed. Refer to AT-92, "DATA MONITOR MODE" .

Does the A/T shift up D4 → D5 at the correct speed?

YES >> GO TO 6.
NO >> Enter a check mark at “A/T Does Not Shift:D4 → D5” on the “DIAGNOSTICS WORKSHEET” (AT-45), then continue the road test.

6. CHECK LOCK-UP

When releasing accelerator pedal from D5, check lock-up from D5 to L/U.

- Refer to AT-60, "Vehicle Speed When Shifting Gears" .

With CONSULT-II

Select “TCC SOL 0.00A” with the “MAIN SIGNAL” mode for “A/T”. Refer to AT-86, "CONSULT-II REFERENCE VALUE" .

Does it lock-up?

YES >> GO TO 7.
NO >> Enter a check mark at “A/T Does Not Perform Lock-up” on the “DIAGNOSTICS WORKSHEET” (AT-45), then continue the road test.

7. CHECK LOCK-UP HOLD

Check hold lock-up.

With CONSULT-II

Select “TCC SOL 0.00A” with the “MAIN SIGNAL” mode for “A/T”. Refer to AT-86, "CONSULT-II REFERENCE VALUE" .

Does it maintain lock-up status?

YES >> GO TO 8.

NO >> Enter a check mark at “A/T Does Not Hold Lock-up Condition” on the “DIAGNOSTICS WORKSHEET” (AT-45), then continue the road test.

8. CHECK LOCK-UP RELEASE

Check lock-up cancellation by depressing brake pedal lightly to decelerate.

With CONSULT-II

Select “TCC SOL 0.00A” with the “MAIN SIGNAL” mode for “A/T”. Refer to AT-86, "CONSULT-II REFERENCE VALUE" .

Does lock-up cancel?

YES >> GO TO 9.

NO >> Enter a check mark at “Lock-up Is Not Released” on the “DIAGNOSTICS WORKSHEET” (AT-45), then continue the road test.

9. CHECK SHIFT DOWN D5 → D4

Decelerate by pressing lightly on the brake pedal.

With CONSULT-II

Read the gear position and engine speed. AT-92, "DATA MONITOR MODE" .

When the A/T shift down D5 → D4, does the engine speed drop smoothly back to idle?

YES >> 1. Stop the vehicle.
2. Go to AT-58, "Cruise Test - Part 2" .

NO >> Enter a check mark at “Engine Speed Does Not Return To Idle” on the “DIAGNOSTICS WORKSHEET” (AT-45), then continue the road test. Go to AT-58, "Cruise Test - Part 2" .

Cruise Test - Part 2

ACS000HR

1. CHECK STARTING FROM D1

1. Move selector lever into “D” position.
2. Accelerate at half throttle.

With CONSULT-II

Read the gear position. Refer to AT-92, "DATA MONITOR MODE" .

Does it start from D1?

YES >> GO TO 2.

NO >> Enter a check mark at “Vehicle Cannot Be Started From D1” on the “DIAGNOSTICS WORKSHEET” (AT-45), then continue the road test.

2. CHECK SHIFT UP D1 → D2

Press the accelerator pedal down all the way and inspect whether or not the transmission shifts up (D1 → D2) at the correct speed.

- Refer to AT-60, "Vehicle Speed When Shifting Gears" .

With CONSULT-II

Read the gear position, throttle position and vehicle speed. Refer to AT-92, "DATA MONITOR MODE" .

Does the A/T shift up D1 → D2 at the correct speed?

YES >> GO TO 3.
NO >> Enter a check mark at “Vehicle Does Not Shift D1 → D2” on the “DIAGNOSTICS WORKSHEET” (AT-45), then continue the road test.

3. CHECK SHIFT UP D2 → D3

Press the accelerator pedal down all the way and inspect whether or not the transmission shifts up (D2 → D3) at the correct speed.

- Refer to AT-60, "Vehicle Speed When Shifting Gears" .

With CONSULT-II

Read the gear position, throttle position and vehicle speed. Refer to AT-92, "DATA MONITOR MODE" .

Does the A/T shift up D2 → D3 at the correct speed?

YES >> GO TO 4.
NO >> Enter a check mark at “Vehicle Does Not Shift D2 → D3” on the “DIAGNOSTICS WORKSHEET” (AT-45), then continue the road test.

4. CHECK SHIFT UP D3 → D4 AND ENGINE BRAKE

When the transmission changes speed D3 → D4, return the accelerator pedal.

With CONSULT-II

Read the gear position. Refer to AT-92, "DATA MONITOR MODE" .

Does the A/T shift up D3 → D4 and apply the engine brake?

YES >> 1. Stop the vehicle.
2. Go to AT-59, "Cruise Test - Part 3" .
NO >> Enter a check mark at “Vehicle Does Not Shift D3 → D4” on the “DIAGNOSTICS WORKSHEET” (AT-45), then continue the road test. Go to AT-59, "Cruise Test - Part 3" .

Cruise Test - Part 3

ACS000HS

1. MANUAL MODE FUNCTION

Move to manual mode from D position.

Does it switch to manual mode?

YES >> GO TO 2.
NO >> Continue road test and add check mark to “Cannot Be Changed To Manual Mode” on the “DIAGNOSTICS WORKSHEET” (AT-45).

2. CHECK SHIFT DOWN

During manual mode driving, is downshift from M5 → M4 → M3 → M2 → M1 performed?

With CONSULT-II

Read the gear position. Refer to AT-92, "DATA MONITOR MODE" .

Is downshifting correctly performed?

YES >> GO TO 2.
NO >> Enter a check mark at “Vehicle Does Not Shift” at the corresponding position (5th → 4th, 4th → 3rd, 3rd → 2nd, 2nd → 1st) on the “DIAGNOSTICS WORKSHEET” (AT-45), then continue the road test.

3. CHECK ENGINE BRAKE

Check engine brake.

Does engine braking effectively reduce speed in M1 position?

YES >> 1. Stop the vehicle.
2. Perform self-diagnostics. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" , AT-98, "Diagnostic Procedure Without CONSULT-II" .

NO >> Enter a check mark at “Vehicle Does Not Decelerate By Engine Brake” on the “DIAGNOSTICS WORKSHEET” (AT-45), then continue trouble diagnosis.

Vehicle Speed When Shifting Gears

ACS000HT

Throttle position	Vehicle speed km/h (MPH)							
	$D_1 \rightarrow D_2$	$D_2 \rightarrow D_3$	$D_3 \rightarrow D_4$	$D_4 \rightarrow D_5$	$D_5 \rightarrow D_4$	$D_4 \rightarrow D_3$	$D_3 \rightarrow D_2$	$D_2 \rightarrow D_1$
Full throttle	58 - 62 (36 - 39)	90 - 98 (56 - 61)	140 - 150 (87 - 93)	201 - 211 (125 - 131)	197 - 207 (122 - 129)	122 - 132 (76 - 82)	74 - 82 (46 - 51)	34 - 38 (23 - 25)
Half throttle	46 - 50 (29 - 31)	71 - 79 (44 - 49)	107 - 117 (66 - 73)	135 - 145 (84 - 90)	88 - 98 (55 - 61)	63 - 73 (39 - 45)	29 - 37 (18 - 23)	11 - 15 (7 - 9)

- At half throttle, the accelerator opening is 4/8 of the full opening.

Vehicle Speed When Performing and Releasing Complete Lock-up

ACS000HU

Throttle position	Vehicle speed km/h (MPH)	
	Lock-up “ON”	Lock-up “OFF”
Closed throttle	56 - 64 (35 - 40)	53 - 61 (33 - 38)
Half throttle	168 - 176 (104 - 109)	131 - 139 (81 - 86)

- At closed throttle, the accelerator opening is less than 1/8 condition.
- At half throttle, the accelerator opening is 4/8 of the full opening.

Vehicle Speed When Performing and Releasing Slip Lock-up

ACS000HV

Throttle position	Gear position	Vehicle speed km/h (MPH)	
		Slip lock-up “ON”	Slip lock-up “OFF”
Closed throttle	4th	37 - 45 (23 - 28)	34 - 42 (21 - 26)
	5th	44 - 52 (27 - 32)	41 - 49 (25 - 30)

- At closed throttle, the accelerator opening is less than 1/8 condition.

Symptom Chart

ACS00843

- **The diagnostics item numbers show the sequence for inspection. Inspect in order from item 1.**
- **Overhaul and inspect inside the A/T only if A/T fluid condition is NG. Refer to** AT-51, "Fluid Condition Check" .

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
1	Shift Shock	Large shock. (“N” → “D” position) Refer to AT-190, "Large Shock (“N” to “D” Position)" .	ON vehicle	1. Engine idle speed	EC-30
				2. Engine speed signal	AT-117
				3. Accelerator pedal position sensor	AT-127
				4. Control linkage adjustment	AT-228
				5. ATF temperature sensor	AT-130
				6. ATF pressure switch 1 and front brake solenoid valve	AT-170, AT-148
				7. CAN communication line	AT-100
				8. Fluid level and state	AT-51
				9. Line pressure test	AT-52
				10. Control valve with TCM	AT-237
			OFF vehicle	11. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
2		Shock is too large when changing $D_1 \rightarrow D_2$ or $M_1 \rightarrow M_2$.	ON vehicle	1. Accelerator pedal position sensor	AT-127
				2. Control linkage adjustment	AT-228
				3. ATF pressure switch 5 and direct clutch solenoid valve	AT-174, AT-152
				4. CAN communication line	AT-100
				5. Engine speed signal	AT-117
				6. Turbine revolution sensor	AT-135
				7. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				8. Fluid level and state	AT-51
				9. Control valve with TCM	AT-237
			OFF vehicle	10. Direct clutch	AT-306
3		Shock is too large when changing $D_2 \rightarrow D_3$ or $M_2 \rightarrow M_3$.	ON vehicle	1. Accelerator pedal position sensor	AT-127
				2. Control linkage adjustment	AT-228
				3. ATF pressure switch 6 and high and low reverse clutch solenoid valve	AT-176, AT-156
				4. CAN communication line	AT-100
				5. Engine speed signal	AT-117
				6. Turbine revolution sensor	AT-135
				7. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				8. Fluid level and state	AT-51
				9. Control valve with TCM	AT-237
			OFF vehicle	10. High and low reverse clutch	AT-304

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
4	Shift Shock	Shock is too large when changing D3 → D4 or M3 → M4.	ON vehicle	1. Accelerator pedal position sensor	AT-127
				2. Control linkage adjustment	AT-228
				3. ATF pressure switch 3 and input clutch solenoid valve	AT-172, AT-144
				4. CAN communication line	AT-100
				5. Engine speed signal	AT-117
				6. Turbine revolution sensor	AT-135
				7. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				8. Fluid level and state	AT-51
				9. Control valve with TCM	AT-237
			OFF vehicle	10. Input clutch	AT-294
5		Shock is too large when changing D4 → D5 or M4 → M5.	ON vehicle	1. Accelerator pedal position sensor	AT-127
				2. Control linkage adjustment	AT-228
				3. ATF pressure switch 1 and front brake solenoid valve	AT-170, AT-148
				4. CAN communication line	AT-100
				5. Engine speed signal	AT-117
				6. Turbine revolution sensor	AT-135
				7. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				8. Fluid level and state	AT-51
				9. Control valve with TCM	AT-237
			OFF vehicle	10. Front brake (brake band)	AT-266
				11. Input clutch	AT-294
6		Shock is too large for downshift when accelerator pedal is pressed.	ON vehicle	1. Accelerator pedal position sensor	AT-127
				2. Control linkage adjustment	AT-228
				3. CAN communication line	AT-100
				4. Engine speed signal	AT-117
				5. Turbine revolution sensor	AT-135
				6. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				7. Fluid level and state	AT-51
				8. Control valve with TCM	AT-237
			OFF vehicle	9. Front brake (brake band)	AT-266
				10. Input clutch	AT-294
				11. High and low reverse clutch	AT-304
				12. Direct clutch	AT-306

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
7	Shift Shock	Shock is too large for upshift when accelerator pedal is released.	ON vehicle	1. Accelerator pedal position sensor	AT-127
				2. Control linkage adjustment	AT-228
				3. Engine speed signal	AT-117
				4. CAN communication line	AT-100
				5. Turbine revolution sensor	AT-135
				6. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				7. Fluid level and state	AT-51
				8. Control valve with TCM	AT-237
			OFF vehicle	9. Front brake (brake band)	AT-266
				10. Input clutch	AT-294
				11. High and low reverse clutch	AT-304
				12. Direct clutch	AT-306
8		Shock is too large for lock-up.	ON vehicle	1. Accelerator pedal position sensor	AT-127
				2. Control linkage adjustment	AT-228
				3. Engine speed signal	AT-117
				4. CAN communication line	AT-100
				5. Turbine revolution sensor	AT-135
				6. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				7. Torque converter clutch solenoid valve	AT-119
				8. Fluid level and state	AT-51
				9. Control valve with TCM	AT-237
			OFF vehicle	10. Torque converter	AT-274
9		Shock is too large during engine brake.	ON vehicle	1. Accelerator pedal position sensor	AT-127
				2. Control linkage adjustment	AT-228
				3. CAN communication line	AT-100
				4. Fluid level and state	AT-51
				5. Control valve with TCM	AT-237
			OFF vehicle	6. Front brake (brake band)	AT-266
				7. Input clutch	AT-294
				8. High and low reverse clutch	AT-304
				9. Direct clutch	AT-306

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
10	No Up Shift	Gear does not change from $D_1 \rightarrow D_2$ or from $M_1 \rightarrow M_2$. Refer to AT-201, "A/T Does Not Shift: $D_1 \rightarrow D_2$".	ON vehicle	1. Fluid level and state	AT-51
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				3. ATF pressure switch 5 and direct clutch solenoid valve	AT-174, AT-152
				4. Line pressure test	AT-52
				5. CAN communication line	AT-100
				6. Control valve with TCM	AT-237
			OFF vehicle	7. Direct clutch	AT-306
11		Gear does not change from $D_2 \rightarrow D_3$ or from $M_2 \rightarrow M_3$. Refer to AT-203, "A/T Does Not Shift: $D_2 \rightarrow D_3$".	ON vehicle	1. Fluid level and state	AT-51
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				3. ATF pressure switch 6 and high and low reverse clutch solenoid valve	AT-176, AT-156
				4. Line pressure test	AT-52
				5. CAN communication line	AT-100
				6. Control valve with TCM	AT-237
			OFF vehicle	7. High and low reverse clutch	AT-304
12		Gear does not change from $D_3 \rightarrow D_4$ or from $M_3 \rightarrow M_4$. Refer to AT-206, "A/T Does Not Shift: $D_3 \rightarrow D_4$".	ON vehicle	1. Fluid level and state	AT-51
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				3. ATF pressure switch 3 and input clutch solenoid valve	AT-172, AT-144
				4. ATF pressure switch 1 and front brake solenoid valve	AT-170, AT-148
				5. Line pressure test	AT-52
				6. CAN communication line	AT-100
				7. Control valve with TCM	AT-237
			OFF vehicle	8. Input clutch	AT-294
13		Gear does not change from $D_4 \rightarrow D_5$ or from $M_4 \rightarrow M_5$. Refer to AT-208, "A/T Does Not Shift: $D_4 \rightarrow D_5$".	ON vehicle	1. Fluid level and state	AT-51
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				3. ATF pressure switch 1 and front brake solenoid valve	AT-170, AT-148
				4. ATF pressure switch 5 and direct clutch solenoid valve	AT-174, AT-152
				5. Turbine revolution sensor	AT-135
				6. Line pressure test	AT-52
				7. CAN communication line	AT-100
				8. Control valve with TCM	AT-237
			OFF vehicle	9. Front brake (brake band)	AT-274
				10. Input clutch	AT-294

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
14	No Down Shift	In “D” or “M” range, does not downshift to 4th gear. Refer to AT-217, "A/T Does Not Shift: 5th gear → 4th gear" .	ON vehicle	1. Fluid level and state	AT-51
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				3. ATF pressure switch 1 and front brake solenoid valve	AT-170, AT-148
				4. ATF pressure switch 5 and direct clutch solenoid valve	AT-174, AT-152
				5. CAN communication line	AT-100
				6. Line pressure test	AT-52
				7. Control valve with TCM	AT-237
			OFF vehicle	8. Front brake (brake band)	AT-274
				9. Input clutch	AT-294
15		In “D” or “M” range, does not downshift to 3rd gear. Refer to AT-219, "A/T Does Not Shift: 4th gear → 3rd gear" .	ON vehicle	1. Fluid level and state	AT-51
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				3. ATF pressure switch 3 and input clutch solenoid valve	AT-172, AT-144
				4. ATF pressure switch 1 and front brake solenoid valve	AT-170, AT-148
				5. CAN communication line	AT-100
				6. Line pressure test	AT-52
				7. Control valve with TCM	AT-237
			OFF vehicle	8. Input clutch	AT-294
16		In “D” or “M” range, does not downshift to 2nd gear. Refer to AT-221, "A/T Does Not Shift: 3rd gear → 2nd gear" .	ON vehicle	1. Fluid level and state	AT-51
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				3. ATF pressure switch 6 and high and low reverse clutch solenoid valve	AT-176, AT-156
				4. CAN communication line	AT-100
				5. Line pressure test	AT-52
				6. Control valve with TCM	AT-237
			OFF vehicle	7. High and low reverse clutch	AT-304
17		In “D” or “M” range, does not downshift to 1st gear. Refer to AT-223, "A/T Does Not Shift: 2nd gear → 1st gear" .	ON vehicle	1. Fluid level and state	AT-51
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				3. ATF pressure switch 5 and direct clutch solenoid valve	AT-174, AT-152
				4. CAN communication line	AT-100
				5. Line pressure test	AT-52
				6. Control valve with TCM	AT-237
			OFF vehicle	7. Direct clutch	AT-306

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
18	Slips/Will Not engage	When “D” or “M” position, remains in 1st gear.	ON vehicle	1. Fluid level and state	AT-51
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				3. Direct clutch solenoid valve	AT-152
				4. Line pressure test	AT-52
				5. CAN communication line	AT-100
				6. Control valve with TCM	AT-237
			OFF vehicle	7. 3rd one-way clutch	AT-292
				8. 1st one-way clutch	AT-299
				9. Gear system	AT-266
				10. Reverse brake	AT-274
				11. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
				12. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
19		When “D” or “M” position, remains in 2nd gear.	ON vehicle	1. Fluid level and state	AT-51
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112 , AT-137
				3. Low coast brake solenoid valve	AT-160
				4. Line pressure test	AT-52
				5. CAN communication line	AT-100
				6. Control valve with TCM	AT-237
			OFF vehicle	7. 3rd one-way clutch	AT-292
				8. Gear system	AT-266
				9. Direct clutch	AT-306
				10. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
20		When “D” or “M” position, remains in 3rd gear.	ON vehicle	1. Fluid level and state	AT-51
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				3. Line pressure test	AT-52
				4. CAN communication line	AT-100
				5. Control valve with TCM	AT-237
			OFF vehicle	6. 3rd one-way clutch	AT-292
				7. Gear system	AT-266
				8. High and low reverse clutch	AT-304
				9. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
				10. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
21	Slips/Will Not engage	When “D” or “M” position, remains in 4th gear.	ON vehicle	1. Fluid level and state	AT-51
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				3. ATF pressure switch 3 and input clutch solenoid valve	AT-172, AT-144
				4. ATF pressure switch 5 and direct clutch solenoid valve	AT-174, AT-152
				5. ATF pressure switch 6 and high and low reverse clutch solenoid valve	AT-176, AT-156
				6. Low coast brake solenoid valve	AT-160
				7. Front brake solenoid valve	AT-148
				8. Line pressure test	AT-52
				9. CAN communication line	AT-100
				10. Control valve with TCM	AT-237
			OFF vehicle	11. Input clutch	AT-294
				12. Gear system	AT-266
				13. High and low reverse clutch	AT-304
				14. Direct clutch	AT-306
22		When “D” or “M” position, remains in 5th gear.	ON vehicle	1. Fluid level and state	AT-51
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				3. ATF pressure switch 1 and front brake solenoid valve	AT-170, AT-148
				4. Line pressure test	AT-52
				5. CAN communication line	AT-100
				6. Control valve with TCM	AT-237
			OFF vehicle	7. Front brake (brake band)	AT-274
				8. Input clutch	AT-294
				9. Gear system	AT-266
				10. High and low reverse clutch	AT-304

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
23	Slips/Will Not Engage	Vehicle cannot be started from D_1 . Refer to AT-198, "Vehicle Cannot Be Started From D_1" .	ON vehicle	1. Fluid level and state	AT-51
				2. Accelerator pedal position sensor	AT-127
				3. Line pressure test	AT-52
				4. CAN communication line	AT-100
				5. Control valve with TCM	AT-237
			OFF vehicle	6. Torque converter	AT-274
				7. Oil pump assembly	AT-289
				8. 3rd one-way clutch	AT-292
				9. 1st one-way clutch	AT-299
				10. Gear system	AT-266
				11. Reverse brake	AT-274
				12. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
24		Does not lock-up. Refer to AT-211, "A/T Does Not Perform Lock-up" .	ON vehicle	1. Fluid level and state	AT-51
				2. Line pressure test	AT-52
				3. Engine speed signal	AT-117
				4. Turbine revolution sensor	AT-135
				5. Torque converter clutch solenoid valve	AT-119
				6. CAN communication line	AT-100
				7. Control valve with TCM	AT-237
			OFF vehicle	8. Torque converter	AT-274
				9. Oil pump assembly	AT-289
25		Does not hold lock-up condition. Refer to AT-213, "A/T Does Not Hold Lock-up Condition" .	ON vehicle	1. Fluid level and state	AT-51
				2. Line pressure test	AT-52
				3. Engine speed signal	AT-117
				4. Turbine revolution sensor	AT-135
				5. Torque converter clutch solenoid valve	AT-119
				6. CAN communication line	AT-100
				7. Control valve with TCM	AT-237
			OFF vehicle	8. Torque converter	AT-274
				9. Oil pump assembly	AT-289

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
26	Slips/Will Not engage	Lock-up is not released. Refer to AT-214, "Lock-up Is Not Released" .	ON vehicle	1. Fluid level and state	AT-51
				2. Line pressure test	AT-52
				3. Engine speed signal	AT-117
				4. Turbine revolution sensor	AT-135
				5. Torque converter clutch solenoid valve	AT-119
				6. CAN communication line	AT-100
				7. Control valve with TCM	AT-237
			OFF vehicle	8. Torque converter	AT-274
				9. Oil pump assembly	AT-289
27		No shock at all or the clutch slips when vehicle changes speed $D_1 \rightarrow D_2$ or $M_1 \rightarrow M_2$.	ON vehicle	1. Fluid level and state	AT-51
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				3. ATF pressure switch 5 and direct clutch solenoid valve	AT-174, AT-152
				4. CAN communication line	AT-100
				5. Line pressure test	AT-52
				6. Control valve with TCM	AT-237
			OFF vehicle	7. Torque converter	AT-274
				8. Oil pump assembly	AT-289
				9. 3rd one-way clutch	AT-292
				10. Gear system	AT-266
				11. Direct clutch	AT-306
				12. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
28	Slips/Will Not engage	No shock at all or the clutch slips when vehicle changes speed $D_2 \rightarrow D_3$ or $M_2 \rightarrow M_3$.	ON vehicle	1. Fluid level and state	AT-51
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				3. ATF pressure switch 6 and high and low reverse clutch solenoid valve	AT-176, AT-156
				4. CAN communication line	AT-100
				5. Line pressure test	AT-52
				6. Control valve with TCM	AT-237
			OFF vehicle	7. Torque converter	AT-274
				8. Oil pump assembly	AT-289
				9. 3rd one-way clutch	AT-292
				10. Gear system	AT-266
				11. High and low reverse clutch	AT-304
				12. Forward one- way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
29		No shock at all or the clutch slips when vehicle changes speed $D_3 \rightarrow D_4$ or $M_3 \rightarrow M_4$.	ON vehicle	1. Fluid level and state	AT-51
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				3. ATF pressure switch 3 and input clutch solenoid valve	AT-172, AT-144
				4. ATF pressure switch 1 and front brake solenoid valve	AT-170, AT-148
				5. CAN communication line	AT-100
				6. Line pressure test	AT-52
				7. Control valve with TCM	AT-237
			OFF vehicle	8. Torque converter	AT-274
				9. Oil pump assembly	AT-289
				10. Input clutch	AT-294
				11. Gear system	AT-266
				12. High and low reverse clutch	AT-304
				13. Direct clutch	AT-306

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
30	Slips/Will Not engage	No shock at all or the clutch slips when vehicle changes speed $D_4 \rightarrow D_5$ or $M_4 \rightarrow M_5$.	ON vehicle	1. Fluid level and state	AT-51
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				3. ATF pressure switch 1 and front brake solenoid valve	AT-170, AT-148
				4. ATF pressure switch 5 and direct clutch solenoid valve	AT-174, AT-152
				5. CAN communication line	AT-100
				6. Line pressure test	AT-52
				7. Control valve with TCM	AT-237
			OFF vehicle	8. Torque converter	AT-274
				9. Oil pump assembly	AT-289
				10. Front brake (brake band)	AT-274
				11. Input clutch	AT-294
				12. Gear system	AT-266
				13. High and low reverse clutch	AT-304
31		When you press the accelerator pedal and shift speed $D_5 \rightarrow D_4$ or $M_5 \rightarrow M_4$ the engine idles or the transmission slips.	ON vehicle	1. Fluid level and state	AT-51
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				3. ATF pressure switch 1 and front brake solenoid valve	AT-170, AT-148
				4. ATF pressure switch 5 and direct clutch solenoid valve	AT-174, AT-152
				5. CAN communication line	AT-100
				6. Line pressure test	AT-52
				7. Control valve with TCM	AT-237
			OFF vehicle	8. Torque converter	AT-274
				9. Oil pump assembly	AT-289
				10. Input clutch	AT-294
				11. Gear system	AT-266
				12. High and low reverse clutch	AT-304
				13. Direct clutch	AT-306

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
32	Slips/Will Not engage	When you press the accelerator pedal and shift speed $D_4 \rightarrow D_3$ or $M_4 \rightarrow M_3$ the engine idles or the transmission slips.	ON vehicle	1. Fluid level and state	AT-51
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				3. ATF pressure switch 3 and input clutch solenoid valve	AT-172, AT-144
				4. ATF pressure switch 1 and front brake solenoid valve	AT-170, AT-148
				5. CAN communication line	AT-100
				6. Line pressure test	AT-52
				7. Control valve with TCM	AT-237
			OFF vehicle	8. Torque converter	AT-274
				9. Oil pump assembly	AT-289
				10. 3rd one-way clutch	AT-292
				11. Gear system	AT-266
				12. High and low reverse clutch	AT-304
				13. Forward one- way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
				14. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
33		When you press the accelerator pedal and shift speed $D_3 \rightarrow D_2$ or $M_3 \rightarrow M_2$ the engine idles or the transmission slips.	ON vehicle	1. Fluid level and state	AT-51
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				3. ATF pressure switch 6 and high and low reverse clutch solenoid valve	AT-176, AT-156
				4. ATF pressure switch 5 and direct clutch solenoid valve	AT-174, AT-152
				5. CAN communication line	AT-100
				6. Line pressure test	AT-52
				7. Control valve with TCM	AT-237
			OFF vehicle	8. Torque converter	AT-274
				9. Oil pump assembly	AT-289
				10. 3rd one-way clutch	AT-292
				11. Gear system	AT-266
				12. Direct clutch	AT-306
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
34	Slips/Will Not Engage	When you press the accelerator pedal and shift speed $D_2 \rightarrow D_1$ or $M_2 \rightarrow M_1$ the engine idles or the transmission slips.	ON vehicle	1. Fluid level and state	AT-51
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				3. ATF pressure switch 5 and direct clutch solenoid valve	AT-174, AT-152
				4. CAN communication line	AT-100
				5. Line pressure test	AT-52
				6. Control valve with TCM	AT-237
			OFF vehicle	7. Torque converter	AT-274
				8. Oil pump assembly	AT-289
				9. 3rd one-way clutch	AT-292
				10. 1st one-way clutch	AT-299
				11. Gear system	AT-266
				12. Reverse brake	AT-274
				13. Forward one- way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
				14. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
35		With selector lever in “D” position, acceleration is extremely poor.	ON vehicle	1. Fluid level and state	AT-51
				2. Line pressure test	AT-52
				3. Accelerator pedal position sensor	AT-127
				4. CAN communication line	AT-100
				5. PNP switch	AT-108
				6. Control linkage adjustment	AT-228
				7. Control valve with TCM	AT-237
			OFF vehicle	8. Torque converter	AT-274
				9. Oil pump assembly	AT-289
				10. 1st one-way clutch	AT-299
				11. Gear system	AT-266
				12. Reverse brake	AT-274
				13. Forward one- way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
				14. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
36	Slips/Will Not Engage	With selector lever in “R” position, acceleration is extremely poor.	ON vehicle	1. Fluid level and state	AT-51
				2. Line pressure test	AT-52
				3. Accelerator pedal position sensor	AT-127
				4. ATF pressure switch 6 and high and low reverse clutch solenoid valve	AT-176, AT-156
				5. CAN communication line	AT-100
				6. PNP switch	AT-108
				7. Control linkage adjustment	AT-228
				8. Control valve with TCM	AT-237
			OFF vehicle	9. Gear system	AT-266
				10. Output shaft	AT-274
				11. Reverse brake	AT-274
37		While starting off by accelerating in 1st, engine races or slippage occurs.	ON vehicle	1. Fluid level and state	AT-51
				2. Line pressure test	AT-52
				3. Accelerator pedal position sensor	AT-127
				4. CAN communication line	AT-100
				5. Control valve with TCM	AT-237
			OFF vehicle	6. Torque converter	AT-274
				7. Oil pump assembly	AT-289
				8. 3rd one-way clutch	AT-292
				9. 1st one-way clutch	AT-299
				10. Gear system	AT-266
				11. Reverse brake	AT-274
				12. Forward one- way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
38	Slips/Will Not Engage	While accelerating in 2nd, engine races or slippage occurs.	ON vehicle	1. Fluid level and state	AT-51
				2. Line pressure test	AT-52
				3. Accelerator pedal position sensor	AT-127
				4. CAN communication line	AT-100
				5. ATF pressure switch 5 and direct clutch solenoid valve	AT-174, AT-152
				6. Control valve with TCM	AT-237
			OFF vehicle	7. Torque converter	AT-274
				8. Oil pump assembly	AT-289
				9. 3rd one-way clutch	AT-292
				10. Gear system	AT-266
				11. Direct clutch	AT-306
				12. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
39		While accelerating in 3rd, engine races or slippage occurs.	ON vehicle	1. Fluid level and state	AT-51
				2. Line pressure test	AT-52
				3. Accelerator pedal position sensor	AT-127
				4. CAN communication line	AT-100
				5. ATF pressure switch 6 and high and low reverse clutch solenoid valve	AT-176, AT-156
				6. Control valve with TCM	AT-237
			OFF vehicle	7. Torque converter	AT-274
				8. Oil pump assembly	AT-289
				9. 3rd one-way clutch	AT-292
				10. Gear system	AT-266
				11. High and low reverse clutch	AT-304
				12. Forward one- way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
40	Slips/Will Not Engage	While accelerating in 4th, engine races or slippage occurs.	ON vehicle	1. Fluid level and state	AT-51
				2. Line pressure test	AT-52
				3. Accelerator pedal position sensor	AT-127
				4. CAN communication line	AT-100
				5. ATF pressure switch 3 and input clutch solenoid valve	AT-172, AT-144
				6. Control valve with TCM	AT-237
			OFF vehicle	7. Torque converter	AT-274
				8. Oil pump assembly	AT-289
				9. Input clutch	AT-294
				10. Gear system	AT-266
				11. High and low reverse clutch	AT-304
				12. Direct clutch	AT-306
41		While accelerating in 5th, engine races or slippage occurs.	ON vehicle	1. Fluid level and state	AT-51
				2. Line pressure test	AT-52
				3. Accelerator pedal position sensor	AT-127
				4. CAN communication line	AT-100
				5. ATF pressure switch 1 and front brake solenoid valve	AT-170, AT-148
				6. Control valve with TCM	AT-237
			OFF vehicle	7. Torque converter	AT-274
				8. Oil pump assembly	AT-289
				9. Front brake (brake band)	AT-274
				10. Input clutch	AT-294
				11. Gear system	AT-266
				12. High and low reverse clutch	AT-304
42		Slips at lock-up.	ON vehicle	1. Fluid level and state	AT-51
				2. Line pressure test	AT-52
				3. Engine speed signal	AT-117
				4. Turbine revolution sensor	AT-135
				5. Torque converter clutch solenoid valve	AT-119
				6. CAN communication line	AT-100
				7. Control valve with TCM	AT-237
			OFF vehicle	8. Torque converter	AT-274
				9. Oil pump assembly	AT-289

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
43	Slips/Will Not Engage	No creep at all. Refer to AT-193, "Vehicle Does Not Creep Backward In "R" Position" , AT-196, "Vehicle Does Not Creep Forward In "D" Position"	ON vehicle	1. Fluid level and state	AT-51
				2. Line pressure test	AT-52
				3. Accelerator pedal position sensor	AT-127
				4. ATF pressure switch 5 and direct clutch solenoid valve	AT-174, AT-152
				5. PNP switch	AT-108
				6. CAN communication line	AT-100
				7. Control linkage adjustment	AT-228
				8. Control valve with TCM	AT-237
			OFF vehicle	9. Torque converter	AT-274
				10. Oil pump assembly	AT-289
				11. 1st one-way clutch	AT-299
				12. Gear system	AT-266
				13. Reverse brake	AT-274
				14. Direct clutch	AT-306
				15. Forward one- way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
				16. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
44		Vehicle cannot run in all positions.	ON vehicle	1. Fluid level and state	AT-51
				2. Line pressure test	AT-52
				3. PNP switch	AT-108
				4. Control linkage adjustment	AT-228
				5. Control valve with TCM	AT-237
			OFF vehicle	6. Oil pump assembly	AT-289
				7. Gear system	AT-266
				8. Output shaft	AT-274

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
45	Slips/Will Not Engage	With selector lever in “D” position, driving is not possible.	ON vehicle	1. Fluid level and state	AT-51
				2. Line pressure test	AT-52
				3. PNP switch	AT-108
				4. Control linkage adjustment	AT-228
				5. Control valve with TCM	AT-237
			OFF vehicle	6. Torque converter	AT-274
				7. Oil pump assembly	AT-289
				8. 1st one-way clutch	AT-299
				9. Gear system	AT-266
				10. Reverse brake	AT-274
				11. Forward one- way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
				12. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
46		With selector lever in “R” position, driving is not possible.	ON vehicle	1. Fluid level and state	AT-51
				2. Line pressure test	AT-52
				3. PNP switch	AT-108
				4. Control linkage adjustment	AT-228
				5. Control valve with TCM	AT-237
			OFF vehicle	6. Gear system	AT-266
				7. Output shaft	AT-274
				8. Reverse brake	AT-274
47	Does Not Change	Does not change M5 → M4.	ON vehicle	1. PNP switch	AT-108
				2. Fluid level and state	AT-51
				3. Control linkage adjustment	AT-228
				4. Manual mode switch	AT-164
				5. ATF pressure switch 1	AT-170
				6. CAN communication line	AT-100
				7. Control valve with TCM	AT-237
			OFF vehicle	8. Front brake (brake band)	AT-274

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
48	Does Not Change	Does not change M4 → M3.	ON vehicle	1. PNP switch	AT-108
				2. Fluid level and state	AT-51
				3. Control linkage adjustment	AT-228
				4. Manual mode switch	AT-164
				5. ATF pressure switch 1 and ATF pressure switch 3	AT-170, AT-172
				6. CAN communication line	AT-100
				7. Control valve with TCM	AT-237
			OFF vehicle	8. Front brake (brake band)	AT-274
				9. Input clutch	AT-294
49		Does not change M3 → M2.	ON vehicle	1. PNP switch	AT-108
				2. Fluid level and state	AT-51
				3. Control linkage adjustment	AT-228
				4. Manual mode switch	AT-164
				5. ATF pressure switch 6	AT-176
				6. CAN communication line	AT-100
				7. Control valve with TCM	AT-237
			OFF vehicle	8. Front brake (brake band)	AT-274
				9. Input clutch	AT-294
				10. High and low reverse clutch	AT-304
50		Does not change M2 → M1.	ON vehicle	1. PNP switch	AT-108
				2. Fluid level and state	AT-51
				3. Control linkage adjustment	AT-228
				4. Manual mode switch	AT-164
				5. ATF pressure switch 5	AT-174
				6. CAN communication line	AT-100
				7. Control valve with TCM	AT-237
			OFF vehicle	8. Input clutch	AT-294
				9. High and low reverse clutch	AT-304
				10. Direct clutch	AT-306
51		Can not be changed to manual mode. Refer to AT-216, "Cannot Be Changed to Manual Mode" .	ON vehicle	1. Manual mode switch	AT-164
				2. Turbine revolution sensor	AT-135
				3. CAN communication line	AT-100
52	Others	Shift point is high in “D” position.	ON vehicle	1. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				2. Accelerator pedal position sensor	AT-127
				3. CAN communication line	AT-100
				4. ATF temperature sensor	AT-130
				5. Control valve with TCM	AT-237

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
53	Others	Shift point is low in “D” position.	ON vehicle	1. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				2. Accelerator pedal position sensor	AT-127
				3. CAN communication line	AT-100
				4. Control valve with TCM	AT-237
54		Judder occurs during lock-up.	ON vehicle	1. Fluid level and state	AT-51
				2. Engine speed signal	AT-117
				3. Turbine revolution sensor	AT-135
				4. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				5. Accelerator pedal position sensor	AT-127
				6. CAN communication line	AT-100
				7. Torque converter clutch solenoid valve	AT-119
				8. Control valve with TCM	AT-237
			OFF vehicle	9. Torque converter	AT-274
55		Strange noise in “R” position.	ON vehicle	1. Fluid level and state	AT-51
				2. Engine speed signal	AT-117
				3. CAN communication line	AT-100
				4. Control valve with TCM	AT-237
			OFF vehicle	5. Torque converter	AT-274
				6. Oil pump assembly	AT-289
				7. Gear system	AT-266
				8. High and low reverse clutch	AT-304
				9. Reverse brake	AT-274
56		Strange noise in “N” position.	ON vehicle	1. Fluid level and state	AT-51
				2. Engine speed signal	AT-117
				3. CAN communication line	AT-100
				4. Control valve with TCM	AT-237
			OFF vehicle	5. Torque converter	AT-274
				6. Oil pump assembly	AT-289
				7. Gear system	AT-266
57		Strange noise in “D” position.	ON vehicle	1. Fluid level and state	AT-51
				2. Engine speed signal	AT-117
				3. CAN communication line	AT-100
				4. Control valve with TCM	AT-237
			OFF vehicle	5. Torque converter	AT-274
				6. Oil pump assembly	AT-289
				7. Gear system	AT-266
				8. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
58	Others	Vehicle dose not decelerate by engine brake. Refer to AT-225, "Vehicle Does Not Decelerate By Engine Brake" .	ON vehicle	1. PNP switch	AT-108
				2. Fluid level and state	AT-51
				3. Control linkage adjustment	AT-228
				4. Manual mode switch	AT-164
				5. ATF pressure switch 5	AT-174
				6. CAN communication line	AT-100
				7. Control valve with TCM	AT-237
			OFF vehicle	8. Input clutch	AT-294
				9. High and low reverse clutch	AT-304
				10. Direct clutch	AT-306
59		Engine brake does not work M5 → M4.	ON vehicle	1. PNP switch	AT-108
				2. Fluid level and state	AT-51
				3. Control linkage adjustment	AT-228
				4. Manual mode switch	AT-164
				5. ATF pressure switch 1	AT-170
				6. CAN communication line	AT-100
				7. Control valve with TCM	AT-237
			OFF vehicle	8. Front brake (brake band)	AT-274
60		Engine brake does not work M4 → M3.	ON vehicle	1. PNP switch	AT-108
				2. Fluid level and state	AT-51
				3. Control linkage adjustment	AT-228
				4. Manual mode switch	AT-164
				5. ATF pressure switch 1 and ATF pressure switch 3	AT-170, AT-172
				6. CAN communication line	AT-100
				7. Control valve with TCM	AT-237
			OFF vehicle	8. Front brake (brake band)	AT-274
				9. Input clutch	AT-294
61		Engine brake does not work M3 → M2.	ON vehicle	1. PNP switch	AT-108
				2. Fluid level and state	AT-51
				3. Control linkage adjustment	AT-228
				4. Manual mode switch	AT-164
				5. ATF pressure switch 6	AT-176
				6. CAN communication line	AT-100
				7. Control valve with TCM	AT-237
			OFF vehicle	8. Front brake (brake band)	AT-274
				9. Input clutch	AT-294
				10. High and low reverse clutch	AT-304

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
62	Others	Engine brake does not work M2 → M1.	ON vehicle	1. PNP switch	AT-108
				2. Fluid level and state	AT-51
				3. Control linkage adjustment	AT-228
				4. Manual mode switch	AT-164
				5. ATF pressure switch 5	AT-174
				6. CAN communication line	AT-100
				7. Control valve with TCM	AT-237
			OFF vehicle	8. Input clutch	AT-294
				9. High and low reverse clutch	AT-304
				10. Direct clutch	AT-306
63		Maximum speed low.	ON vehicle	1. Fluid level and state	AT-51
				2. Line pressure test	AT-52
				3. Accelerator pedal position sensor	AT-127
				4. CAN communication line	AT-100
				5. Direct clutch solenoid valve	AT-152
				6. Control valve with TCM	AT-237
			OFF vehicle	7. Torque converter	AT-274
				8. Oil pump assembly	AT-289
				9. Input clutch	AT-294
				10. Gear system	AT-266
				11. High and low reverse clutch	AT-304
				12. Direct clutch	AT-306
				13. Forward one- way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
				14 Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
64		Extremely large creep.	ON vehicle	1. Engine idle speed	EC-30
				2. CAN communication line	AT-100
				3. ATF pressure switch 5	AT-174
			OFF vehicle	4. Torque converter	AT-274
65		With selector lever in “P” position, vehicle does not enter parking condition or, with selector lever in another position, parking condition is not cancelled. Refer to AT-188, "In “P” Position, Vehicle Moves When Pushed" .	ON vehicle	1. PNP switch	AT-108
				2. Control linkage adjustment	AT-228
				3. Parking pawl components	AT-266

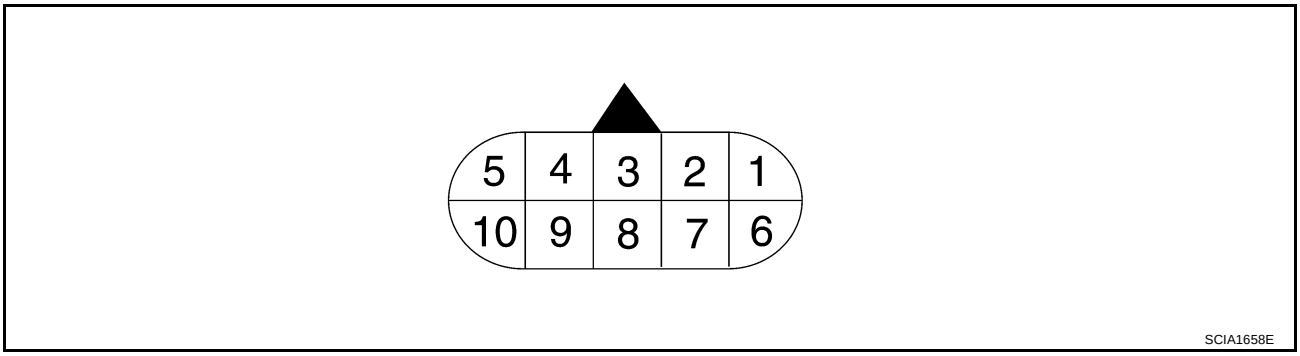
No.	Items	Symptom	Condition	Diagnostic Item	Reference page
66	Others	Vehicle runs with transmission in “P” position.	ON vehicle	1. PNP switch	AT-108
				2. Fluid level and state	AT-51
				3. Control linkage adjustment	AT-228
				4. Control valve with TCM	AT-237
				5. Parking pawl components	AT-266
			OFF vehicle	6. Gear system	AT-266
67		Vehicle runs with transmission in “N” position. Refer to AT-189, "In “N” Position, Vehicle Moves" .	ON vehicle	1. PNP switch	AT-108
				2. Fluid level and state	AT-51
				3. Control linkage adjustment	AT-228
				4. Control valve with TCM	AT-237
			OFF vehicle	5. Input clutch	AT-294
				6. Gear system	AT-266
				7. Direct clutch	AT-306
				8. Reverse brake	AT-274
				9. Forward one- way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
				10. Low coast brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-Sectional View" .)	AT-274
68		Engine does not start in “N” or “P” position. Refer to AT-187, "Engine Cannot Be Started In “P” or “N” Position" .	ON vehicle	1. Ignition switch and starter	PG-4, SC-10
				2. Control linkage adjustment	AT-228
				3. PNP switch	AT-108
69		Engine starts in positions other than “N” or “P”.	ON vehicle	1. Ignition switch and starter	PG-4, SC-10
				2. Control linkage adjustment	AT-228
				3. PNP switch	AT-108
70		Engine stall.	ON vehicle	1. Fluid level and state	AT-51
				2. Engine speed signal	AT-117
				3. Turbine revolution sensor	AT-135
				4. Torque converter clutch solenoid valve	AT-119
				5. CAN communication line	AT-100
				6. Control valve with TCM	AT-237
			OFF vehicle	7. Torque converter	AT-274

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
71	Others	Engine stalls when select lever shifted “N” → “D”, “R”.	ON vehicle	1. Fluid level and state	AT-51
				2. Engine speed signal	AT-117
				3. Turbine revolution sensor	AT-135
				4. Torque converter clutch solenoid valve	AT-119
				5. CAN communication line	AT-100
				6. Control valve with TCM	AT-237
			OFF vehicle	7. Torque converter	AT-274
72		Engine speed does not return to idle. Refer to AT-215, "Engine Speed Does Not Return To Idle" .	ON vehicle	1. Fluid level and state	AT-51
				2. ATF pressure switch 5 and direct clutch solenoid valve	AT-174, AT-152
				3. ATF pressure switch 1 and front brake solenoid valve	AT-170, AT-148
				4. Accelerator pedal position sensor	AT-127
				5. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-112, AT-137
				6. CAN communication line	AT-100
				7. Control valve with TCM	AT-237
			OFF vehicle	8. Front brake (brake band)	AT-274
				9. Direct clutch	AT-306

TCM Input/Output Signal Reference Values

ACS000HX

A/T ASSEMBLY HARNESS CONNECTOR TERMINAL LAYOUT



TCM INSPECTION TABLE

Data are reference value and are measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
1	R/W	Power supply (Memory back-up)	Always		Battery voltage
2	R/W	Power supply (Memory back-up)	Always		Battery voltage
3	L	CAN-H	–		–
4	PU/W	K-line (CONSULT-II signal)	The terminal is connected to the data link connector for CONSULT-II.		–
5	B	Ground	Always		0V
6	Y/R	Power supply		–	Battery voltage
				–	0V
7	P	Back-up lamp relay		Selector lever in “R” position.	0V
				Selector lever in other positions.	Battery voltage
8	P	CAN-L	–		–
9	GY/R	Starter relay		Selector lever in “N” and “P” positions.	Battery voltage
				Selector lever in other positions.	0V
10	B	Ground	Always		0V

CONSULT-II

ACS000HY

After performing AT-88, "SELF-DIAGNOSTIC RESULT MODE" , place check marks for results on the AT-45, "DIAGNOSTIC WORKSHEET" . Reference pages are provided following the items.

NOTICE:

1. The CONSULT-II electrically displays shift timing and lock-up timing (that is, operation timing of each solenoid).
   Check for time difference between actual shift timing and the CONSULT-II display. If the difference is noticeable, mechanical parts (except solenoids, sensors, etc.) may be malfunctioning. Check mechanical parts using applicable diagnostic procedures.
2. Shift schedule (which implies gear position) displayed on CONSULT-II and that indicated in Service Manual may differ slightly. This occurs because of the following reasons:

- Actual shift schedule has more or less tolerance or allowance,
- Shift schedule indicated in Service Manual refers to the point where shifts start, and
- Gear position displayed on CONSULT-II indicates the point where shifts are completed.

3. Display of solenoid valves on CONSULT-II changes at the start of shifting, while gear position is displayed upon completion of shifting (which is computed by TCM).
4. Additional CONSULT-II information can be found in the Operation Manual supplied with the CONSULT-II unit.

FUNCTION

Diagnostic test mode	Function	Reference page
Self-diagnostic results	Self-diagnostic results can be read and erased quickly.	AT-88
Data monitor	Input/Output data in the ECM can be read.	AT-92
CAN diagnostic support monitor	The results of transmit/receive diagnosis of CAN communication can be read.	—
Function test	Conducted by CONSULT-II instead of a technician to determine whether each system is “OK” or “NG”.	—
DTC work support	Select the operating condition to confirm Diagnosis Trouble Codes.	AT-95
ECM part number	ECM part number can be read.	—

CONSULT-II REFERENCE VALUE

Item name	Condition	Display value (Approx.)
ATF TEMP SE 1	0°C (32° F) - 20°C (68°F) - 80°C (176°F)	2.2 - 1.8 - 0.6 V
ATF TEMP SE 2		2.2 - 1.7 - 0.45 V
TCC SOLENOID	When performing slip lock-up	0.2 - 0.4 A
	When performing lock-up	0.4 - 0.6 A
SLCT LVR POSI	Selector lever in “N” and “P” positions.	N/P
	Selector lever in “R” position.	R
	Selector lever in “D” position.	D
VHCL/S SE·A/T	During driving	Approximately matches the speedometer reading.
ENGINE SPEED	Engine running	Closely matches the tachometer reading.
LINE PRES SOL	During driving	0.2 - 0.6 A
TURBINE REV	During driving (lock-up ON)	Approximately matches the engine speed.
VHCL/S SE·MTR	During driving	Approximately matches the speedometer reading.
ATF PRES SW 1	Front brake engaged. Refer to AT-19 .	ON
	Front brake disengaged. Refer to AT-19 .	OFF

Item name	Condition	Display value (Approx.)
ATF PRES SW 2	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF
ATF PRES SW 3	Input clutch engaged. Refer to AT-19 .	ON
	Input clutch disengaged. Refer to AT-19 .	OFF
ATF PRES SW 5	Direct clutch engaged. Refer to AT-19 .	ON
	Direct clutch disengaged. Refer to AT-19 .	OFF
ATF PRES SW 6	High and low reverse clutch engaged. Refer to AT-19 .	ON
	High and low reverse clutch disengaged. Refer to AT-19 .	OFF
I/C SOLENOID	Input clutch disengaged. Refer to AT-19 .	0.6 - 0.8 A
	Input clutch engaged. Refer to AT-19 .	0 - 0.05 A
FR/B SOLENOID	Front brake engaged. Refer to AT-19 .	0.6 - 0.8 A
	Front brake disengaged. Refer to AT-19 .	0 - 0.05 A
D/C SOLENOID	Direct clutch disengaged. Refer to AT-19 .	0.6 - 0.8 A
	Direct clutch engaged. Refer to AT-19 .	0 - 0.05 A
HLR/C SOL	High and low reverse clutch disengaged. Refer to AT-19 .	0.6 - 0.8 A
	High and low reverse clutch engaged. Refer to AT-19 .	0 - 0.05 A
ON OFF SOL	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF
MANU MODE SW	Manual shift gate position (neutral)	ON
	Other than the above	OFF
NON M-MODE SW	Manual shift gate position	OFF
	Other than the above	ON
UP SW LEVER	Selector lever: + side	ON
	Other than the above	OFF
DOWN SW LEVER	Selector lever: - side	ON
	Other than the above	OFF
STARTER RELAY	Selector lever in “N” and “P” positions.	ON
	Selector lever in other positions.	OFF
ACCELE POSI	Released accelerator pedal.	0.0/8
	Fully depressed accelerator pedal.	8/8
THROTTLE POSI	Released accelerator pedal.	0.0/8
	Fully depressed accelerator pedal.	8/8
CLSD THL POS	Released accelerator pedal.	ON
	Fully depressed accelerator pedal.	OFF
W/O THL POS	Fully depressed accelerator pedal.	ON
	Released accelerator pedal.	OFF
BRAKE SW	Depressed brake pedal.	ON
	Released brake pedal.	OFF

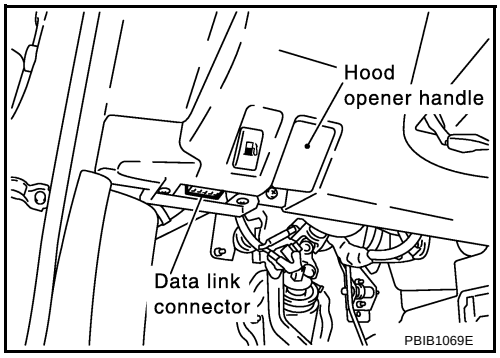
CONSULT-II SETTING PROCEDURE

CAUTION:

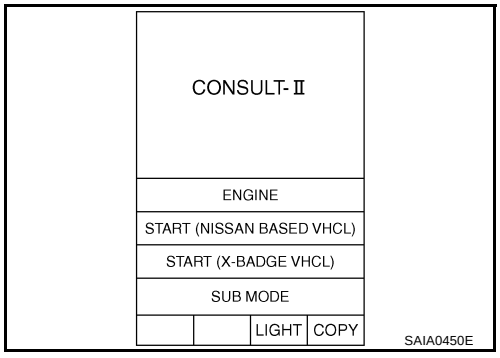
If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which perform CAN communication.

- For details, refer to the separate “CONSULT-II Operations Manual”.

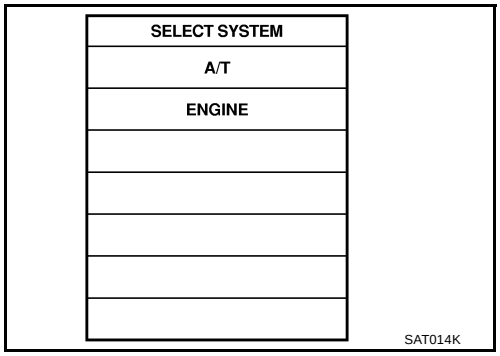
1. Turn ignition switch “OFF”.
2. Connect CONSULT-II and CONSULT-II CONVERTER to data link connector, which is located in instrument lower panel on driver side.



3. Turn ignition switch “ON”. (Do not start engine.)
4. Touch “START (NISSAN BASED VHCL)”.



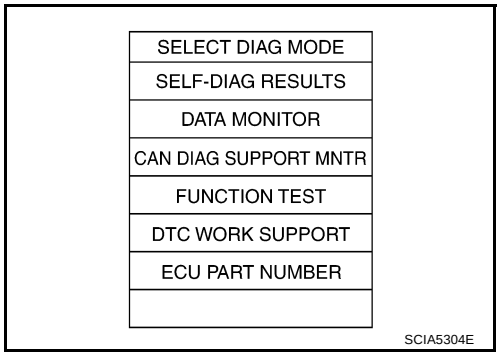
5. Touch “A/T”.
   If “A/T” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .
6. Perform each diagnostic test mode according to each service procedure.



SELF-DIAGNOSTIC RESULT MODE

Operation Procedure

1. Perform “CONSULT-II SETTING PROCEDURE”. Refer to AT-88, "CONSULT-II SETTING PROCEDURE" .
2. Touch “SELF-DIAG RESULTS”.
   Display shows malfunction experienced since the last erasing operation.



Display Items List

X: Applicable, —: Not applicable

Items (CONSULT-II screen terms)	Malfunction is detected when...	TCM self-diagnosis		OBD-II (DTC)
		A/T CHECK indicator lamp	"A/T" with CONSULT-II	MIL indicator lamp*1, "ENGINE" with CONSULT-II or GST
CAN COMM CIRCUIT	● When a malfunction is detected in CAN communications	X	U1000	U1000
STARTER RELAY/CIRC	● If this signal is ON other than in P or N position, this is judged to be a malfunction. (And if it is OFF in P or N position, this too is judged to be a malfunction.)	X	P0615	—
TCM	● TCM is malfunctioning	—	P0700	P0700
PNP SW/CIRC	● PNP switch 1-4 signals input with impossible pattern ● P position is detected from N position without any other position being detected in between.	X	P0705	P0705
VEH SPD SEN/CIR AT (Revolution sensor)	● Signal from vehicle speed sensor A/T (Revolution sensor) not input due to cut line or the like ● Unexpected signal input during running ● After ignition switch is turned ON, unexpected signal input from vehicle speed sensor MTR before the vehicle starts moving	X	P0720	P0720
ENGINE SPEED SIG	● TCM does not receive the CAN communication signal from the ECM.	X	P0725	P0725
TCC SOLENOID/CIRC	● Normal voltage not applied to solenoid due to cut line, short, or the like	X	P0740	P0740
A/T TCC S/V FNCTN	● A/T cannot perform lock-up even if electrical circuit is good. ● TCM detects as irregular by comparing difference value with slip rotation.	X	P0744	P0744*2
L/PRESS SOL/CIRC	● Normal voltage not applied to solenoid due to cut line, short, or the like ● TCM detects as irregular by comparing target value with monitor value.	X	P0745	P0745
TCM·RAM	● TCM memory (RAM) is malfunctioning.	—	P1702	—
TCM·ROM	● TCM memory (ROM) is malfunctioning.	—	P1703	—
TP SEN/CIRC A/T	● TCM does not receive the proper accelerator pedal position signals (input by CAN communication) from ECM.	X	P1705	P1705
ATF TEMP SEN/CIRC	● During running, the ATF temperature sensor signal voltage is excessively high or low	X	P1710	P0710
TURBINE REV S/CIRC	● TCM does not receive the proper voltage signal from the sensor. ● TCM detects an irregularity only at position of 4th gear for turbine revolution sensor 2.	X	P1716	P1716
VEH SPD SE/CIR·MTR	● Signal (CAN communication) from vehicle speed sensor MTR not input due to cut line or the like ● Unexpected signal input during running	—	P1721	—
A/T INTERLOCK	● Except during shift change, the gear position and pressure switch states are monitored and comparative judgement made.	X	P1730	P1730
A/T 1ST E/BRAKING	● Each pressure switch and solenoid current is monitored and if a pattern is detected having engine braking 1st gear other than in the M1 position, a malfunction is detected.	X	P1731	—

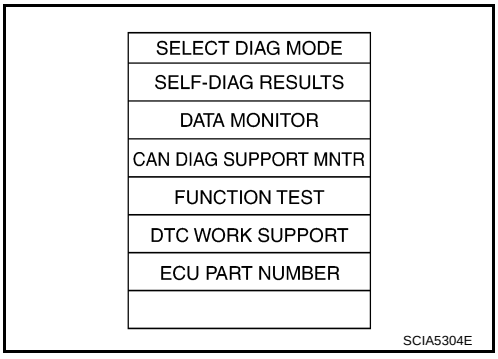
Items (CONSULT-II screen terms)	Malfunction is detected when...	TCM self-diagnosis		OBD-II (DTC)
		A/T CHECK indicator lamp	"A/T" with CONSULT-II	MIL indicator lamp*1, "ENGINE" with CONSULT-II or GST
I/C SOLENOID/ CIRC	● Normal voltage not applied to solenoid due to functional malfunction, cut line, short, or the like ● TCM detects as irregular by comparing target value with monitor value.	X	P1752	P1752
I/C SOLENOID FNCTN	● TCM detects that actual gear ratio is irregular, and relation between gear position and condition of pressure switch 3 is irregular during depressing accelerator pedal. (Other than during shift change) ● TCM detects that relation between gear position and condition of pressure switch 3 is irregular during releasing accelerator pedal. (Other than during shift change)	X	P1754	P1754*2
FR/B SOLENOID/ CIRC	● Normal voltage not applied to solenoid due to functional malfunction, cut line, short, or the like ● TCM detects as irregular by comparing target value with monitor value.	X	P1757	P1757
FR/B SOLENOID FNCT	● TCM detects that actual gear ratio is irregular, and relation between gear position and condition of pressure switch 1 is irregular during depressing accelerator pedal. (Other than during shift change) ● TCM detects that relation between gear position and condition of pressure switch 1 is irregular during releasing accelerator pedal. (Other than during shift change)	X	P1759	P1759*2
D/C SOLENOID/ CIRC	● Normal voltage not applied to solenoid due to cut line, short, or the like ● TCM detects as irregular by comparing target value with monitor value.	X	P1762	P1762
D/C SOLENOID FNCTN	● TCM detects that actual gear ratio is irregular, and relation between gear position and condition of pressure switch 5 is irregular during depressing accelerator pedal. (Other than during shift change) ● TCM detects that relation between gear position and condition of pressure switch 5 is irregular during releasing accelerator pedal. (Other than during shift change)	X	P1764	P1764*2
HLR/C SOL/CIRC	● Normal voltage not applied to solenoid due to functional malfunction, cut line, short, or the like ● TCM detects as irregular by comparing target value with monitor value.	X	P1767	P1767
HLR/C SOL FNCTN	● TCM detects that actual gear ratio is irregular, and relation between gear position and condition of pressure switch 6 is irregular during depressing accelerator pedal. (Other than during shift change) ● TCM detects that relation between gear position and condition of pressure switch 6 is irregular during releasing accelerator pedal. (Other than during shift change)	X	P1769	P1769*2
LC/B SOLENOID/ CIRC	● Normal voltage not applied to solenoid due to functional malfunction, cut line, short, or the like	X	P1772	P1772
LC/B SOLENOID FNCT	● TCM detects an improper voltage drop when it tries to operate the solenoid valve. ● Condition of pressure switch 2 is different from monitor value, and relation between gear position and actual gear ratio is irregular.	X	P1774	P1774*2

Items (CONSULT-II screen terms)	Malfunction is detected when...	TCM self-diagnosis		OBD-II (DTC)
		A/T CHECK indicator lamp	"A/T" with CONSULT-II	MIL indicator lamp*1, "ENGINE" with CONSULT-II or GST
MANU MODE SW/ CIRC	● When an impossible pattern of switch signals is detected, a malfunction is detected.	—	P1815	—
ATF PRES SW 1/ CIRC	● TCM detects that actual gear ratio is normal, and relation between gear position and condition of pressure switch 1 is irregular during depressing accelerator pedal. (Other than during shift change)	—	P1841	—
ATF PRES SW 3/ CIRC	● TCM detects that actual gear ratio is normal, and relation between gear position and condition of pressure switch 3 is irregular during depressing accelerator pedal. (Other than during shift change)	—	P1843	—
ATF PRES SW 5/ CIRC	● TCM detects that actual gear ratio is normal, and relation between gear position and condition of pressure switch 5 is irregular during depressing accelerator pedal. (Other than during shift change)	—	P1845	—
ATF PRES SW 6/ CIRC	● TCM detects that actual gear ratio is normal, and relation between gear position and condition of pressure switch 6 is irregular during depressing accelerator pedal. (Other than during shift change)	—	P1846	—
NO DTC IS DETECTED FURTHER TESTING MAY BE REQUIRED	● No NG item has been detected.	—	X	X

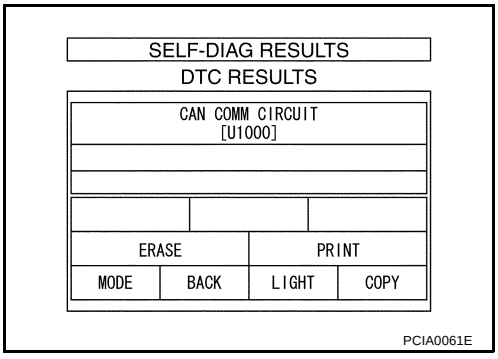
*1:Refer to AT-40, "Malfunction Indicator Lamp (MIL)" .
*2:These malfunctions cannot be displayed MIL if another malfunction is assigned to MIL.

How to Erase Self-diagnostic Results

1. Perform "CONSULT-II SETTING PROCEDURE". Refer to AT-88, "CONSULT-II SETTING PROCEDURE" .
2. Touch "SELF-DIAG RESULTS".



3. Touch "ERASE". (The self-diagnostic results will be erased.)

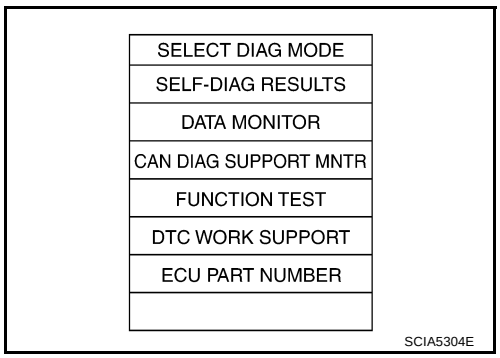


DATA MONITOR MODE

Operation Procedure

1. Perform “CONSULT-II SETTING PROCEDURE”. Refer to AT-88, "CONSULT-II SETTING PROCEDURE".
2. Touch “DATA MONITOR”.

NOTE:
When malfunction is detected, CONSULT-II performs “REAL-TIME DIAGNOSIS”. Also, any malfunction detected while in this mode will be displayed at real time.



Display Items List

X: Standard, —: Not applicable

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
VHCL/S SE·A/T (km/h)	X	X	X	Revolution sensor
VHCL/S SE·MTR (km/h)	X	—	X	
ACCELE POSI (0.0/8)	X	—	X	Accelerator pedal position signal
THROTTLE POSI (0.0/8)	X	X	X	Degree of opening for accelerator recognized by the TCM For fail-safe operation, the specific value used for control is displayed.
BATTERY BOLT (V)	X	—	X	
ENGINE SPEED (rpm)	X	X	X	
TURBINE REV (rpm)	X	X	X	
ATF TEMP 1 (°C)	—	X	X	
ATF TEMP 2 (°C)	—	X	X	
OUTPUT REV (rpm)	X	X	X	
ATF TEMP SE 1 (V)	X	—	X	
ATF TEMP SE 2 (V)	X	—	X	
ATF PRES SW 1 (ON-OFF display)	X	X	X	(for FR/B solenoid)
ATF PRES SW 2 (ON-OFF display)	X	X	X	(for LC/B solenoid)
ATF PRES SW 3 (ON-OFF display)	X	X	X	(for I/C solenoid)
ATF PRES SW 5 (ON-OFF display)	X	X	X	(for D/C solenoid)
ATF PRES SW 6 (ON-OFF display)	X	X	X	(for HLR/C solenoid)
PNP SW 1 (ON-OFF display)	X	—	X	
PNP SW 2 (ON-OFF display)	X	—	X	
PNP SW 3 (ON-OFF display)	X	—	X	
PNP SW 4 (ON-OFF display)	X	—	X	
1 POSITION SW (ON-OFF display)	X	—	X	
ASCD·CRUISE (ON-OFF display)	X	—	X	
ASCD·OD CUT (ON-OFF display)	X	—	X	
OD OFF SW (ON-OFF display)	X	—	X	Not mounted but displayed.
MANU MODE SW (ON-OFF display)	X	—	X	

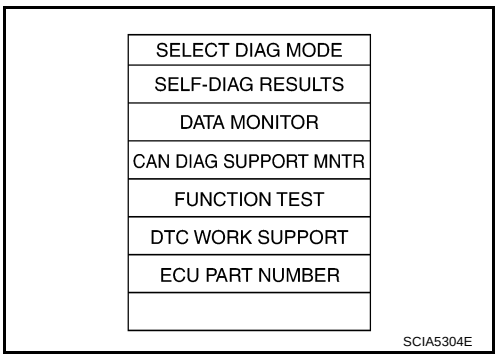
Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
NON M-MODE SW (ON-OFF display)	X	—	X	
UP SW LEVER (ON-OFF display)	X	—	X	
DOWN SW LEVER (ON-OFF display)	X	—	X	
POWER SHIFT SW (ON-OFF display)	X	—	X	Not mounted but displayed.
CLSD THL POS (ON-OFF display)	X	—	X	Signal input with CAN communications.
W/O THL POS (ON-OFF display)	X	—	X	Signal input with CAN communications.
TCC SOLENOID (A)	—	X	X	
LINE PRES SOL (A)	—	X	X	
I/C SOLENOID (A)	—	X	X	
FR/B SOLENOID (A)	—	X	X	
D/C SOLENOID (A)	—	X	X	
HLR/C SOL (A)	—	X	X	
HOLD SW (ON-OFF display)	X	—	X	Not mounted but displayed.
BRAKE SW (ON-OFF display)	X	—	X	Stop lamp switch
GEAR	—	X	X	Gear position recognized by the TCM updated after gear-shifting.
GEAR RATIO	—	X	X	
SLCTLVR POSI	—	X	X	Selector lever position is recognized by the TCM. For fail safe operation, the specific value used for control is displayed.
VEHICLE SPEED (km/h)	—	X	X	Vehicle speed recognized by the TCM.
TC SLIP SPEED (rpm)	—	X	X	Difference between engine speed and torque converter input shaft speed.
Voltage (V)	—	—	X	Displays the value measured by the voltage probe.
F SUN GO REV (rpm)	—	—	X	
F CARR GR REV (rpm)	—	—	X	
SFT UP ST SW	—	—	X	Not mounted but displayed.
SFT DOWN ST SW	—	—	X	
ABS SIGNAL	—	—	X	
ACC OD CUT	—	—	X	Not mounted but displayed.
ACC SIGNAL	—	—	X	
TCS GR/P KEEP	—	—	X	
TCS SIGNAL 2	—	—	X	
TCS SIGNAL 1	—	—	X	
ON OFF SOL (ON-OFF display)	—	—	X	LC/B solenoid
TCC SOL MON	—	—	X	
L/P SOL MON	—	—	X	
I/C SL MON	—	—	X	
FR/B SOL MON	—	—	X	
D/C SOL MON	—	—	X	
HLR/C SOL MON	—	—	X	
ON OFF SOL MON	—	—	X	LC/B solenoid

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
P POSI IND	—	—	X	
R POSI IND	—	—	X	
N POSI IND	—	—	X	
D POSI IND	—	—	X	
4TH POSI IND	—	—	X	
3RD POSI IND	—	—	X	
2ND POSI IND	—	—	X	
1ST POSI IND	—	—	X	
M MODE IND	—	—	X	
POWER M LAMP	—	—	X	
F-SAFE IND/L	—	—	X	
ATF WARN LAMP	—	—	X	
BACK-UP LAMP	—	—	X	
STARTER RELAY	—	—	X	
PNP SW3 MON	—	—	X	
TRGT GR RATIO	—	—	X	
TRGT PRES TCC	—	—	X	
TRGT PRES L/P	—	—	X	
TRGT PRES I/C	—	—	X	
TRGT PRES FR/B	—	—	X	
TRGT PRES D/C	—	—	X	
TRG PRE HLR/C	—	—	X	
SHIFT PATTERN	—	—	X	
C/V CLB ID1	—	—	X	
C/V CLB ID2	—	—	X	
C/V CLB ID3	—	—	X	
UNIT CLB ID1	—	—	X	
UNIT CLB ID2	—	—	X	
UNIT CLB ID3	—	—	X	
DRV CST JUDGE	—	—	X	
START RLY MON	—	—	X	
NEXT GR POSI	—	—	X	
SHIFT MODE	—	—	X	
MANU GR POSI	—	—	X	
Frequency (Hz)	—	—	X	The value measured by the pulse probe is displayed.
DUTY·HI (high) (%)	—	—	X	
DUTY·LOW (low) (%)	—	—	X	
PLS WIDTH·HI (ms)	—	—	X	
PLS WIDTH·LOW (ms)	—	—	X	

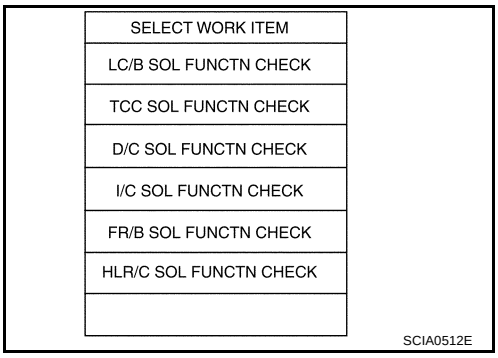
DTC WORK SUPPORT MODE WITH CONSULT-II

Operation Procedure

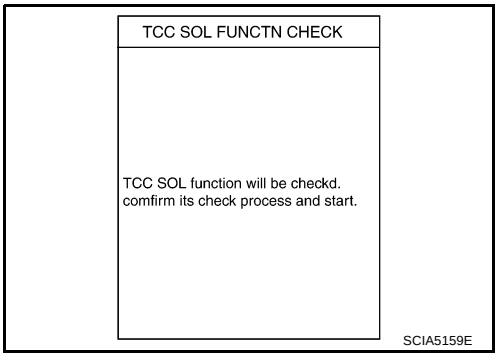
1. Perform “CONSULT-II SETTING PROCEDURE”. Refer to AT-88, "CONSULT-II SETTING PROCEDURE".
2. Touch “DTC WORK SUPPORT”.



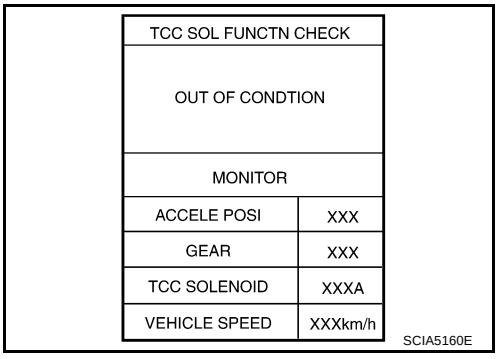
3. Touch select item menu.



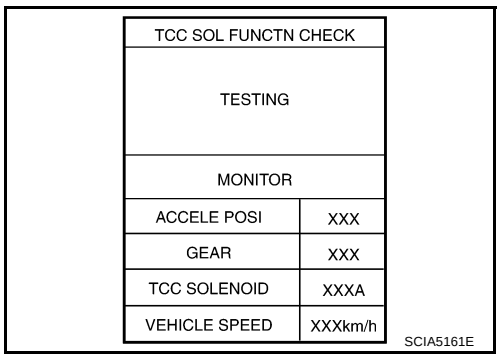
4. Touch “START”.



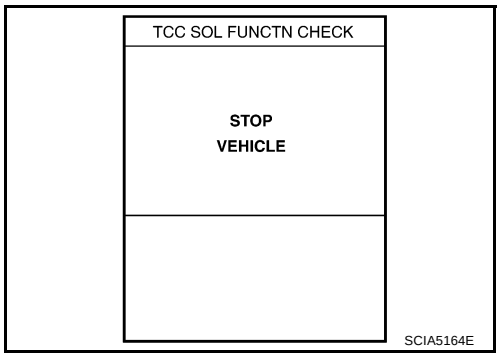
5. Perform driving test according to “DTC CONFIRMATION PROCEDURE” in “TROUBLE DIAGNOSIS FOR DTC”.



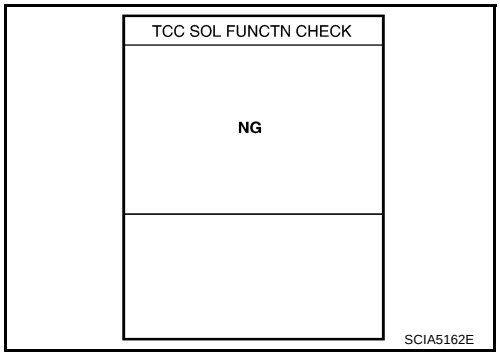
- **When testing conditions are satisfied, CONSULT-II screen changes from “OUT OF CONDITION” to “TESTING”.**



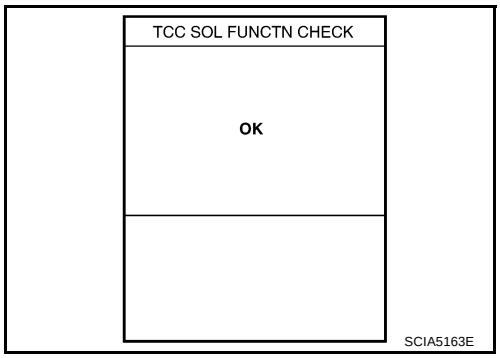
6. Stop vehicle.



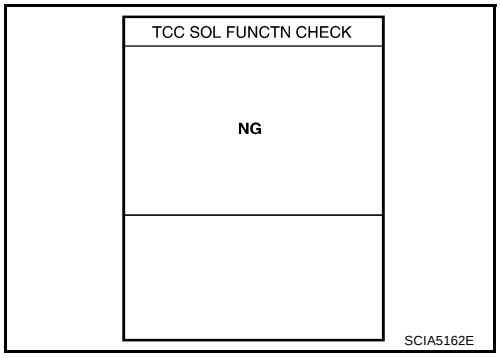
- **If “NG” appears on the screen, malfunction may exist. Go to “Diagnostic Procedure”.**



7. Perform test drive to check gear shift feeling in accordance with instructions displayed.
8. Touch “YES” or “NO”.
9. CONSULT-II procedure ended.



- **If “NG” appears on the screen, malfunction may exist. Go to “Diagnostic Procedure”.**



Display Items List

DTC work support item	Description	Check item
I/C SOL FUNCTN CHECK*	—	—
FR/B SOL FUNCTN CHECK*	—	—
D/C SOL FUNCTN CHECK*	—	—
HLR/C SOL FUNCTN CHECK*	—	—
LC/B SOL FUNCTN CHECK*	—	—
TCC SOL FUNCTN CHECK	Following items for “TCC solenoid function (lock-up) ” can be confirmed. ● Self-diagnosis status (whether the diagnosis is being performed or not) ● Self-diagnosis result (OK or NG)	● TCC solenoid valve ● Hydraulic control circuit

*: Do not use, but displayed.

Diagnostic Procedure Without CONSULT-II

ACS000HZ

OBD-II SELF-DIAGNOSTIC PROCEDURE (WITH GST)

Refer to EC-116, "Generic Scan Tool (GST) Function" .

OBD-II SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)

Refer to EC-63, "Malfunction Indicator Lamp (MIL)" .

TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)

Description

In the unlikely event of a malfunction in the electrical system, when the ignition switch is switched “ON”, the A/T CHECK indicator lamp lights up for 2 seconds, then flashes for 8 seconds. If there is no malfunction, when the ignition switch is turned “ON”, the indicator lamp lights up for 2 seconds. As a method for locating the suspect circuit, when the self-diagnostics start signal is input, the memory for the malfunction location is output and the A/T CHECK indicator lamp flashes to display the corresponding DTC.

Diagnostic Procedure

1. CHECK A/T CHECK INDICATOR LAMP

1. Start the engine with selector lever in “P” position. Warm engine to normal operating temperature.
2. Turn ignition switch “ON” and “OFF” at least twice, then leave it in the “OFF” position.
3. Wait 10 seconds.
4. Turn ignition switch to “ON” position. (Do not start engine.)

Does A/T CHECK indicator lamp come on for about 2 seconds?

YES >> GO TO 2.
NO >> GO TO AT-187, "A/T Check Indicator Lamp Does Not Come On" .

2. JUDGEMENT PROCEDURE STEP 1

1. Turn ignition switch “OFF”.
2. Push shift lock release button.
3. Move selector lever from “P” to “D” position.
4. Release accelerator pedal. (Set the closed throttle position signal “ON”.)
5. Depress brake pedal. (Stop lamp switch signal “ON”.)
6. Turn ignition switch “ON”. (Do not start engine.)
7. Wait 3 seconds.
8. Move the selector lever to the Manual shift gate side. (Manual mode switch “ON”.)
9. Release brake pedal. (Stop lamp switch signal “OFF”.)
10. Move the selector lever to “D” position. (Manual mode switch “OFF”.)
11. Depress brake pedal. (Stop lamp switch signal “ON”.)
12. Release brake pedal. (Stop lamp switch signal “OFF”.)
13. Depress accelerator pedal fully and release it.

>> GO TO 3.

3. CHECK SELF-DIAGNOSIS CODE

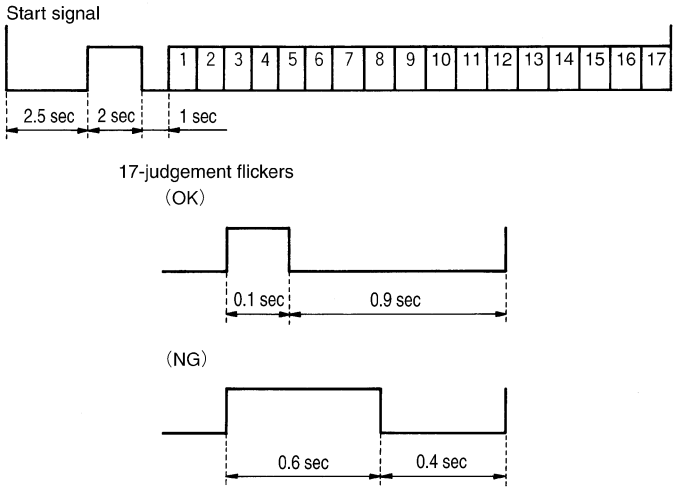
Check A/T CHECK indicator lamp. Refer to AT-99, "Judgement Self-diagnosis Code" .
If the system does not go into self-diagnostics. Refer to AT-108, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" , AT-164, "DTC P1815 MANUAL MODE SWITCH" , AT-182, "CLOSED THROTTLE POSITION AND WIDE OPEN THROTTLE POSITION CIRCUIT" , AT-183, "BRAKE SIGNAL CIRCUIT" .

>> **DIAGNOSIS END**

Judgement Self-diagnosis Code

If there is a malfunction, the lamp lights up for the time corresponding to the suspect circuit.

1	Revolution sensor
2	Direct clutch solenoid valve
3	Torque converter clutch solenoid valve
4	Line pressure solenoid valve
5	Input clutch solenoid valve
6	Front brake solenoid valve
7	Low coast brake solenoid valve
8	High and low reverse clutch solenoid valve
9	PNP switch
10	A/T fluid temperature sensor
11	Turbine revolution sensor
12	A/T interlock
13	A/T 1st engine braking
14	Start signal
15	Accelerator pedal position sensor
16	Engine speed signal
17	CAN



※ Solenoid valve is checked for open and short circuit, and malfunctions.

SCIA4758E

Erase Self-diagnosis

- In order to make it easier to find the cause of hard-to-duplicate malfunctions, malfunction information is stored into the control unit as necessary during use by the user. This memory is not erased no matter how many times the ignition switch is turned ON and OFF.
- However, this information is erased by turning ignition switch “OFF” after executing self-diagnostics or by erasing the memory using the CONSULT-II.

DTC U1000 CAN COMMUNICATION LINE

PFP:23710

Description

ACS003MG

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent malfunction detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

On Board Diagnosis Logic

ACS003MH

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “CAN COMM CIRCUIT” with CONSULT-II or U1000 without CONSULT-II is detected when TCM cannot communicate to other control units.

Possible Cause

ACS003MI

Harness or connectors
(CAN communication line is open or shorted.)

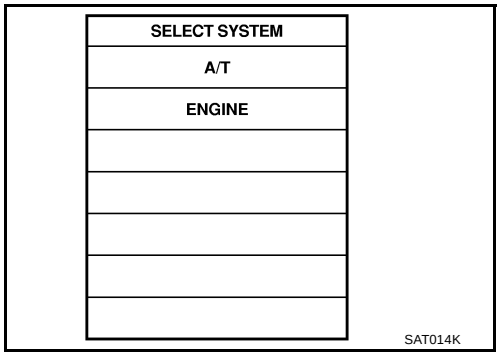
DTC Confirmation Procedure

ACS003MJ

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.
3. Start engine and wait for at least 6 seconds.
4. If DTC is detected, go to AT-102, "Diagnostic Procedure" .



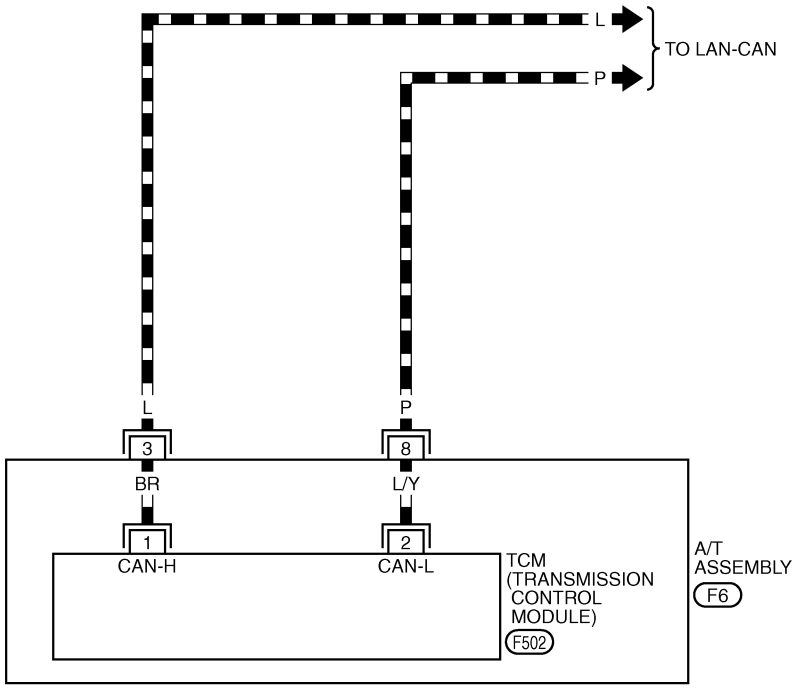
WITH GST

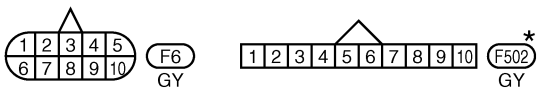
Follow the procedure “WITH CONSULT-II”.

Wiring Diagram — AT — CAN

ACS0080J

AT-CAN-01





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0259E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition	Data (Approx.)
3	L	CAN-H	–	–
8	P	CAN-L	–	–

Diagnostic Procedure

ACS003MK

1. CHECK CAN COMMUNICATION CIRCUIT

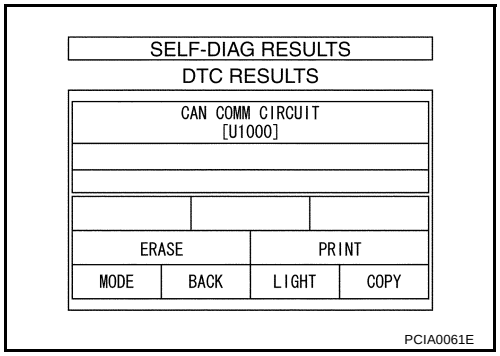
With CONSULT-II

1. Turn ignition switch “ON” and start engine.
2. Select “SELF-DIAG RESULTS” mode for “A/T” with CONSULT-II.

Is any malfunction of the “CAN COMM CIRCUIT” indicated?

YES >> Print out CONSULT-II screen, GO TO LAN section. Refer to LAN-3, "Precautions When Using CONSULT-II"

NO >> **INSPECTION END**



DTC P0615 START SIGNAL CIRCUIT

PFP:25230

Description

ACS000I6

Prohibits cranking other at “P” or “N” position.

CONSULT-II Reference Value

ACS006C0

Item name	Condition	Display value
STARTER RELAY	Selector lever in “N” and “P” positions.	ON
	Selector lever in other positions.	OFF

On Board Diagnosis Logic

ACS000I7

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “STARTER RELAY/CIRC” with CONSULT-II or 14th judgement flicker without CONSULT-II is detected when starter relay is switched “ON” other than at “P” or “N” position. (Or when switched “OFF” at “P” or “N” position).

Possible Cause

ACS000I8

- Harness or connectors
  (Starter relay and TCM circuit is open or shorted.)
- Starter relay circuit

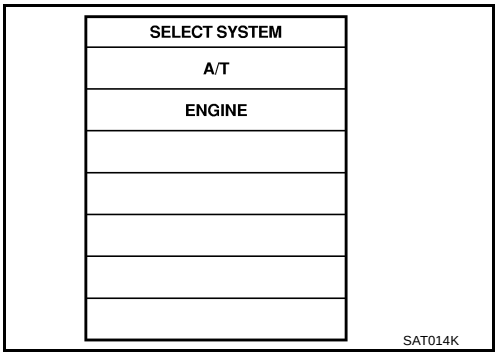
DTC Confirmation Procedure

ACS000I9

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine.
4. Vehicle start for at least 2 consecutive seconds.
5. If DTC is detected, go to AT-105, "Diagnostic Procedure" .

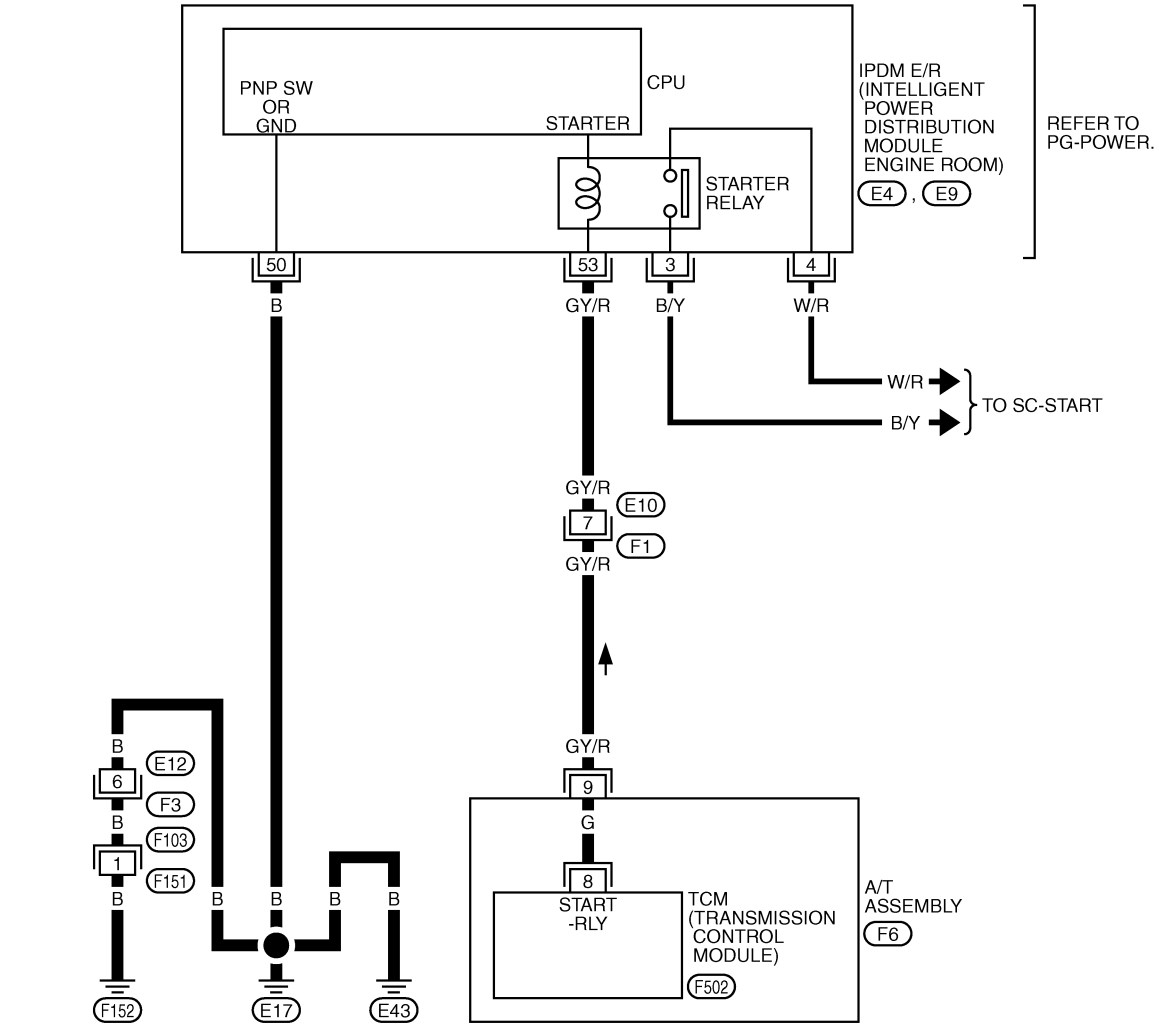


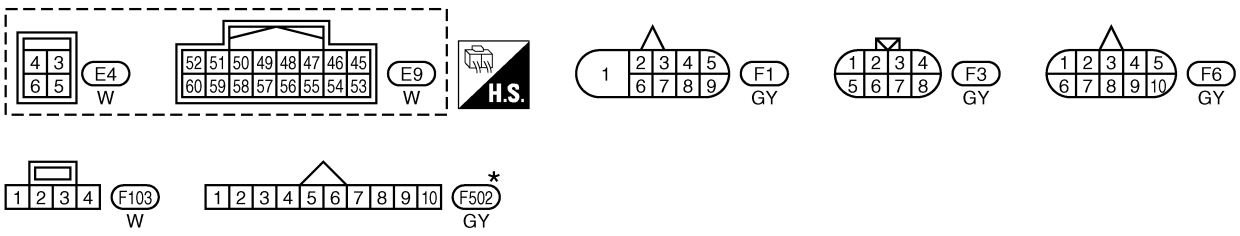
Wiring Diagram — AT — STSIG

ACS0080K

AT-STSIG-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0260E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
9	GY/R	Starter relay		Selector lever in “N” and “P” positions.	Battery voltage
				Selector lever in other positions.	0V

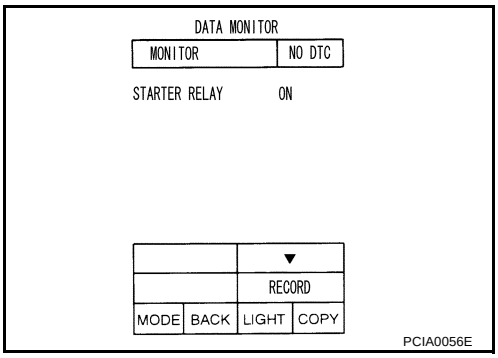
Diagnostic Procedure

ACS000IB

1. CHECK STARTER RELAY

With CONSULT-II

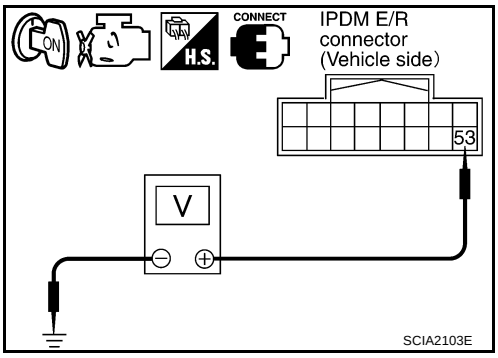
1. Turn ignition switch ON. (Do not start engine.)
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “A/T” with CONSULT-II and check monitor “STARTER RELAY” ON/OFF.



Item name	Condition	Display value
STARTER RELAY	Selector lever in “N” and “P” positions.	ON
	Selector lever in other positions.	OFF

Without CONSULT-II

1. Turn ignition switch ON. (Do not start engine.)
2. Check voltage between the IPDM E/R connector and ground.



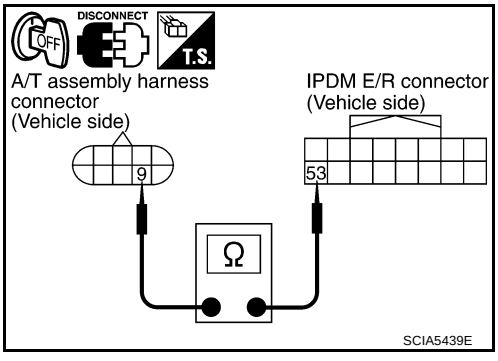
Item	Connector	Terminal (Wirer color)		Shift position	Voltage (Approx.)
Starter relay	E9	53 (GY/R)	Ground	“N” and “P”	Battery voltage
				“R” and “D”	0V

OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK HARNESS BETWEEN A/T ASSEMBLY HARNESS CONNECTOR AND IPDM E/R CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect A/T assembly harness connector and IPDM E/R connector.
3. Check continuity between A/T assembly harness connector and IPDM E/R connector.



Item	Connector	Terminal (Wire color)	Continuity
A/T assembly harness connector	F6	9 (GY/R)	Yes
IPDM E/R connector	E9	53 (GY/R)	

4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

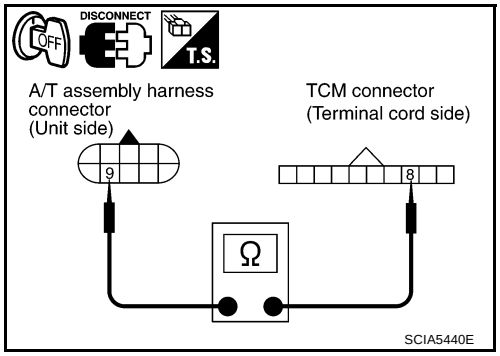
OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK TERMINAL CORD ASSEMBLY

1. Remove control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disconnect A/T assembly harness connector and TCM connector.
3. Check continuity between A/T assembly harness connector terminal and TCM connector terminal.

Item	Connector	Terminal (Wire color)	Continuity
A/T assembly harness connector	F6	9 (G)	Yes
TCM connector	F502	8 (G)	



4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

OK or NG

OK >> GO TO 4.
NG >> Replace open circuit or short to ground and short to power in harness or connectors.

4. DETECT MALFUNCTIONING ITEM

Check the following items:

- Starter relay, Refer to SC-10, "STARTING SYSTEM" .
- IPDM E/R, Refer to PG-17, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)" .

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

5. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-103, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P0700 TCM

PFP:31036

Description

ACS006DL

TCM consists of a microcomputer and connectors for signal input and output and for power supply. TCM controls A/T.

On Board Diagnosis Logic

ACS006DM

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “TCM” with CONSULT-II or P0700 without CONSULT-II is detected when TCM is malfunctioning.

Possible Cause

ACS006DN

TCM.

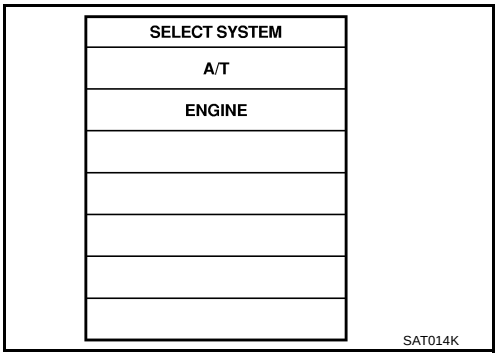
DTC Confirmation Procedure

ACS006DO

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine.
4. Run engine for at least 2 consecutive seconds at idle speed.
5. If DTC is detected, go to AT-107, "Diagnostic Procedure" .



Diagnostic Procedure

ACS006DP

1. CHECK DTC

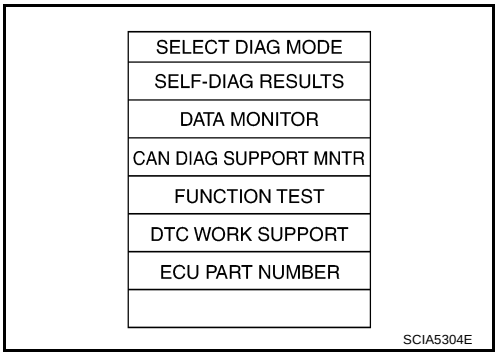
With CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “SELF DIAG RESULTS” mode for “A/T” with CONSULT-II.
3. Touch “ERASE”.
4. Turn ignition switch “OFF” and wait at least 10 seconds.
5. Perform “DTC confirmation procedure”. Refer to AT-107, "DTC Confirmation Procedure" .

Is the “TCM” displayed again?

YES >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .

NO >> **INSPECTION END**



DTC P0705 PARK/NEUTRAL POSITION SWITCH

PFP:32006

Description

ACS003ML

- Park/neutral position (PNP) switch includes a transmission range switch.
- Transmission range switch detects the selector lever position and sends a signal to TCM.

CONSULT-II Reference Value

ACS003MM

Item name	Condition	Display value
SLC TLVR POSI	Selector lever in “N” and “P” positions.	N/P
	Selector lever in “R” position.	R
	Selector lever in “D” position.	D

On Board Diagnosis Logic

ACS003MN

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “PNP SW/CIRC” with CONSULT-II or P0705 without CONSULT-II is detected under the following conditions.

– When TCM does not receive the correct voltage signal from PNP switch 1, 2, 3, 4 based on the gear position.

– When no other position but “P” position is detected from “N” positions.

Possible Cause

ACS003MO

- Harness or connectors
  [Park/neutral position (PNP) switch 1, 2, 3, 4 and TCM circuit is open or shorted.]
- Park/neutral position (PNP) switch 1, 2, 3, 4

DTC Confirmation Procedure

ACS003MP

CAUTION:

Always drive vehicle at a safe speed.

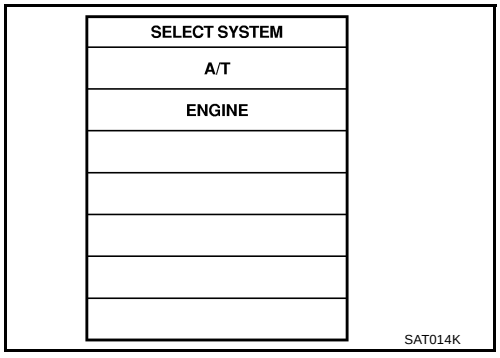
NOTE:

If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.
   THRTL POS SEN: More than 1.2V
5. If DTC is detected, go to AT-110, "Diagnostic Procedure" .



WITH GST

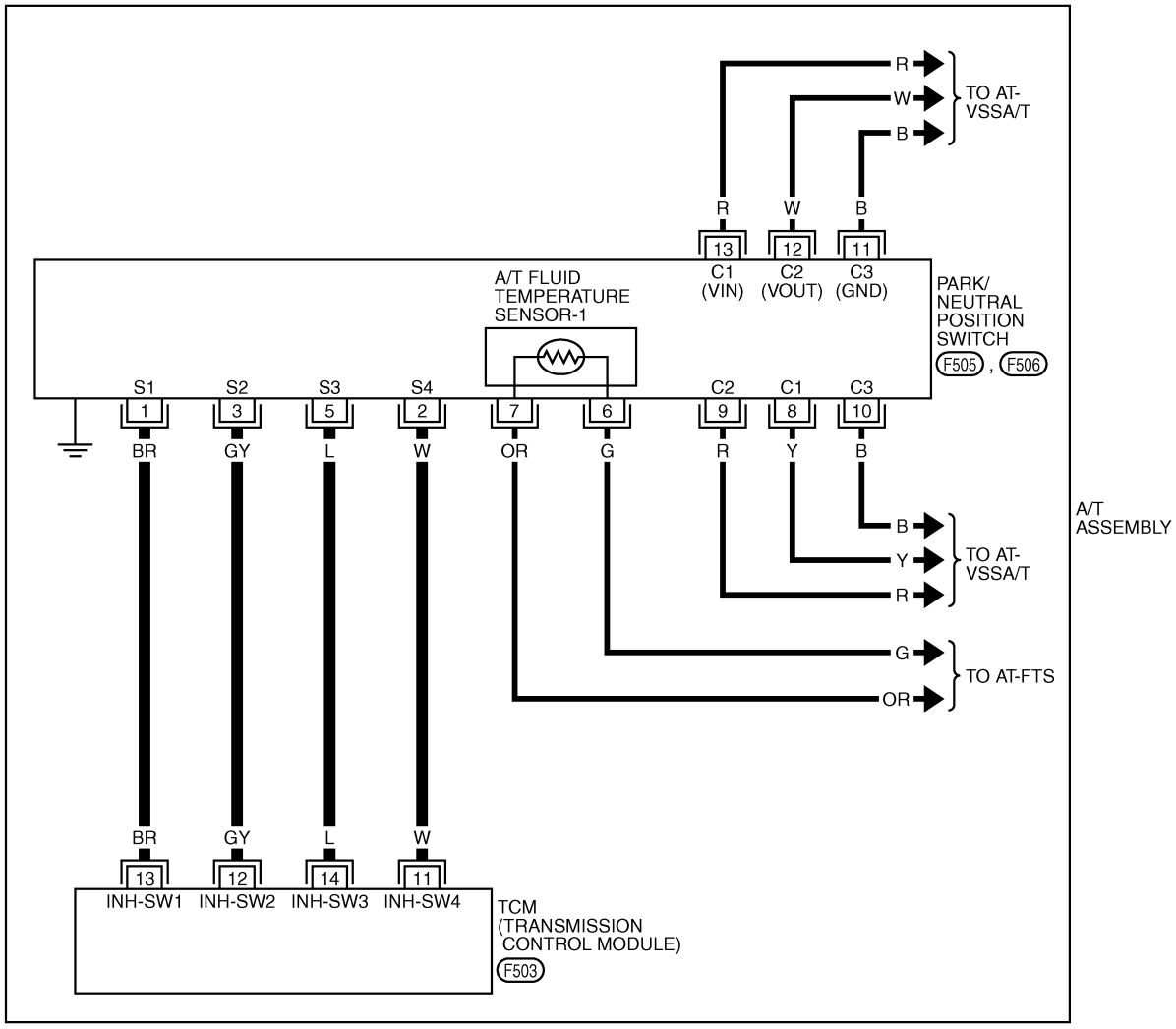
Follow the procedure “With CONSULT-II”.

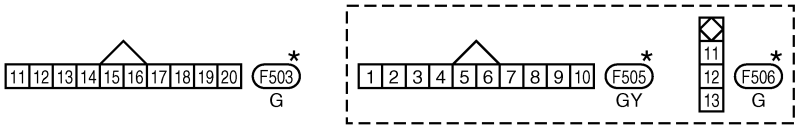
Wiring Diagram — AT — PNP/SW

ACS0080L

AT-PNP/SW-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0248E

Diagnostic Procedure

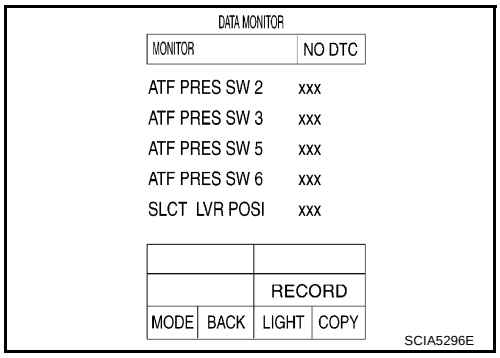
ACS003MQ

1. CHECK PNP SW CIRCUIT

With CONSULT-II

1. Turn ignition switch ON. (Do not start engine.)
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Check if correct selector lever position (N/P, R or D) is displayed as selector lever is moved into each position.

Item name	Condition	Display value
SLCT LVR POSI	Selector lever in “N” and “P” positions.	N/P
	Selector lever in “R” position.	R
	Selector lever in “D” position.	D



OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check the following items:

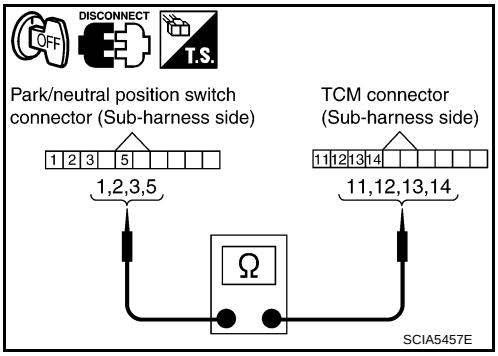
- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. CHECK SUB-HARNESS

1. Remove control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disconnect park/neutral position switch connector and TCM connector.
3. Check continuity between park/neutral position switch connector terminals and TCM connector terminals.



Item	Connector	Terminal (Wire color)	Continuity
Park/neutral position switch connector	F505	1 (BR)	Yes
TCM connector	F503	13 (BR)	
Park/neutral position switch connector	F505	2 (W)	Yes
TCM connector	F503	11 (W)	
Park/neutral position switch connector	F505	3 (GY)	Yes
TCM connector	F503	12 (GY)	
Park/neutral position switch connector	F505	5 (L)	Yes
TCM connector	F503	14 (L)	

4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .

NG >> Replace open circuit or short to ground and short to power in harness or connectors.

5. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-108, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 2.

DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)

PFP:32702

Description

ACS003MR

Revolution sensor detects the revolution of the idler gear parking pawl lock gear and emits a pulse signal. The pulse signal is sent to the TCM which converts it into vehicle speed.

CONSULT-II Reference Value

ACS003MS

Item name	Condition	Display value (km/h)
VHCL/S SE·A/T	During driving	Approximately matches the speedometer reading.

On Board Diagnosis Logic

ACS003MT

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “VEH SPD SEN/CIR AT” with CONSULT-II or P0720 without CONSULT-II is detected under the following conditions.
  - When TCM does not receive the proper voltage signal from the sensor.
  - After ignition switch is turned “ON”, irregular signal input from vehicle speed sensor MTR before the vehicle starts moving.

Possible Cause

ACS003MU

- Harness or connectors
  (Sensor circuit is open or shorted.)
- Revolution sensor
- Vehicle speed sensor MTR

DTC Confirmation Procedure

ACS003MV

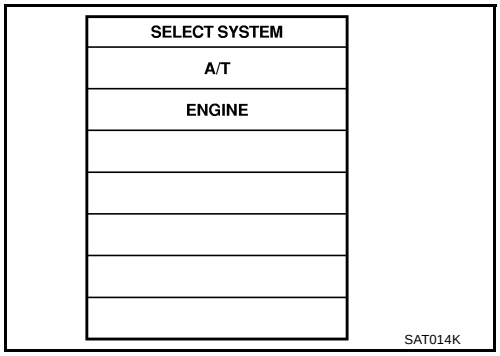
CAUTION:

- **Always drive vehicle at a safe speed.**
- **Be careful not to rev engine into the red zone on the tachometer.**

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Drive vehicle and check for an increase of “VHCL/S SE·A/T” value in response to “VHCL/S SE·MTR” value.
   If the check result is NG, go to AT-115, "Diagnostic Procedure" .
   If the check result is OK, go to following step.
4. Select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.
5. Start engine and maintain the following conditions for at least 5 consecutive seconds.
   VHCL SPEED SE: 30 km/h (19 MPH) or more
   THRTL POS SEN: More than 1.0/8
   Selector lever: “D” position
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
   If the check result is NG, go to AT-115, "Diagnostic Procedure" .
   If the check result is OK, go to following step.



6. Maintain the following conditions for at least 5 consecutive seconds.
   ENGINE SPEED: 3,500 rpm or more
   THRTL POS SEN: More than 1.0/8
   Selector lever: “D” position
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
   If the check result is NG, go to AT-115, "Diagnostic Procedure" .

WITH GST

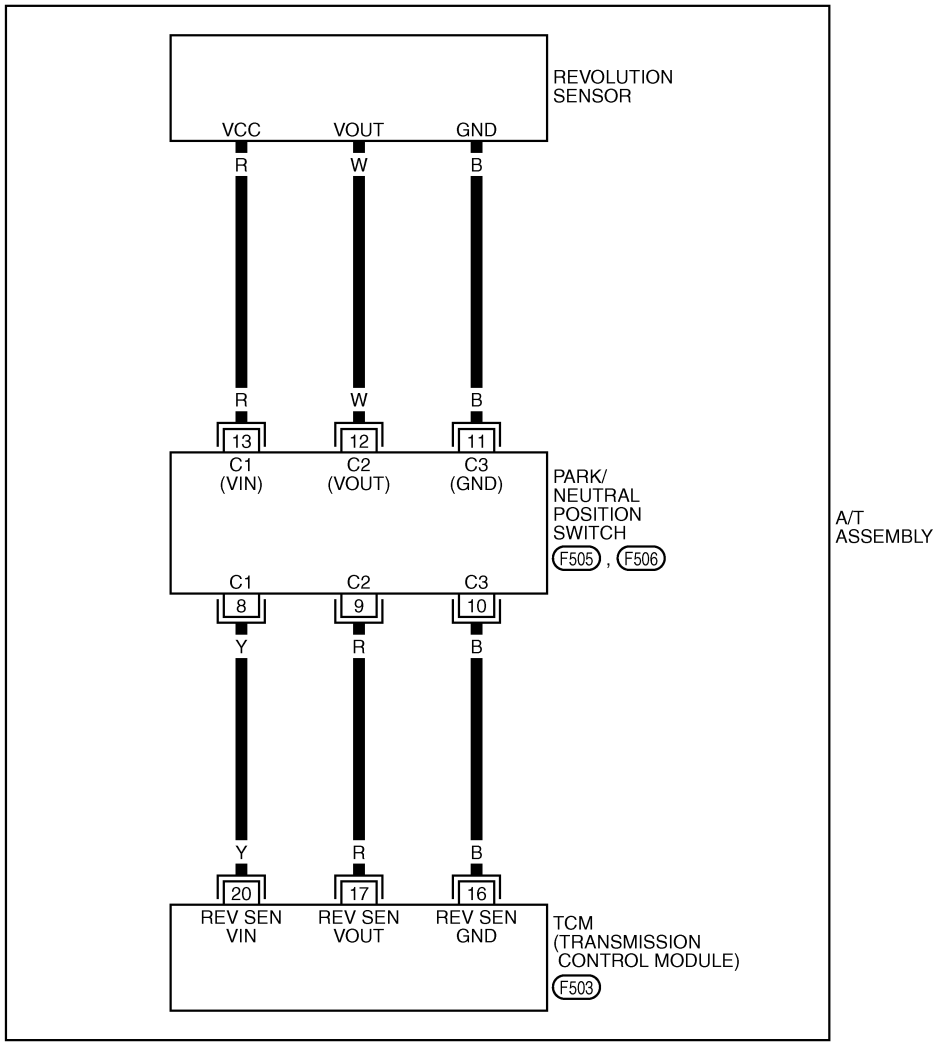
Follow the procedure “With CONSULT-II”.

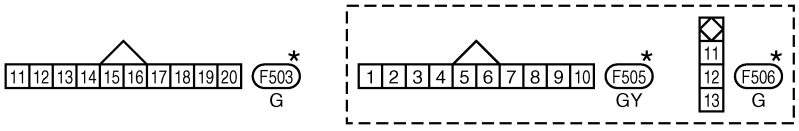
Wiring Diagram — AT — VSSA/T

ACS0080M

AT-VSSA/T-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0249E

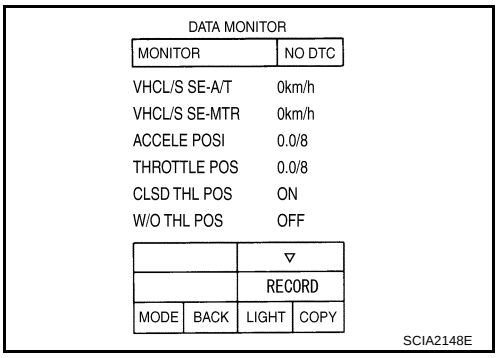
Diagnostic Procedure

ACS003MW

1. CHECK INPUT SIGNAL

With CONSULT-II

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start the engine.
4. Read out the value of “VHCL/S SE·A/T” while driving. Check the value changes according to driving speed.



Item name	Condition	Display value (km/h)
VHCL/S SE·A/T	During driving	Approximately matches the speedometer reading.

OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check the following items:

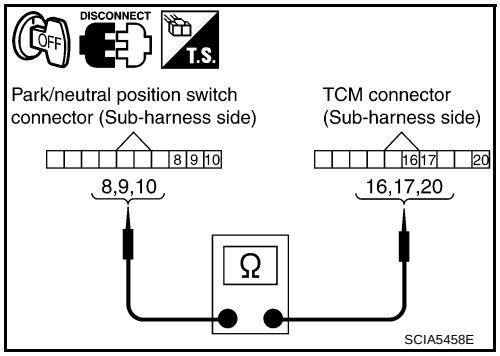
- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. CHECK SUB-HARNESS

1. Remove control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disconnect park/neutral position switch connector and TCM connector.
3. Check continuity between park/neutral position switch connector terminals and TCM connector terminals.



Item	Connector	Terminal (Wire color)	Continuity
Park/neutral position switch connector	F505	8 (Y)	Yes
TCM connector	F503	20 (Y)	
Park/neutral position switch connector	F505	9 (R)	Yes
TCM connector	F503	17 (R)	
Park/neutral position switch connector	F505	10 (B)	Yes
TCM connector	F503	16 (B)	

4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Replace open circuit or short to ground and short to power in harness or connectors.

5. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-112, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P0725 ENGINE SPEED SIGNAL

PFP:24825

Description

ACS003MX

The engine speed signal is sent from the ECM to the TCM.

CONSULT-II Reference Value

ACS003MY

Item name	Condition	Display value (rpm)
ENGINE SPEED	Engine running	Closely matches the tachometer reading.

On Board Diagnosis Logic

ACS003MZ

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “ENGINE SPEED SIG” with CONSULT-II or P0725 without CONSULT-II is detected when TCM does not receive the ignition signal from ECM during engine cranking or running.

Possible Cause

ACS003N0

Harness or connectors
(ECM to TCM circuit is open or shorted.)

DTC Confirmation Procedure

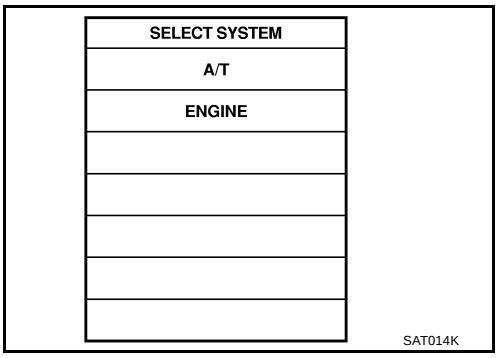
ACS003N1

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON” and select “DATA MONITOR” mode for “A/T” with CONSULT-II.
2. Start engine and maintain the following conditions for at least 10 consecutive seconds.
   VHCL SPEED SE: 10 km/h (6 MPH) or more
   ACCELE POSI: More than 1/8
   Selector lever: “D” position
3. If DTC is detected, go to AT-118, "Diagnostic Procedure" .



WITH GST

Follow the procedure “With CONSULT-II”.

Diagnostic Procedure

ACS003N2

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" , AT-98, "Diagnostic Procedure Without CONSULT-II" .

Is a malfunction in the CAN communication indicated in the results?

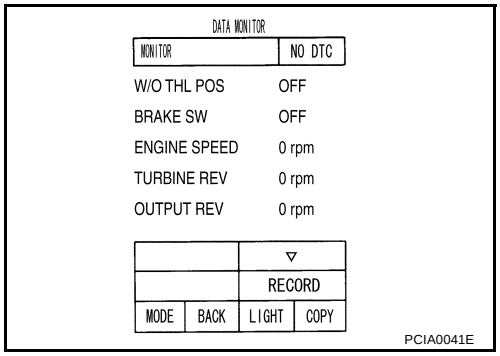
YES >> Check CAN communication line. Refer to AT-100, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK DTC WITH TCM

With CONSULT-II

1. Start engine.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. While monitoring engine speed, check for engine speed change corresponding to wide-open throttle position signal.

Item name	Condition	Display value (rpm)
ENGINE SPEED	Engine running	Closely matches the tachometer reading.



With GST

Follow the procedure “WITH CONSULT-II”.

OK or NG

OK >> GO TO 3.
NG >> Check the ignition signal circuit.
- Refer to EC-620, "IGNITION SIGNAL" .

3. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-117, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 4.

4. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

5. DETECT MALFUNCTIONING ITEM

Check the following items:

- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

PFP:31940

Description

ACS003N3

- Torque converter clutch solenoid valve is activated, with the gear in D_4 , D_5 by TCM in response to signals sent from the vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Torque converter clutch piston operation will then be controlled.
- Lock-up operation, however, is prohibited when A/T fluid temperature is too low.
- When the accelerator pedal is depressed (less than 1/8) in lock-up condition, the engine speed should not change abruptly. If there is a big jump in engine speed, there is no lock-up.

CONSULT-II Reference Value

ACS003N4

Item name	Condition	Display value (Approx.)
TCC SOLENOID	When performing slip lock-up	0.2 - 0.4 A
	When performing lock-up	0.4 - 0.6 A

On Board Diagnosis Logic

ACS003N5

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “TCC SOLENOID/CIRC” with CONSULT-II or P0740 without CONSULT-II is detected under the following conditions.

– When TCM detects an improper voltage drop when it tries to operate the solenoid valve.

– When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

ACS003N6

- Torque converter clutch solenoid valve
- Harness or connectors
  (Solenoid circuit is open or shorted.)

DTC Confirmation Procedure

ACS003N7

CAUTION:

Always drive vehicle at a safe speed.

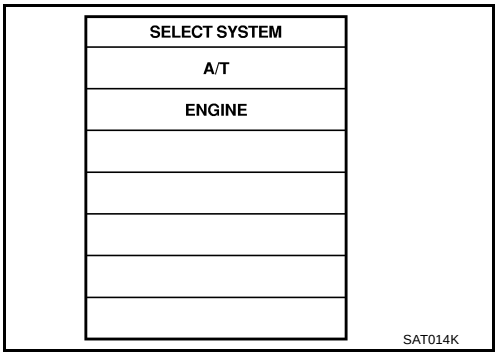
NOTE:

If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.
3. Start engine and maintain the following conditions for at least 5 consecutive seconds.
   VHCL SPEED SE: 80 km/h (50 MPH) or more
   ACCELE POSI: 0.5/8 - 1.0/8
   SELECTOR LEVER: “D” position
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
4. If DTC is detected go to AT-120, "Diagnostic Procedure" .



WITH GST

Follow the procedure “With CONSULT-II”.

Diagnostic Procedure

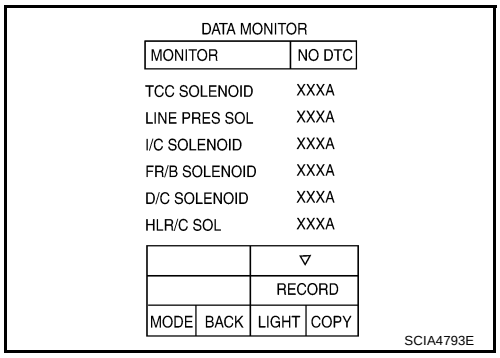
ACS003N8

1. CHECK INPUT SIGNAL

With CONSULT-II

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine.
4. Read out the value of “TCC SOLENOID” while driving.

Item name	Condition	Display value (Approx.)
TCC SOLENOID	When performing slip lock-up	0.2 - 0.4 A
	When performing lock-up	0.4 - 0.6 A



OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check the following items:

- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-119, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P0744 A/T TCC S/V FUNCTION (LOCK-UP)

PFP:31940

Description

ACS003N9

This malfunction is detected when A/T does not shift into 5th gear position or the torque converter clutch does not lock-up as instructed by TCM. This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

CONSULT-II Reference Value

ACS003NA

Item name	Condition	Display value (Approx.)
TCC SOLENOID	When performing slip lock-up	0.2 - 0.4 A
	When performing lock-up	0.4 - 0.6 A

On Board Diagnosis Logic

ACS003NB

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “A/T TCC S/V FNCTN” with CONSULT-II or P0744 without CONSULT-II is detected under the following conditions.
  - When A/T cannot perform lock-up even if electrical circuit is good.
  - When TCM detects as irregular by comparing difference value with slip rotation.

Possible Cause

ACS003NC

- Harness or connectors
  (Solenoid circuit is open or shorted.)
- Torque converter clutch solenoid valve
- Hydraulic control circuit

DTC Confirmation Procedure

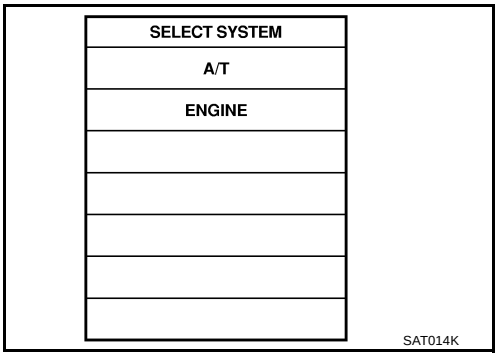
ACS003ND

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Start engine and Select “TCC SOL FUNCTN CHECK” of “DTC WORK SUPPORT” mode for “A/T” with CONSULT-II and touch “START”.
2. Accelerate vehicle to more than 80 km/h (50 MPH) and maintain the following condition continuously until “TESTING” has turned to “COMPLETE”. (It will take approximately 30 seconds after “TESTING” shows.)
   ACCELE POSI: More than 1.0/8 (at all times during step 4)
   TCC SOLENOID: 0.4 - 0.6 A
   Selector lever: “D” position
   [Reference speed: Constant speed of more than 80 km/h (50 MPH)]



   - **Make sure “GEAR” shows “5”.**
   - **For shift schedule, refer to AT-328, "Vehicle Speed When Performing and Releasing Complete Lock-up" .**
   - **If “TESTING” does not appear on CONSULT-II for a long time, select “SELF-DIAG RESULTS”. In case a 1st trip DTC other than P0744 is shown, refer to applicable “TROUBLE DIAGNOSIS FOR DTC”.**
3. Make sure that “OK” is displayed. (If “NG” is displayed, refer to “DIAGNOSTIC PROCEDURE”.)
   Refer to AT-122, "Diagnostic Procedure" .
   Refer to shift schedule, AT-328, "Vehicle Speed When Performing and Releasing Complete Lock-up" .

WITH GST

Follow the procedure “With CONSULT-II”.

Diagnostic Procedure

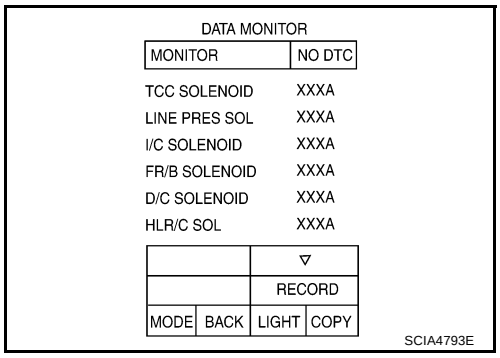
ACS003NE

1. CHECK INPUT SIGNAL

With CONSULT-II

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start the engine.
4. Read out the value of “TCC SOLENOID” while driving.

Item name	Condition	Display value (Approx.)
TCC SOLENOID	When performing slip lock-up	0.2 - 0.4 A
	When performing lock-up	0.4 - 0.6 A



OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check the following items:

- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-121, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P0745 LINE PRESSURE SOLENOID VALVE

PFP:31940

Description

ACS003NF

The line pressure solenoid valve regulates oil pump discharge pressure to suit the driving condition in response to a signal sent from TCM.

The line pressure duty cycle value is not consistent when the closed throttle position signal is “ON”. To confirm the line pressure duty cycle at low pressure, the accelerator (throttle) should be open until the closed throttle position signal is “OFF”.

CONSULT-II Reference Value

ACS003NG

Item name	Condition	Display value (Approx.)
LINE PRES SOL	During driving	0.2 - 0.6 A

On Board Diagnosis Logic

ACS003NH

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “L/PRESS SOL/CIRC” with CONSULT-II or P0745 without CONSULT-II is detected under the following conditions.
  - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

ACS003NI

- Harness or connectors
  (Solenoid circuit is open or shorted.)
- Line pressure solenoid valve

DTC Confirmation Procedure

ACS003NJ

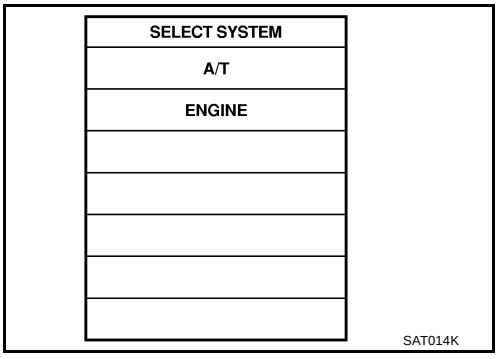
NOTE:

If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON” and select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.
2. Engine start and wait at least 5 second.
3. If DTC is detected, go to “AT-124, "Diagnostic Procedure" .



WITH GST

Follow the procedure “With CONSULT-II”.

Diagnostic Procedure

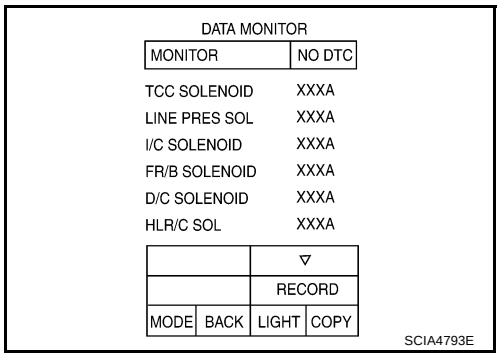
ACS003NK

1. CHECK INPUT SIGNAL

With CONSULT-II

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start the engine.
4. Read out the value of “LINE PRES SOL” while driving.

Item name	Condition	Display value (Approx.)
LINE PRES SOL	During driving	0.2 - 0.6 A



OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check the following items:

- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-123, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1702 TRANSMISSION CONTROL MODULE (RAM)

PFP:31036

Description

ACS003NQ

TCM consists of a microcomputer and connectors for signal input and output and for power supply. TCM controls A/T.

On Board Diagnosis Logic

ACS003NR

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “TCM·RAM” with CONSULT-II is detected when TCM memory RAM is malfunctioning.

Possible Cause

ACS003NS

TCM.

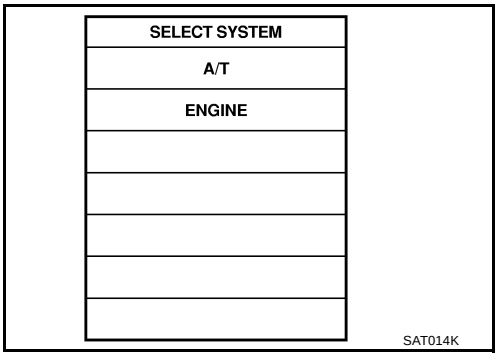
DTC Confirmation Procedure

ACS003NT

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine.
4. Run engine for at least 2 consecutive seconds at idle speed.
5. If DTC is detected, go to AT-125, "Diagnostic Procedure" .



Diagnostic Procedure

ACS003NU

1. CHECK DTC

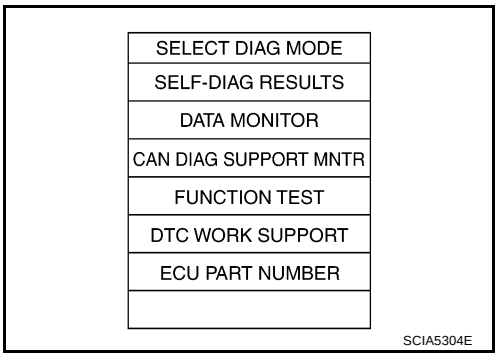
With CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “SELF-DIAG RESULTS” mode for “A/T” with CONSULT-II.
3. Touch “ERASE”.
4. Turn ignition switch “OFF” and wait at least 10 seconds.
5. Perform “DTC confirmation procedure”. Refer to AT-125, "DTC Confirmation Procedure" .

Is the “TCM·RAM” displayed again?

YES >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .

NO >> **INSPECTION END**



DTC P1703 TRANSMISSION CONTROL MODULE (ROM)

PFP:31036

Description

ACS003NV

TCM consists of a microcomputer and connectors for signal input and output and for power supply. TCM controls A/T.

On Board Diagnosis Logic

ACS003NW

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “TCM·ROM” with CONSULT-II is detected when TCM memory ROM is malfunctioning.

Possible Cause

ACS003NX

TCM.

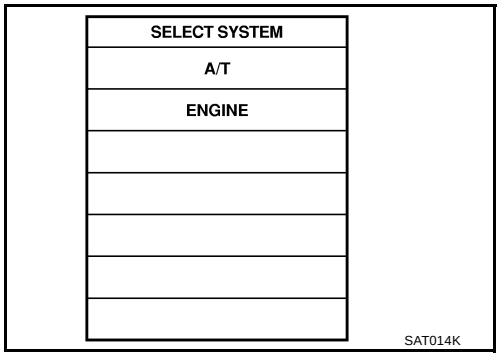
DTC Confirmation Procedure

ACS003NY

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch to “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for A/T with CONSULT-II.
3. Start engine.
4. Run engine for at least 2 consecutive seconds at idle speed.
5. If DTC is detected, go to AT-126, "Diagnostic Procedure" .



Diagnostic Procedure

ACS003NZ

1. CHECK DTC

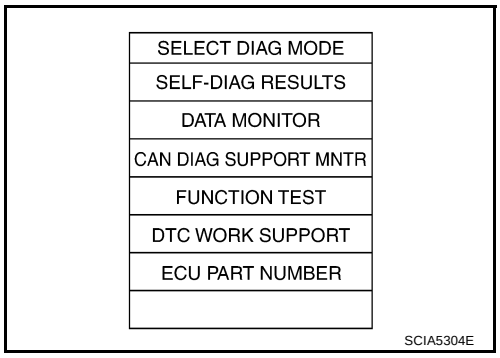
With CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “SELF-DIAG RESULTS” mode for “A/T” with CONSULT-II.
3. Touch “ERASE”.
4. Turn ignition switch “OFF” and wait at least 10 seconds.
5. Perform “DTC confirmation procedure”. Refer to AT-126, "DTC Confirmation Procedure" .

Is the “TCM·ROM” displayed again?

YES >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .

NO >> **INSPECTION END**



DTC P1705 THROTTLE POSITION SENSOR

PFP:22620

Description

ACS003O5

Electric throttle control actuator consists of throttle control motor, accelerator pedal position sensor, throttle position sensor, etc. The actuator sends a signal to the ECM, and ECM sends signals to TCM with CAN communication.

CONSULT-II Reference Value

ACS006C1

Item name	Condition	Display value (Approx.)
ACCELE POSI	Released accelerator pedal.	0.0/8
	Fully depressed accelerator pedal.	8/8
THROTTLE POSI	Released accelerator pedal.	0.0/8
	Fully depressed accelerator pedal.	8/8

On Board Diagnosis Logic

ACS003O6

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “TP SEN/CIRC A/T” with CONSULT-II or P1705 without CONSULT-II is detected when TCM does not receive the proper accelerator pedal position signals (input by CAN communication) from ECM.

Possible Cause

ACS003O7

Harness or connectors
(Sensor circuit is open or shorted.)

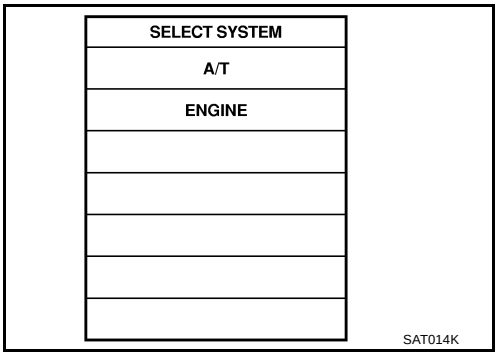
DTC Confirmation Procedure

ACS003O8

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine and let it idle for 1 second.
4. If DTC is detected, go to AT-128, "Diagnostic Procedure" .



WITH GST

Follow the procedure “With CONSULT-II”.

Diagnostic Procedure

ACS003O9

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" , AT-98, "Diagnostic Procedure Without CONSULT-II" .

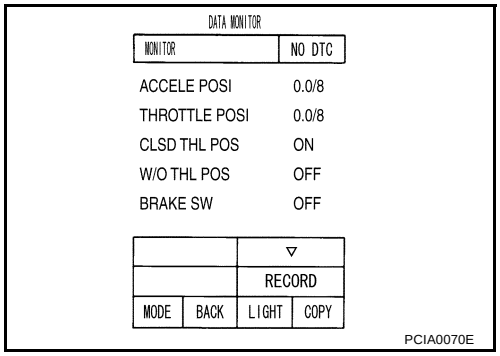
Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-100, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK DTC WITH TCM

With CONSULT-II

1. Turn ignition switch ON. (Do not start engine.)
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Depress accelerator pedal and read out the value of “ACCELE POSI” and “THROTTLE POSI”.



Item name	Condition	Display value (Approx.)
ACCELE POSI	Released accelerator pedal.	0.0/8
	Fully depressed accelerator pedal.	8/8
THROTTLE POSI	Released accelerator pedal.	0.0/8
	Fully depressed accelerator pedal.	8/8

4. Select “SELF-DIAG RESULTS” mode for “A/T” with CONSULT-II. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE"

With GST

Follow the procedure “With CONSULT-II”.

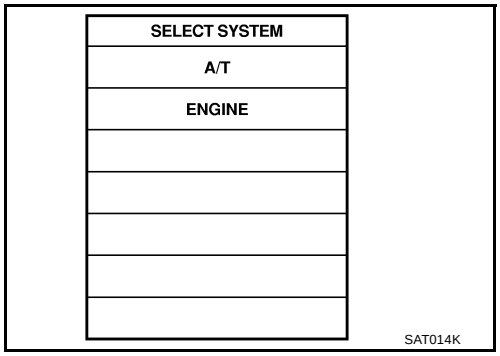
OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. CHECK DTC WITH ECM

With CONSULT-II

1. Turn ignition switch ON. (Do not start engine.)
2. Select “SELF-DIAG RESULTS” mode for “ENGINE” with CONSULT-II. Refer to EC-104, "CONSULT-II Function" .



With GST

Follow the procedure “With CONSULT-II”.

OK or NG

OK >> GO TO 4.
NG >> Check the DTC detected item. Refer to EC-104, "CONSULT-II Function" .
- If CAN communication line is detected, go to AT-100, "DTC U1000 CAN COMMUNICATION LINE" .

4. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-127, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 5.

5. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 6.
NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

Check the following items:

- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

PFP:31940

Description

ACS003OA

A/T fluid temperature sensor detects A/T fluid temperature and sends a signal to TCM.

CONSULT-II Reference Value

ACS003OB

Item name	Condition °C (°F)	Display value (Approx.)
ATF TEMP SE 1	0 (32) - 20 (68) - 80 (176)	2.2 - 1.8 - 0.6 V
ATF TEMP SE 2		2.2 - 1.7 - 0.45 V

On Board Diagnosis Logic

ACS003OC

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “ATF TEMP SEN/CIRC” with CONSULT-II or P1710 (A/T), P0710 (ENGINE) without CONSULT-II is detected when TCM receives an excessively low or high voltage from the sensor.

Possible Cause

ACS003OD

- Harness or connectors
  (Sensor circuit is open or shorted.)
- A/T fluid temperature sensors 1 and/or 2

DTC Confirmation Procedure

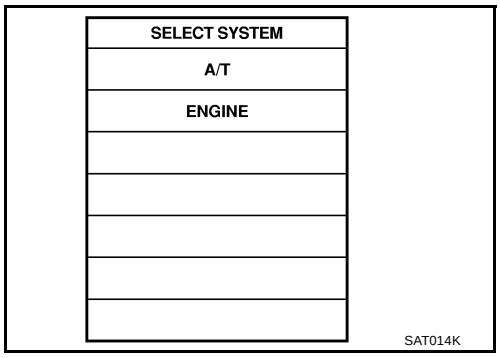
ACS003OE

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.
3. Start engine and maintain the following conditions for at least 10 minutes (Total). (It is not necessary to maintain continuously.)
   VHCL SPEED SE: 10 km/h (6 MPH) or more
   THRTL POS SEN: More than 1.0/8
   Selector lever: “D” position
4. If DTC is detected, go to AT-132, "Diagnostic Procedure" .



WITH GST

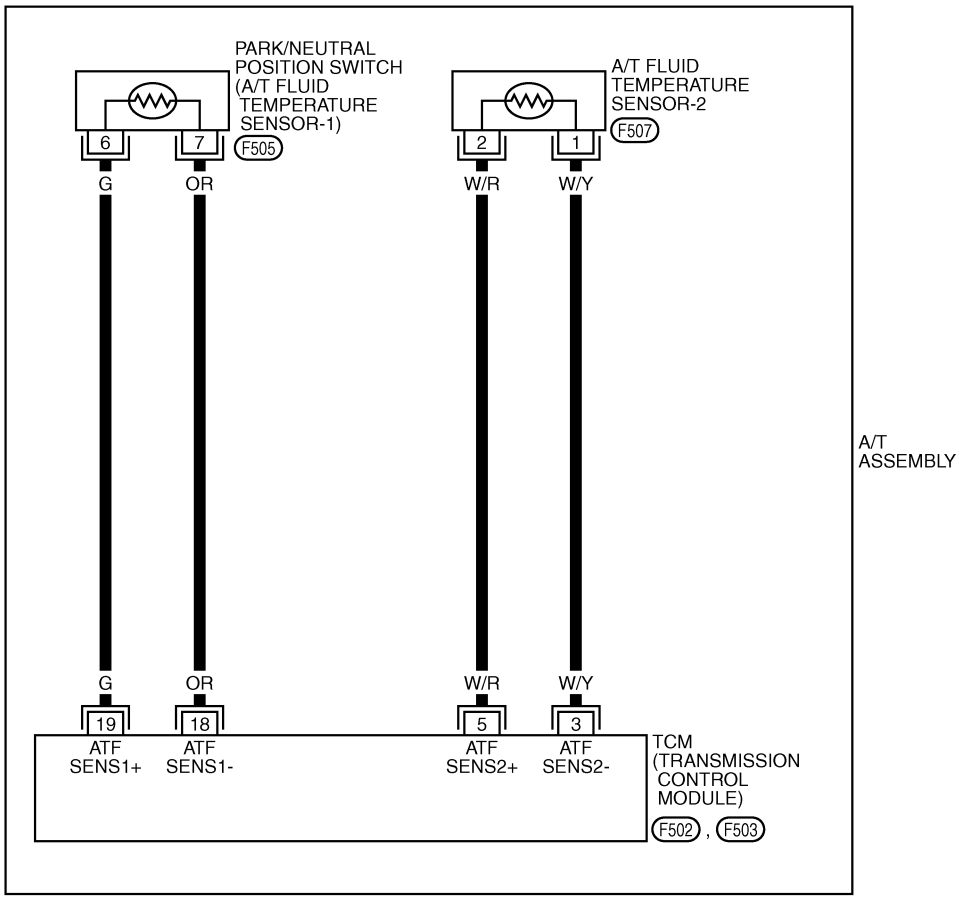
Follow the procedure “With CONSULT-II”.

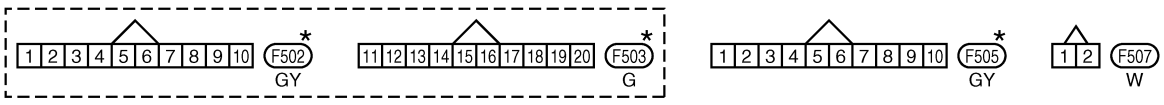
Wiring Diagram — AT — FTS

ACS0080N

AT-FTS-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0251E

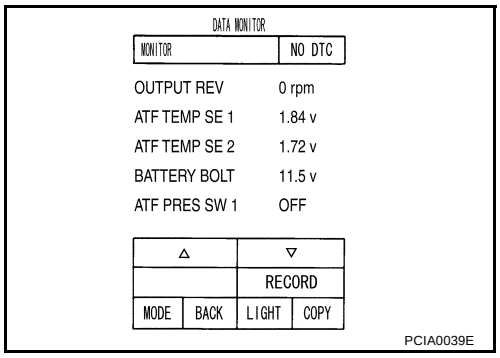
Diagnostic Procedure

ACS003OF

1. CHECK A/T FLUID TEMPERATURE SENSOR 1 SIGNAL

With CONSULT-II

1. Start engine.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Read out the value of “ATF TEMP SE 1”.



Item name	Condition °C (°F)	Display value (Approx.)
ATF TEMP SE 1	0 (32) - 20 (68) - 80 (176)	2.2 - 1.8 - 0.6 V

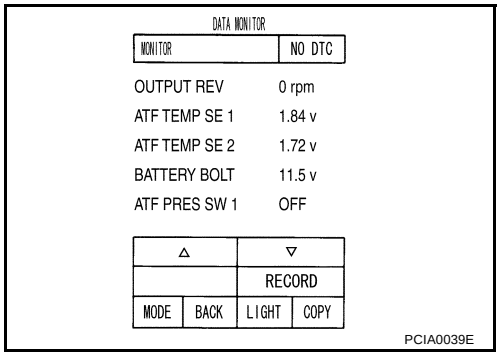
OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK A/T FLUID TEMPERATURE SENSOR 2 SIGNAL

With CONSULT-II

1. Start engine.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Read out the value of “ATF TEMP SE 2”.



Item name	Condition °C (°F)	Display value (Approx.)
ATF TEMP SE 2	0 (32) - 20 (68) - 80 (176)	2.2 - 1.7 - 0.45 V

OK or NG

OK >> GO TO 8.
NG >> GO TO 5.

3. CHECK A/T FLUID TEMPERATURE SENSOR 1

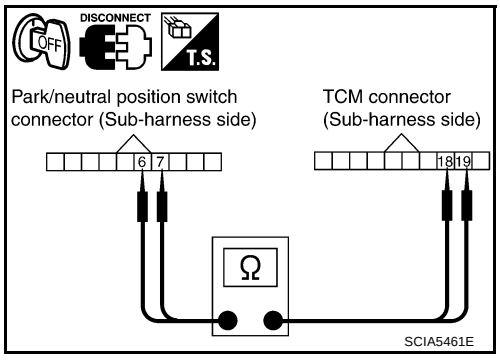
Check A/T fluid temperature sensor 1. Refer to AT-134, "A/T FLUID TEMPERATURE SENSOR 1" .

OK or NG

OK >> GO TO 4.
NG >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .

4. CHECK SUB-HARNESS

1. Disconnect park/neutral position switch connector and TCM connector.
2. Check continuity between park/neutral position switch connector terminals and TCM connector terminals.



Item	Connector	Terminal (Wire color)	Continuity
Park/neutral position switch connector	F505	6 (G)	Yes
TCM connector	F503	19 (G)	
Park/neutral position switch connector	F505	7 (OR)	Yes
TCM connector	F503	18 (OR)	

3. If OK, check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> Replace open circuit or short to ground and short to power in harness or connectors.

5. CHECK A/T FLUID TEMPERATURE SENSOR 2

Check A/T fluid temperature sensor 2. Refer to AT-134, "A/T FLUID TEMPERATURE SENSOR 2" .

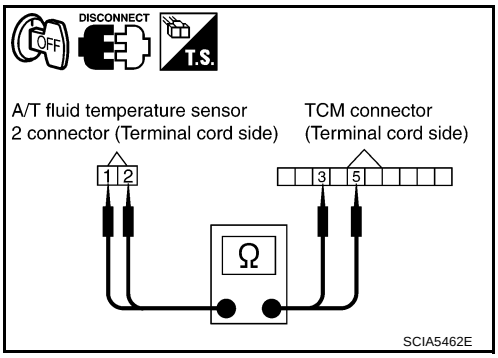
OK or NG

OK >> GO TO 6.
NG >> Replace A/T fluid temperature sensor 2. Refer to AT-245, "A/T FLUID TEMPERATURE SENSOR 2 REMOVAL AND INSTALLATION" .

6. CHECK TERMINAL CORD ASSEMBLY

1. Disconnect A/T fluid temperature sensor 2 connector and TCM connector.
2. Check continuity between A/T fluid temperature sensor 2 connector terminals and TCM connector terminals.

Item	Connector	Terminal (Wire color)	Continuity
A/T fluid temperature sensor 2 connector	F507	1 (W/Y)	Yes
TCM connector	F502	3 (W/Y)	
A/T fluid temperature sensor 2 connector	F507	2 (W/R)	Yes
TCM connector	F502	5 (W/R)	



3. If OK, check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> Replace open circuit or short to ground and short to power in harness or connectors.

7. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

1. Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .
2. Reinstall any part removed.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

8. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-130, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 1.

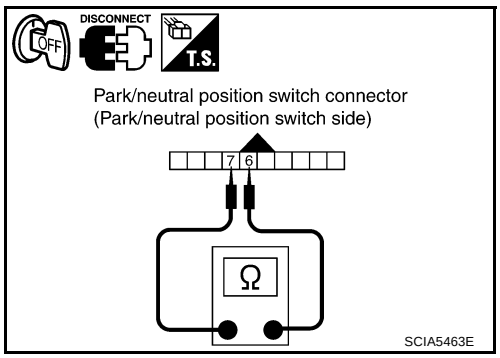
Component Inspection

ACS00864

A/T FLUID TEMPERATURE SENSOR 1

1. Remove control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check resistance between terminals.

Name	Connector	Terminal	Temperature °C (°F)	Resistance (Approx.) (kΩ)
A/T fluid temperature sensor 1	F505	6 - 7	0 (32)	15
			20 (68)	6.5
			80 (176)	0.9

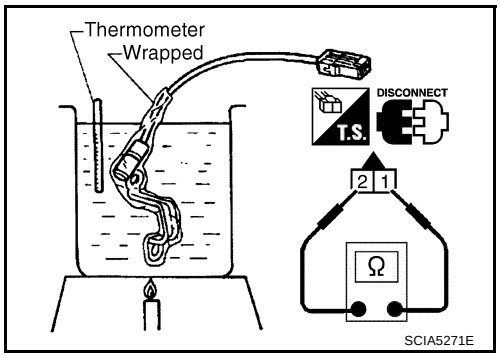


3. If NG, replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .

A/T FLUID TEMPERATURE SENSOR 2

1. Remove A/T fluid temperature sensor 2. Refer to AT-245, "A/T FLUID TEMPERATURE SENSOR 2 REMOVAL AND INSTALLATION" .
2. Check resistance between terminals.

Name	Connector	Terminal	Temperature °C (°F)	Resistance (Approx.) (kΩ)
A/T fluid temperature sensor 2	F507	1 - 2	0 (32)	10
			20 (68)	4
			80 (176)	0.5



3. If NG, replace A/T fluid temperature sensor 2. Refer to AT-245, "A/T FLUID TEMPERATURE SENSOR 2 REMOVAL AND INSTALLATION" .

DTC P1716 TURBINE REVOLUTION SENSOR

PFP:31935

Description

ACS003OG

Turbine revolution sensor detects input shaft rpm (revolutions per minute). It is located on the input side of automatic transmission. Monitors revolution of sensor 1 and sensor 2 for non-standard conditions.

CONSULT-II Reference Value

ACS003OH

Item name	Condition	Display value (rpm)
TURBINE REV	During driving (lock-up ON)	Approximately matches the engine speed.

On Board Diagnosis Logic

ACS003OI

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “TURBINE REV S/CIRC” with CONSULT-II or P1716 without CONSULT-II is detected under the following conditions.
  - When TCM does not receive the proper voltage signal from the sensor.
  - When TCM detects an irregularity only at position of 4th gear for turbine revolution sensor 2.

Possible Cause

ACS003OJ

- Harness or connectors
  (Sensor circuit is open or shorted.)
- Turbine revolution sensor 1 and/or 2

DTC Confirmation Procedure

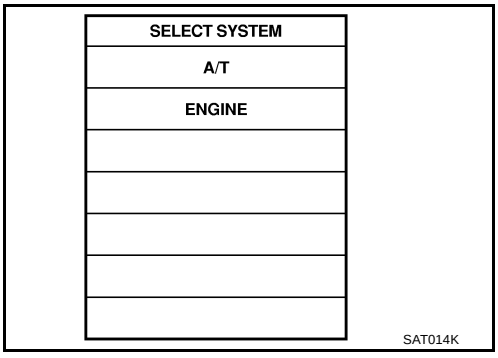
ACS003OK

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine and maintain the following conditions for at least 5 consecutive seconds.
   VHCL SPEED SE: 40 km/h (25 MPH) or more
   ENGINE SPEED: 1,500 rpm or more
   ACCELE POSI: 0.5/8 or more
   Selector lever: “D” position
   Gear position (Turbine revolution sensor 1): 4th or 5th position
   Gear position (Turbine revolution sensor 2): All position
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.



4. If DTC is detected, go to AT-136, "Diagnostic Procedure" .

WITH GST

Follow the procedure “With CONSULT-II”.

Diagnostic Procedure

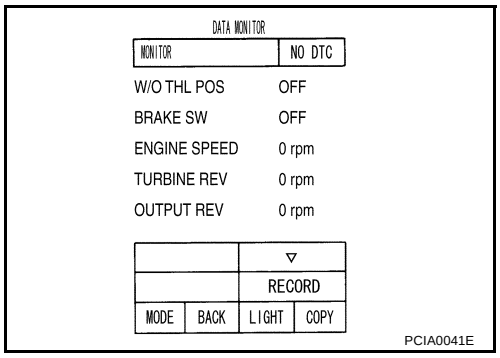
ACS003OL

1. CHECK INPUT SIGNAL

With CONSULT-II

1. Start engine.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Vehicle start and read out the value of “TURBINE REV”.

Item name	Condition	Display value (rpm)
TURBINE REV	During driving (lock-up ON)	Approximately matches the engine speed.



OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check the following items:

- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-135, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1721 VEHICLE SPEED SENSOR MTR

PFP:24814

Description

ACS003OM

Vehicle speed sensor·MTR signal is transmitted from combination meter to TCM by CAN communication line. The signal functions as an auxiliary device to revolution sensor when it is malfunctioning. TCM will then use vehicle speed sensor·MTR signal.

CONSULT-II Reference Value

ACS003ON

Item name	Condition	Display value (km/h)
VHCL/S SE·MTR	During driving	Approximately matches the speedometer reading.

On Board Diagnosis Logic

ACS003OO

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “VHE SPD SE/CIR·MTR” with CONSULT-II is detected when TCM does not receive the proper vehicle speed sensor MTR signal (input by CAN communication) from combination meter.

Possible Cause

ACS003OP

Harness or connectors
(Sensor circuit is open or shorted.)

DTC Confirmation Procedure

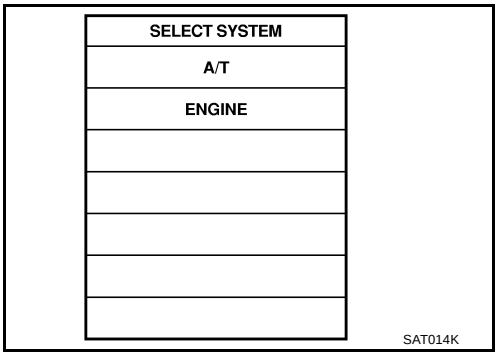
ACS003OQ

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine and maintain the following conditions for at least 5 consecutive seconds.
   ACCELE POSI: 1/8 or less
   VHCL SPEED SE: 30 km/h (17 MPH) or more
4. If DTC is detected, go to AT-138, "Diagnostic Procedure" .



Diagnostic Procedure

ACS003OR

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" , AT-98, "Diagnostic Procedure Without CONSULT-II" .

Is malfunction in the CAN communication indicated in the result?

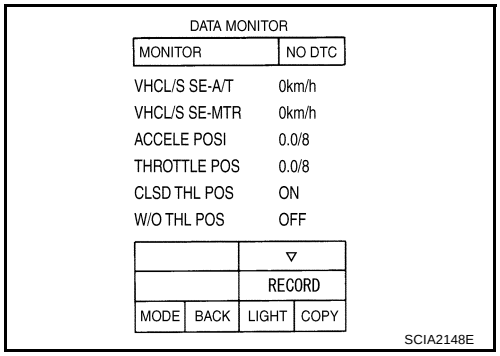
YES >> Check CAN communication line. Refer to AT-100, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK INPUT SIGNAL

With CONSULT-II

1. Start engine.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Drive vehicle and read out the value of “VHCL/S SE·MTR”.

Item name	Condition	Display value (km/h)
VHCL/S SE·MTR	During driving	Approximately matches the speedometer reading.



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. CHECK COMBINATION METERS

Check combination meters. Refer to DI-14, "How to Proceed with Trouble Diagnosis" .

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-137, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 5.

5. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 6.
NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

Check the following items:

- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

DTC P1730 A/T INTERLOCK

PFP:00000

Description

ACS003OS

- Fail-safe function to detect interlock conditions.

On Board Diagnosis Logic

ACS003OT

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “A/T INTERLOCK” with CONSULT-II or P1730 without CONSULT-II is detected when TCM does not receive the proper voltage signal from the sensor and switch.
- TCM monitors and compares gear position and conditions of each ATF pressure switch when gear is steady.

Possible Cause

ACS003OU

- Harness or connectors
  (Solenoid and switch circuit is open or shorted.)
- Low coast brake solenoid valve
- ATF pressure switch 2

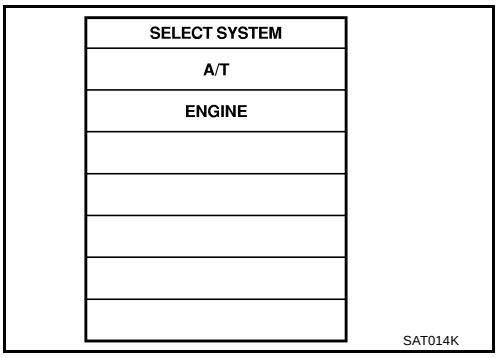
DTC Confirmation Procedure

ACS003OV

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.
   Selector lever: “D” position
5. If DTC is detected, go to AT-140, "Diagnostic Procedure" .



WITH GST

Follow the procedure “With CONSULT-II”.

Judgement of A/T Interlock

ACS003OW

When A/T Interlock is judged to be malfunctioning, the vehicle should be fixed in 2nd gear, and should be set in a condition in which it can travel.
When one of the following fastening patterns is detected, the fail-safe function in correspondence with the individual pattern should be performed.

A/T INTERLOCK COUPLING PATTERN TABLE

●: NG, X: OK

Gear position		ATF pressure switch output					Fail-safe function	Clutch pressure output pattern after fail-safe function					
		SW3 (I/C)	SW6 (HLR/C)	SW5 (D/C)	SW1 (FR/B)	SW2 (LC/B)		I/C	HLR/C	D/C	FR/B	LC/B	L/U
A/T interlock coupling pattern	3rd	–	X	X	–	●	Held in 2nd gear	OFF	OFF	ON	OFF	OFF	OFF
	4th	–	X	X	–	●	Held in 2nd gear	OFF	OFF	ON	OFF	OFF	OFF
	5th	X	X	–	X	●	Held in 2nd gear	OFF	OFF	ON	OFF	OFF	OFF

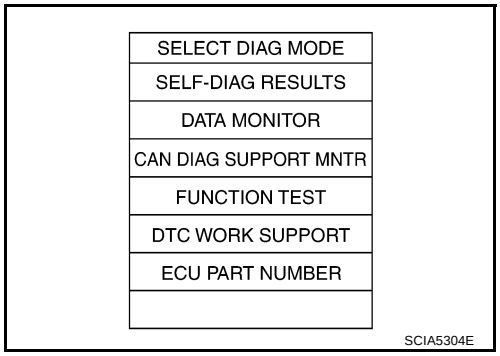
Diagnostic Procedure

ACS003OX

1. SELF-DIAGNOSIS

With CONSULT-II

1. Drive vehicle.
2. Stop vehicle and turn ignition switch OFF.
3. Turn ignition switch ON.
4. Select “SELF-DIAG RESULTS” mode for “A/T” with CONSULT-II.



Without CONSULT-II

1. Drive vehicle.
2. Stop vehicle and turn ignition switch OFF.
3. Turn ignition switch ON. (Do not start engine.)
4. Perform self-diagnosis. Refer to AT-98, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG

OK >> GO TO 2.
NG >> Check low coast brake solenoid valve circuit and function. Refer to AT-160, "DTC P1772 LOW COAST BRAKE SOLENOID VALVE" , AT-162, "DTC P1774 LOW COAST BRAKE SOLENOID VALVE FUNCTION" .

2. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-139, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 3.

3. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. DETECT MALFUNCTIONING ITEM

Check the following items:

- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .

NG >> Repair or replace damaged parts.

DTC P1731 A/T 1ST ENGINE BRAKING

PFP:00000

Description

ACS00866

Fail-safe function to prevent sudden decrease in speed by engine brake other than at M1 position.

CONSULT-II Reference Value

ACS00867

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF
ATF PRES SW 2	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF

On Board Diagnosis Logic

ACS008D3

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “A/T 1ST E/BRAKING” with CONSULT-II or 13th judgement flicker without CONSULT-II is detected under the following conditions.

– When TCM does not receive the proper voltage signal from the sensor.

– When TCM monitors each ATF pressure switch and solenoid monitor value, and detects as irregular when engine brake of 1st gear acts other than at M1 position.

Possible Cause

ACS008D4

- Harness or connectors
  (The sensor circuit is open or shorted.)
- Low coast brake solenoid valve
- ATF pressure switch 2

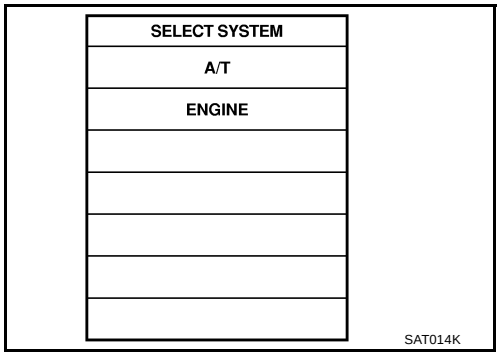
DTC Confirmation Procedure

ACS008D5

NOTE:
If “DTC Confirmation Procedure” has been previously preformed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.
   ENGINE SPEED: 1,200 rpm
   Selector lever: “M” position
   Gear position: 1st gear
5. If DTC is detected, go to AT-143, "Diagnostic Procedure" .



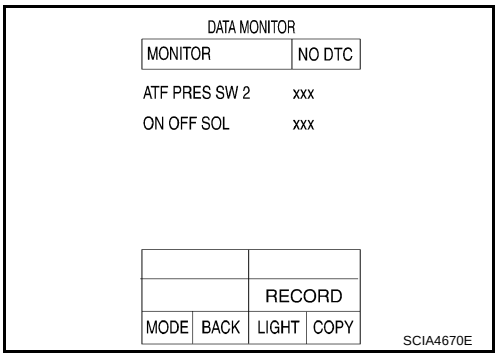
Diagnostic Procedure

ACS008D6

1. CHECK INPUT SIGNALS

With CONSULT-II

1. Start the engine.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Drive vehicle in the “M” position (1st gear), and confirm the ON/OFF actuation of “ATF PRES SW 2” and “ON OFF SOL”.



Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF
ATF PRES SW 2	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check the following items:

- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-142, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1752 INPUT CLUTCH SOLENOID VALVE

PFP:31940

Description

ACS003P4

Input clutch solenoid valve is controlled by TCM in response to signals sent from PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

CONSULT-II Reference Value

ACS003P5

Item name	Condition	Display value (Approx.)
I/C SOLENOID	Input clutch disengaged. Refer to AT-19 .	0.6 - 0.8 A
	Input clutch engaged. Refer to AT-19 .	0 - 0.05 A

On Board Diagnosis Logic

ACS003P6

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “I/C SOLENOID/CIRC” with CONSULT-II or P1752 without CONSULT-II is detected under the following conditions.
  - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

ACS003P7

- Harness or connectors
  (Solenoid circuit is open or shorted.)
- Input clutch solenoid valve

DTC Confirmation Procedure

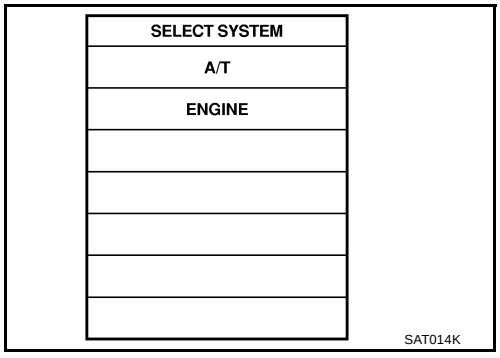
ACS003P8

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
   ACCELE POSI: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 3rd ⇒ 4th Gear (I/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
5. If DTC is detected go to “AT-145, "Diagnostic Procedure" .



WITH GST

Follow the procedure “With CONSULT-II”.

Diagnostic Procedure

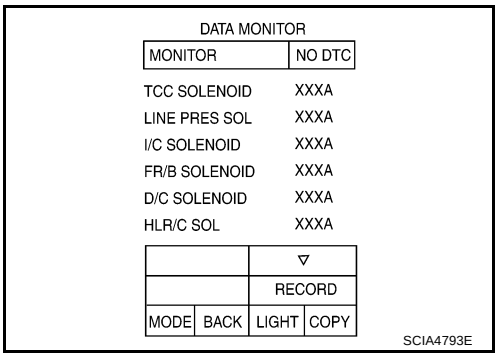
ACS003P9

1. CHECK INPUT SIGNAL

With CONSULT-II

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start the engine.
4. Read out the value of “I/C SOLENOID” while driving.

Item name	Condition	Display value (Approx.)
I/C SOLENOID	Input clutch disengaged. Refer to AT-19 .	0.6 - 0.8 A
	Input clutch engaged. Refer to AT-19 .	0 - 0.05 A



OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check the following items:

- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-144, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1754 INPUT CLUTCH SOLENOID VALVE FUNCTION

PFP:31940

Description

ACS003PA

- Input clutch solenoid valve is controlled by TCM in response to signals sent from PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.
- This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

CONSULT-II Reference Value

ACS003PB

Item name	Condition	Display value (Approx.)
I/C SOLENOID	Input clutch disengaged. Refer to AT-19 .	0.6 - 0.8 A
	Input clutch engaged. Refer to AT-19 .	0 - 0.05 A
ATF PRES SW 3	Input clutch engaged. Refer to AT-19 .	ON
	Input clutch disengaged. Refer to AT-19 .	OFF

On Board Diagnosis Logic

ACS003PC

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “I/C SOLENOID FNCTN” with CONSULT-II or P1754 without CONSULT-II is detected under the following conditions.
  - When TCM detects that actual gear ratio is irregular, and relation between gear position and condition of pressure switch 3 is irregular during depressing accelerator pedal. (Other than during shift change)
  - When TCM detects that relation between gear position and condition of ATF pressure switch 3 is irregular during releasing accelerator pedal. (Other than during shift change)

Possible Cause

ACS003PD

- Harness or connectors
  (Solenoid and switch circuits are open or shorted.)
- Input clutch solenoid valve
- ATF pressure switch 3

DTC Confirmation Procedure

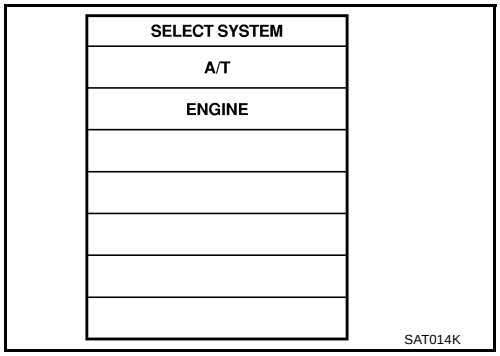
ACS003PE

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Start engine.
2. Accelerate vehicle to maintain the following conditions.
   ACCELE POSI: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 3rd ⇒ 4th Gear (I/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
3. Perform step “2” again.
4. Turn ignition switch “OFF”, then perform step “1” to “3” again.
5. Check “SELF-DIAG RESULTS” mode for “A/T” with CONSULT-II. If DTC (P1754) is detected, refer to AT-147, "Diagnostic Procedure" .
   If DTC (P1752) is detected, go to AT-145, "Diagnostic Procedure" .
   If DTC (P1843) is detected, go to AT-173, "Diagnostic Procedure" .



WITH GST

Follow the procedure “With CONSULT-II”.

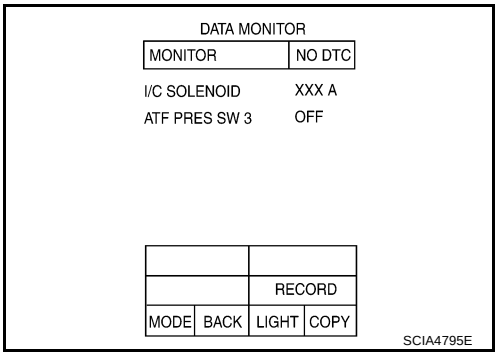
Diagnostic Procedure

ACS003PF

1. CHECK INPUT SIGNALS

With CONSULT-II

1. Start engine.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Drive vehicle in “D” position (3rd ⇒ 4th gear), and confirm the ON/OFF actuation of “ATF PRES SW 3” and electrical current value of “I/C SOLENOID”.



Item name	Condition	Display value (Approx.)
I/C SOLENOID	Input clutch disengaged. Refer to AT-19 .	0.6 - 0.8 A
	Input clutch engaged. Refer to AT-19 .	0 - 0.05 A
ATF PRES SW 3	Input clutch engaged. Refer to AT-19 .	ON
	Input clutch disengaged. Refer to AT-19 .	OFF

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check the following items:

- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-146, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1757 FRONT BRAKE SOLENOID VALVE

PFP:31940

Description

ACS003PG

Front brake solenoid valve is controlled by TCM in response to signals sent from PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

CONSULT-II Reference Value

ACS003PH

Item name	Condition	Display value (Approx.)
FR/B SOLENOID	Front brake engaged. Refer to AT-19 .	0.6 - 0.8 A
	Front brake disengaged. Refer to AT-19 .	0 - 0.05 A

On Board Diagnosis Logic

ACS003PI

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “FR/B SOLENOID/CIRC” with CONSULT-II or P1757 without CONSULT-II is detected under the following conditions.
  - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

ACS003PJ

- Harness or connectors
  (Solenoid circuit is open or shorted.)
- Front brake solenoid valve

DTC Confirmation Procedure

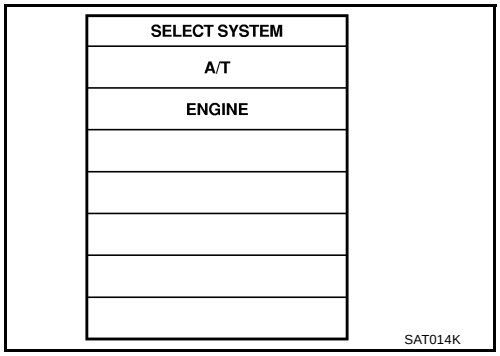
ACS003PK

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before preforming the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
   ACCELE POSI: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 3rd ⇒ 4th Gear (FR/B ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
5. If DTC is detected go to AT-149, "Diagnostic Procedure" .



WITH GST

Follow the procedure “With CONSULT-II”.

Diagnostic Procedure

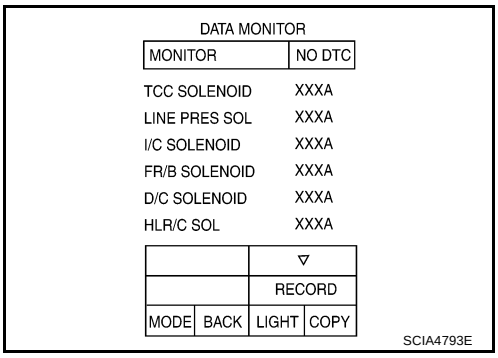
ACS003PL

1. CHECK INPUT SIGNAL

With CONSULT-II

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine.
4. Read out the value of “FR/B SOLENOID” while driving.

Item name	Condition	Display value (Approx.)
FR/B SOLENOID	Front brake engaged. Refer to AT-19 .	0.6 - 0.8 A
	Front brake disengaged. Refer to AT-19 .	0 - 0.05 A



OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check the following items:

- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-148, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1759 FRONT BRAKE SOLENOID VALVE FUNCTION

PFP:31940

Description

ACS003PM

- Front brake solenoid valve is controlled by TCM in response to signals sent from PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.
- This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

CONSULT-II Reference Value

ACS003PN

Item name	Condition	Display value (Approx.)
FR/B SOLENOID	Front brake engaged. Refer to AT-19 .	0.6 - 0.8 A
	Front brake disengaged. Refer to AT-19 .	0 - 0.05 A
ATF PRES SW 1	Front brake engaged. Refer to AT-19 .	ON
	Front brake disengaged. Refer to AT-19 .	OFF

On Board Diagnosis Logic

ACS003PO

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “FR/B SOLENOID FNCT” with CONSULT-II or P1759 without CONSULT-II is detected under the following conditions.
  - When TCM detects that actual gear ratio is irregular, and relation between gear position and condition of ATF pressure switch 1 is irregular during depressing accelerator pedal. (Other than during shift change)
  - When TCM detects that relation between gear position and condition of ATF pressure switch 1 is irregular during releasing accelerator pedal. (Other than during shift change)

Possible Cause

ACS003PP

- Harness or connectors
  (Solenoid and switch circuits are open or shorted.)
- Front brake solenoid valve
- ATF pressure switch 1

DTC Confirmation Procedure

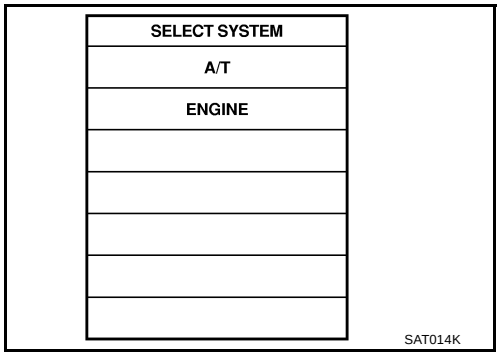
ACS003PQ

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Start engine.
2. Accelerate vehicle to maintain the following conditions.
   ACCELE POSI: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 3rd ⇒ 4th Gear (FR/B ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
3. Perform step “2” again.
4. Turn ignition switch “OFF”, then perform step “1” to “3” again.
5. Check “SELF-DIAG RESULTS” mode for “A/T” with CONSULT-II. If DTC (P1759) is detected, refer to AT-151, "Diagnostic Procedure" .
   If DTC (P1757) is detected, go to AT-149, "Diagnostic Procedure" .
   If DTC (P1841) is detected, go to AT-171, "Diagnostic Procedure" .



WITH GST

Follow the procedure “With CONSULT-II”.

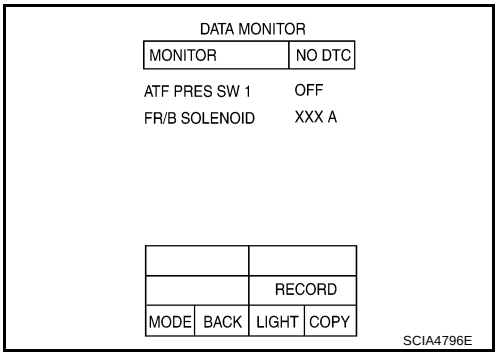
Diagnostic Procedure

ACS003PR

1. CHECK INPUT SIGNALS

With CONSULT-II

1. Start engine.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Drive vehicle in the “D” position (3rd ⇒ 4th gear), and confirm the ON/OFF actuation of the “ATF PRES SW 1” and electrical current value of “FR/B SOLENOID”.



Item name	Condition	Display value (Approx.)
FR/B SOLENOID	Front brake engaged. Refer to AT-19 .	0.6 - 0.8 A
	Front brake disengaged. Refer to AT-19 .	0 - 0.05 A
ATF PRES SW 1	Front brake engaged. Refer to AT-19 .	ON
	Front brake disengaged. Refer to AT-19 .	OFF

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check the following items:

- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-150, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1762 DIRECT CLUTCH SOLENOID VALVE

PFP:31940

Description

ACS003PS

Direct clutch solenoid valve is controlled by TCM in response to signals sent from PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

CONSULT-II Reference Value

ACS003PT

Item name	Condition	Display value (Approx.)
D/C SOLENOID	Direct clutch disengaged. Refer to AT-19 .	0.6 - 0.8 A
	Direct clutch engaged. Refer to AT-19 .	0 - 0.05 A

On Board Diagnosis Logic

ACS003PU

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “D/C SOLENOID/CIRC” with CONSULT-II or P1762 without CONSULT-II is detected under the following conditions.
  - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

ACS003PV

- Harness or connectors
  (Solenoid circuit is open or shorted.)
- Direct clutch solenoid valve

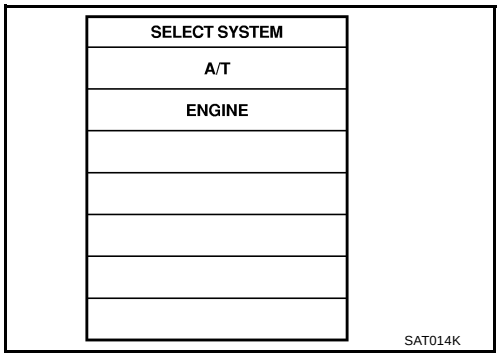
DTC Confirmation Procedure

ACS003PW

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
   ACCELE POSI: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 1st ⇒ 2nd Gear (D/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.



5. If DTC is detected, go to AT-153, "Diagnostic Procedure" .

WITH GST

Follow the procedure “With CONSULT-II”.

Diagnostic Procedure

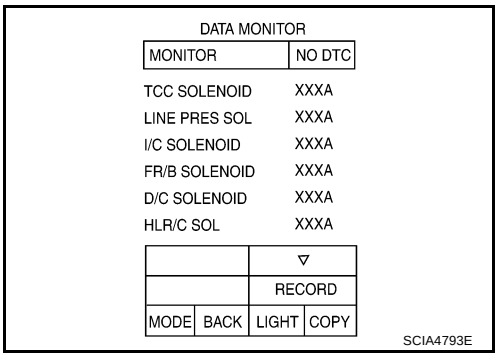
ACS003PX

1. CHECK INPUT SIGNAL

With CONSULT-II

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start the engine.
4. Read out the value of “D/C SOLENOID” while driving.

Item name	Condition	Display value (Approx.)
D/C SOLENOID	Direct clutch disengaged. Refer to AT-19 .	0.6 - 0.8 A
	Direct clutch engaged. Refer to AT-19 .	0 - 0.05 A



OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check the following items:

- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-152, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1764 DIRECT CLUTCH SOLENOID VALVE FUNCTION

PFP:31940

Description

ACS003PY

- Direct clutch solenoid valve is controlled by TCM in response to signals sent from PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.
- This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

CONSULT-II Reference Value

ACS003PZ

Item name	Condition	Display value (Approx.)
D/C SOLENOID	Direct clutch disengaged. Refer to AT-19 .	0.6 - 0.8 A
	Direct clutch engaged. Refer to AT-19 .	0 - 0.05 A
ATF PRES SW 5	Direct clutch engaged. Refer to AT-19 .	ON
	Direct clutch disengaged. Refer to AT-19 .	OFF

On Board Diagnosis Logic

ACS003Q0

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “D/C SOLENOID FNCTN” with CONSULT-II or P1764 without CONSULT-II is detected under the following conditions.
  - When TCM detects that actual gear ratio is irregular, and relation between gear position and condition of ATF pressure switch 5 is irregular during depressing accelerator pedal. (Other than during shift change)
  - When TCM detects that relation between gear position and condition of ATF pressure switch 5 is irregular during releasing accelerator pedal. (Other than during shift change)

Possible Cause

ACS003Q1

- Harness or connectors
  (Solenoid and switch circuits are open or shorted.)
- Direct clutch solenoid valve
- ATF pressure switch 5

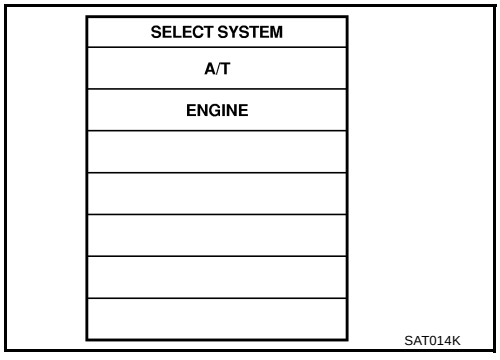
DTC Confirmation Procedure

ACS003Q2

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Start engine.
2. Accelerate vehicle to maintain the following conditions.
   ACCELE POSI: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 1st ⇒ 2nd Gear (D/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
3. Perform step “2” again.
4. Turn ignition switch “OFF”, then perform step “1” to “3” again.
5. Check “SELF-DIAG RESULTS” mode for “A/T” with CONSULT-II. If DTC (P1764) is detected, refer to AT-155, "Diagnostic Procedure" .
   If DTC (P1762) is detected, go to AT-153, "Diagnostic Procedure" .
   If DTC (P1845) is detected, go to AT-175, "Diagnostic Procedure" .



WITH GST

Follow the procedure “With CONSULT-II”.

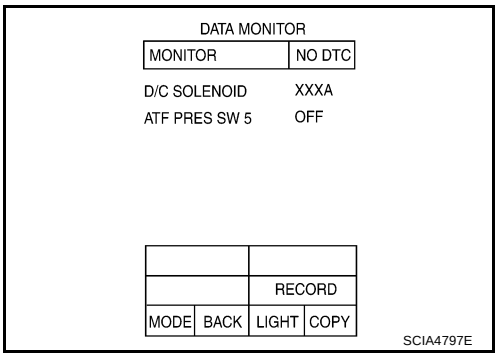
Diagnostic Procedure

ACS003Q3

1. CHECK INPUT SIGNALS

With CONSULT-II

1. Start engine.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Drive vehicle in the “D” position (1st ⇒ 2nd gear), and confirm the display actuation of the “ATF PRES SW 5” and electrical current value of “D/C SOLENOID”.



Item name	Condition	Display value (Approx.)
D/C SOLENOID	Direct clutch disengaged. Refer to AT-19 .	0.6 - 0.8 A
	Direct clutch engaged. Refer to AT-19 .	0 - 0.05 A
ATF PRES SW 5	Direct clutch engaged. Refer to AT-19 .	ON
	Direct clutch disengaged. Refer to AT-19 .	OFF

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check the following items:

- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-154, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE

PFP:31940

Description

ACS003Q4

High and low reverse clutch solenoid valve is controlled by TCM in response to signals sent from PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

CONSULT-II Reference Value

ACS003Q5

Item name	Condition	Display value (Approx.)
HLR/C SOL	High and low reverse clutch disengaged. Refer to AT-19 .	0.6 - 0.8 A
	High and low reverse clutch engaged. Refer to AT-19 .	0 - 0.05 A

On Board Diagnosis Logic

ACS003Q6

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “HLR/C SOL/CIRC” with CONSULT-II or P1767 without CONSULT-II is detected under the following conditions.
  - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

ACS003Q7

- Harness or connectors
  (Solenoid circuit is open or shorted.)
- High and low reverse clutch solenoid valve

DTC Confirmation Procedure

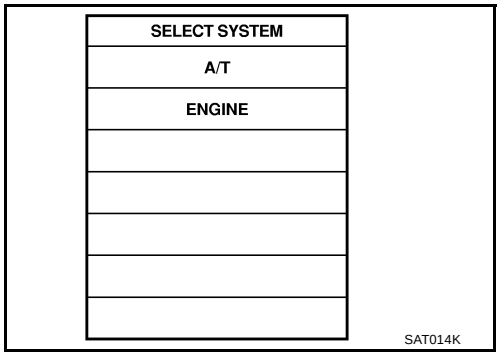
ACS003Q8

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
   ACCELE POSI: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 2nd ⇒ 3rd Gear (HLR/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
5. If DTC is detected, go to AT-157, "Diagnostic Procedure" .



WITH GST

Follow the procedure “With CONSULT-II”.

Diagnostic Procedure

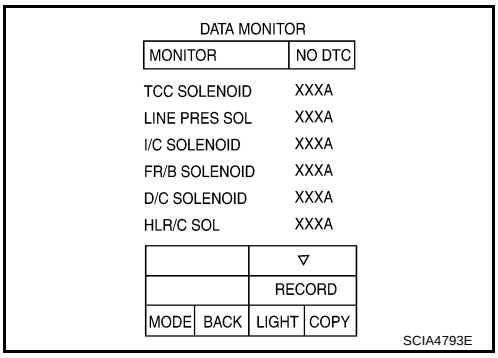
ACS003Q9

1. CHECK INPUT SIGNAL

With CONSULT-II

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start the engine.
4. Read out the value of “HLR/C SOLENOID” while driving.

Item name	Condition	Display value (Approx.)
HLR/C SOL	High and low reverse clutch disengaged. Refer to AT-19 .	0.6 - 0.8 A
	High and low reverse clutch engaged. Refer to AT-19 .	0 - 0.05 A



OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check the following items:

- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK TCM

Perform “DTC Confirmation Procedure”.

- Refer to AT-156, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1769 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE FUNCTION

PFP:31940

Description

ACS003QA

- High and low reverse clutch solenoid valve is controlled by TCM in response to signals sent from PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.
- This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

CONSULT-II Reference Value

ACS003QB

Item name	Condition	Display value (Approx.)
HLR/C SOL	High and low reverse clutch disengaged. Refer to AT-19 .	0.6 - 0.8 A
	High and low reverse clutch engaged. Refer to AT-19 .	0 - 0.05 A
ATF PRES SW 6	High and low reverse clutch engaged. Refer to AT-19 .	ON
	High and low reverse clutch disengaged. Refer to AT-19 .	OFF

On Board Diagnosis Logic

ACS003QC

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “HLR/C SOL FNCTN” with CONSULT-II or P1769 without CONSULT-II is detected under the following conditions.
  - When TCM detects that actual gear ratio is irregular, and relation between gear position and condition of ATF pressure switch 6 is irregular during depressing accelerator pedal. (Other than during shift change)
  - When TCM detects that relation between gear position and condition of ATF pressure switch 6 is irregular during releasing accelerator pedal. (Other than during shift change)

Possible Cause

ACS003QD

- Harness or connectors
  (Solenoid and switch circuits are open or shorted.)
- High and low reverse clutch solenoid valve
- ATF pressure switch 6

DTC Confirmation Procedure

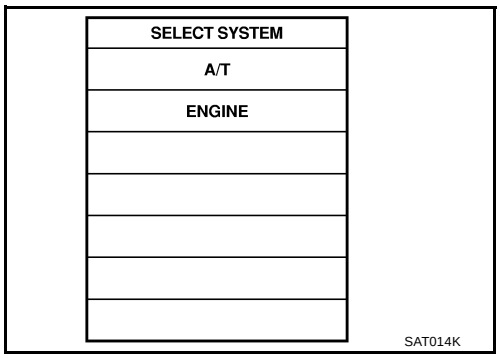
ACS003QE

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Start engine.
2. Accelerate vehicle to maintain the following conditions.
   ACCELE POSI: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 2nd ⇒ 3rd Gear (HLR/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
3. Perform step “2” again.
4. Turn ignition switch “OFF”, then perform step “1” to “3” again.
5. Check “SELF-DIAG RESULTS” mode for “A/T” with CONSULT-II. If DTC (P1769) is detected, refer to AT-159, "Diagnostic Procedure" .
   If DTC (P1767) is detected, go to AT-157, "Diagnostic Procedure" .
   If DTC (P1846) is detected, go to AT-177, "Diagnostic Procedure" .



WITH GST

Follow the procedure “With CONSULT-II”.

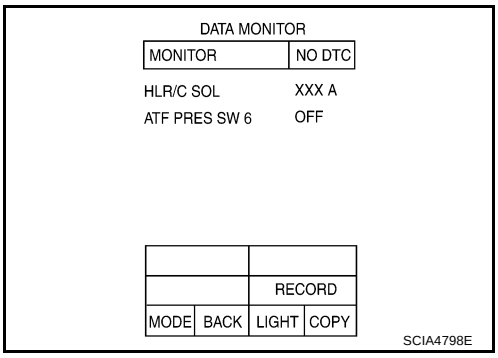
Diagnostic Procedure

ACS003QF

1. CHECK INPUT SIGNALS

With CONSULT-II

1. Start the engine.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Drive vehicle in the “D” position (2nd ⇒ 3rd gear), and confirm the ON/OFF actuation of the “ATF PRES SW 6” and electrical current value of “HLR/C SOL”.



Item name	Condition	Display value (Approx.)
HLR/C SOL	High and low reverse clutch disengaged. Refer to AT-19 .	0.6 - 0.8 A
	High and low reverse clutch engaged. Refer to AT-19 .	0 - 0.05 A
ATF PRES SW 6	High and low reverse clutch engaged. Refer to AT-19 .	ON
	High and low reverse clutch disengaged. Refer to AT-19 .	OFF

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check the following items:

- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-158, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1772 LOW COAST BRAKE SOLENOID VALVE

PFP:31940

Description

ACS003QG

Low coast brake solenoid valve is turned “ON” or “OFF” by TCM in response to signals sent from PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

CONSULT-II Reference Value

ACS003QH

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF

On Board Diagnosis Logic

ACS003QI

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “LC/B SOLENOID/CIRC” with CONSULT-II or P1772 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.

Possible Cause

ACS003QJ

- Harness or connectors
  (Solenoid circuit is open or shorted.)
- Low coast brake solenoid valve

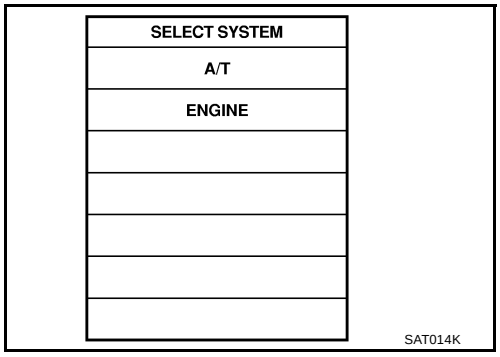
DTC Confirmation Procedure

ACS003QK

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
   Selector lever: “M” position
   Gear position: “M1-1st” or “M2-2nd” gear (LC/B ON/OFF)
5. If DTC is detected, go to AT-161, "Diagnostic Procedure" .



WITH GST

Follow the procedure “With CONSULT-II”.

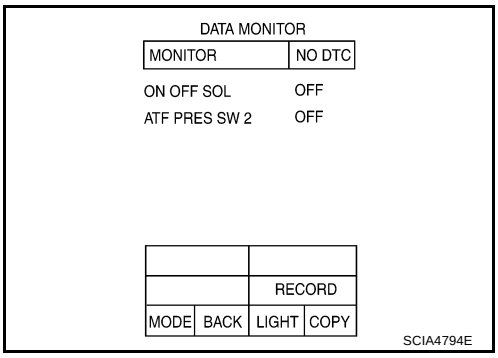
Diagnostic Procedure

ACS003QL

1. CHECK INPUT SIGNAL

With CONSULT-II

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start the engine.
4. Read out the value of “ON OFF SOL” while driving.



Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check the following items:

- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-160, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1774 LOW COAST BRAKE SOLENOID VALVE FUNCTION

PFP:31940

Description

ACS003QM

- Low coast brake solenoid valve is turned “ON” or “OFF” by TCM in response to signals sent from PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.
- This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

CONSULT-II Reference Value

ACS003QN

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF
ATF PRES SW 2	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF

On Board Diagnosis Logic

ACS008D7

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “LC/B SOLENOID FNCT” with CONSULT-II or P1774 without CONSULT-II is detected under the following conditions.
  - When TCM detects that actual gear ratio is irregular, and relation between gear position and condition of ATF pressure switch 2 is irregular during depressing accelerator pedal. (Other than during shift change)
  - When TCM detects that relation between gear position and condition of ATF pressure switch 2 is irregular during releasing accelerator pedal. (Other than during shift change)

Possible Cause

ACS008D8

- Harness or connectors
  (The solenoid and switch circuits are open or shorted.)
- Low coast brake solenoid valve
- ATF pressure switch 2

DTC Confirmation Procedure

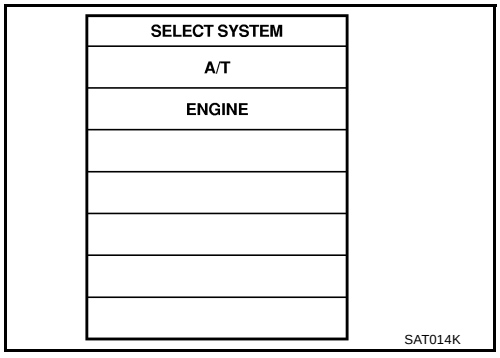
ACS008D9

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Start engine.
2. Accelerate vehicle to maintain the following conditions.
   Selector lever: “M” position
   Gear position: “M1-1st” or “M2-2nd” gear (LC/B ON/OFF)
3. Perform step “2” again.
4. Turn ignition switch “OFF”, then perform step “1” to “3” again.
5. Check “SELF-DIAG RESULTS” mode for “A/T” with CONSULT-II. If DTC (P1774) is detected, refer to AT-163, "Diagnostic Procedure" .
   If DTC (P1772) is detected, go to AT-161, "Diagnostic Procedure" .



WITH GST

Follow the procedure “With CONSULT-II”.

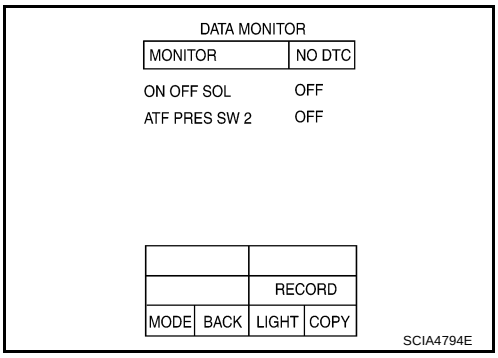
Diagnostic Procedure

ACS008DA

1. CHECK INPUT SIGNALS

With CONSULT-II

1. Start the engine.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Drive vehicle in the manual mode (“M1-1st” or “M2-2nd” gear), and confirm the ON/OFF actuation of the “ATF PRES SW 2” and “ON OFF SOL”.



Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF
ATF PRES SW 2	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check the following items:

- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-162, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1815 MANUAL MODE SWITCH

PFP:34901

Description

ACS004YC

Manual mode switch is installed in A/T device. It sends manual mode switch, shift up and shift down switch signals to TCM.
TCM sends the switch signals to unified meter and A/C amp. By CAN communication line. Then manual mode switch position is indicated on the A/T position indicator. For inspection, refer to AT-168, "A/T Position Indicator" .

CONSULT-II Reference Value in Data Monitor Mode

ACS003QT

Item name	Condition	Display Value
MANU MODE SW	Manual shift gate position (neutral)	ON
	Other than the above	OFF
NON M-MODE SW	Manual shift gate position	OFF
	Other than the above	ON
UP SW LEVER	Selector lever: + side	ON
	Other than the above	OFF
DOWN SW LEVER	Selector lever: - side	ON
	Other than the above	OFF

On Board Diagnosis Logic

ACS003QU

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “MANU MODE SW/CIR” with CONSULT-II is detected when TCM monitors Manual mode, Non manual mode, Up or Down switch signal, and detects as irregular when impossible input pattern occurs 1 second or more.

Possible Cause

ACS003QV

- Harness or connectors
  (These switches circuit is open or shorted.)
- Mode select switch (Into control device)
- Position select switch (Into control device)

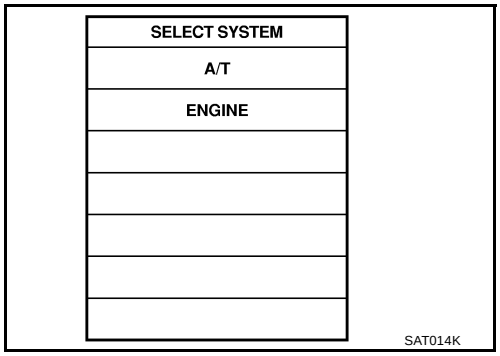
DTC Confirmation Procedure

ACS003QW

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

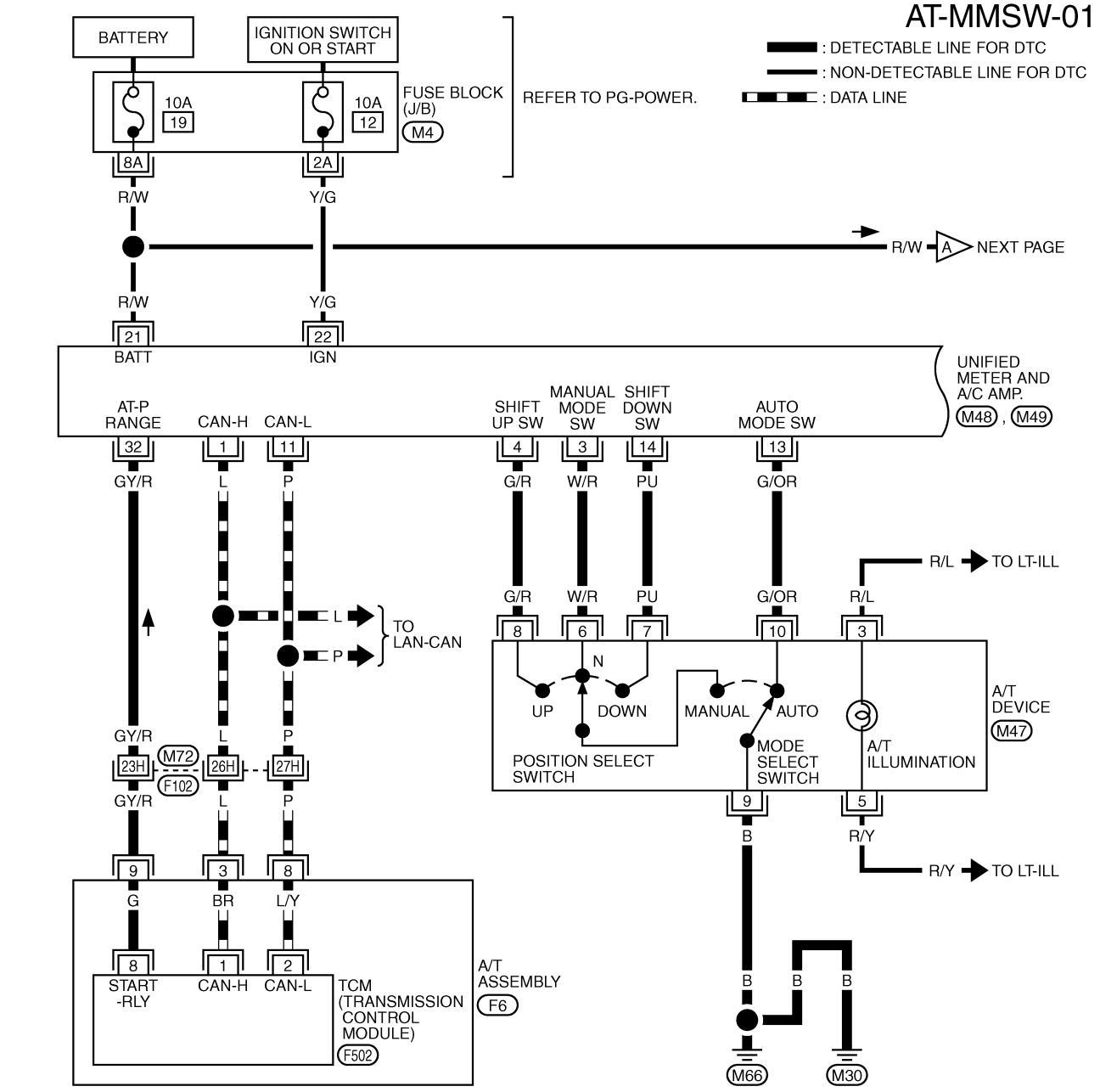
WITH CONSULT-II

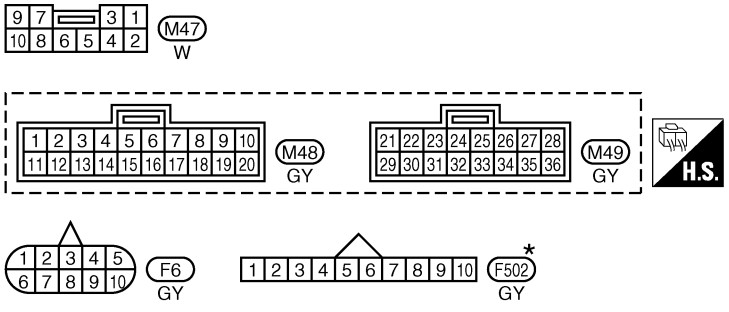
1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine.
4. Move selector lever to “M” position.
5. Drive vehicle for at least 2 consecutive seconds.
6. If DTC is detected, go to AT-167, "Diagnostic Procedure" .



Wiring Diagram — AT — MMSW

ACS0080O

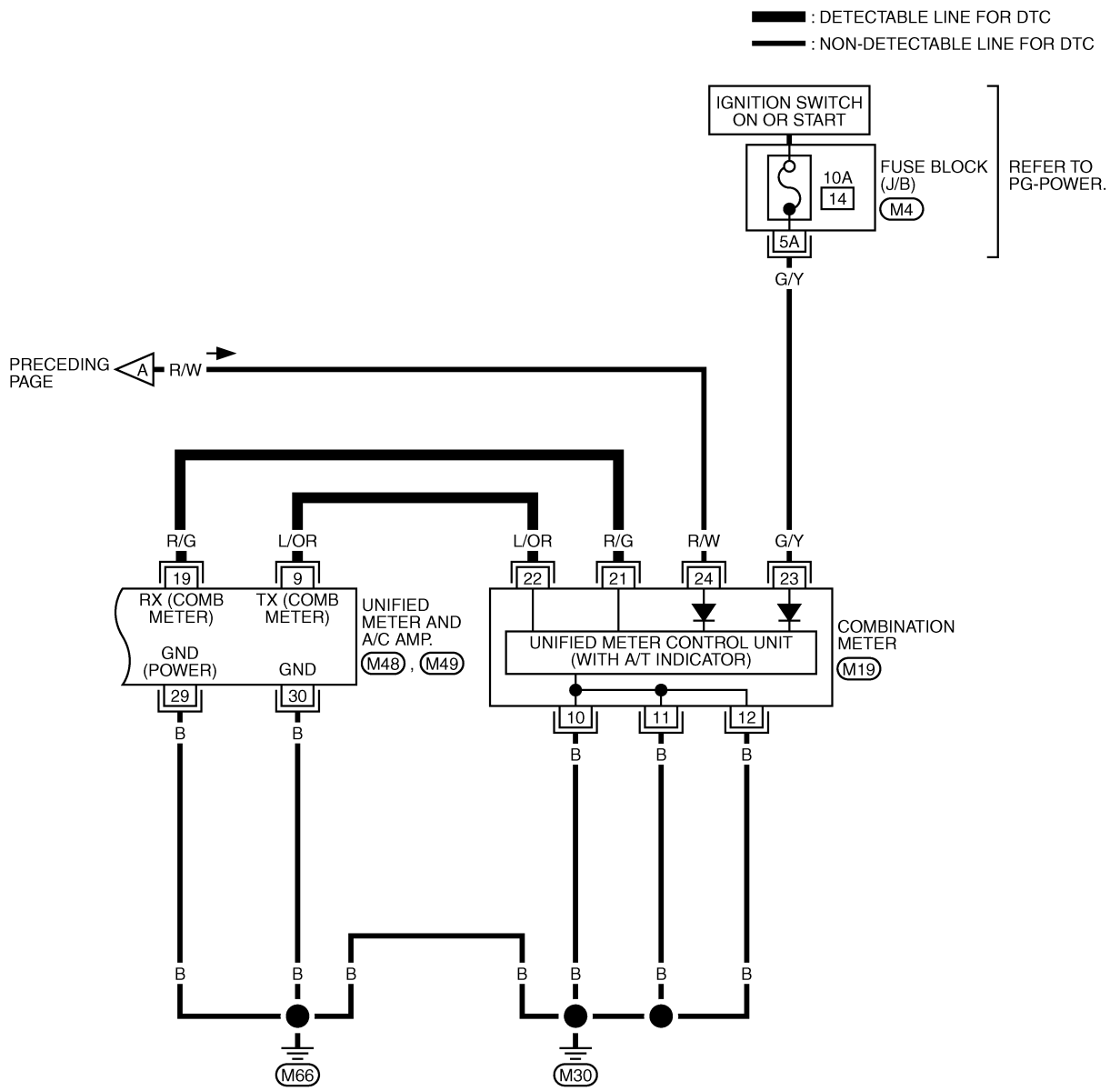


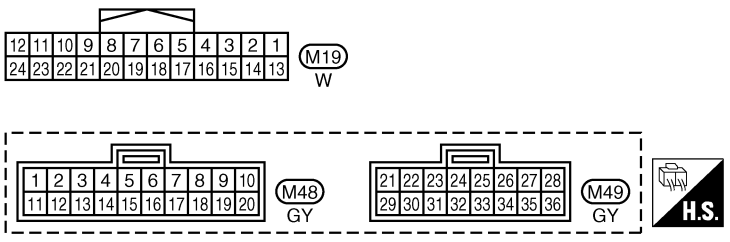


REFER TO THE FOLLOWING.
F102 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TCWM0262E

AT-MMSW-02





REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TCWM0263E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
3	L	CAN-H	–		–
8	P	CAN-L	–		–
9	GY/R	Starter relay		Selector lever in “N” and “ P” positions.	Battery voltage
				Selector lever in other positions.	0V

Diagnostic Procedure

ACS003QX

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" .

Is a malfunction in the CAN communication indicated in the results?

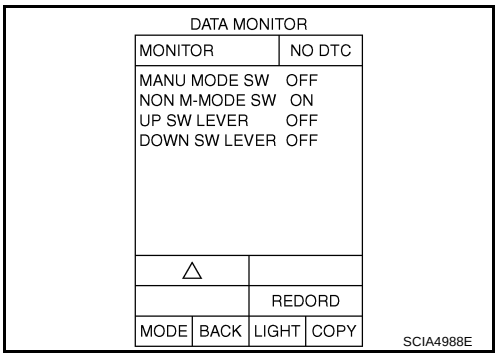
YES >> Check CAN communication line. Refer to AT-100, "DTC U1000 CAN COMMUNICATION LINE" .

NO >> GO TO 2.

2. CHECK MANUAL MODE SWITCH CIRCUIT

With CONSULT-II

1. Turn ignition switch ON. (Do not start engine.)
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Read out ON/OFF switching action of “MANU MODE SW”, “NON M-MODE SW”, “UP SW LEVER”, “DOWN SW LEVER”.



Item name	Condition	Display Value
MANU MODE SW	Manual shift gate position (neutral)	ON
	Other than the above	OFF
NON M-MODE SW	Manual shift gate position	OFF
	Other than the above	ON
UP SW LEVER	selector lever: +side	ON
	Other than the above	OFF
DOWN SW LEVER	selector lever: -side	ON
	Other than the above	OFF

Without CONSULT-II

Drive vehicle in the manual mode, and confirm that the actual gear position and the meter's indication of the position mutually coincide when the selector lever is shifted to the “+ (up)” or “- (down)” side (1st ⇔ 5th gear).

OK or NG

OK >> GO TO 4.

NG >> GO TO 3.

3. DETECT MALFUNCTIONING ITEM

Check the following items.

- Manual mode switch. Refer to AT-168, "Component Inspection" .
- Pin terminals for damage or loose connection with harness connector.
- Open circuit or short to ground or short to power in harness or connector for A/T device (manual mode switch).
- Unified meter and A/C amp. Refer to DI-54, "UNIFIED METER AND A/C AMP" .

OK or NG

OK >> GO TO 4.

NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-164, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 5.

5. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 6.
NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

Check the following items:

- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer toAT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

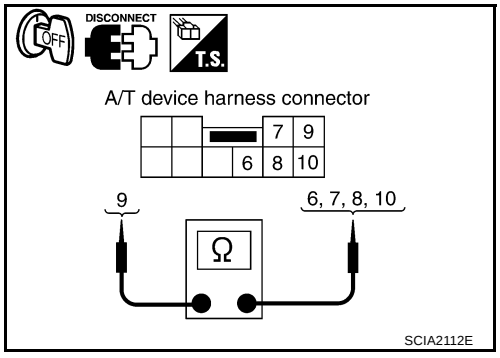
Component Inspection

ACS003QY

MANUAL MODE SWITCH

Check continuity between terminals.

Item	Position	Connector	Terminal (Unit side)	Continuity
Manual mode select switch	Auto	M47	9 - 10	Yes
	Manual		6 - 9	
Manual mode position select switch	UP		8 - 9	
	DOWN		7 - 9	



A/T Position Indicator

ACS003QZ

DIAGNOSTIC PROCEDURE

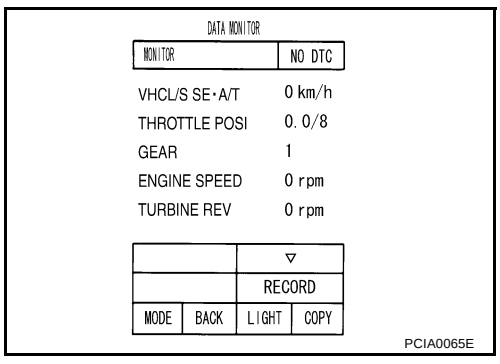
1. CHECK INPUT SIGNALS

With CONSULT-II

1. Start engine.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for A/T with CONSULT-II and read out the value of “GEAR”.
3. Drive vehicle in the manual mode, and confirm that the actual gear position and the meter's indication of the position mutually coincide when the selector lever is shifted to the “+ (up)” or “- (down)” side (1st ⇔ 5th gear).

OK or NG

OK >> **INSPECTION END**
NG >> Check the following items.



A/T Position Indicator Symptom Chart

Items	Presumed Location of Trouble
The actual gear position does not change, or shifting into the manual mode is not possible (no gear shifting in the manual mode possible). The A/T position indicator is not indicated.	Manual mode switch Refer to AT-164, "DTC P1815 MANUAL MODE SWITCH" . A/T main system (Fail-safe function actuated) ● Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" .
The actual gear position changes, but the A/T position indicator is not indicated.	Perform the self-diagnosis function. ● Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" .
The actual gear position and the indication on the A/T position indicator do not coincide.	Perform the self-diagnosis function. ● Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" .
Only a specific position or positions is/are not indicated on the A/T position indicator.	Check the unified meter and A/C amp. Refer to DI-4, "COMBINATION METERS" .

DTC P1841 ATF PRESSURE SWITCH 1

PFP:25240

Description

ACS003R0

Fail-safe function to detect front brake clutch solenoid valve condition.

CONSULT-II Reference Value

ACS003R1

Item name	Condition	Display value
ATF PRES SW 1	Front brake engaged. Refer to AT-19 .	ON
	Front brake disengaged. Refer to AT-19 .	OFF

On Board Diagnosis Logic

ACS003R2

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “ATF PRES SW 1/CIRC” with CONSULT-II is detected when TCM detects that actual gear ratio is normal, and relation between gear position and condition of ATF pressure switch 1 is irregular during depressing accelerator pedal. (Other than during shift change)

Possible Cause

ACS003R3

- ATF pressure switch 1
- Harness or connectors
  (Switch circuit is open or shorted.)

DTC Confirmation Procedure

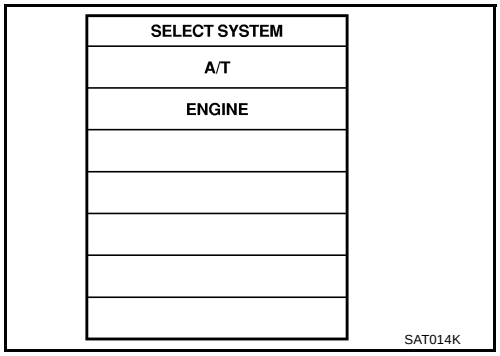
ACS003R4

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Start engine.
2. Accelerate vehicle to maintain the following conditions.
   ACCELE POSI: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 3rd ⇒ 4th Gear (FR/B ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
3. Perform step “2” again.
4. Turn ignition switch “OFF”, then perform step “1” to “3” again.
5. Check “SELF-DIAG RESULTS” mode for “A/T” with CONSULT-II.
   If DTC (P1841) is detected, go to AT-171, "Diagnostic Procedure" .
   If DTC (P1757) is detected, go to AT-149, "Diagnostic Procedure" .



Diagnostic Procedure

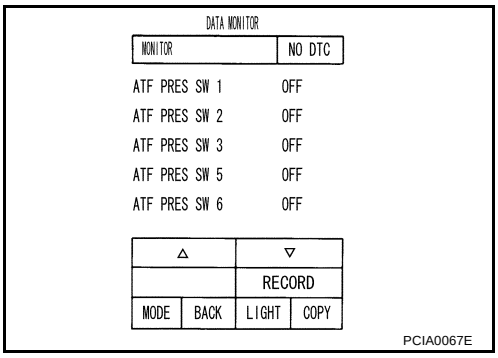
ACS003R5

1. CHECK INPUT SIGNAL

With CONSULT-II

1. Start engine.
2. Select “ECU INPUT SIGNALS” or “MAIN SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Drive vehicle in the “D” position (3rd ⇒ 4th gear), and confirm the ON/OFF actuation of the “ATF PRES SW 1”.

Item name	Condition	Display value
ATF PRES SW 1	Front brake engaged. Refer to AT-19 .	ON
	Front brake disengaged. Refer to AT-19 .	OFF



OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check the following items:

- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-170, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1843 ATF PRESSURE SWITCH 3

PFP:25240

Description

ACS003R6

Fail-safe function to detect input clutch solenoid valve condition.

CONSULT-II Reference Value

ACS003R7

Item name	Condition	Display value
ATF PRES SW 3	Input clutch engaged. Refer to AT-19 .	ON
	Input clutch disengaged. Refer to AT-19 .	OFF

On Board Diagnosis Logic

ACS003R8

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “ATF PRES SW 3/CIRC” with CONSULT-II is detected when TCM detects that actual gear ratio is normal, and relation between gear position and condition of ATF pressure switch 3 is irregular during depressing accelerator pedal. (Other than during shift change)

Possible Cause

ACS003R9

- ATF pressure switch 3
- Harness or connectors
  (Switch circuit is open or shorted.)

DTC Confirmation Procedure

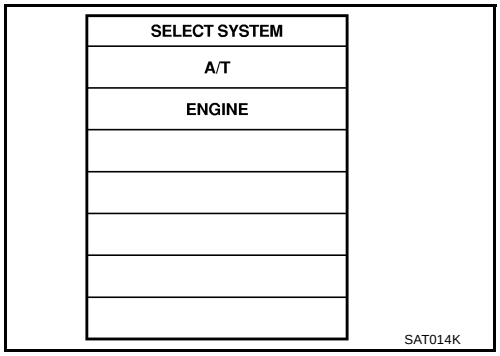
ACS003RA

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Start engine.
2. Accelerate vehicle to maintain the following conditions.
   ACCELE POSI: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 3rd ⇒ 4th Gear (I/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
3. Perform step “2” again.
4. Turn ignition switch “OFF”, then perform step “1” to “3” again.
5. Check “SELF-DIAG RESULTS” mode for “A/T” with CONSULT-II.
   If DTC (P1843) is detected, go to AT-173, "Diagnostic Procedure" .
   If DTC (P1752) is detected, go to AT-145, "Diagnostic Procedure" .



Diagnostic Procedure

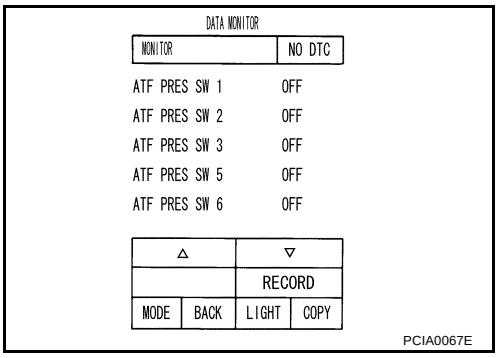
ACS003RB

1. CHECK INPUT SIGNAL

With CONSULT-II

1. Start engine.
2. Select “ECU INPUT SIGNALS” or “MAIN SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Drive vehicle in the “D” position (3rd ⇒ 4th gear), and confirm the ON/OFF actuation of the “ATF PRES SW 3”.

Item name	Condition	Display value
ATF PRES SW 3	Input clutch engaged. Refer to AT-19 .	ON
	Input clutch disengaged. Refer to AT-19 .	OFF



OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check the following items:

- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-172, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1845 ATF PRESSURE SWITCH 5

PFP:25240

Description

ACS003RC

Fail-safe function to detect direct clutch solenoid valve condition.

CONSULT-II Reference Value

ACS003RD

Item name	Condition	Display value
ATF PRES SW 5	Direct clutch engaged. Refer to AT-19 .	ON
	Direct clutch disengaged. Refer to AT-19 .	OFF

On Board Diagnosis Logic

ACS003RE

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “ATF PRES SW 5/CIRC” with CONSULT-II is detected when TCM detects that actual gear ratio is normal, and relation between gear position and condition of ATF pressure switch 5 is irregular during depressing accelerator pedal. (Other than during shift change)

Possible Cause

ACS003RF

- ATF pressure switch 5
- Harness or connectors
  (Switch circuit is open or shorted.)

DTC Confirmation Procedure

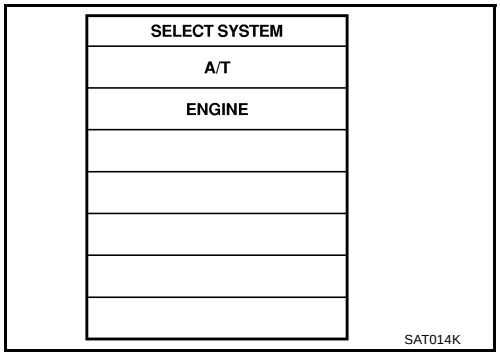
ACS003RG

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Start engine.
2. Accelerate vehicle to maintain the following conditions.
   ACCELE POSI: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 1st ⇒ 2nd Gear (D/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
3. Perform step “2” again.
4. Turn ignition switch “OFF”, then perform step “1” to “3” again.
5. Check “SELF-DIAG RESULTS” mode for “A/T” with CONSULT-II.
   If DTC (P1845) is detected, go to AT-175, "Diagnostic Procedure" .
   If DTC (P1762) is detected, go to AT-153, "Diagnostic Procedure" .



Diagnostic Procedure

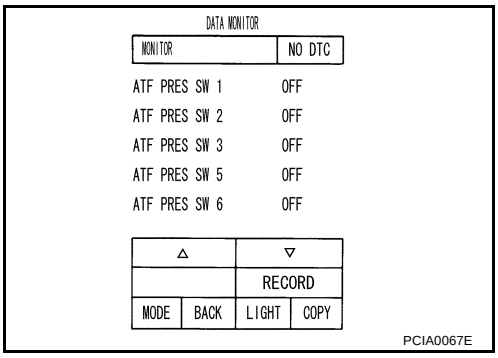
ACS003RH

1. CHECK INPUT SIGNAL

With CONSULT-II

1. Start engine.
2. Select “ECU INPUT SIGNALS” or “MAIN SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Drive vehicle in the “D” position (1st ⇒ 2nd gear), and confirm the ON/OFF actuation of the “ATF PRES SW 5”.

Item name	Condition	Display value
ATF PRES SW 5	Direct clutch engaged. Refer to AT-19 .	ON
	Direct clutch disengaged. Refer to AT-19 .	OFF



OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check the following items:

- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-174, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1846 ATF PRESSURE SWITCH 6

PFP:25240

Description

ACS003RI

Fail-safe function to detect high and low reverse clutch solenoid valve condition.

CONSULT-II Reference Value

ACS003RJ

Item name	Condition	Display value
ATF PRES SW 6	High and low reverse clutch engaged. Refer to AT-19 .	ON
	High and low reverse clutch disengaged. Refer to AT-19 .	OFF

On Board Diagnosis Logic

ACS003RK

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “ATF PRES SW 6/CIRC” with CONSULT-II is detected when TCM detects that actual gear ratio is normal, and relation between gear position and condition of ATF pressure switch 6 is irregular during depressing accelerator pedal. (Other than during shift change)

Possible Cause

ACS003RL

- ATF pressure switch 6
- Harness or connectors
  (Switch circuit is open or shorted.)

DTC Confirmation Procedure

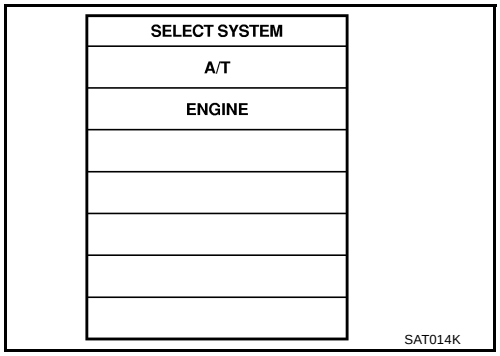
ACS003RM

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Start engine.
2. Accelerate vehicle to maintain the following conditions.
   ACCELE POSI: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 2nd ⇒ 3rd Gear (HLR/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
3. Perform step “2” again.
4. Turn ignition switch “OFF”, then perform step “1” to “3” again.
5. Check “SELF-DIAG RESULTS” mode for “A/T” with CONSULT-II.
   If DTC (P1846) is detected, go to AT-177, "Diagnostic Procedure" .
   If DTC (P1767) is detected, go to AT-157, "Diagnostic Procedure" .



Diagnostic Procedure

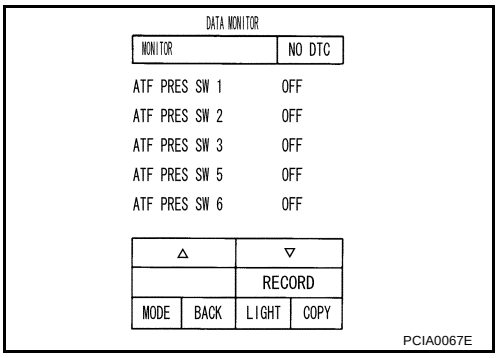
ACS003RN

1. CHECK INPUT SIGNAL

With CONSULT-II

1. Start the engine.
2. Select “ECU INPUT SIGNALS” or “MAIN SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Drive vehicle in the “D” position (2nd ⇒ 3rd gear), and confirm the ON/OFF actuation of the “ATF PRES SW 6”.

Item name	Condition	Display value
ATF PRES SW 6	High and low reverse clutch engaged. Refer to AT-19 .	ON
	High and low reverse clutch disengaged. Refer to AT-19 .	OFF



OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check the following items:

- A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform “DTC Confirmation Procedure”.

- Refer to AT-176, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

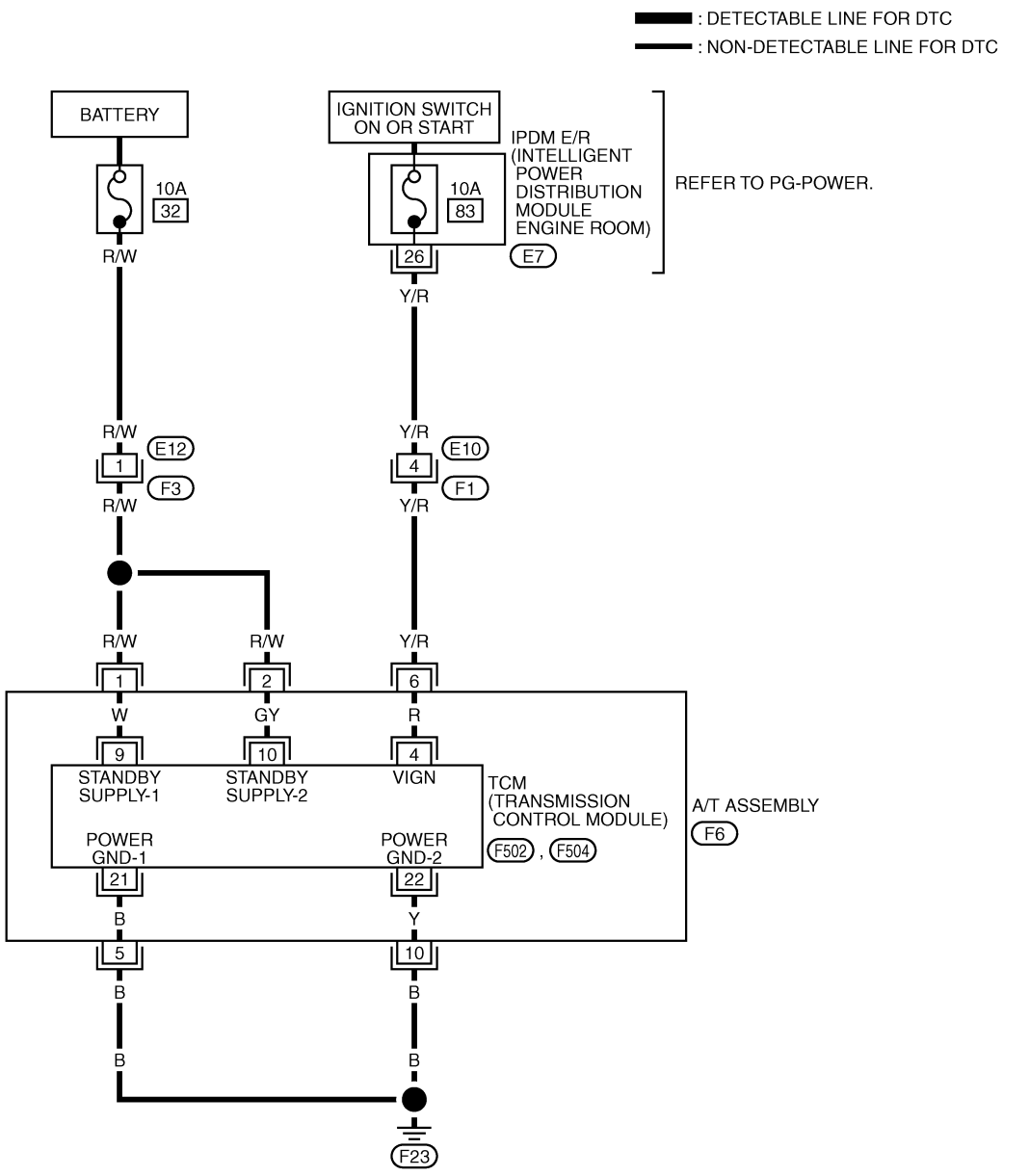
MAIN POWER SUPPLY AND GROUND CIRCUIT

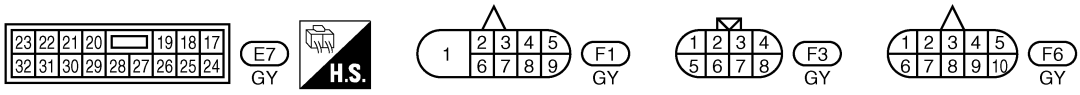
PFP:00100

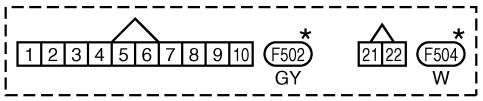
Wiring Diagram — AT — MAIN

ACS0085Z

AT-MAIN-01







*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWB0266E

TCM terminals and data are reference value. Measured between each terminal and ground.

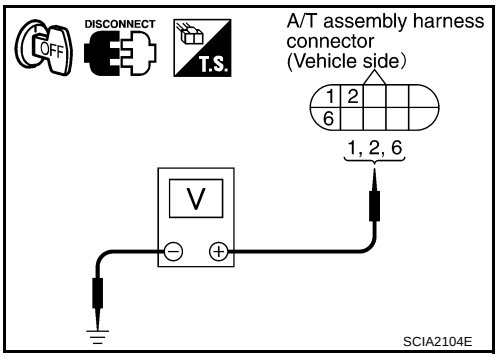
Terminal	Wire color	Item	Condition		Data (Approx.)
1	R/W	Power supply (Memory back-up)	Always		Battery voltage
2	R/W	Power supply (Memory back-up)	Always		Battery voltage
5	B	Ground	Always		0V
6	Y/R	Power supply		–	Battery voltage
				–	0V
10	B	Ground	Always		0V

Diagnostic Procedure

ACS00860

1. CHECK TCM POWER SOURCE STEP 1

1. Turn ignition switch “OFF”.
2. Disconnect A/T assembly harness connector.
3. Check voltage between A/T assembly harness connector and ground.



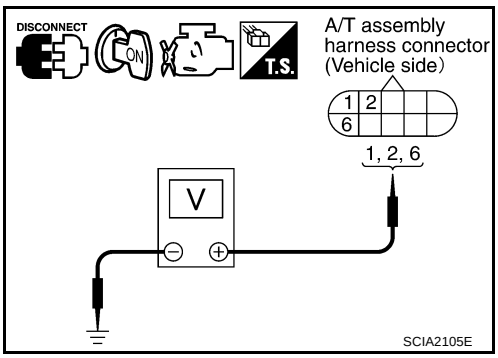
Item	Connector	Terminal (Wire color)	Voltage
TCM	F6	1 (R/W) - Ground	Battery voltage
		2 (R/W) - Ground	
		6 (Y/R) - Ground	0V

OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK TCM POWER SOURCE STEP 2

1. Disconnect A/T assembly harness connector.
2. Turn ignition switch “ON”. (Do not start engine.)
3. Check voltage between A/T assembly harness connector and ground.



Item	Connector	Terminal (Wire color)	Voltage
TCM	F6	1 (R/W) - Ground	Battery voltage
		2 (R/W) - Ground	
		6 (Y/R) - Ground	

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short or open between battery and A/T assembly harness connector terminals 1, 2
- Harness for short or open between ignition switch and A/T assembly harness connector terminal 6
- 10A fuse (No.32, located in the fuse and fusible link block) and 10A fuse (No.83, located in the IPDM E/R)
- Ignition switch, Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

OK or NG

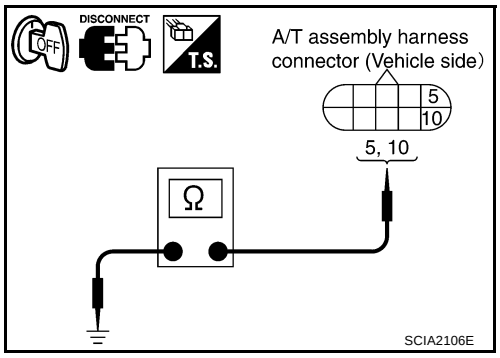
OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. CHECK TCM GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect A/T assembly harness connector.
3. Check continuity between A/T assembly harness connector terminals and ground.

   Continuity should exist.

   If OK, check harness for short to ground and short to power.



OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. DETECT MALFUNCTIONING ITEM

Check the following items:

- The A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> GO TO 6.
NG >> Repair or replace damaged parts.

6. PERFORM SELF-DIAGNOSIS

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" .

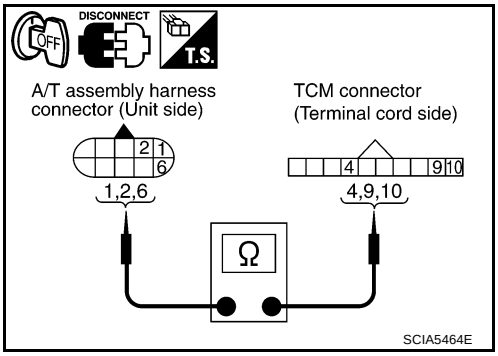
OK or NG

OK >> **INSPECTION END**
NG-1 >> Self-diagnosis does not activate: GO TO 7.
NG-2 >> DTC is displayed: Check the malfunctioning system. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" .

7. CHECK TERMINAL CORD ASSEMBLY

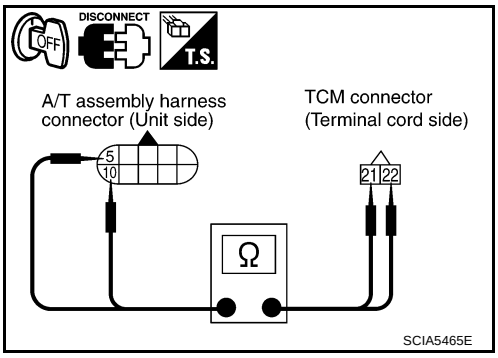
1. Remove control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disconnect A/T assembly harness connector and TCM connector.
3. Check continuity between A/T assembly harness connector terminals and TCM connector terminals.

Item	Connector	Terminal (Wire color)	Continuity
A/T assembly harness connector	F6	1 (W)	Yes
TCM connector	F502	9 (W)	
A/T assembly harness connector	F6	2 (GY)	Yes
TCM connector	F502	10 (GY)	
A/T assembly harness connector	F6	6 (R)	Yes
TCM connector	F502	4 (R)	



4. Check continuity between A/T assembly harness connector terminals and TCM connector terminals.

Item	Connector	Terminal (Wire color)	Continuity
A/T assembly harness connector	F6	5 (B)	Yes
TCM connector	F504	21 (B)	
A/T assembly harness connector	F6	10 (Y)	Yes
TCM connector	F504	22 (Y)	



5. If OK, check harness for short to ground and short to power.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .

NG >> Replace open circuit or short to ground and short to power in harness or connectors.

CLOSED THROTTLE POSITION AND WIDE OPEN THROTTLE POSITION CIRCUIT

PFP:18002

CONSULT-II Reference Value

ACS006C2

Item name	Condition	Display value
CLSD THL POS	Released accelerator pedal.	ON
	Fully depressed accelerator pedal.	OFF
W/O THL POS	Fully depressed accelerator pedal.	ON
	Released accelerator pedal.	OFF

Diagnostic Procedure

ACS003RO

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" , AT-98, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

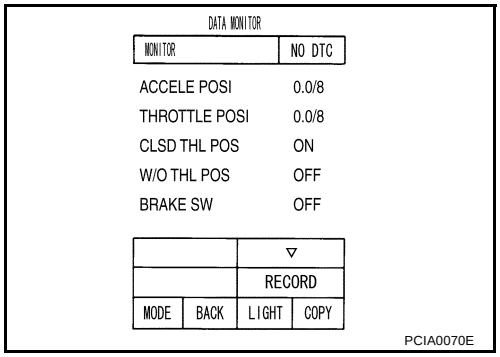
Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-100, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK THROTTLE POSITION SIGNAL CIRCUIT

With CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Depress accelerator pedal and read out the value of “CLSD THL POS” and “W/O THL POS”.



Accelerator Pedal Operation	Monitor Item	
	CLSD THL POS	W/O THL POS
Released	ON	OFF
Fully depressed	OFF	ON

OK or NG

OK >> **INSPECTION END**
NG >> Check the following items. If NG, repair or replace damaged parts.

- Perform self-diagnosis for “ENGINE” with CONSULT-II. Refer to EC-104, "CONSULT-II Function" .
- Open circuit or short to ground or short to power in harness or connectors.
- Pin terminals for damage or loose connection with harness connector.

BRAKE SIGNAL CIRCUIT

PFP:25320

CONSULT-II Reference Value

ACS006C3

Item name	Condition	Display value
BRAKE SW	Depressed brake pedal.	ON
	Released brake pedal.	OFF

Diagnostic Procedure

ACS003RP

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" , AT-98, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

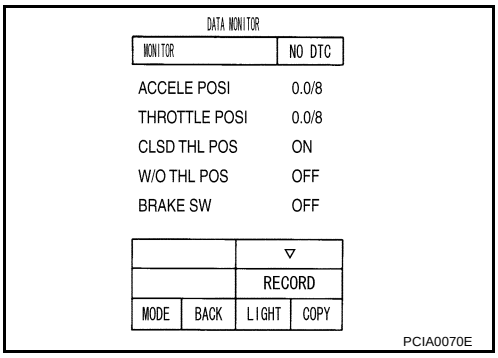
Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-100, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK STOP LAMP SWITCH CIRCUIT

With CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Read out ON/OFF switching action of the “BRAKE SW”.



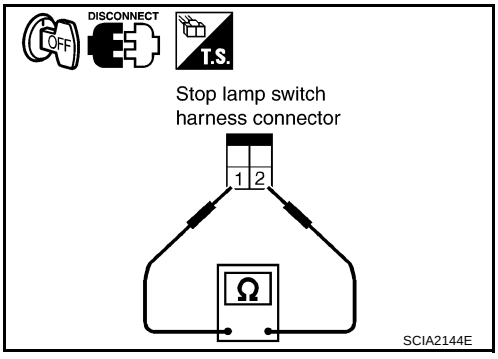
Item name	Condition	Display value
BRAKE SW	Depressed brake pedal.	ON
	Released brake pedal.	OFF

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 3.

3. CHECK STOP LAMP SWITCH

Check continuity between stop lamp switch harness connector E111 terminals 1 and 2. Refer to AT-184, "Wiring Diagram — AT — NON-DTC" .



Condition	Continuity
When brake pedal is depressed	Yes
When brake pedal is released	No

Check stop lamp switch after adjusting brake pedal — refer to BR-6, "BRAKE PEDAL" .

OK or NG

OK >> **INSPECTION END**
NG >> Check the following items. If NG, repair or replace damaged parts.

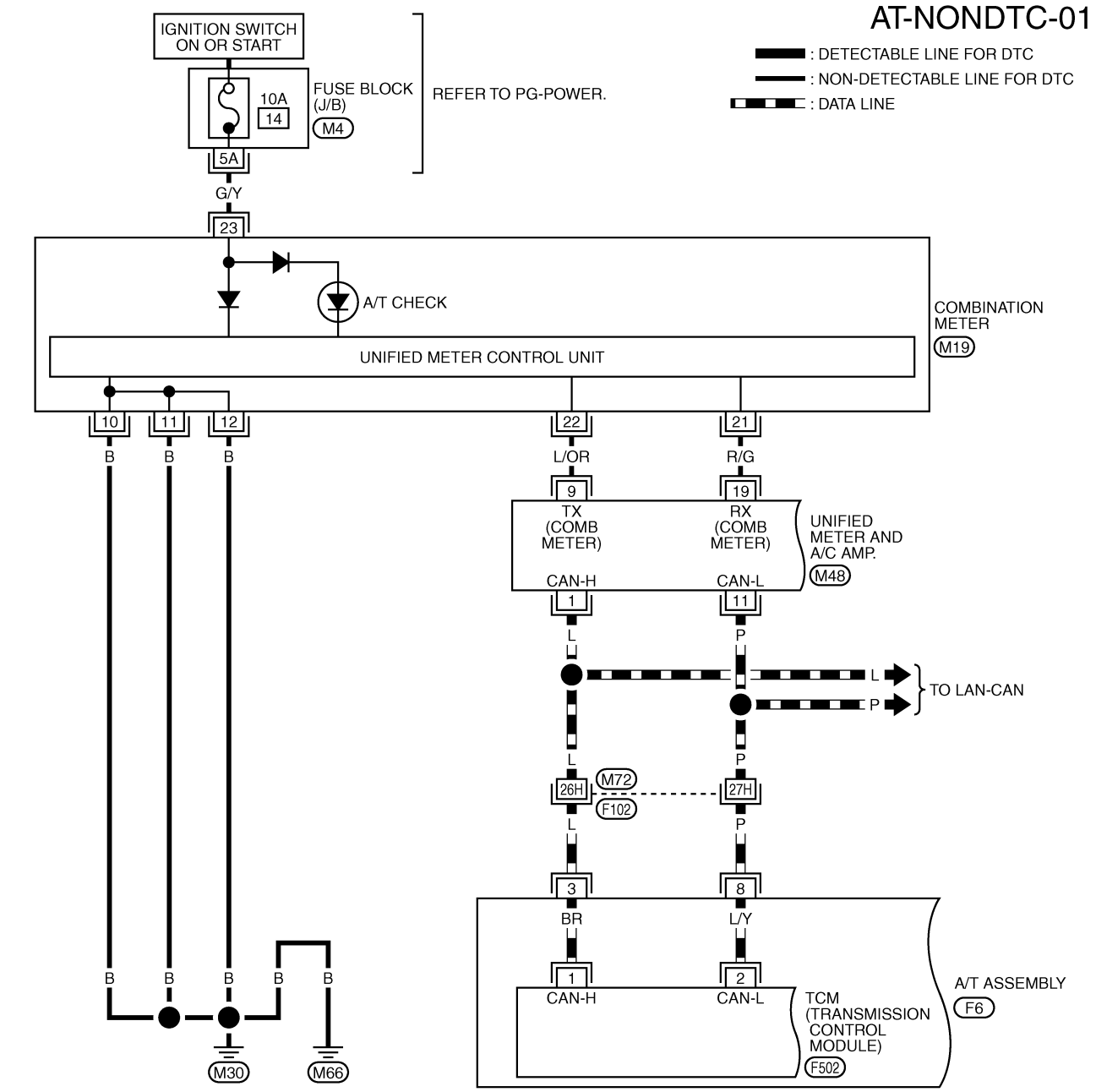
- Harness for short or open between battery and stop lamp switch.
- Harness for short or open between stop lamp switch and unified meter and A/C amp.

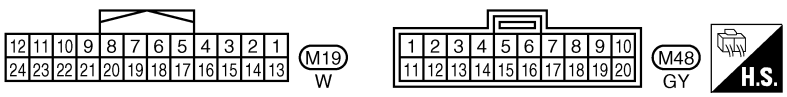
TROUBLE DIAGNOSIS FOR SYMPTOMS

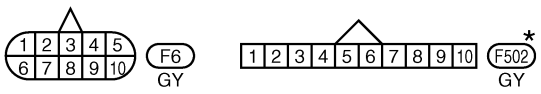
PFP:00007

Wiring Diagram — AT — NONDTC

ACS00844







*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

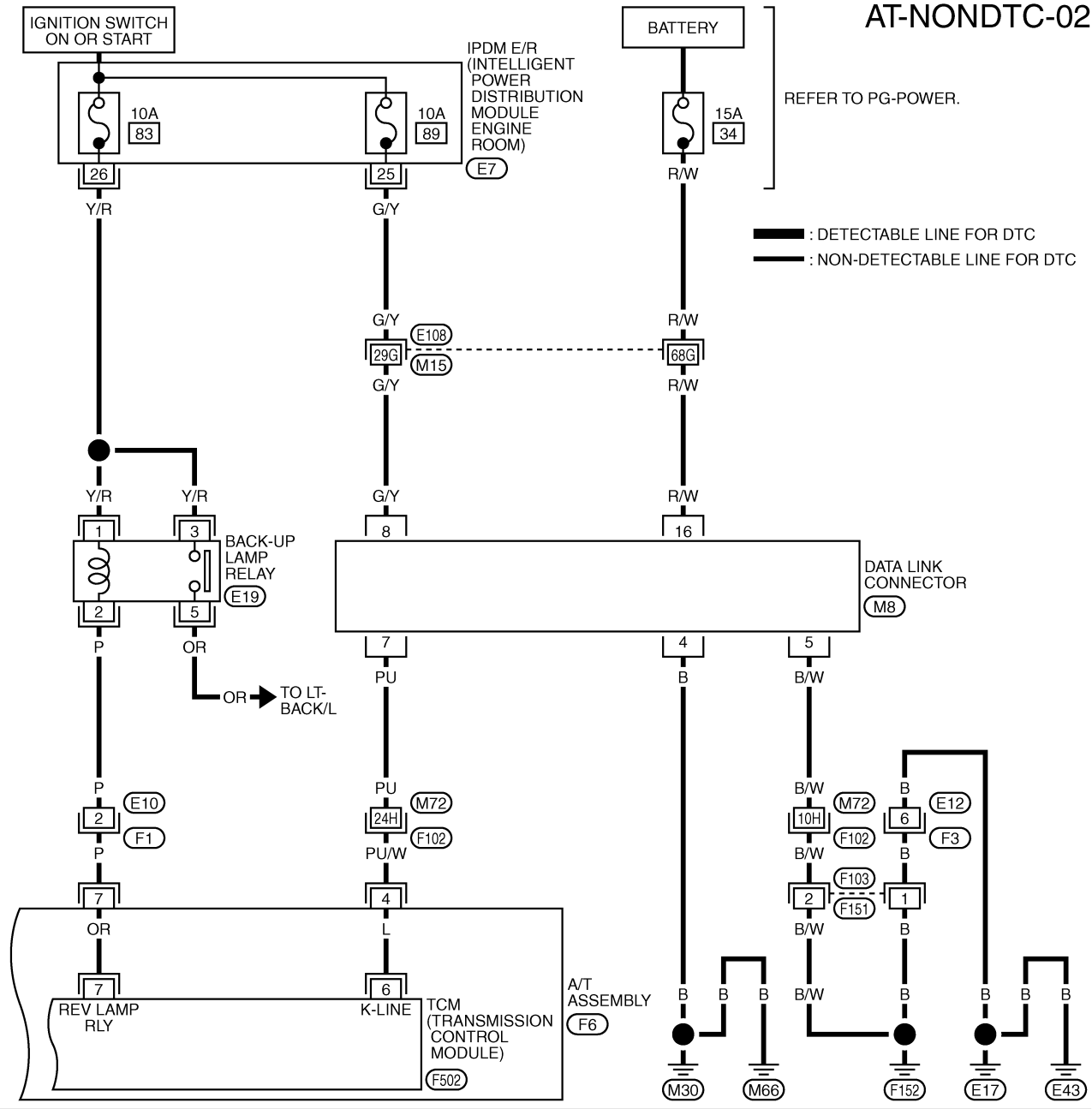
REFER TO THE FOLLOWING.

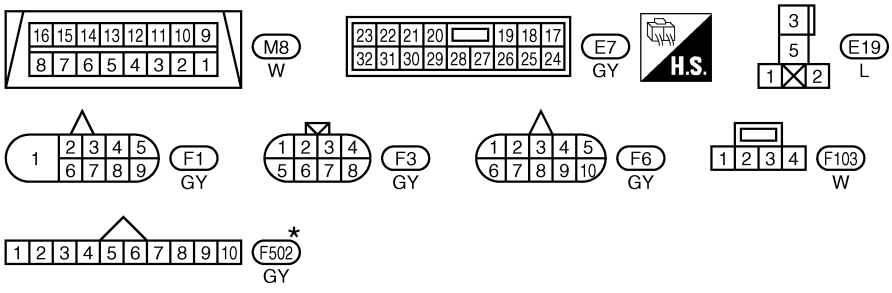
F102 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TCWM0264E

AT-NONDTC-02



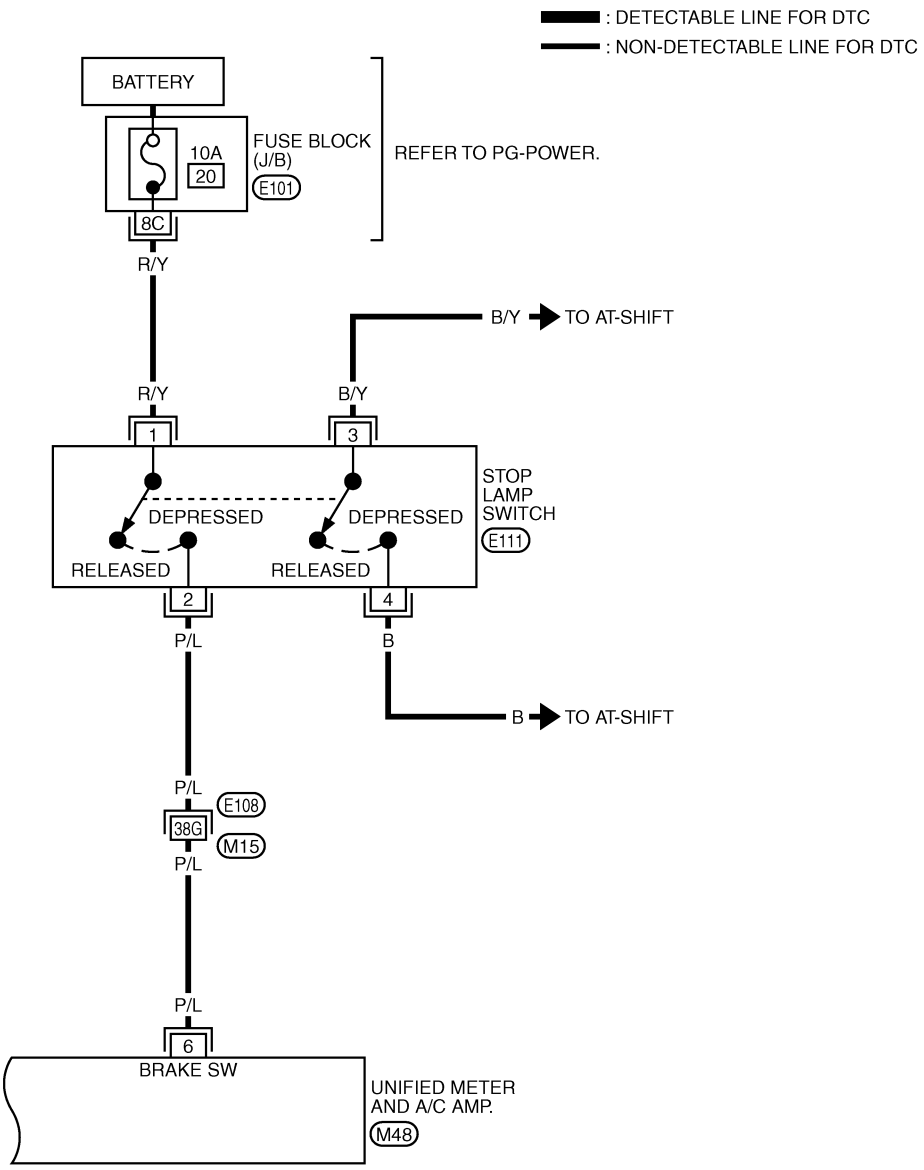


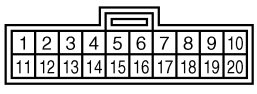
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.
E108 , F102 -SUPER MULTIPLE JUNCTION (SMJ)

TCWM0265E

AT-NONDTC-03





M48
GY

E111
W

REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TCWM0266E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
3	L	CAN-H	–		–
4	PU/W	K-line (CONSULT-II signal)	The terminal is connected to the data link connector for CONSULT-II.		–
7	P	Back-up lamp relay		Selector lever in “R” position.	0V
				Selector lever in other positions.	Battery voltage
8	P	CAN-L	–		–

A/T Check Indicator Lamp Does Not Come On

ACS00845

SYMPTOM:

A/T CHECK indicator lamp does not come on for about 2 seconds when turning ignition switch to “ON”.

DIAGNOSTIC PROCEDURE

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" , AT-98, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-100, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK A/T CHECK INDICATOR LAMP CIRCUIT

Check combination meter. Refer to DI-4, "COMBINATION METERS" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-178, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

Engine Cannot Be Started In “P” or “N” Position

ACS00846

SYMPTOM:

- **Engine cannot be started with selector lever in “P” or “N” position.**
- **Engine can be started with selector lever in “D” or “R” position.**

DIAGNOSTIC PROCEDURE

1. CHECK PNP SWITCH CIRCUIT

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" , AT-98, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

Do the self-diagnosis results indicate PNP switch?

YES >> Check the malfunctioning system. Refer to AT-108, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .
NO >> GO TO 2.

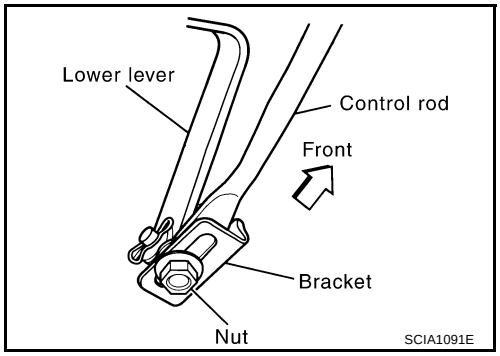
2. CHECK CONTROL LINKAGE

Check control linkage.

- Refer to AT-228, "Checking of A/T Position" .

OK or NG

OK >> GO TO 3.
NG >> Adjust control linkage. Refer to AT-228, "Adjustment of A/T Position" .



3. CHECK STARTING SYSTEM

Check starting system. Refer to SC-10, "STARTING SYSTEM" .

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

In "P" Position, Vehicle Moves When Pushed

ACS00847

SYMPTOM:

Even though the selector lever is set in the "P" position, the parking mechanism is not actuated, allowing the vehicle to be moved when it is pushed.

DIAGNOSTIC PROCEDURE

1. CHECK PNP SWITCH CIRCUIT

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" , AT-98, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

Do the self-diagnosis results indicate PNP switch?

YES >> Check the malfunctioning system. Refer to AT-108, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .
NO >> GO TO 2.

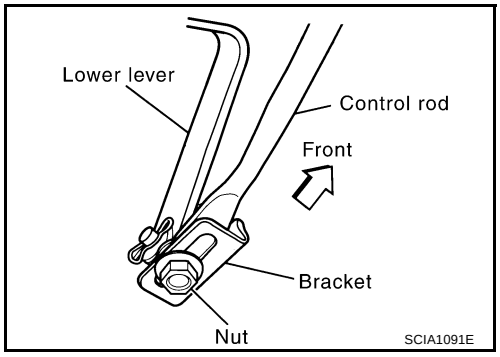
2. CHECK CONTROL LINKAGE

Check control linkage.

- Refer to AT-228, "Checking of A/T Position" .

OK or NG

OK >> GO TO 3.
NG >> Adjust control linkage. Refer to AT-228, "Adjustment of A/T Position" .



3. CHECK PARKING COMPONENTS

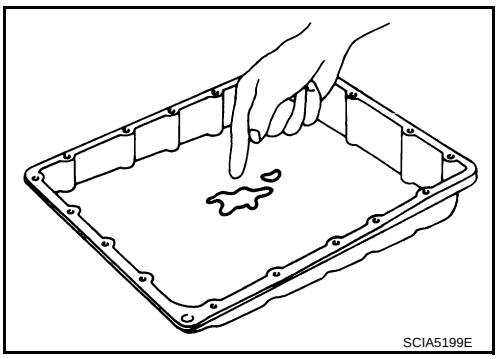
Check parking components. Refer to AT-249, "Parking Components" .

OK or NG

OK >> GO TO 4
NG >> Repair or replace damaged parts.

4. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-51, "Fluid Condition Check" .


SCIA5199E

OK or NG

OK >> **INSPECTION END**
NG >> Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.65).

In “N” Position, Vehicle Moves

ACS00848

SYMPTOM:

Vehicle moves forward or backward when selecting “N” position.

DIAGNOSTIC PROCEDURE

1. CHECK PNP SWITCH CIRCUIT

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" , AT-98, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

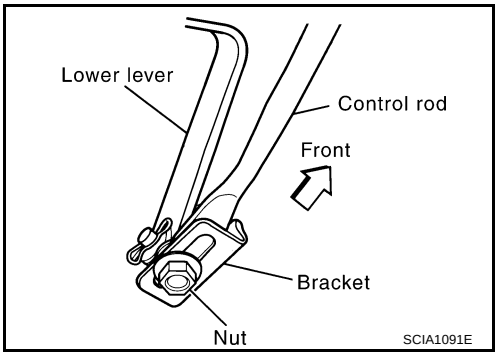
Do the self-diagnostic results indicate PNP switch?

YES >> Check the malfunctioning system. Refer to AT-108, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .
NO >> GO TO 2.

2. CHECK CONTROL LINKAGE

Check control linkage.

- Refer to AT-228, "Checking of A/T Position" .



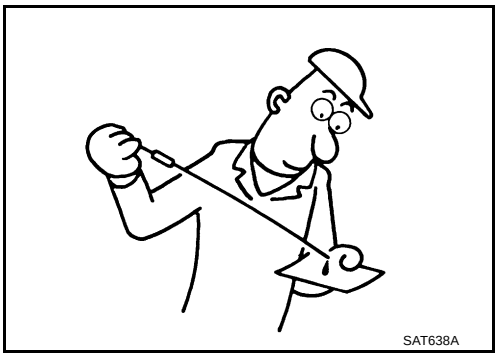
SCIA1091E

OK or NG

OK >> GO TO 3.
NG >> Adjust control linkage. Refer to AT-228, "Adjustment of A/T Position" .

3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

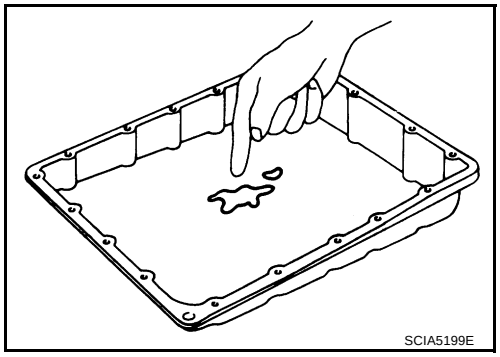

SAT638A

OK or NG

OK >> GO TO 4.
NG >> Refill ATF.

4. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-51, "Fluid Condition Check" .



OK or NG

OK >> GO TO 5.
NG >> Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.67).

5. CHECK SYMPTOM

Check again. Refer to AT-55, "Check at Idle" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 6.

6. CHECK TCM

1. Check TCM input/output signals. Refer to AT-85, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

Large Shock (“N” to “D” Position)

ACS00849

SYMPTOM:

A noticeable shock occurs when the selector lever is shifted from the “N” to “D” position.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" .

Do the self-diagnostic results indicate A/T fluid temperature sensor, engine speed signal, accelerator pedal position sensor, ATF pressure switch 1, front brake solenoid valve, CAN communication line?

YES >> Check the malfunctioning system. Refer to AT-130, "DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT" , AT-117, "DTC P0725 ENGINE SPEED SIGNAL" , AT-127, "DTC P1705 THROTTLE POSITION SENSOR" , AT-170, "DTC P1841 ATF PRESSURE SWITCH 1" , AT-148, "DTC P1757 FRONT BRAKE SOLENOID VALVE" , AT-100, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. ENGINE IDLE SPEED

Check engine idle speed. Refer to EC-30, "Idle Speed and Ignition Timing Check" .

OK or NG

OK >> GO TO 3.
NG >> Repair.

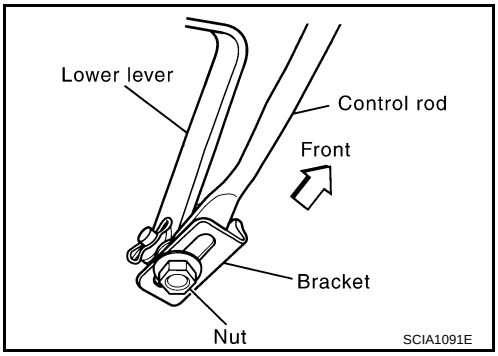
3. CHECK CONTROL LINKAGE

Check control linkage.

- Refer to AT-228, "Checking of A/T Position" .

OK or NG

OK >> GO TO 4.
NG >> Adjust control linkage. Refer to AT-228, "Adjustment of A/T Position" .

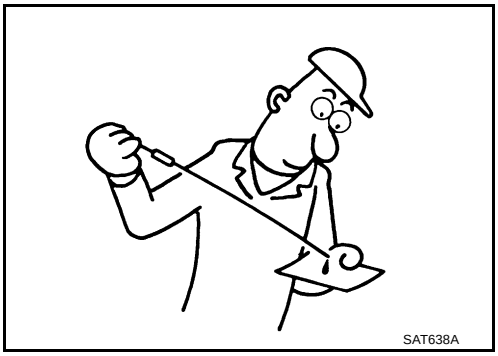


4. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 5.
NG >> Refill ATF.

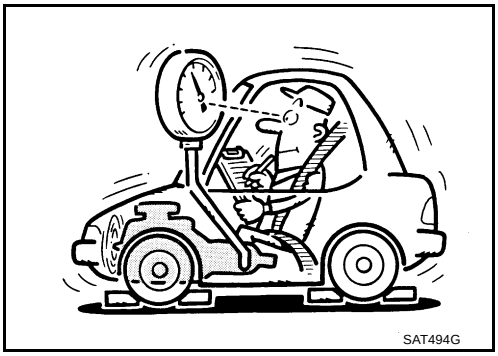


5. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in “D” position. Refer to AT-52, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 8.
NG - 1 >> Line pressure high: GO TO 6.
NG - 2 >> Line pressure low: GO TO 7.



6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-274, "DISASSEMBLY" .
3. Check the following items:

– Oil pump assembly. Refer to AT-289, "Oil Pump" .

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

7. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-274, "DISASSEMBLY" .
3. Check the following items:

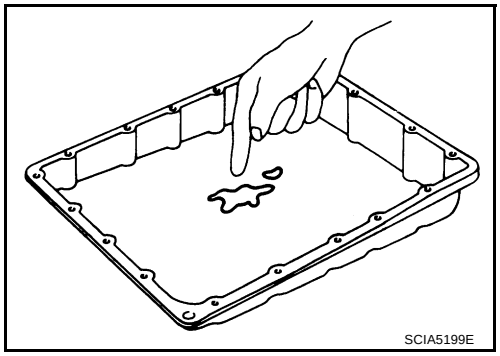
- Oil pump assembly. Refer to AT-289, "Oil Pump" .
- Power train system. Refer to AT-274, "DISASSEMBLY" .
- Transmission case. Refer to AT-274, "DISASSEMBLY" .

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-51, "Fluid Condition Check" .



OK or NG

OK >> GO TO 10.
NG >> GO TO 9.

9. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.1).

OK or NG

OK >> GO TO 10.
NG >> Repair or replace damaged parts.

10. CHECK SYMPTOM

Check again. Refer to AT-55, "Check at Idle" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 11.

11. CHECK TCM

1. Check TCM input/output signals. Refer to AT-85, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

Vehicle Does Not Creep Backward In “R” Position

ACS0084A

SYMPTOM:

The vehicle does not creep in the “R” position. Or an extreme lack of acceleration is observed.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" .

Do the self-diagnostic results indicate accelerator pedal position sensor, ATF pressure switch 6, high and low reverse clutch solenoid valve, CAN communication line, PNP switch?

YES >> Check the malfunctioning system. Refer to AT-127, "DTC P1705 THROTTLE POSITION SENSOR" , AT-176, "DTC P1846 ATF PRESSURE SWITCH 6" , AT-156, "DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE" , AT-100, "DTC U1000 CAN COMMUNICATION LINE" , AT-108, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .

NO >> GO TO 2.

2. CHECK CONTROL LINKAGE

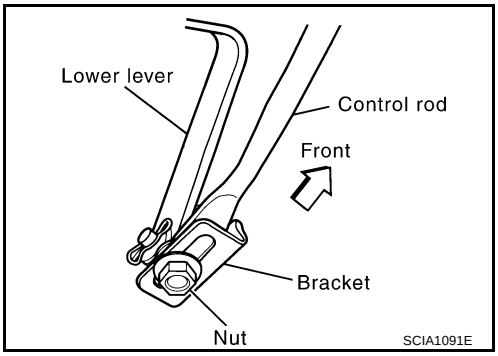
Check control linkage.

- Refer to AT-228, "Checking of A/T Position" .

OK or NG

OK >> GO TO 3.

NG >> Adjust control linkage. Refer to AT-228, "Adjustment of A/T Position" .



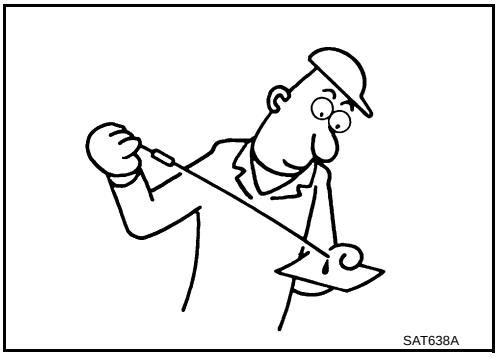
3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 4.

NG >> Refill ATF.



4. CHECK STALL TEST

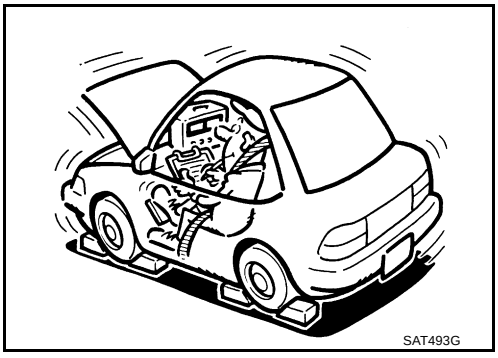
Check stall revolution with selector lever in “M” and “R” positions.
Refer to AT-51, "STALL TEST" .

OK or NG

OK >> GO TO 6.

OK in “M” position, NG in “R” position>>GO TO 5.

NG in both “M” and “R” positions>>GO TO 8.



5. DETECT MALFUNCTIONING ITEM

1. Disassemble A/T. Refer to AT-274, "DISASSEMBLY" .
2. Check the following items:

– Reverse brake. Refer to AT-274, "Disassembly" .

OK or NG

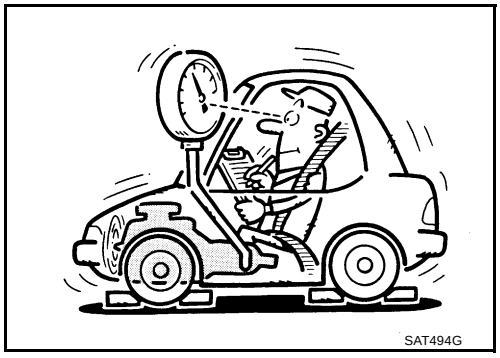
OK >> GO TO 9.
NG >> Repair or replace damaged parts.

6. CHECK LINE PRESSURE

Check line pressure with the engine idling. Refer to AT-52, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 9.
NG - 1 >> Line pressure high. GO TO 7.
NG - 2 >> Line pressure low. GO TO 8.



7. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-274, "DISASSEMBLY" .
3. Check the following items:

– Oil pump assembly. Refer to AT-289, "Oil Pump" .

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

8. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-274, "DISASSEMBLY" .
3. Check the following items:

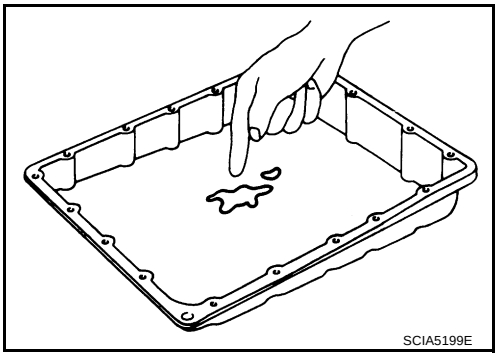
– Oil pump assembly. Refer to AT-289, "Oil Pump" .
– Power train system. Refer to AT-274, "DISASSEMBLY" .
– Transmission case. Refer to AT-274, "DISASSEMBLY" .

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

9. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-51, "Fluid Condition Check" .



OK or NG

OK >> GO TO 10.
NG >> GO TO 13.

10. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.43).

OK or NG

OK >> GO TO 11.
NG >> Repair or replace damaged parts.

11. CHECK SYMPTOM

Check again. Refer to AT-55, "Check at Idle" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 12.

12. CHECK TCM

1. Check TCM input/output signals. Refer to AT-85, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

13. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.43).

OK or NG

OK >> GO TO 11.
NG >> Repair or replace damaged parts.

Vehicle Does Not Creep Forward In “D” Position

ACS0084B

SYMPTOM:

Vehicle does not creep forward when selecting “D” position.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" , AT-98, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

Do the self-diagnostic results indicate accelerator pedal position sensor, CAN communication line, PNP switch?

YES >> Check the malfunctioning system. Refer to AT-127, "DTC P1705 THROTTLE POSITION SENSOR" , AT-100, "DTC U1000 CAN COMMUNICATION LINE" , AT-108, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .

NO >> GO TO 2.

2. CHECK CONTROL LINKAGE

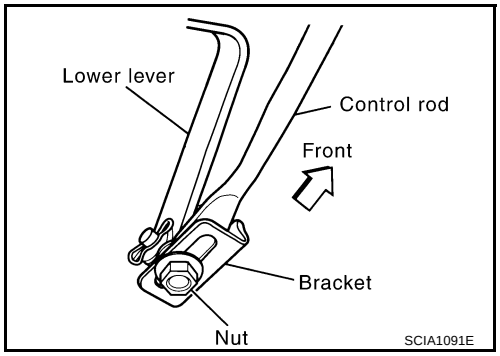
Check control linkage.

- Refer to AT-228, "Checking of A/T Position" .

OK or NG

OK >> GO TO 3.

NG >> Adjust control linkage. Refer to AT-228, "Adjustment of A/T Position" .



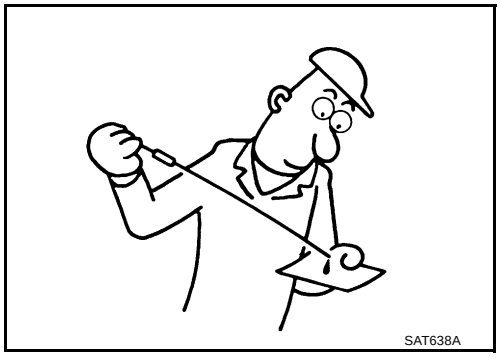
3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 4.

NG >> Refill ATF.



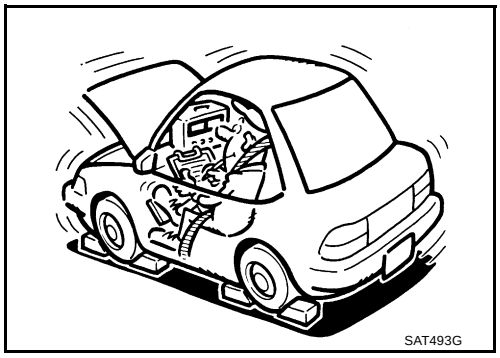
4. CHECK STALL TEST

Check stall revolution with selector lever in “D” position. Refer to AT-51, "STALL TEST" .

OK or NG

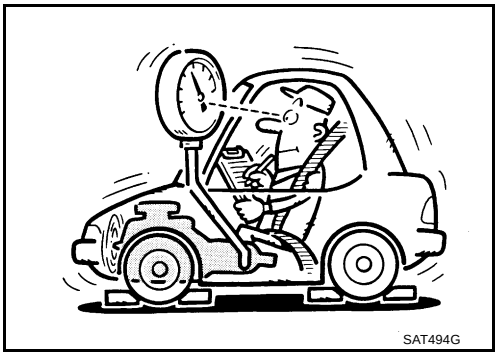
OK >> GO TO 5.

NG >> GO TO 7.



5. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in “D” position. Refer to AT-52, "LINE PRESSURE TEST" .


SAT494G

OK or NG

OK >> GO TO 8.
NG - 1 >> Line pressure high. GO TO 6.
NG - 2 >> Line pressure low. GO TO 7.

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-274, "DISASSEMBLY" .
3. Check the following items:

- Oil pump assembly. Refer to AT-289, "Oil Pump" .

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

7. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-274, "DISASSEMBLY" .
3. Check the following items:

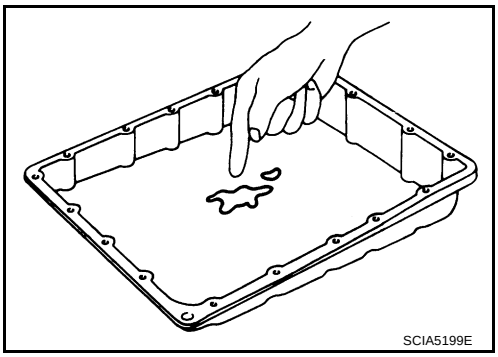
- Oil pump assembly. Refer to AT-289, "Oil Pump" .
- Power train system. Refer to AT-274, "DISASSEMBLY" .
- Transmission case. Refer to AT-274, "DISASSEMBLY" .

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-51, "Fluid Condition Check" .


SCIA5199E

OK or NG

OK >> GO TO 9.
NG >> GO TO 12.

9. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.43).

OK or NG

OK >> GO TO 10.
NG >> Repair or replace damaged parts.

10. CHECK SYMPTOM

Check again. Refer to AT-55, "Check at Idle" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 11.

11. CHECK TCM

1. Check TCM input/output signals. Refer to AT-85, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

12. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.43).

OK or NG

OK >> GO TO 10.
NG >> Repair or replace damaged parts.

Vehicle Cannot Be Started From D1

ACS0084C

SYMPTOM:

Vehicle cannot be started from D1 on cruise test - Part 1.

DIAGNOSTIC PROCEDURE

1. CONFIRM THE SYMPTOM

Check if vehicle creeps in “R” position.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-193, "Vehicle Does Not Creep Backward In “R” Position" .

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" , AT-98, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)"

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" , AT-99, "Judgement Self-diagnosis Code" .
NO >> GO TO 3.

3. CHECK ACCELERATOR POSITION (APP) SENSOR

Check accelerator pedal position (APP) sensor. Refer to AT-127, "DTC P1705 THROTTLE POSITION SENSOR"

OK or NG

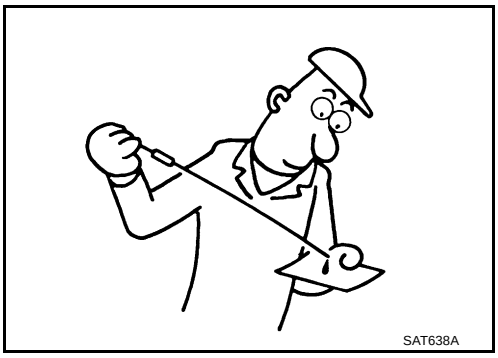
OK >> GO TO 4.
NG >> Repair or replace accelerator pedal position (APP) sensor.

4. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 5.
NG >> Refill ATF.

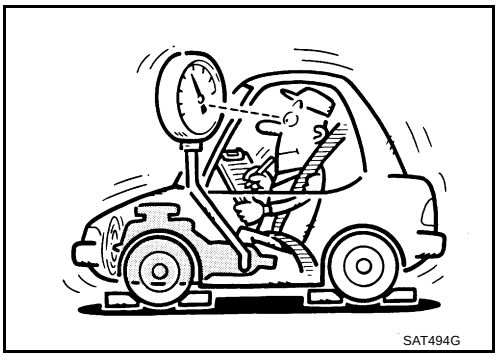

SAT638A

5. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to AT-52, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 8.
NG - 1 >> Line pressure high. GO TO 6.
NG - 2 >> Line pressure low. GO TO 7.


SAT494G

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-274, "DISASSEMBLY" .
3. Check the following items:

- Oil pump assembly. Refer to AT-289, "Oil Pump" .

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

7. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-274, "DISASSEMBLY" .
3. Check the following items:

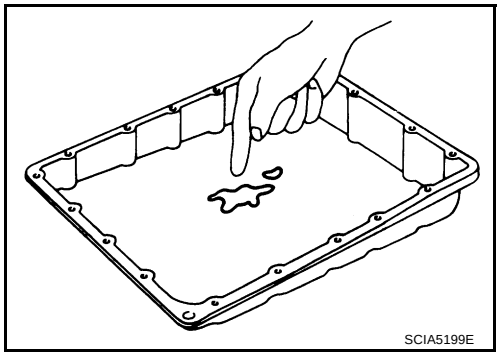
- Oil pump assembly. Refer to AT-289, "Oil Pump" .
- Power train system. Refer to AT-274, "DISASSEMBLY" .
- Transmission case. Refer to AT-274, "DISASSEMBLY" .

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-51, "Fluid Condition Check" .



OK or NG

OK >> GO TO 9.
NG >> GO TO 12.

9. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.23).

OK or NG

OK >> GO TO 10.
NG >> Repair or replace damaged parts.

10. CHECK SYMPTOM

Check again. Refer to AT-56, "Cruise Test - Part 1" , AT-58, "Cruise Test - Part 2" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 11.

11. CHECK TCM

1. Check TCM input/output signals. Refer to AT-85, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

12. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.23).

OK or NG

OK >> GO TO 10.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: $D_1 \rightarrow D_2$

ACS0084D

SYMPTOM:

The vehicle does not shift-up from the D_1 to D_2 gear at the specified speed.

DIAGNOSTIC PROCEDURE

1. CONFIRM THE SYMPTOM

Check if vehicle creeps forward in “D” position and vehicle can be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-196, "Vehicle Does Not Creep Forward In “D” Position" , AT-198, "Vehicle Cannot Be Started From D_1" .

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" .

Do the self-diagnostic results indicate ATF pressure switch 5, direct clutch solenoid valve, accelerator pedal position sensor, vehicle speed sensor A/T (revolution sensor) and vehicle speed sensor MTR?

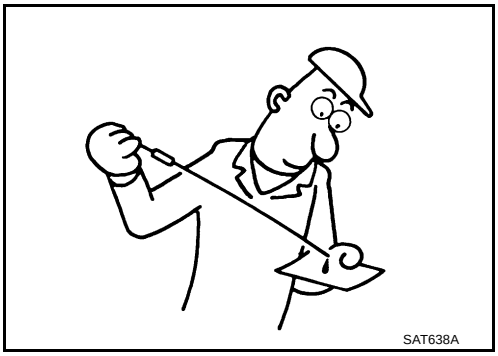
YES >> Check the malfunctioning system. Refer to AT-174, "DTC P1845 ATF PRESSURE SWITCH 5" , AT-152, "DTC P1762 DIRECT CLUTCH SOLENOID VALVE" , AT-127, "DTC P1705 THROTTLE POSITION SENSOR" , AT-112, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)" , AT-137, "DTC P1721 VEHICLE SPEED SENSOR MTR" .
NO >> GO TO 3.

3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 4.
NG >> Refill ATF.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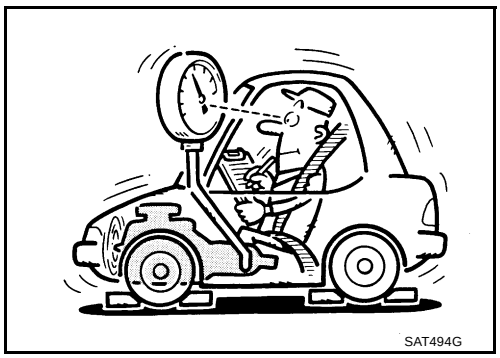
4. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to AT-52, "LINE PRESSURE TEST" .



OK or NG

OK >> GO TO 7.
NG - 1 >> Line pressure high. GO TO 5.
NG - 2 >> Line pressure low. GO TO 6.

5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-274, "DISASSEMBLY" .
3. Check the following items:

- Oil pump assembly. Refer to AT-289, "Oil Pump" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-274, "DISASSEMBLY" .
3. Check the following items:

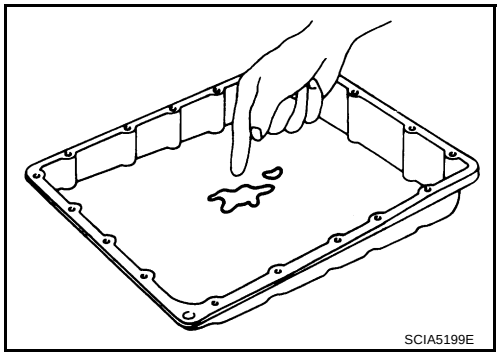
- Oil pump assembly. Refer to AT-289, "Oil Pump" .
- Power train system. Refer to AT-274, "DISASSEMBLY" .
- Transmission case. Refer to AT-274, "DISASSEMBLY" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-51, "Fluid Condition Check" .



OK or NG

OK >> GO TO 8.
NG >> GO TO 11.

8. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.10).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

9. CHECK SYMPTOM

Check again. Refer to AT-56, "Cruise Test - Part 1" , AT-58, "Cruise Test - Part 2" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 10.

10. CHECK TCM

1. Check TCM input/output signals. Refer to AT-85, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

11. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.10).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: $D_2 \rightarrow D_3$

ACS0084E

SYMPTOM:

The vehicle does not shift-up from D_2 to D_3 gear at the specified speed.

DIAGNOSTIC PROCEDURE

1. CONFIRM THE SYMPTOM

Check if vehicle creeps forward in “D” position and vehicle can be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-196, "Vehicle Does Not Creep Forward In “D” Position" , AT-198, "Vehicle Cannot Be Started From D_1" .

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" .

Do the self-diagnostic results indicate ATF pressure switch 6, high and low reverse clutch solenoid valve, accelerator pedal position sensor, vehicle speed sensor A/T (revolution sensor) and vehicle speed sensor MTR?

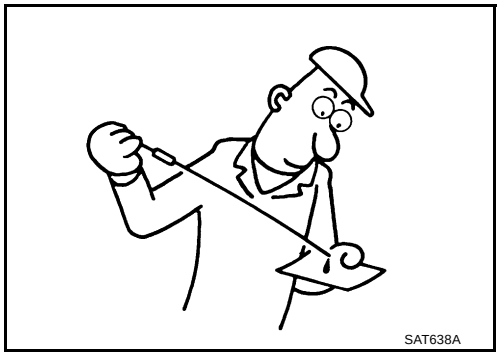
YES >> Check the malfunctioning system. Refer to AT-176, "DTC P1846 ATF PRESSURE SWITCH 6" , AT-156, "DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE" , AT-127, "DTC P1705 THROTTLE POSITION SENSOR" , AT-112, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)" , AT-137, "DTC P1721 VEHICLE SPEED SENSOR MTR" .
NO >> GO TO 3.

3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 4.
NG >> Refill ATF.

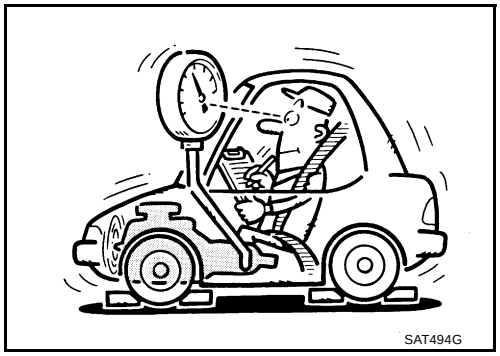


4. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to AT-52, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 7.
NG - 1 >> Line pressure high. GO TO 5.
NG - 2 >> Line pressure low. GO TO 6.



5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-274, "DISASSEMBLY" .
3. Check the following items:

- Oil pump assembly. Refer to AT-289, "Oil Pump" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-274, "DISASSEMBLY" .
3. Check the following items:

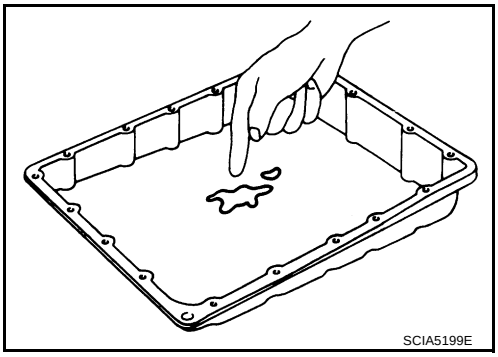
- Oil pump assembly. Refer to AT-289, "Oil Pump" .
- Power train system. Refer to AT-274, "DISASSEMBLY" .
- Transmission case. Refer to AT-274, "DISASSEMBLY" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-51, "Fluid Condition Check" .



OK or NG

OK >> GO TO 8.
NG >> GO TO 11.

8. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.11).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

9. CHECK SYMPTOM

Check again. Refer to AT-56, "Cruise Test - Part 1" , AT-58, "Cruise Test - Part 2" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 10.

10. CHECK TCM

1. Check TCM input/output signals. Refer to AT-85, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

11. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.11).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: $D_3 \rightarrow D_4$

ACS0084F

SYMPTOM:

- **The vehicle does not shift-up from the D_3 to D_4 gear at the specified speed.**
- **The vehicle does not shift-up from the D_3 to D_4 gear unless A/T is warmed up.**

DIAGNOSTIC PROCEDURE

1. CONFIRM THE SYMPTOM

Check if vehicle creeps forward in “D” position and vehicle can be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-196, "Vehicle Does Not Creep Forward In “D” Position" , AT-198, "Vehicle Cannot Be Started From D_1" .

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" .

Do the self-diagnostic results indicate ATF pressure switch 1, ATF pressure switch 3, front brake solenoid valve, input clutch solenoid valve, accelerator pedal position sensor, vehicle speed sensor A/T (revolution sensor) and vehicle speed sensor MTR?

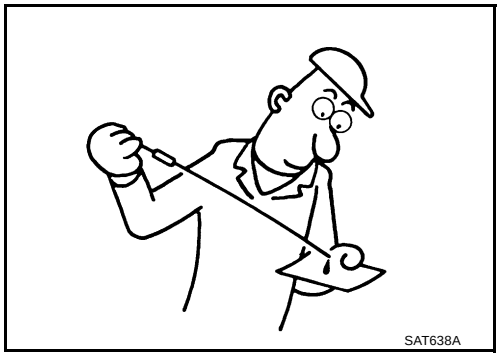
YES >> Check the malfunctioning system. Refer to AT-170, "DTC P1841 ATF PRESSURE SWITCH 1" , AT-172, "DTC P1843 ATF PRESSURE SWITCH 3" , AT-144, "DTC P1752 INPUT CLUTCH SOLENOID VALVE" , AT-148, "DTC P1757 FRONT BRAKE SOLENOID VALVE" , AT-127, "DTC P1705 THROTTLE POSITION SENSOR" , AT-112, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)" , AT-137, "DTC P1721 VEHICLE SPEED SENSOR MTR" .
NO >> GO TO 3.

3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 4.
NG >> Refill ATF.

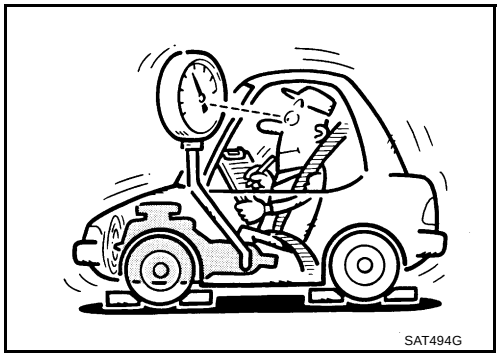

SAT638A

4. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to AT-52, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 7.
NG - 1 >> Line pressure high. GO TO 5.
NG - 2 >> Line pressure low. GO TO 6.


SAT494G

5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-274, "DISASSEMBLY" .
3. Check the following items:

– Oil pump assembly. Refer to AT-289, "Oil Pump" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-274, "DISASSEMBLY" .
3. Check the following items:

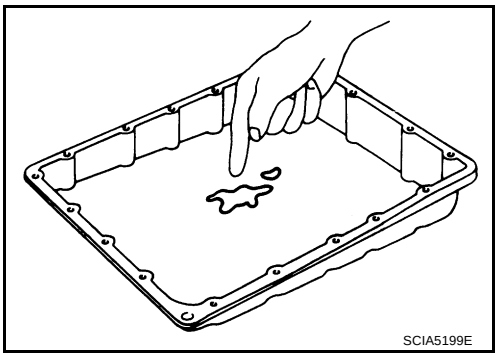
– Oil pump assembly. Refer to AT-289, "Oil Pump" .
– Power train system. Refer to AT-274, "DISASSEMBLY" .
– Transmission case. Refer to AT-274, "DISASSEMBLY" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-51, "Fluid Condition Check" .


SCIA5199E

OK or NG

OK >> GO TO 8.
NG >> GO TO 11.

8. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.12).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

9. CHECK SYMPTOM

Check again. Refer to AT-56, "Cruise Test - Part 1" , AT-58, "Cruise Test - Part 2" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 10.

10. CHECK TCM

1. Check TCM input/output signals. Refer to AT-85, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

11. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.12).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: $D_4 \rightarrow D_5$

ACS0084G

SYMPTOM:

- **The vehicle does not shift-up from the D_4 to D_5 gear at the specified speed.**
- **The vehicle does not shift-up from the D_4 to D_5 gear unless A/T is warmed up.**

DIAGNOSTIC PROCEDURE

1. CONFIRM THE SYMPTOM

Check if vehicle creeps forward in “D” position and vehicle can be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-196, "Vehicle Does Not Creep Forward In “D” Position" , AT-198, "Vehicle Cannot Be Started From D_1" .

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" .

Do the self-diagnostic results indicate ATF pressure switch 1, ATF pressure switch 5, front brake solenoid valve, direct clutch solenoid valve, accelerator pedal position sensor, turbine revolution sensor, vehicle speed sensor A/T (revolution sensor) and vehicle speed sensor MTR?

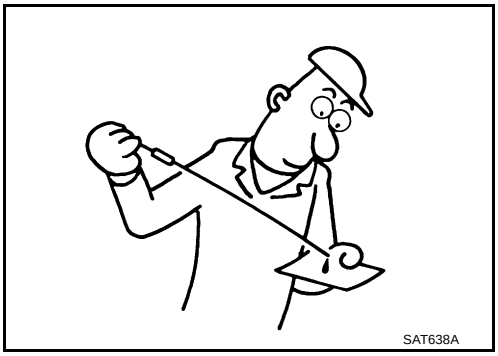
YES >> Check the malfunctioning system. Refer to AT-170, "DTC P1841 ATF PRESSURE SWITCH 1" , AT-174, "DTC P1845 ATF PRESSURE SWITCH 5" , AT-148, "DTC P1757 FRONT BRAKE SOLENOID VALVE" , AT-152, "DTC P1762 DIRECT CLUTCH SOLENOID VALVE" , AT-127, "DTC P1705 THROTTLE POSITION SENSOR" , AT-135, "DTC P1716 TURBINE REVOLUTION SENSOR" , AT-112, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)" , AT-137, "DTC P1721 VEHICLE SPEED SENSOR MTR" .
NO >> GO TO 3.

3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 4.
NG >> Refill ATF.

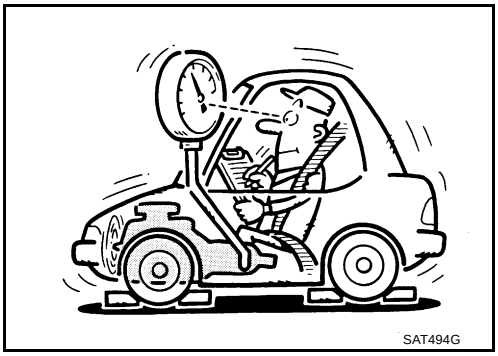


4. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to AT-52, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 7.
NG - 1 >> Line pressure high. GO TO 5.
NG - 2 >> Line pressure low. GO TO 6.



5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-274, "DISASSEMBLY" .
3. Check the following items:

- Oil pump assembly. Refer to AT-289, "Oil Pump" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-274, "DISASSEMBLY" .
3. Check the following items:

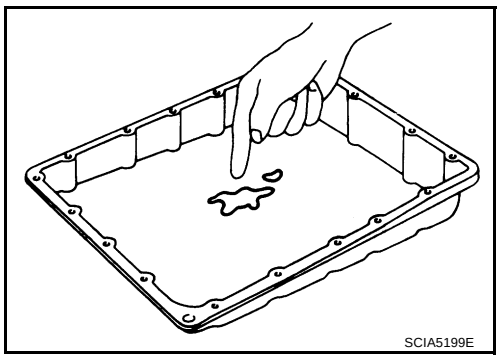
- Oil pump assembly. Refer to AT-289, "Oil Pump" .
- Power train system. Refer to AT-274, "DISASSEMBLY" .
- Transmission case. Refer to AT-274, "DISASSEMBLY" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-51, "Fluid Condition Check" .



OK or NG

OK >> GO TO 8.
NG >> GO TO 11.

8. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.13).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

9. CHECK SYMPTOM

Check again. Refer to AT-56, "Cruise Test - Part 1" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 10.

10. CHECK TCM

1. Check TCM input/output signals. Refer to AT-85, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

11. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.13).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

A/T Does Not Perform Lock-up

ACS0084H

SYMPTOM:

A/T does not perform lock-up at the specified speed.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" , AT-98, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

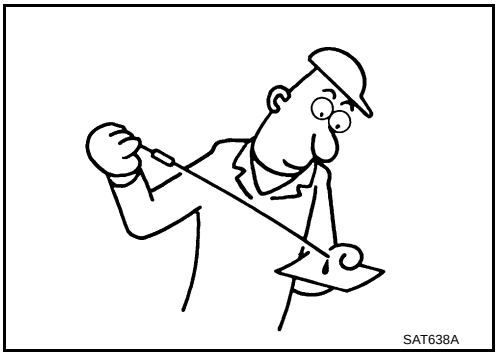
Do the self-diagnostic results indicate torque converter clutch solenoid valve, engine speed signal, turbine revolution sensor, accelerator pedal position sensor, CAN communication?

YES >> Check the malfunctioning system. Refer to AT-119, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE" , AT-117, "DTC P0725 ENGINE SPEED SIGNAL" , AT-135, "DTC P1716 TURBINE REVOLUTION SENSOR" , AT-127, "DTC P1705 THROTTLE POSITION SENSOR" , AT-100, "DTC U1000 CAN COMMUNICATION LINE" .

NO >> GO TO 2.

2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .


SAT638A

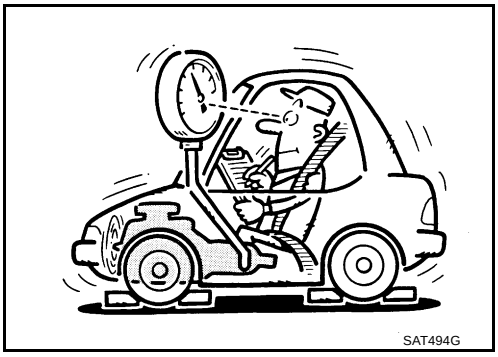
OK or NG

OK >> GO TO 3.

NG >> Refill ATF.

3. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to AT-52, "LINE PRESSURE TEST" .


SAT494G

OK or NG

OK >> GO TO 6.

NG - 1 >> Line pressure high. GO TO 4.

NG - 2 >> Line pressure low. GO TO 5.

4. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-274, "DISASSEMBLY" .
3. Check the following items:

- Oil pump assembly. Refer to AT-289, "Oil Pump" .

OK or NG

OK >> GO TO 6.

NG >> Repair or replace damaged parts.

5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-274, "DISASSEMBLY" .
3. Check the following items:

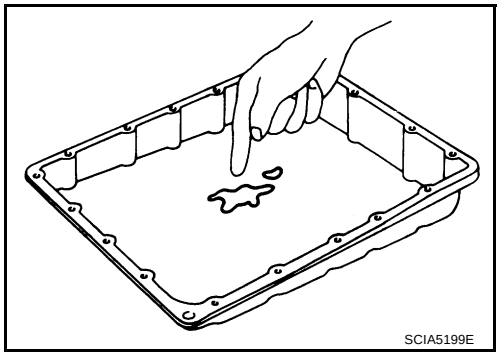
- Oil pump assembly. Refer to AT-289, "Oil Pump" .
- Power train system. Refer to AT-274, "DISASSEMBLY" .
- Transmission case. Refer to AT-274, "DISASSEMBLY" .

OK or NG

OK >> GO TO 6.
NG >> Repair or replace damaged parts.

6. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-51, "Fluid Condition Check" .



OK or NG

OK >> GO TO 7.
NG >> GO TO 10.

7. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.24).

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK SYMPTOM

Check again. Refer to AT-56, "Cruise Test - Part 1" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 9.

9. CHECK TCM

1. Check TCM input/output signals. Refer to AT-85, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

10. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.24).

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

A/T Does Not Hold Lock-up Condition

ACS0084I

SYMPTOM:

The lock-up condition cannot be maintained for more than 30 seconds.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

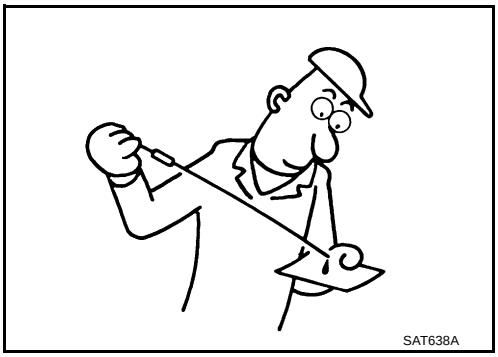
Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" , AT-98, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

Do the self-diagnostic results indicate torque converter clutch solenoid valve, engine speed signal, turbine revolution sensor, CAN communication?

YES >> Check the malfunctioning system. Refer to AT-119, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE" , AT-117, "DTC P0725 ENGINE SPEED SIGNAL" , AT-135, "DTC P1716 TURBINE REVOLUTION SENSOR" , AT-100, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

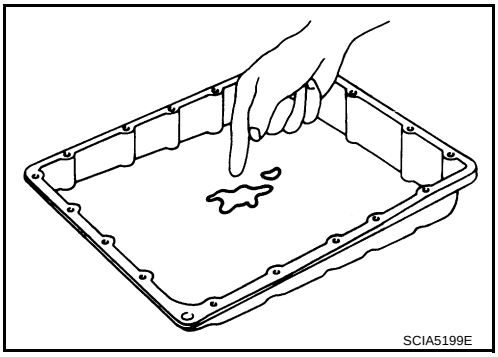

SAT638A

OK or NG

OK >> GO TO 3.
NG >> Refill ATF.

3. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-51, "Fluid Condition Check" .


SCIA5199E

OK or NG

OK >> GO TO 4.
NG >> GO TO 7.

4. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.25).

OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

5. CHECK SYMPTOM

Check again. Refer to AT-56, "Cruise Test - Part 1" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 6.

6. CHECK TCM

1. Check TCM input/output signals. Refer to AT-85, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

7. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.25).

OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

Lock-up Is Not Released

ACS0084J

SYMPTOM:

The lock-up condition cannot be cancelled even after releasing the accelerator pedal.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" , AT-98, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

Do the self-diagnostic results indicate torque converter clutch solenoid valve, engine speed signal, turbine revolution sensor, CAN communication?

YES >> Check the malfunctioning system. Refer to AT-119, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE" , AT-117, "DTC P0725 ENGINE SPEED SIGNAL" , AT-135, "DTC P1716 TURBINE REVOLUTION SENSOR" , AT-100, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK SYMPTOM

Check again. Refer to AT-56, "Cruise Test - Part 1" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 3.

3. CHECK TCM

1. Check TCM input/output signals. Refer to AT-85, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

Engine Speed Does Not Return To Idle

ACS0084K

SYMPTOM:

When a shift-down is performed, the engine speed does not smoothly return to the idling speed.

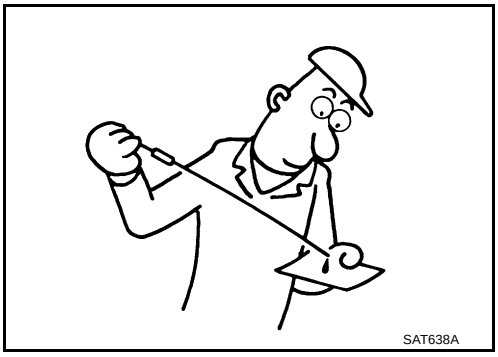
DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 2.
NG >> Refill ATF.



2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" .

Do the self-diagnostic results indicate front brake solenoid valve, direct clutch solenoid valve, ATF pressure switch 1, ATF pressure switch 5, accelerator pedal position sensor, vehicle speed sensor A/T (revolution sensor) and vehicle speed sensor MTR?

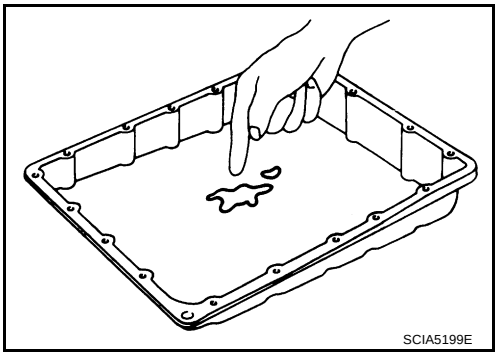
YES >> Check the malfunctioning system. Refer to AT-148, "DTC P1757 FRONT BRAKE SOLENOID VALVE" , AT-152, "DTC P1762 DIRECT CLUTCH SOLENOID VALVE" , AT-170, "DTC P1841 ATF PRESSURE SWITCH 1" , AT-174, "DTC P1845 ATF PRESSURE SWITCH 5" , AT-127, "DTC P1705 THROTTLE POSITION SENSOR" , AT-112, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)" , AT-137, "DTC P1721 VEHICLE SPEED SENSOR MTR" .
NO >> GO TO 3.

3. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-51, "Fluid Condition Check" .

OK or NG

OK >> GO TO 4.
NG >> GO TO 7.



4. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.72).

OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

5. CHECK SYMPTOM

Check again. Refer to AT-56, "Cruise Test - Part 1" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 6.

6. CHECK TCM

1. Check TCM input/output signals. Refer to AT-85, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

7. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.72).

OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

Cannot Be Changed to Manual Mode

ACS0084L

SYMPTOM:

Does not change to manual mode when manual shift gate is used.

DIAGNOSTIC PROCEDURE

1. MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-164, "DTC P1815 MANUAL MODE SWITCH" .

OK or NG

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK SELF-DIAGNOSIS RESULTS

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" .

Do the self-diagnosis results indicate turbine revolution sensor?

YES >> Check the malfunctioning system. Refer to AT-135, "DTC P1716 TURBINE REVOLUTION SENSOR" .
NO >> **INSPECTION END**

A/T Does Not Shift: 5th gear → 4th gear

ACS0084M

SYMPTOM:

When shifted from M5 to M4 position in manual mode, does not downshift from 5th to 4th gear.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" .

Do the self-diagnostic results indicate PNP switch, ATF pressure switch 1?

YES >> Check the malfunctioning system. Refer to AT-108, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" , AT-170, "DTC P1841 ATF PRESSURE SWITCH 1" .

NO >> GO TO 2.

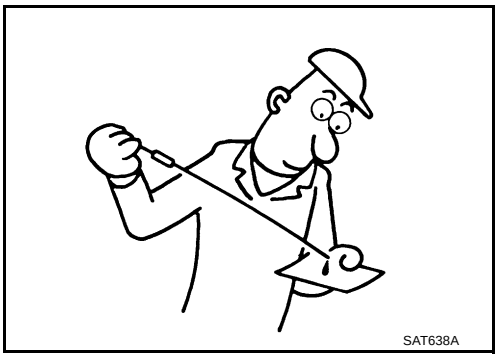
2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 3.

NG >> Refill ATF.



3. CHECK CONTROL LINKAGE

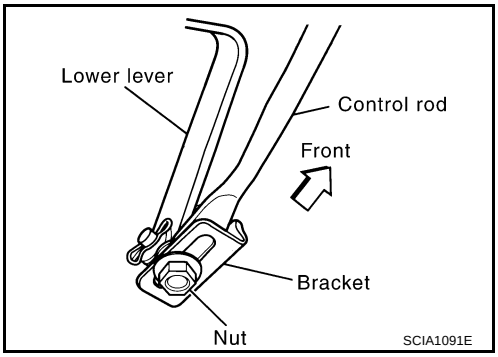
Check control linkage.

- Refer to AT-228, "Checking of A/T Position" .

OK or NG

OK >> GO TO 4.

NG >> Adjust control linkage. Refer to AT-228, "Adjustment of A/T Position" .



4. MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-164, "DTC P1815 MANUAL MODE SWITCH" .

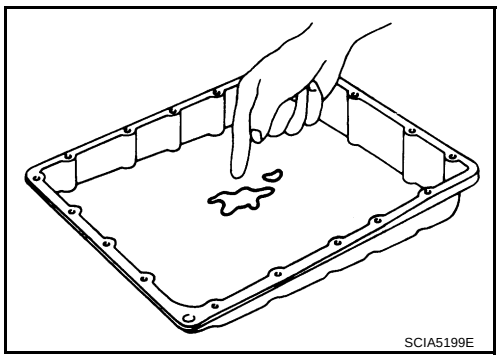
OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts.

5. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-51, "Fluid Condition Check" .



OK or NG

OK >> GO TO 6.
NG >> GO TO 9.

6. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.14).

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK SYMPTOM

Check again. Refer to AT-59, "Cruise Test - Part 3" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 8.

8. CHECK TCM

1. Check TCM input/output signals. Refer to AT-85, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

9. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.14).

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: 4th gear → 3rd gear

ACS0084N

SYMPTOM:

When shifted from M4 to M3 position in manual mode, does not downshift from 4th to 3rd gear.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" .

Do the self-diagnostic results indicate PNP switch, ATF pressure switch 1, ATF pressure switch 3?

YES >> Check the malfunctioning system. Refer to AT-108, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" , AT-170, "DTC P1841 ATF PRESSURE SWITCH 1" , AT-172, "DTC P1843 ATF PRESSURE SWITCH 3" .

NO >> GO TO 2.

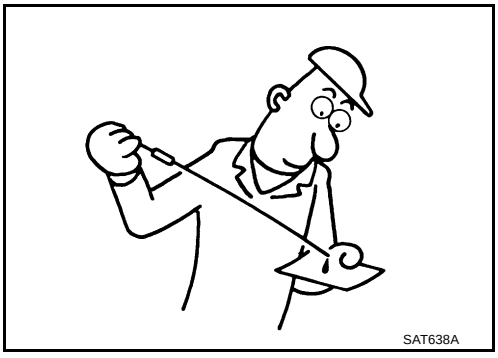
2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 3.

NG >> Refill ATF.



3. CHECK CONTROL LINKAGE

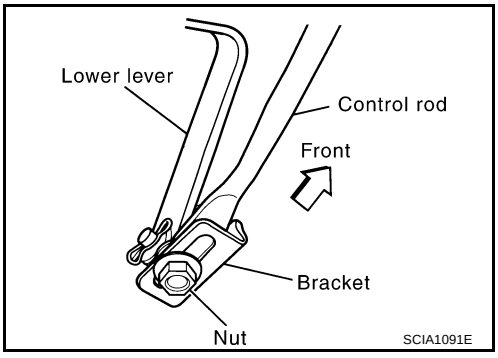
Check control linkage.

- Refer to AT-228, "Checking of A/T Position" .

OK or NG

OK >> GO TO 4.

NG >> Adjust control linkage. Refer to AT-228, "Adjustment of A/T Position" .



4. MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-164, "DTC P1815 MANUAL MODE SWITCH" .

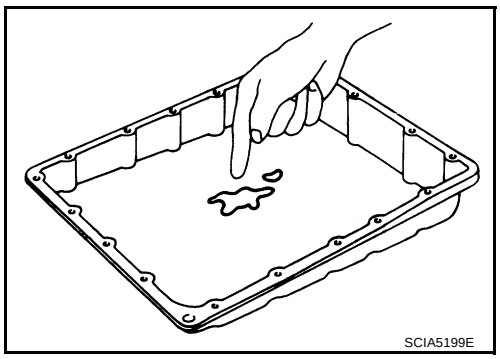
OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts.

5. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-51, "Fluid Condition Check" .



OK or NG

OK >> GO TO 6.
NG >> GO TO 9.

6. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.15).

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK SYMPTOM

Check again. Refer to AT-59, "Cruise Test - Part 3" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 8.

8. CHECK TCM

1. Check TCM input/output signals. Refer to AT-85, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

9. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.15).

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: 3rd gear → 2nd gear

ACS0084O

SYMPTOM:

When shifted from M3 to M2 position in manual mode, does not downshift from 3rd to 2nd gear.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" .

Do the self-diagnostic results indicate PNP switch, ATF pressure switch 6?

YES >> Check the malfunctioning system. Refer to AT-108, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" , AT-176, "DTC P1846 ATF PRESSURE SWITCH 6" .

NO >> GO TO 2.

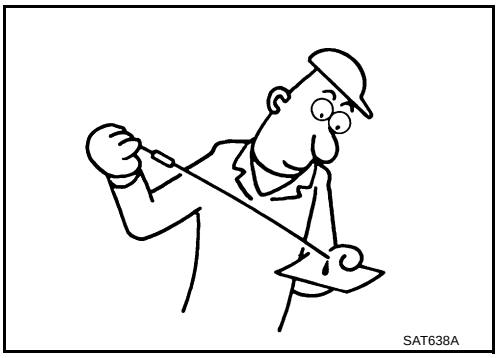
2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 3.

NG >> Refill ATF.



3. CHECK CONTROL LINKAGE

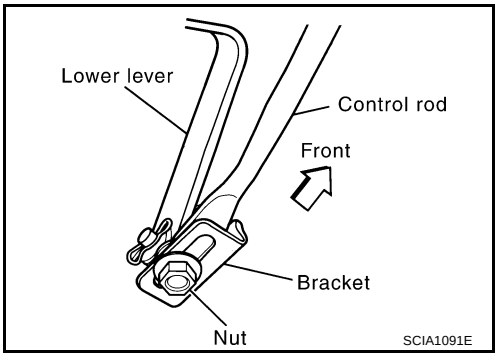
Check control linkage.

- Refer to AT-228, "Checking of A/T Position" .

OK or NG

OK >> GO TO 4.

NG >> Adjust control linkage. Refer to AT-228, "Adjustment of A/T Position" .



4. MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-164, "DTC P1815 MANUAL MODE SWITCH" .

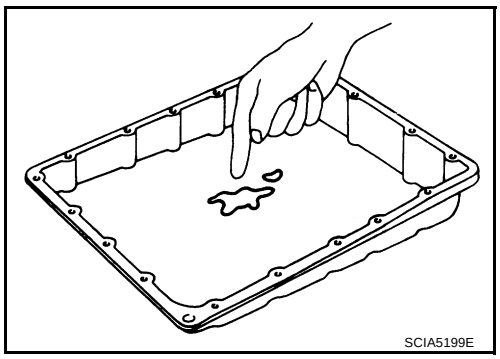
OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts.

5. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-51, "Fluid Condition Check" .



OK or NG

OK >> GO TO 6.
NG >> GO TO 9.

6. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.16).

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK SYMPTOM

Check again. Refer to AT-59, "Cruise Test - Part 3" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 8.

8. CHECK TCM

1. Check TCM input/output signals. Refer to AT-85, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

9. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.16).

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: 2nd gear → 1st gear

ACS0084P

SYMPTOM:

When shifted from M2 to M1 position in manual mode, does not downshift from 2nd to 1st gear.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" .

Do the self-diagnostic results indicate PNP switch, ATF pressure switch 5?

YES >> Check the malfunctioning system. Refer to AT-108, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" , AT-174, "DTC P1845 ATF PRESSURE SWITCH 5" .

NO >> GO TO 2.

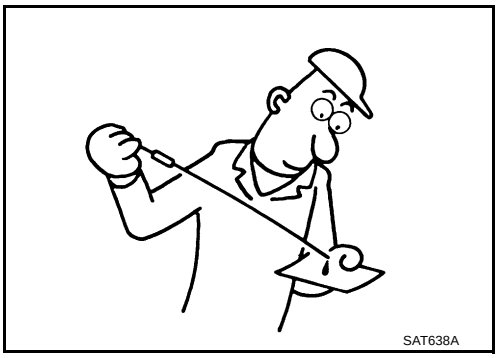
2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 3.

NG >> Refill ATF.



3. CHECK CONTROL LINKAGE

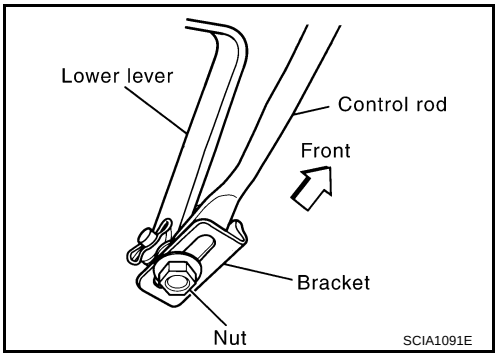
Check control linkage.

- Refer to AT-228, "Checking of A/T Position" .

OK or NG

OK >> GO TO 4.

NG >> Adjust control linkage. Refer to AT-228, "Adjustment of A/T Position" .



4. MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-164, "DTC P1815 MANUAL MODE SWITCH" .

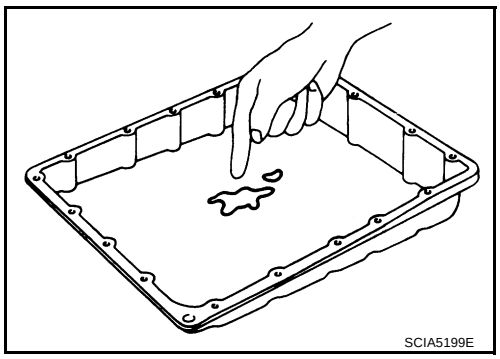
OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts.

5. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-51, "Fluid Condition Check" .



OK or NG

OK >> GO TO 6.
NG >> GO TO 9.

6. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.17).

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK SYMPTOM

Check again. Refer to AT-59, "Cruise Test - Part 3" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 8.

8. CHECK TCM

1. Check TCM input/output signals. Refer to AT-85, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

9. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.17).

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

Vehicle Does Not Decelerate By Engine Brake

ACS0084Q

SYMPTOM:

No engine brake is applied when the gear is shifted from the 2nd to 1st gear.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-88, "SELF-DIAGNOSTIC RESULT MODE" .

Do the self-diagnostic results indicate PNP switch, ATF pressure switch 5?

YES >> Check the malfunctioning system. Refer to AT-108, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" , AT-174, "DTC P1845 ATF PRESSURE SWITCH 5" .

NO >> GO TO 2.

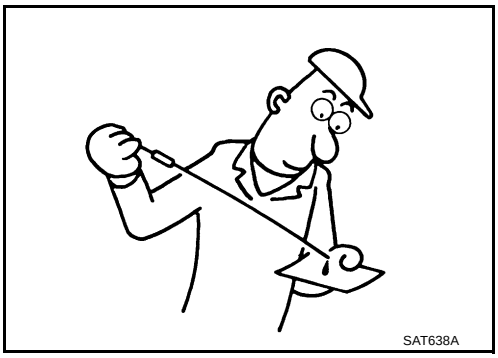
2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 3.

NG >> Refill ATF.



3. CHECK CONTROL LINKAGE

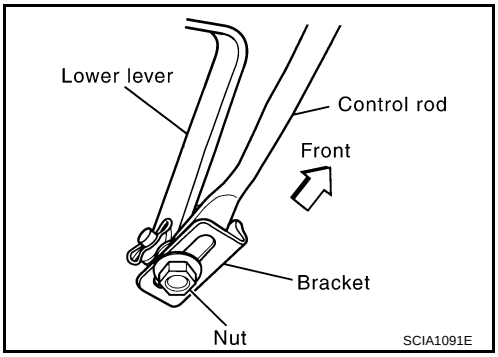
Check control linkage.

- Refer to AT-228, "Checking of A/T Position" .

OK or NG

OK >> GO TO 4.

NG >> Adjust control linkage. Refer to AT-228, "Adjustment of A/T Position" .



4. MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-164, "DTC P1815 MANUAL MODE SWITCH" .

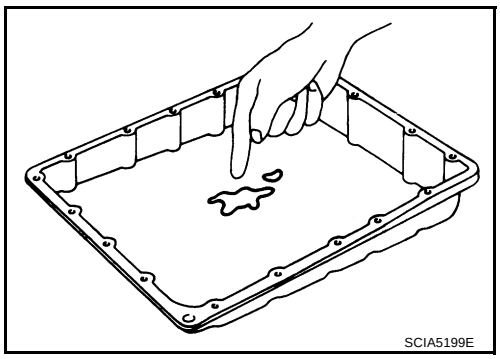
OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts.

5. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-237, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-51, "Fluid Condition Check" .



OK or NG

OK >> GO TO 6.
NG >> GO TO 9.

6. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.58).

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK SYMPTOM

Check again. Refer to AT-59, "Cruise Test - Part 3" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 8.

8. CHECK TCM

1. Check TCM input/output signals. Refer to AT-85, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

9. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-61, "Symptom Chart" (Symptom No.58).

OK or NG

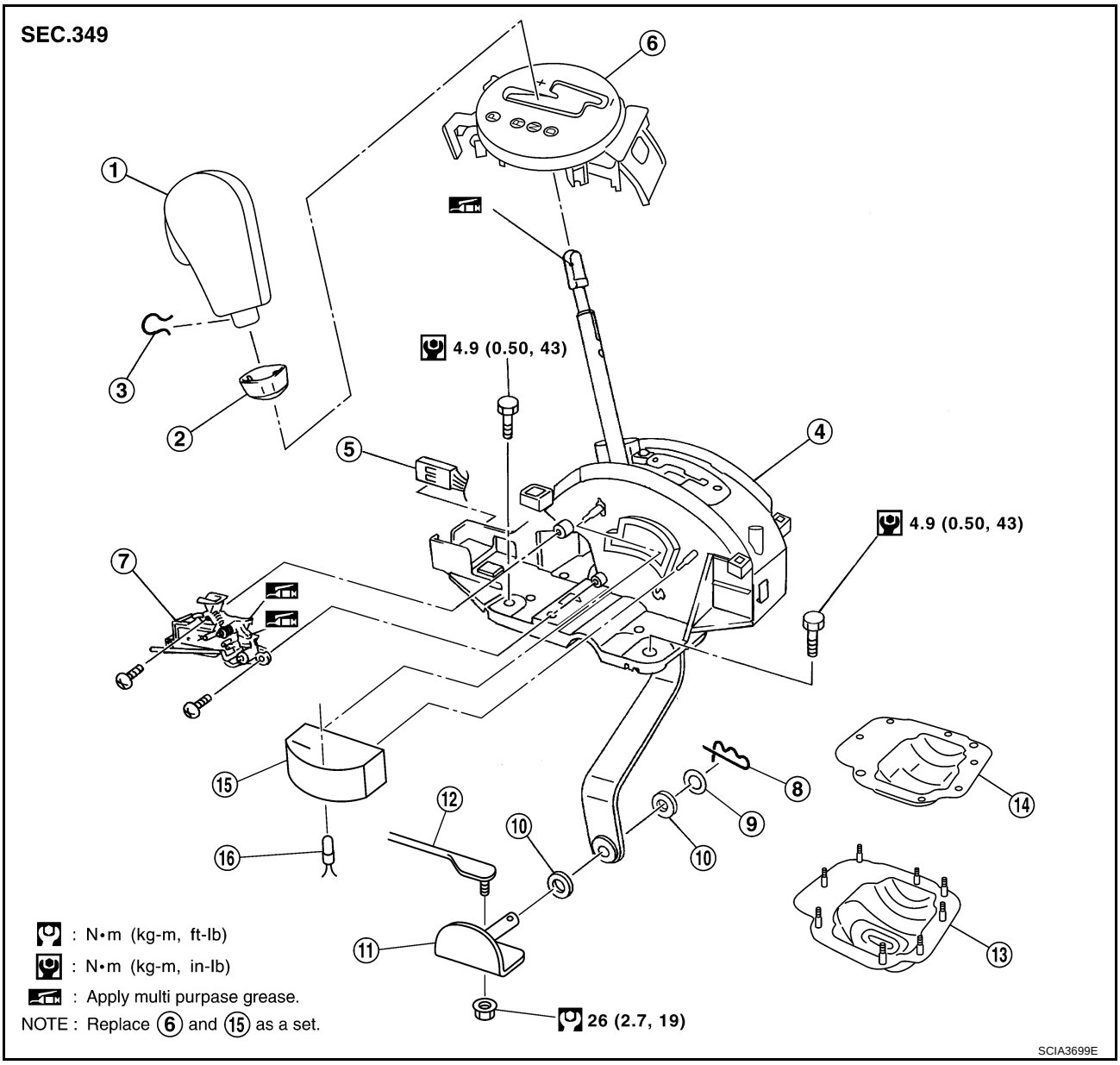
OK >> GO TO 7.
NG >> Repair or replace damaged parts.

SHIFT CONTROL SYSTEM

PFP:34901

Control Device Removal and Installation

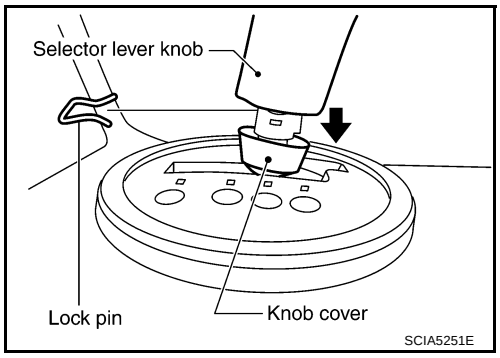
ACS000O6



1. Selector lever knob	2. Knob cover	3. Lock pin
4. Control device assembly	5. A/T device harness connector	6. Position indicator plate
7. Shift lock solenoid and park position switch assembly	8. Snap pin	9. Conical washer
10. Plain washer	11. Bracket	12. Control rod
13. Dust cover	14. Dust cover plate	15. Bulb case
16. Position lamp		

REMOVAL

1. Disconnect lower lever of control device and control rod.
2. Remove knob cover below selector lever downward.
3. Pull lock pin out of selector lever knob.
4. Remove selector lever knob.
5. Remove console finisher (A/T ring) and console finisher.
   - Refer to IP-10, "Component Parts Drawing" .
6. Remove center console.
   - Refer to IP-10, "Component Parts Drawing" .
7. Remove key interlock cable from control device.
   - Refer to AT-235, "Removal and Installation" .
8. Disconnect A/T device harness connector.
9. Remove control device assembly.



CAUTION:
Do not impact, or damage propeller shaft tube.

INSTALLATION

Install in reverse order of removal. Be careful of the following:

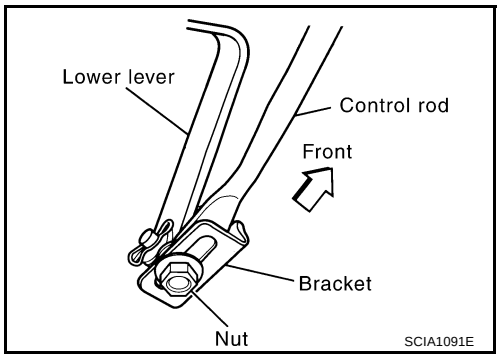
- After installation is completed, adjust and check A/T position.

Adjustment of A/T Position

ACS000O7

1. Loosen nut of control rod.
2. Place PNP switch and selector lever in “P” position.
3. While pressing lower lever toward rear of vehicle (in “P” position direction), tighten nut to specified torque.

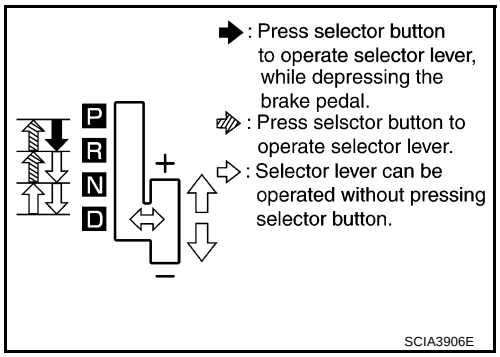
: 26 N·m (2.7 kg-m, 19 ft-lb)



Checking of A/T Position

ACS000O8

1. Place selector lever in “P” position, and turn ignition switch ON (engine stop).
2. Check that selector lever can be shifted to other than “P” position when brake pedal is depressed. Also check that selector lever can be shifted from “P” position only when brake pedal is depressed.
3. Move the selector lever and check for excessive effort, sticking, noise or rattle.
4. Confirm the selector lever stops at each position with the feel of engagement when it is moved through all the positions. Check whether or not the actual position the selector lever is in matches the position shown by the shift position indicator and the transmission body.
5. The method of operating the lever to individual positions correctly should be as shown in the figure.
6. When selector button is pressed in “P”, “R”, or “N” position without applying forward/backward force to selector lever, check button operation for sticking.
7. Confirm the back-up lamps illuminate only when lever is placed in the “R” position. Confirm the back-up lamps does not illuminate when selector lever is pushed against “R” position in the “P” or “N” position.
8. Confirm the engine can only be started with the selector lever in the “P” and “N” positions. (With selector lever in the “P” position, engine can be started even when selector lever is moved forward and backward.)
9. Check that transmission is locked completely in “P” position.



10. When selector lever is set to manual shift gate, check that manual mode is displayed on combination meter.
    Shift selector lever to “+” and “-” sides, and check that set shift position changes.

A/T SHIFT LOCK SYSTEM

PFP:34950

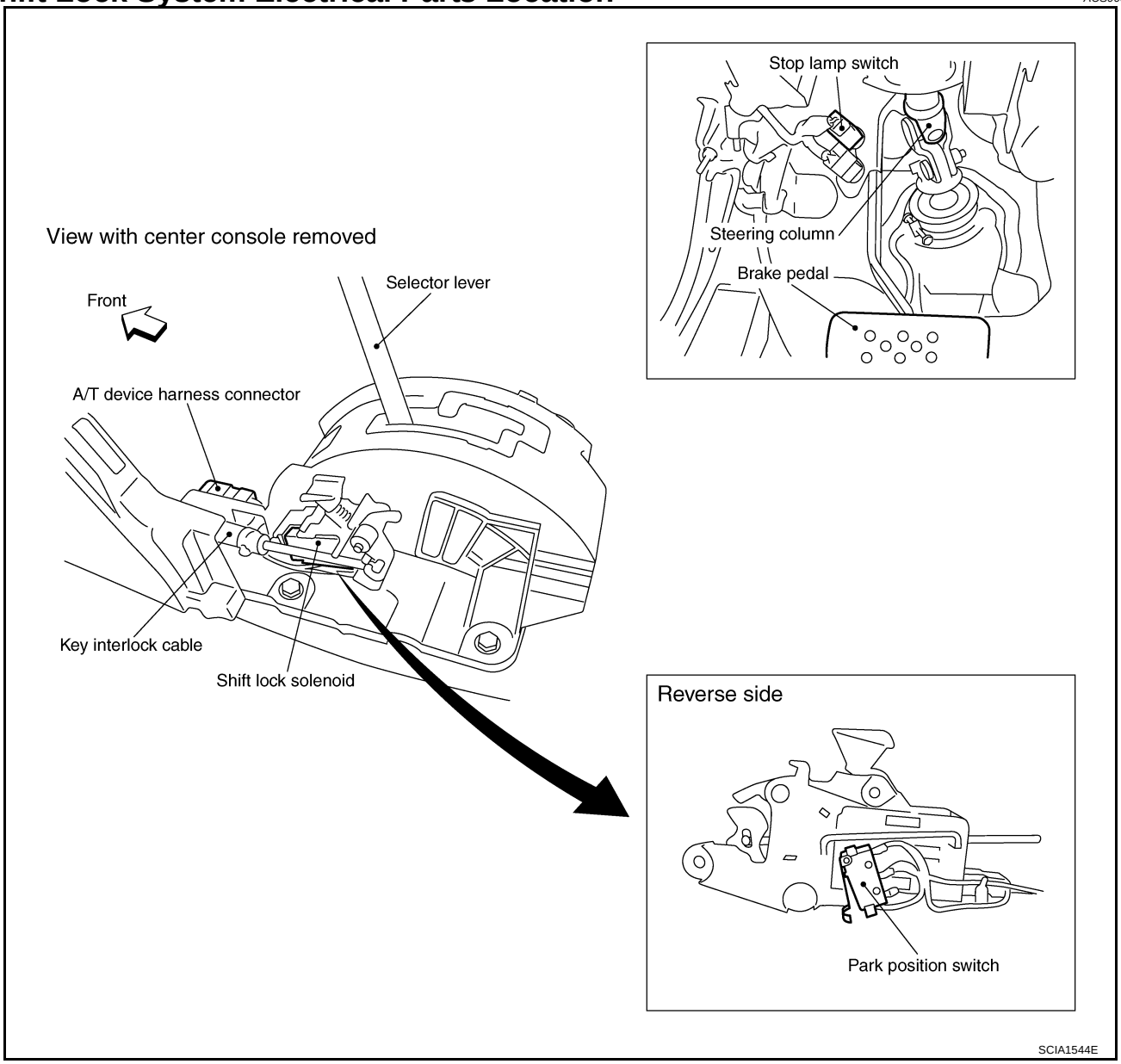
Description

ACS000O9

- The mechanical key interlock mechanism also operates as a shift lock:
  With the ignition switch turned to ON, the selector lever cannot be shifted from “P” (parking) to any other position unless the brake pedal is depressed.
  With the key removed, the selector lever cannot be shifted from “P” to any other position.
  The key cannot be removed unless the selector lever is placed in “P”.
- The shift lock and key interlock mechanisms are controlled by the ON-OFF operation of the shift lock solenoid and by the operation of the rotator and slider located inside the key cylinder.

Shift Lock System Electrical Parts Location

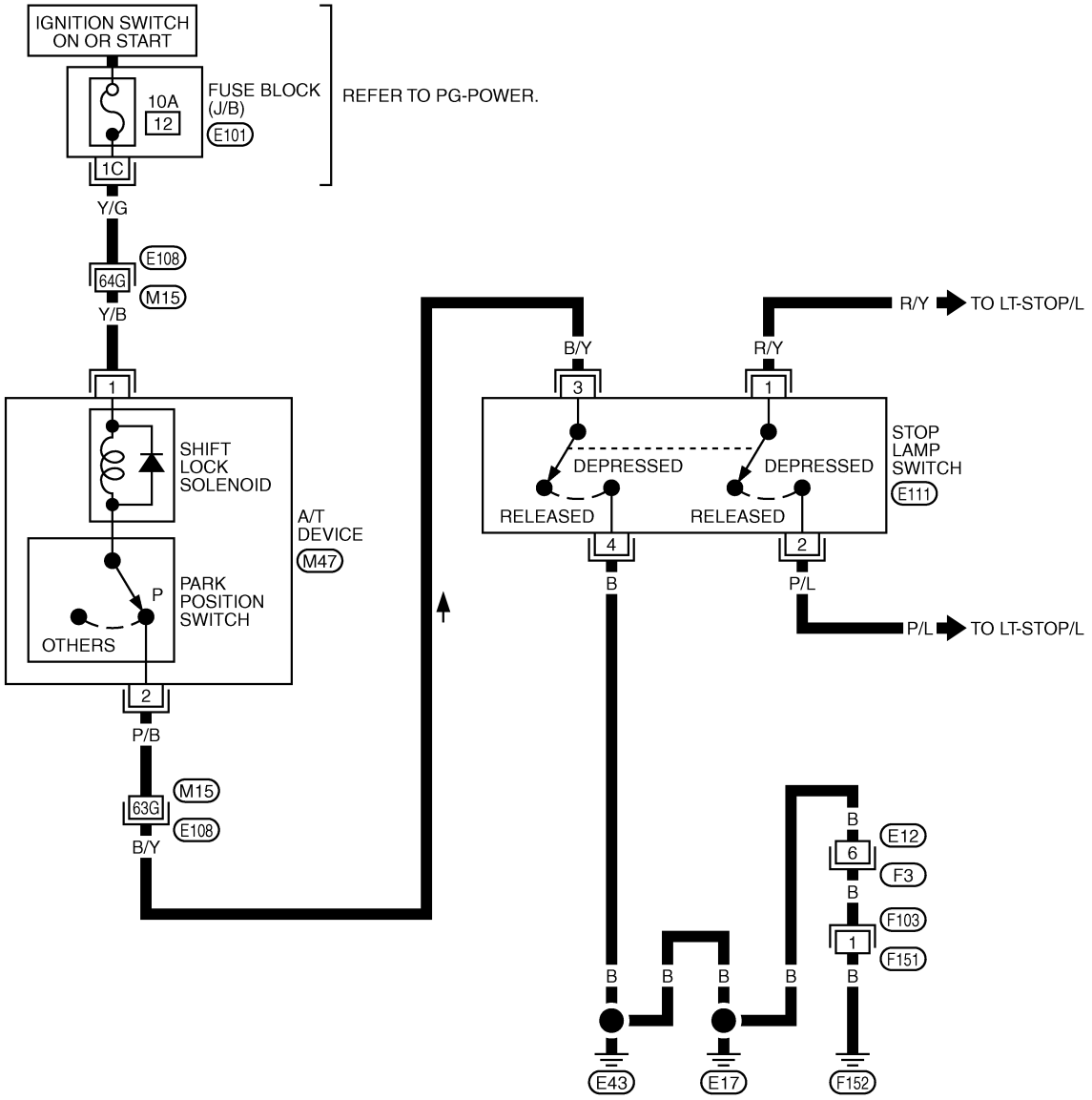
ACS000OA

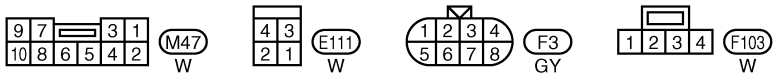


Wiring Diagram — AT — SHIFT

ACS001LG

AT-SHIFT-01





REFER TO THE FOLLOWING.

E108 -SUPER MULTIPLE JUNCTION (SMJ)

E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TCWT0202E

Diagnostic Procedure

ACS003RQ

SYMPTOM 1:

- **Selector lever cannot be moved from “P” position with key in ON position and brake pedal applied.**
- **Selector lever can be moved from “P” position with key in ON position and brake pedal released.**
- **Selector lever can be moved from “P” position when key is removed from key cylinder.**

SYMPTOM 2:

- **Ignition key cannot be removed when selector lever is set to “P” position.**
- **Ignition key can be removed when selector lever is set to any position except “P” position.**

1. CHECK KEY INTERLOCK CABLE

Check the key interlock cable for damage.

OK or NG

OK >> GO TO 2.
NG >> Replace key interlock cable. Refer to AT-234, "KEY INTERLOCK CABLE" .

2. CHECK SELECTOR LEVER POSITION

Check the selector lever position for damage. Refer to AT-228, "Checking of A/T Position" .

OK or NG

OK >> GO TO 3.
NG >> Check selector lever. Refer to AT-228, "Adjustment of A/T Position" .

3. CHECK SHIFT LOCK SOLENOID AND PARK POSITION SWITCH

1. Connect A/T device harness connector.
2. Turn ignition switch “ON”. (Do not start engine.)
3. Selector lever is set in “P” position.
4. Check operation.

Condition	Brake pedal	Operation
When ignition switch is turned to “ON” position and selector lever is set in “P” position.	Depressed	Yes
	Released	No

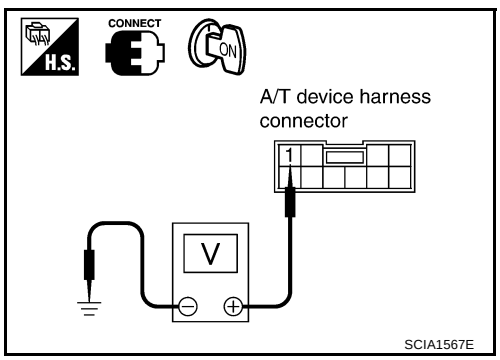
OK or NG

OK >> **INSPECTION END**
NG >> GO TO 4.

4. CHECK POWER SOURCE

1. Turn ignition switch “ON”. (Do not start engine.)
2. Check voltage between A/T device harness connector M47 terminal 1 (Y/B) and ground. Refer to AT-231, "Wiring Diagram — AT — SHIFT" .

Voltage: Battery voltage

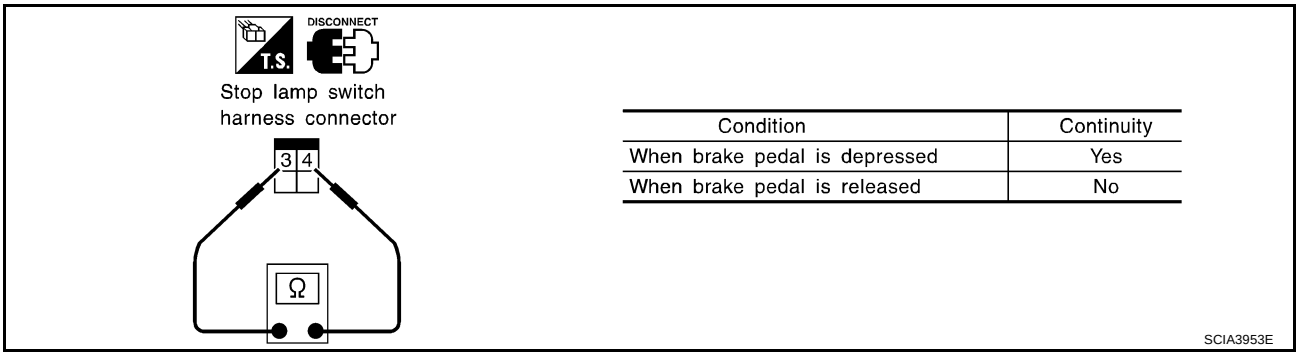


OK or NG

OK >> GO TO 5.
NG >> GO TO 6.

5. CHECK STOP LAMP SWITCH

Check continuity between stop lamp switch harness connector E111 terminals 3 and 4. Refer to AT-231, "Wiring Diagram — AT — SHIFT" .



Condition	Continuity
When brake pedal is depressed	Yes
When brake pedal is released	No

Check stop lamp switch after adjusting brake pedal — refer to BR-6, "BRAKE PEDAL" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

Check the following items. If any items are damaged, repair or replace damaged parts.

1. Harness for short or open between ignition switch and A/T device harness connector terminal 1
2. 10A fuse [No.12, located in the fuse block (J/B)]
3. Ignition switch (Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .)

OK or NG

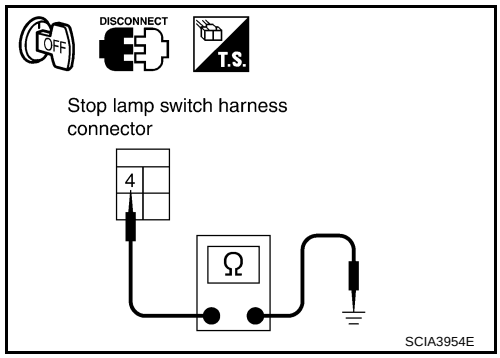
OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

7. CHECK GROUND CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect stop lamp switch harness connector.
3. Check continuity between stop lamp switch harness connector E111 terminal 4 (B) and ground. Refer to AT-231, "Wiring Diagram — AT — SHIFT" .

   Continuity should exist.

   If OK, check harness for short to ground and short to power.
4. Connect stop lamp switch harness connector.



OK or NG

OK >> GO TO 8.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

8. DETECT MALFUNCTIONING ITEM

Check the following items. If any items are damaged, repair or replace damaged parts.

- Harness for short or open between A/T device harness connector M47 terminal 2 (P/B) and stop lamp switch harness connector E111 terminal 3 (B/Y). Refer to AT-231, "Wiring Diagram — AT — SHIFT" .

OK or NG

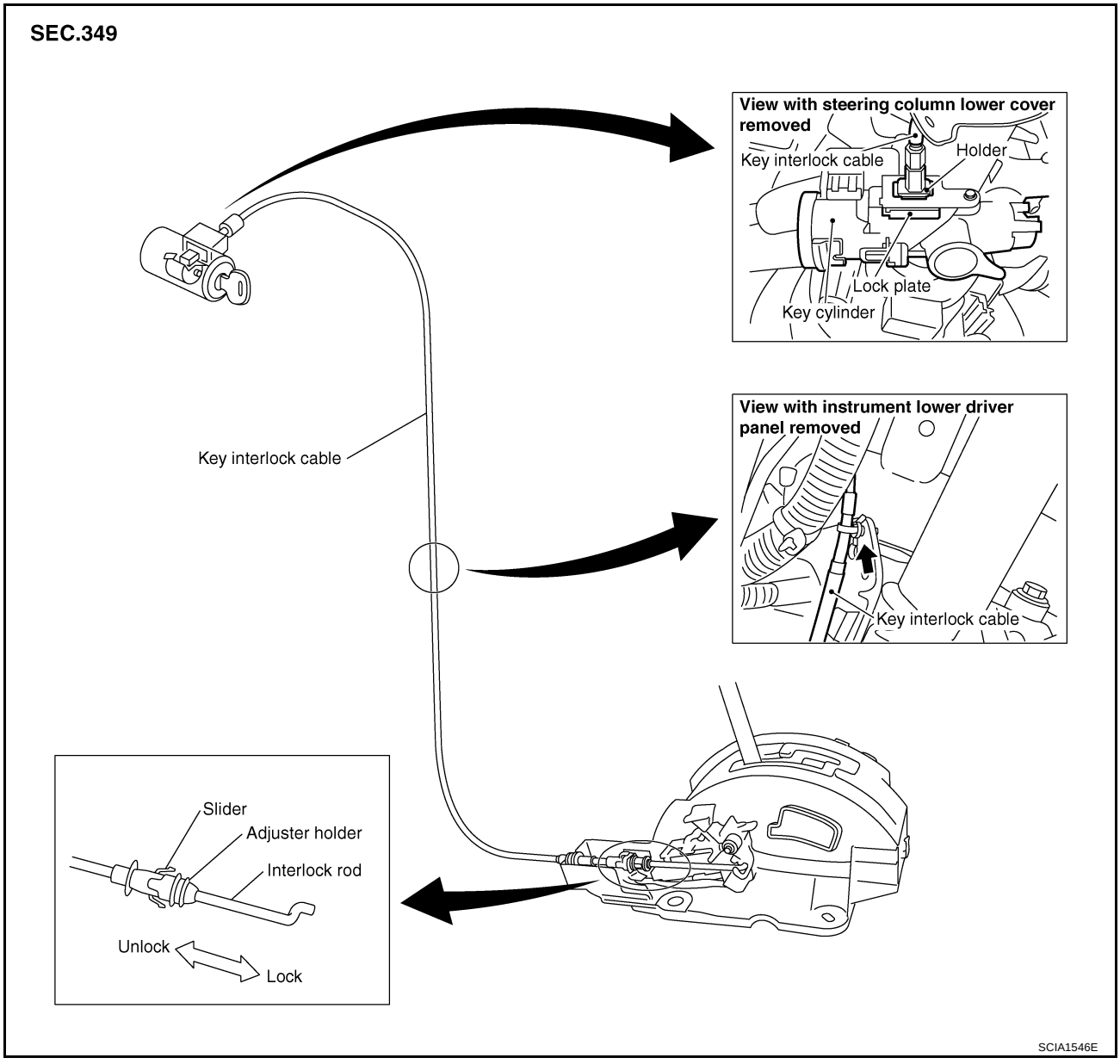
OK >> Replace shift lock solenoid or park position switch.
NG >> Repair or replace damaged parts.

KEY INTERLOCK CABLE

PFP:34908

Components

ACS000OD



CAUTION:

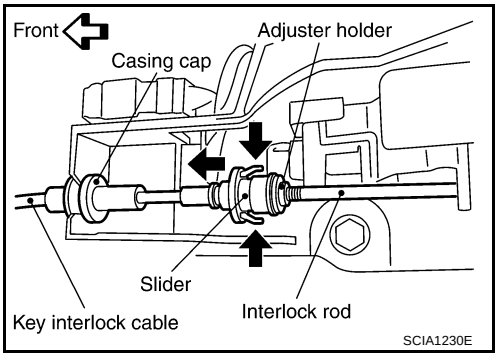
- **Install key interlock cable in such a way that it will not be damaged by sharp bends, twists or interference with adjacent parts.**
- **After installing key interlock cable to control device, make sure that casing cap and bracket are firmly secured in their positions. If casing cap be removed with an external load of less than 39.2 N (4.0 kg, 8.8 lb), replace key interlock cable with new one.**

Removal and Installation

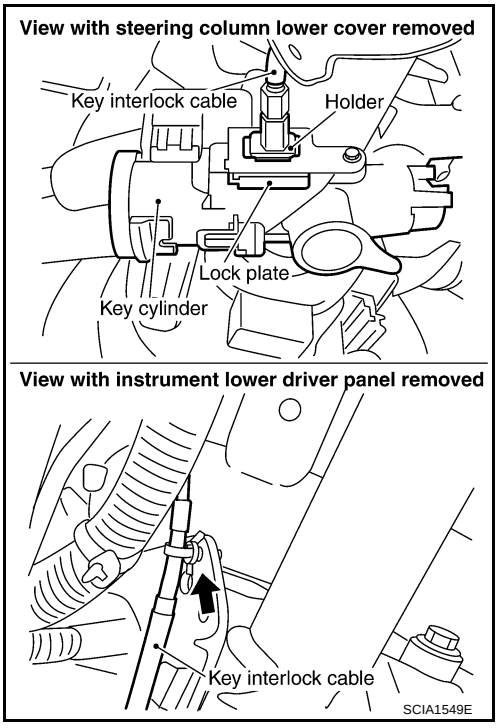
ACS000OE

REMOVAL

1. Unlock slider by squeezing lock tabs on slider from adjuster holder.
2. Remove casing cap from bracket of control device assembly and remove interlock rod from adjuster holder.



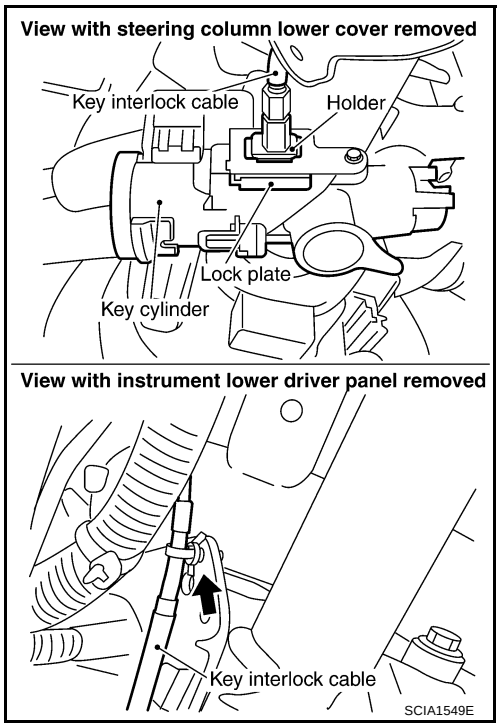
3. Remove lock plate from key cylinder.
4. Remove holder from key cylinder and remove key interlock cable.



INSTALLATION

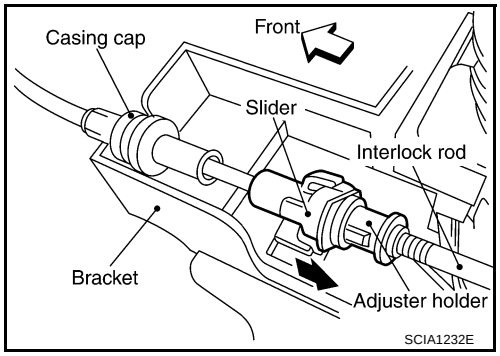
1. Set holder of key interlock cable to key cylinder and install lock plate.

   CAUTION:
   Do not reuse the lock plate
2. Clamp key interlock cable and fix to key interlock cable with band.
3. Turn ignition key to lock position.
4. Set selector lever to “P” position.



5. Insert interlock rod into adjuster holder.
6. Install casing cap to bracket.
7. Move slider in order to fix adjuster holder to interlock rod.

   CAUTION:
   Do not touch any parts except slider. Do not add any force to slider except force toward slider.



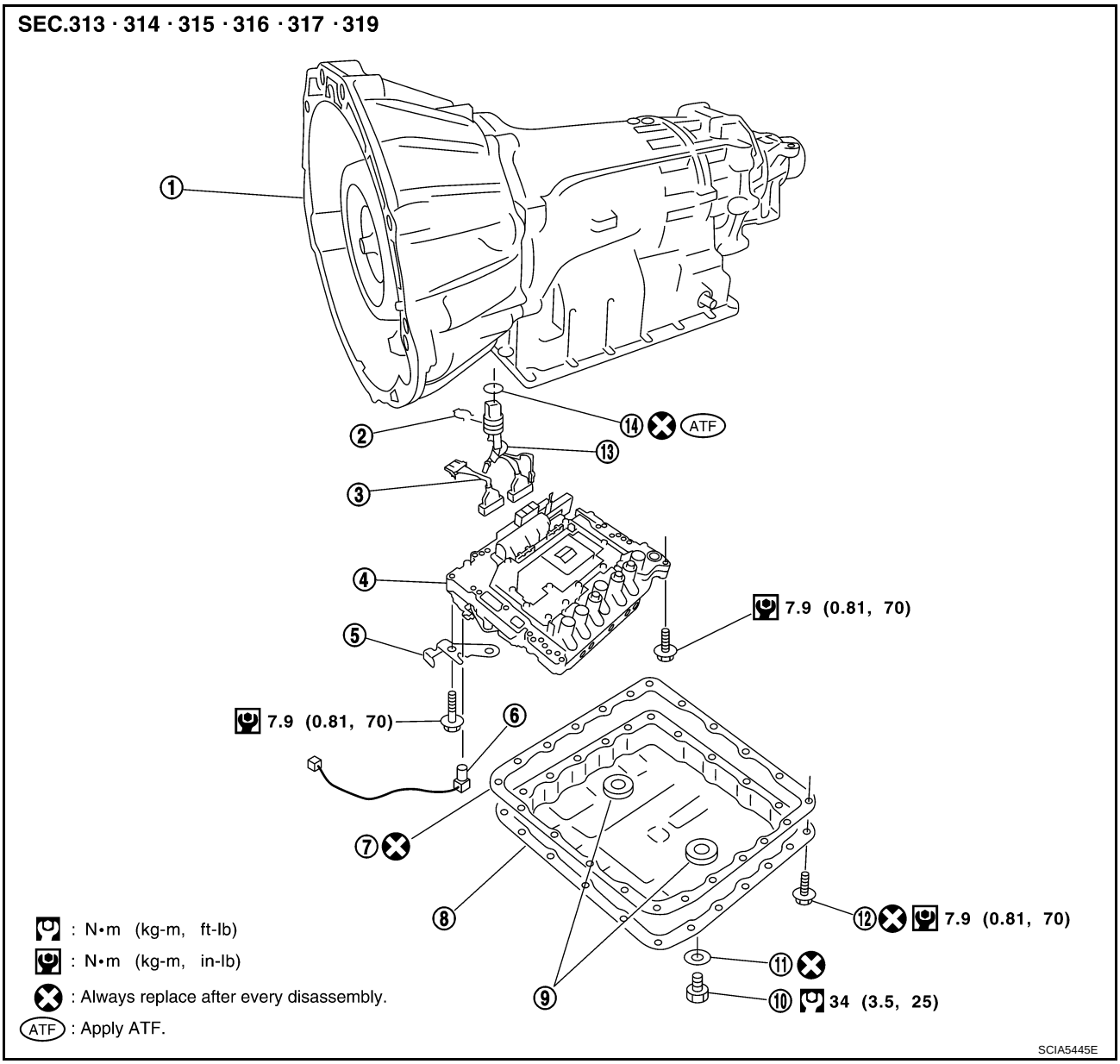
ON-VEHICLE SERVICE

PFP:00000

Control Valve with TCM and A/T Fluid Temperature Sensor 2

ACS0084R

COMPONENTS



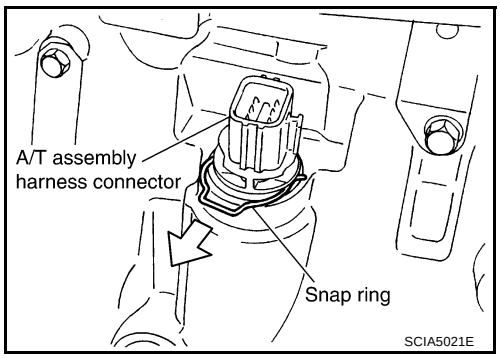
1. Transmission
2. Snap ring
3. Sub-harness
4. Control valve with TCM
5. Bracket
6. A/T fluid temperature sensor 2
7. Oil pan gasket
8. Oil pan
9. Magnet
10. Drain plug
11. Drain plug gasket
12. Oil pan mounting bolt
13. Terminal cord assembly
14. O-ring

CONTROL VALVE WITH TCM ASSEMBLY REMOVAL AND INSTALLATION

Removal

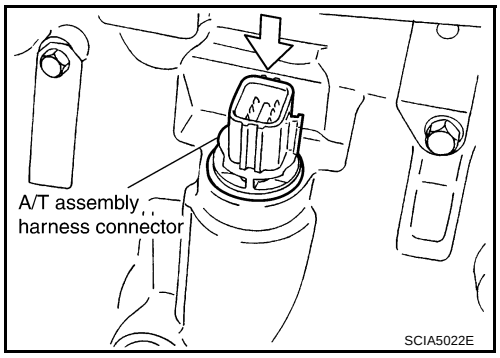
1. Disconnect negative battery terminal.
2. Disconnect heated oxygen sensor 2 harness connector.
3. Drain ATF through drain plug.
4. Disconnect A/T assembly harness connector.

5. Remove snap ring from A/T assembly harness connector.

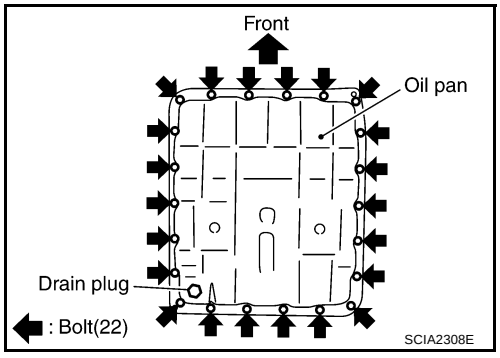


6. Push A/T assembly harness connector.

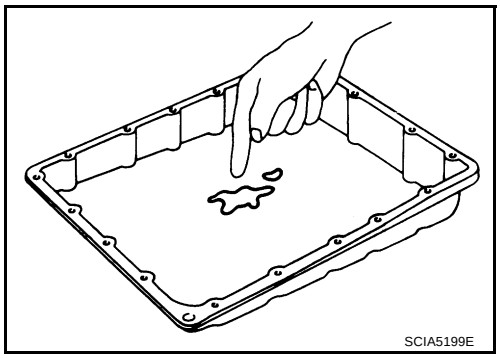
CAUTION:
Be careful not to damage connector.



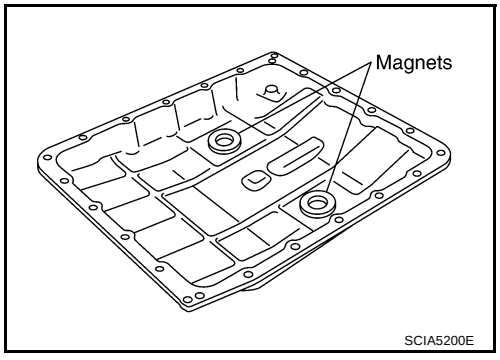
7. Remove oil pan and oil pan gasket.



8. Check foreign materials in oil pan to help determine causes of malfunction. If the A/T fluid is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.
   - **If frictional material is detected, perform A/T fluid cooler cleaning. Refer to AT-14, "A/T Fluid Cooler Cleaning".**

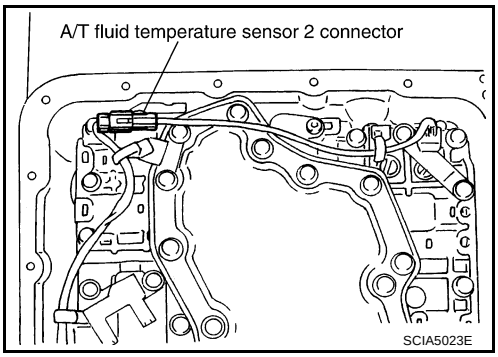


9. Remove magnets from oil pan.

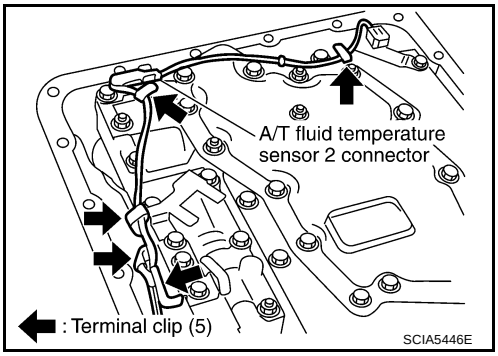


10. Disconnect A/T fluid temperature sensor 2 connector.

CAUTION:
Be careful not to damage connector.

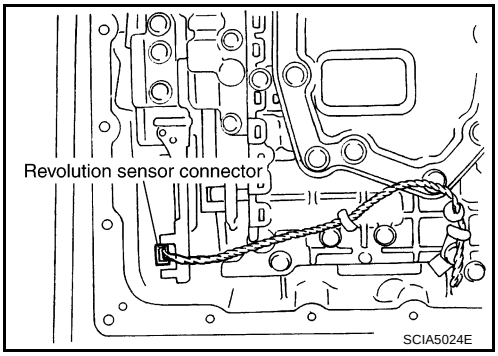


11. Straighten terminal clips to free terminal cord assembly and A/T fluid temperature sensor 2 harness.

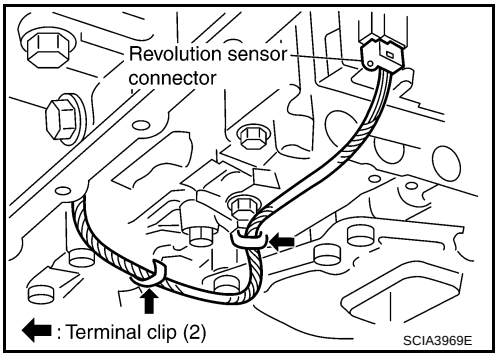


12. Disconnect revolution sensor connector.

CAUTION:
Be careful not to damage connector.

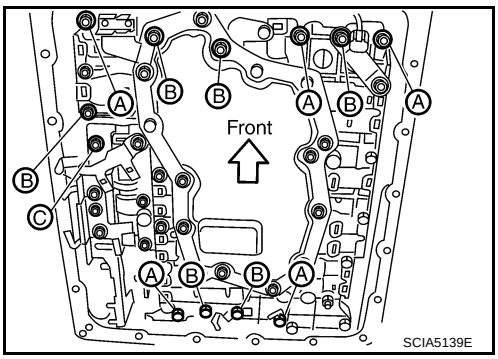


13. Straighten terminal clips to free revolution sensor harness.



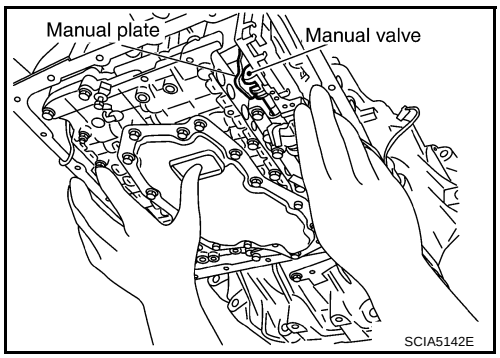
14. Remove bolts A, B and C from control valve with TCM.

Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1

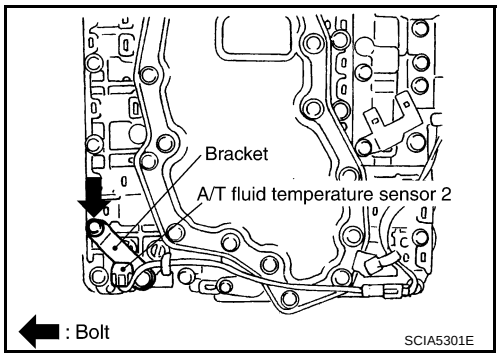


15. Remove control valve with TCM from transmission case.

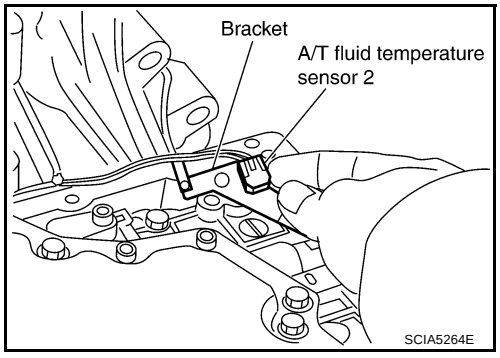
CAUTION:
When removing, be careful with the manual valve notch and manual plate height. Remove it vertically.



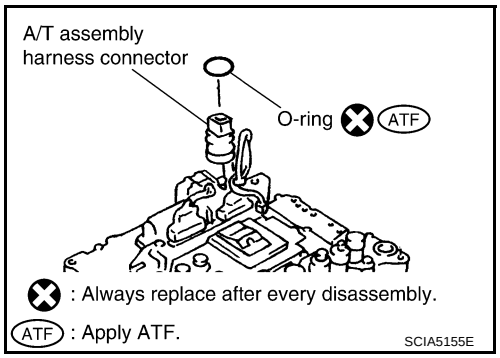
16. Remove A/T fluid temperature sensor 2 with bracket from control valve with TCM.



17. Remove bracket from A/T fluid temperature sensor 2.

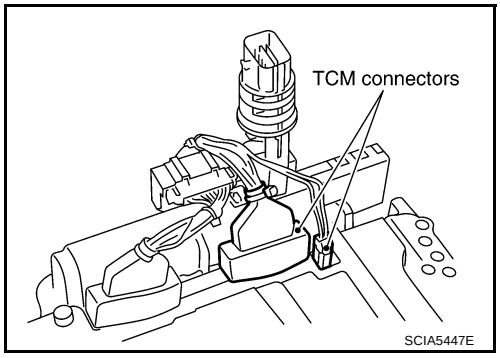


18. Remove O-ring from A/T assembly harness connector.

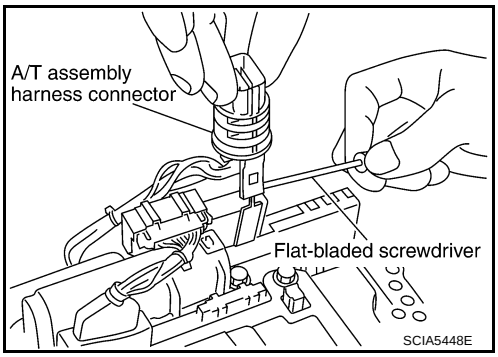


19. Disconnect TCM connectors.

CAUTION:
Be careful not to damage connectors.

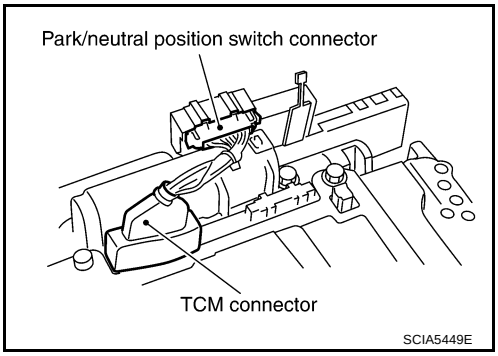


20. Remove A/T assembly harness connector from control valve with TCM using a flat-bladed screwdriver.



21. Disconnect TCM connector and park/neutral position switch connector.

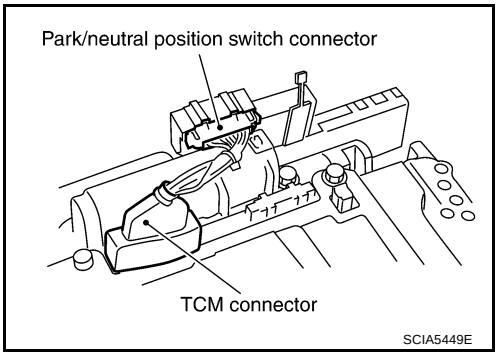
CAUTION:
Be careful not to damage connectors.



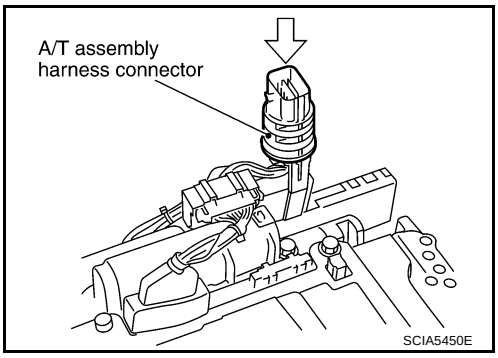
Installation

CAUTION:
After completing installation, check A/T fluid leakage and fluid level. Refer to AT-12, "Changing A/T Fluid" , AT-12, "Checking A/T Fluid" .

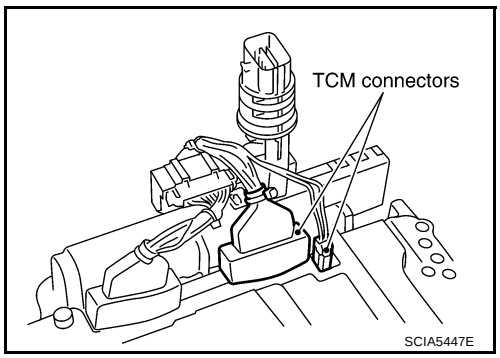
1. Connect TCM connector and park/neutral position switch connector.



2. Install A/T assembly harness connector from control valve with TCM.



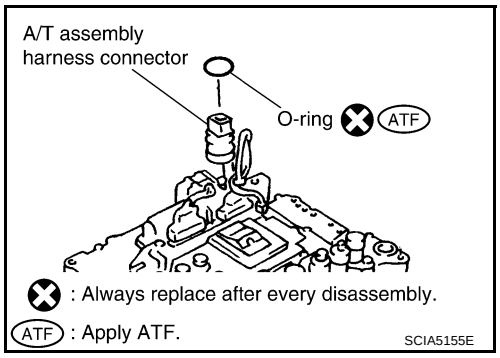
3. Connect TCM connectors.



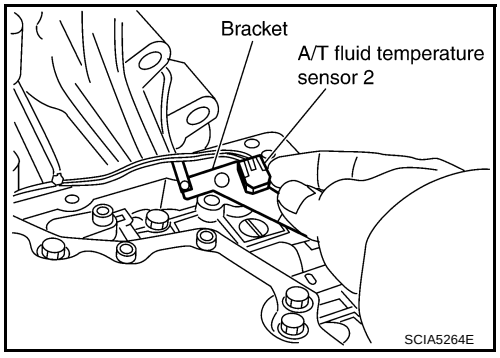
4. Install O-ring in A/T assembly harness connector.

CAUTION:

- **Do not reuse O-ring.**
- **Apply ATF to O-ring.**



5. Install A/T fluid temperature sensor 2 to bracket.

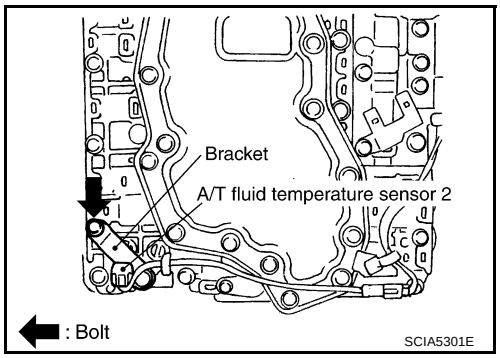


6. Install A/T fluid temperature sensor 2 (with bracket) in control valve with TCM.

CAUTION:

Adjust bolt hole of bracket to bolt hole of control valve with TCM.

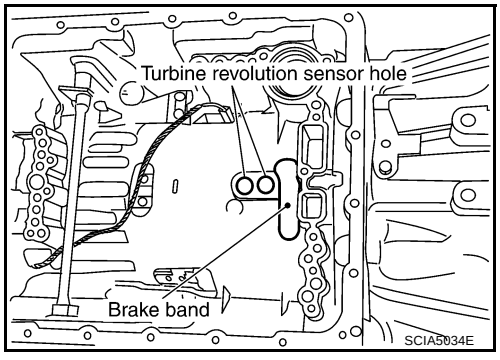
: 7.9 N·m (0.81 kg-m, 70 in-lb)



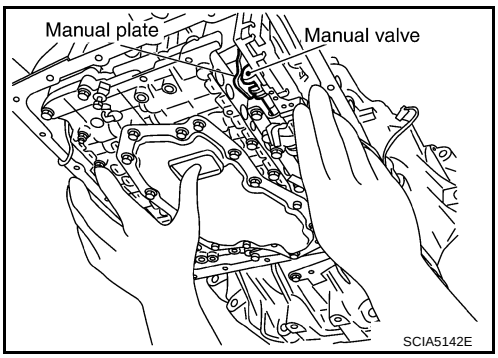
7. Install control valve with TCM in transmission case.

CAUTION:

- **Make sure that turbine revolution sensor securely installs turbine revolution sensor hole.**
- **Hang down revolution sensor harness toward outside so as not to disturb installation of control valve with TCM.**
- **Adjust A/T assembly harness connector of control valve with TCM to terminal hole of transmission case.**

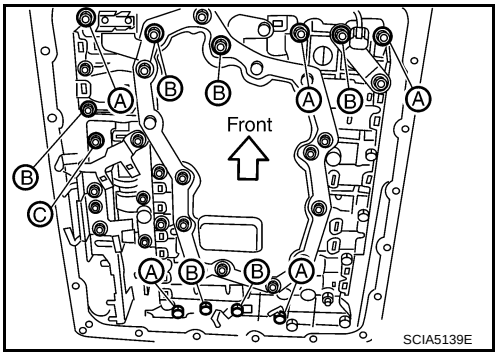


- **Assemble it so that manual valve cutout is engaged with manual plate projection.**



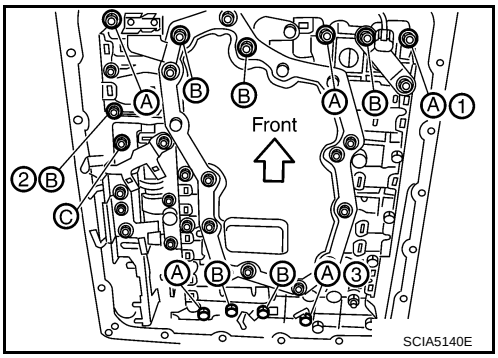
8. Install bolts A, B and C in control valve with TCM.

Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1

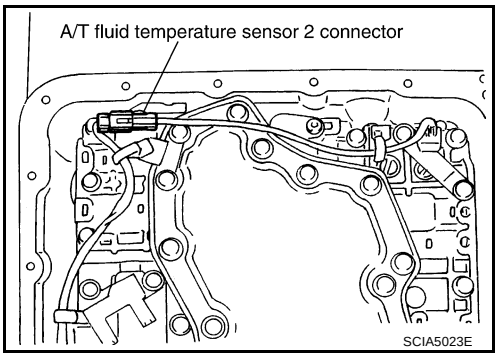


9. Tighten bolt 1, 2 and 3 temporarily to prevent dislocation. After that tighten them in order (1 → 2 → 3), and then tighten other bolts.

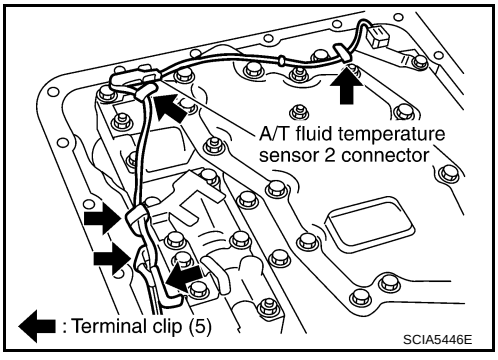
: 7.9 N·m (0.81 kg-m, 70 in-lb)



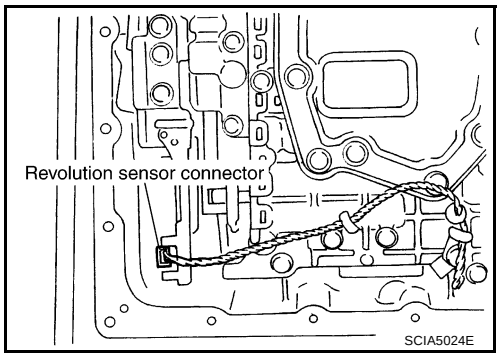
10. Connect A/T fluid temperature sensor 2 connector.



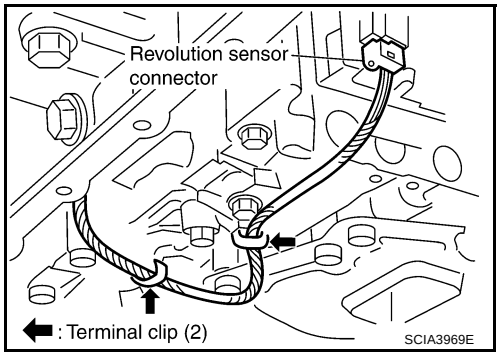
11. Securely fasten terminal cord assembly and A/T fluid temperature sensor 2 harness with terminal clips.



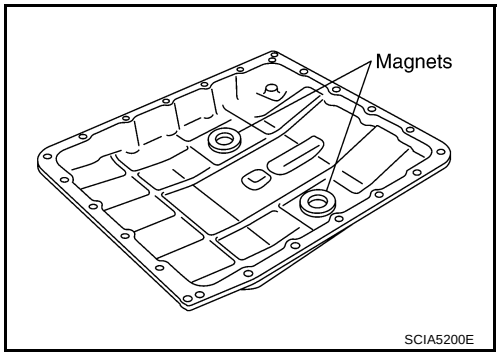
12. Connect revolution sensor connector.



13. Securely fasten revolution sensor harness with terminal clips.



14. Install magnets in oil pan.



15. Install oil pan to transmission case.

a. Install oil pan gasket to oil pan.

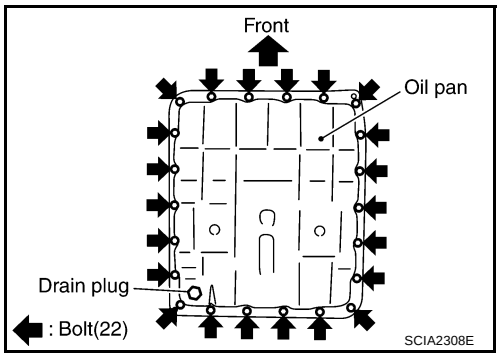
CAUTION:

- **Do not reuse oil pan gasket.**
- **Install it in the direction to align hole positions.**
- **Complete remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface.**

b. Install oil pan (with oil pan gasket) to transmission case.

CAUTION:

- **Install it so that drain plug comes to the position as shown in the figure.**
- **Be careful not to pinch harnesses.**
- **Complete remove all moisture, oil and old gasket, etc. from oil pan mounting surface.**



c. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them.

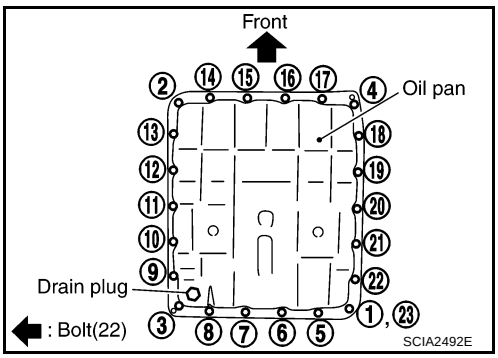
CAUTION:
Do not reuse oil pan mounting bolts.

: 7.9 N·m (0.81 kg-m, 70 in-lb)

16. Install drain plug to oil pan.

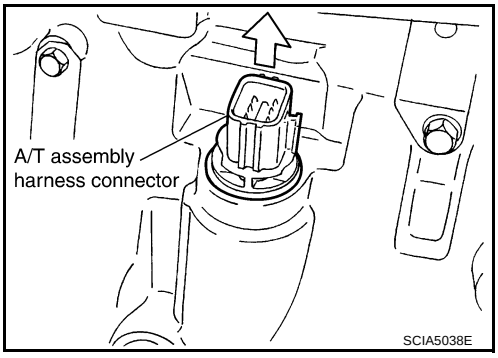
CAUTION:
Do not reuse drain plug gasket.

: 34 N·m (3.5 kg-m, 25 ft-lb)

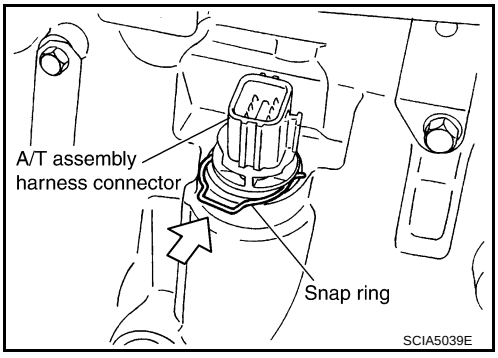


17. Pull up A/T assembly harness connector.

CAUTION:
Be careful not to damage connector.



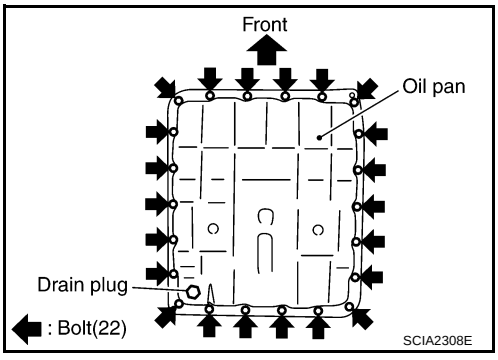
18. Install snap ring to A/T assembly harness connector.
19. Connect A/T assembly harness connector.
20. Connect heated oxygen sensor 2 harness connector.
21. Pour ATF into transmission assembly. Refer to AT-12, "Changing A/T Fluid" .
22. Connect negative battery terminal.



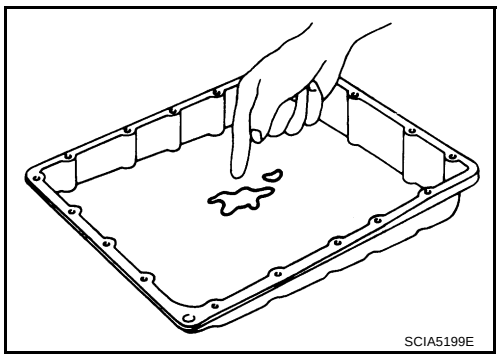
A/T FLUID TEMPERATURE SENSOR 2 REMOVAL AND INSTALLATION

Removal

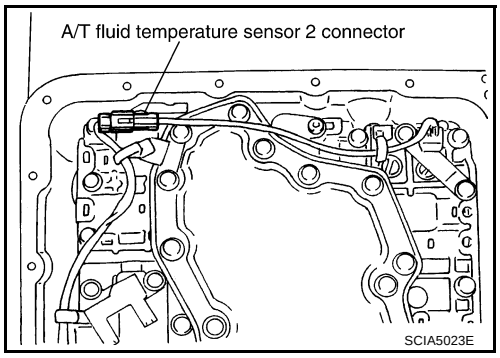
1. Disconnect negative battery terminal.
2. Disconnect heated oxygen sensor 2 harness connector.
3. Drain ATF through drain plug.
4. Remove oil pan and oil pan gasket.



5. Check foreign materials in oil pan to help determine causes of malfunction. If the A/T fluid is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.
   - **If frictional material is detected, perform A/T fluid cooler cleaning. Refer to AT-14, "A/T Fluid Cooler Cleaning".**

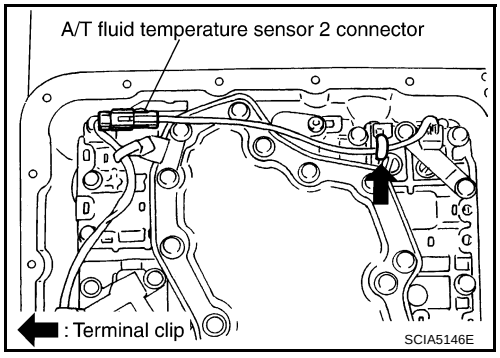

SCIA5199E

6. Disconnect A/T fluid temperature sensor 2 connector.
   CAUTION:
   Be careful not to damage connector.



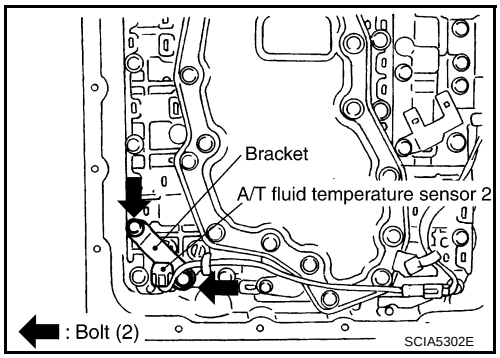
SCIA5023E

7. Straighten terminal clip to free A/T fluid temperature sensor 2 harness.



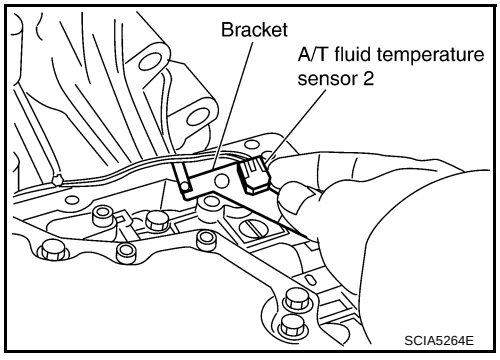
SCIA5146E

8. Remove A/T fluid temperature sensor 2 with bracket from control valve with TCM.



SCIA5302E

9. Remove bracket from A/T fluid temperature sensor 2.



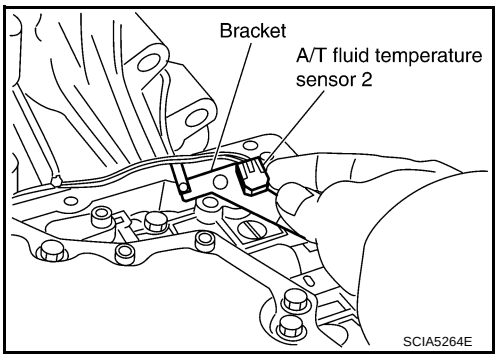
SCIA5264E

Installation

CAUTION:

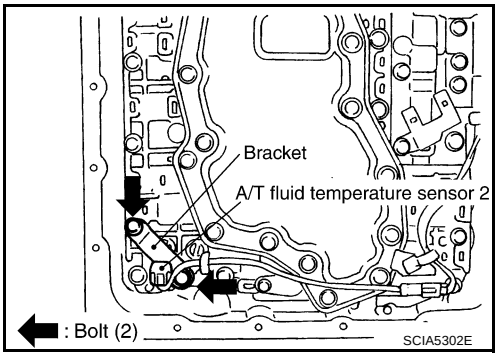
After completing installation, check A/T fluid leakage and fluid level. Refer to AT-12, "Changing A/T Fluid" , AT-12, "Checking A/T Fluid" .

1. Install A/T fluid temperature sensor 2 to bracket.

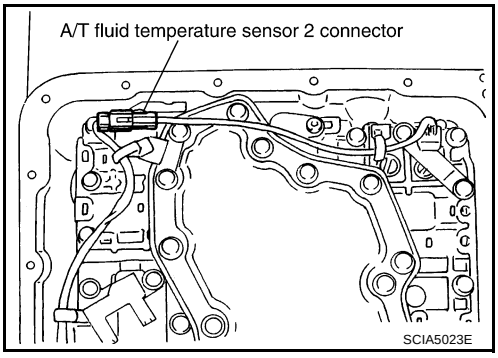


2. Install A/T fluid temperature sensor 2 (with bracket) in control valve with TCM.

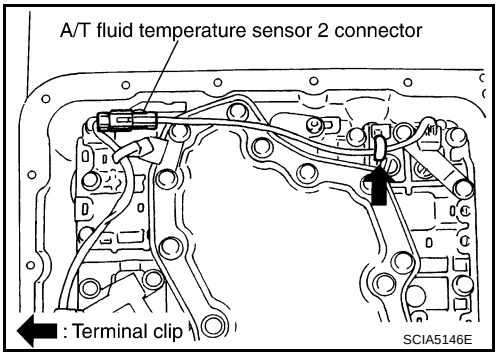
   : 7.9 N·m (0.81 kg-m, 70 in-lb)



3. Connect A/T fluid temperature sensor 2 connector.



4. Securely fasten A/T fluid temperature sensor 2 harness with terminal clip.



5. Install oil pan to transmission case.

a. Install oil pan gasket to oil pan.

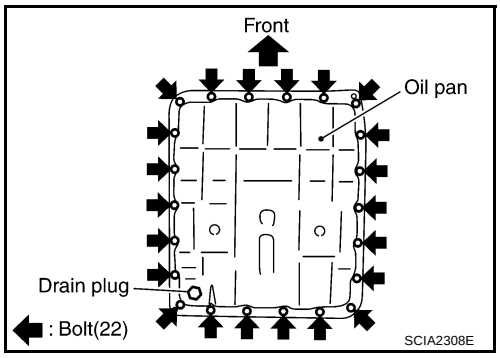
CAUTION:

- **Do not reuse oil pan gasket.**
- **Install it in the direction to align hole positions.**
- **Complete remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface.**

b. Install oil pan (with oil pan gasket) to transmission case.

CAUTION:

- **Install it so that drain plug comes to the position as shown in the figure.**
- **Be careful not to pinch harnesses.**
- **Complete remove all moisture, oil and old gasket, etc. from oil pan mounting surface.**

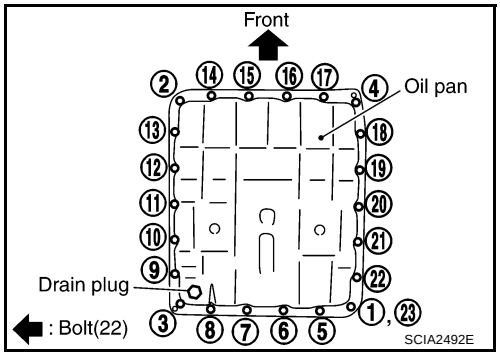


c. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them.

CAUTION:

Do not reuse oil pan mounting bolts.

: 7.9 N·m (0.81 kg-m, 70 in-lb)



6. Install drain plug to oil pan.

CAUTION:

Do not reuse drain plug gasket.

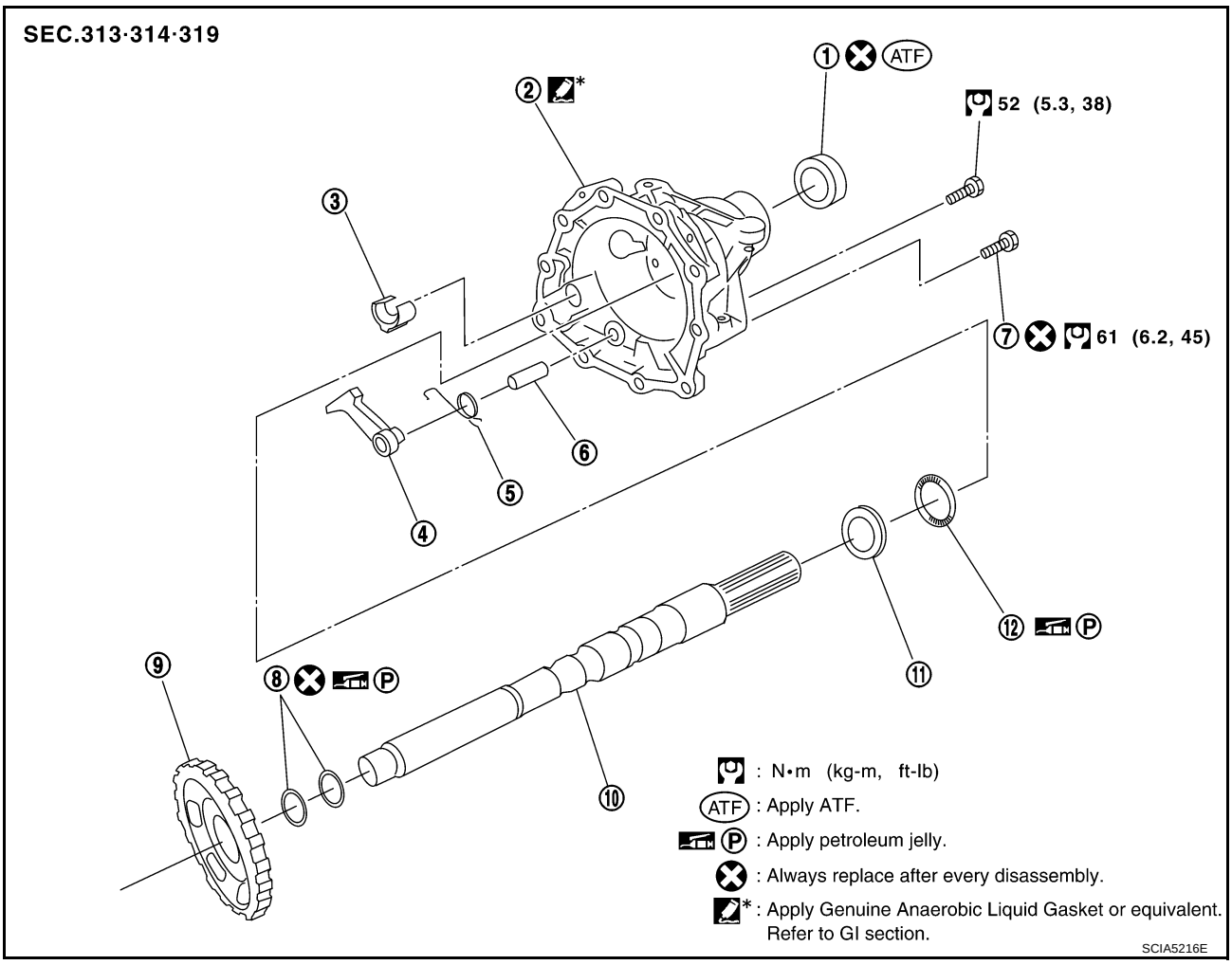
: 34 N·m (3.5 kg-m, 25 ft-lb)

7. Connect heated oxygen sensor 2 harness connector.
8. Pour ATF into transmission assembly. Refer to AT-12, "Changing A/T Fluid" .
9. Connect negative battery terminal.

Parking Components

ACS0084S

COMPONENTS



1. Rear oil seal	2. Rear extension	3. Parking actuator support
4. Parking pawl	5. Return spring	6. Pawl shaft
7. Self-sealing bolt	8. Seal ring	9. Parking gear
10. Output shaft	11. Bearing race	12. Needle bearing

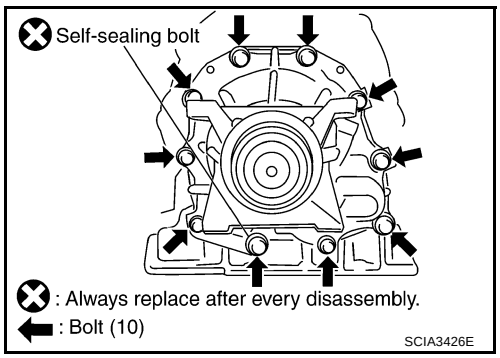
REMOVAL

1. Drain ATF through drain plug.
2. Remove exhaust front tube and center muffler with power tool. Refer to EX-3, "Removal and Installation" .
3. Remove rear propeller shaft. Refer to PR-7, "Removal and Installation" .

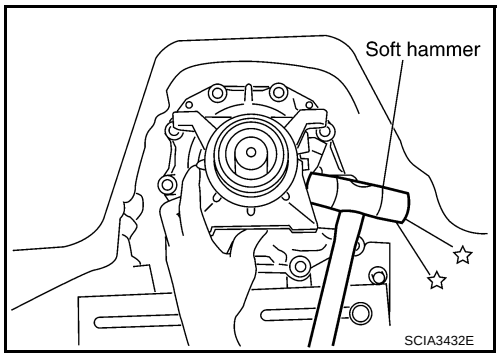
   CAUTION:
   Do not impact or damage propeller shaft tube.
4. Support transmission assembly with a transmission jack.

   CAUTION:
   When setting transmission jack, be careful not to allow it to collide against the drain plug.
5. Remove engine rear member with power tool. Refer to AT-263, "Removal and Installation" .

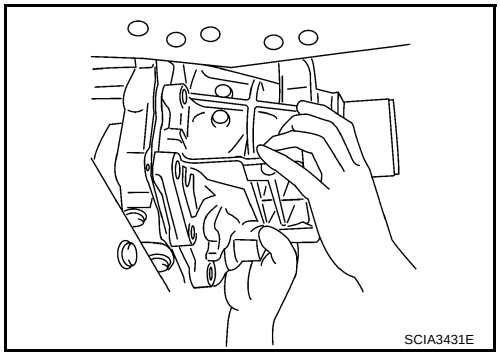
6. Remove tightening bolts for rear extension assembly and transmission case.



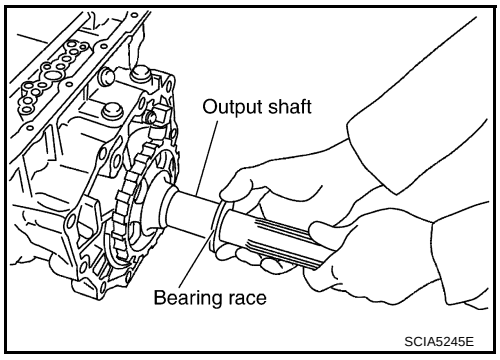
7. Tap rear extension assembly with soft hammer.



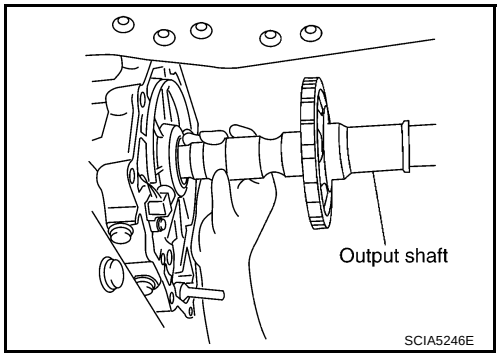
8. Remove rear extension assembly from transmission case. (With needle bearing.)



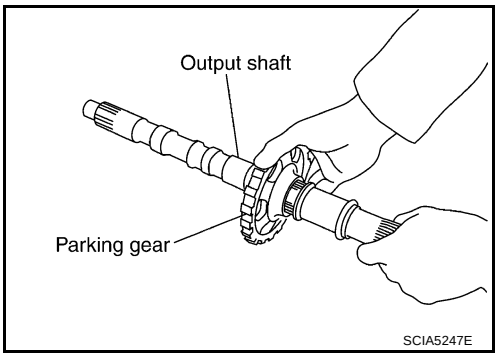
9. Remove bearing race from output shaft.



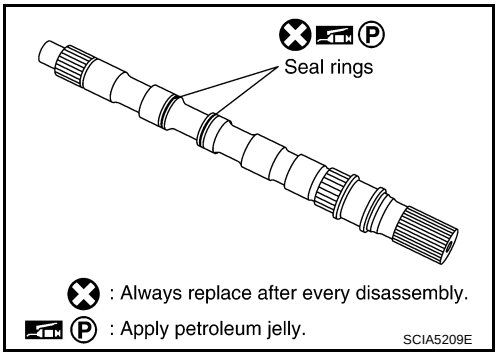
10. Remove output shaft from transmission case by rotating left/right.



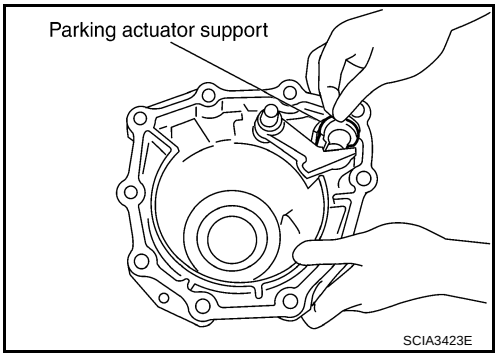
11. Remove parking gear from output shaft.



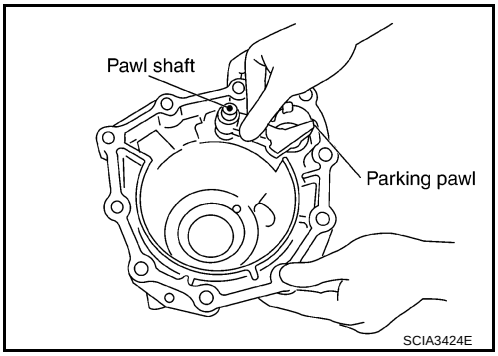
12. Remove seal rings from output shaft.



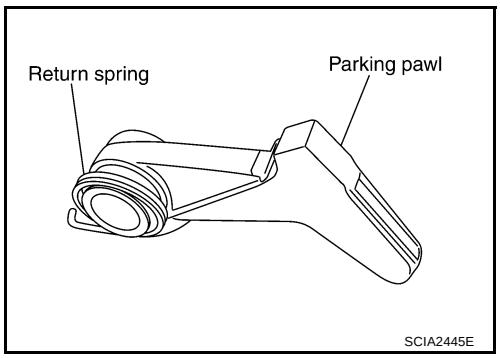
13. Remove needle bearing from rear extension.
14. Remove parking actuator support from rear extension.



15. Remove parking pawl (with return spring) and pawl shaft from rear extension.



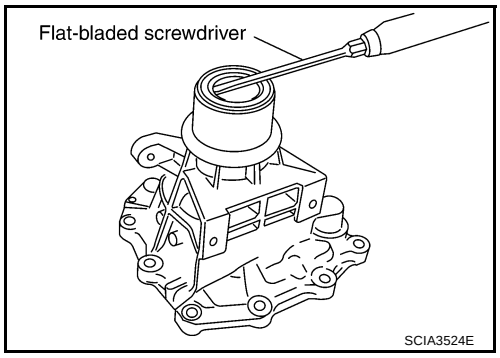
16. Remove return spring from parking pawl.



17. Remove rear oil seal from rear extension.

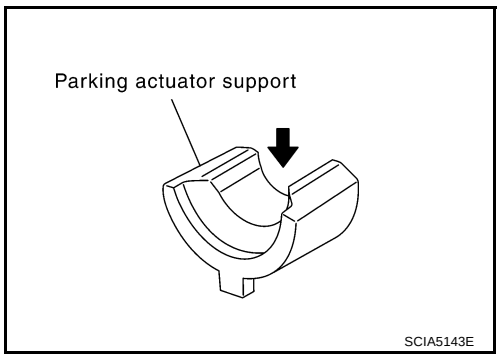
CAUTION:

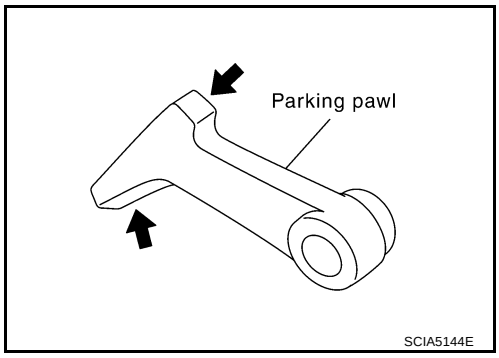
Be careful not to scratch rear extension.



INSPECTION

- If the contact surface on parking actuator support, parking pawl, etc. has excessive wear, abrasion, bend, or any other damage, replace the components.



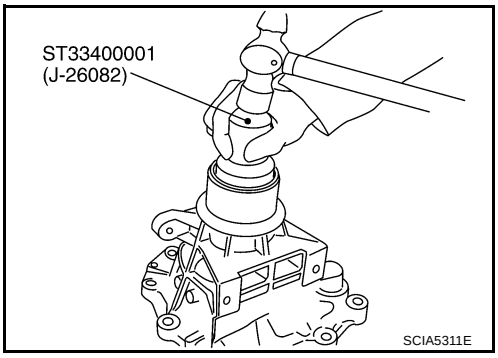


INSTALLATION

CAUTION:

After completing installation, check A/T fluid leakage and fluid level. Refer to AT-12, "Changing A/T Fluid" , AT-12, "Checking A/T Fluid" .

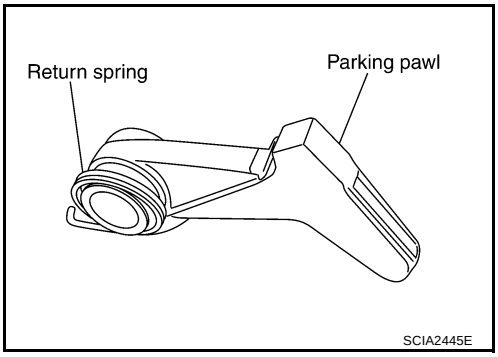
1. As shown in the right figure illustration, use a drift to drive rear oil seal into the rear extension until it is flush.



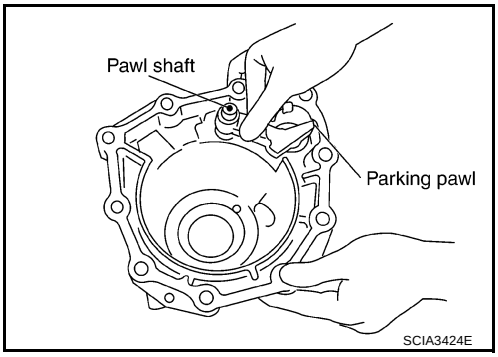
CAUTION:

- **Apply ATF to rear oil seal.**
- **Do not reuse rear oil seal.**

2. Install return spring to parking pawl.



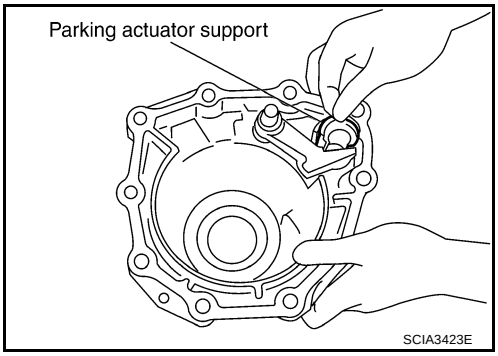
3. Install parking pawl (with return spring) and pawl shaft to rear extension.



4. Install parking actuator support to rear extension.
5. Install needle bearing to rear extension.

CAUTION:

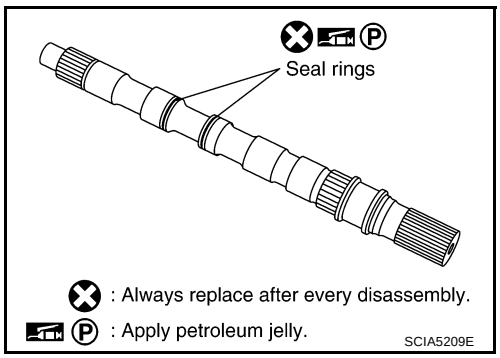
Apply petroleum jelly to needle bearing.



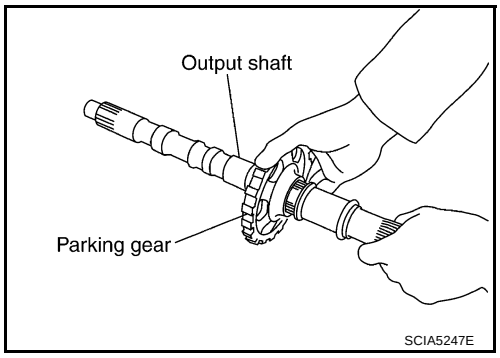
6. Install seal rings in output shaft.

CAUTION:

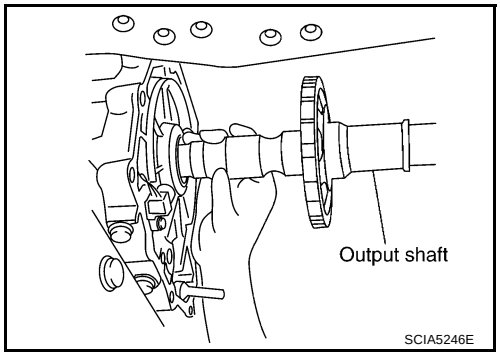
- **Do not reuse seal rings.**
- **Apply petroleum jelly to seal rings.**



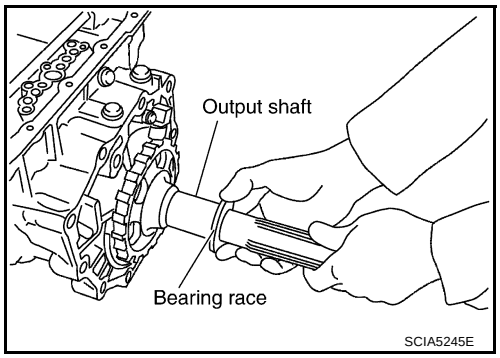
7. Install parking gear to output shaft.



8. Install output shaft to transmission case.



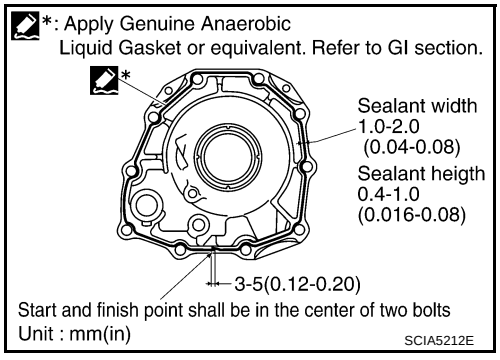
9. Install bearing race to output shaft.



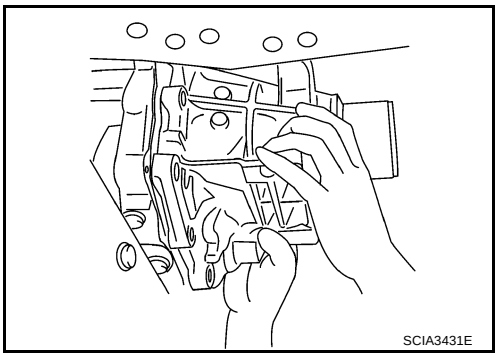
10. Apply recommended sealant (Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-47, "Recommended Chemical Products and Sealants" .) to rear extension assembly as shown in illustration.

CAUTION:

Complete remove all moisture, oil and old sealant, etc. from the transmission case and rear extension assembly mounting surfaces.



11. Install rear extension assembly to transmission case. (With needle bearing.)



12. Tighten rear extension assembly mounting bolts to specified torque.

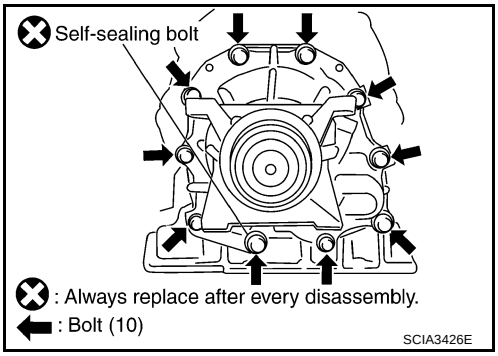
CAUTION:
Do not reuse self-sealing bolt.

Rear extension assembly mounting bolt:

: 52 N·m (5.3 Kg-m, 38 ft-lb)

Self-sealing bolt:

: 61 N·m (6.2 Kg-m, 45 ft-lb)



13. Install engine rear member. Refer to AT-263, "Removal and Installation" .
14. Install rear propeller shaft. Refer to PR-7, "Removal and Installation" .

CAUTION:
Do not impact or damage propeller shaft tube.

15. Install exhaust front tube and center muffler. Refer to EX-3, "Removal and Installation" .
16. Install drain plug in oil pan.

CAUTION:
Do not reuse drain plug gasket.

: 34 N·m (3.5 kg-m, 25 ft-lb)

17. Pour ATF into transmission assembly. Refer to AT-12, "Changing A/T Fluid" .

Rear Oil Seal

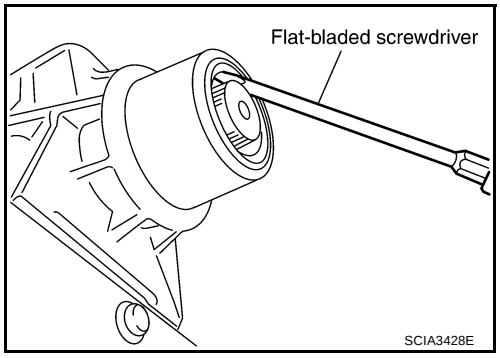
ACS0084T

REMOVAL

1. Remove exhaust front tube and center muffler with power tool. Refer to EX-3, "Removal and Installation" .
2. Remove rear propeller shaft. Refer to PR-7, "Removal and Installation" .

   CAUTION:
   Do not impact or damage propeller shaft tube.
3. Remove rear oil seal using a flat-bladed screwdriver.

   CAUTION:
   Be careful not to scratch rear extension assembly.



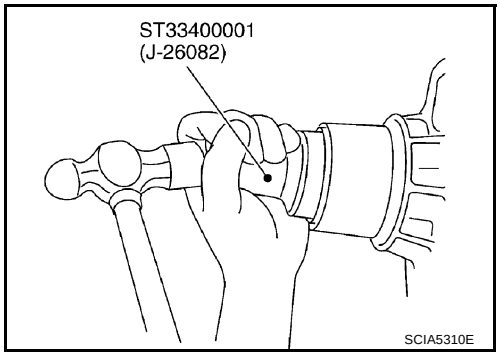
INSTALLATION

CAUTION:
After completing installation, check fluid leakage and fluid level. Refer to AT-12, "Changing A/T Fluid" , AT-12, "Checking A/T Fluid" .

1. As shown in the right figure illustration, use the drift to drive rear oil seal into rear extension assembly until it is flush.

   CAUTION:
   - **Apply ATF to rear oil seal.**
   - **Do not reuse rear oil seal.**
2. Install rear propeller shaft. Refer to PR-7, "Removal and Installation" .

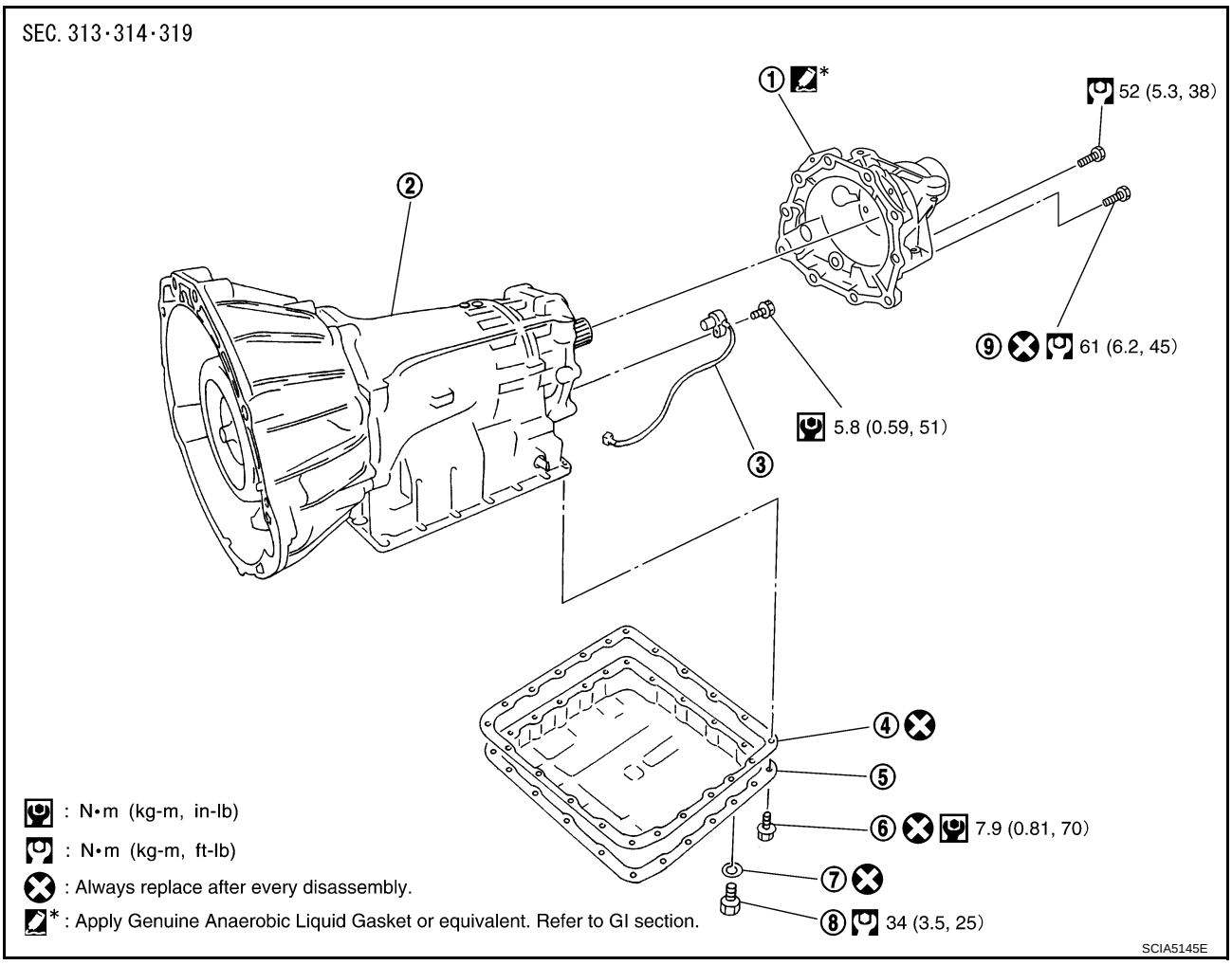
   CAUTION:
   Do not impact or damage propeller shaft tube.
3. Install exhaust front tube and center muffler. Refer to EX-3, "Removal and Installation" .



Revolution Sensor

ACS0084U

COMPONENTS

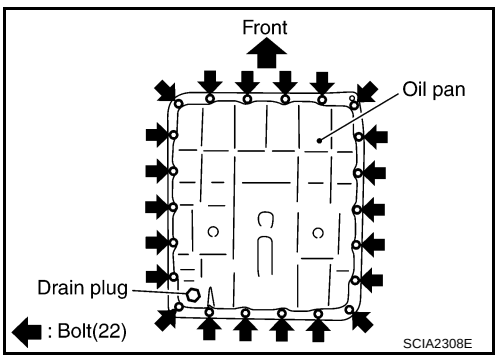


1. Rear extension
2. Transmission
3. Revolution sensor
4. Oil pan gasket
5. Oil pan
6. Oil pan mounting bolt
7. Drain plug gasket
8. Drain plug
9. Self-sealing bolt

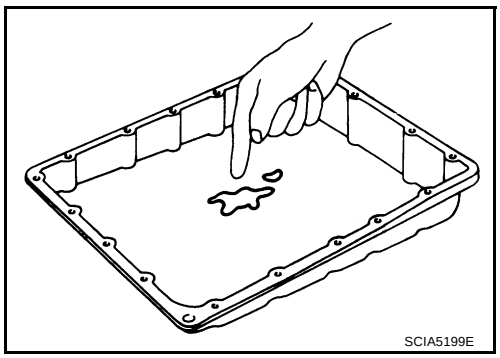
REMOVAL

1. Disconnect negative battery terminal.
2. Drain ATF through drain plug.
3. Remove exhaust front tube and center muffler with power tool. Refer to EX-3, "Removal and Installation" .
4. Remove rear propeller shaft. Refer to PR-7, "Removal and Installation" .

   CAUTION:
   Do not impact or damage propeller shaft tube.
5. Remove oil pan and oil pan gasket.

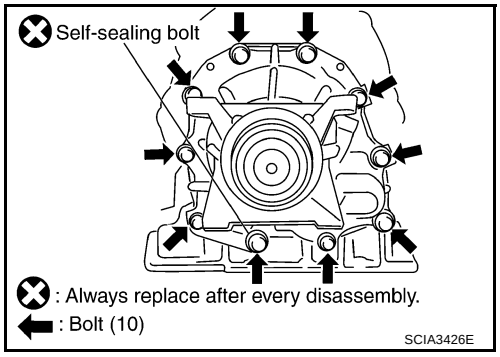


6. Check foreign materials in oil pan to help determine causes of malfunction. If the A/T fluid is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.
   - **If frictional material is detected, perform A/T fluid cooler cleaning. Refer to AT-14, "A/T Fluid Cooler Cleaning".**

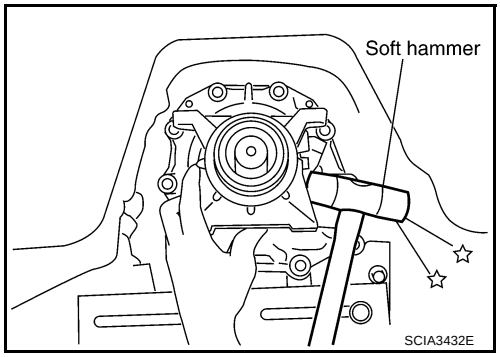


7. Support transmission assembly with a transmission jack.

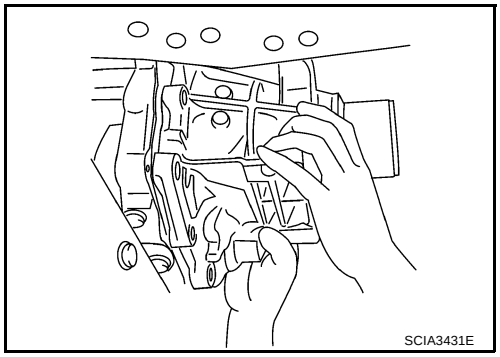
   CAUTION:
   When setting transmission jack, place wooden blocks to prevent from damaging control valve with TCM and transmission case.
8. Remove engine rear member with power tool. Refer to AT-263, "Removal and Installation" .
9. Remove tightening bolts for rear extension assembly and transmission case.



10. Tap rear extension assembly with soft hammer.



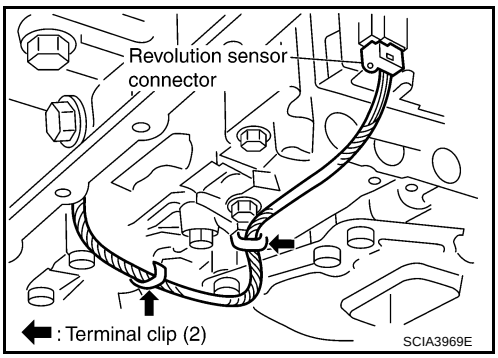
11. Remove rear extension assembly from transmission case. (With needle bearing.)



12. Disconnect revolution sensor connector.

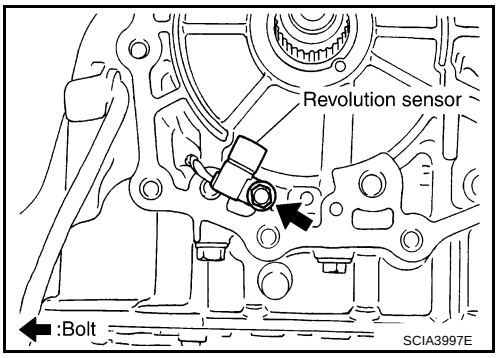
CAUTION:
Be careful not to damage connector.

13. Straighten terminal clips to free revolution sensor harness.



14. Remove revolution sensor from transmission case.

CAUTION:
- **Do not subject it to impact by dropping or hitting it.**
- **Do not disassemble.**
- **Do not allow metal filings, etc., to get on the sensor's front edge magnetic area.**
- **Do not place in an area affected by magnetism.**



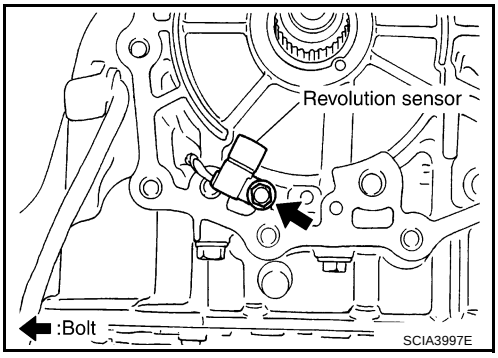
INSTALLATION

CAUTION:
After completing installation, check A/T fluid leakage and fluid level. Refer to AT-12, "Changing A/T Fluid" , AT-12, "Checking A/T Fluid" .

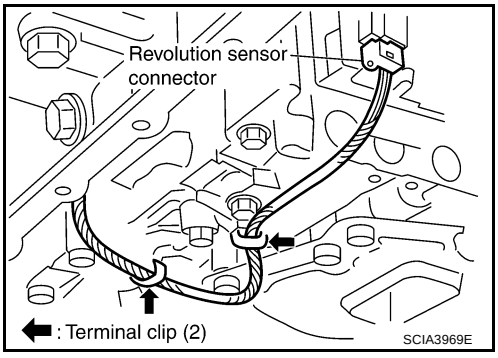
1. Install revolution sensor in transmission case.

CAUTION:
- **Do not subject it to impact by dropping or hitting it.**
- **Do not disassemble.**
- **Do not allow metal filings, etc., to get on the sensor's front edge magnetic area.**
- **Do not place in an area affected by magnetism.**

: 5.8 N·m (0.59 kg-m, 51 in-lb)



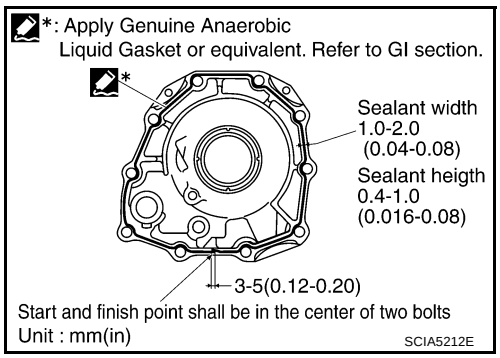
2. Connect revolution sensor connector.
3. Securely fasten revolution sensor harness with clips.



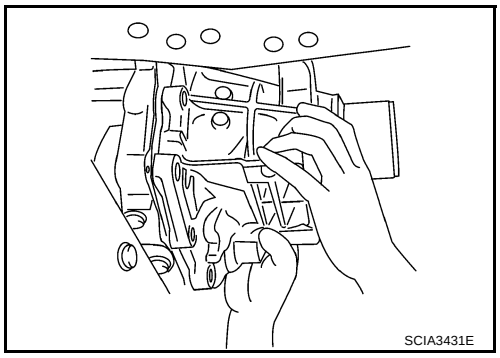
4. Apply recommended sealant (Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-47, "Recommended Chemical Products and Sealants" .) to rear extension assembly as shown in illustration.

CAUTION:

Complete remove all moisture, oil and old sealant, etc. from transmission case and rear extension assembly mounting surfaces.



5. Install rear extension assembly to transmission case. (With needle bearing.)



6. Tighten rear extension assembly mounting bolts to specified torque.

CAUTION:

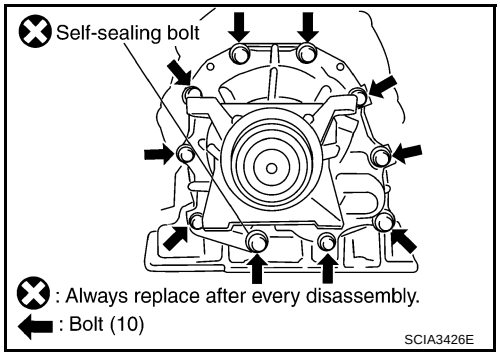
Do not reuse self-sealing bolt.

Rear extension assembly mounting bolt:

: 52 N·m (5.3 Kg-m, 38 ft-lb)

Self-sealing bolt:

: 61 N·m (6.2 Kg-m, 45 ft-lb)



7. Install engine rear member. Refer to AT-263, "Removal and Installation" .
8. Install oil pan to transmission case.

a. Install oil pan gasket to oil pan.

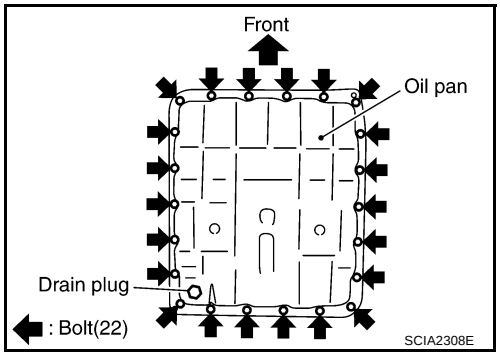
CAUTION:

- **Do not reuse oil pan gasket.**
- **Install it in the direction to align hole positions.**
- **Complete remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface.**

b. Install oil pan (with oil pan gasket) to transmission case.

CAUTION:

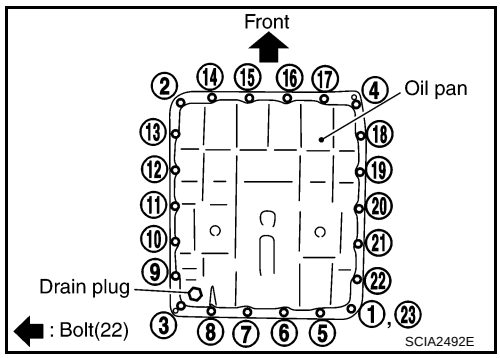
- **Install it so that drain plug comes to the position as shown in the figure.**
- **Be careful not to pinch harnesses.**
- **Complete remove all moisture, oil and old gasket, etc. from oil pan mounting surface.**



c. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them.

CAUTION:
Do not reuse oil pan mounting bolts.

: 7.9 N·m (0.81 kg-m, 70 in-lb)



9. Install drain plug to oil pan.

CAUTION:
Do not reuse drain plug gasket.

: 34 N·m (3.5 kg-m, 25 ft-lb)

10. Install rear propeller shaft. Refer to PR-7, "Removal and Installation" .

CAUTION:
Do not impact or damage propeller shaft tube.

11. Install exhaust front tube and center muffler. Refer to EX-3, "Removal and Installation" .
12. Pour ATF into transmission assembly. Refer to AT-12, "Changing A/T Fluid" .
13. Connect negative battery terminal.

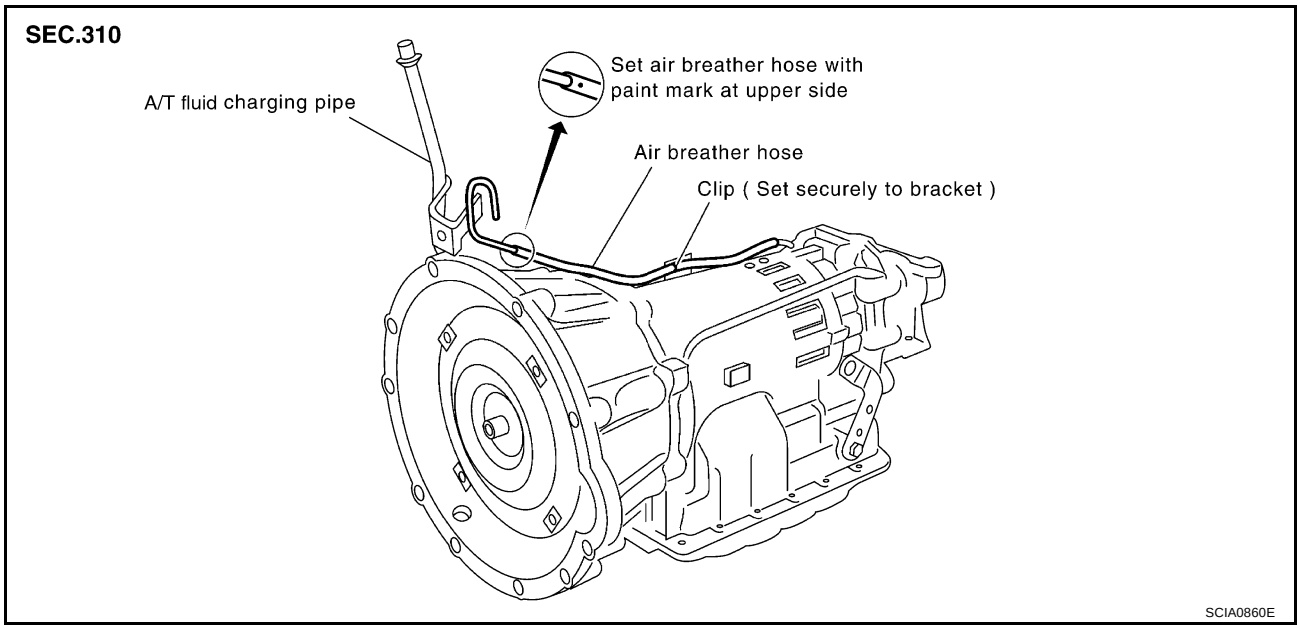
AIR BREATHER HOSE

PFP:31098

Removal and Installation

ACS000OG

Refer to the figure below for air breather hose removal and installation procedure.



CAUTION:

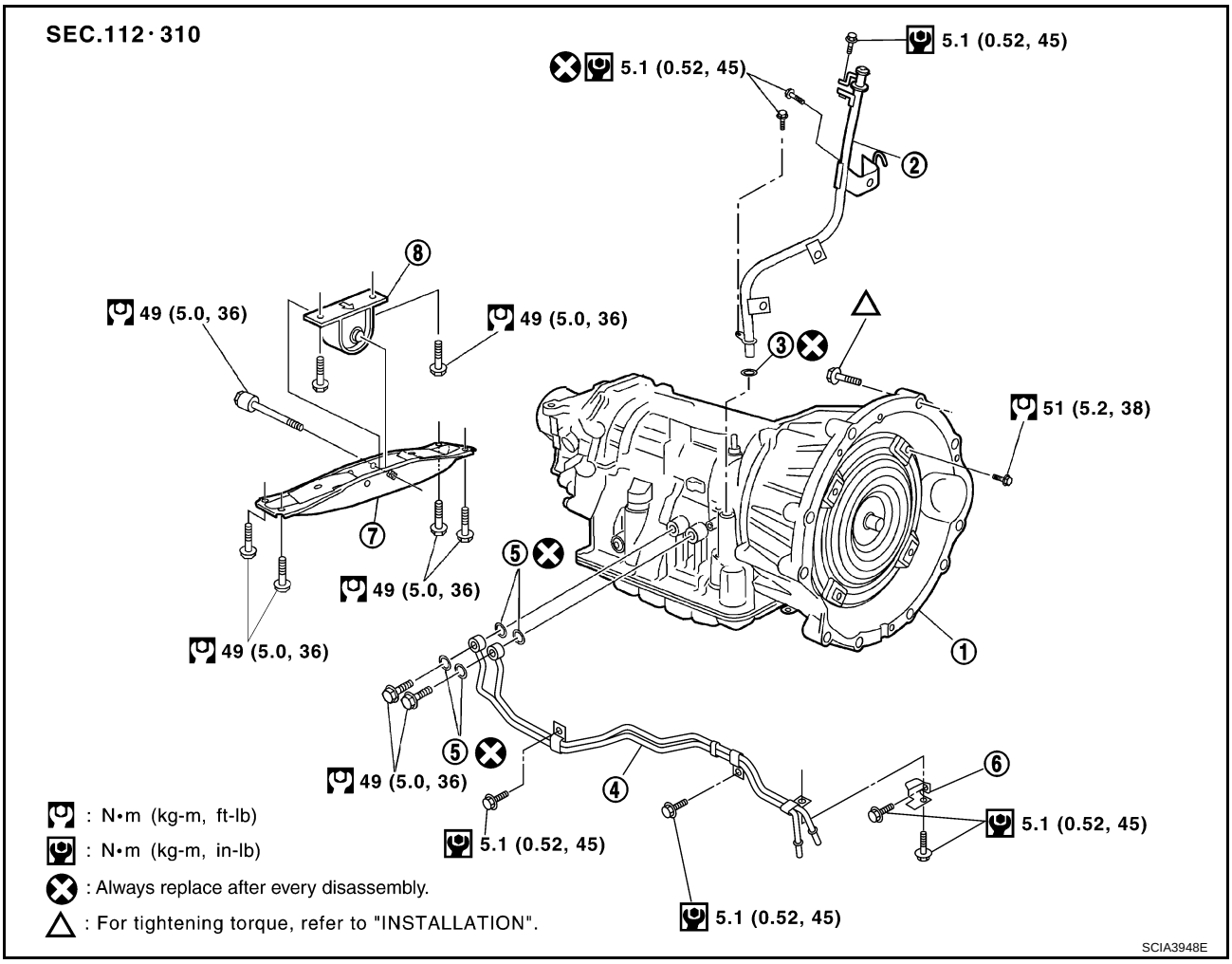
- **When installing an air breather hose, be careful not to be crushed or blocked by folding or bending the hose.**
- **When inserting a hose to the transmission tube, be sure to insert it fully until its end reaches the tube bend R portion.**

TRANSMISSION ASSEMBLY

PFP:31020

Removal and Installation

ACS000OH



1. Transmission assembly
2. A/T fluid charging pipe
3. O-ring
4. Fluid cooler tube
5. Copper washer
6. Bracket
7. Engine rear member
8. Insulator

REMOVAL

CAUTION:

When removing the A/T assembly from engine, first remove the crankshaft position sensor (POS) from the A/T assembly.

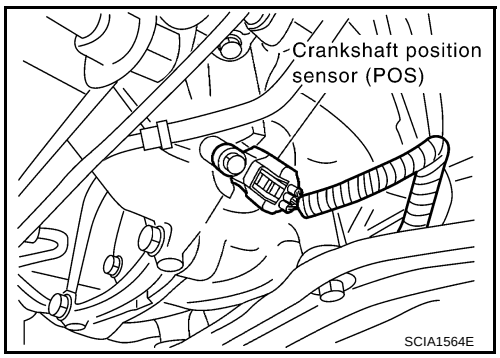
Be careful not to damage sensor edge.

1. Disconnect the negative battery terminal.
2. Remove tower bar with power tool. Refer to FSU-20, "Removal and Installation" .
3. Remove engine under cover with power tool.
4. Remove front cross bar with power tool. Refer to FSU-8, "Components" .
5. Remove exhaust front tube and center muffler with power tool. Refer to EX-3, "Removal and Installation" .
6. Remove three way catalyst. Refer to EM-23, "Removal and Installation" .
7. Remove rear propeller shaft. Refer to PR-7, "Removal and Installation" .

   CAUTION:

   Do not impact, or damage propeller shaft tube.
8. Remove control rod. Refer to AT-227, "Control Device Removal and Installation" .
9. Disconnect A/T assembly harness connector.

10. Remove crankshaft position sensor (POS). Refer to EM-27, "Removal and Installation" .



CAUTION:
- **Do not subject it to impact by dropping or hitting it.**
- **Do not disassemble.**
- **Do not allow metal filings, etc., to get on the sensor's front edge magnetic area.**
- **Do not place in an area affected by magnetism.**

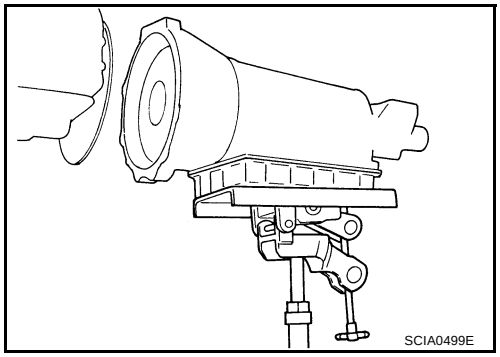
11. Remove fluid cooler tube and A/T fluid charging pipe.
12. Plug up openings such as the fluid charging pipe hole, etc.
13. Remove air breather hose. Refer to AT-262, "Removal and Installation" .
14. Remove starter motor with power tool. Refer to SC-19, "Removal and Installation" .
15. Remove rear cover plate. Refer to EM-27, "Removal and Installation" .
16. Remove rear plate from converter housing part. Refer to EM-27, "Removal and Installation" .
17. Turn crankshaft, and remove the four tightening bolts for drive plate and torque converter.

CAUTION:
When turning crankshaft, turn it clockwise as viewed from the front of the engine.

18. Support transmission assembly with a transmission jack.

CAUTION:
When setting the transmission jack, be careful not to allow it to collide against the drain plug.

19. Remove engine rear member with power tool.
20. Remove bolts fixing transmission assembly to engine with power tool.
21. Remove transmission assembly from vehicle with a transmission jack.
    - **Secure torque converter to prevent it from dropping.**
    - **Secure transmission assembly to a transmission jack.**

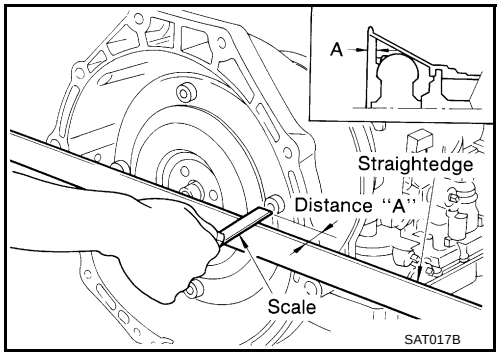


INSPECTION

Installation and Inspection of Torque Converter

- After inserting a torque converter to a transmission, be sure to check distance “A” to ensure it is within the reference value limit.

Distance “A” : 25.0 mm (0.98 in) or more

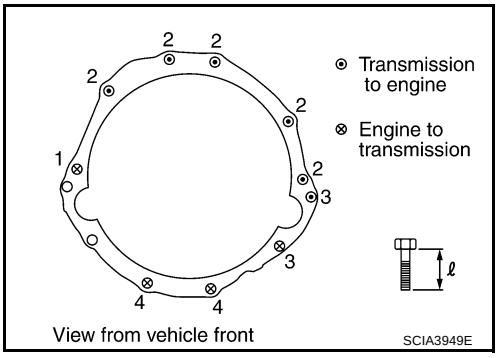


INSTALLATION

Install the removed parts in the reverse order of the removal, while paying attention to the following work.

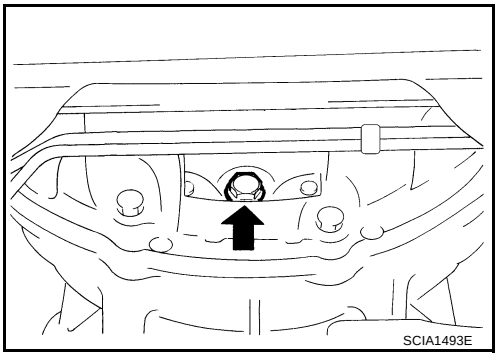
- When installing transmission assembly to the engine, attach the fixing bolts in accordance with the following standard.

Bolt No.	1	2	3	4
Number of bolts	1	5	2	2
Bolt length "ℓ" mm (in)	55 (2.17)	65 (2.56)	56 (2.20)	35 (1.38)
Tightening torque N·m (kg-m, ft-lb)	75 (7.7, 55)		55 (5.6, 41)	47 (4.8, 35)



- Align the positions of tightening bolts for drive plate with those of the torque converter, and temporarily tighten the bolts. Then tighten the bolts with the specified torque.

: **5.1 N·m (5.2 kg-m, 38 ft-lb)**



CAUTION:

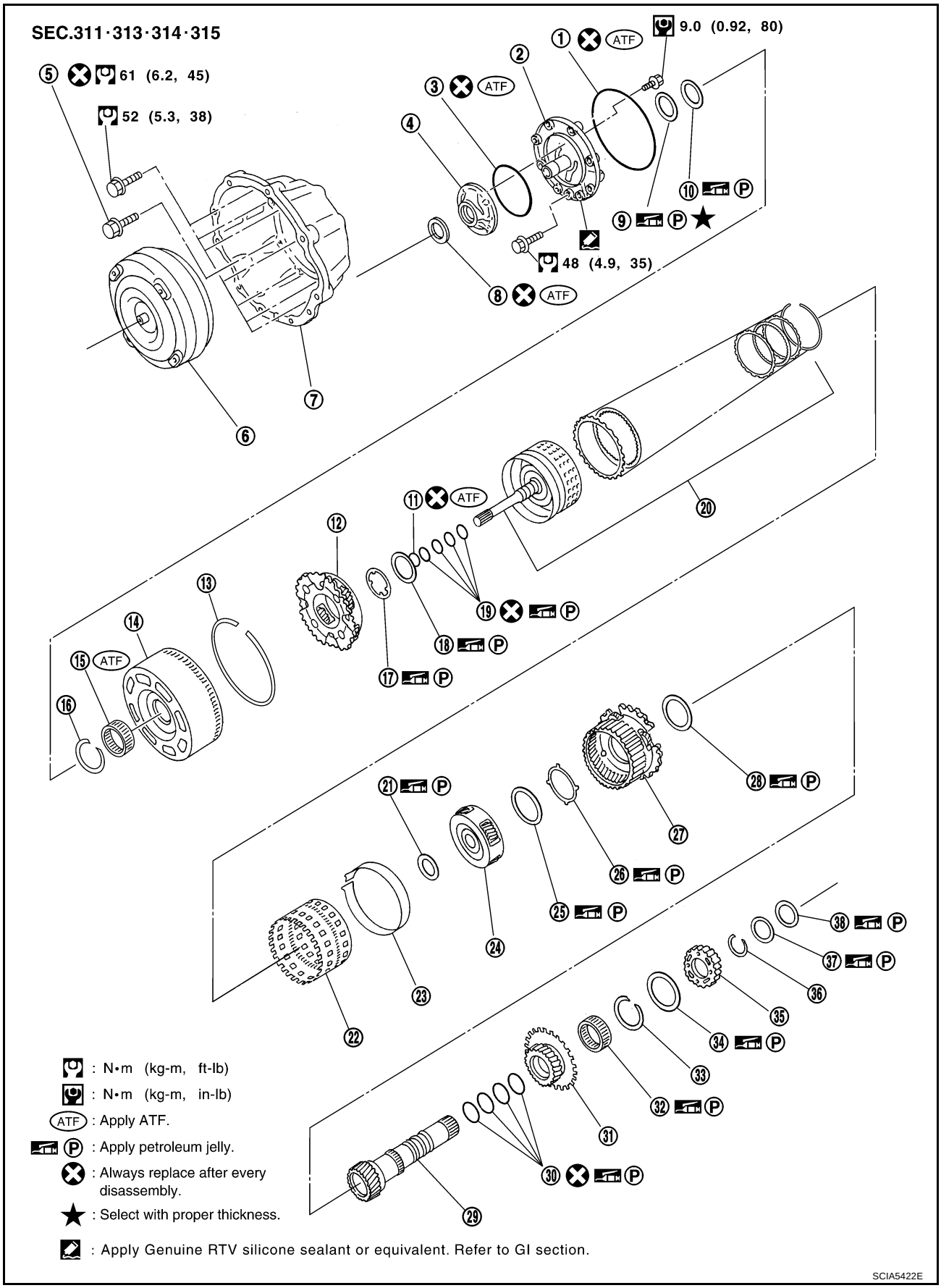
- **When turning crankshaft, turn it clockwise as viewed from the front of the engine.**
- **When tightening the tightening bolts for the torque converter after fixing the crankshaft pulley bolts, be sure to confirm the tightening torque of the crankshaft pulley mounting bolts.**
- **After converter is installed to drive plate, rotate crankshaft several turns and check to be sure that transmission rotates freely without binding.**
- Install crankshaft position sensor (POS). Refer to EM-27, "Removal and Installation" .
- After completing installation, check fluid leakage, fluid level, and the A/T positions of A/T. Refer to AT-12, "Checking A/T Fluid" , AT-228, "Adjustment of A/T Position" , AT-228, "Checking of A/T Position" .

OVERHAUL

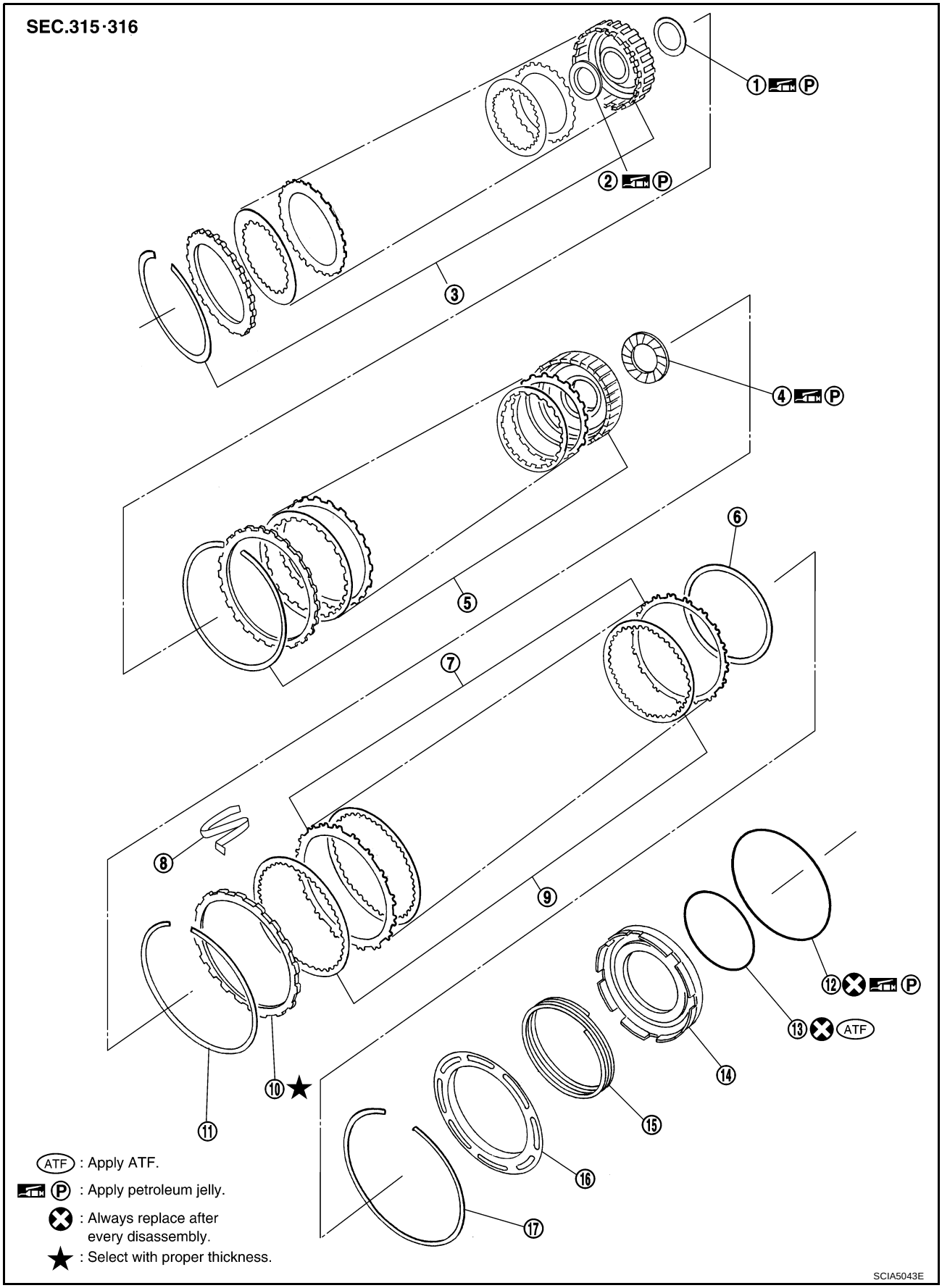
PFP:00000

Components

ACS0084V



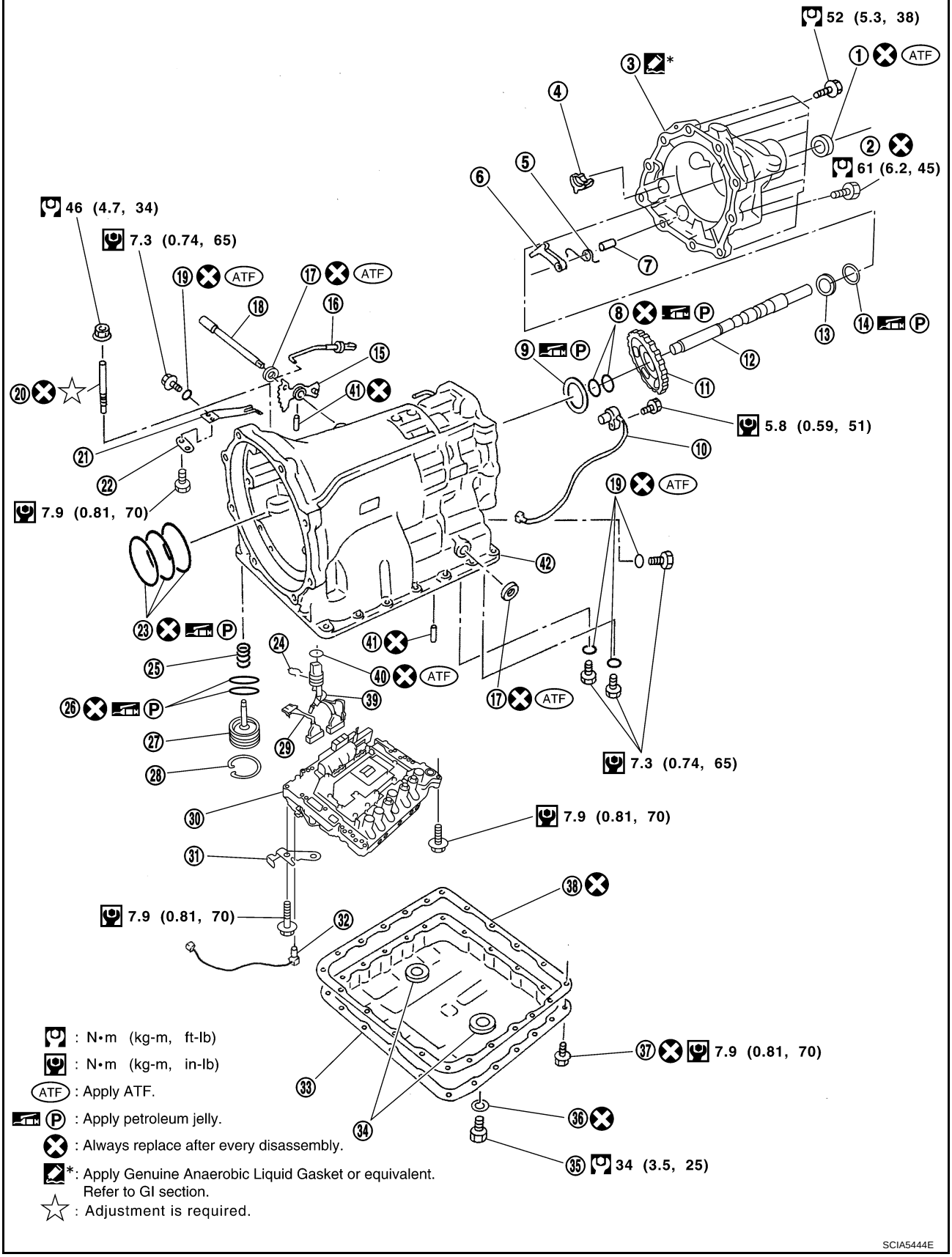
1. O-ring
2. Oil pump cover
3. O-ring
4. Oil pump housing
5. Self-sealing bolt
6. Torque converter
7. Converter housing
8. Oil pump housing oil seal
9. Bearing race
10. Needle bearing
11. O-ring
12. Front carrier assembly
13. Snap ring
14. Front sun gear
15. 3rd one-way clutch
16. Snap ring
17. Bearing race
18. Needle bearing
19. Seal ring
20. Input clutch assembly
21. Needle bearing
22. Rear internal gear
23. Brake band
24. Mid carrier assembly
25. Needle bearing
26. Bearing race
27. Rear carrier assembly
28. Needle bearing
29. Mid sun gear
30. Seal ring
31. Rear sun gear
32. 1st one-way clutch
33. Snap ring
34. Needle bearing
35. High and low reverse clutch hub
36. Snap ring
37. Bearing race
38. Needle bearing



1. Needle bearing
2. Bearing race
3. High and low reverse clutch assembly
4. Needle bearing
5. Direct clutch assembly
6. Reverse brake dish plate

7. Reverse brake driven plate
8. N-spring
9. Reverse brake drive plate
10. Reverse brake retaining plate
11. Snap ring
12. Lip seal
13. D-ring
14. Reverse brake piston
15. Return spring
16. Spring retainer
17. Snap ring

SEC.313 · 314 · 315 · 316 · 317 · 319

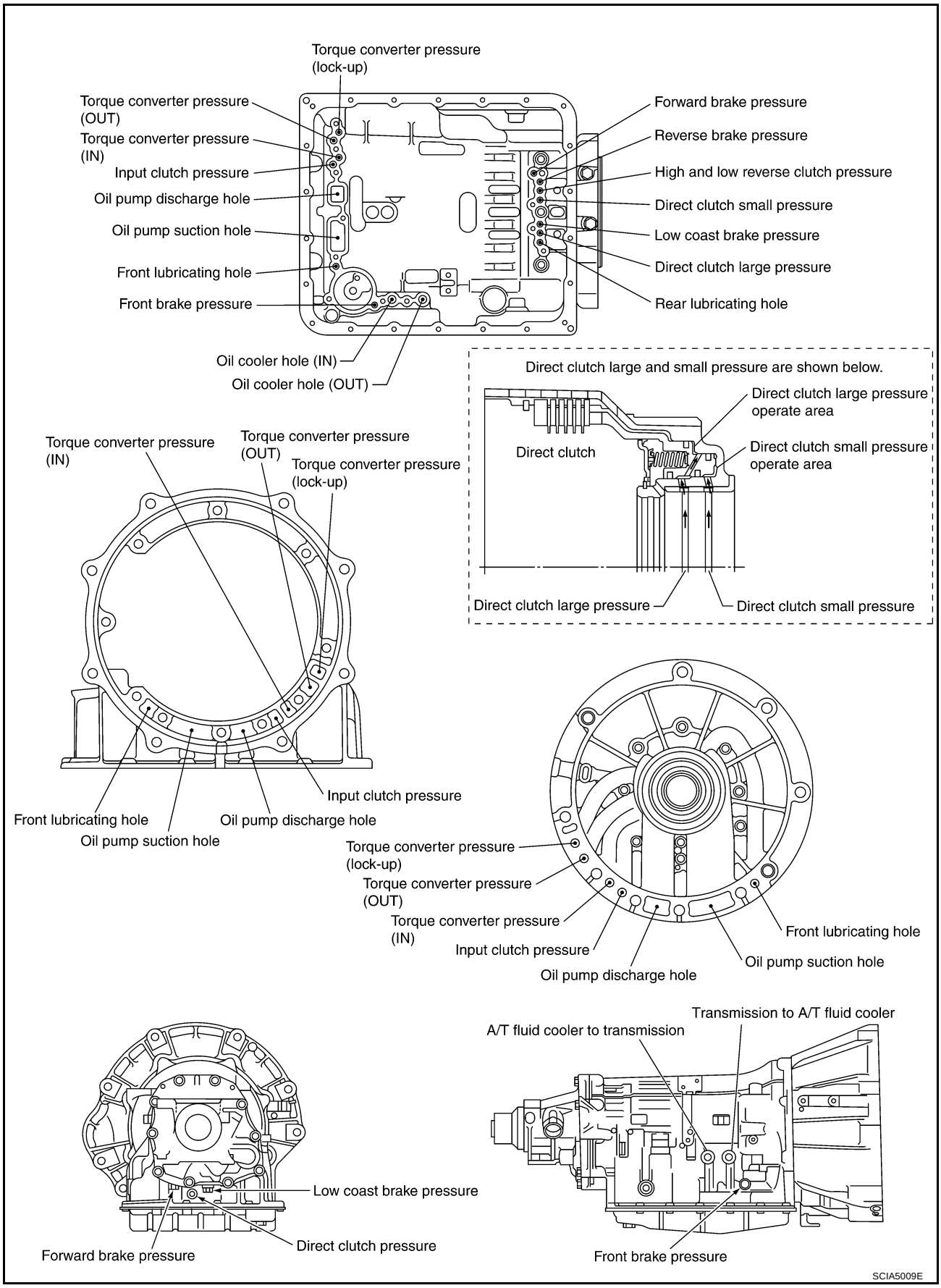


1. Rear oil seal
2. Self-sealing bolt
3. Rear extension
4. Parking actuator support
5. Return spring
6. Parking pawl
7. Pawl shaft
8. Seal ring
9. Needle bearing

10. Revolution sensor
11. Parking gear
12. Output shaft
13. Bearing race
14. Needle bearing
15. Manual plate
16. Parking rod
17. Manual shaft oil seal
18. Manual shaft
19. O-ring
20. Band servo anchor end pin
21. Detent spring
22. Spacer
23. Seal ring
24. Snap ring
25. Return spring
26. O-ring
27. Servo assembly
28. Snap ring
29. Sub-harness
30. Control valve with TCM
31. Bracket
32. A/T fluid temperature sensor 2
33. Oil pan
34. Magnet
35. Drain plug
36. Drain plug gasket
37. Oil pan mounting bolt
38. Oil pan gasket
39. Terminal cord assembly
40. O-ring
41. Retaining pin
42. Transmission case

Oil Channel

ACS0084W



Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings

ACS0084X

Outer diameter of snap rings

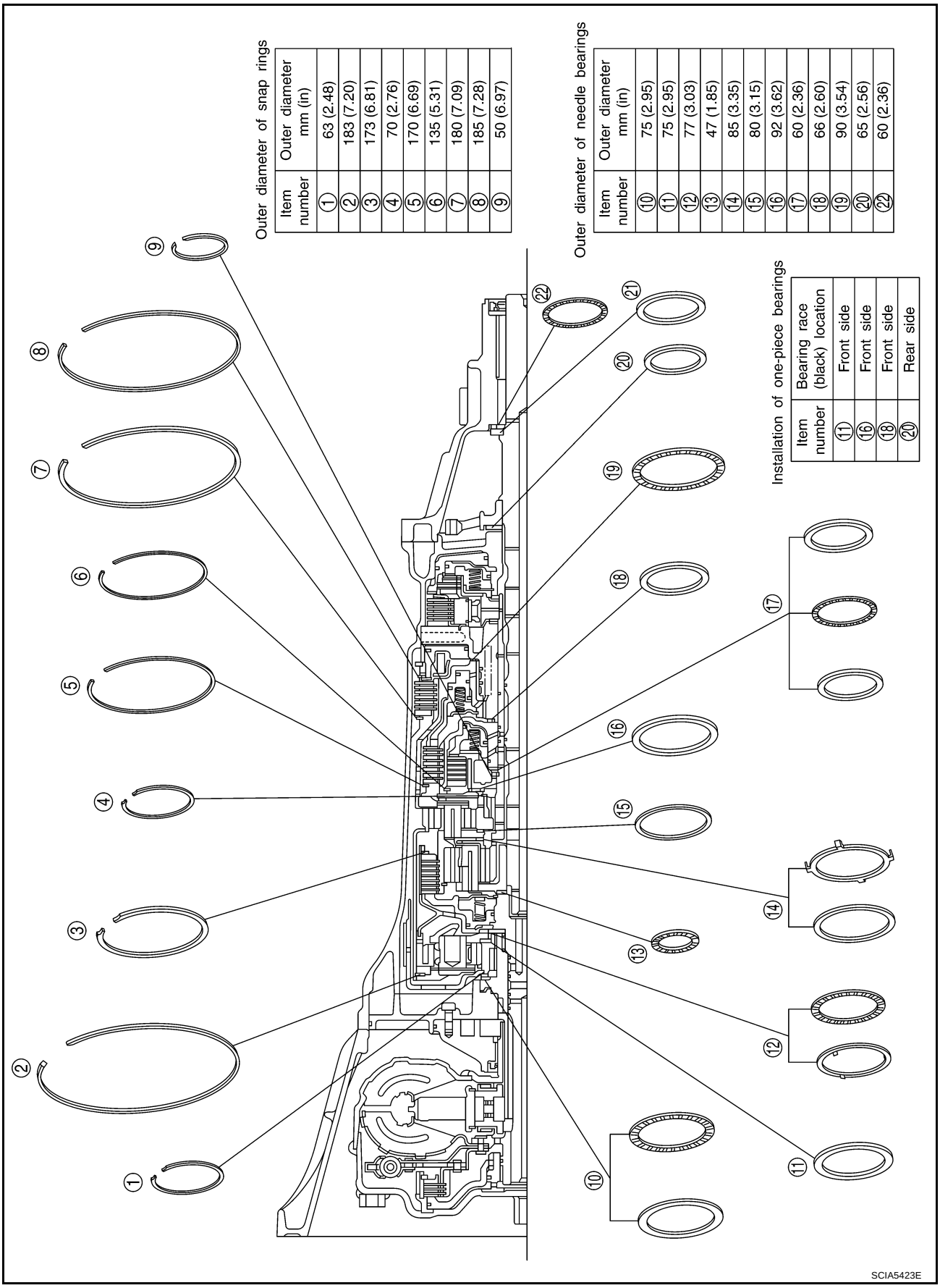
Item number	Outer diameter mm (in)
①	63 (2.48)
②	183 (7.20)
③	173 (6.81)
④	70 (2.76)
⑤	170 (6.69)
⑥	135 (5.31)
⑦	180 (7.09)
⑧	185 (7.28)
⑨	50 (6.97)

Outer diameter of needle bearings

Item number	Outer diameter mm (in)
⑩	75 (2.95)
⑪	75 (2.95)
⑫	77 (3.03)
⑬	47 (1.85)
⑭	85 (3.35)
⑮	80 (3.15)
⑯	92 (3.62)
⑰	60 (2.36)
⑱	66 (2.60)
⑲	90 (3.54)
⑳	65 (2.56)
㉒	60 (2.36)

Installation of one-piece bearings

Item number	Bearing race (black) location
⑪	Front side
⑯	Front side
⑱	Front side
⑳	Rear side



DISASSEMBLY

PFP:31020

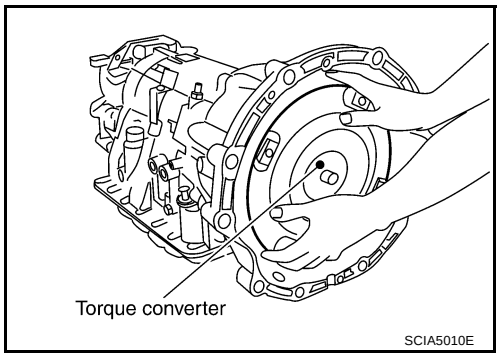
Disassembly

ACS0084Y

CAUTION:

Do not disassemble parts behind Drum Support. Refer to AT-17, "Cross-Sectional View" .

1. Drain ATF through drain plug.
2. Remove torque converter by holding it firmly and turing while pulling straight out.

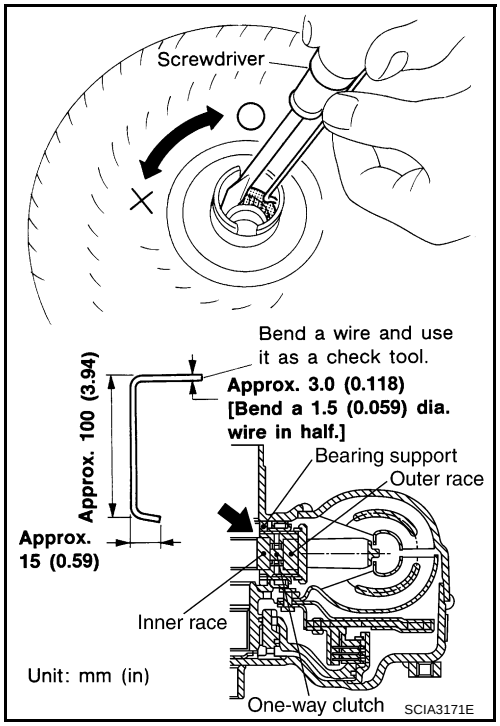


3. Check torque converter one-way clutch using check tool as shown at figure.

a. Insert check tool into the groove of bearing support built into one-way clutch outer race.

b. When fixing bearing support with check tool, rotate one- way clutch spline using screwdriver.

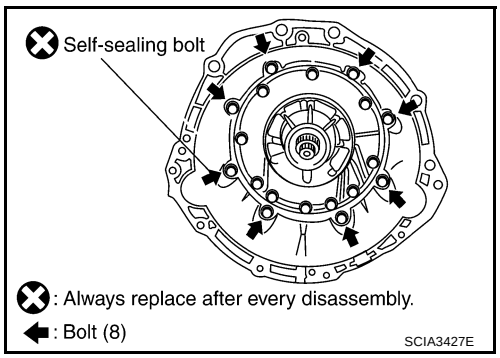
c. Check that inner race rotates clockwise only. If not, replace torque converter assembly.



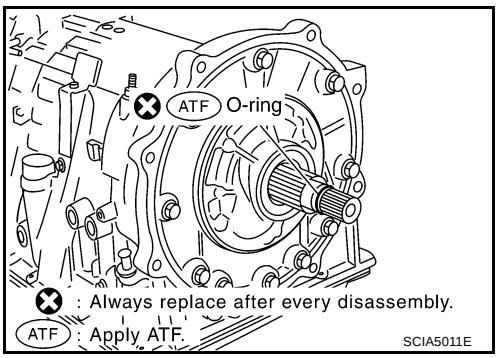
4. Remove converter housing from transmission case.

CAUTION:

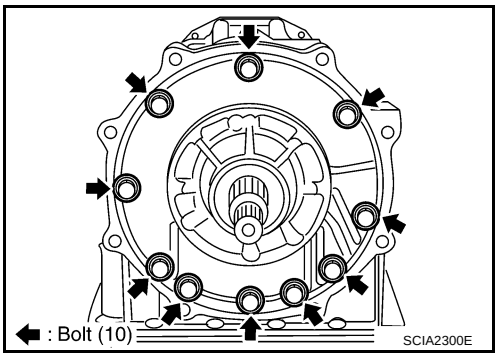
Be careful not to scratch converter housing.



5. Remove O-ring from input clutch assembly.



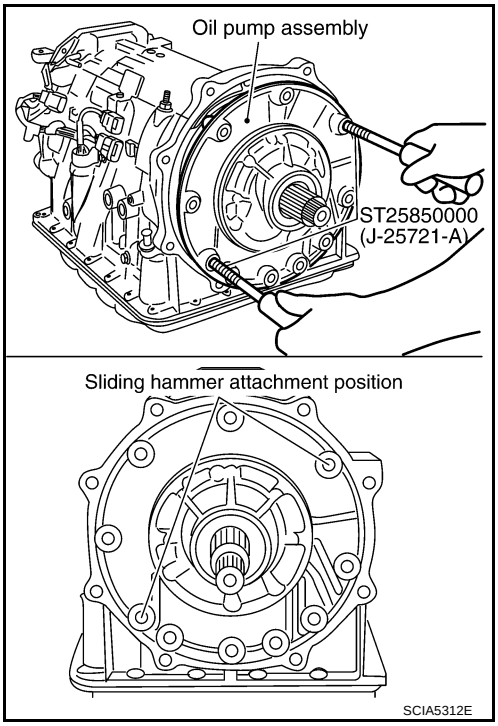
6. Remove tightening bolts for oil pump assembly and transmission case.



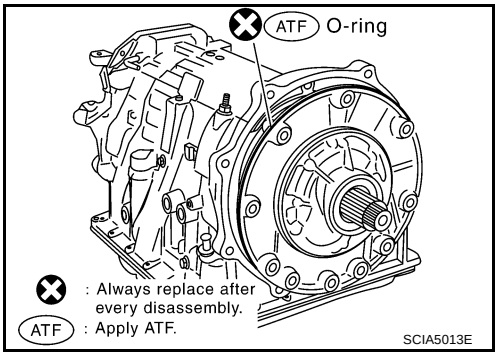
7. Attach the sliding hammers to oil pump assembly and extract it evenly from transmission case.

CAUTION:

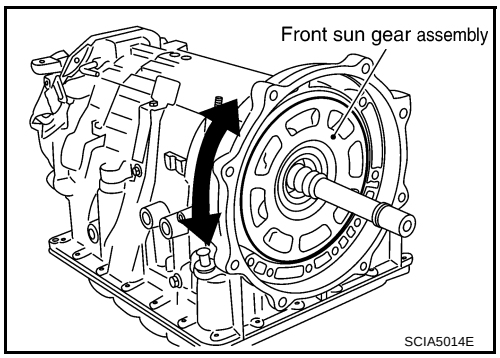
- **Fully tighten sliding hammer screw.**
- **Make sure that bearing race is installed to the oil pump assembly edge surface.**



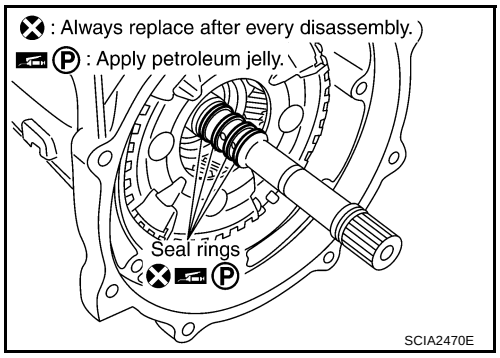
8. Remove O-ring from oil pump assembly.
9. Remove bearing race from oil pump assembly.
10. Remove needle bearing from front sun gear.



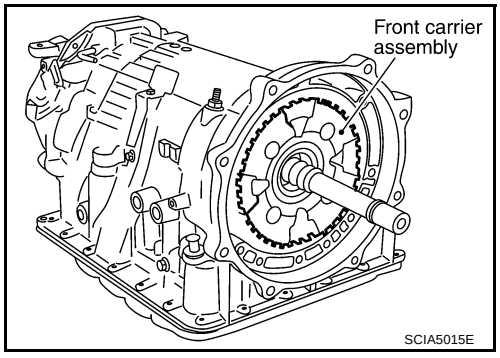
11. Remove front sun gear assembly from front carrier assembly.
    NOTE:
    Remove front sun gear by rotating left/right.



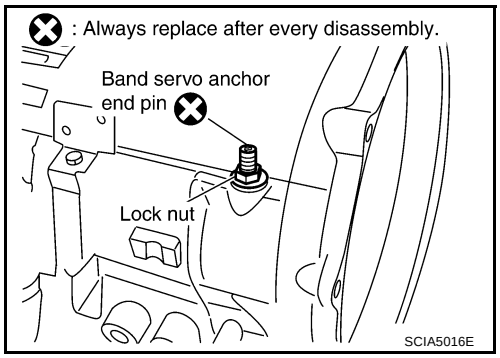
12. Remove seal rings from input clutch assembly.



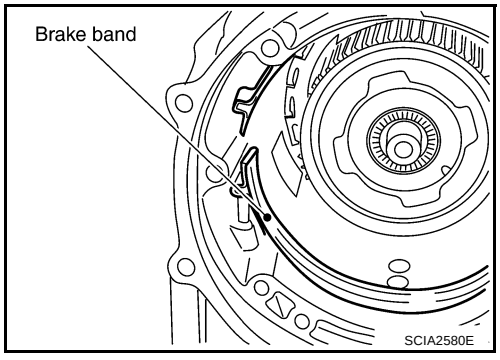
13. Remove front carrier assembly from rear carrier assembly. (With input clutch assembly and rear internal gear.)
    CAUTION:
    Be careful to remove it with needle bearing.



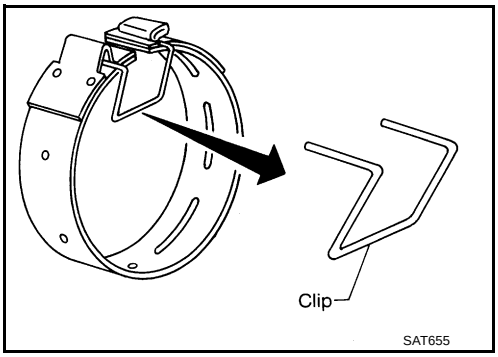
14. Loosen lock nut and remove band servo anchor end pin from transmission case.



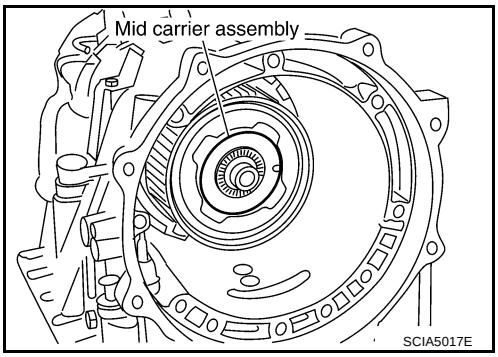
15. Remove brake band from transmission case.



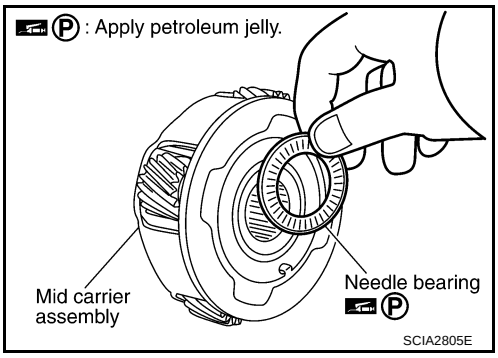
- **To prevent brake linings from cracking or peeling, do not stretch the flexible band unnecessarily. When removing the brake band, always secure it with a clip as shown in the figure at right.**
  Leave the clip in position after removing the brake band.
- **Check brake band facing for damage, cracks, wear or burns.**



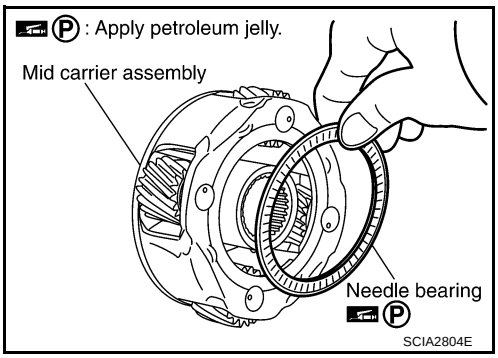
16. Remove mid carrier assembly and rear carrier assembly as a unit.



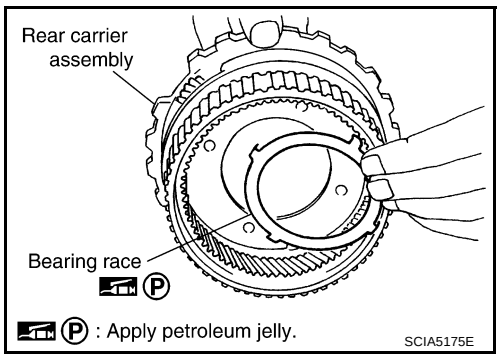
17. Remove mid carrier assembly from rear carrier assembly.
18. Remove needle bearing (front side) from mid carrier assembly.



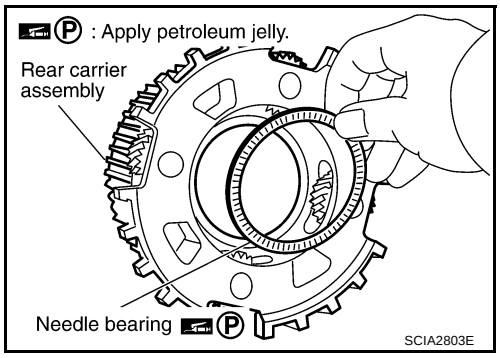
19. Remove needle bearing (rear side) from mid carrier assembly.



20. Remove bearing race from rear carrier assembly.

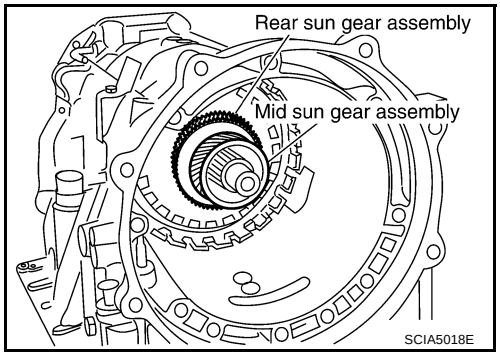


21. Remove needle bearing from rear carrier assembly.



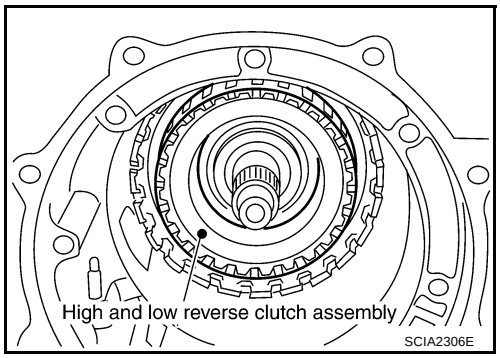
22. Remove mid sun gear assembly, rear sun gear assembly and high and low reverse clutch hub as a unit.

CAUTION:
Be careful to remove then with bearing race and needle bearing.

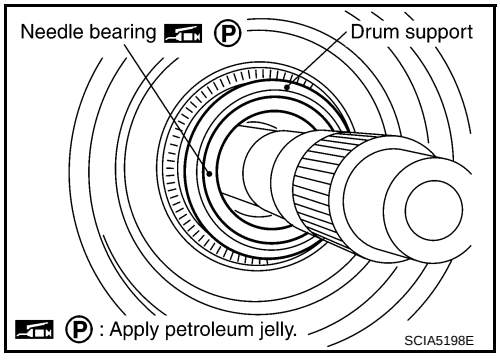


23. Remove high and low reverse clutch assembly from direct clutch assembly.

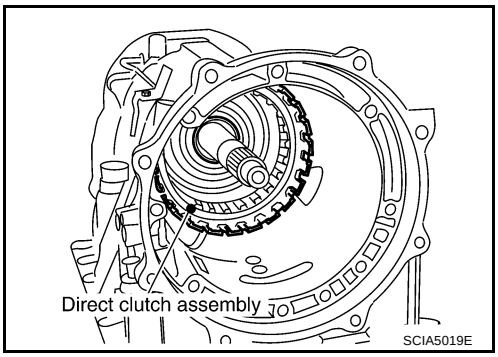
CAUTION:
Make sure that needle bearing is installed to the high and low reverse clutch assembly edge surface.



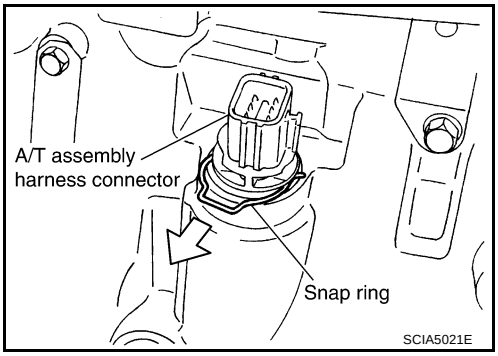
24. Remove needle bearing from drum support.



25. Remove direct clutch assembly from reverse brake.



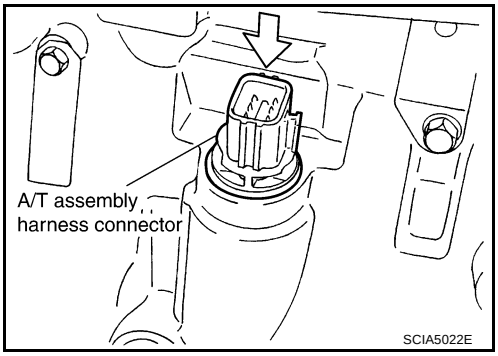
26. Remove snap ring from A/T assembly harness connector.



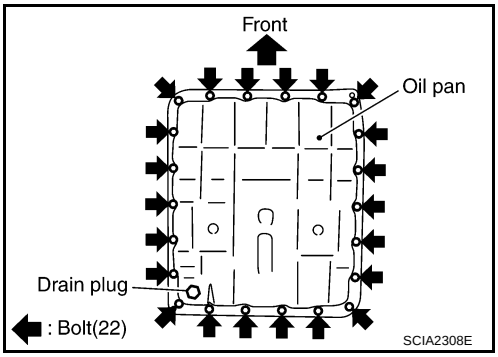
27. Push A/T assembly harness connector.

CAUTION:

Be careful not to damage connector.

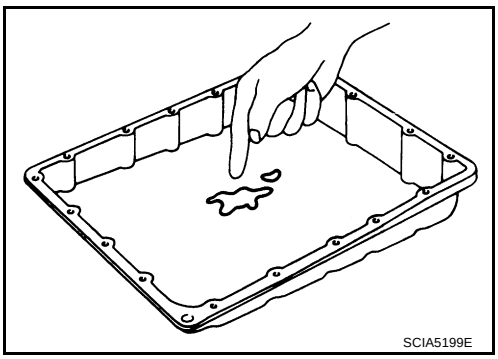


28. Remove oil pan and oil pan gasket.

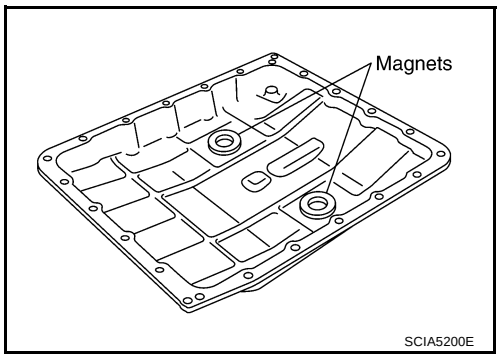


29. Check foreign materials in oil pan to help determine causes of malfunction. If the A/T fluid is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.

- **If frictional material is detected, perform A/T fluid cooler cleaning. Refer to AT-14, "A/T Fluid Cooler Cleaning".**

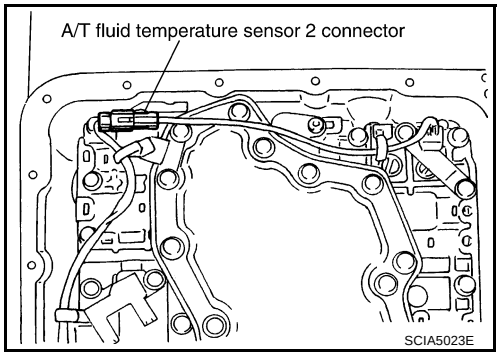


30. Remove magnets from oil pan.

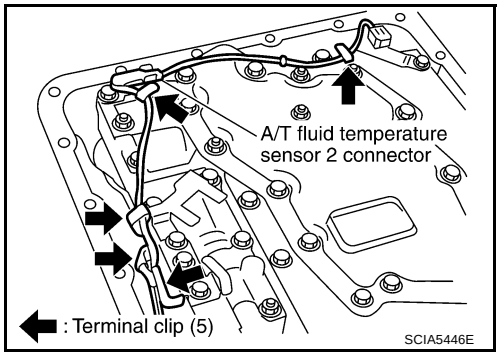


31. Disconnect A/T fluid temperature sensor 2 connector.

CAUTION:
Be careful not to damage connector.

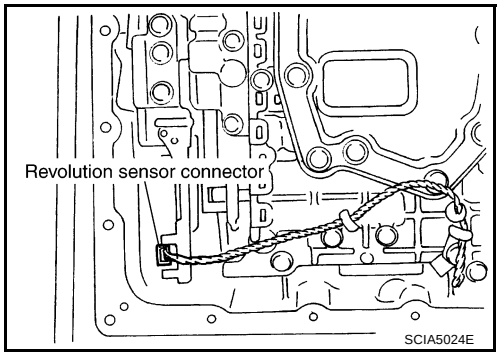


32. Straighten terminal clips to free terminal cord assembly and A/T fluid temperature sensor 2 harness.

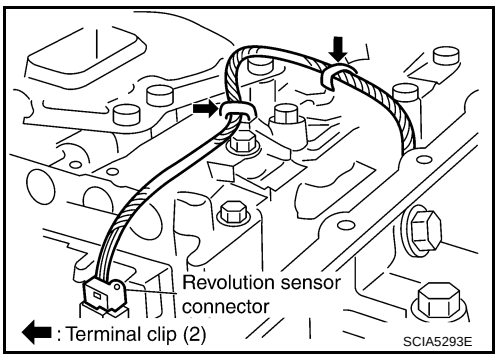


33. Disconnect revolution sensor connector.

CAUTION:
Be careful not to damage connector.

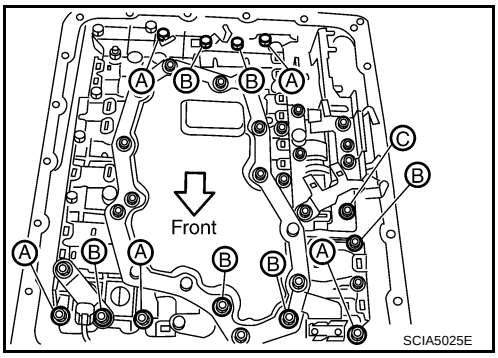


34. Straighten terminal clips to free revolution sensor harness.



35. Remove bolts A, B and C from control valve with TCM.

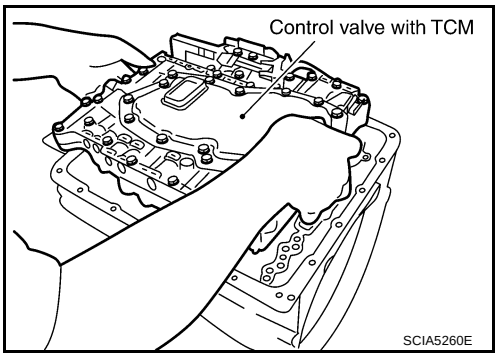
Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1



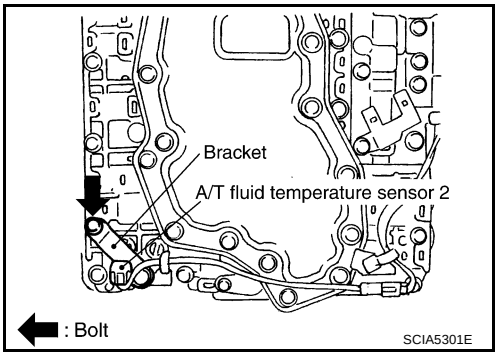
36. Remove control valve with TCM from transmission case.

CAUTION:

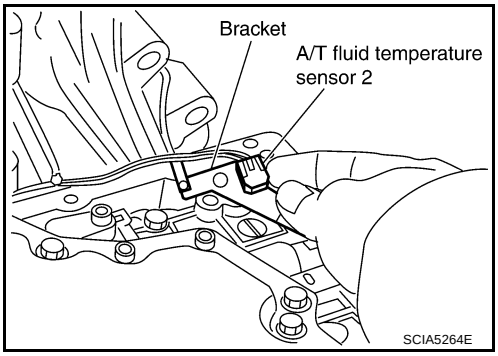
When removing, be careful with the manual valve notch and manual plate height. Remove it vertically.



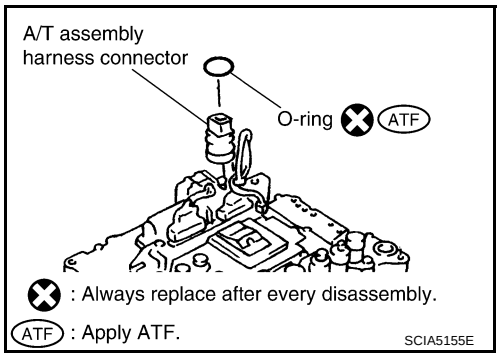
37. Remove A/T fluid temperature sensor 2 with bracket from control valve with TCM.



38. Remove bracket from A/T fluid temperature sensor 2.

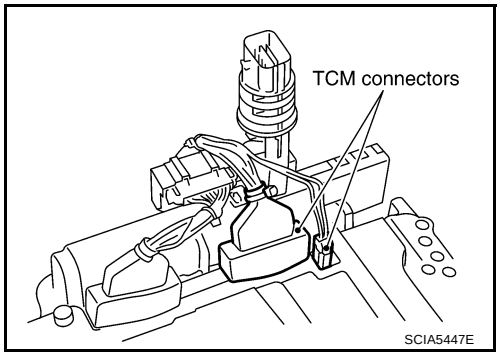


39. Remove O-ring from A/T assembly harness connector.

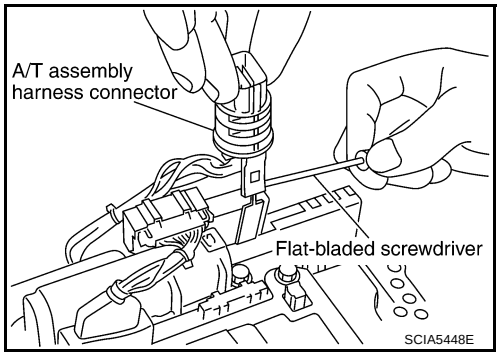


40. Disconnect TCM connectors.

CAUTION:
Be careful not to damage connectors.

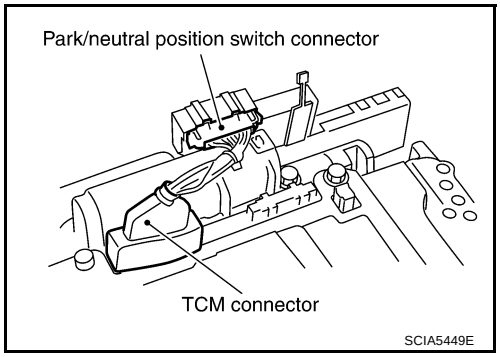


41. Remove A/T assembly harness connector from control valve with TCM using a flat-bladed screwdriver.

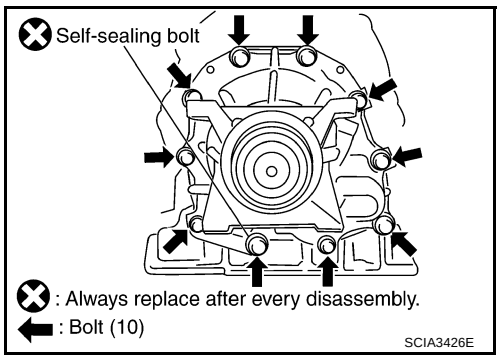


42. Disconnect TCM connector and park/neutral position switch connector.

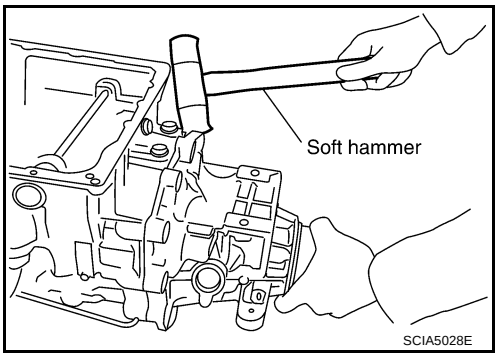
CAUTION:
Be careful not to damage connectors.



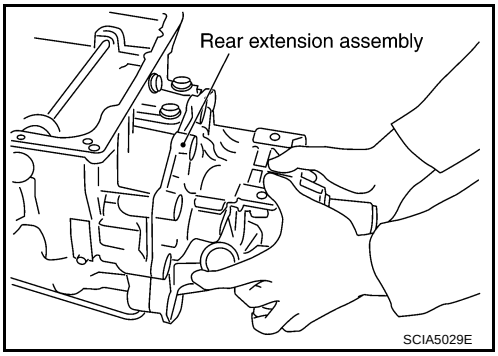
43. Remove tightening bolts for rear extension assembly and transmission case.



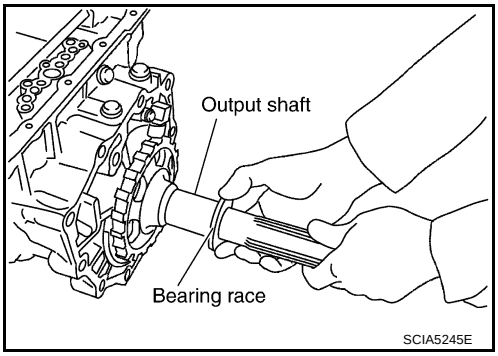
44. Tap rear extension assembly with soft hammer.



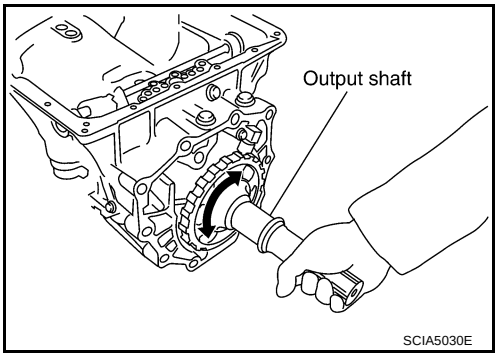
45. Remove rear extension assembly from transmission case. (With needle bearing)



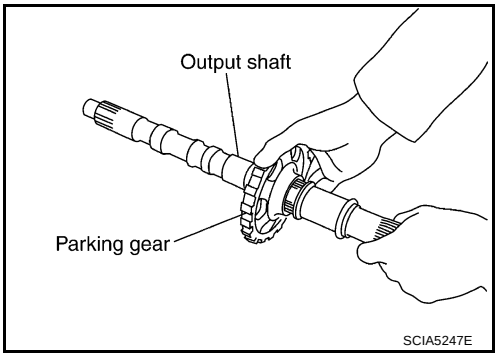
46. Remove bearing race from output shaft.



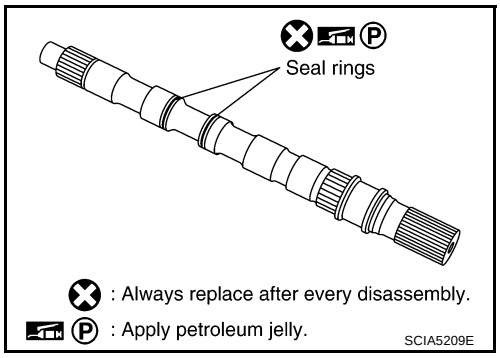
47. Remove output shaft from transmission case by rotating left/ right.



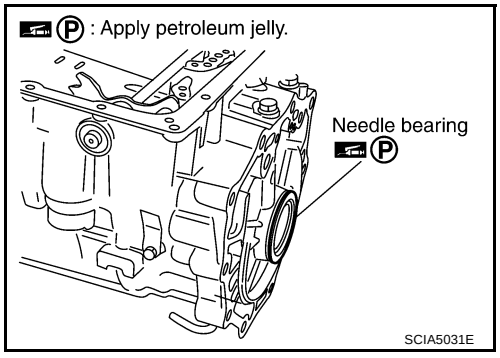
48. Remove parking gear from output shaft.



49. Remove seal rings from output shaft.



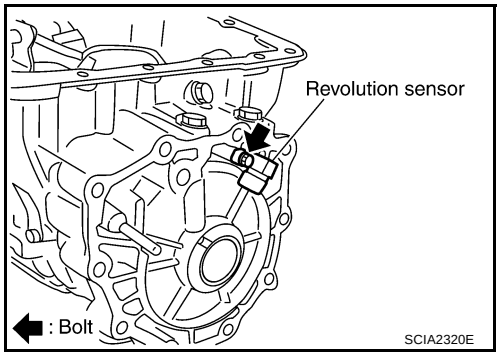
50. Remove needle bearing from transmission case.



51. Remove revolution sensor from transmission case.

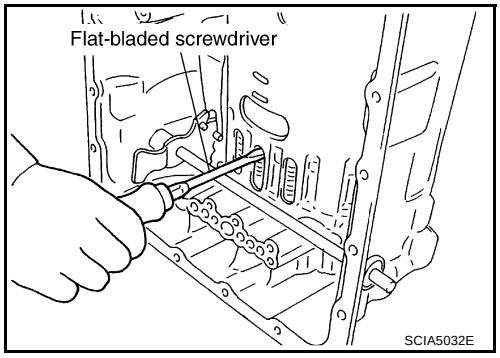
CAUTION:

- **Do not subject it to impact by dropping or hitting it.**
- **Do not disassemble.**
- **Do not allow metal filings, etc., to get on the sensor's front edge magnetic area.**
- **Do not place in an area affected by magnetism.**



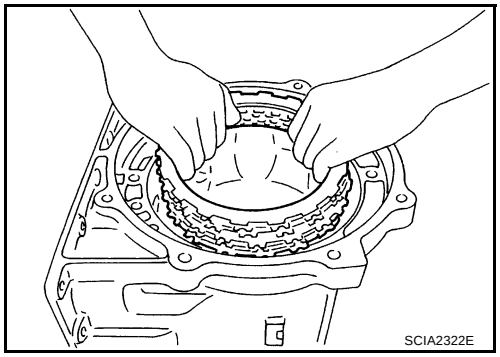
52. Remove reverse brake snap ring (fixing plate) using 2 flat-bladed screwdrivers.

NOTE:
Press out snap ring from the transmission case oil pan side gap using a flat-bladed screwdriver, and remove it using another screwdriver.

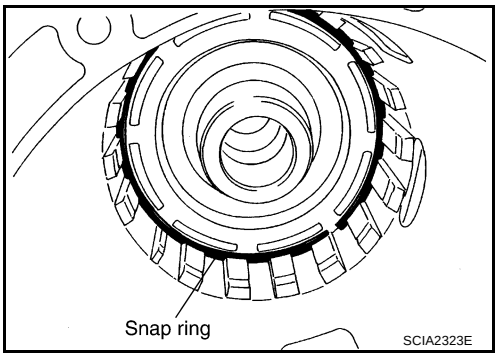


53. Remove reverse brake retaining plate, drive plates, driven plates and dish plate from transmission case.

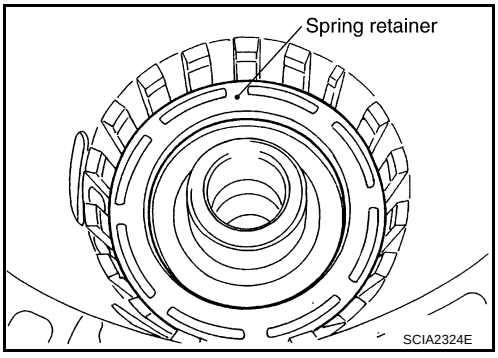
CAUTION:
Be careful to remove it with N-spring.



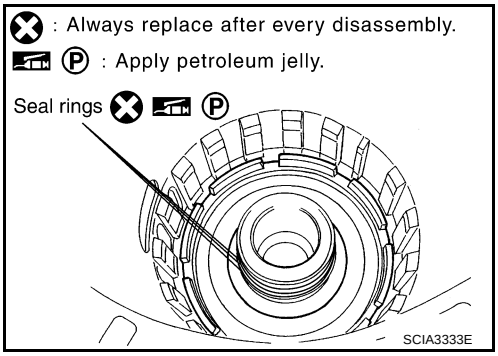
54. Remove snap ring (fixing spring retainer) using a flat-bladed screwdriver.



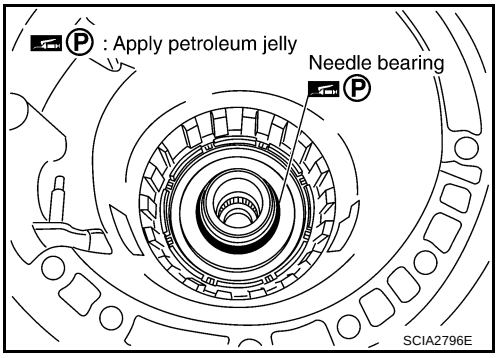
55. Remove spring retainer and return spring from transmission case.



56. Remove seal rings from drum support.



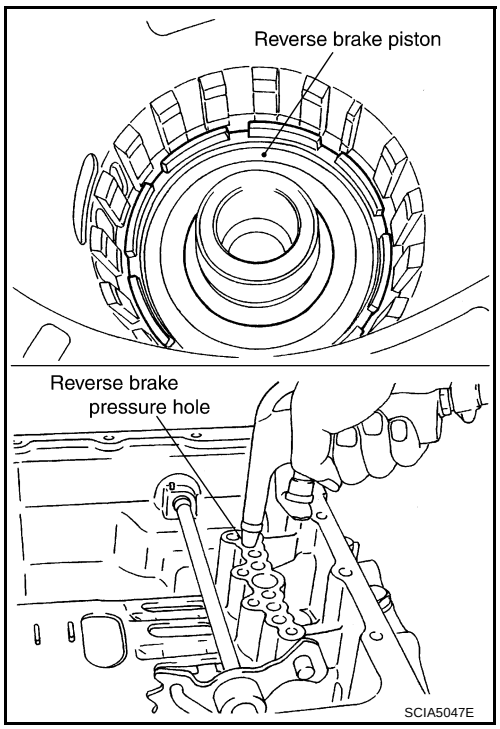
57. Remove needle bearing from drum support edge surface.



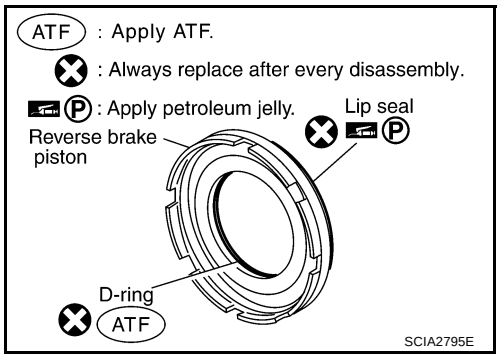
58. Remove reverse brake piston from transmission case with compressed air. Refer to AT-272, "Oil Channel" .

CAUTION:

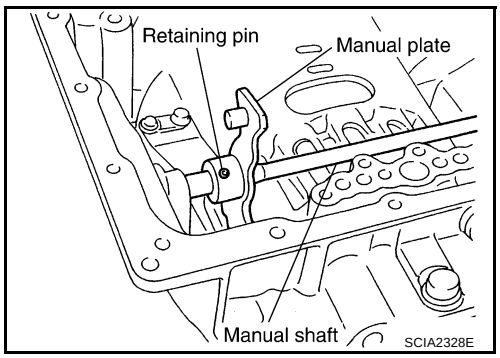
Care should be taken not to abruptly blow air. It makes pistons incline, as the result, it becomes hard to disassemble the pistons.



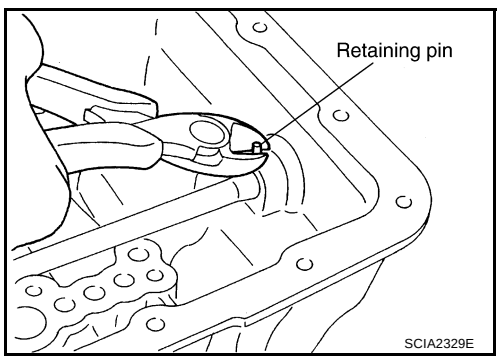
59. Remove lip seal and D-ring from reverse brake piston.



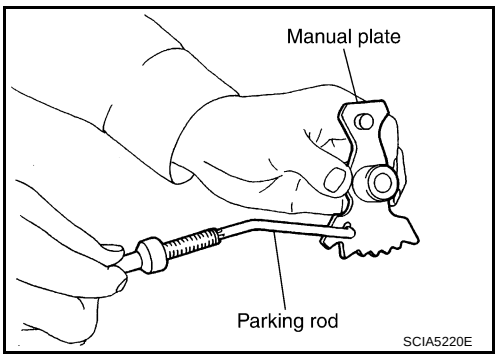
60. Use a pin punch (4mm dia. commercial service tool) to knock out retaining pin.



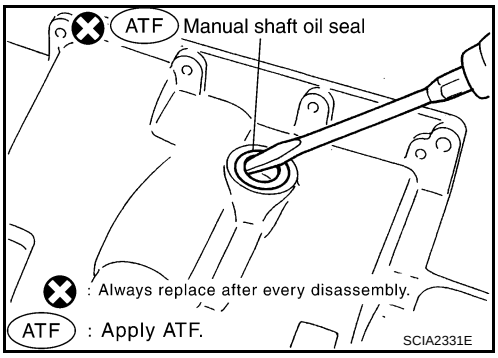
61. Remove manual shaft retaining pin with nippers.
62. Remove manual plate (with parking rod) from manual shaft.



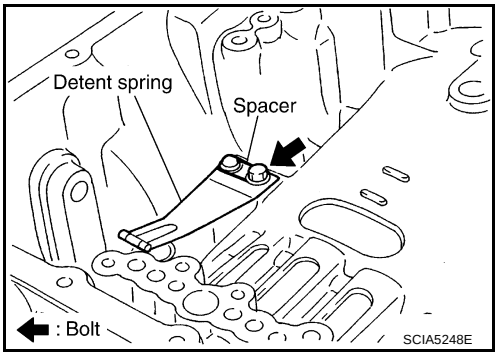
63. Remove parking rod from manual plate.
64. Remove manual shaft from transmission case.



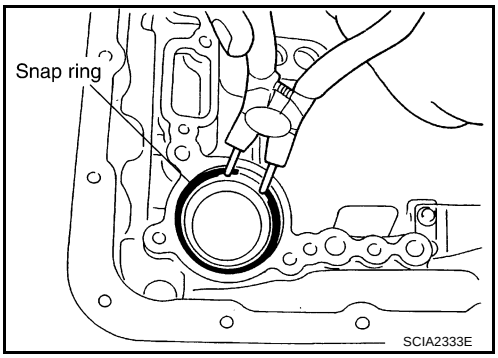
65. Remove manual shaft oil seals using a flat-bladed screwdriver.
CAUTION:
Be careful not to scratch transmission case.



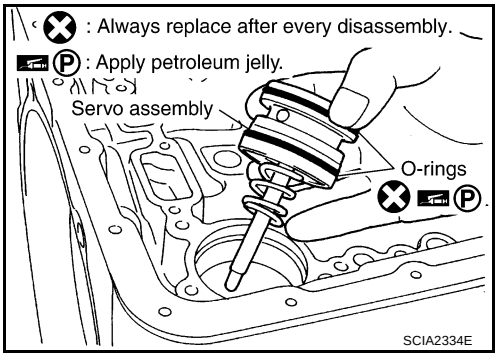
66. Remove detent spring and spacer from transmission case.



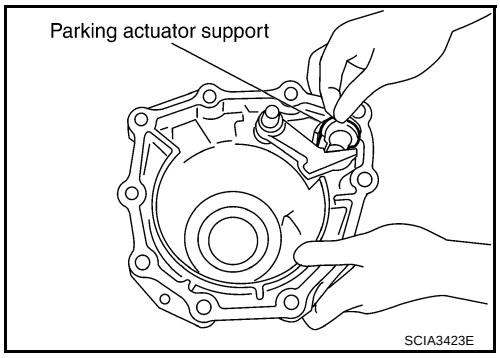
67. Using snap ring pliers, remove snap ring from transmission case.



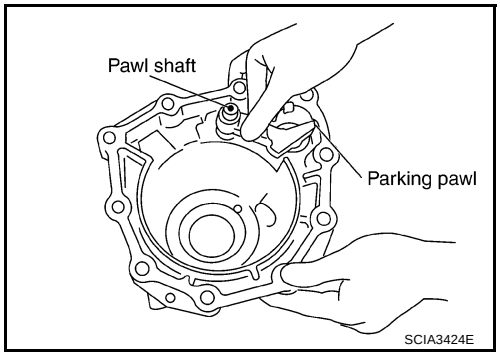
68. Remove servo assembly (with return spring) from transmission case.
69. Remove return spring from servo assembly.
70. Remove O-rings from servo assembly.



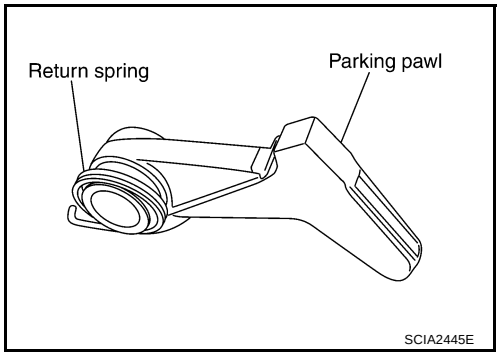
71. Remove parking actuator support from rear extension.



72. Remove parking pawl (with return spring) and pawl shaft from rear extension.

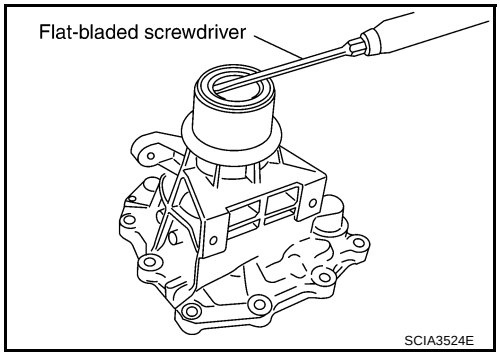


73. Remove return spring from parking pawl.



74. Remove needle bearing from rear extension.
75. Remove rear oil seal from rear extension.

CAUTION:
Be careful not to scratch rear extension.



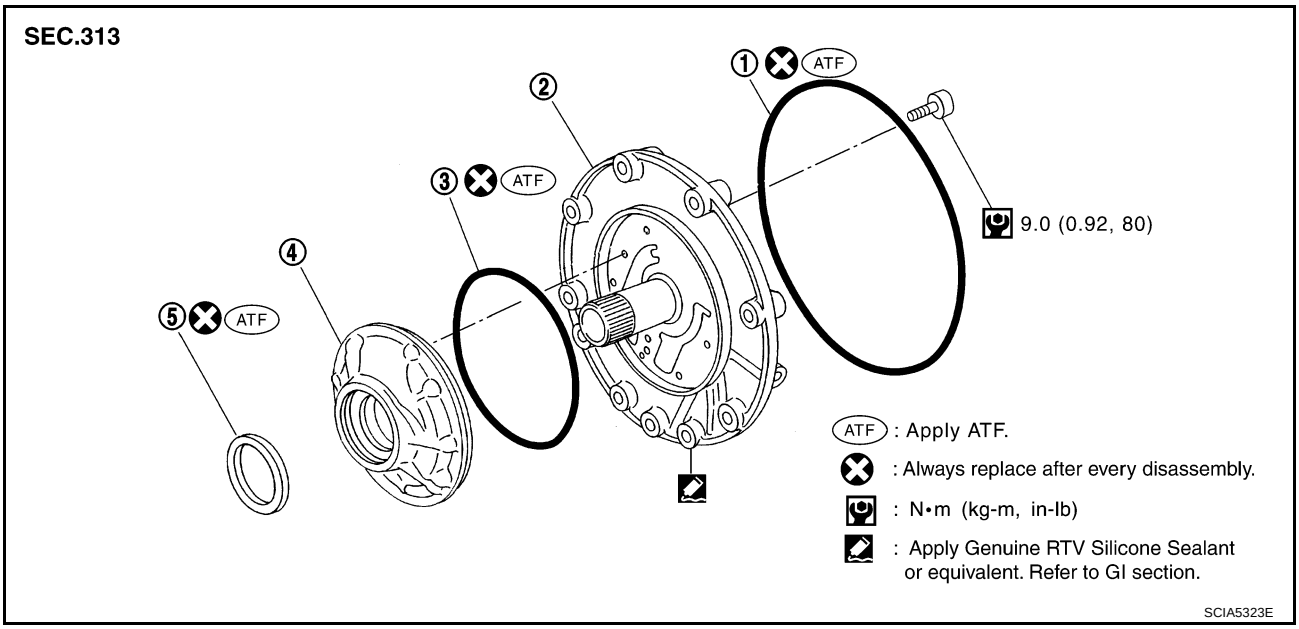
REPAIR FOR COMPONENT PARTS

PFP:00000

Oil Pump

ACS0084Z

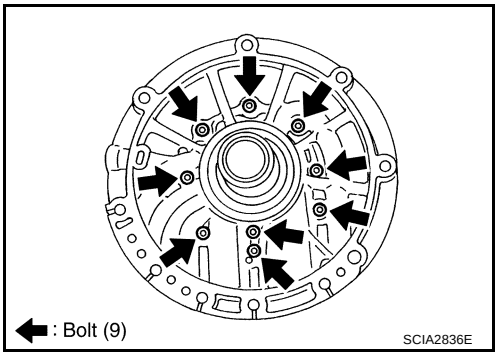
COMPONENTS



1. O-ring
2. Oil pump cover
3. O-ring
4. Oil pump housing
5. Oil pump housing oil seal

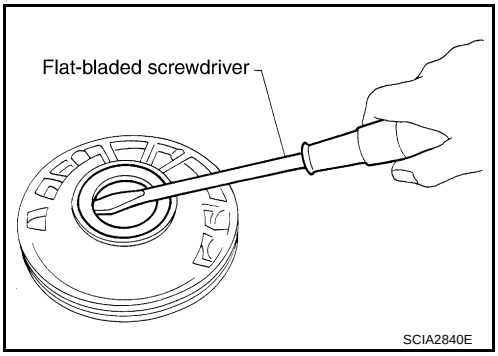
DISASSEMBLY

1. Remove oil pump housing from oil pump cover.

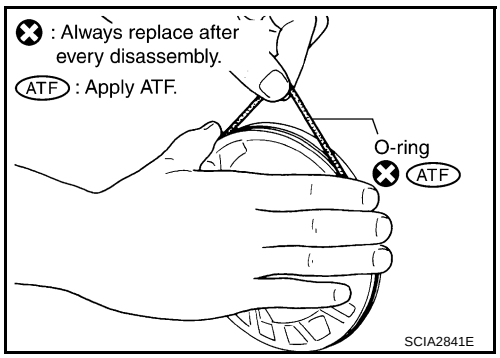


2. Remove oil pump housing oil seal using a flat-bladed screwdriver.

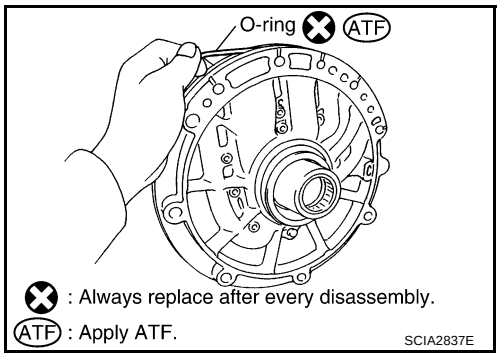
CAUTION:
Be careful not to scratch oil pump housing.



3. Remove O-ring from oil pump housing.



4. Remove O-ring from oil pump cover.

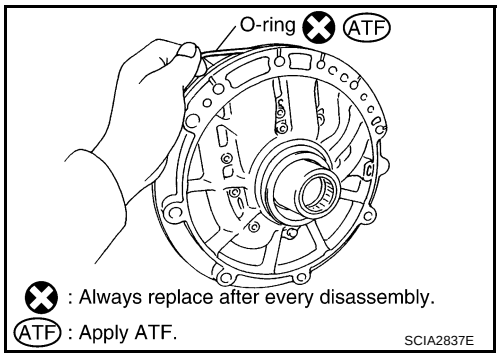


ASSEMBLY

1. Install O-ring to oil pump cover.

CAUTION:

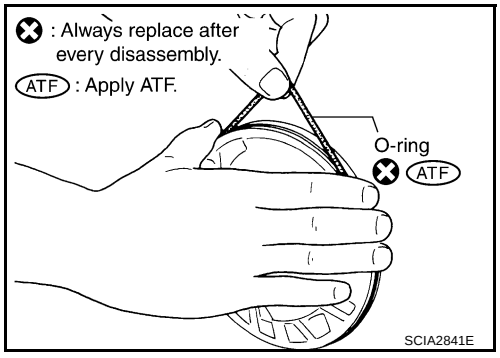
- **Do not reuse O-ring.**
- **Apply ATF to O-ring.**



2. Install O-ring to oil pump housing.

CAUTION:

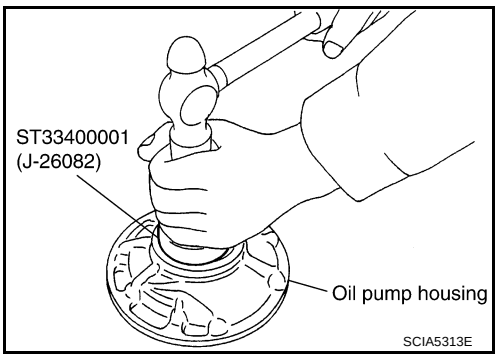
- **Do not reuse O-ring.**
- **Apply ATF to O-ring.**



3. Using a drift, install oil pump housing oil seal to the oil pump housing until it is flush.

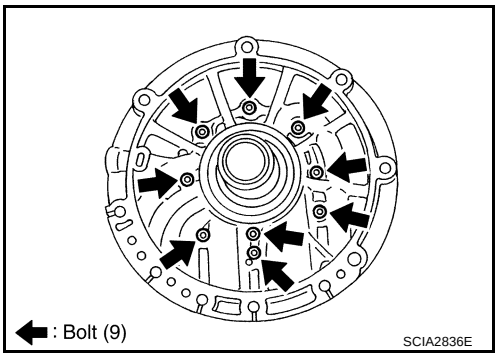
CAUTION:

- **Do not reuse oil seal.**
- **Apply ATF to oil seal.**



4. Install oil pump housing to oil pump cover.

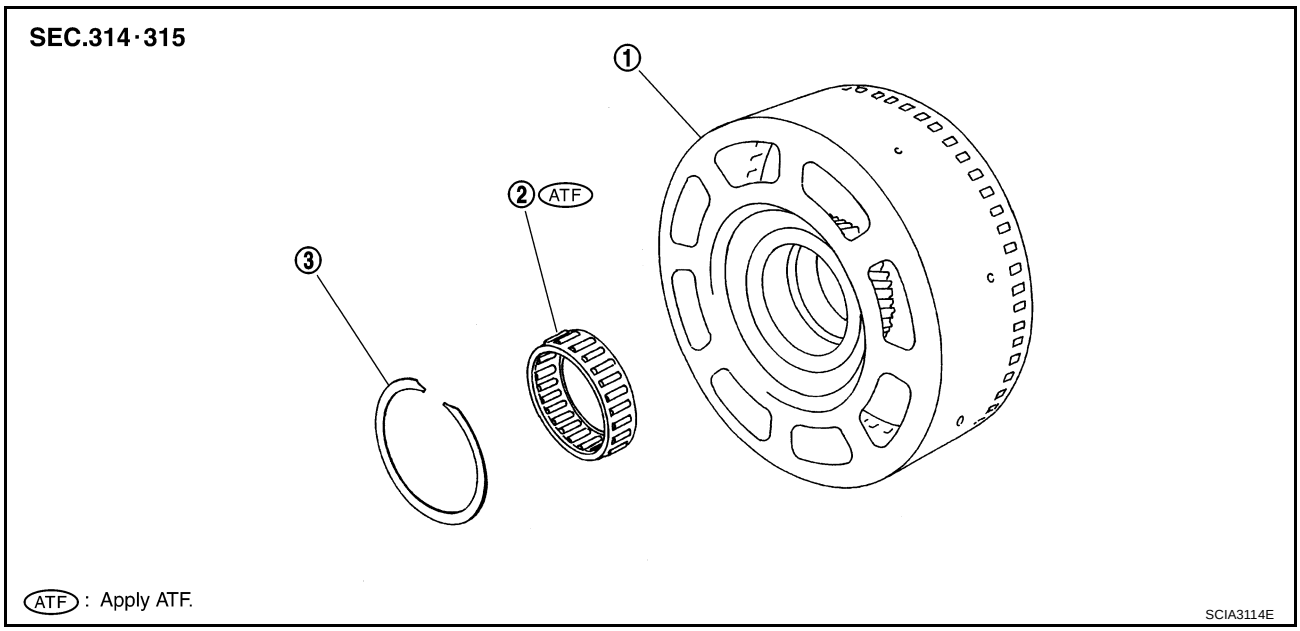
: 9.0 N·m (0.92 kg-m, 80 in-lb.)



Front Sun Gear, 3rd One-Way Clutch

ACS00850

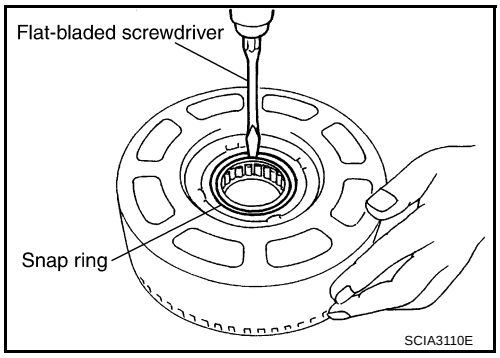
COMPONENTS



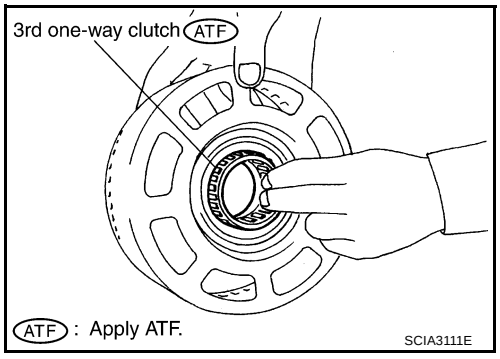
1. Front sun gear
2. 3rd one-way clutch
3. Snap ring

DISASSEMBLY

1. Using a flat-bladed screwdriver, remove snap ring from front sun gear.



2. Remove 3rd one-way clutch from front sun gear.



INSPECTION

3rd One-Way Clutch

- Check frictional surface for wear or damage.

  CAUTION:

  If necessary, replace the 3rd one-way clutch.

Front Sun Gear Snap Ring

- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace the snap ring.

Front Sun Gear

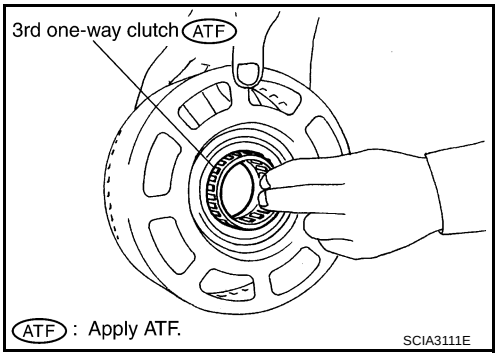
- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace the front sun gear.

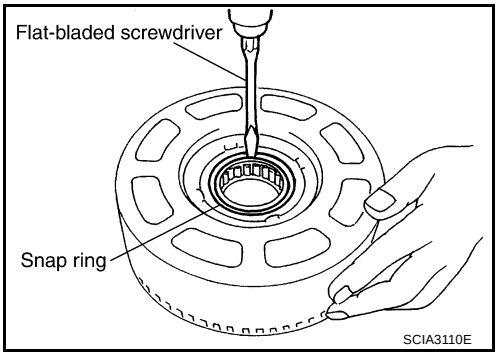
ASSEMBLY

1. Install 3rd one-way clutch in front sun gear.

CAUTION:
Apply ATF to 3rd one-way clutch.



2. Using a flat-bladed screwdriver, install snap ring in front sun gear.

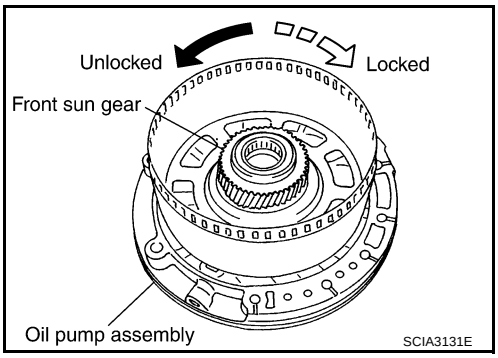


3. Check operation of 3rd one-way clutch.

a. Hold oil pump assembly and turn front sun gear.

b. Check 3rd one-way clutch for correct locking and unlocking directions.

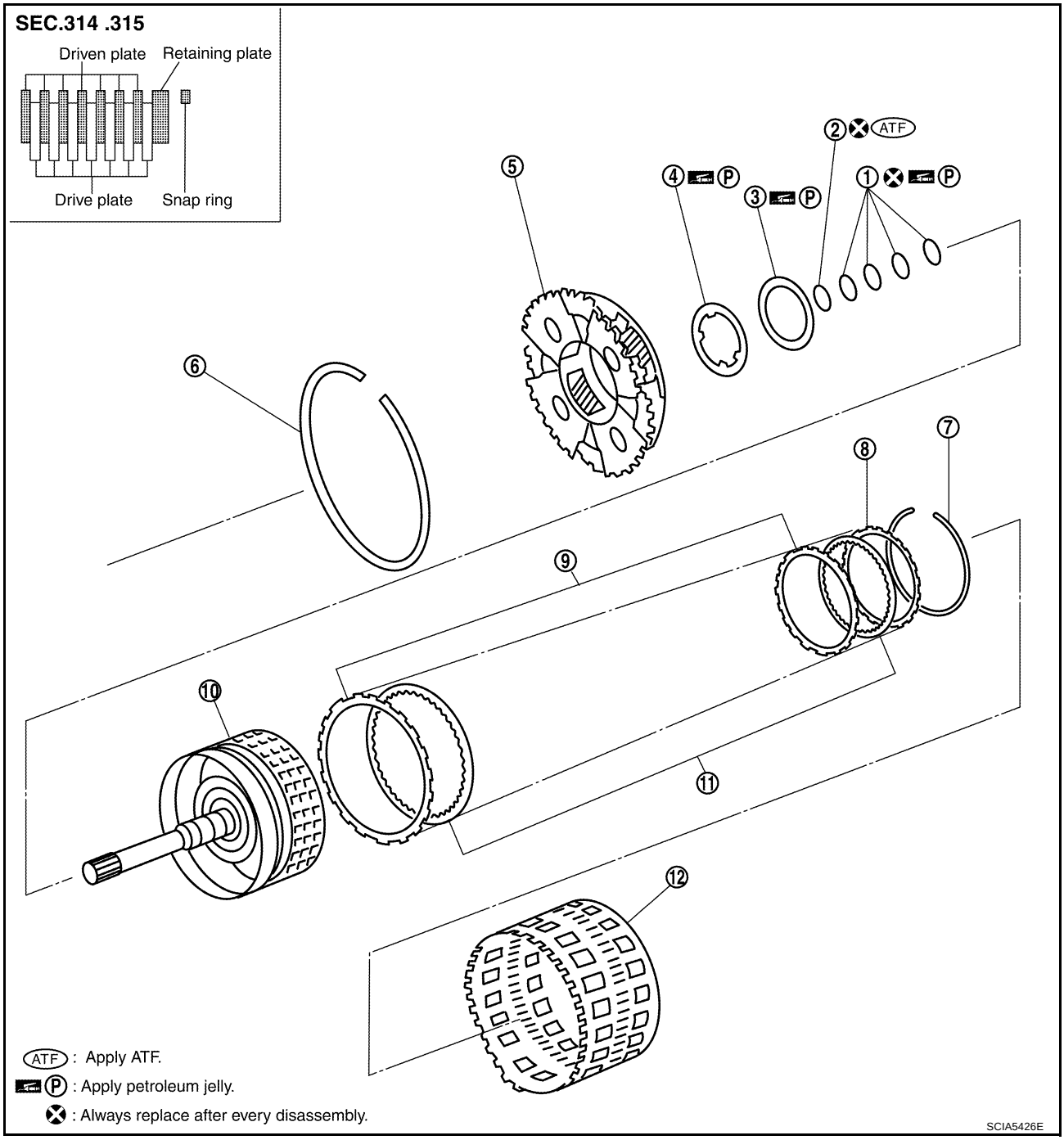
CAUTION:
If not as shown in illustration, check installation direction of 3rd one-way clutch.



Front Carrier, Input Clutch, Rear Internal Gear

ACS00851

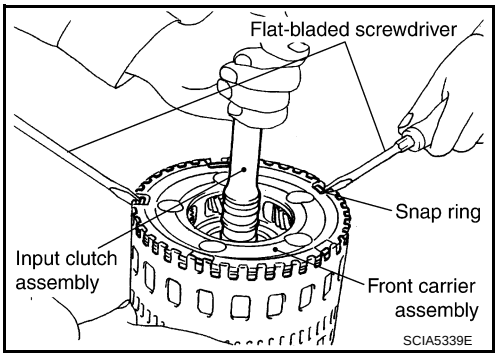
COMPONENTS



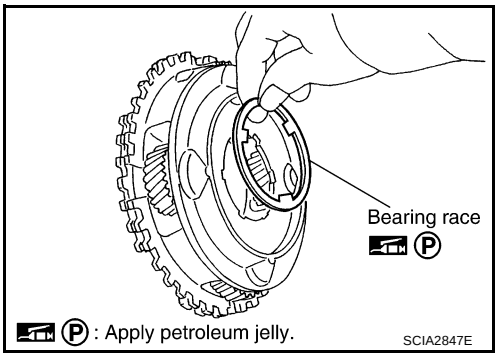
1. Seal ring
2. O-ring
3. Needle bearing
4. Bearing race
5. Front carrier assembly
6. Snap ring
7. Snap ring
8. Retaining plate
9. Driven plate
10. Input clutch drum
11. Drive plate
12. Rear internal gear

DISASSEMBLY

1. Compress snap ring using 2 flat-bladed screwdrivers.
2. Remove front carrier assembly and input clutch assembly from rear internal gear.
3. Remove front carrier assembly from input clutch assembly.

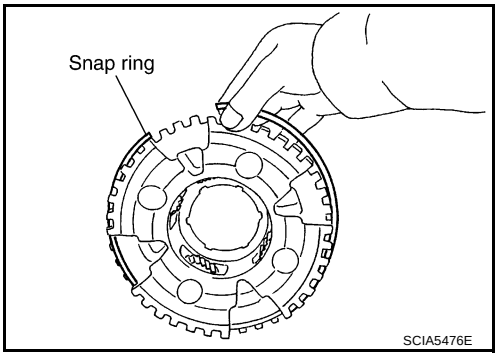


a. Remove bearing race from front carrier assembly.



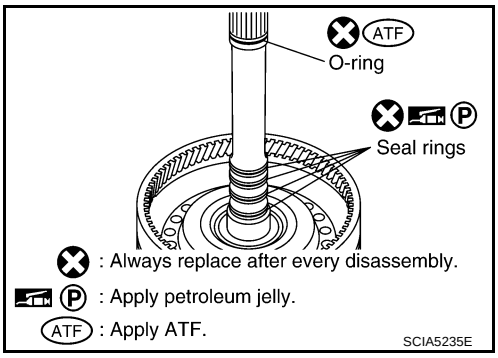
b. Remove snap ring from front carrier assembly.

CAUTION:
Do not expand snap ring excessively.

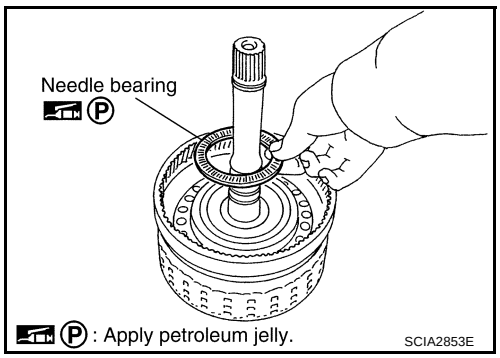


4. Disassemble input clutch assembly.

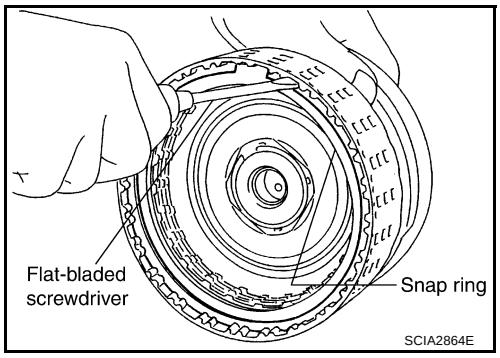
a. Remove O-ring and seal rings from input clutch assembly.



b. Remove needle bearing from input clutch assembly.



c. Using a flat-bladed screwdriver, remove snap ring from input clutch drum.
d. Remove drive plates, driven plates and retaining plate from input clutch drum.



INSPECTION

Front Carrier Snap Ring

- Check for deformation, fatigue or damage.

  CAUTION:
  If necessary, replace the snap ring.

Input Clutch Snap Ring

- Check for deformation, fatigue or damage.

  CAUTION:
  If necessary, replace the input clutch assembly.

Input Clutch Drum

- Check for deformation, fatigue or damage or burns.

  CAUTION:
  If necessary, replace the input clutch assembly.

Input Clutch Drive Plates

- Check facing for burns, cracks or damage.

  CAUTION:
  If necessary, replace the input clutch assembly.

Input Clutch Retaining Plate and Driven Plates

- Check facing for burns, cracks or damage.

  CAUTION:
  If necessary, replace the input clutch assembly.

Front Carrier

- Check for deformation, fatigue or damage.

  CAUTION:
  If necessary, replace the front carrier assembly.

Rear Internal Gear

- Check for deformation, fatigue or damage.

  CAUTION:
  If necessary, replace the rear internal gear assembly.

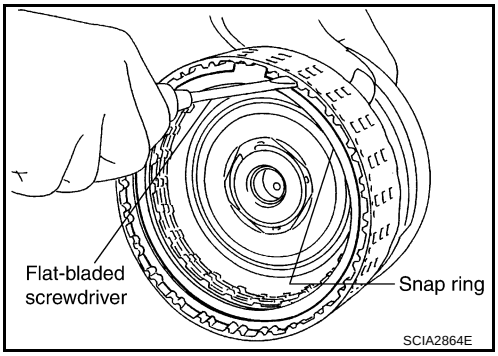
ASSEMBLY

1. Install input clutch.

a. Install drive plates, driven plates and retaining plate in input clutch drum.

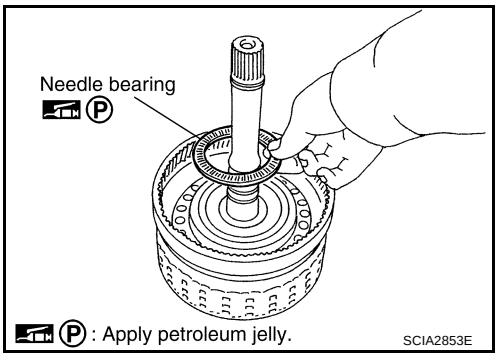
CAUTION:
Take care with order of plates.

b. Using a flat-bladed screwdriver, install snap ring in input clutch drum.



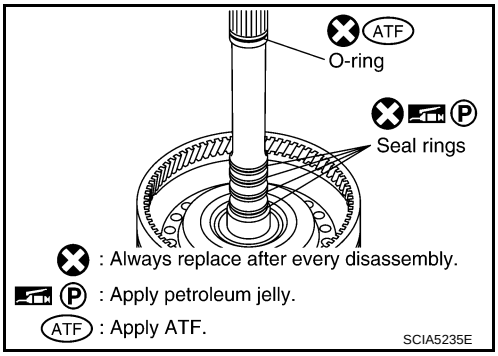
c. Install needle bearing in input clutch assembly.

CAUTION:
Apply petroleum jelly to needle bearing.



d. Install O-ring and seal rings in input clutch assembly.

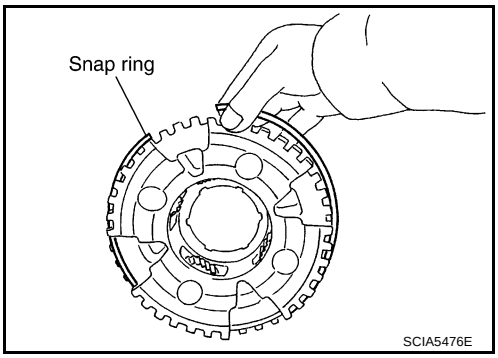
CAUTION:
- **Do not reuse O-ring and seal rings.**
- **Apply ATF to O-ring.**
- **Apply petroleum jelly to seal rings.**



2. Install front carrier assembly.

a. Install snap ring to front carrier assembly.

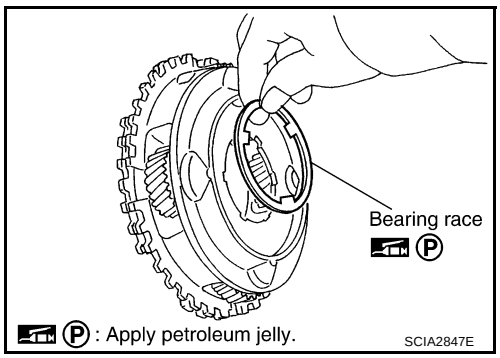
CAUTION:
Do not expand snap ring excessively.



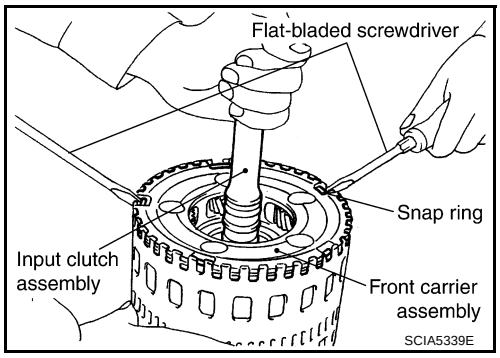
b. Install bearing race in front carrier assembly.

CAUTION:
Apply petroleum jelly to bearing race.

c. Install front carrier assembly to input clutch assembly.



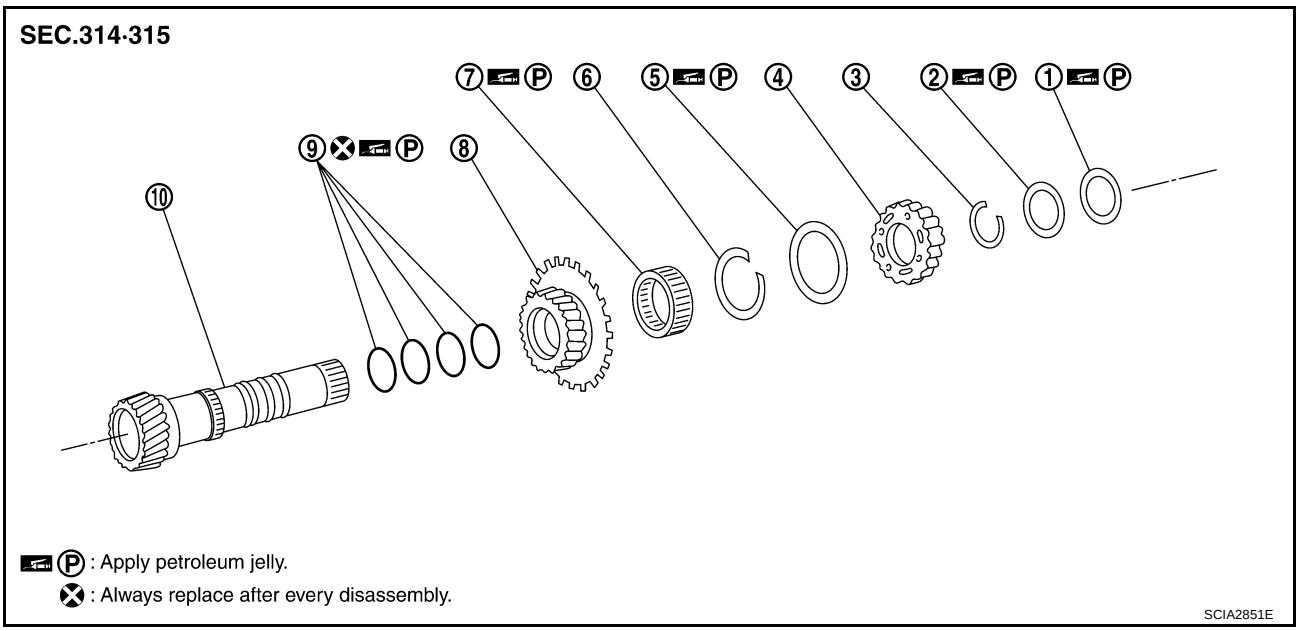
3. Compress snap ring using 2 flat-bladed screwdrivers.
4. Install front carrier assembly and input clutch assembly to rear internal gear.



Mid Sun Gear, Rear Sun Gear, High and Low Reverse Clutch Hub

ACS00852

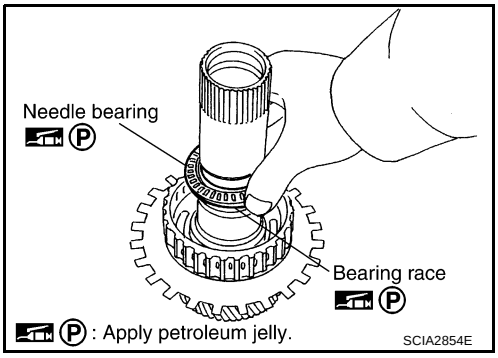
COMPONENTS



1. Needle bearing
2. Bearing race
3. Snap ring
4. High and low reverse clutch hub
5. Needle bearing
6. Snap ring
7. 1st one-way clutch
8. Rear sun gear
9. Seal ring
10. Mid sun gear

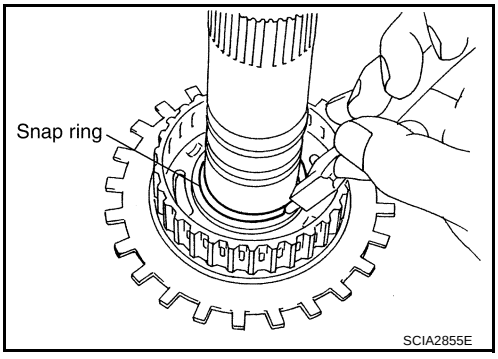
DISASSEMBLY

1. Remove needle bearing and bearing race from high and low reverse clutch hub.

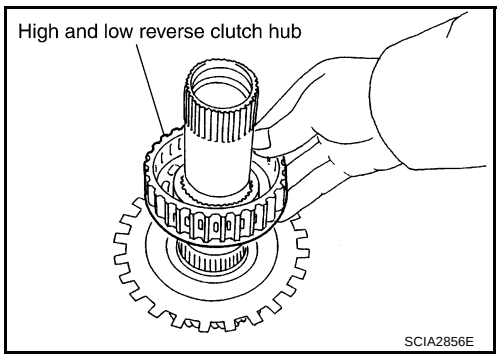


2. Using snap ring pliers, remove snap ring from mid sun gear assembly.

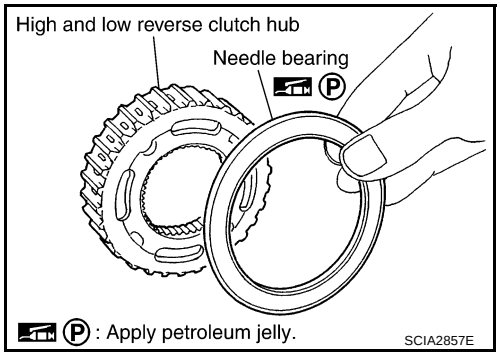
CAUTION:
Do not expand snap ring excessively.



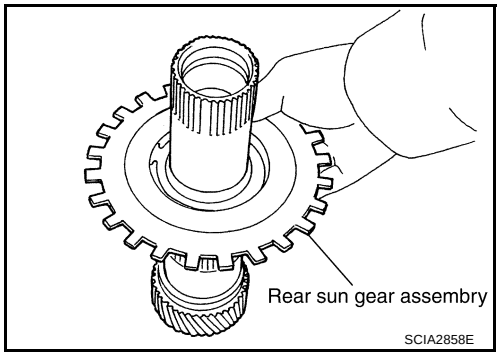
3. Remove high and low reverse clutch hub from mid sun gear assembly.



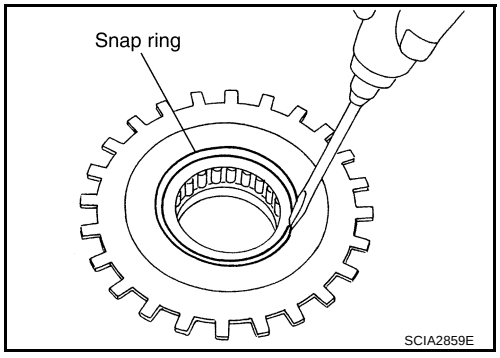
a. Remove needle bearing from high and low reverse clutch hub.



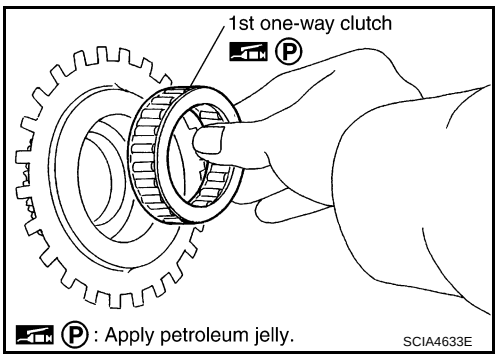
4. Remove rear sun gear assembly from mid sun gear assembly.



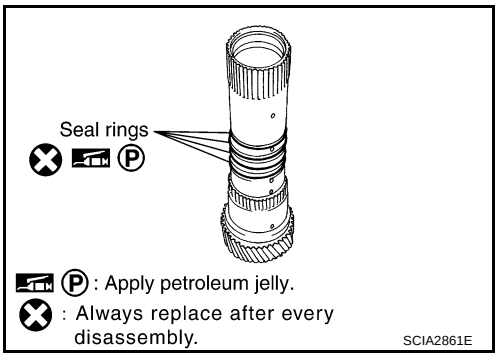
a. Using a flat-bladed screwdriver, remove snap ring from rear sun gear.



b. Remove 1st one-way clutch from rear sun gear.



5. Remove seal rings from mid sun gear.



INSPECTION

High and Low Reverse Clutch Hub Snap Ring, Rear Sun Gear Snap Ring

- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace the snap ring.

1st One-Way Clutch

- Check frictional surface for wear or damage.

CAUTION:
If necessary, replace the 1st one-way clutch.

Mid Sun Gear

- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace the mid sun gear.

Rear Sun Gear

- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace the rear sun gear.

High and Low Reverse Clutch Hub

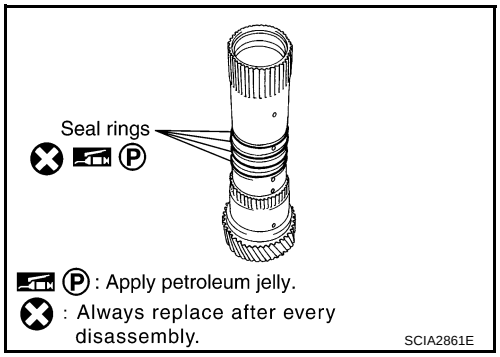
- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace the high and low reverse clutch hub.

ASSEMBLY

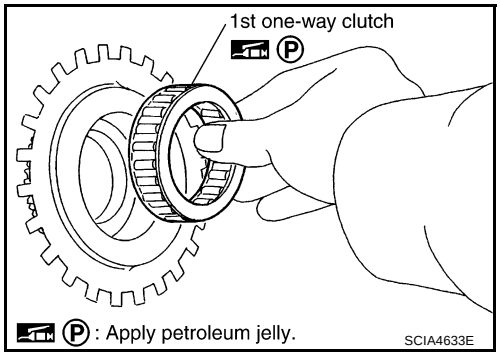
1. Install seal rings to mid sun gear.

CAUTION:
- **Do not reuse seal rings.**
- **Apply petroleum jelly to seal rings.**

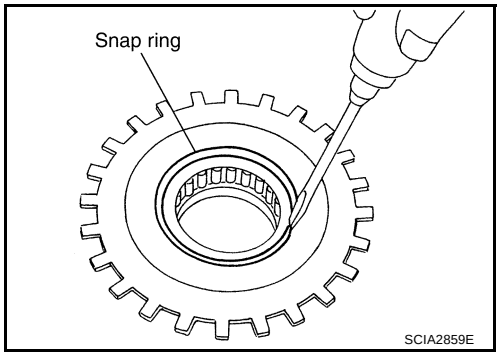


2. Install 1st one-way clutch to rear sun gear.

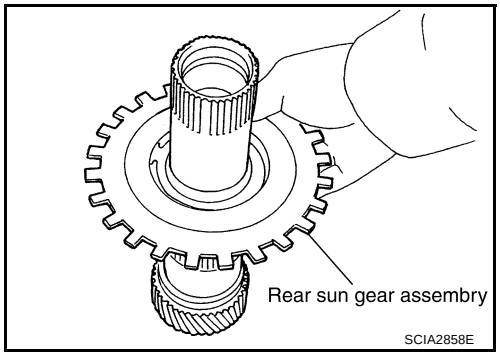
CAUTION:
Apply petroleum jelly to 1st one-way clutch.



3. Using a flat-bladed screwdriver, install snap ring to rear sun gear.

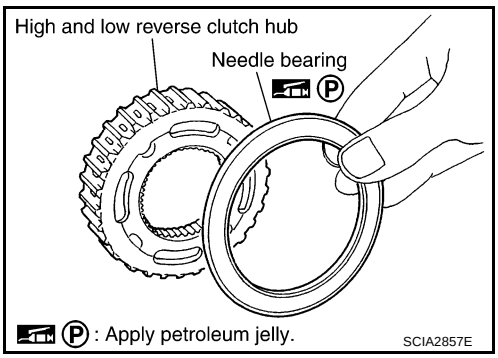


4. Install rear sun gear assembly to mid sun gear assembly.

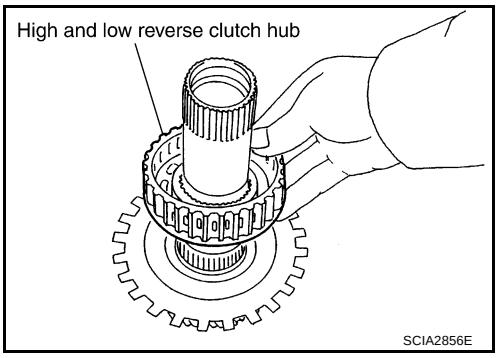


5. Install needle bearing to high and low reverse clutch hub.

CAUTION:
Apply petroleum jelly to needle bearing.

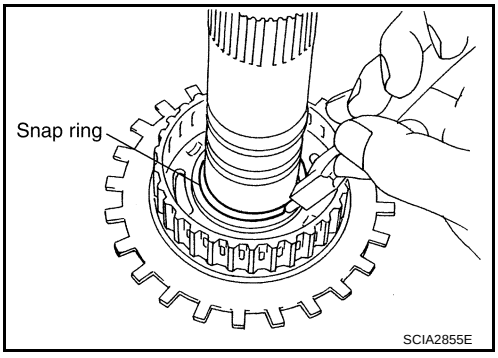


6. Install high and low reverse clutch hub to mid sun gear assembly.



7. Using snap ring pliers, install snap ring to mid sun gear assembly.

CAUTION:
Do not expand snap ring excessively.

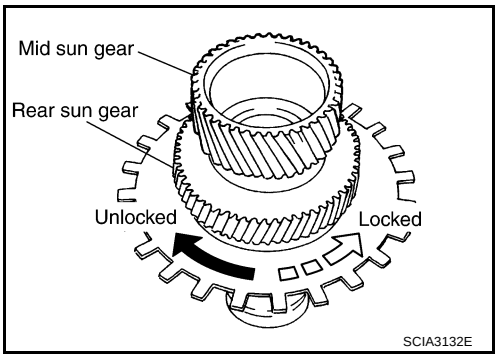


8. Check operation of 1st one-way clutch.

a. Hold mid sun gear and turn rear sun gear.

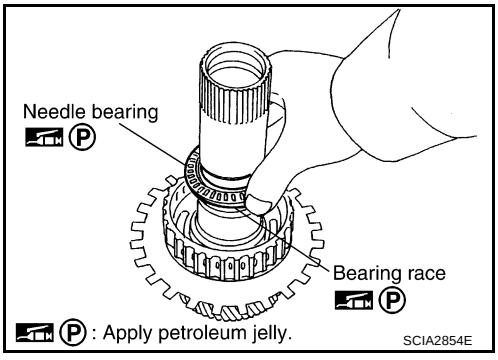
b. Check 1st one-way clutch for correct locking and unlocking directions.

CAUTION:
If not as shown in illustration, check installation direction of 1st one-way clutch.



9. Install needle bearing and bearing race to high and low reverse clutch hub.

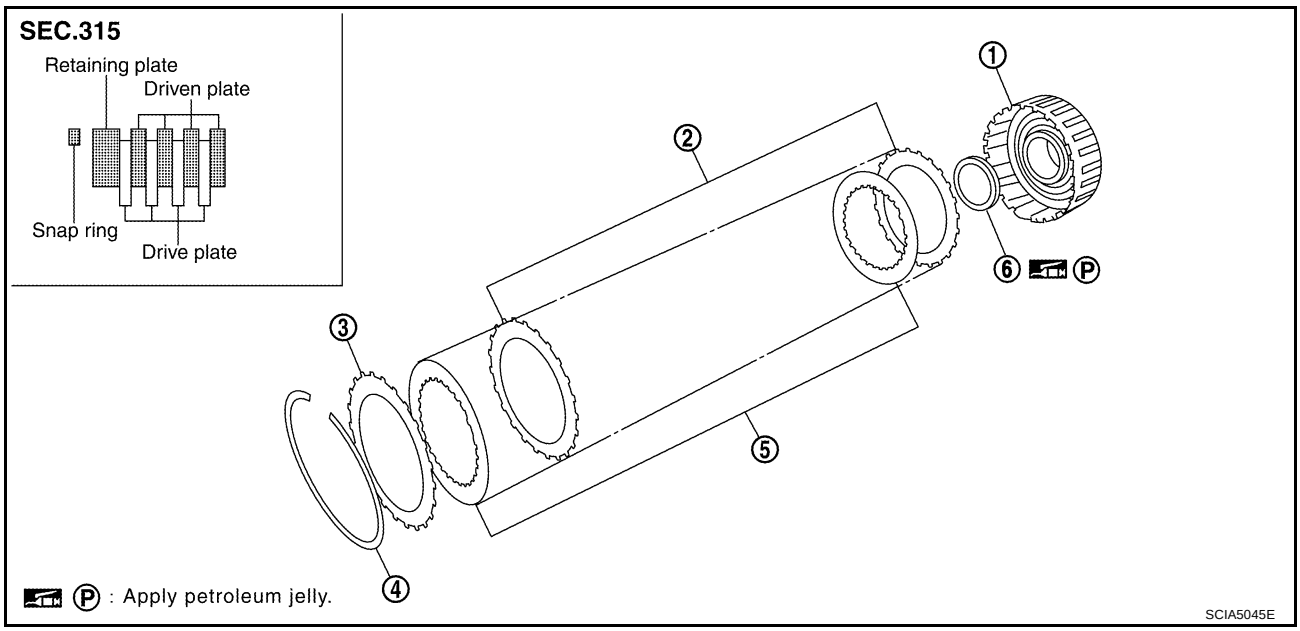
CAUTION:
Apply petroleum jelly to needle bearing and bearing race.



High and Low Reverse Clutch

ACS00853

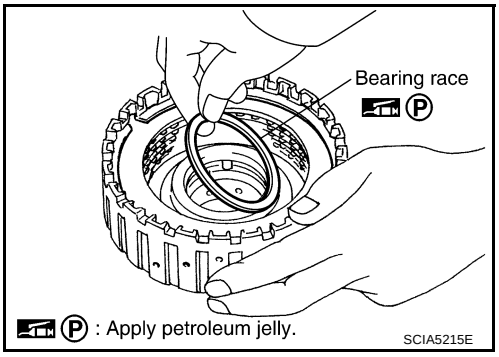
COMPONENTS



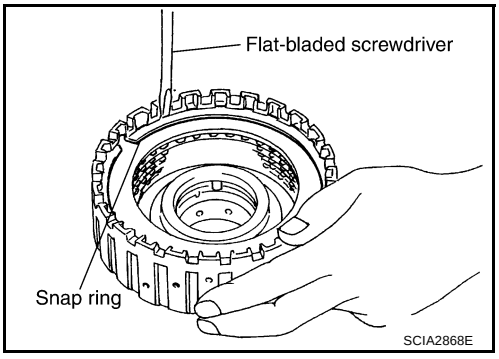
1. High and low reverse clutch drum
2. Driven plate
3. Retaining plate
4. Snap ring
5. Drive plate
6. Bearing race

DISASSEMBLY

1. Remove bearing race from high and low reverse clutch drum.



2. Using a flat-bladed screwdriver, remove snap ring from high and low reverse clutch drum.
3. Remove drive plates, driven plates and retaining plate from high and low reverse clutch drum.



INSPECTION

- **Check the following, and replace high and low reverse clutch assembly if necessary.**

High and Low Reverse Clutch Snap Ring

- Check for deformation, fatigue or damage.

High and Low Reverse Clutch Drive Plates

- Check facing for burns, cracks or damage.

High and Low Reverse Clutch Retaining Plate and Driven Plates

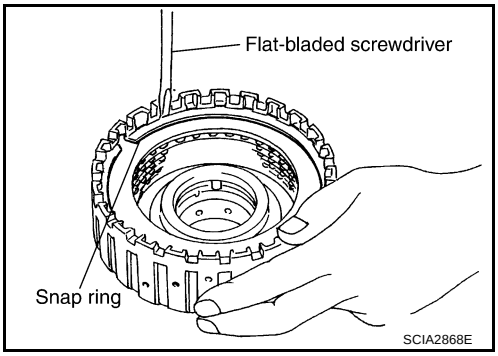
- Check facing for burns, cracks or damage.

ASSEMBLY

1. Install drive plates, driven plates and retaining plate in high and low reverse clutch drum.

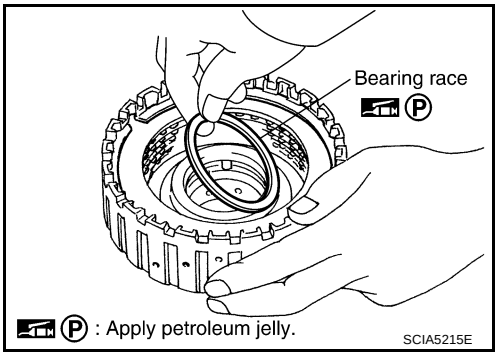
   CAUTION:
   Take care with order of plates.

2. Using a flat-bladed screwdriver, install snap ring in high and low reverse clutch drum.



3. Install bearing race to high and low reverse clutch drum.

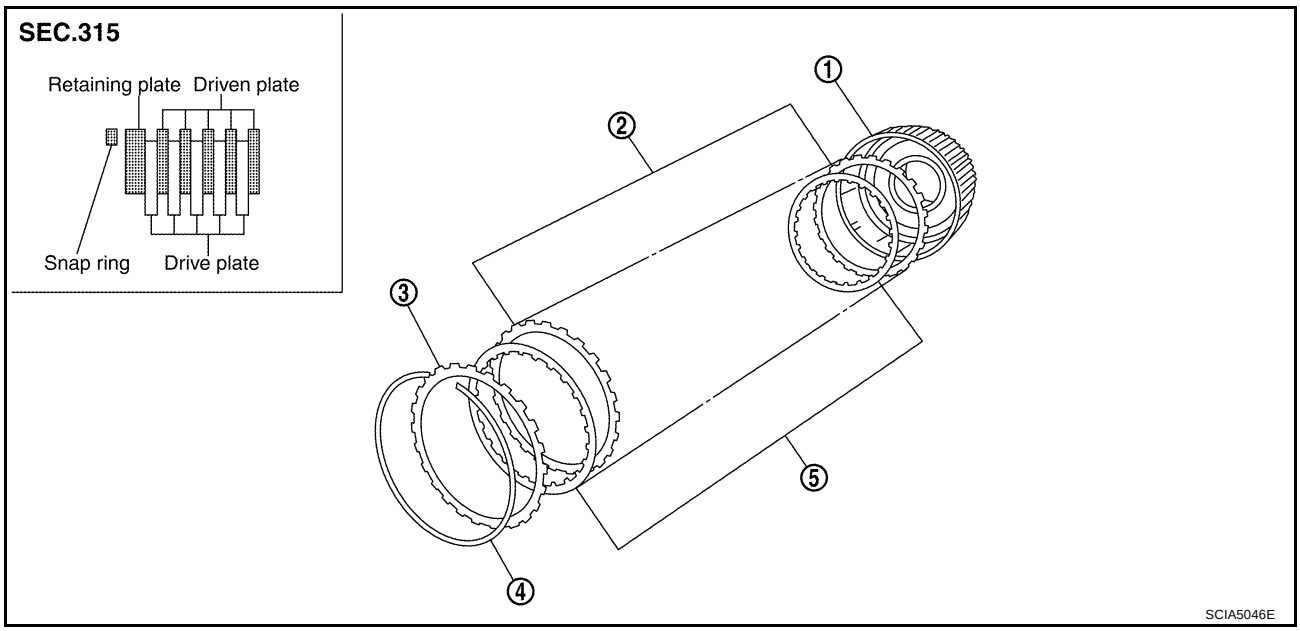
   CAUTION:
   Apply petroleum jelly to bearing race.



Direct Clutch

ACS00854

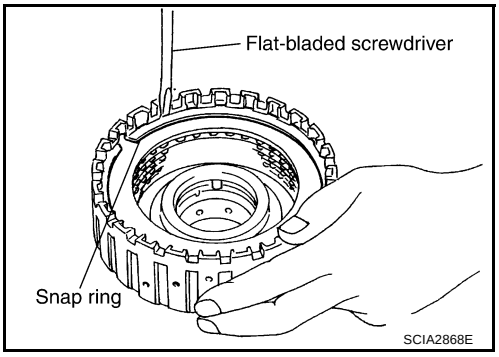
COMPONENTS



1. Direct clutch drum
2. Driven plate
3. Retaining plate
4. Snap ring
5. Drive plate

DISASSEMBLY

1. Using a flat-bladed screwdriver, remove snap ring from direct clutch drum.
2. Remove drive plates, driven plates and retaining plate from direct clutch drum.



INSPECTION

- **Check the following, and replace direct clutch assembly if necessary.**

Direct Clutch Snap Ring

- Check for deformation, fatigue or damage.

Direct Clutch Drive Plates

- Check facing for burns, cracks or damage.

Direct Clutch Retaining Plate and Driven Plates

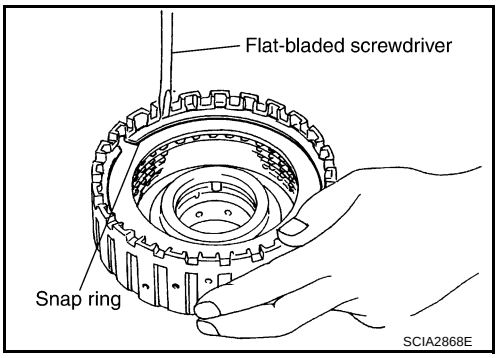
- Check facing for burns, cracks or damage.

ASSEMBLY

1. Install drive plates, driven plates and retaining plate in direct clutch drum.

   CAUTION:
   Take care with order of plates.

2. Using a flat-bladed screwdriver, install snap ring in direct clutch drum.



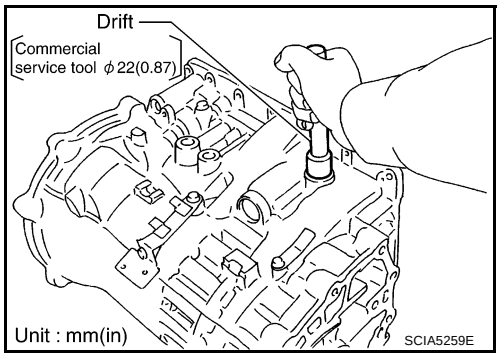
ASSEMBLY

PFP:00000

Assembly (1)

ACS00855

1. As shown in the right figure illustration, use a drift [commercial service tool ϕ22 mm (0.87 in)] to drive manual shaft oil seals into the transmission case until it is flush.

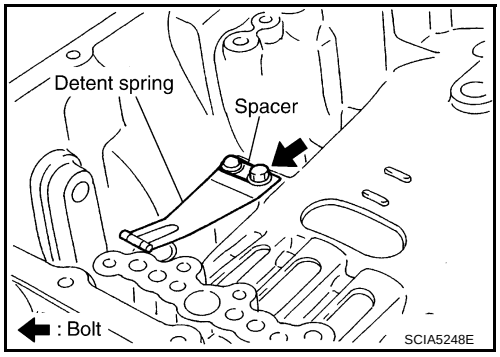


CAUTION:

- **Apply ATF to manual shaft oil seals.**
- **Do not reuse manual shaft oil seals.**

2. Install detent spring and spacer in transmission case.

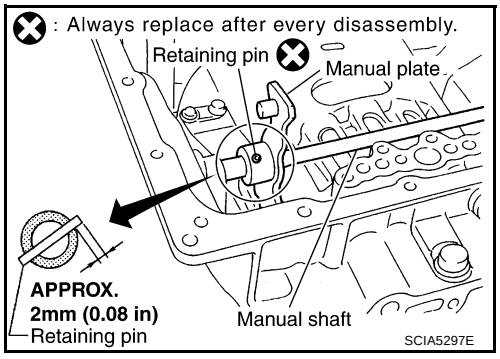
: 7.9 N·m (0.81 kg-m, 70 in-lb)



3. Assemble manual shaft, manual plate, and parking rod after installing manual shaft to transmission case.
4. Install retaining pin into the manual plate and manual shaft.

a. Fit pinhole of the manual plate to pinhole of the manual shaft with a pin punch.

b. Use a hammer to tap the retaining pin into the manual plate.



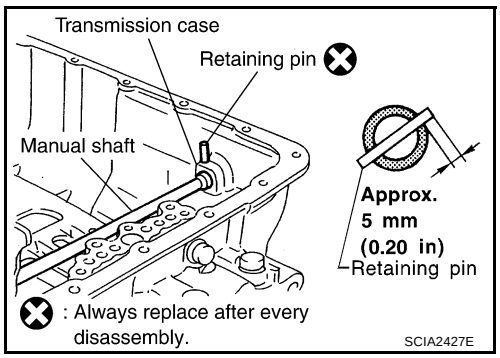
CAUTION:

- **Drive retaining pin to 2 & plusmn;0.5 mm over the manual plate.**
- **Do not reuse retaining pin.**

5. Install retaining pin into the transmission case and manual shaft.

a. Fit pinhole of the transmission case to pinhole of the manual shaft with a pin punch.

b. Use a hammer to tap the retaining pin into the transmission case.



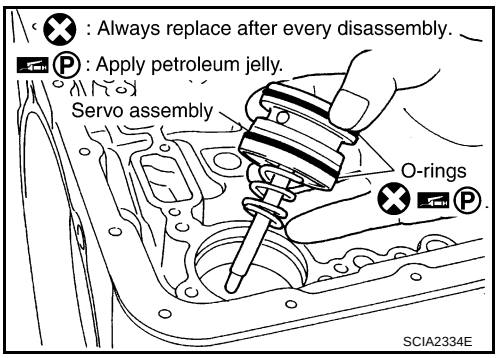
CAUTION:

- **Drive retaining pin to 5 & plusmn;1 mm over the transmission case.**
- **Do not reuse retaining pin.**

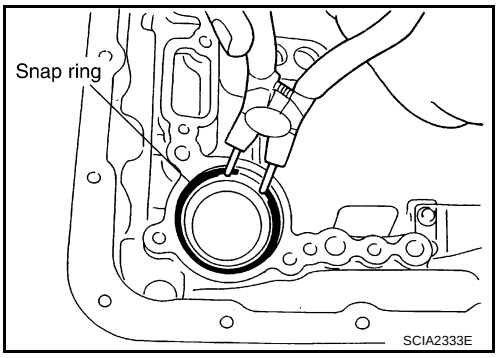
6. Install O-rings to servo assembly.

CAUTION:
Do not reuse O-rings.
Apply petroleum jelly to O-rings.

7. Install return spring to servo assembly.
8. Install servo assembly in transmission case.

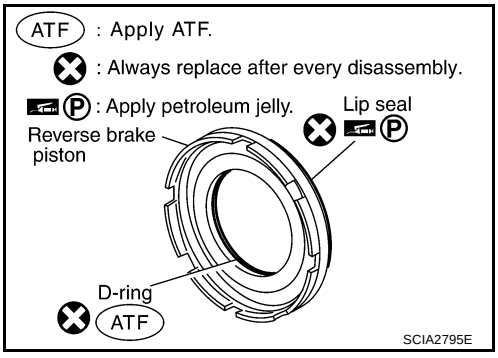


9. Using snap ring pliers, install snap ring to transmission case.

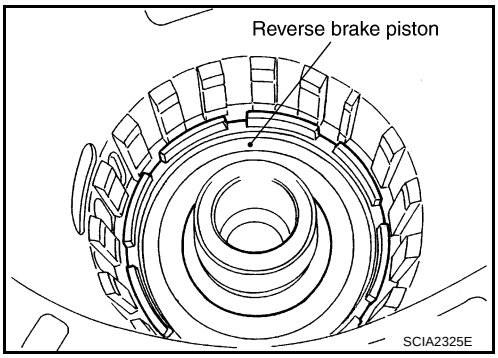


10. Install lip seal and D-ring in reverse brake piston.

CAUTION:
- **Do not reuse lip seal and D-ring.**
- **Apply petroleum jelly to lip seal.**
- **Apply ATF to D-ring.**

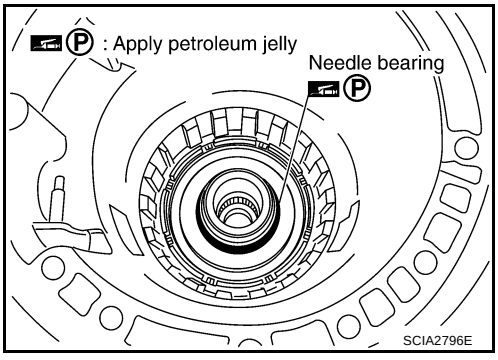


11. Install reverse brake piston in transmission case.



12. Install needle bearing to drum support edge surface.

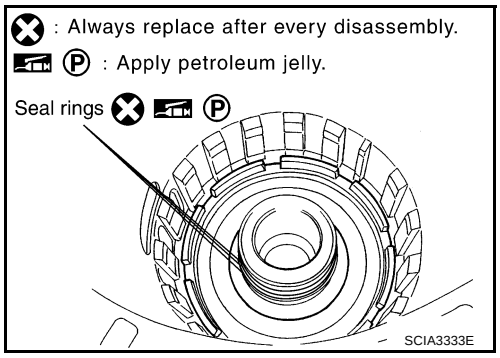
CAUTION:
Apply petroleum jelly to needle bearing.



13. Install seal rings to drum support.

CAUTION:

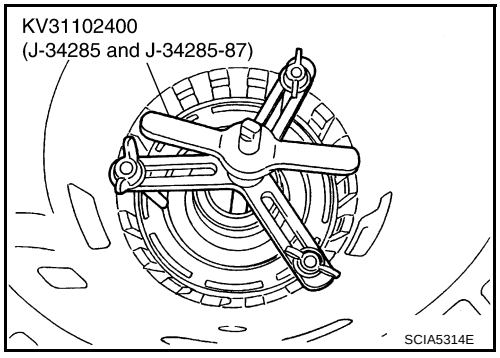
- **Do not reuse seal rings.**
- **Apply petroleum jelly to seal rings.**



14. After installing the return spring and spring retainer in transmission case, use a clutch spring compressor to install snap ring in transmission case.

CAUTION:

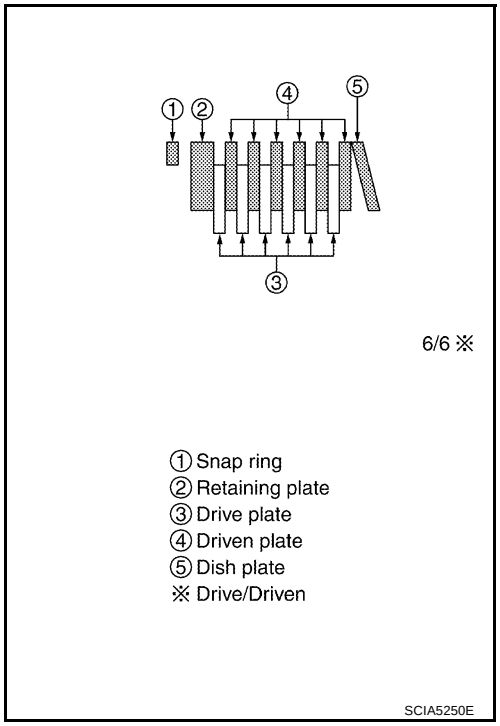
Securely assemble them using a flat-bladed screwdriver so that snap ring tension is slightly weak.



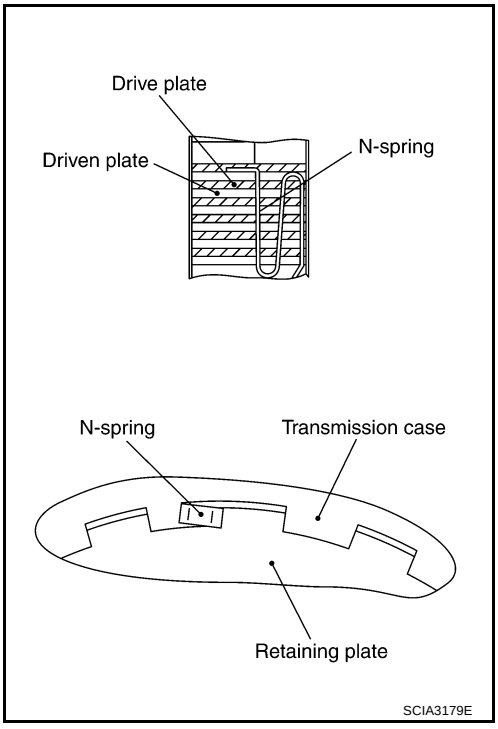
15. Install reverse brake retaining plate, drive plates, driven plates and dish plate in transmission case.

CAUTION:

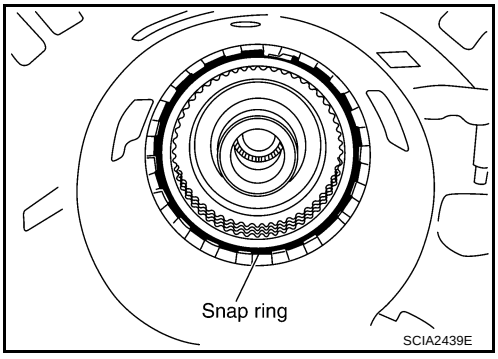
Take care with order of plates.



16. Assemble N-spring.



17. Install snap ring in transmission case.



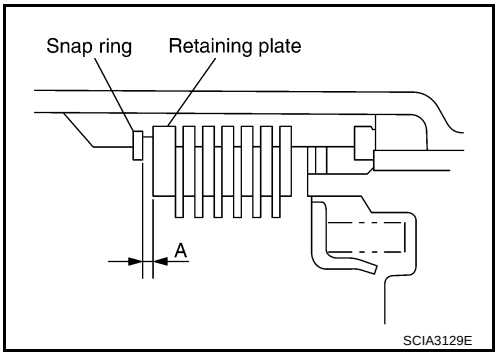
18. Measure clearance between retaining plate and snap ring. If not within specified clearance, select proper retaining plate.

Specified clearance “A”:

Standard: 0.7 - 1.1mm (0.028 - 0.043 in)

Retaining plate:

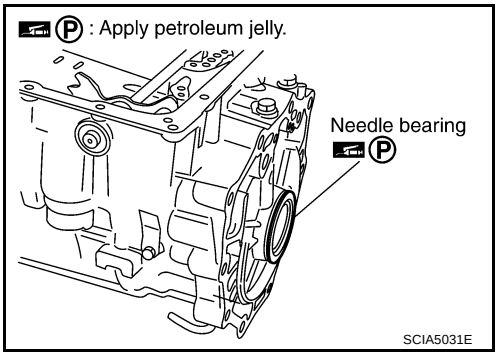
Refer to AT-329, "Reverse Brake" .



19. Install needle bearing to transmission case.

CAUTION:

- **Apply petroleum jelly to needle bearing.**

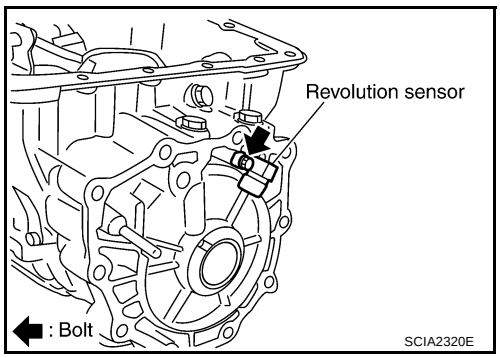


20. Install revolution sensor to transmission case.

CAUTION:

- **Do not subject it to impact by dropping or hitting it.**
- **Do not disassemble.**
- **Do not allow metal filings, etc., to get on the sensor's front edge magnetic area.**
- **Do not place in an area affected by magnetism.**

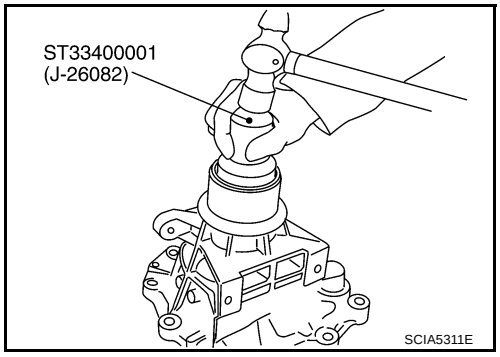
: 5.8 N·m (0.59 kg-m, 51 in-lb)



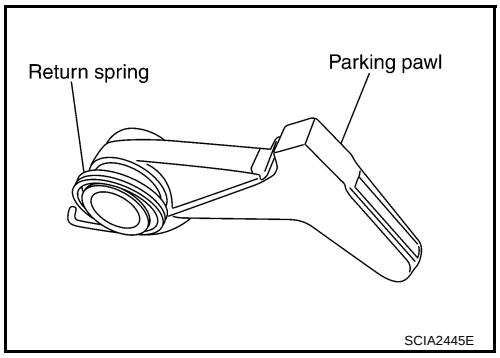
21. As shown in the right figure illustration, use a drift to drive rear oil seal into the rear extension until it is flush.

CAUTION:

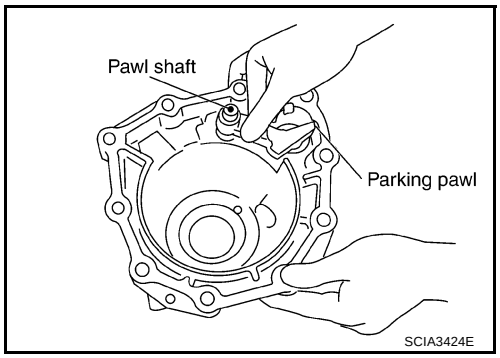
- **Apply ATF to rear oil seal.**
- **Do not reuse rear oil seal.**



22. Install return spring to parking pawl.



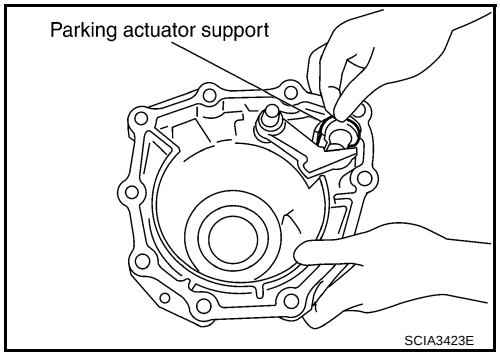
23. Install parking pawl (with return spring) and pawl shaft to rear extension.



24. Install parking actuator support to rear extension.
25. Install needle bearing to rear extension.

CAUTION:

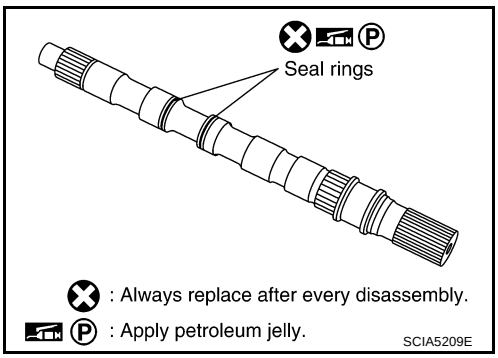
Apply petroleum jelly to needle bearing.



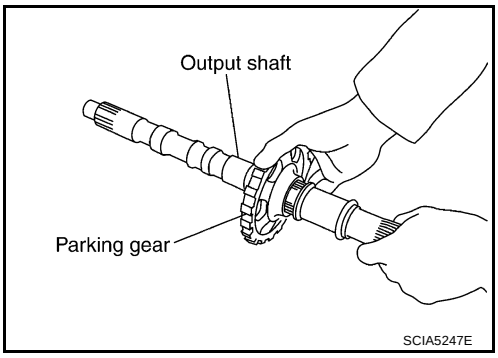
26. Install seal rings to output shaft.

CAUTION:

- **Do not reuse seal rings.**
- **Apply petroleum jelly to seal rings.**



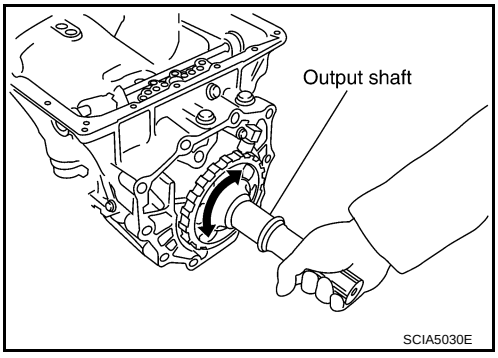
27. Install parking gear to output shaft.



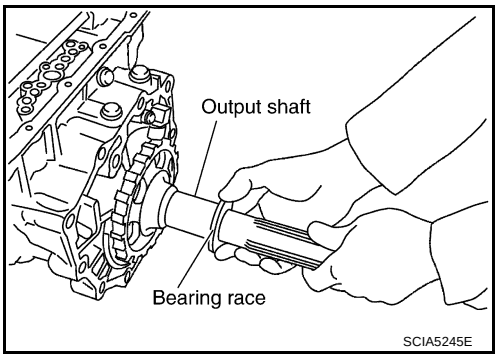
28. Install output shaft in transmission case.

CAUTION:

Be careful not to mistake front for rear because both sides looks similar. (Thinner end is front side.)



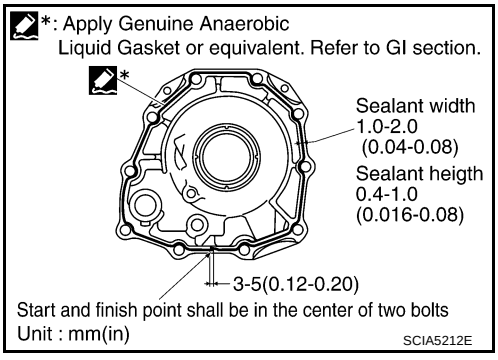
29. Install bearing race to output shaft.



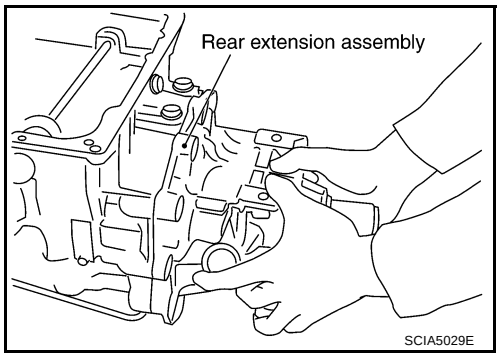
30. Apply recommended sealant (Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-47, "Recommended Chemical Products and Sealants" .) to rear extension assembly as shown in illustration.

CAUTION:

Completely remove all moisture, oil and old sealant, etc. from the transmission case and rear extension assembly mounting surfaces.



31. Install rear extension assembly to transmission case.



32. Tighten rear extension assembly mounting bolts to specified torque.

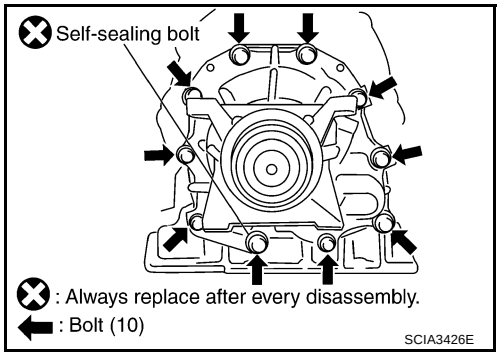
CAUTION:
Do not reuse self-sealing bolt.

Rear extension assembly mounting bolt:

: 52 N·m (5.3 kg-m, 38 ft-lb)

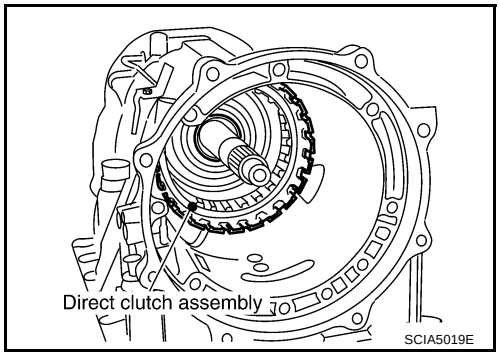
Self-sealing bolt:

: 61 N·m (6.2 kg-m, 45 ft-lb)



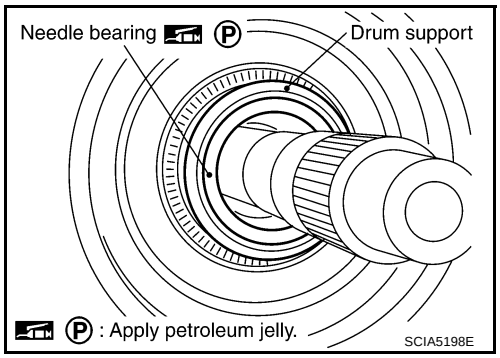
33. Install direct clutch assembly in reverse brake.

CAUTION:
Make sure that drum support edge surface and direct clutch inner boss edge surface come to almost same place.

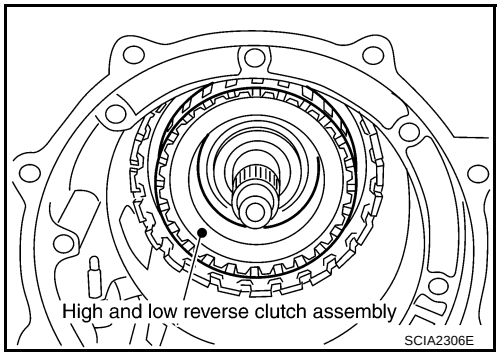


34. Install needle bearing in drum support.

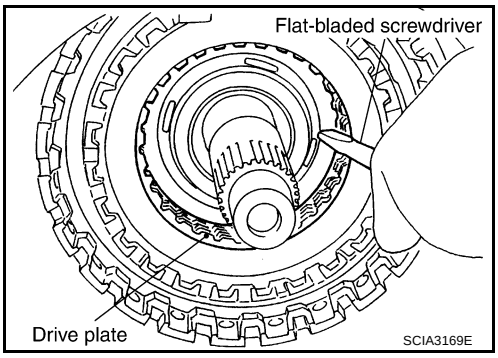
CAUTION:
Apply petroleum jelly to needle bearing.



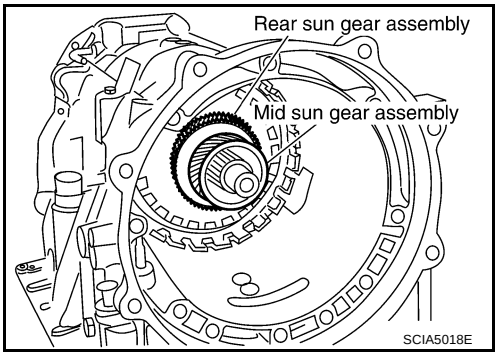
35. Install high and low reverse clutch assembly in direct clutch.



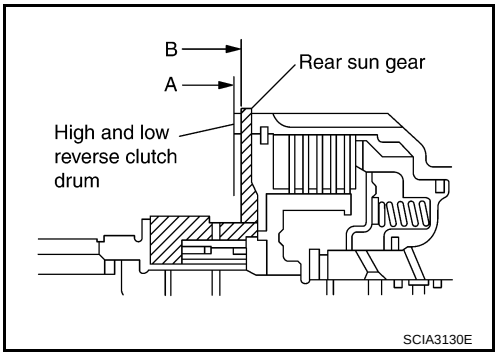
36. Using a flat-bladed screwdriver, adjust the drive plate.



37. Install high and low reverse clutch hub, mid sun gear assembly and rear sun gear assembly as a unit.

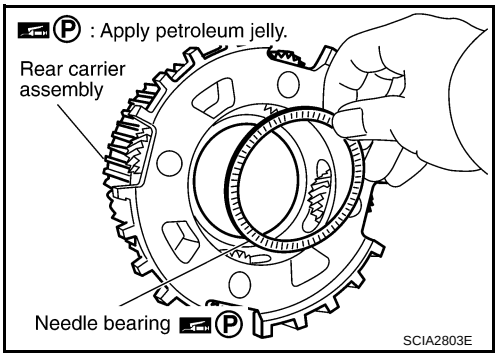


CAUTION:
Check that portion “A” of high and low reverse clutch drum protrudes approximately 2 mm (0.08 in) beyond portion B of rear sun gear.



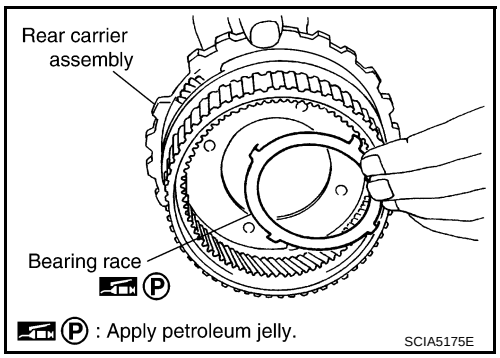
38. Install needle bearing in rear carrier assembly.

CAUTION:
Apply petroleum jelly to needle bearing.

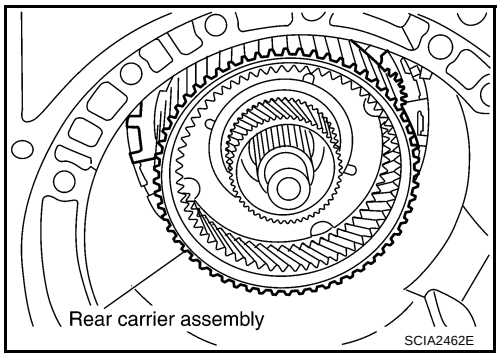


39. Install bearing race in rear carrier assembly.

CAUTION:
Apply petroleum jelly to bearing race.

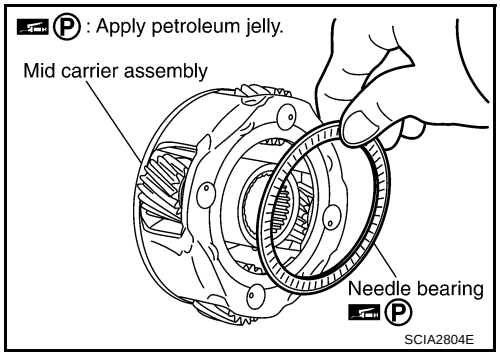


40. Install rear carrier assembly in direct clutch drum.



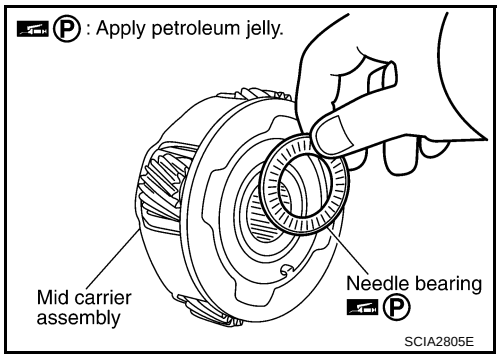
41. Install needle bearing (rear side) to mid carrier assembly.

CAUTION:
Apply petroleum jelly to needle bearing.

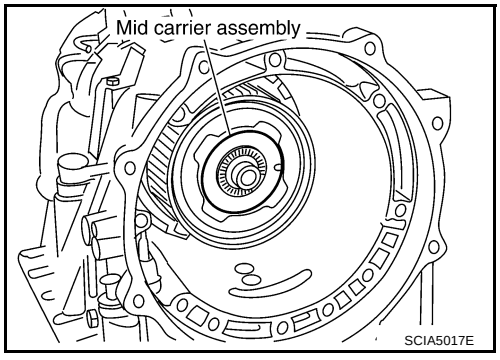


42. Install needle bearing (front side) to mid carrier assembly.

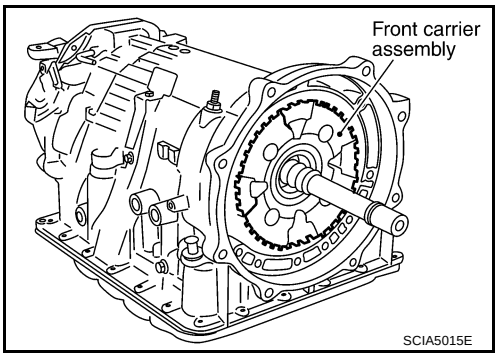
CAUTION:
Apply petroleum jelly to needle bearing.



43. Install mid carrier assembly in rear carrier assembly.



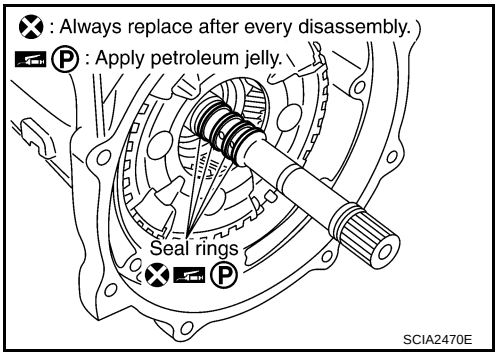
44. Install front carrier assembly, input clutch assembly and rear internal gear as a unit.



45. Install seal rings in input clutch assembly.

CAUTION:

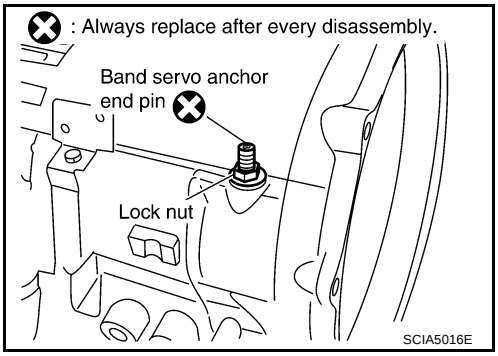
- **Do not reuse seal rings.**
- **Apply petroleum jelly to seal rings.**



46. Install band servo anchor end pin and lock nut in transmission case.

CAUTION:

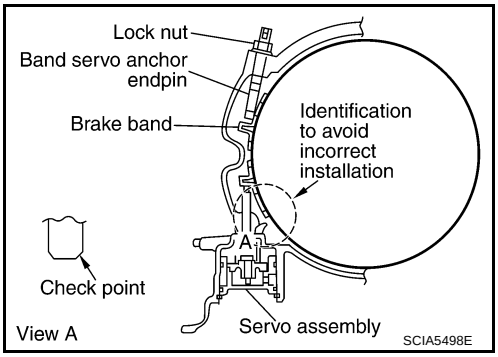
Do not reuse band servo anchor end pin.



47. Install brake band in transmission case.

CAUTION:

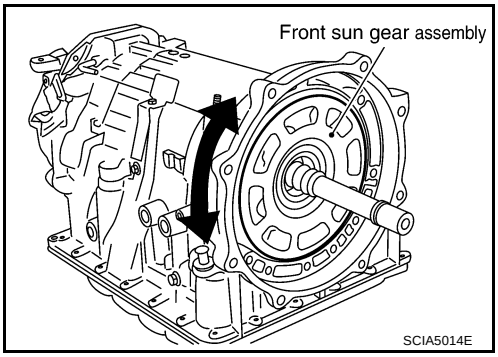
Assemble it so that identification to avoid incorrect installation faces servo side.



48. Install front sun gear to front carrier assembly.

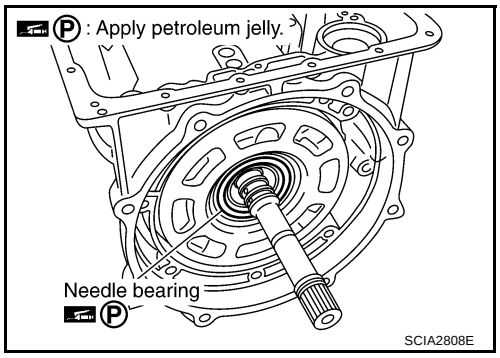
CAUTION:

Apply ATF to front sun gear bearing and 3rd one-way clutch end bearing.

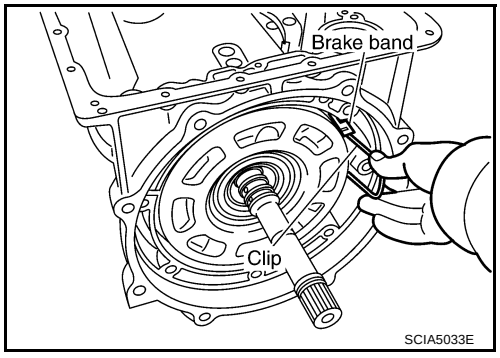


49. Install needle bearing to front sun gear.

CAUTION:
Apply petroleum jelly to needle bearing.



50. Adjust brake band tilting using clips so that brake band contacts front sun gear drum evenly.

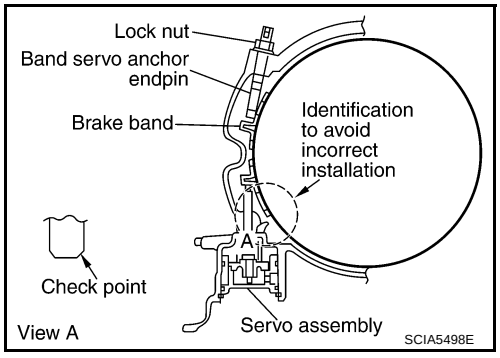


51. Adjust brake band.
a. Loosen lock nut.
b. Tighten band servo anchor end pin to specified torque.

: 5.0 N·m (0.51 kg-m, 44 in-lb)

c. Back of band servo anchor end pin three turns.
d. Holding band servo anchor end pin, tighten lock nut to specified torque.

: 46 N·m (4.7 kg-m, 34 ft-lb)

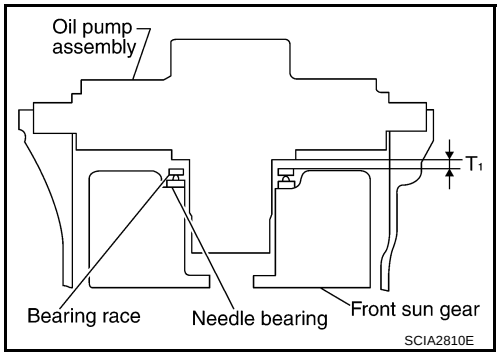


Adjustment

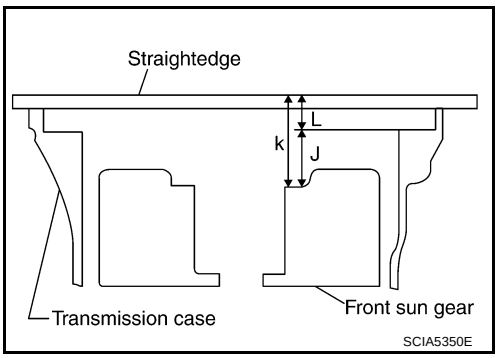
ACS00856

TOTAL END PLAY

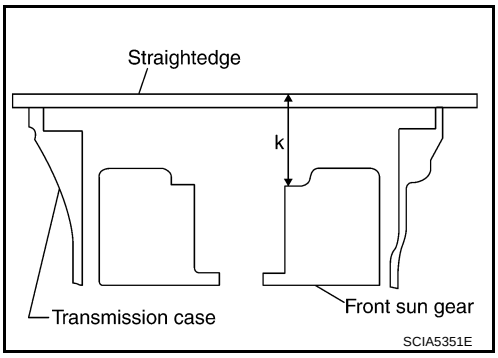
- Measure clearance between front sun gear and bearing race for oil pump cover.
- Select proper thickness of bearing race so that end play is within specifications.



1. Measure dimensions “K” and “L” and then calculate dimension “J”.



a. Measure dimension “K”.

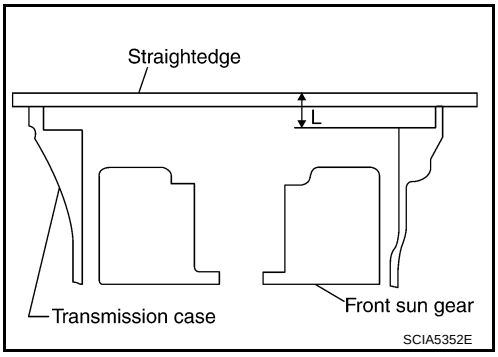


b. Measure dimension “L”.

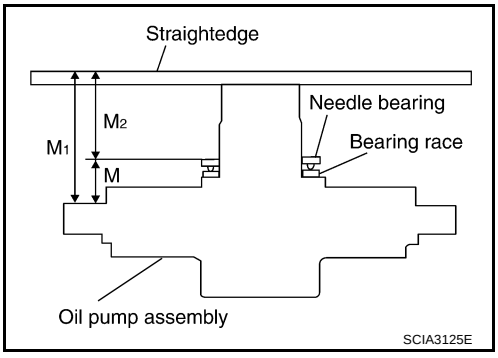
c. Calculate dimension “J”.

“J”: Distance between oil pump fitting surface of transmission case and needle bearing mating surface of front sun gear.

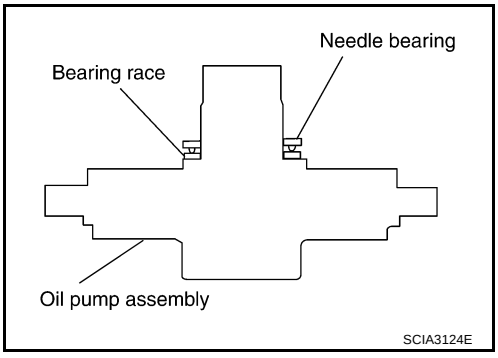
J = K – L



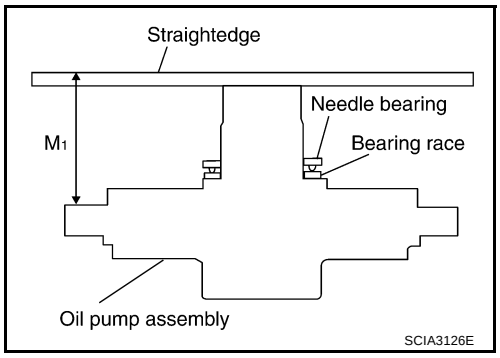
2. Measure dimensions “M_1 ” and “M_2 ” and then calculate dimension “M”.



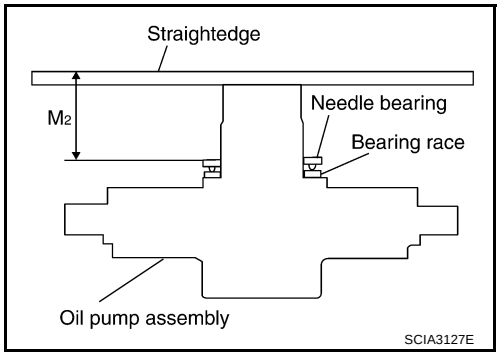
a. Place bearing race and needle bearing on oil pump assembly.



b. Measure dimension “M_1 ”.



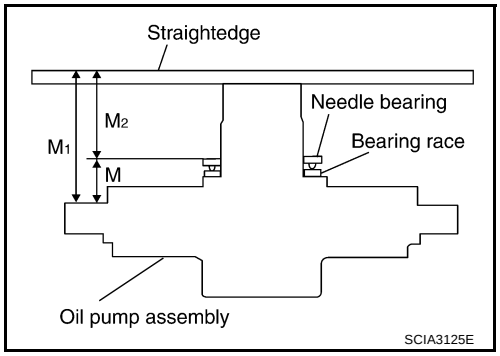
c. Measure dimension “M_2 ”.



d. Calculate dimension “M”.

“M”: Distance between transmission case fitting surface of oil pump and needle bearing on oil pump.

$M = M_1 - M_2$



3. Adjust total end play “T_1 ”.

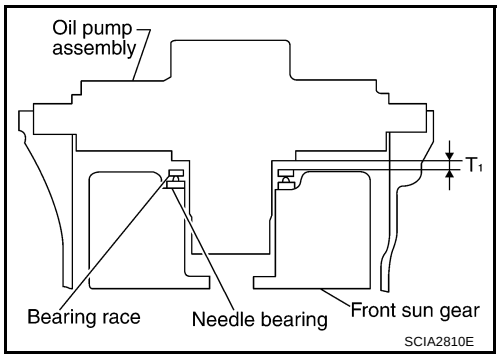
$T_1 = J - M$

Total end play “T_1 ”:

0.25 - 0.55 mm (0.0098 - 0.0217 in)

- Select proper thickness of bearing race so that total end play is within specifications.

Bearing races: **Refer to** **AT-329, "BEARING RACE FOR ADJUSTING TOTAL END PLAY"** .

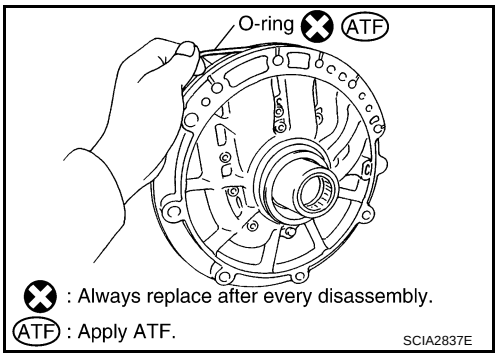


Assembly (2)

ACS00857

1. Install O-ring to oil pump assembly.

   CAUTION:
   - **Do not reuse O-ring.**
   - **Apply ATF to O-ring.**

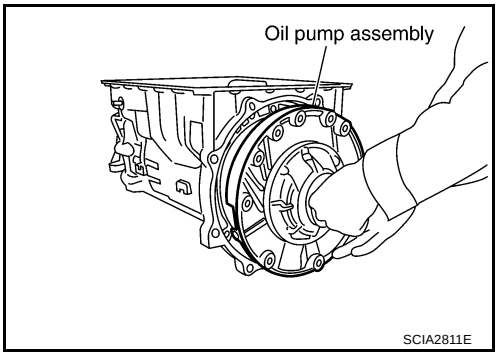


2. Install bearing race to oil pump assembly.

   CAUTION:
   Apply petroleum jelly to bearing race.

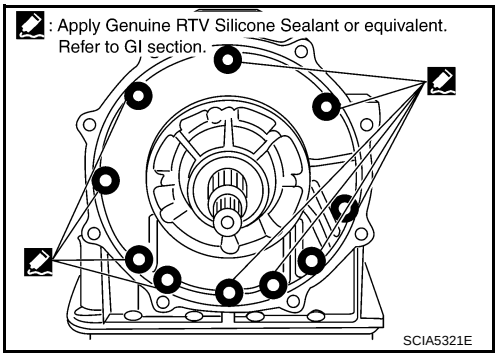
3. Install oil pump assembly in transmission case.

   CAUTION:
   Apply ATF to oil pump bearing.



4. Apply recommended sealant (Genuine RTV Silicone Sealant or equivalent. Refer to GI-47, "Recommended Chemical Products and Sealants" .) to oil pump assembly as shown in illustration.

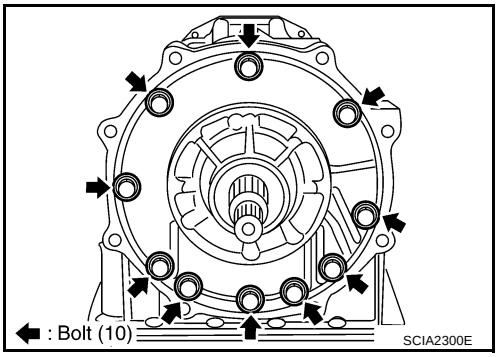
   CAUTION:
   Completely remove all moisture, oil and old sealant, etc. From the oil pump mounting bolts and oil pump mounting bolt mounting surfaces.



5. Tighten oil pump mounting bolts to specified torque.

   CAUTION:
   Apply ATF to oil pump bushing.

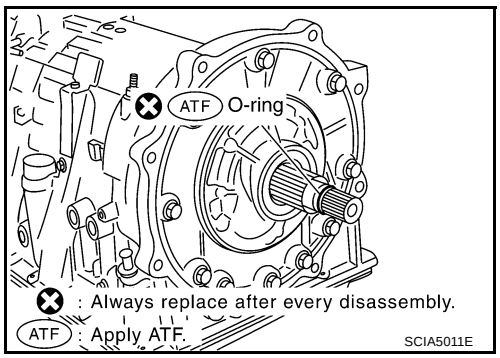
   : 48 N·m (4.9 kg-m, 35 ft-lb)



6. Install O-ring to input clutch assembly.

CAUTION:

- **Do not reuse O-ring.**
- **Apply ATF to O-ring.**



7. Install converter housing to transmission case.

CAUTION:

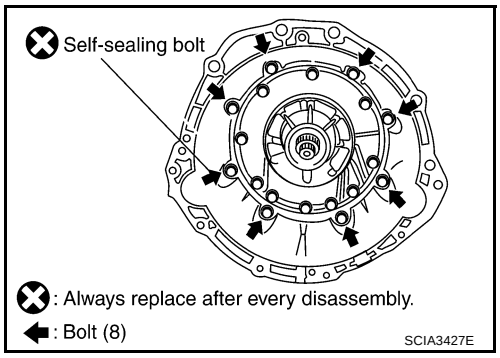
Do not reuse self-sealing bolt.

Converter housing mounting bolt:

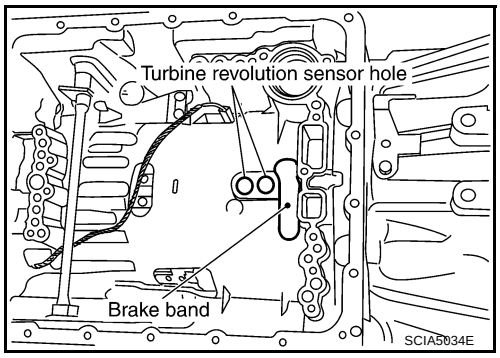
: 52 N·m (5.3 kg-m, 38 ft-lb)

Self-sealing bolt:

: 61 N·m (6.2 kg-m, 45 ft-lb)

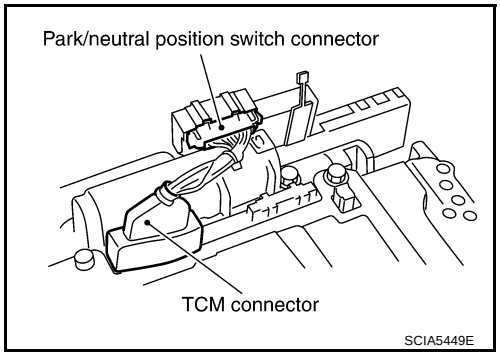


8. Make sure that brake band does not close turbine revolution sensor hole.

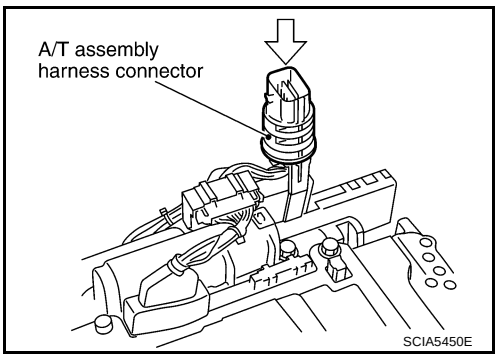


9. Install control valve with TCM.

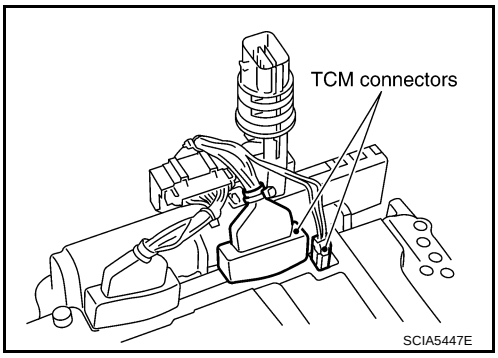
a. Connect TCM connector and park/neutral position switch connector.



b. Install A/T assembly harness connector from control valve with TCM.



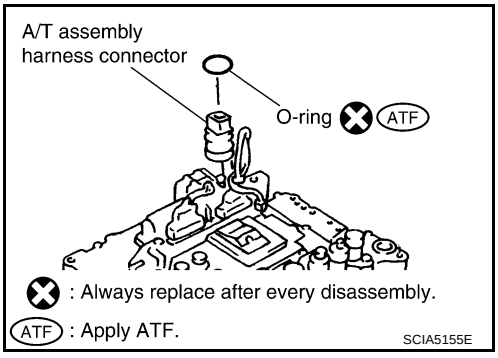
c. Connect TCM connectors.



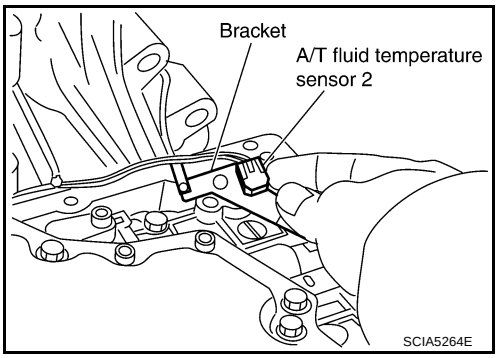
d. Install O-ring to A/T assembly harness connector.

CAUTION:

- **Do not reuse O-ring.**
- **Apply ATF to O-ring.**



e. Install A/T fluid temperature sensor 2 to bracket.

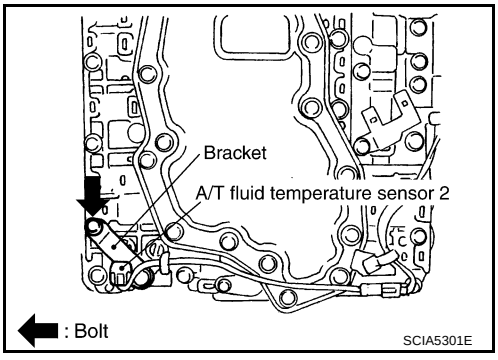


f. Install A/T fluid temperature sensor 2 (with bracket) in control valve with TCM.

CAUTION:

Adjust bolt hole of bracket to bolt hole of control valve.

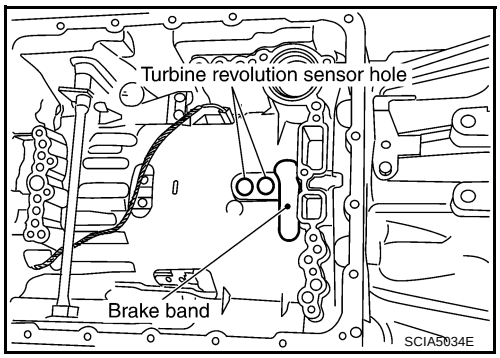
: 7.9 N·m (0.81 kg-m, 70 in-lb)



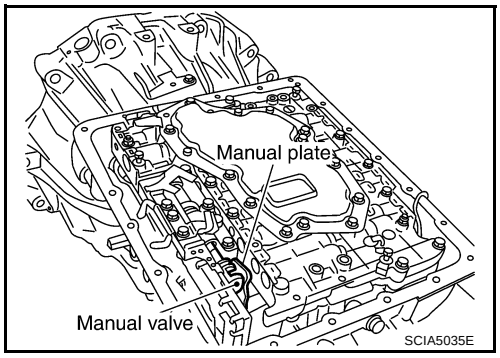
g. Install control valve with TCM in transmission case.

CAUTION:

- **Make sure that turbine revolution sensor securely installs turbine revolution sensor hole.**
- **Hang down revolution sensor harness toward outside so as not to disturb installation of control valve with TCM.**
- **Adjust A/T assembly harness connector of control valve with TCM to terminal hole of transmission case.**

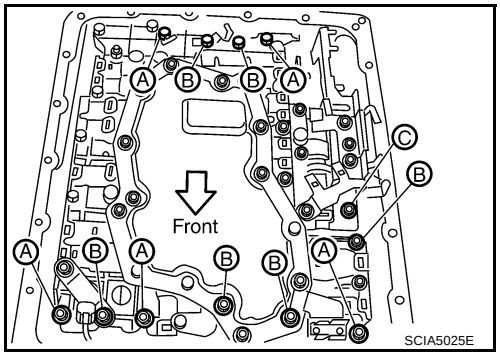


- **Assemble it so that manual valve cutout is engaged with manual plate projection.**



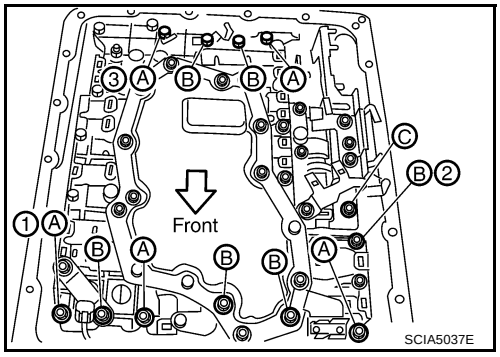
h. Install bolts A, B and C to control valve with TCM.

Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1

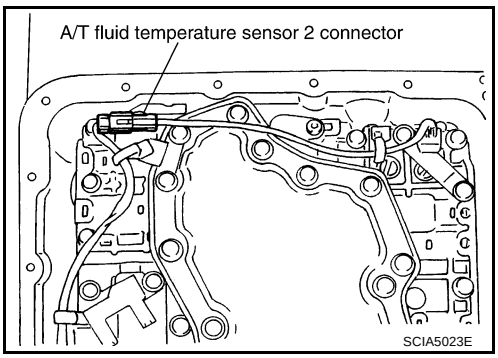


i. Tighten bolt 1, 2 and 3 temporarily to prevent dislocation. After that tighten them in order (1 → 2 → 3), and then tighten other bolts.

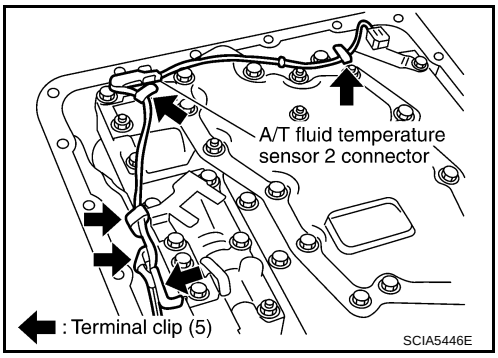
: 7.9 N·m (0.81 kg-m, 70 in-lb)



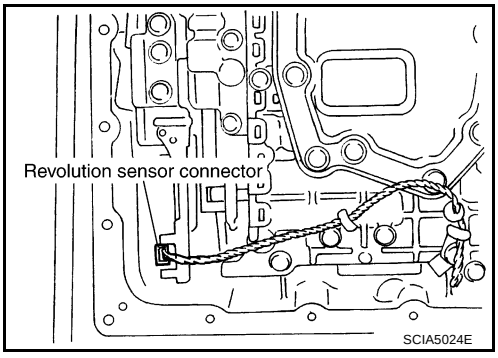
10. Connect A/T fluid temperature sensor 2 connector.



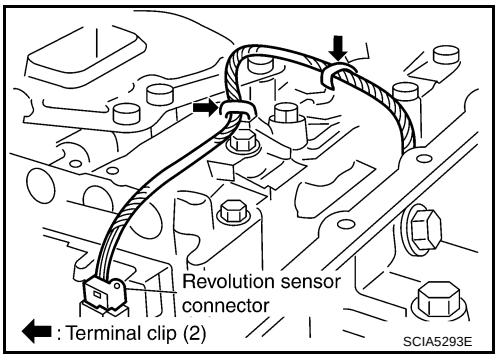
11. Securely fasten terminal cord assembly and A/T fluid temperature sensor 2 harness with terminal clips.



12. Connect revolution sensor connector.



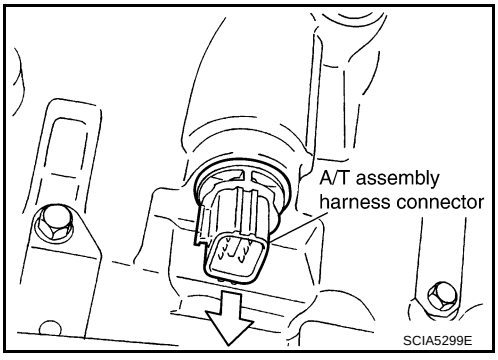
13. Securely fasten revolution sensor harness with terminal clips.



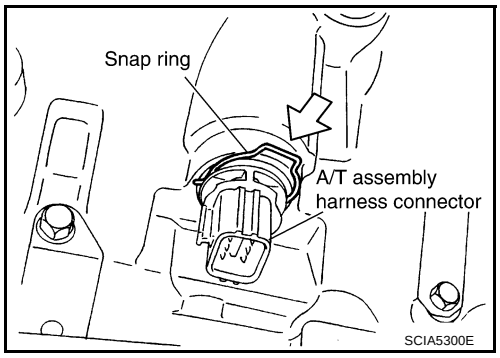
14. Pull down A/T assembly harness connector.

CAUTION:

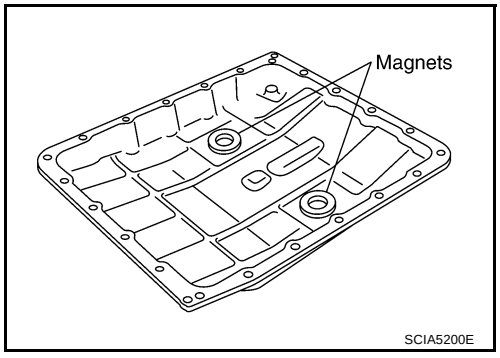
Be careful not to damage connector.



15. Install snap ring to A/T assembly harness connector.



16. Install magnets in oil pan.



17. Install oil pan to transmission case.

a. Install oil pan gasket to oil pan.

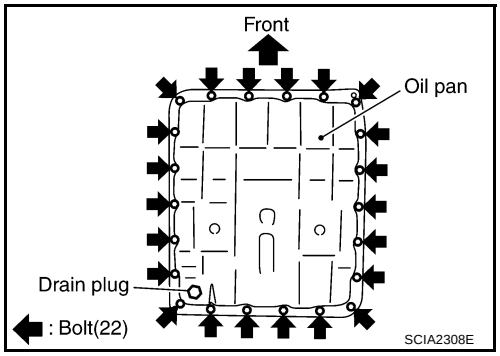
CAUTION:

- **Do not reuse oil pan gasket.**
- **Install it in the direction to align hole positions.**
- **Complete remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface.**

b. Install oil pan (with oil pan gasket) to transmission case.

CAUTION:

- **Install it so that drain plug comes to the position as shown in the figure.**
- **Be careful not to pinch harnesses.**
- **Complete remove all moisture, oil and old gasket, etc. from oil pan mounting surface.**

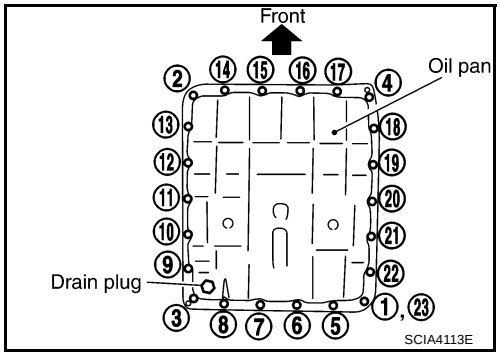


c. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them.

CAUTION:

Do not reuse oil pan mounting bolts.

: 7.9 N·m (0.81 kg-m, 70 in-lb)



18. Install drain plug to oil pan.

CAUTION:

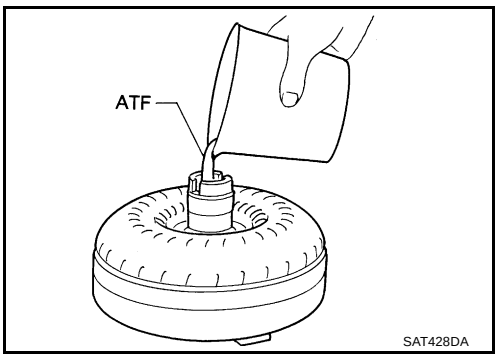
Do not reuse drain plug gasket.

: 34 N·m (3.5 kg-m, 25 ft-lb)

19. Install torque converter.

a. Pour ATF into torque converter.

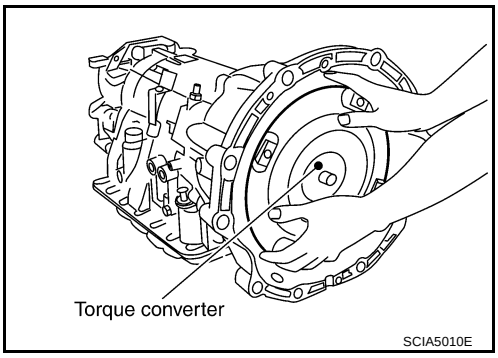
- **Approximately 2 liter (2-1/8 US qt, 1-3/4 Imp qt) of fluid is required for a new torque converter.**
- **When reusing old torque converter, add the same amount of fluid as was drained.**



b. Install torque converter while aligning notches of torque converter with notches of oil pump.

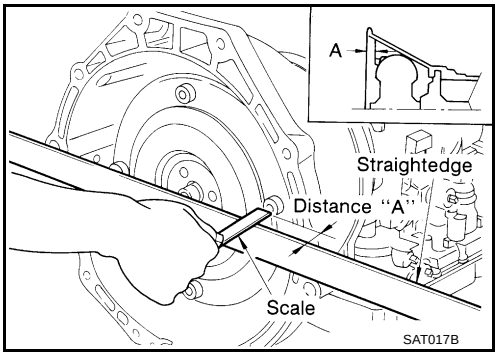
CAUTION:

Install torque converter while rotating it.



c. Measure distance “A” to check that torque converter is in proper position.

Distance “A”: 25.0 mm (0.98 in) or more



SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

ACS000OI

Applied model		VQ35DE engine
Automatic transmission model		RE5R05A
Transmission model code number		92X01
Stall torque ratio		2.0: 1
Transmission gear ratio	1st	3.540
	2nd	2.264
	3rd	1.471
	4th	1.000
	5th	0.834
	Reverse	2.370
Recommended fluid		Genuine Nissan Matic J ATF*1
Fluid capacity		10.3 liter (10-7/8 US qt, 9-1/8 Imp qt)

CAUTION:

- **Use only Genuine Nissan Matic J ATF. Do not mix with other fluid.**
- **Using automatic transmission fluid other than Genuine Nissan Matic J ATF will deteriorate in driveability and automatic transmission durability, and may damage the automatic transmission, which is not covered by the warranty.**

*1: Refer to MA-12, "Fluids and Lubricants" .

Vehicle Speed When Shifting Gears

ACS000OJ

Throttle position	Vehicle speed km/h (MPH)							
	$D_1 \rightarrow D_2$	$D_2 \rightarrow D_3$	$D_3 \rightarrow D_4$	$D_4 \rightarrow D_5$	$D_5 \rightarrow D_4$	$D_4 \rightarrow D_3$	$D_3 \rightarrow D_2$	$D_2 \rightarrow D_1$
Full throttle	58 - 62 (36 - 39)	90 - 98 (56 - 61)	140 - 150 (87 - 93)	201 - 211 (125 - 131)	197 - 207 (122 - 129)	122 - 132 (76 - 82)	74 - 82 (46 - 51)	34 - 38 (23 - 25)
Half throttle	46 - 50 (29 - 31)	71 - 79 (44 - 49)	107 - 117 (66 - 73)	135 - 145 (84 - 90)	88 - 98 (55 - 61)	63 - 73 (39 - 45)	29 - 37 (18 - 23)	11 - 15 (7 - 9)

- At half throttle, the accelerator opening is 4/8 of the full opening.

Vehicle Speed When Performing and Releasing Complete Lock-up

ACS000OK

Throttle position	Vehicle speed km/h (MPH)	
	Lock-up “ON”	Lock-up “OFF”
Closed throttle	56 - 64 (35 - 40)	53 - 61 (33 - 38)
Half throttle	168 - 176 (104 - 109)	131 - 139 (81 - 86)

- At closed throttle, the accelerator opening is less than 1/8 condition.
- At half throttle, the accelerator opening is 4/8 of the full opening.

Vehicle Speed When Performing and Releasing Slip Lock-up

ACS000OL

Throttle position	Gear position	Vehicle speed km/h (MPH)	
		Slip lock-up “ON”	Slip lock-up “OFF”
Closed throttle	4th	37 - 45 (23 - 28)	34 - 42 (21 - 26)
	5th	44 - 52 (27 - 32)	41 - 49 (25 - 30)

- At closed throttle, the accelerator opening is less than 1/8 condition.

Stall Speed

ACS000OM

Stall speed	2,650 - 2,950 rpm

Line Pressure

ACS000ON

Engine speed	Line pressure [kPa (kg/cm^2 , psi)]	
	"R" position	"D", "M" positions
At idle speed	392 - 441 (4.0 - 4.5, 57 - 64)	373 - 422 (3.8 - 4.3, 54 - 61)
At stall speed	1,700 - 1,890 (17.3 - 19.3, 247 - 274)	1,310 - 1,500 (13.3 - 15.3, 190 - 218)

A/T Fluid Temperature Sensor

ACS0080E

Name	Condition	CONSULT-II "DATA MONITOR" (Approx.) (V)	Resistance (Approx.) (kΩ)
A/T fluid temperature sensor 1	0°C (32°F)	2.2	15
	20°C (68°F)	1.8	6.5
	80°C (176°F)	0.6	0.9
A/T fluid temperature sensor 2	0°C (32°F)	2.2	10
	20°C (68°F)	1.7	4
	80°C (176°F)	0.45	0.5

Turbine Revolution Sensor

ACS0080F

Name	Condition	Data (Approx.)
Turbine revolution sensor 1	When running at 50 km/h (31 MPH) in 4th speed with the closed throttle position switch "OFF".	1.3 (kHz)
Turbine revolution sensor 2	When moving at 20 km/h (12 MPH) in 1st speed with the closed throttle position switch "OFF".	

Vehicle Speed Sensor A/T (Revolution Sensor)

ACS0080G

Name	Condition	Data (Approx.)
Revolution sensor	When moving at 20 km/h (12 MPH).	185 (Hz)

Reverse Brake

ACS0080H

	Thickness mm (in)	Part number*
Thickness of retaining plates	4.2 (0.165)	31667 90X14
	4.4 (0.173)	31667 90X15
	4.6 (0.181)	31667 90X16
	4.8 (0.189)	31667 90X17
	5.0 (0.197)	31667 90X18
	5.2 (0.205)	31667 90X19

*: Always check with the Parts Department for the latest parts information.

Total End Play

ACS0080I

Total end play mm (in)	0.25 - 0.55 (0.0098 - 0.0217)

BEARING RACE FOR ADJUSTING TOTAL END PLAY

Thickness mm (in)	Part number*
1.2 (0.047)	31435 90X02
1.4 (0.055)	31435 90X03
1.6 (0.063)	31435 90X04
1.8 (0.071)	31435 90X05
2.0 (0.079)	31435 90X06

*: Always check with the Parts Department for the latest parts information.

SECTION PR
PROPELLER SHAFT

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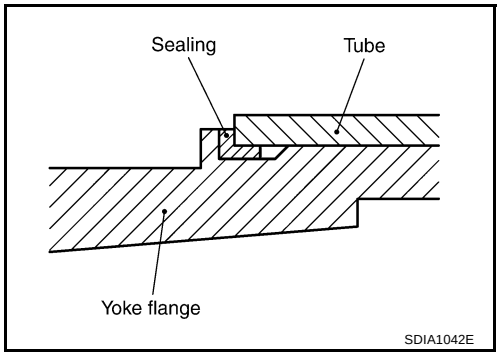
PRECAUTIONS

PFP:00001

Precautions for Propeller Shaft

ADS0007M

- If propeller shaft is dropped, replace propeller shaft with new one.
- Do not hit, impact, or damage tube.
- If damage such as cracks or peeling off in sealing (joint between yoke and tube) is found, replace propeller shaft with new one.
- If there is chipping or bend in tube, replace propeller shaft with new one.
- Check that the gap is between tube and yoke flange. If there is no gap, replace propeller shaft.
- Protect propeller shaft with protector (special service tool) during work.



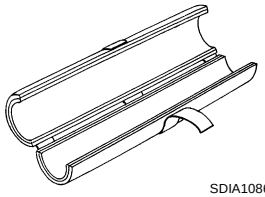
PREPARATION

PFP:00002

Special Service Tools

ADS0002D

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
– (J46208) Propeller shaft protector  SDIA1086E	Removing and installing propeller shaft

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

ADS0002F

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page			—	—	Refer to PR-5	—	NVH in RFD section	NVH in FAX, RAX, FSU, and RSU section	NVH in WT section	NVH in WT section	NVH in RAX section	NVH in BR section	NVH in PS section
Possible cause and SUSPECTED PARTS			Uneven rotation torque	Excessive joint angle	Rotation imbalance	Excessive runout	DIFFERENTIAL	AXLE AND SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES	STEERING
Symptom	PROPELLER SHAFT	Noise	×	×	×	×	×	×	×	×	×	×	×
		Shake		×				×	×	×	×	×	×
		Vibration	×	×	×	×		×	×		×		×

×: Applicable

REAR PROPELLER SHAFT

PFP:37000

On-Vehicle Service

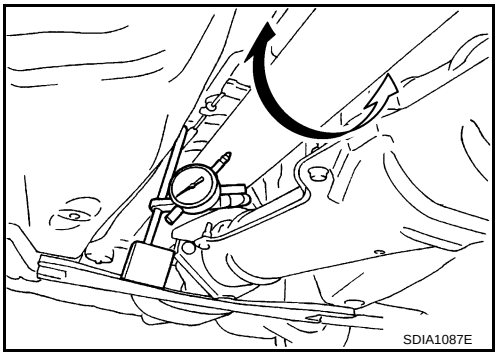
ADS0002G

PROPELLER SHAFT VIBRATION

If vibration is present at high speed, inspect propeller shaft runout first.

1. Measure propeller shaft runout at several points by rotating final drive companion flange with hands.

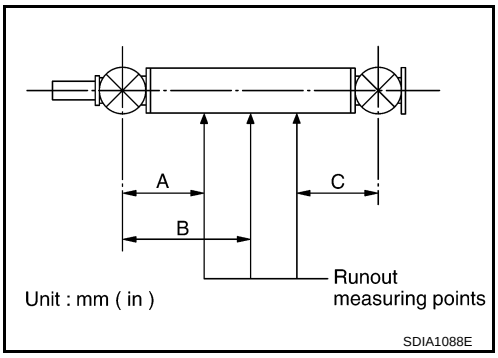
Runout limit : 1.5 mm (0.059 in) or less



Propeller shaft runout measuring points:

Unit: mm (in)

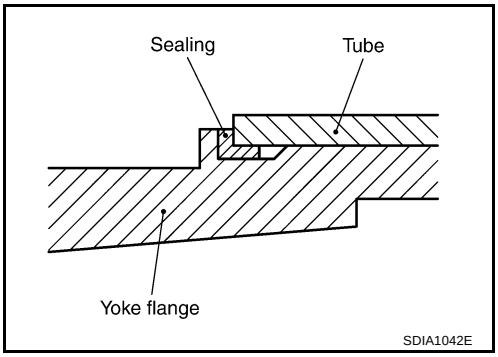
Distance	A	B	C
M/T	340 (13.39)	660.5 (26.00)	340 (13.39)
A/T	340 (13.39)	641.5 (25.26)	340 (13.39)



2. If runout still exceeds specifications, disconnect propeller shaft at final drive companion flange; then rotate companion flange 90, 180, 270 degrees and reconnect propeller shaft.
3. Check runout again. If runout still exceeds specifications, replace propeller shaft assembly.

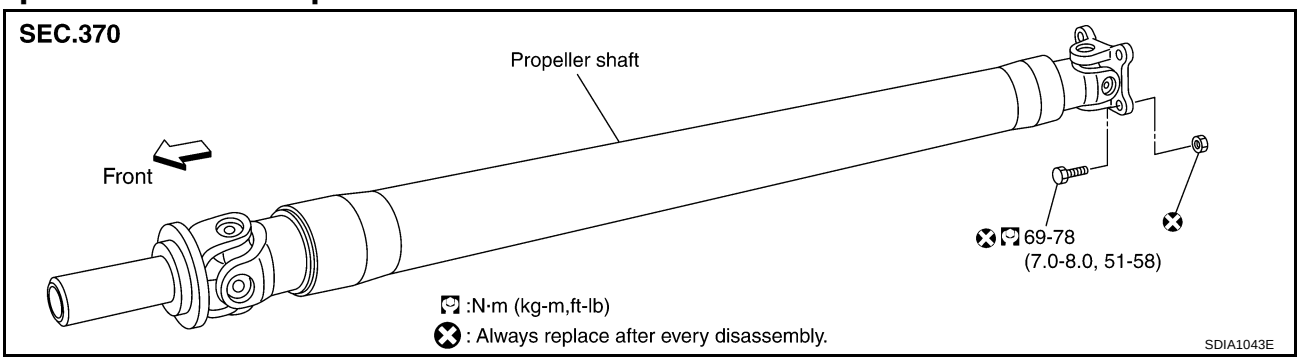
APPEARANCE CHECKING

- Inspect propeller shaft tube surface for dents or cracks. If damaged, replace propeller shaft assembly.
- If damage such as cracks or peeling off sealing (joint between yoke and tube) is found, replace propeller shaft with new one.
- Check that the gap is between tube and yoke flange. If there is no gap, replace propeller shaft.



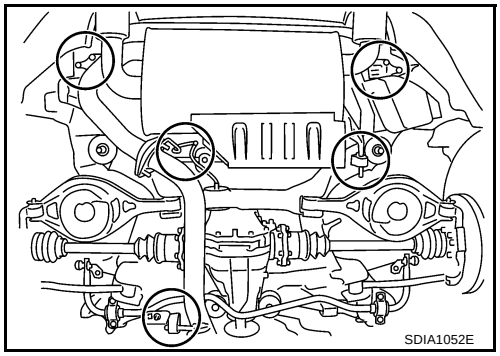
Replacement of Propeller Shaft

ADS0007W



REMOVAL

1. Shift selector lever to neutral (M/T) or N position (A/T).
2. Release parking brake.
3. To keep space for removing propeller shaft, first detach rear-side mounts (5 locations) of exhaust tube and main muffler. Then lower exhaust tube and main muffler, and support them with jack or equivalent. (See figure.)
4. Remove mounting bolts (4) securing final drive and propeller shaft, and remove propeller shaft from vehicle. (Do not reuse them.)



INSTALLATION

CAUTION:

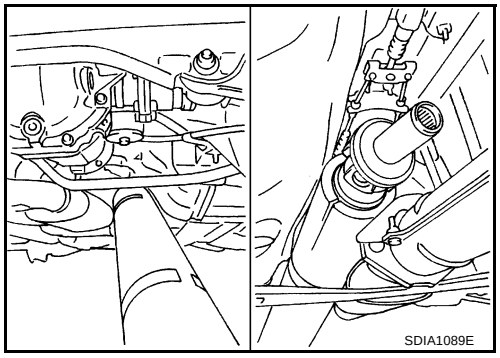
- **When installing propeller shaft, handle it carefully.**
- **Propeller shaft must be installed with packing material attached (delivered condition). Do not install propeller shaft with packing material removed.**

1. Insert propeller shaft with packing material between floor reinforcement and floor panel.

CAUTION:

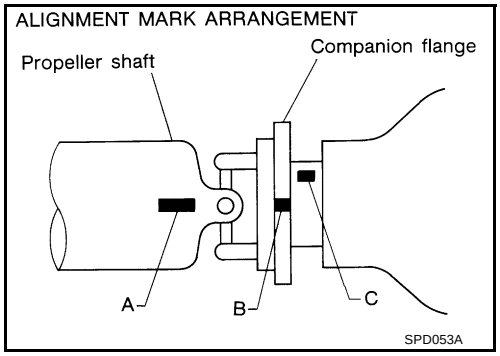
After insertion, check that shift control boot does not come off (M/T).

2. Fix propeller shaft temporarily.

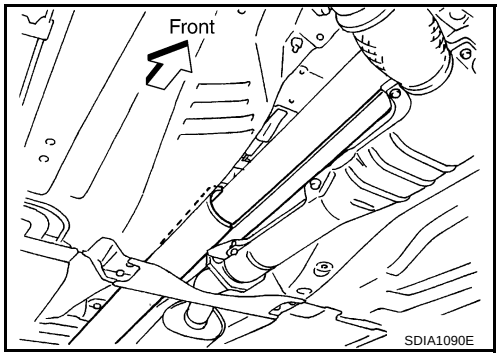


3. Face mark C on final drive joint upward.
4. With mark C facing upward, install final drive so that unbalance mark A on propeller shaft comes near as possible to joint mating mark B.
5. Tighten mounting bolts (4) securing final drive and propeller shaft to specified torque.

: **69 - 78 N·m (7.0 - 8.0 kg-m, 51 - 58 ft-lb)**

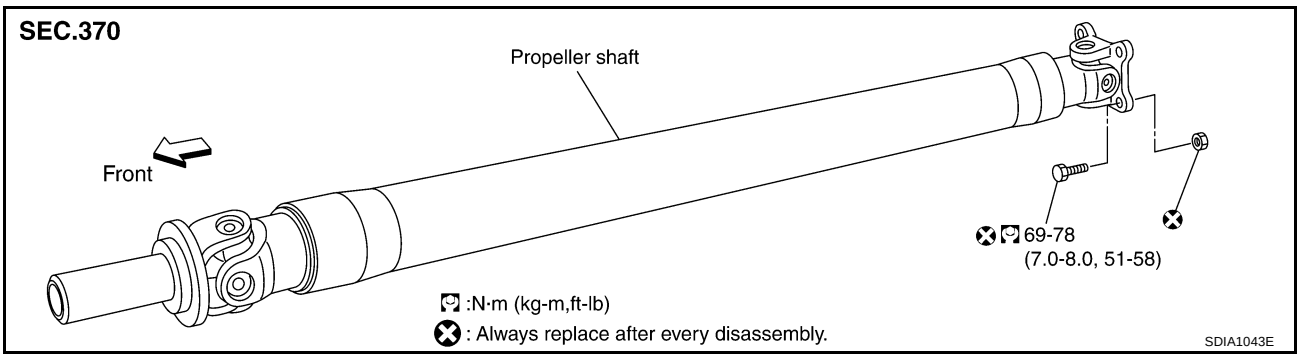


6. Remove tape with fixing packing material for propeller shaft.
7. Remove packing material from propeller shaft.
8. Return exhaust system to its original position. For tightening torque, EX-3, "Removal and Installation" .



Removal and Installation

ADS0007X

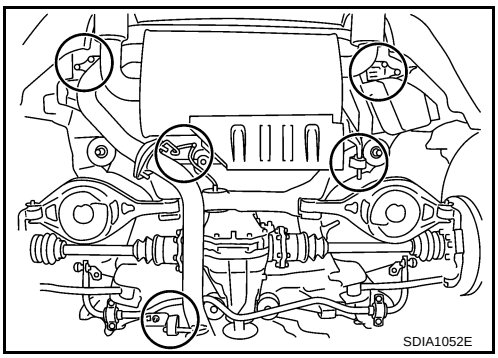


REMOVAL

CAUTION:

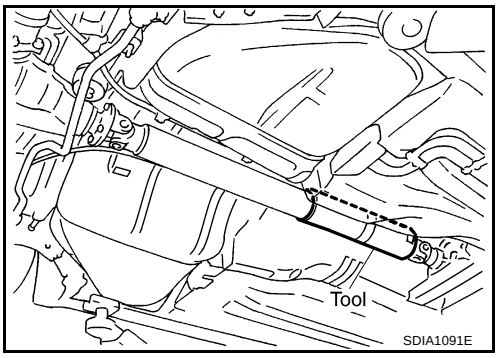
- **Protector (special service tool) is intended to protect propeller shaft. Therefore, do not detach it during work.**
- **When removing propeller shaft, handle it carefully.**

1. To keep space for removing propeller shaft, first detach rear-side mounts (5 locations) of exhaust tube and main muffler. Then lower exhaust tube and main muffler, and support them with jack or equivalent. (See figure.)



2. Attach protector (special service tool) to propeller shaft.

Tool number : –(J46208)

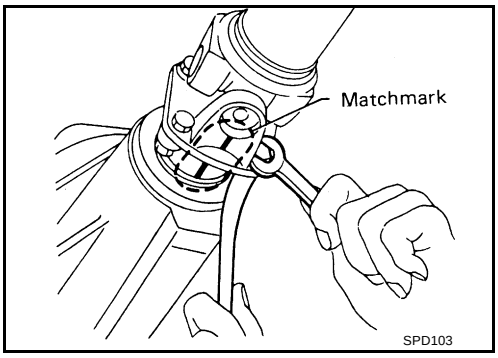


3. Put matchmarks on flanges and separate propeller shaft from final drive.

CAUTION:

Use paint or something similar for matchmarks in order to avoid scratching.

4. Remove mounting bolts (4) securing final drive and propeller shaft, then remove propeller shaft from vehicle.



INSTALLATION

CAUTION:

When installing propeller shaft, handle it carefully.

1. With protector (special service tool) attached, align mating marks made during removal, and install propeller shaft.
2. Tighten mounting bolts (4) securing final drive and propeller shaft to specified torque.

: 69 - 78 N·m (7.0 - 8.0 kg-m, 51 - 58 ft-lb)

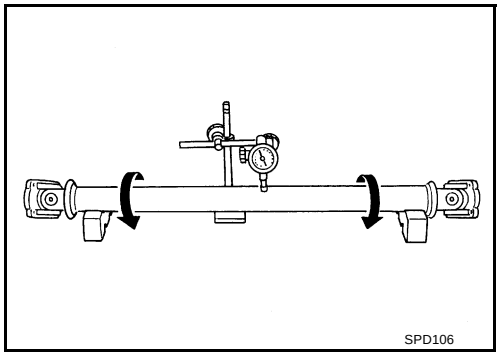
3. Remove propeller shaft from protector (special service tool).
4. Return exhaust system to its original position. For tightening torque, EX-3, "Removal and Installation" .

Inspection

ADS0007Z

- Inspect propeller shaft runout. If runout exceeds specifications, replace propeller shaft assembly.

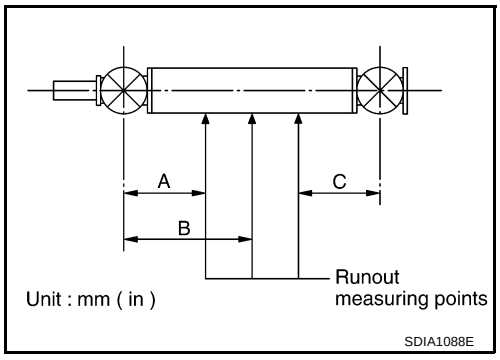
Runout limit : 1.5 mm (0.059 in) or less



- **Propeller shaft runout measuring points:**

Unit: mm (in)

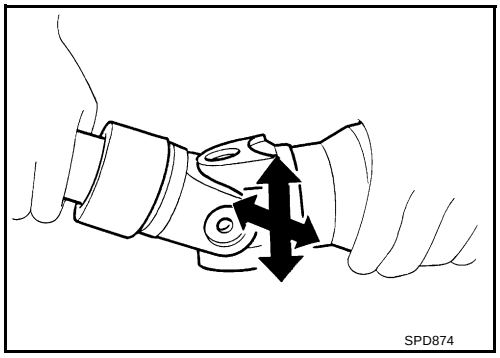
Distance	A	B	C
M/T	340 (13.39)	660.5 (26.00)	340 (13.39)
A/T	340 (13.39)	641.5 (25.26)	340 (13.39)



- If runout still exceeds specifications, replace propeller shaft assembly.

- Inspect journal axial play. If the play exceeds specifications, replace propeller shaft assembly.

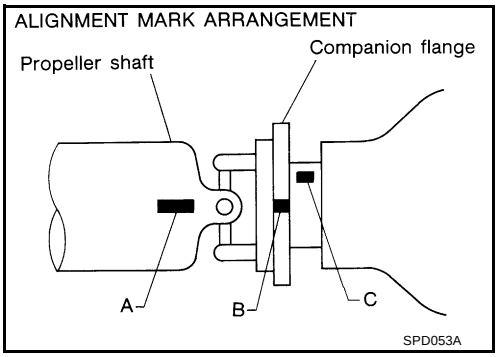
Journal axial play : 0 mm (0 in)



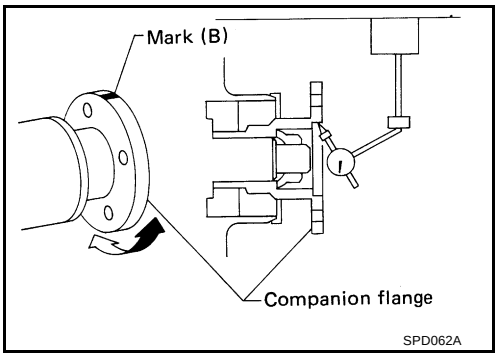
Companion Flange Installation

ADS00080

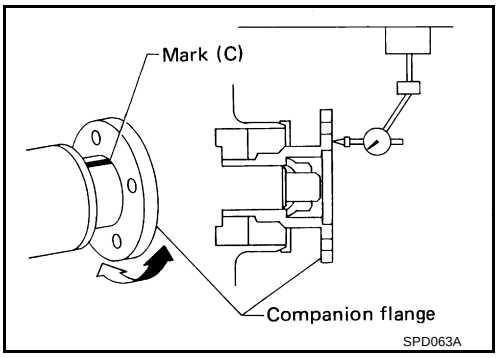
If companion flange has been removed, put new alignment marks B and C on it. Then, reassemble using the following procedure. (Perform step 4 when final drive and propeller shaft are separated from each other. Also perform step 4 when either of these parts is replaced with a new one.)



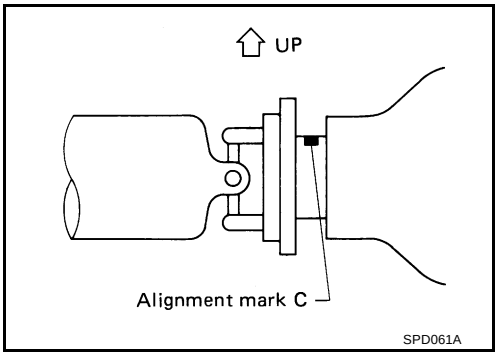
1. Erase original marks B and C from companion flange with suitable solvent.
2. Measure companion flange vertical runout.
3. Determine the position where maximum runout is read on dial gauge. Put mark (shown by B in figure) on flange perimeter corresponding to maximum runout position.



4. Measure companion flange surface runout.
5. Determine the position where maximum runout is read on dial gauge. Put mark (shown by C in figure) on flange perimeter corresponding to maximum runout position.



6. Position companion flange and propeller shaft using alignment marks A and B. Set the marks A and B as close to each other as possible. Temporarily attach bolts and nuts.
7. Press down propeller shaft with alignment mark C facing upward. Then tighten the lower nut to specified torque.
8. Tighten remaining nuts to specified torque.



SERVICE DATA

PFP:00030

General Specifications

ADS0008N

Applied model		VQ35DE	
		M/T	A/T
Propeller shaft model		2S80A CFRP	
Number of joints		2	
Coupling method with transmission		Sleeve type	
Type of journal bearings		Shell type (Non-disassembly type)	
Distance between yokes	mm (in)	95 (3.74)	
Shaft length (Spider to spider)	mm (in)	1321 (52.007)	1283 (50.512)
Shaft outer diameter	mm (in)	85.0 (3.346)	

Journal Axial Play

ADS0002J

Model		2S80A CFRP
Journal axial play	mm (in)	0 (0)

Propeller Shaft Runout Limit

ADS0002K

Model		2S80A CFRP
Propeller shaft runout limit	mm (in)	1.5 (0.059) or less

SECTION RFD
REAR FINAL DRIVE

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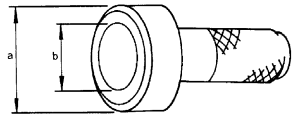
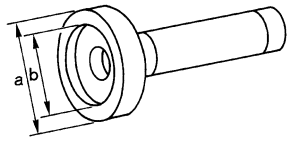
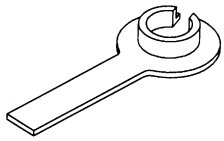
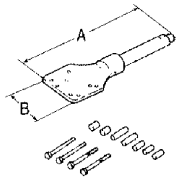
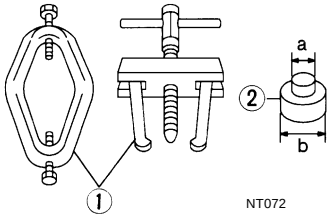
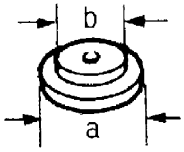
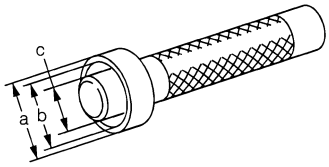
PREPARATION

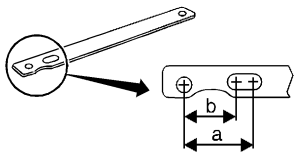
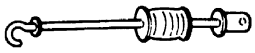
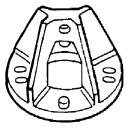
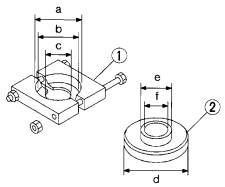
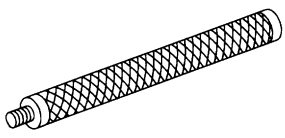
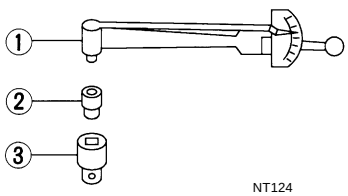
PFP:00002

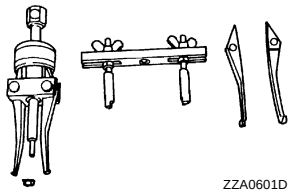
Special Service Tools

ADS0005U

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

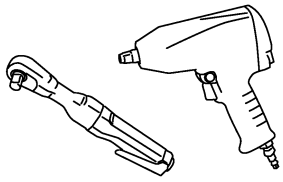
Tool name Tool number (Kent-Moore No.)		Description
Drift ST30720000 (J25405) a: 77 mm (3.03 in) dia. b: 55 mm (2.17 in) dia.	 ZZA0811D	Installing front oil seal
Drift KV38100200 (J26233) a: 65 mm (2.56 in) dia. b: 49 mm (1.93 in) dia.	 ZZA1143D	Installing side oil seal
Protector KV38107900 (J39352)	 S-NT129	Installing side flange
Attachment KV38100800 (J25604-01) a: 541 mm (21.30 in) b: 200 mm (7.87 in)	 SDIA0267E	Fixing unit assembly
Differential side bearing puller set ST3306S001 (–) 1.ST3305S001 (–) 2.ST33061000 (J8107–2) a: 28.5 mm (1.122 in) dia. b: 38 mm (1.50 in) dia.	 NT072	Removing and installing side bearing
Drift ST30613000 (J25742-3) a: 72 mm (2.83 in) dia. b: 48 mm (1.89 in) dia.	 ZZA0810D	Installing pinion front and rear bearing outer race
Drift KV38100300 (J25523) a: 54 mm (2.13 in) dia. b: 46 mm (1.81 in) dia. c: 32 mm (1.26 in) dia.	 ZZA1046D	Installing side bearing

Tool name Tool number (Kent-Moore No.)		Description
Drive pinion flange wrench KV40104000 (–) a : 85 mm (3.35 in) dia. b : 65 mm (2.56 in) dia.	 NT659	Removing and installing drive pinion nut
Sliding hammer ST36230000 (J25840-A)	 ZZA0803D	Removing side flange
Axle stand KV40104100 (–)	 ZZA0804D	Removing side flange
Slideing hammer HT72400000 (–)	 S-NT125	Removing differential case assembly
Drive pinion rear inner race puller set ST3090S000 (–) 1. ST30031000 (J22912-01) Puller 2. ST30901000 (–) Base Equivalent tool (J26010-01) a : 90 mm (3.54 in) dia. b : 80 mm (3.15 in) dia. c : 50 mm (1.97 in) dia. d : 79 mm (3.11 in) dia. e : 45 mm (1.77 in) dia. f : 35 mm (1.38 in) dia.	 S-NT640	Removing and installing drive pinion rear bearing inner race
Drift ST30611000 (J25742–1)	 S-NT090	Installing pinion rear bearing outer race (Use with ST30613000)
Preload gauge ST3127S000 (see J25765-A) 1. GG91030000 Torque wrench (J25765) 2. HT62940000 (–) Socket adapter (1/2″) 3. HT62900000 (–) Socket adapter (3/8″)	 NT124	Measuring pinion bearing preload and total preload

Tool name Tool number (Kent-Moore No.)	Description
Oil seal puller ST33290001 (J34286)  ZZA0601D	Removing fornt oil seal
Differential shim selection (J34309) NT134	Adjusting bearing preload gear height

Commercial Service Tools

ADS0005V

Power tool  PBIC0190E	

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

ADS0005W

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

			Reference page	Refer to RFD-21, "Contact Surfaces"	Refer to RFD-27, "TOOTH CONTACT"	Refer to RFD-21, "Contact Surfaces"	Refer to RFD-15, "Pre-Inspection"	—	Refer to MA-25, "Changing Differential Gear Oil"	NVH in PR section.	NVH in FAX, RAX, FSU and RSU sections.	NVH in WT section.	NVH in WT section.	NVH in RAX section.	NVH in BR section.	NVH in PS section.
			Possible cause and SUSPECTED PARTS	Rough gear tooth	Improper gear contact	Tooth surfaces worn	Incorrect backlash	Companion flange excessive runout	Improper gear oil	PROPELLER SHAFT	AXLE AND SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES	STEERING
Symptom	DIFFERENTIAL	Noise		×	×	×	×	×	×	×	×	×	×	×	×	×

×: Applicable

FRONT OIL SEAL

PFP:38189

Removal and Installation

ADS00081

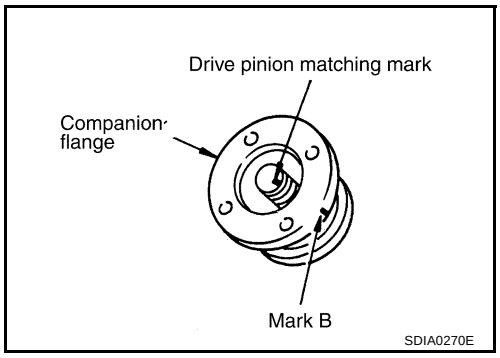
REMOVAL

1. Remove the propeller shaft. Refer to PR-7, "Removal and Installation" .

   CAUTION:
   Do not impact or damage propeller shaft tube.

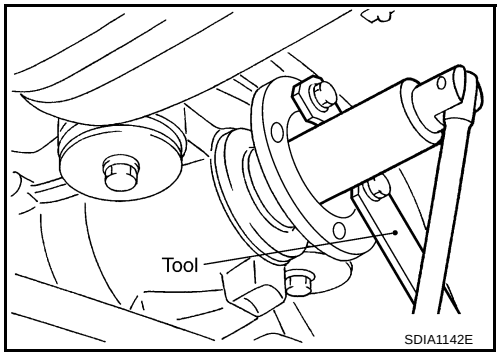
2. Put a mark on the end of the drive pinion corresponding to the B position mark on the companion flange.

   CAUTION:
   - **For matching mark, use paint. Never damage drive pinion.**
   - **The mark on the final drive companion flange indicates the maximum vertical runout position.**

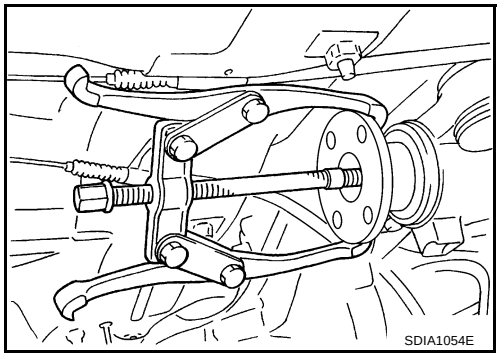


3. Using the drive pinion flange wrench, Remove drive pinion nut.

   Tool number : KV40104000 (–)

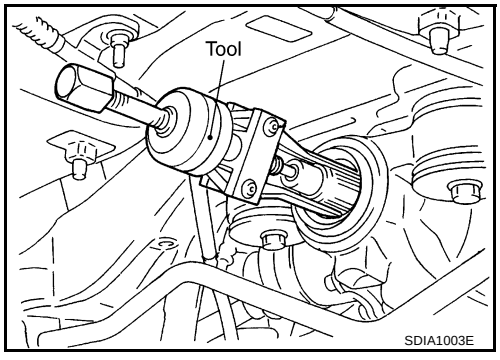


4. Using the puller, remove the companion flange.



5. Using the oil seal puller, remove front oil seal.

   Tool number : ST33290001 (J34286)

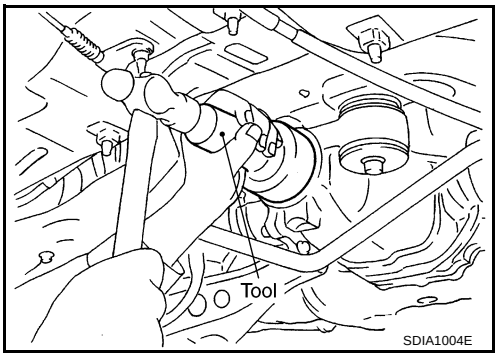


INSTALLATION

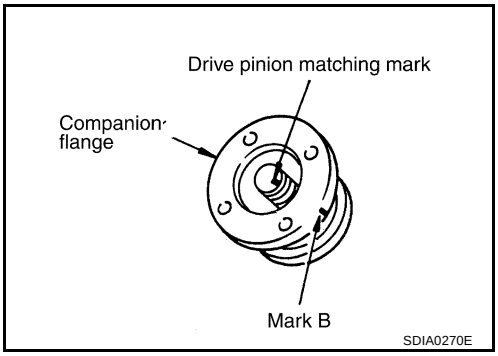
1. Apply multi-purpose grease to sealing lips of oil seal. Press front oil seal into carrier with tool.

   Tool number : ST30720000 (J25405)

   CAUTION:
   - **When installing the oil seal, be careful not to get it inclined.**
   - **Discard the old oil seal. Always replace with new one.**



2. Align the matching mark of drive pinion with the matching mark B of companion flange, then install the companion flange.



3. Apply oil or grease on the screw part of drive pinion and the seating surface of drive pinion nut.
4. Install drive pinion nut with tool.

   Tool number : KV4010400 (–)

   : 147 - 323N·m (15.0 - 32.0 kg-m, 109 - 238 ft-lb)

   CAUTION:
   The drive pinion nut is not reusable. Never reuse drive pinion nut.
5. Install propeller shaft. Refer to PR-7, "Removal and Installation" .

SIDE OIL SEAL

PFP:33142

Removal and Installation

ADS0006Q

REMOVAL

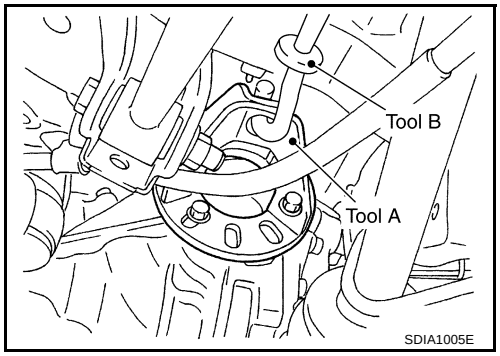
1. Remove side flange with the following procedure for press-fitting.

a. Remove rear ABS wheel sensor. Refer to BRC-83, "WHEEL SENSORS" .

b. Remove drive shaft. Refer to RAX-10, "REAR DRIVE SHAFT" and RAX-6, "WHEEL HUB" .

c. Install axle stand to side flange.

Tool number A : KV40104100 (–)

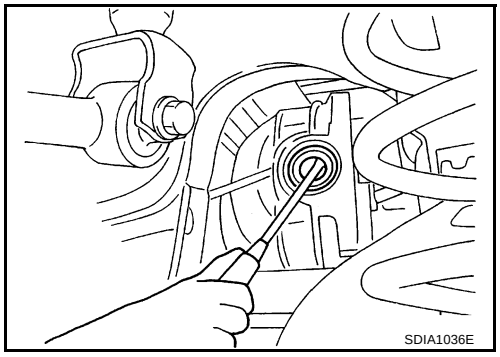


d. Using a sliding hammer, pull out the side flange.

Tool number B : ST36230000 (J25840–A)

Model	Circular clip installation position	
	Right side	Left side
R200	Final drive side	
R200V	Final drive side	Side flange side

2. Remove oil seal using a flat-bladed screwdriver.



INSTALLATION

NOTE:

Be sure to install the RH companion flange of the R200V, then install the LH companion flange. If LH companion flange is installed first, the RH companion flange comes out sometimes from the shock of installing the RH companion flange.

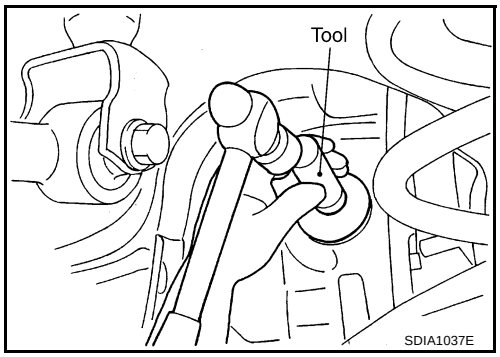
1. Apply multi-purpose grease to sealing lips of side oil seal.

2. Using the drift, press-fit oil seal so that its surface comes face to face with the end surface of the case.

Tool number : KV38100200 (J26233)

CAUTION:

- **When installing the oil seal be careful not to get it inclined.**
- **Discard the old oil seal. Always replace with new one.**

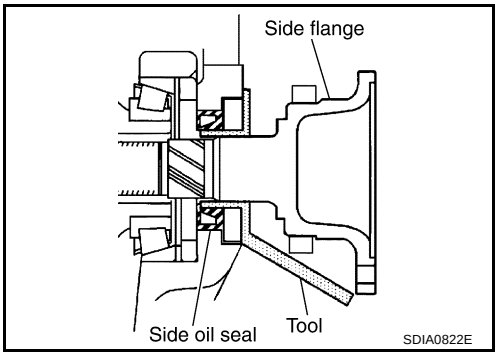


3. Install the side flange with the following procedure.

a. Attach the protector to side oil seal.

Tool number : KV38107900 (J39352)

b. After the side flange is inserted and the serrated part of side gear has engaged the serrated part of flange, remove the protector.



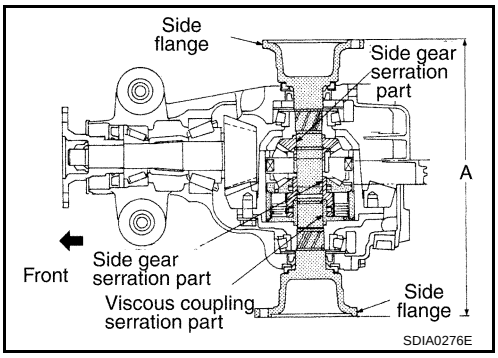
c. Put suitable drift on the center of side flange, then drive it until sound changes.

NOTE:
When installation is completed, driving sound of the side flange turns into a sound which seems to affect the whole final drive.

4. Confirm that the dimension of the side flange installation (Measurement A) in the illustration comes into the following, then install the drive shaft.

Measurement A

: Approx. 326 - 328 mm (12.83 - 12.91 in)



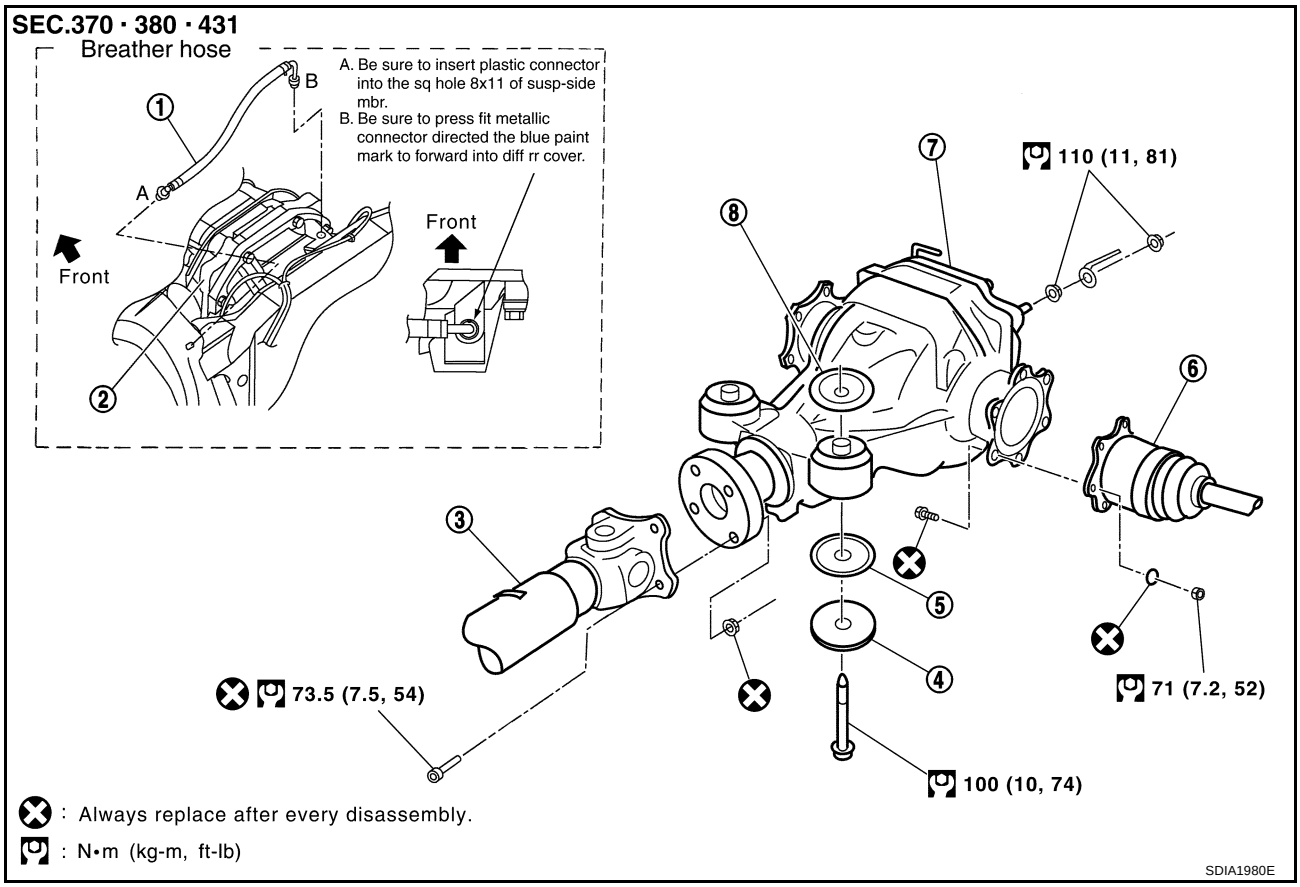
5. Align the installing position of the ABS wheel sensor. Refer to BRC-83, "WHEEL SENSORS" .

REAR FINAL DRIVE ASSEMBLY

PFP:38300

Removal and Installation

ADS0006R



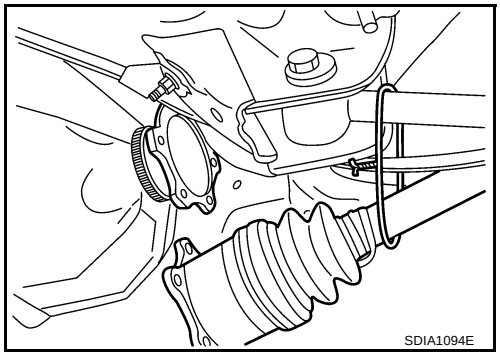
1. Breather hose
2. Final drive
3. Rear propeller shaft
4. Washer
5. Lower stopper
6. Drive shaft
7. Rear final drive assembly
8. Upper stopper

REMOVAL

1. Remove rear propeller shaft from the final drive. Refer to PR-7, "Removal and Installation" .

   CAUTION:
   Do not impact or damage propeller shaft tube.
2. Remove rear stabilizer bar with power tool. Refer to RSU-16, "STABILIZER BAR" .
3. Remove drive shaft from final drive. Then suspend it by wire etc. Refer to RAX-10, "REAR DRIVE SHAFT" .
4. Remove breather hose from the final drive.
5. Remove ABS wheel sensor. Refer to BRC-83, "WHEEL SENSORS" .
6. Place a transmission jack on the final drive.

   CAUTION:
   Do not place a transmission jack on the rear cover (aluminum case).
7. Remove the mounting bolts and nuts connecting to the suspension member, and remove the rear final drive.



INSTALLATION

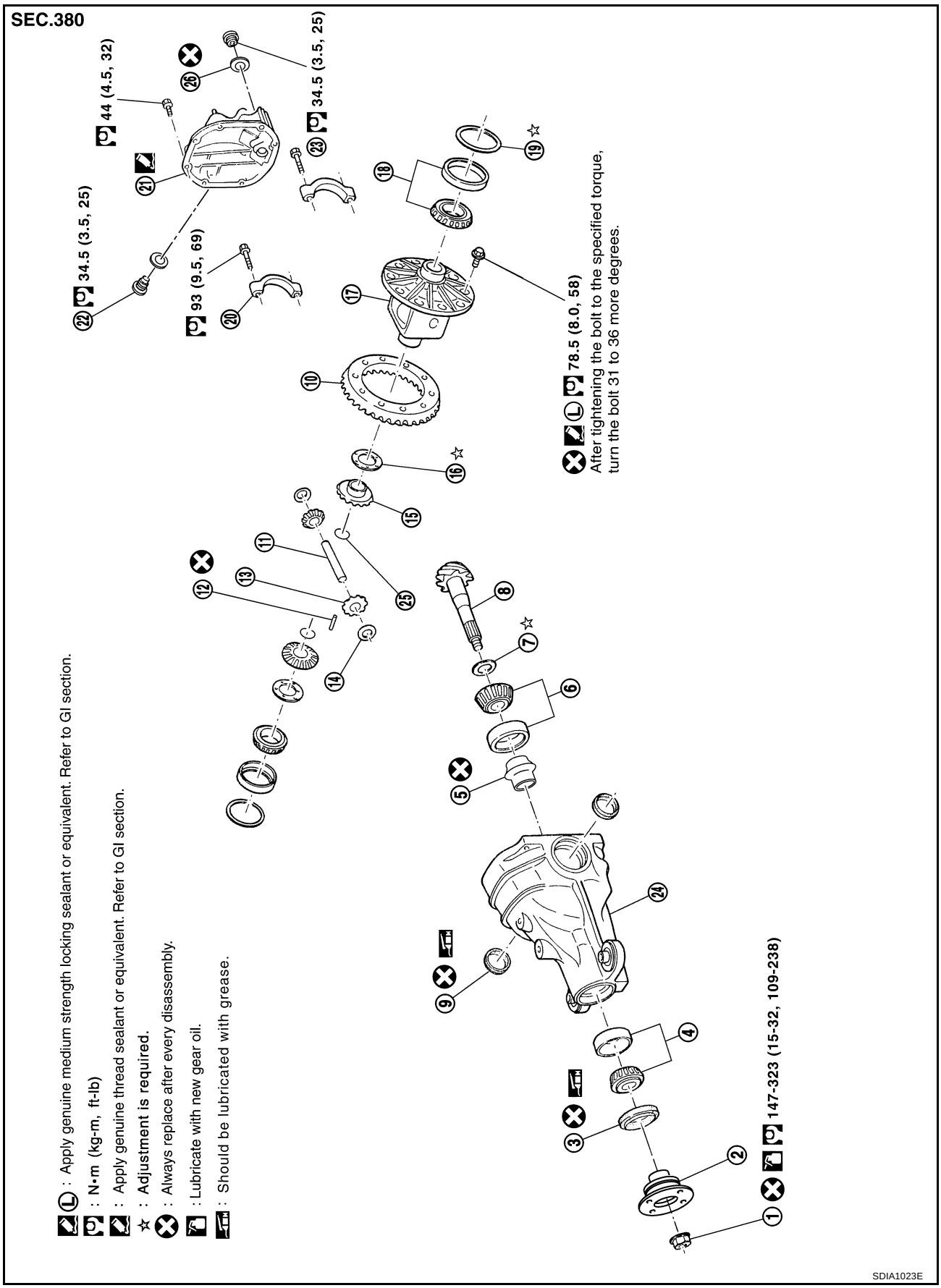
Install in the reverse order of removal.

CAUTION:

After installation, check the final drive oil level. Refer to MA-25, "Checking Differential Gear Oil" .

Components
R200 2–PINION

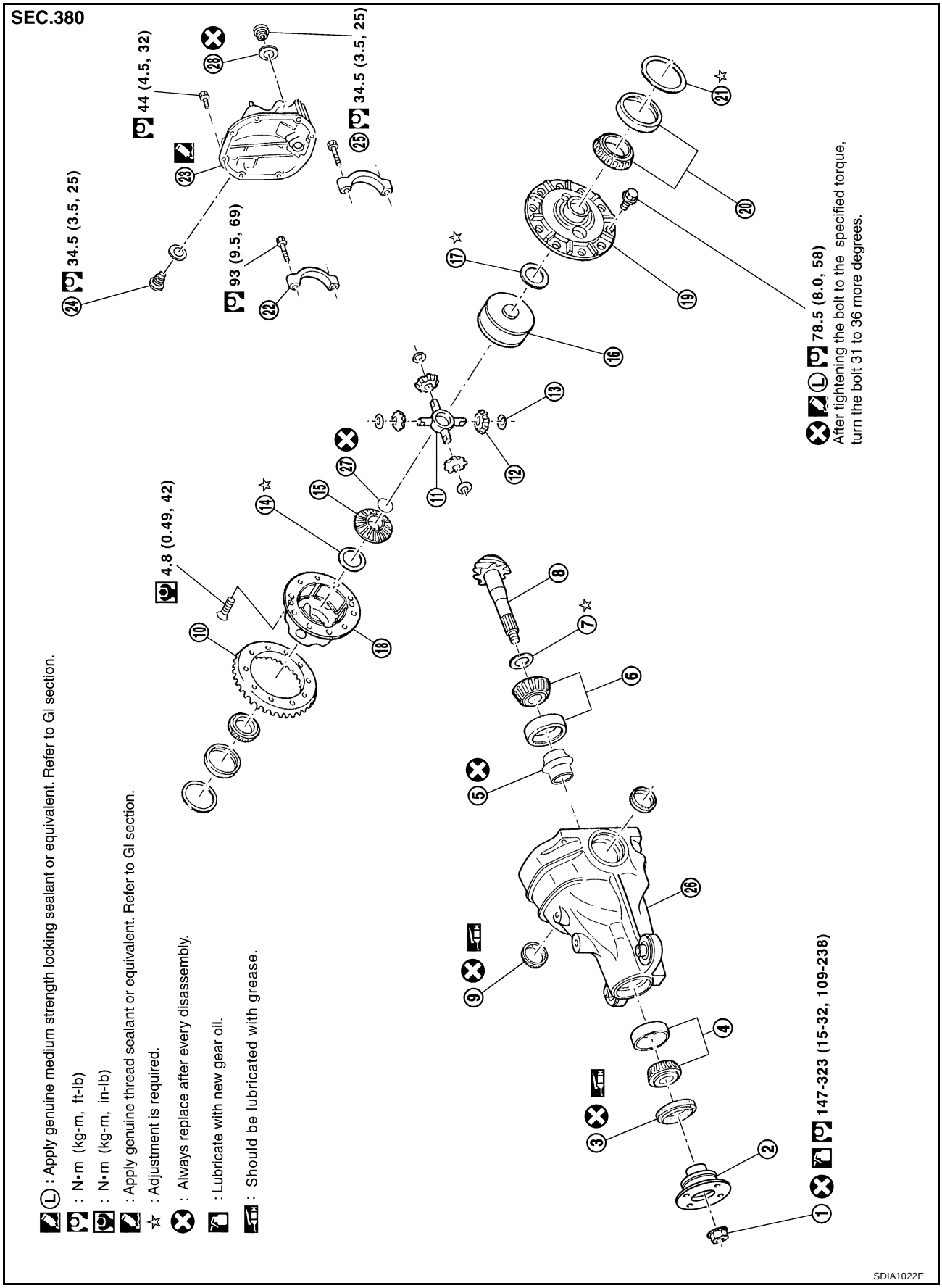
ADS0006S



1. Drive pinion nut
2. Companion flange
3. Front oil seal
4. Pinion front bearing
5. Pinion bearing adjusting spacer (Collapsible spacer)
6. Pinion rear bearing
7. Pinion height adjusting washer
8. Drive pinion
9. Side oil seal
10. Drive gear
11. Pinion mate shaft
12. Look pin
13. Pinion mate gear
14. Pinion mate thrust washer
15. Side gear
16. Side gear thrust washer
17. Differential case
18. Side bearing
19. Side bearing adjusting washer
20. Bearing cap
21. Rear cover
22. Filler plug
23. Drain plug
24. Gear carrier
25. Circular clip
26. Gasket

R200V VISCOUS

SEC.380



1. Drive pinion nut
2. Companion flange
3. Front oil seal
4. Pinion front bearing
5. Pinion bearing adjusting spacer (Collapsible spacer)
6. Pinion rear bearing
7. Pinion height adjusting washer
8. Drive pinion
9. Side oil seal
10. Drive gear
11. Pinion mate shaft
12. Pinion mate gear
13. Pinion mate thrust washer
14. Side gear thrust washer
15. Side gear
16. Viscous coupling
17. Side gear thrust washer
18. Differential case B
19. Differential case A
20. Side bearing
21. Side bearing adjusting washer
22. Bearing cap
23. Rear cover
24. Filler plug
25. Drain plug
26. Gear carrier
27. Circular clip
28. Gasket

Pre-Inspection

ADS0006T

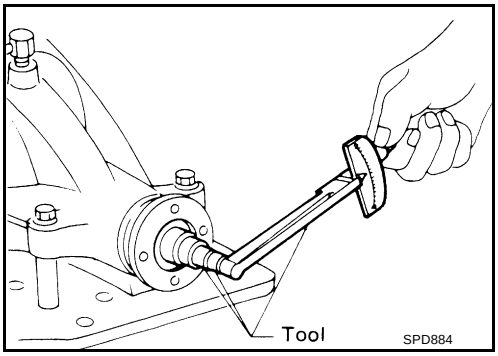
Before disassembling final drive, perform the following inspection.

TOTAL PRELOAD

1. Turn drive pinion in both directions several times to set bearing rollers.
2. Check total preload with Tool.

Tool number
: ST3127S000 (see J25765-A)

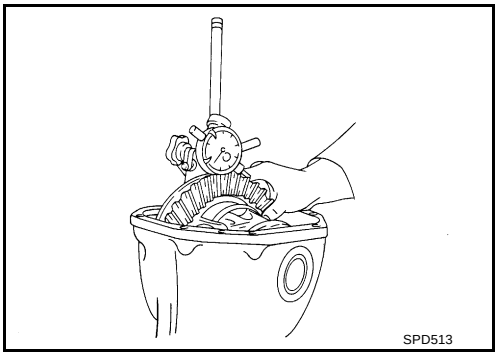
Total preload
: 2.84 - 3.75 N·m (0.29 - 0.38 kg-m, 26 - 33 in-lb)



DRIVE GEAR TO DRIVE PINION BACKLASH

Check drive gear to drive pinion backlash with a dial gauge at several points.

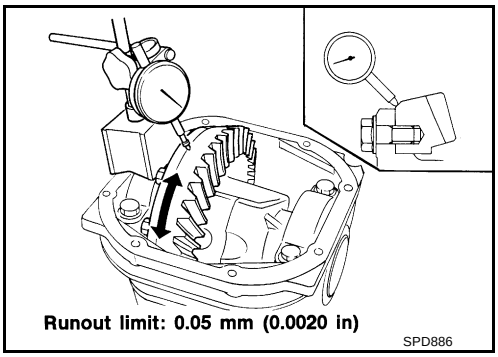
Drive gear backlash
: 0.10 - 0.15 mm (0.0039 - 0.0059 in)



DRIVE GEAR RUNOUT

Check runout of drive gear with a dial gauge.

Runout limit : 0.05 mm (0.0020 in) less



TOOTH CONTACT

Check tooth contact. Refer to RFD-27, "TOOTH CONTACT" .

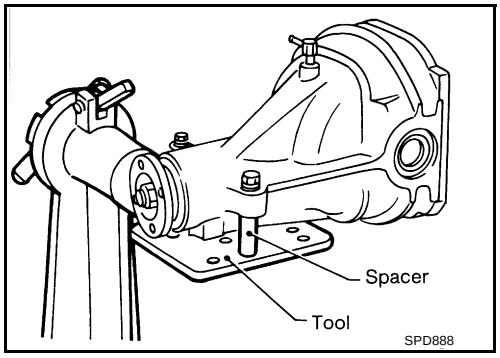
Disassembly and Assembly

ADS0006U

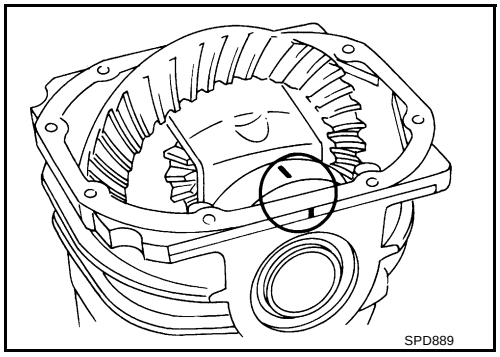
REMOVAL OF DIFFERENTIAL CASE ASSEMBLY

1. Using two 45 mm (1.77 in) spacers, mount carrier on Tool.

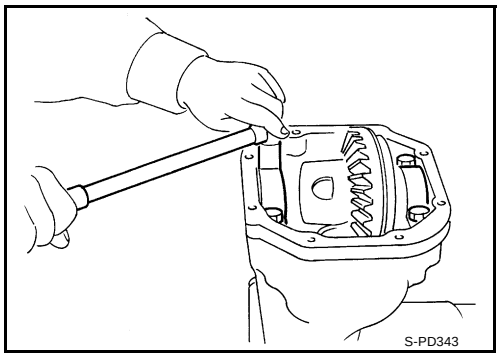
   Tool number : KV38100800 (J25604–01)



2. For proper reinstallation, paint match marks on one side of the bearing cap.
   Bearing caps are line-board during manufacture. Replace them in their proper positions.

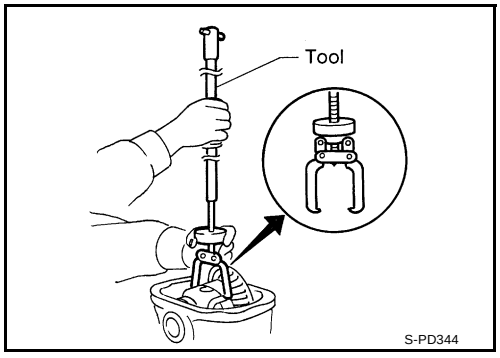


3. Remove bearing caps.

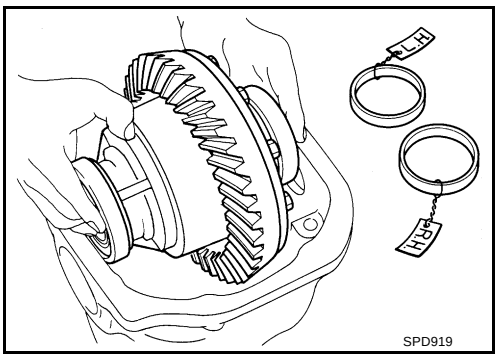


4. Lift differential case assembly out with Tool.

   Tool number : HT72400000 (–)



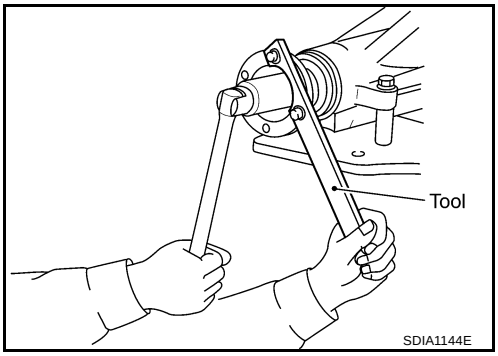
- Keep the side bearing outer races together with inner races. Do not mix them up.
  Also, keep adjusting washers together with bearings.



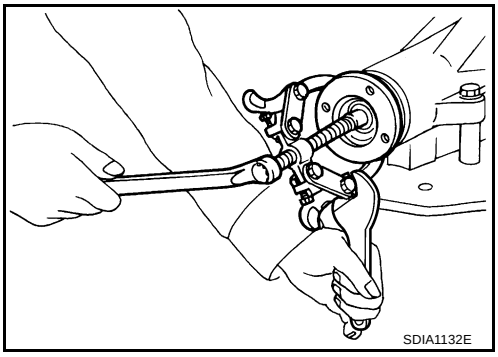
REMOVAL OF DRIVE PINION ASSEMBLY

1. Put match marks on companion flange and drive pinion with paint.
2. Loosen drive pinion nut with tool.

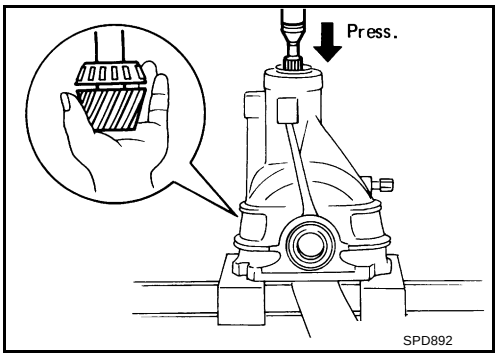
   Tool number : KV40104000 (–)



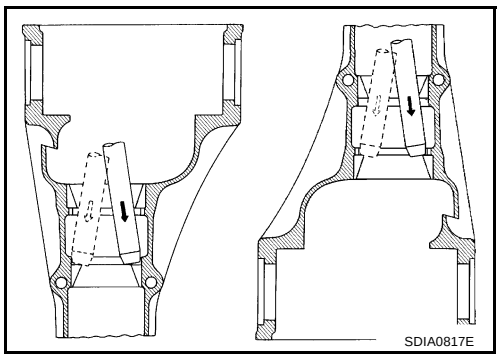
3. Using the puller remove companion flange.



4. Take out drive pinion (together with rear bearing inner race, bearing adjusting spacer).
5. Remove front oil seal. Refer to RFD-6, "FRONT OIL SEAL"
6. Remove pinion front bearing inner race.
7. Remove side oil seal. Refer to RFD-8, "SIDE OIL SEAL"

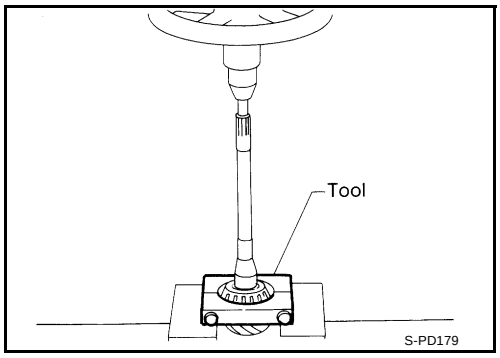


8. Remove pinion bearing outer races with a brass drift.



9. Remove pinion rear bearing inner race and drive pinion height adjusting washer with Tool.

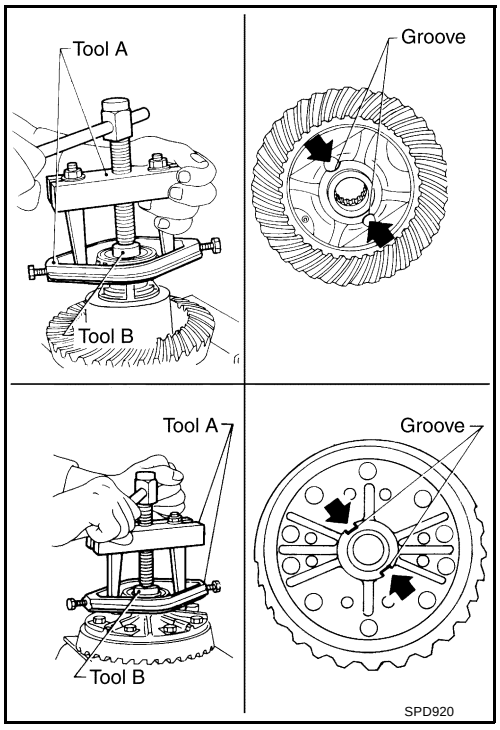
Tool number: : ST30031000 (J22912-01)



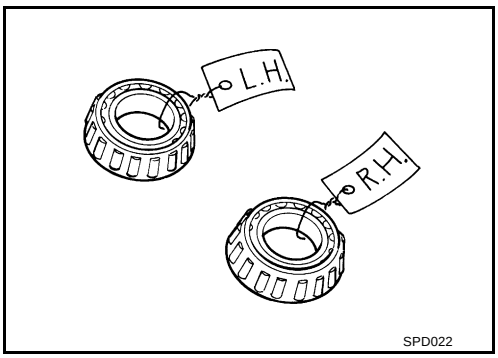
DISASSEMBLY OF DIFFERENTIAL CASE ASSEMBLY (R200 2–PINION)

1. Remove side bearing inner races.
   To prevent damage to bearing, engage puller jaws in groove.

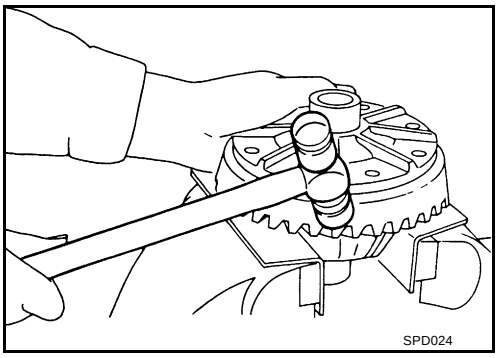
Tool number : A ST3305S001 (–)
: B ST33061000 (J8107-2)



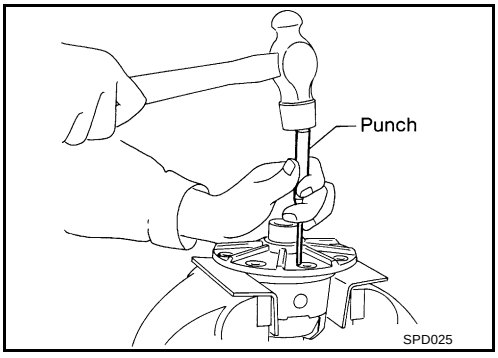
- Be careful not to confuse left- and right-hand parts.



2. Loosen drive gear bolts in a criss-cross fashion.
3. Tap drive gear off the differential case with a soft hammer.
   - Tap evenly all around to keep drive gear from binding.



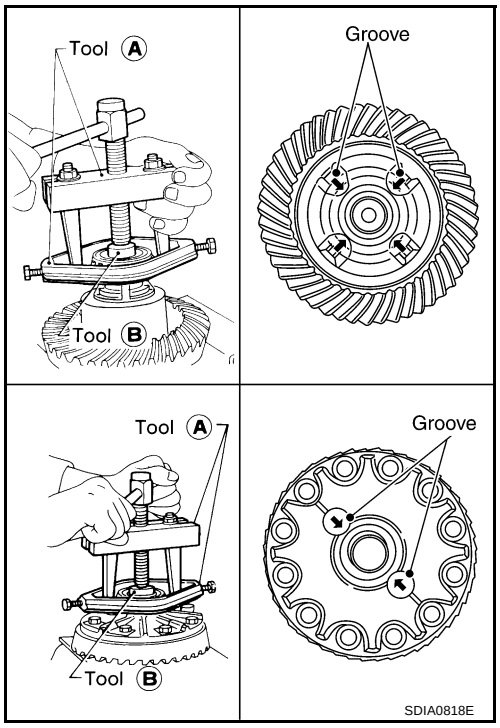
4. Drive out pinion mate shaft lock pin with punch from drive gear side.



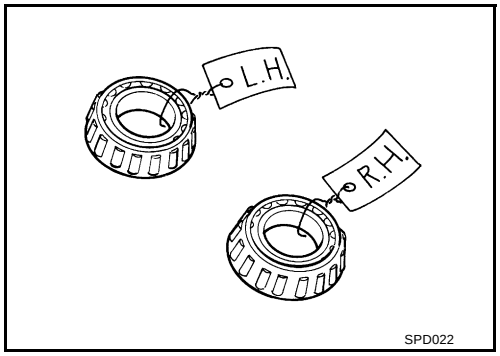
DISASSEMBLY OF DIFFERENTIAL CASE ASSEMBLY(R200V)

1. Remove side bearing inner race.
   To prevent damage to bearing, engage puller jaws in groove.

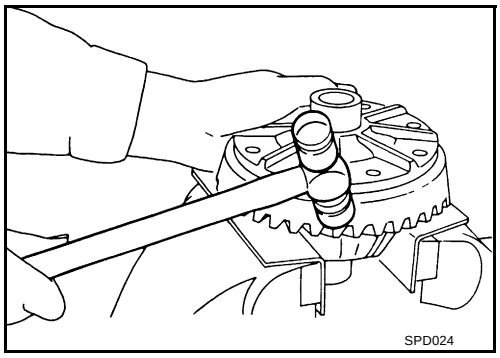
   Tool number : A ST3305S001 (–)
   : B ST33061000 (J8107-2)



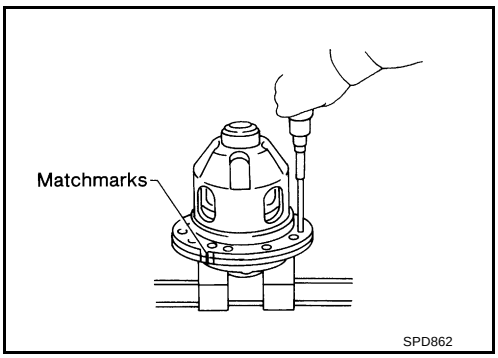
- Be careful not to confuse left- and right-hand parts.



2. Loosen drive gear bolts in a criss-cross fashion.
3. Tap ring gear off the differential case with a soft hammer.
   - Tap evenly all around to keep drive gear from binding.



4. Put match marks with paint
5. Loosen screws on differential cases A and B.
6. Separate differential cases A and B.



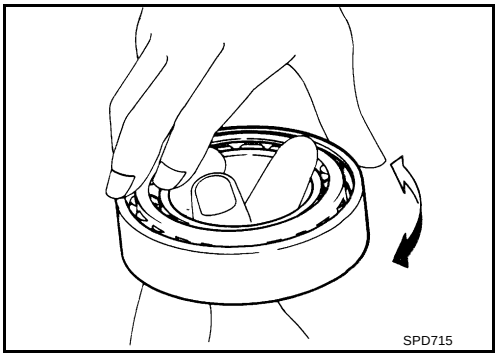
INSPECTION

Contact Surfaces

1. Clean the disassembled parts in suitable solvent and blow dry with compressed air.
2. If following surfaces are found to be burred or scratched, smooth with oil stone.
   - Differential case
   - Side gear
   - Pinion mate gear
   - Pinion mate shaft

Bearing

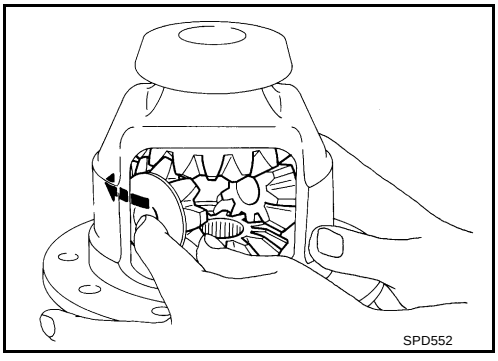
1. Thoroughly clean bearing.
2. Check bearings for wear, scratches, pitting or flaking.
   Check tapered roller bearing for smooth rotation. If damaged, replace outer race and inner race as a set.



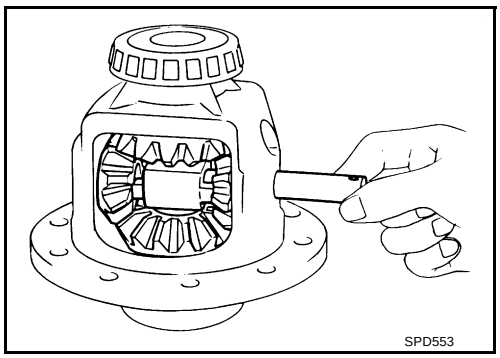
ADJUSTMENT OF DIFFERENTIAL CASE (R200 2–PINION)

Thrust Washer Selection

1. Install side gears, pinion mate gears, thrust washers into differential case.



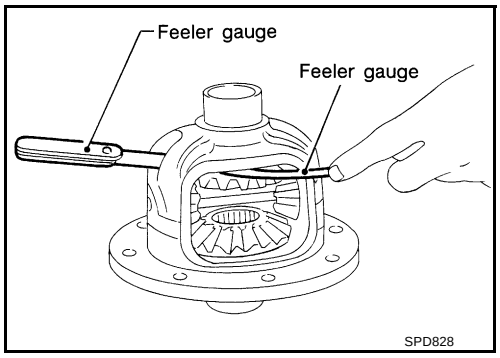
2. Fit pinion mate shaft to differential case so that it meets lock pin holes.



3. Adjust clearance between rear face of side gear and thrust washer by selecting side gear thrust washer. Refer to RFD-34, "AVAILABLE SIDE GEAR THRUST WASHERS" .
Use two feeler gauges to prevent leaning of side gear as shown, figure.

Clearance between side gear thrust washer and differential case

: 0.20 mm (0.0079 in) less

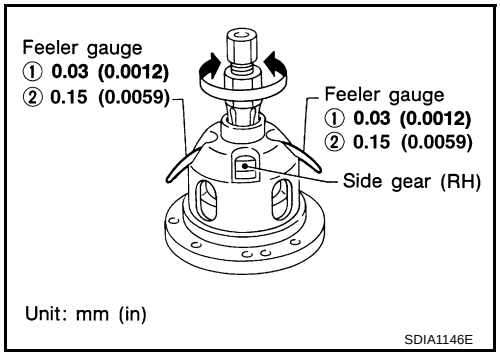


ADJUSTMENT OF DIFFERENTIAL CASE (R200V)

Side Gear Thrust Washer Selection

Whenever side gears or pinion mate gears are replaced, select suitable thrust washers as follows:

1. Clean side gears and pinion mate gears using white gasoline.
2. Before assembling gears, apply hypoid gear oil to frictional surfaces.
3. Install the previously removed thrust washer on right side gear. On left side gear, install a suitable thrust washer. Temporarily tighten differential cases using two screws.
4. Position differential assembly so that right side gear is on the upper side. Place feeler gauge of 0.03 mm (0.0012 in) thickness between right side gear and thrust washer as shown.



- Do not place feeler gauge at groove side of differential case.

5. Also place a 0.03 mm (0.0012 in) additional feeler gauge between right side gear and thrust washer so that it is positioned diagonal to (180° apart from) the feeler gauge described previously.
6. Rotate right side gear with a suitable tool attached to splines. If hard to rotate, replace thrust washer on left side gear with a thinner one.
7. Replace both 0.03 mm (0.0012 in) feeler gauges with 0.15 mm (0.0059 in) gauges. At this point, make sure right side gear does not rotate. If it rotates, replace thrust washer on left side gear with a thicker one to prevent rotation.
8. As explained in above example, select suitable thrust washers to ensure that:

a. Both side gears rotate. [0.03 mm (0.0012 in) feeler gauges are used in this case.]
b. Side gear is held stationary. [0.15 mm (0.0059 in) feeler gauges are used in this case.]

For quiet and reliable final drive operation, the following five adjustments must be made correctly.

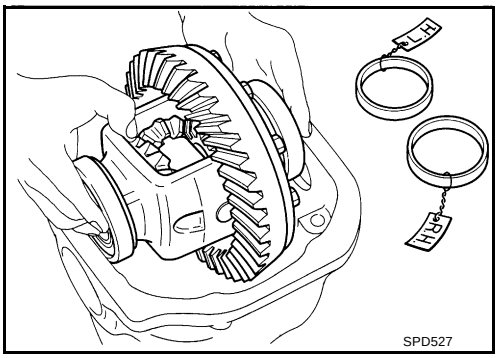
1. Side bearing preload
2. Pinion gear height
3. Pinion bearing preload
4. Drive gear to pinion backlash.

5. Drive and pinion gear tooth contact pattern

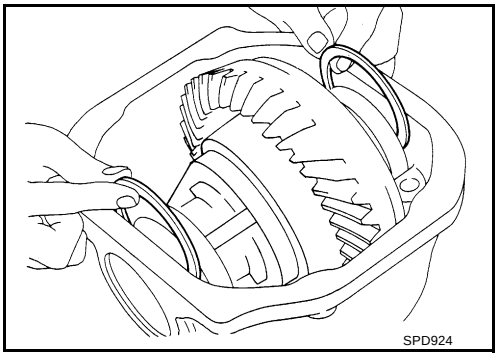
SIDE BEARING PRELOAD

A selection of carrier side bearing adjusting washers is required for successful completion of this procedure.

1. Make sure all parts are clean. Also, make sure the bearings are well lubricated with light oil or DEXRON™ type automatic transmission fluid.
2. Place the differential case assembly, with side bearing outer races installed, gear carrier.



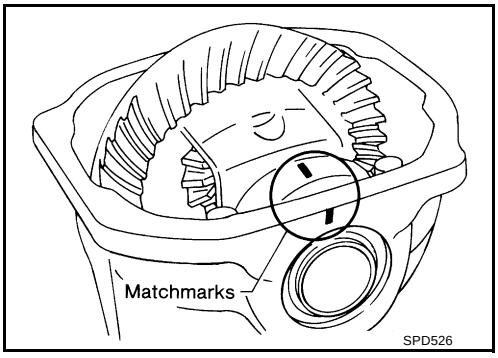
3. Insert left and right side bearing adjusting washer in place between side bearings and gear carrier.



4. Install the bearing caps in their correct locations and torque the bearing cap retaining bolts.

   : 88 - 98 N·m (9.0 - 9.9 kg-m, 65 - 72 ft.-lb)

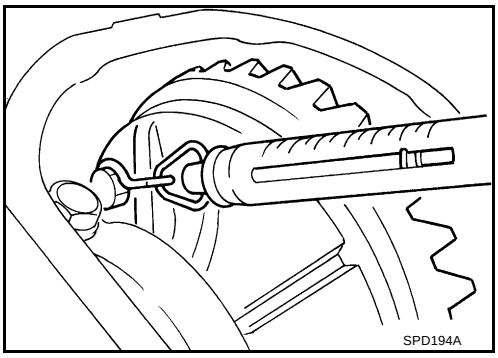
5. Turn the carrier several times to seat the bearings.



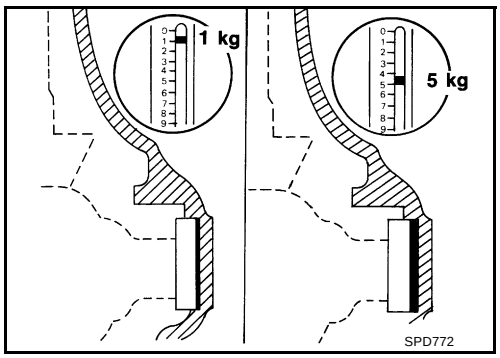
6. Measure the turning torque of the carrier at the drive gear retaining bolts with a spring gauge, J-8129.

   Specification

   : 34.2 - 39.2 N (3.5 - 4 kg, 7.7 - 8.8 lb)
   of pulling force at the drive gear bolt

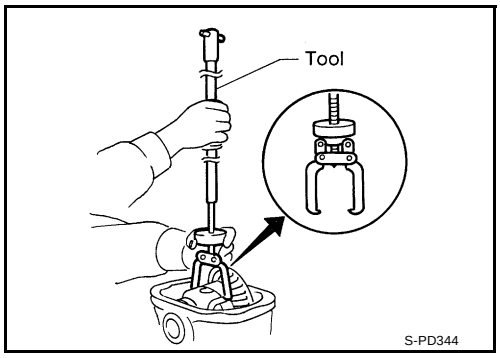


7. If the turning torque is not within the specifications, correct the torque as follows:
   - If the turning torque is less than the specified range, install washers of greater thickness.
   - If the turning torque is greater than the specification, install thinner washers.
   - See the SDS section for washer dimensions and part numbers.
8. Record the total amount of washer thickness required for the correct carrier side bearing preload.



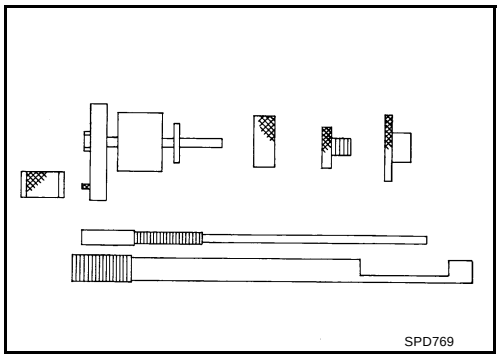
9. Remove the carrier from the final drive housing. Save the selected washers for later use during the assembly of the final drive unit.

Tool number : HT72400000 (–)

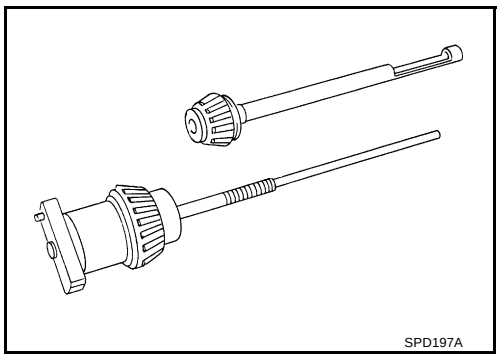


PINION GEAR HEIGHT

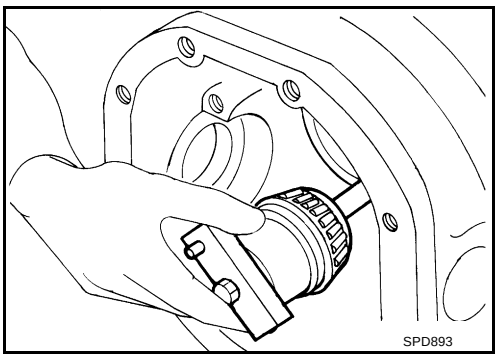
1. Make sure all parts are clean and that the bearings are well lubricated.
2. Assemble the pinion bearings into the differential shim selection Tool, J34309.



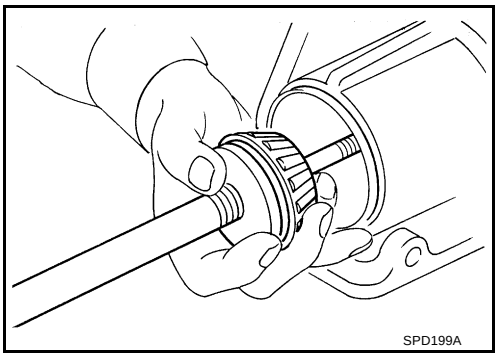
- Pinion front bearing; make sure the J34309-3 pinion front bearing seat is secured tightly against the J34309-2 gauge anvil. Then turn the pinion front bearing pilot, J34309-5, to secure the bearing in its proper position.
- Rear pinion bearing; the pinion rear bearing pilot, J34309-8, is used to center the pinion rear bearing only. The pinion rear bearing locking seat, J34309-4, is used to lock the bearing to the assembly.
- Installation of J34309-9 and J34309-16; place a suitable 2.5 mm (0.098 in) thick plain washer between J34309-9 and J34309-16. Both surfaces of J34309-9 and J34309-16 must be parallel with a clearance of 2.5 mm (0.098 in).



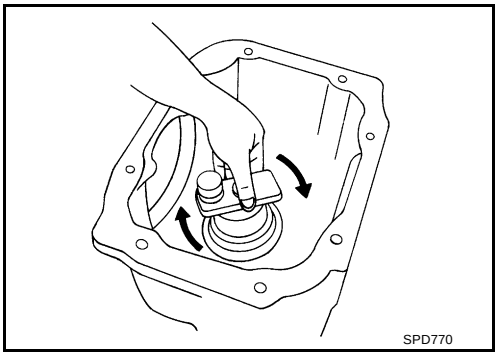
3. Install the pinion rear bearing inner race into the final drive housing. Then place the pinion preload shim selector Tool, J34309-1, gauge screw assembly.



4. Assemble the front pinion bearing inner race and the J34309-2 gauge anvil. Assemble them together with the J34309-1 gauge screw in the final drive housing. Make sure that the pinion height gauge plate, J34309-16, will turn a full 360 degrees. Tighten the two sections together by hand.



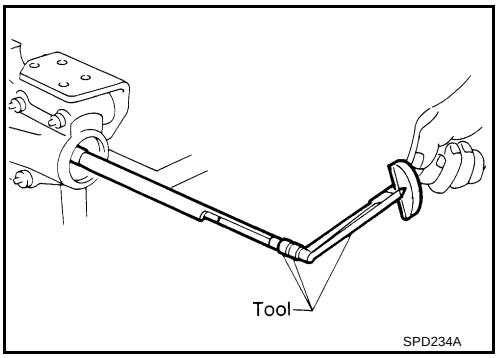
5. Turn the assembly several times to seat the bearings.



6. Measure the turning torque at the end of the J34309-2 gauge anvil using torque wrench J-25765A.

Turning torque specification

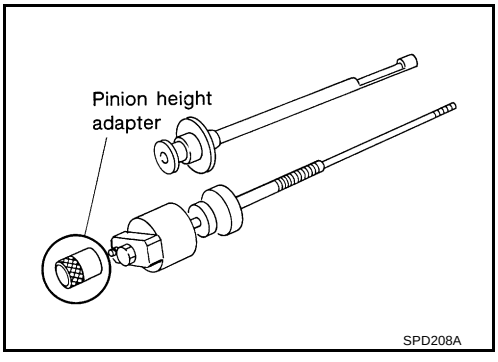
: 1.0 - 1.3 N·m(0.11 - 0.13 kg-m, 9 - 11 in-lb)



7. Place the J34309-11 “R200A” pinion height adapter onto the gauge plate and tighten it by hand.

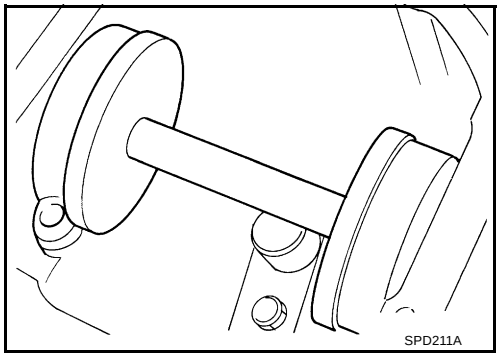
CAUTION:

Make sure all machined surfaces are clean.

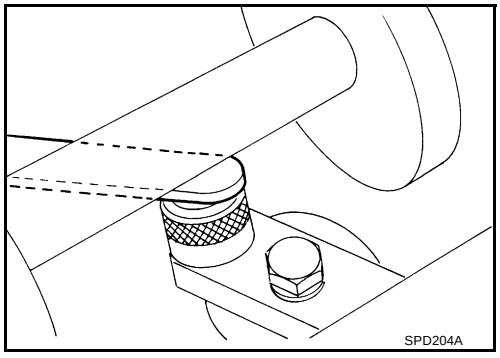


Pinion Height Adjusting Washer Selection

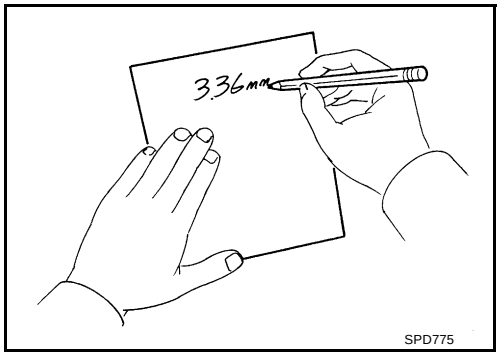
1. Now, position the side bearing discs, J25269-4, and arbor firmly into the side bearing bores. Install the bearing caps and tighten the cap bolts to proper torque.


SPD211A

2. Select the correct standard pinion height adjusting washer thickness. Select by using a standard gauge of 3 mm (0.12 in) and your J34309-101 feeler gauge. Measure the distance between the J34309-11 pinion height adapter including the standard gauge and the arbor.

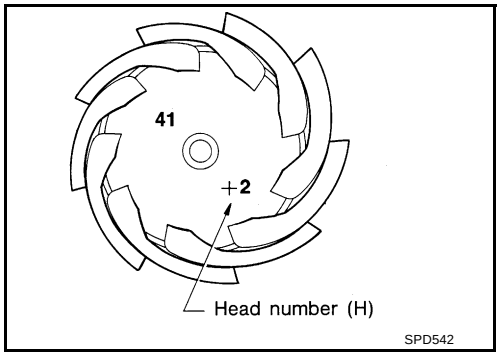

SPD204A

3. Write down your exact measurement (the value of feeler gauge).



SPD775

4. Correct the pinion height washer size by referring to the “pinion head number”.

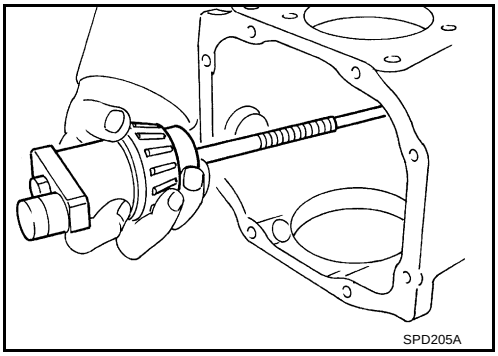


SPD542

There are two numbers painted on the drive pinion gear. The first one refers to the drive pinion and drive gear as a matched set. This number should be the same as the number on the drive gear. The second number is the “pinion head height number”. It refers to the ideal pinion height from standard for quietest operation. Use the following chart to determine the correct pinion height washer.

Pinion head height number	Add or remove from the standard pinion height washer thickness measurement
- 6	Add 0.06 mm (0.0024 in)
- 5	Add 0.05 mm (0.0020 in)
- 4	Add 0.04 mm (0.0016 in)
- 3	Add 0.03 mm (0.0012 in)
- 2	Add 0.02 mm (0.0008 in)
- 1	Add 0.01 mm (0.0004 in)
0	Use the selected washer thickness
+1	Subtract 0.01 mm (0.0004 in)
+2	Subtract 0.02 mm (0.0008 in)
+3	Subtract 0.03 mm (0.0012 in)
+4	Subtract 0.04 mm (0.0016 in)
+5	Subtract 0.05 mm (0.0020 in)
+6	Subtract 0.06 mm (0.0024 in)

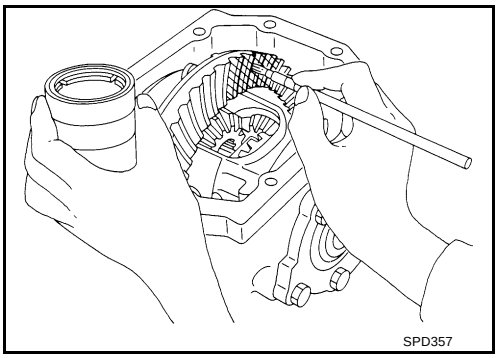
5. Select the correct pinion height washer as follows. Refer to RFD-35, "AVAILABLE PINION HEIGHT ADJUSTING WASHERS" .
6. Remove the J34309 pinion differential shim selection Tool from the final drive housing. Then disassemble to retrieve the pinion bearings.


SPD205A

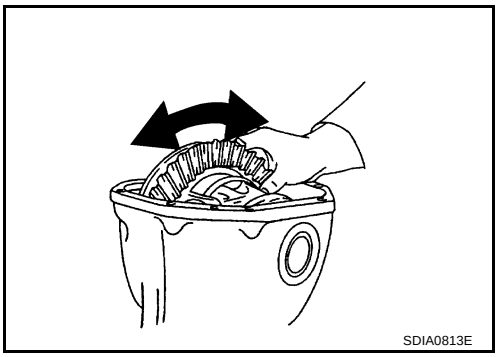
TOOTH CONTACT

Checking gear tooth contact pattern is necessary to verify correct relationship between drive gear and drive pinion.
Hypoid gears which are not positioned in proper arrangement may be noisy and/or have a short life. Check gear tooth contact pattern to obtain the best contact for low noise and long life.

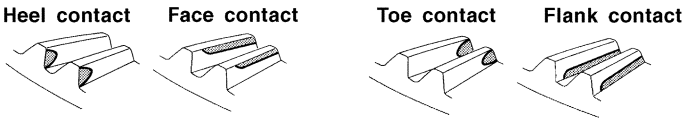
1. Thoroughly clean drive gear and drive pinion teeth.
2. Lightly apply a mixture of powdered ferric oxide and oil or the equivalent. Apply it to 3 or 4 teeth of drive gear drive side.


SPD357

3. Hold companion flange steady by hand and rotate the drive gear in both directions.

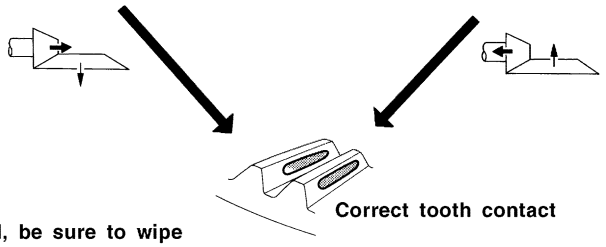

SDIA0813E

Usually the pattern will be correct if shims are correctly calculated and the backlash is correct. However, in rare cases, trial and error processes may be employed to obtain a correct pattern. The tooth pattern is the best indication of how well a differential has been set up.



To correct, increase thickness of pinion height adjusting washer in order to bring drive pinion close to Drive gear.

To correct, reduce thickness of pinion height adjusting washer in order to make drive pinion go away from Drive gear.



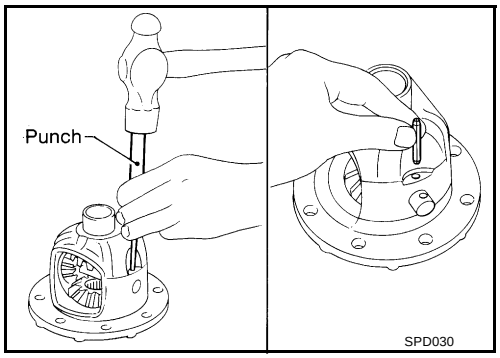
Correct tooth contact

When adjustment is completed, be sure to wipe off completely the ferric oxide and oil or their equivalent.

SDIA1910E

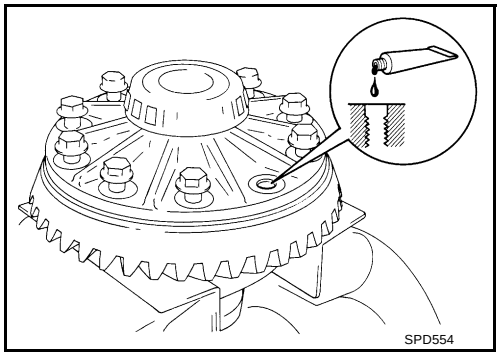
ASSEMBLY OF DIFFERENTIAL CASE ASSEMBLY (R200 2–PINION)

1. Install pinion mate shaft lock pin with a punch.
   Make sure lock pin is flush with case.



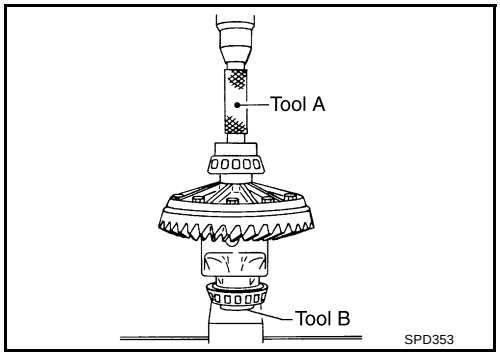
2. Place differential case on drive gear.
3. Apply genuine medium strength locking sealant or equivalent. Refer to GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" to drive gear bolts, and install them.

- Tighten bolts in a criss-cross fashion.
- After tightening the bolt to the specified torque, turn the bolt 31 to 36 more degrees.



4. Press-fit side bearing inner races on differential case with Tool.

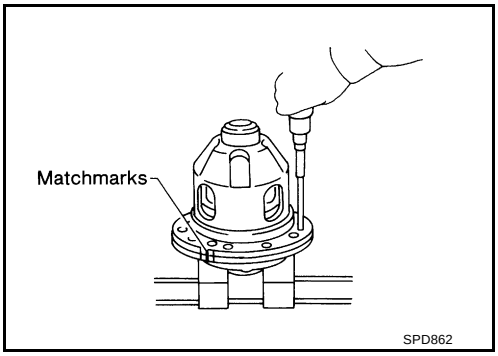
Tool number : A KV38100300 (J25523)
: B ST33061000 (J8107-2)



ASSEMBLY OF DIFFERENTIAL CASE ASSEMBLY (R200V)

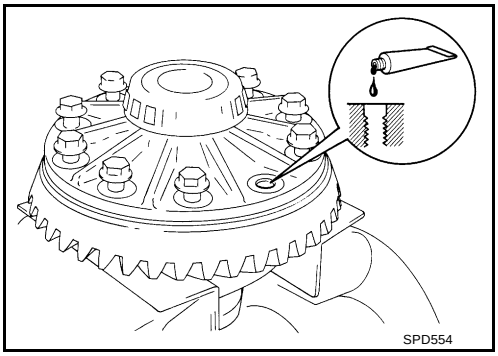
1. Install differential cases A and B.

: 3.8 - 5.8 N·m(0.39 - 0.59 kg-m, 34 - 51 in-lb)



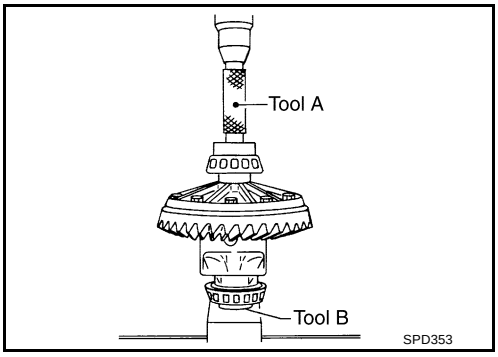
2. Place differential case on drive gear.
3. Apply genuine medium strength locking sealant or equivalent. Refer to GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" to drive gear bolts, and install them.

- Tighten bolts in a criss-cross fashion.
- After tightening the bolt to the specified torque, turn the bolt 31 to 36 more degrees.



4. Press-fit side bearing inner races on differential case with Tool.

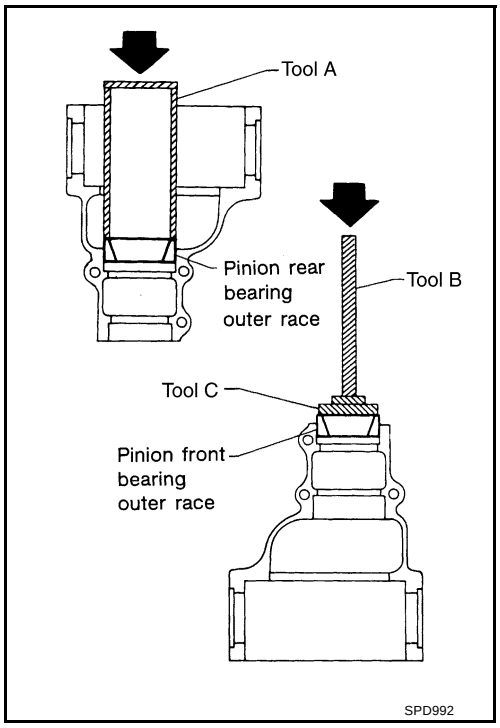
Tool number : A KV38100300 (J25523)
: B ST33061000 (J8107-2)



INSTALLATION OF DRIVE PINION ASSEMBLY

1. Press-fit pinion front and rear bearing outer races with Tools.

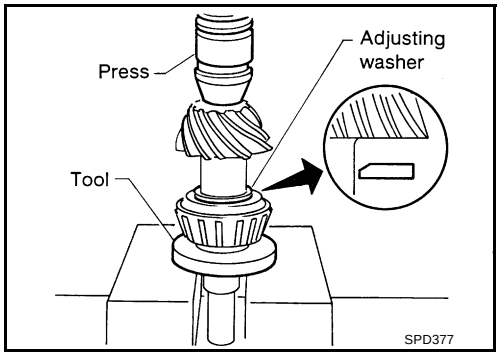
Tool number : A Suitable tool
: B ST30611000 (J25742-1)
: C ST30613000 (J25742-3)



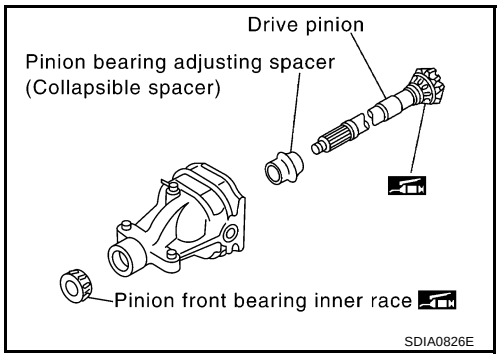
2. Select pinion height adjusting washer. Refer to RFD-26, "Pinion Height Adjusting Washer Selection" .

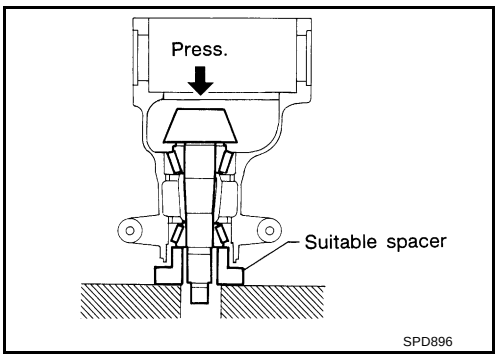
3. Install selected pinion height adjusting washer in drive pinion. Using press and Tool, press-fit pinion rear bearing inner race into it.

Tool number : ST30901000 (–)



4. Set drive pinion assembly (as shown in figure) in differential carrier and install drive pinion, with press and suitable tool.
Stop when drive pinion touches bearing.
Apply multi-purpose grease to pinion rear bearing inner race and pinion front bearing inner race.



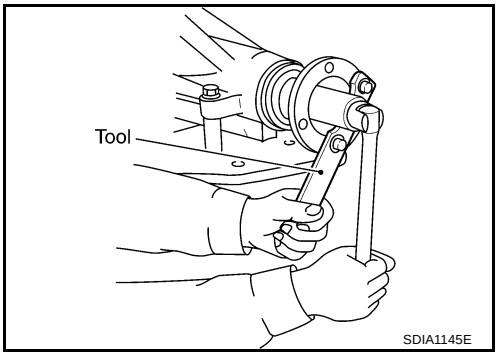


5. Install front oil seal with Tool. Refer toRFD-6, "Removal and Installation" .

6. Install companion flange, and tighten pinion nut to minimum. Ascertain that threaded portion of drive pinion and drive pinion nut are free from oil or grease.

Tool number : KV40104000 (–)

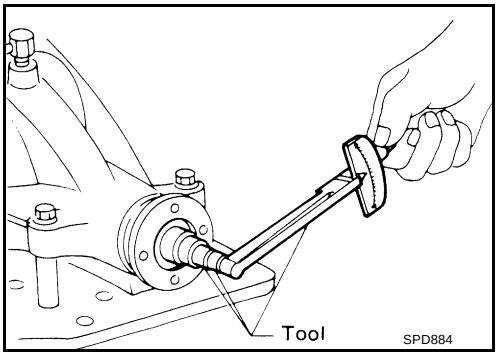
CAUTION:
The drive pinion nut is not reusable. Never reuse drive pinion nut.



7. Tighten the drive pinion nut by very small degrees until the specified preload in achieved, when checking the preload, turn drive pinion in both directions several times.

Tool number
: ST3127S000 (See J25765-A)

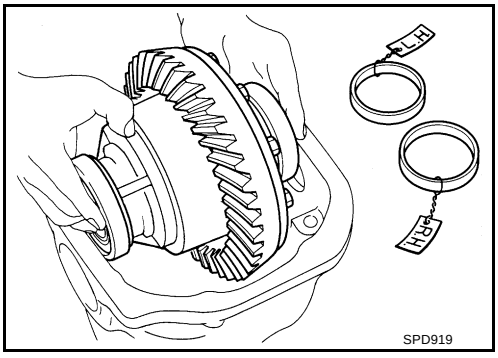
Pinion bearing preload
: 2.65 - 3.23 N·m (0.27 - 0.32 kg-m, 24 - 28 in-lb)



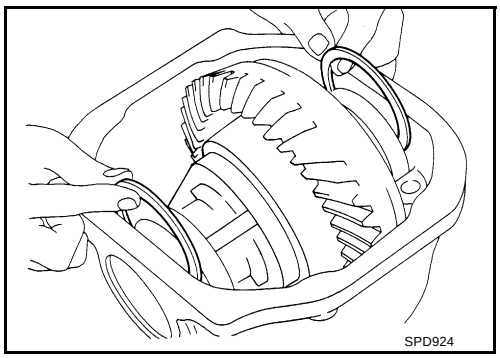
- If pinion bearing preload is too small, tighten the drive pinion nut more.
- If pinion bearing preload is too great, replace pinion bearing adjusting spacer.

INSTALLATION OF DIFFERENTIAL CASE ASSEMBLY

1. Select side bearing adjusting washer. Refer to RFD-23, "SIDE BEARING PRELOAD" .
2. Install differential case assembly with side bearing outer races into gear carrier.

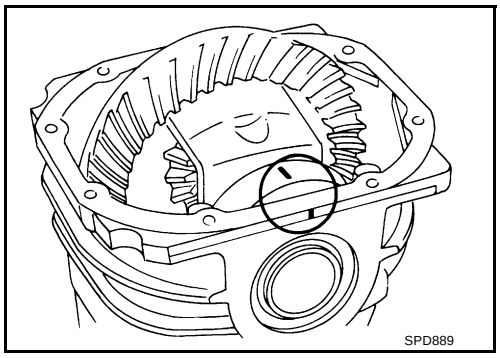


3. Insert left and right side bearing adjusting washers in place between side bearings and carrier.



4. Align mark on bearing cap with that on gear carrier and install bearing cap on gear carrier.

   : **88 - 98 N·m (9.0 - 9.9 kg-m, 65 - 72 ft-lb)**

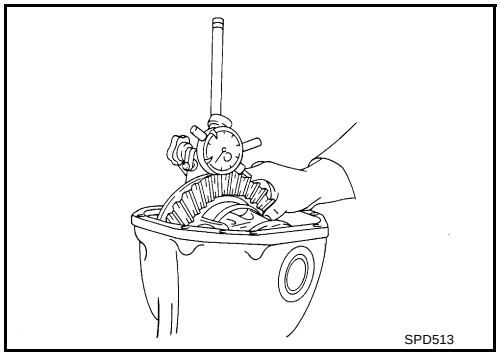


5. Install side oil seal. Refer to RFD-8, "Removal and Installation" .

6. Measure drive gear-to-drive pinion backlash with a dial indicator at several point.

   Drive gear backlash

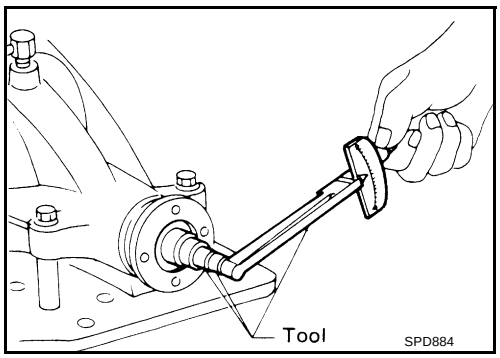
   : 0.10 - 0.15 mm (0.0039 - 0.0059 in) less



- It backlash is too small, adjustment of washer thickness is required. Decrease thickness of left shim and increase thickness of right by the same amount.
  If backlash is too great, reverse the above procedure.
- Never change the total amount of washers as it will change the bearing preload.

7. Check total preload with Tool.

   Tool number : ST3127S000 (See J25765-A)



When checking preload, turn drive pinion in both directions several times to seat bearing rollers correctly.

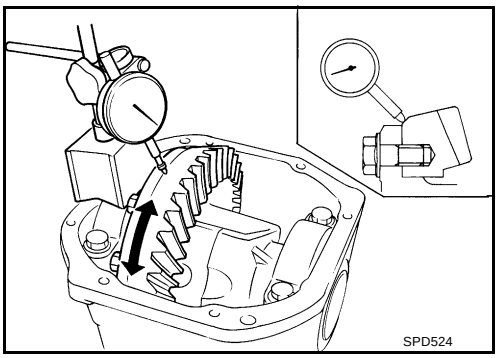
Total preload : 2.84 - 3.75 N·m (0.29 - 0.38 kg-m, 26 - 33 in-lb)

- If preload is too great, remove the same amount of washer to each side.
- If preload is too small, add the same amount of washer to each side.
  Never add or remove a different number of washers for each side. Difference in number of washers will change drive gear to drive pinion backlash.

8. Recheck drive gear to drive pinion backlash. Increase or decrease in thickness of shims will cause change to drive gear to pinion backlash.

- Check whether the backlash varies excessively in different places. Foreign matter may be caught between the drive gear and the differential case causing the trouble.
- The backlash can vary greatly even when the drive gear runout is within a specified range. In that case, replace the hypoid gear set or differential case.

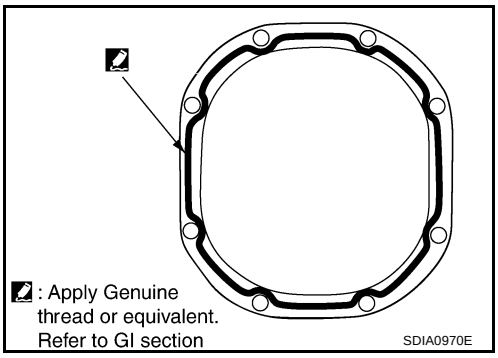
9. Check runout of drive gear with a dial indicator.



Runout limit : 0.05 mm (0.0020 in) less

10. Check tooth contact.
    Refer to RFD-27, "TOOTH CONTACT" .

11. Install rear cover. Apply sealant to rear cover side and install gear carrier.



SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

ADS0008B

Applied model	VQ35DE engine		
	M / T		A / T
Final drive model	R200 (2 – pinion)	R200V (LSD)	
Gear ratio	3.538		3.357
Number of teeth (Drive gear / drive pinion)	46 / 13		47 / 14
Oil capacity (Approx.)	1.4 liter (3 US pt, 2 - 1/2 Imp pt)		

Drive Gear Runout

ADS0008C

Unit: mm (in)

Type	R200, R200V
Drive gear runout limit	0.05 (0.0020) less

Side Gear Adjustment

ADS0008H

Unit: mm (in)

Type	R200	R200V
Clearance limit between side gear and differential case mm (in)	0.20 (0.0079) less	0.15 (0.0059) less

AVAILABLE SIDE GEAR THRUST WASHERS

Unit: mm (in)

Type	R200		R200V	
	Thickness	Part number	Thickness	Part number
Thrust washer	0.75 (0.0295)	38424 0C000	0.80 (0.0315)	38424 40F60
	0.78 (0.0307)	38424 0C001	0.83 (0.0327)	38424 40F61
	0.81 (0.0319)	38424 0C002	0.86 (0.0339)	38424 40F62
	0.84 (0.0331)	38424 0C003	0.89 (0.0350)	38424 40F63
	0.87 (0.0343)	38424 0C004	0.92 (0.0362)	38424 40F64
	0.90 (0.0350)	38424 0C005	0.95 (0.0374)	38424 40F65
	0.93 (0.0366)	38424 0C006	0.98 (0.0386)	38424 40F66
			1.01 (0.0398)	38424 40F67
			1.04 (0.0409)	38424 40F68
			1.07 (0.0421)	38424 40F69
			1.10 (0.0433)	38424 40F70
			1.13 (0.0445)	38424 40F71
			1.16 (0.0457)	38424 40F72
			1.19 (0.0469)	38424 40F73
			1.22 (0.0480)	38424 40F74
			1.25 (0.0492)	38424 40F75
			1.28 (0.0504)	38424 40F76
			1.31 (0.0516)	38424 40F77
			1.34 (0.0528)	38424 40F78
			1.37 (0.0539)	38424 40F79
			1.40 (0.0551)	38424 40F80
			1.43 (0.0563)	38424 40F81
			1.46 (0.0575)	38424 40F82
			1.49 (0.0587)	38424 40F83

Drive Pinion Height Adjustment

ADS0008J

AVAILABLE PINION HEIGHT ADJUSTING WASHERS

Unit: mm (in)

Type	R200, R200V			
	Thickness	Part number	Thickness	Part number
Adjusting washer	3.05 (0.1201)	38154 0C000	3.35 (0.1319)	38154 0C010
	3.08 (0.1213)	38154 0C001	3.38 (0.1331)	38154 0C011
	3.11 (0.1224)	38154 0C002	3.41 (0.1343)	38154 0C012
	3.14 (0.1236)	38154 0C003	3.44 (0.1354)	38154 0C013
	3.17 (0.1248)	38154 0C004	3.47 (0.1366)	38154 0C014
	3.20 (0.1260)	38154 0C005	3.50(0.1378)	38154 0C015
	3.23 (0.1272)	38154 0C006		
	3.26 (0.1283)	38154 0C007		
	3.29 (0.1295)	38154 0C008		
	3.32 (0.1307)	38154 0C009		

Drive Pinion Preload Adjustment

ADS0008K

Type	R200, R200V
Drive pinion preload	2.65 – 3.23 N·m (0.27 – 0.32 kg–m, 24 – 28 in lb)

Side Bearing Preload Adjustment

ADS0008L

Type	R200, R200V
Side bearing preload <Reference value>	0.20 – 0.52 N·m (0.02 – 0.05 kg–m, 2 – 4 in lb)
Torque by spring gauge	34.2 – 39.2 N (3.5 – 4 kg, 7.7 – 8.8 lb)

SIDE BEARING ADJUSTING WASHERS

Unit: mm (in)

Type	R200, R200V			
	Thickness	Part number	Thickness	Part number
Adjusting washer	2.00 (0.0787)	38453 N3100	2.35 (0.0925)	38453 N3107
	2.05 (0.0807)	38453 N3101	2.40 (0.0945)	38453 N3108
	2.10 (0.0827)	38453 N3102	2.45 (0.0965)	38453 N3109
	2.15 (0.0846)	38453 N3103	2.50 (0.0984)	38453 N3110
	2.20 (0.0866)	38453 N3104	2.55 (0.1004)	38453 N3111
	2.25 (0.0886)	38453 N3105	2.60 (0.1024)	38453 N3112
	2.30 (0.0906)	38453 N3106	2.65 (0.1043)	38453 N3113

Total Preload Adjustment

ADS0008M

Type	R200, R200V
Total preload with oil seal	2.84 – 3.75 N·m (0.29 – 0.38 kg–m, 26 – 33 in lb)
Drive gear to drive pinion backlash	0.10 – 0.15 mm (0.0039 – 0.0059 in)

SECTION FAX
FRONT AXLE

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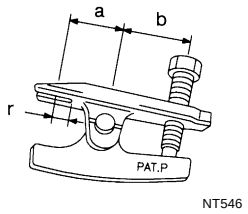
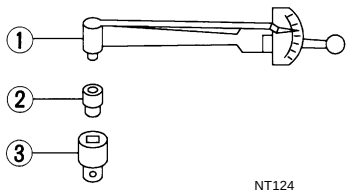
PREPARATION

PFP:00002

Special Service Tools (SST)

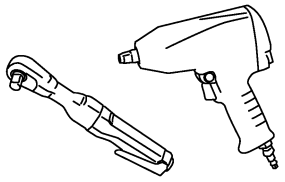
ADS00031

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
HT72520000 (J25730-A) Ball joint remover a: 33 mm (1.30 in) b: 50 mm (1.97 in) r: 11.5 mm (0.453 in)  NT546	Removing steering outer socket
ST3127S000 (See J25742-1) Preload gauge 1. GG91030000 Torque wrench (J25765) 2. HT62940000 (—) Socket adapter (1/2″) 3. HT62900000 (—) Socket adapter (3/8″)  NT124	Measuring rotating torque of ball joint

Commercial Service Tools

ADS00032

Tool name	Description
Power tool  PBIC0190E	● Removing wheel nuts ● Removing undercover ● Removing brake caliper assembly

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

ADS00033

Use chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page			FAX-4	—	FAX-4	NVH in WT section.	NVH in WT section.	NVH in PS section.
Possible cause and SUSPECTED PARTS			Improper installation, looseness	Parts interference	Wheel bearing damage	TIRES	ROAD WHEEL	STEERING
Symptom	FRONT AXLE	Noise	×	×		×	×	×
		Shake	×	×		×	×	×
		Vibration	×	×		×		×
		Shimmy	×	×		×	×	×
		Judder	×			×	×	×
		Poor quality ride or handling	×	×	×	×	×	

×: Applicable

FRONT WHEEL HUB AND KNUCKLE

PFP:40202

On-Vehicle Inspection and Service

ADS00034

Make sure the mounting conditions (looseness, back lash) of each component and component status (wear, damage) are normal.

WHEEL BEARING INSPECTION

- Move wheel hub in the axial direction by hand. Make sure there is no looseness of wheel bearing.

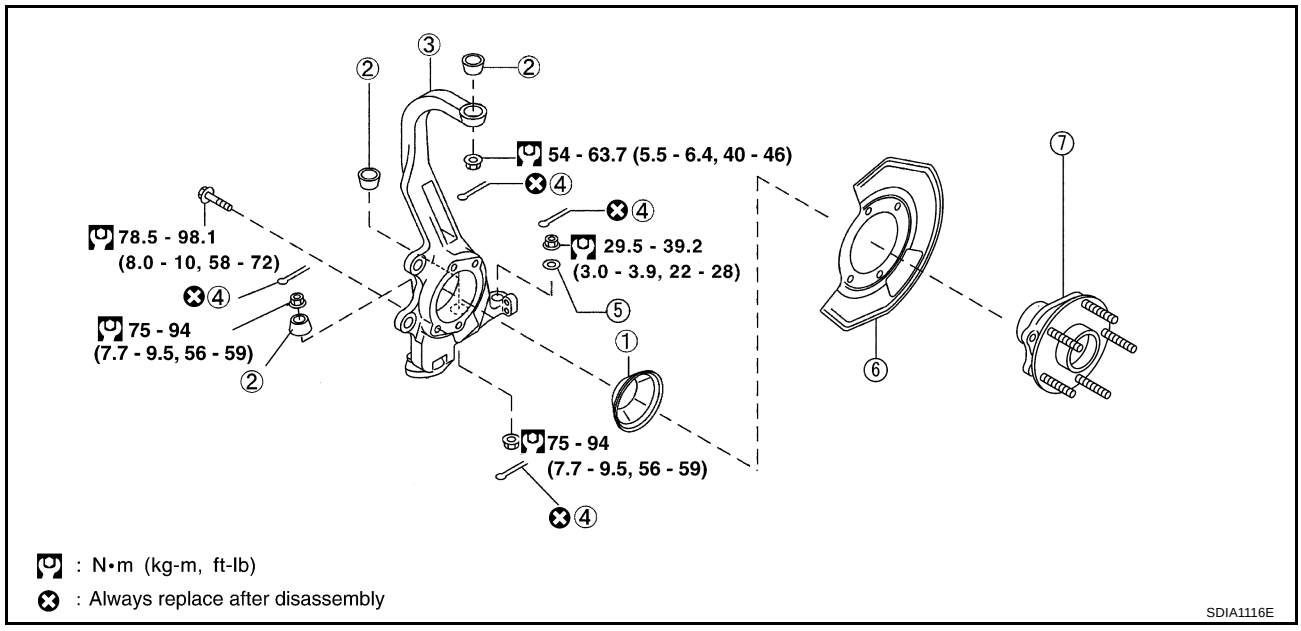
Standard value

Axial end play : 0.05 mm (0.002 in) or less

- Rotate wheel hub and make sure there is no unusual noise or other irregular conditions. If there are any irregular conditions, replace wheel hub and bearing assembly.

Removal and Installation

ADS00035



1. Hub cap
2. Ball seat
3. Steering knuckle
4. Cotter pin
5. Washer
6. Splash guard
7. Wheel hub and bearing assembly

REMOVAL

1. Remove tire from vehicle with power tool.
2. Remove undercover with power tool.
3. Remove brake caliper with power tool. Hang it in a place where it will not interfere with work. Refer to BR-25, "FRONT DISC BRAKE (CLZ25VD TYPE)" , BR-31, "FRONT DISC BRAKE (OPB27VA TYPE)" .

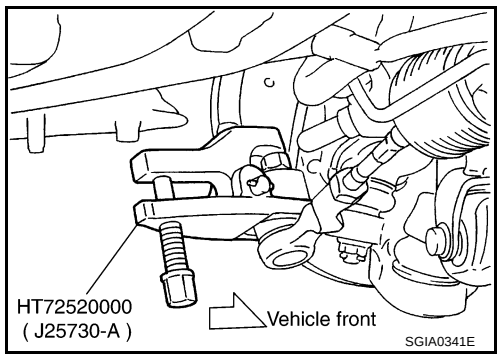
   NOTE:
   Avoid depressing brake pedal while brake caliper is removed.
4. Remove disc rotor.
5. Remove wheel sensor from steering knuckle. Refer to BRC-83, "WHEEL SENSORS" (with TCS), BRC-143, "WHEEL SENSORS" (with VDC).

   CAUTION:
   Do not pull on wheel sensor harness.
6. Remove brake hose bracket from steering knuckle. Refer to BR-11, "BRAKE PIPING AND HOSE" .
7. Remove cotter pin at steering outer socket, then loosen mounting nut.

8. Use a ball joint remover (SST) to remove steering outer socket from steering knuckle. Be careful not to damage ball joint boot.

CAUTION:
Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (SST) from coming off.

9. After removing upper link, transverse link, compression rod and cotter pin at steering knuckle, loosen mounting nut.
10. Use a ball joint remover (suitable tool) to remove upper link, transverse link and compression rod from steering knuckle. Be careful not to damage ball joint boot.



CAUTION:
Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (suitable tool) from coming off.

11. Remove steering knuckle and wheel hub and bearing assembly fixing bolt.
12. Remove wheel hub and bearing assembly from steering knuckle.

INSPECTION AFTER REMOVAL

- About the inspection for upper link, compression rod, steering outer socket, refer to FSU-14, "UPPER LINK" , FSU-16, "COMPRESSION ROD" , PS-17, "POWER STEERING GEAR AND LINKAGE" .

Visual Inspection

- Check steering knuckle and ball seat for deformation, cracks, and other damage. Replace steering knuckle and ball seat if cracks, deformation or other damage is found.
- Check ball joint boot for deformation, damage, and also for grease leakage. Replace steering knuckle assembly if cracks, deformation or also for grease leakage is found.

Steering Knuckle Ball Joint Inspection

- Manually move ball stud to confirm it moves smoothly with no binding.

Swing Torque Inspection

CAUTION:
Before measurement, move ball joint at least ten times by hand to check for smooth movement.

- Hook spring scale at cotter pin mounting hole. Confirm spring scale measurement value is within specifications when ball stud begins moving.

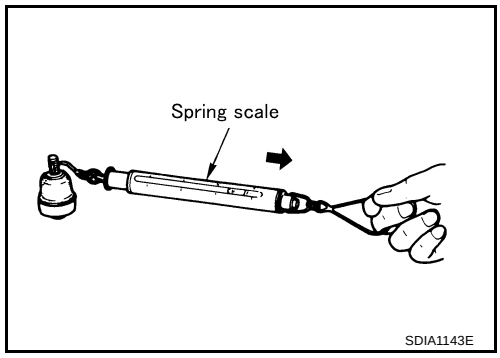
Standard value

Swing force:

0.147 - 1.4 N·m (0.02 - 0.14 kg-m, 2 - 12 in-lb)

Measurement force:

2.23 - 21.2 N (0.22 - 2.16 kg, 0.50 - 4.77 lb)



- If the value is outside the standard, replace steering knuckle.

Rotating Torque Inspection

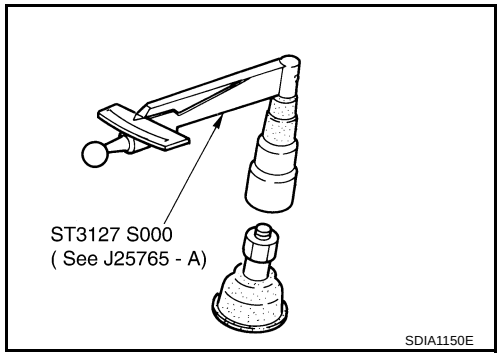
- Attach mounting nut to ball stud. Check that rotating torque is within specifications with a preload gauge (SST).

Standard value

Rotating torque:

0.147 - 1.4 N·m (0.02 - 0.14 kg-m, 2 - 12 in-lb)

- If the value is outside the standard, replace steering knuckle.



Axial End Play Inspection

- Move tip of ball joint in axial direction to check for looseness.

Standard value

Axial end play : 0 mm (0 in)

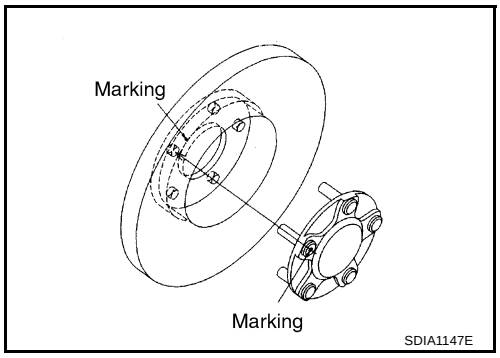
- If the value is outside the standard, replace steering knuckle.

INSTALLATION

- Refer to FAX-4, "Removal and Installation" for tightening torque. Install in the reverse order of removal.

NOTE:
Refer to component parts location and do not reuse non-reusable parts.

- Wheel hub and bearing assembly and disc must be installed to fit the marked position each other.



SERVICE DATA

PFP:00030

Wheel Bearing

ADS00036

Axial end play limit	0.05 mm (0.002 in) or less

BALL JOINT

Swing force	0.147 - 1.4 N·m (0.02 - 0.14 kg-m, 2 - 12 in-lb)
Measurement on spring balance (Spring scale hooking position: cotter pin mounting hole)	2.23 - 21.2 N (0.22 - 2.16 kg, 0.50 - 4.77 lb)
Rotating torque	0.147 - 1.4 N·m (0.02 - 0.14 kg-m, 2 - 12 in-lb)
Axial end play limit	0 mm (0 in)

SECTION RAX
REAR AXLE

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PRECAUTIONS

PFP:00001

Caution

ADS00037

Observe the following precautions when disassembling and servicing drive shaft.

- Perform work in a location which is as dust-free as possible.
- Before disassembling and servicing, clean the outside of parts.
- Prevention of the entry of foreign objects must be taken into account during disassembly of the service location.
- Disassembled parts must be carefully reassembled in the correct order. If work is interrupted, a clean cover must be placed over parts.
- Paper shop cloths must be used. Fabric shop cloths must not be used because of the danger of lint adhering to parts.
- Disassembled parts (except for rubber parts) should be cleaned with kerosene which shall be removed by blowing with air or wiping with paper shop cloths.

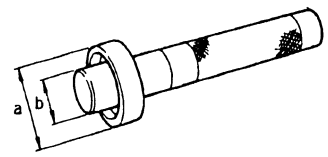
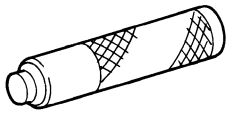
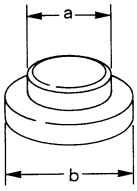
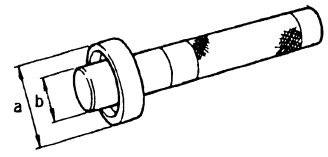
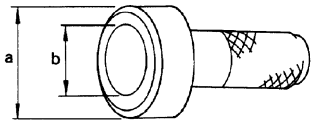
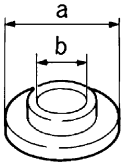
PREPARATION

PFP:00002

Special Service Tools (SST)

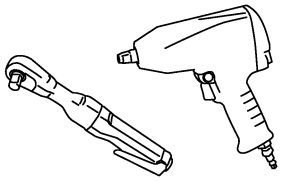
ADS00038

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
ST3322 0000 (—) Drift a: 32 mm (1.26 in) dia. b: 21 mm (0.83 in) dia.	 ZZA0539D	● Removing wheel hub ● Removing wheel bearing outer side inner race ● Inspection of wheel bearing rotating torque
ST3325 1000 (—) Drift	 ZZA0982D	Installing wheel hub
ST3530 0000 (—) Drift a: 45 mm (1.77 in) dia. b: 59 mm (2.32 in) dia.	 ZZA0881D	● Installing wheel hub ● Inspection of wheel bearing rotating torque
KV401 00900 (—) Drift a: 52 mm (2.05 in) dia. b: —	 ZZA0539D	Wheel bearing rotating torque inspection
KV381 00500 (—) Drift a: 80 mm (3.15 in) dia. b: 60 mm (2.36 in) dia.	 ZZA0701D	Installing drive shaft plug
KV381 02200 (—) Drift a: 90 mm (3.54 in) dia. b: 31 mm (1.22 in) dia.	 ZZA0920D	Installing drive shaft plug

Commercial Service Tools

ADS00039

Tool name	Description
Power tool  PBIC0190E	● Removing wheel nuts ● Removing brake caliper assembly ● Removing suspension links ● Removing drive shaft fixing bolts and nuts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

ADS0003A

Use chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page			—	RAX-12	—	RAX-6	—	NVH in PR section.	NVH in RFD section.	NVH in FAX and FSU sections.	Refer to REAR AXLE in this chart.	NVH in WT section.	NVH in WT section.	Refer to DRIVE SHAFT in this chart.	NVH in BR section.	NVH in PS section.
Possible cause and SUSPECTED PARTS			Excessive joint angle	Joint sliding resistance	Imbalance	Improper installation, looseness	Parts interference	PROPELLER SHAFT	DIFFERENTIAL	FRONT AXLE AND FRONT SUSPENSION	REAR AXLE	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES	STEERING
Symptom	DRIVE SHAFT	Noise	×	×				×	×	×	×	×	×		×	×
		Shake	×		×			×		×	×	×	×		×	×
	REAR AXLE	Noise				×	×	×	×	×		×	×	×	×	×
		Shake				×	×	×		×		×	×	×	×	×
		Vibration				×	×	×		×		×		×		×
		Shimmy				×	×			×		×	×		×	×
		Judder				×				×		×	×		×	×
		Poor quality ride or handling				×	×			×		×	×			

×: Applicable

WHEEL HUB

PFP:43202

On-Vehicle Inspection and Service

ADS0003B

Make sure the mounting conditions (looseness, back lash) of each component and component status (wear, damage) are normal.

WHEEL BEARING INSPECTION

- Move wheel hub in the axial direction by hand. Make sure there is no looseness of wheel bearing.

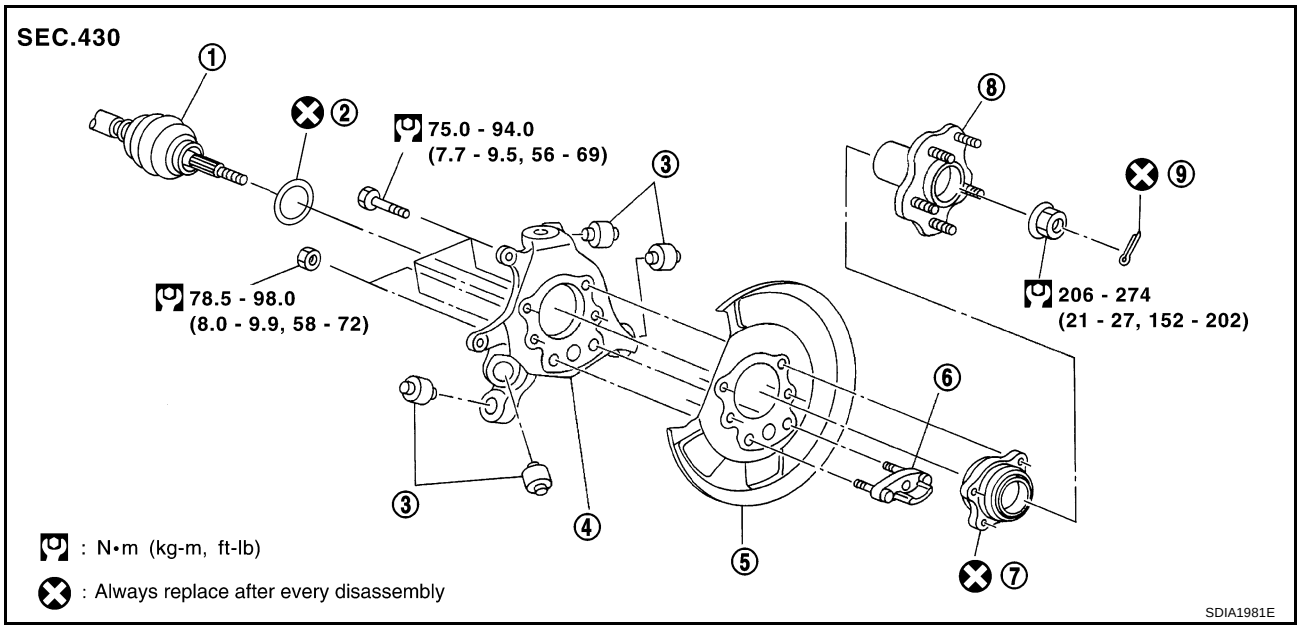
  Standard value

  Axial end play : 0.05 mm (0.002 in) or less

- Rotate wheel hub and make sure there is no unusual noise or other irregular conditions. If there are any irregular conditions, replace wheel bearings.

Removal and Installation

ADS0003C



1. Drive shaft
2. Dust shield
3. Bushing
4. Axle
5. Back plate
6. Anchor block
7. Wheel bearing
8. Wheel hub
9. Cotter pin

REMOVAL

1. Remove tire with power tool.
2. Remove cotter pin. Then remove lock nut from drive shaft.
3. Remove brake caliper with power tool. Hang it in a place where it will not interfere with work. Refer to BR-38, "REAR DISC BRAKE (AD14VE TYPE)" , BR-44, "REAR DISC BRAKE (OPB13VB TYPE)" .

   NOTE:
   Avoid depressing brake pedal while brake caliper is removed.
4. Remove disc rotor and remove parking cable and parking brake shoe from back plate. Refer to PB-3, "PARKING BRAKE CONTROL" , PB-4, "PARKING BRAKE SHOE" .
5. Remove fixing bolts and nuts in axle side of radius rod, front lower link with power tool.
6. Remove fixing bolt and nut in axle side of rear lower link with power tool. Then remove coil spring. Refer to RSU-15, "REAR LOWER LINK & COIL SPRING" .
7. Remove fixing bolt and nut in axle side of shock absorber with power tool.
8. Using a puller (suitable tool), remove axle from drive shaft.

   CAUTION:
   - **When removing axle, do not apply an excessive angle to drive shaft joint. Also be careful not to excessively extend slide joint.**

- **Do not allow drive shaft to hang down without support for counter shaft, wheel joints, and other parts.**

9. Remove suspension arm and cotter pin at axle, then loosen mounting nut.
10. Use a ball joint remover (suitable tool) to remove suspension arm from axle. Be careful not to damage ball joint boot.

CAUTION:
Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (suitable tool) from coming off.

INSPECTION AFTER REMOVAL

Ball Joint Inspection

- Check for boot breakage, axial looseness, and torque of suspension arm ball joint. Refer to RSU-11, "SUSPENSION ARM" .

INSTALLATION

- Refer to RAX-6, "Removal and Installation" for tightening torque. Install in the reverse order of removal.

NOTE:
Refer to component parts location and do not reuse non-reusable parts.

Disassembly and Assembly

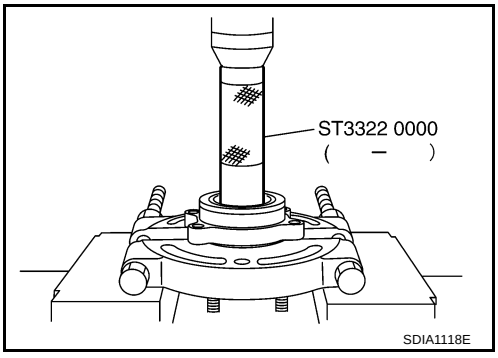
ADS0003D

DISASSEMBLY

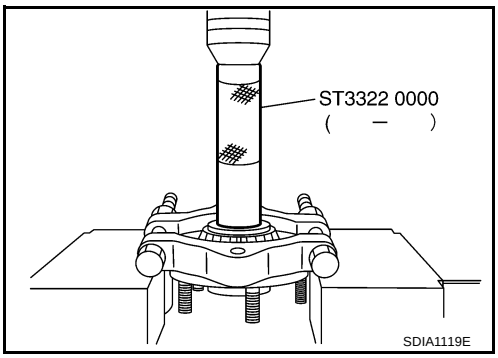
Wheel Bearing

CAUTION:
Do not disassemble if wheel bearing has no trouble.

1. Remove wheel bearing fixing bolts and anchor block fixing nuts, and remove wheel hub and bearing assembly, back plate and anchor block from axle.
2. Using a drift (SST) and a puller (suitable tool), press wheel hub out to remove from wheel bearing.

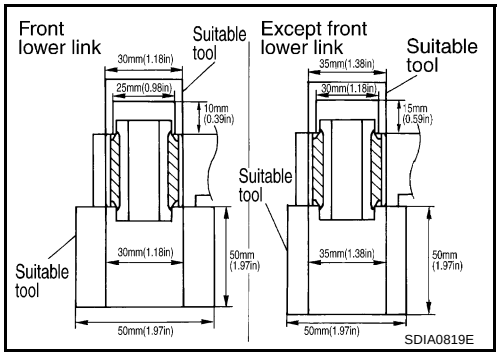


3. Using a drift (SST) and a puller (suitable tool), press wheel bearing outer side inner race out to remove from wheel hub.



Bushing

- Using a suitable drift, remove each bushing from axle.



INSPECTION AFTER DISASSEMBLY

Check for deformity, cracks and damage of each parts, replace if necessary.

Wheel Hub

- Inspect wheel hub for deformation, cracks, and other damage. If any irregular conditions are found, replace wheel hub.

Axle

- Inspect axle for deformation, cracks, and other damage. If any irregular conditions are found, replace axle.

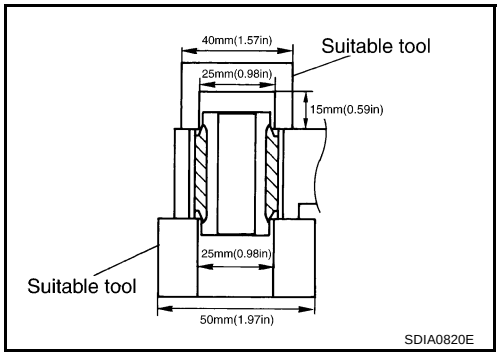
Back Plate

- Inspect back plate for deformation, cracks, and other damage. If any irregular conditions are found, replace back plate.

ASSEMBLY

Bushing

- Using a suitable drift to install each bushing onto axle.



Wheel Bearing

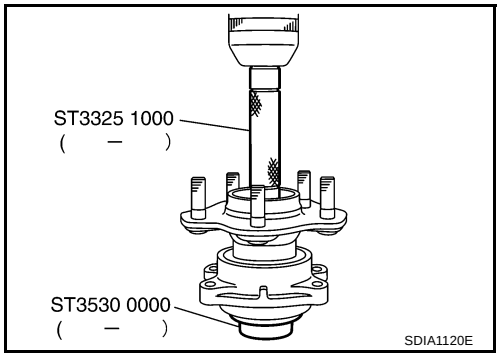
1. Press fit a wheel hub into wheel bearing with a drift (SST).

   CAUTION:

   - **Press fit a drift (SST) while holding it against wheel bearing inner side inner race.**
   - **Wheel bearing cannot be reused. Do not attempt to reuse it.**

   NOTE:

   Final press load guideline 49,033 N (5,000 kg, 11,000 lb)
2. Install back plate and wheel hub and bearing assembly.
3. Install anchor block onto axle.



INSPECTION AFTER ASSEMBLY

1. With wheel bearing pressed into axle housing, apply 49,033 N (5,000 kg, 11,000 lb) to wheel hub and rotate both clockwise and counterclockwise 10 times to minimize resistance.
2. Attach spring scale in the position shown in illustration and pull at a rate of 10 ± 2 rpm to measure rotating torque.

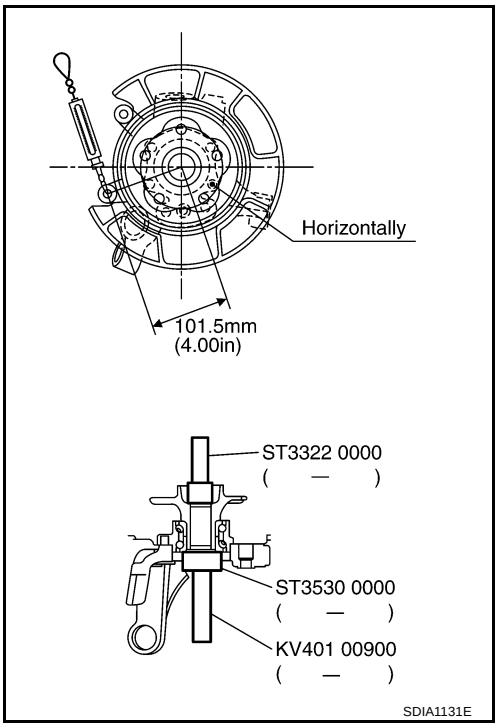
Standard value

Rotating torque:

Less than 1.88 N·m (0.19 kg-m, 17 in-lb)

Spring scale reading:

Less than 18.5 N (1.89 kg, 4.16 lb)

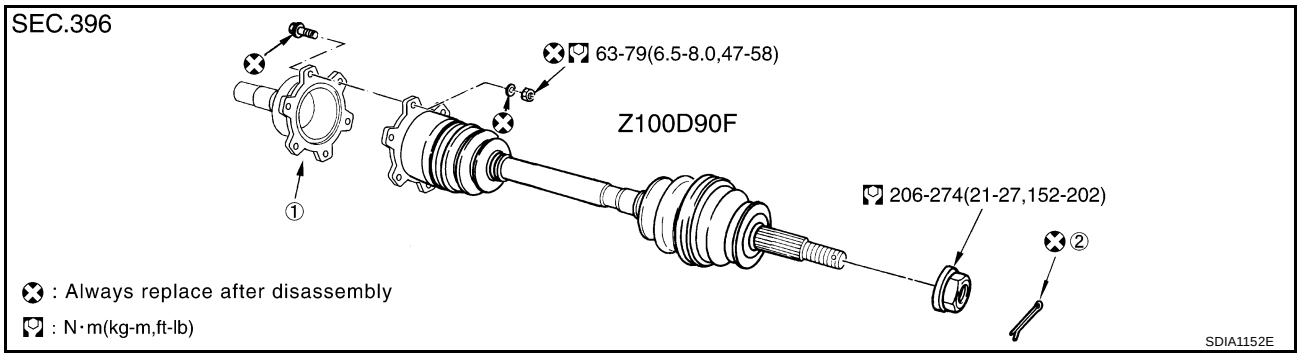


REAR DRIVE SHAFT

PFP:39600

Removal and Installation

ADS0003E



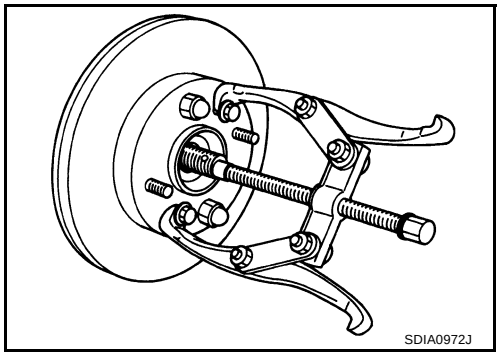
1. Side flange
2. Cotter pin

REMOVAL

1. Remove tire with power tool.
2. Remove cotter pin. Then remove lock nut from drive shaft.
3. Remove stabilizer connecting rod mounting bracket bolt and free stabilizer connecting rod.
4. Remove fixing nuts and bolts between side flange and drive shaft with power tool.
5. Using a puller (suitable tool), remove drive shaft from axle.

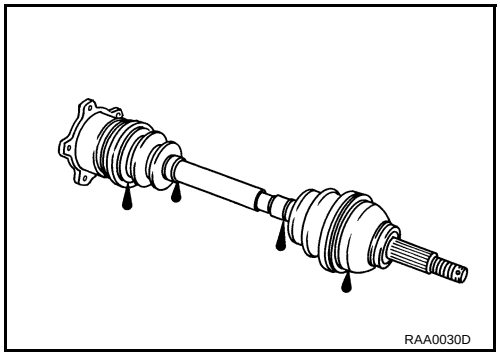
CAUTION:

- **When removing drive shaft, do not apply an excessive angle to drive shaft joint. Also be careful not to excessively extend slide joint.**



INSPECTION AFTER REMOVAL

- Move joint up/down, left/right, and in the axial direction. Check for any rough movement or significant looseness.
- Check boot for cracks or other damage, and also for grease leakage.
- If a trouble is found, disassemble drive shaft, and then replace with new one.



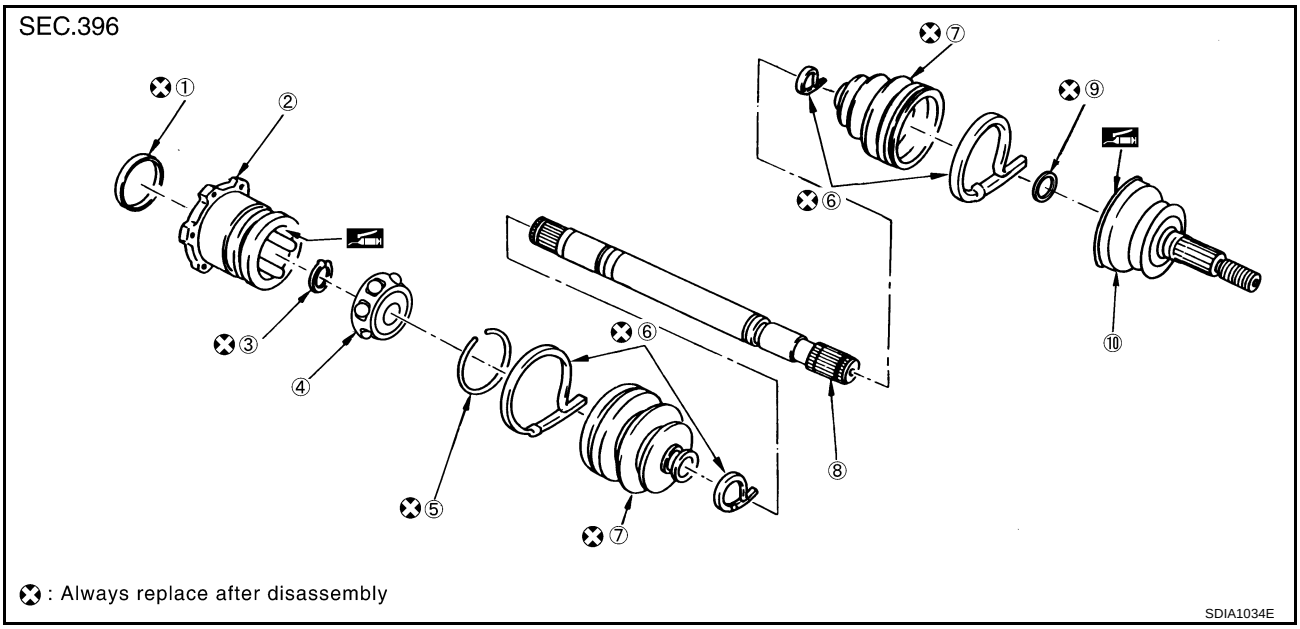
INSTALLATION

- Refer to RAX-10, "Removal and Installation" for tightening torque. Install in the reverse order of removal.

NOTE:
Refer to component parts location and do not reuse non-reusable parts.

Disassembly and Assembly

ADS0003F



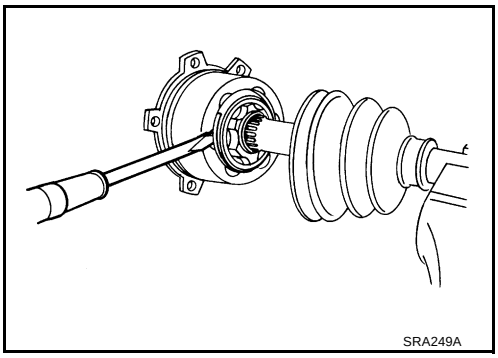
1. Plug
2. Housing
3. Snap ring
4. Ball cage/Steel ball/Inner race assembly
5. Stopper ring
6. Boot band
7. Boot
8. Shaft
9. Circular clip
10. Joint sub-assembly

DISASSEMBLY

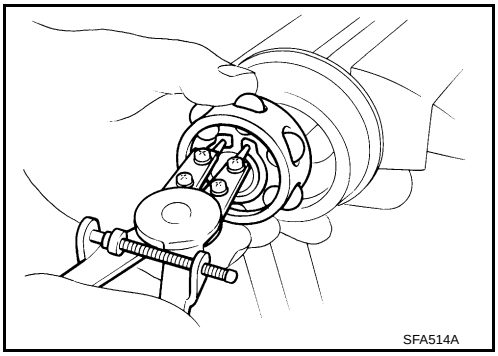
Final Drive Side

1. Press shaft in a vice.

   CAUTION:
   When retaining drive shaft in a vice, always use copper or aluminum plates between vise and shaft.
2. Remove boot bands.
3. If plug needs to be removed, move boot to wheel side, and drive it out with a plastic hammer.
4. Remove stopper ring with a flat-bladed screwdriver, and pull out housing.



5. Remove snap ring, then remove ball cage/steel ball/inner race assembly from shaft.
6. Remove boot from shaft.
7. Remove old grease on housing with paper towels.



Wheel Side

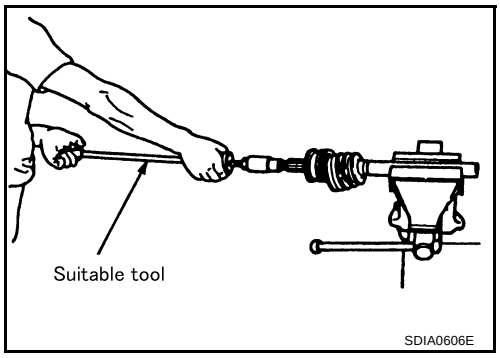
1. Place shaft in a vice.

   CAUTION:
   When retaining drive shaft in a vice, always use copper or aluminum plates between vise and shaft.

2. Remove boot bands. Then remove boot from joint sub-assembly.
3. Screw a drive shaft puller 30 mm (1.18 in) or more into threaded part of joint sub-assembly. Pull joint sub-assembly out of shaft.

   CAUTION:
   - **If joint sub-assembly cannot be removed after five or more unsuccessful attempts, replace shaft and joint sub assembly as a set.**
   - **Align sliding hammer and drive shaft and remove them by pulling directly.**

4. Remove boot from shaft.
5. Remove circular clip from shaft.
6. While rotating ball cage, remove old grease on joint sub-assembly with paper towels.



INSPECTION AFTER DISASSEMBLY

Shaft

- Replace shaft if there is any runout, cracking, or other damage.

Joint sub-assembly

- Make sure there is no rough rotation or unusual axial looseness.
- Make sure there is no foreign material inside joint.
- Check joint sub-assembly for compression scars, cracks, fractures.

  CAUTION:
  If there are any irregular conditions of joint sub-assembly components, replace the entire joint sub-assembly.

Sliding Joint Side (Housing)

- Make sure there are compression scars, cracks, factures or unusual wear of ball rolling surface.
- Make sure there is no damage to shaft screws.
- Make sure there is no deformation of boot installation parts.

Ball Cage

- Make sure there are compression scars, cracks, factures of sliding surface.

Steel Ball

- Make sure there are compression scars, cracks, factures or unusual wear.

Inner Race

- Check ball sliding surface for compression scars, cracks or fractures.
- Make sure there is no damage to serrated part.

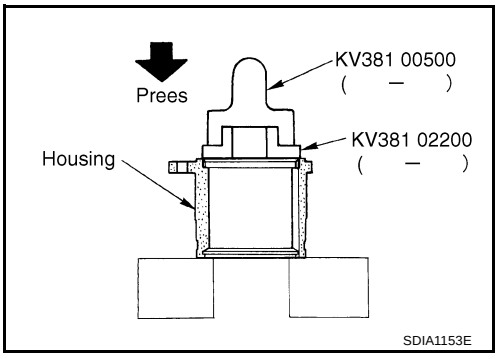
  CAUTION:
  If there are any irregular conditions in the component, replace with a new set of housing, ball cage, steel ball and inner race.

ASSEMBLY

Final Drive Side

1. If plug has been removed, use a drift (SST) to press in a new one.

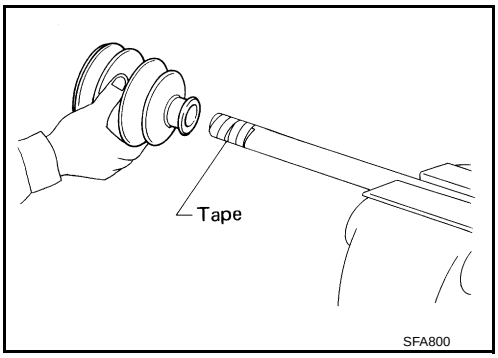
   NOTE:
   Discard old plug; replace with new one.



2. Wind serrated part of shaft with tape. Install boot band and boot to shaft. Be careful not to damage boot.

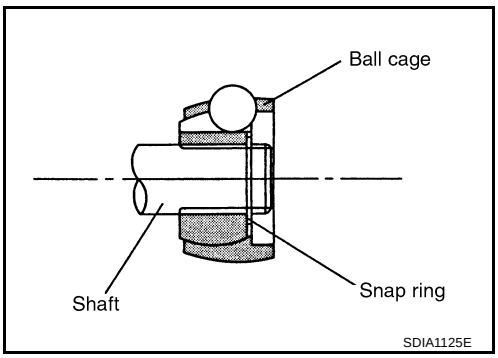
   NOTE:
   Discard old boot band and boot; replace with new one.

3. Remove protective tape wound around serrated part of shaft.



4. Install ball cage/steel ball/inner race assembly to shaft, and secure them tightly with a snap ring.

   NOTE:
   Discard old snap ring; replace with new one.

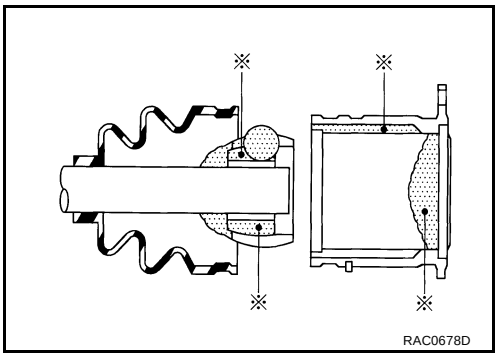


5. Insert the amount grease (NISSAN genuine grease or equivalent) onto housing (* point) to the quantity mentioned below, and install it to shaft.

   Reference value

   Grease amount : 124 - 134 g (4.37 - 4.73 oz)

6. Install stopper ring to housing.
7. After installed, pull shaft to check engagement between joint sub-assembly and stopper ring.



8. Install boot securely into grooves (indicated by * marks) shown in the figure.

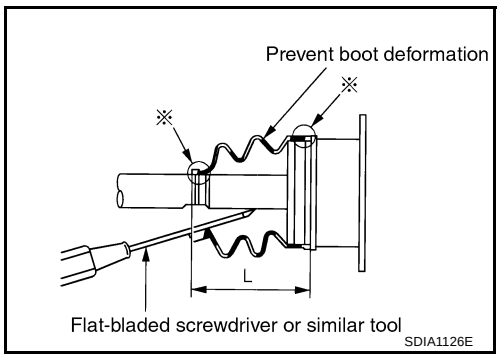
   CAUTION:

   If there is grease on boot mounting surfaces (indicated by* marks) of shaft and housing, boot may come off. Remove all grease from surfaces.

9. Make sure boot installation length “L” is the length indicated below. Insert a flat-bladed screwdriver or similar tool into smaller side of boot. Bleed air from boot to prevent boot deformation.

   Standard value

   Boot installation Length “L ” : 93.9 mm (3.697 in)



CAUTION:

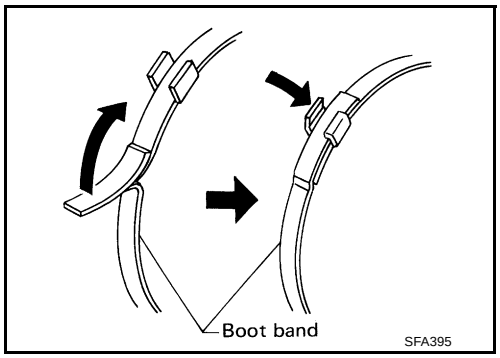
- **Boot may break if boot installation length is less than standard value.**
- **Take care not to touch the tip of screwdriver to inside of boot.**

10. Secure big and small ends of boot with new boot bands as shown in the figure.

    NOTE:

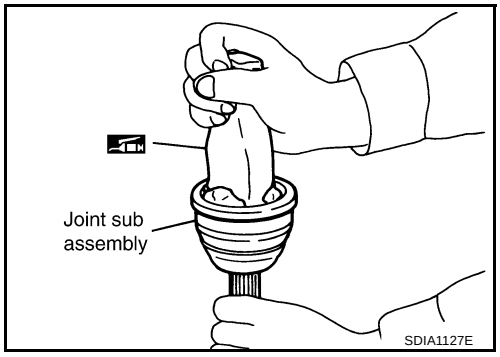
    Discard old boot bands; replace with new ones.

11. After installing housing and shaft, rotate boot to check whether or not the actual position is correct. If boot position is not correct, secure boot with new boot band again.



Wheel Side

1. Insert the amount grease (NISSAN genuine grease or equivalent) into joint sub-assembly serration hole until grease begins to ooze from ball groove and serration hole. After insert grease, use a shop cloth to wipe off old grease that has oozed out.

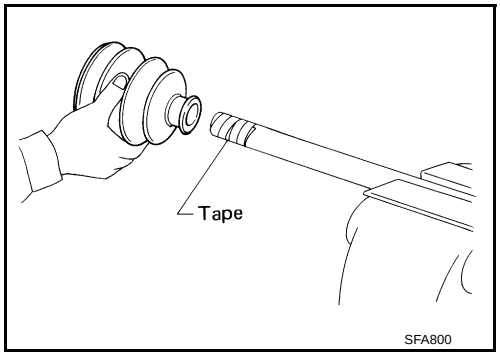


2. Wind serrated part of shaft with tape. Install boot band and boot to shaft. Be careful not to damage boot.

   NOTE:

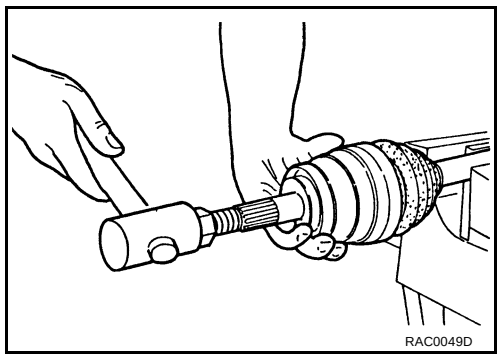
   Discard old boot band and boot; replace with each new one.

3. Remove protective tape wound around serrated part of shaft.



4. Attach circular clip to shaft. At this time, circular clip must fit securely into shaft groove. Attach nut to joint sub-assembly. Use a wooden hammer to press-fit.

   NOTE:
   Discard old circular clip; replace with new one.



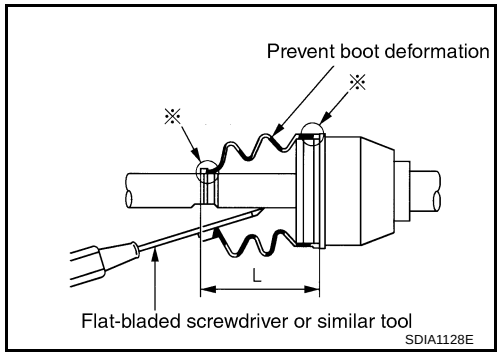
5. Insert the amount grease (NISSAN genuine grease or equivalent) listed below into housing from large end of boot.

   Reference value

   Grease amount : 86 - 96 g (3.03 - 3.39 oz)

6. Install boot securely into grooves (indicated by * marks) shown in the figure.

   CAUTION:
   If there is grease on boot mounting surfaces (indicated by* marks) of shaft and housing, boot may come off. Remove all grease from surfaces.



7. Make sure boot installation length “L” is the length indicated below. Insert a flat-bladed screwdriver or similar tool into smaller side of boot. Bleed air from boot to prevent boot deformation.

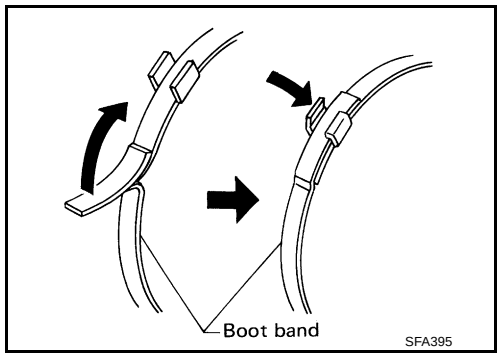
   Standard value

   Boot installation length “L” :97 mm (3.82 in)

   CAUTION:
   - **Boot may brake if boot installation length is less than standard value.**
   - **Be careful that screwdriver tip does not contact inside surface of boot.**

8. Secure big and small ends of boot with new boot bands as shown in the figure.

   NOTE:
   Discard old boot bands; replace with new ones.



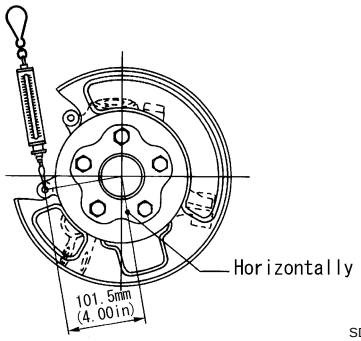
9. After installing joint sub-assembly and shaft, rotate boot to check whether or not the actual position is correct. If boot position is not correct, secure boot with new boot bands again.

SERVICE DATA

PFP:00030

Wheel Bearing

ADS0003G

Axial end play	0.05 mm (0.002 in) or less
Rotating torque	At a load of 49,033 N (5,000 kg, 11,000 lb) Less than 1.88 N·m (0.19 kg-m, 17 in-lb)
Measurement of spring scale	Less than 18.5 N (1.89 kg, 4.16 lb)
Measuring point (Brake caliper installation points)	 SDIA0801E

Drive Shaft

ADS0003H

Joint type	Wheel side	Final drive side
Grease quantity	86 - 96 g (3.03 - 3.39 oz)	124 - 134 g (4.37 - 4.73 oz)
Boots installed length	97 mm (3.82 in)	93.9 mm (3.697 in)

Tightening Torque

ADS00082

Drive shaft - Side flange	63 - 79 N·m (6.5 - 8.0 kg-m, 47 - 58 lb)
Hub lock nut	206 - 274 N·m (21 - 27 kg-m, 152 - 202 lb)

SECTION FSU
FRONT SUSPENSION

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PRECAUTIONS

PFP:00001

Caution

AES0002P

- When installing rubber bushings, final tightening must be carried out under unladen conditions with tires on ground. Oil will shorten the life of rubber bushings. Be sure to wipe off any spilled oil.
- Unladen conditions mean that fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.
- After servicing suspension parts, be sure to check wheel alignment.
- Caulking nuts are not reusable. Always use new ones when installing. Since new caulking nuts are pre-oiled, tighten as they are.
- Avoid burden to front cross bar.

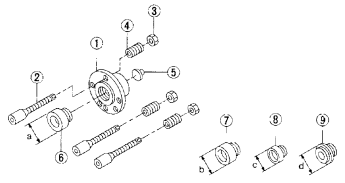
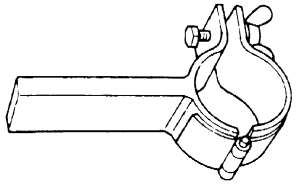
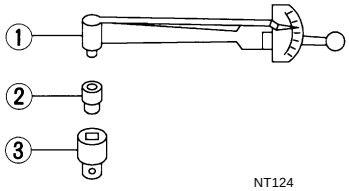
PREPARATION

PFP:00002

Special Service Tools (SST)

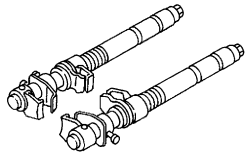
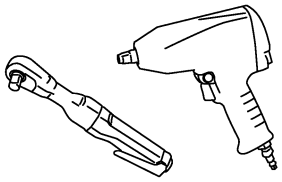
AES0002Q

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
KV991040S0 (—) CCK gauge attachment 1. Plate 2. Guide bolts 3. Nuts 4. Springs 5. Center plate 6. KV9910 4020 Adapter A a: 72 mm (2.83 in) dia. 7. KV9910 4030 Adapter B b: 65 mm (2.56 in) dia. 8. KV9910 4040 Adapter C c: 57 mm (2.24 in) dia. 9. KV9910 4050 Adapter D d: 53.4 mm (2.102 in) dia.  S-NT498	Measuring wheel alignment
ST3565 2000 (—) Strut attachment  ZZA0807D	Disassembling and assembling shock absorber
ST3127 S000 (See J25742-1) Preload gauge 1. GG91030000 Torque wrench (J25765) 2. HT62940000 (—) Socket adapter (1/2″) 3. HT62900000 (—) Socket adapter (3/8″)  NT124	Measuring rotating torque of ball joint

Commercial Service Tools

AES0002R

Tool name	Description
Spring compressor  S-NT717	Removing coil spring
Power tool  PBIC0190E	● Removing wheel nuts ● Removing brake caliper assembly ● Removing undercover ● Removing front suspension components parts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

AES0002S

Use chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page			FSU-8	FSU-11	—	—	—	FSU-8	FSU-6	FSU-18	NVH in PR section	NVH in RFD section.	NVH in RAX and RSU section.	NVH in WT section.	NVH in WT section.	NVH in RAX section.	NVH in BR section.	NVH in PS section.
Possible cause and SUSPECTED PARTS			Improper installation, looseness	Shock absorber deformation, damage or deflection	Bushing or mounting deterioration	Parts interference	Spring fatigue	Suspension looseness	Incorrect wheel alignment	Stabilizer bar fatigue	PROPELLER SHAFT	DIFFERENTIAL	REAR AXLE AND REAR SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES	STEERING
Symptom	FRONT SUSPENSION	Noise	×	×	×	×	×	×			×	×	×	×	×	×	×	×
		Shake	×	×	×	×		×			×		×	×	×	×	×	×
		Vibration	×	×	×	×	×				×		×	×		×		×
		Shimmy	×	×	×	×			×				×	×	×		×	×
		Judder	×	×	×								×	×	×		×	×
		Poor quality ride or handling	×	×	×	×	×		×	×			×	×	×			

×: Applicable

FRONT SUSPENSION ASSEMBLY

PFP:54010

On-Vehicle Inspection and Service

AES0002U

Make sure the mounting conditions (looseness, back lash) of each component and component statues (wear, damage) are normal.

INSPECTION OF BALL JOINT END PLAY OF EACH LINK

1. Set front wheels in a straight-ahead position. Do not depress brake pedal.
2. Check ball joint axial end play of each link.

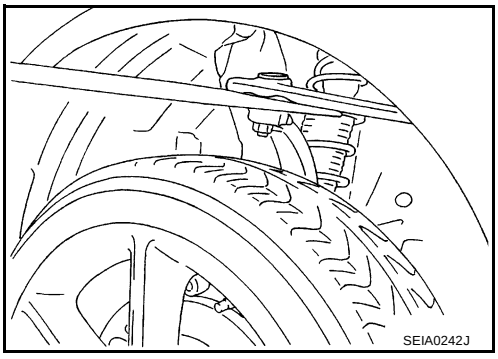
CAUTION:
Be careful not to damage ball joint boot.

Upper Link Ball Joint

- Measure axial end play by installing and moving up/down with an iron pry bar or something similar between upper link and steering knuckle.

Standard value

Axial end play : 0 mm (0 in)

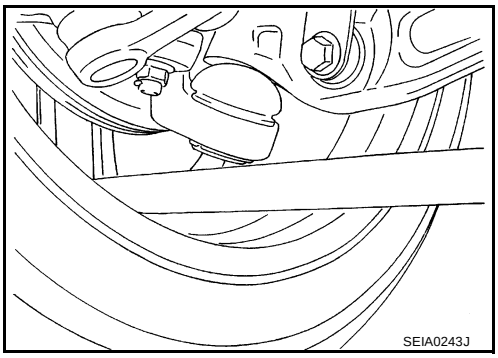


Steering Knuckle Lower Ball Joint

- Measure axial end play by installing and moving up/down with an iron pry bar or something similar between steering knuckle and wheel.

Standard value

Axial end play : 0 mm (0 in)

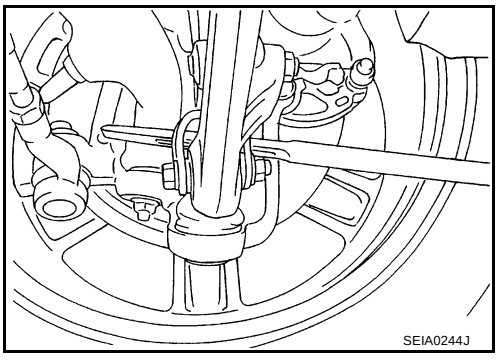


Compression Rod Ball Joint

- Measure axial end play by installing and moving up/down with an iron pry bar or something similar between compression rod and transverse link.

Standard value

Axial end play : 0 mm (0 in)



SHOCK ABSORBER INSPECTION

Check shock absorber for oil leakage, damage and replace if necessary. Refer to FSU-10, "COIL SPRING AND SHOCK ABSORBER" .

Wheel Alignment Inspection

AES0002V

DESCRIPTION

- Measure wheel alignment under unladen conditions.

  NOTE:
  Unladen conditions mean that fuel, engine coolant, and lubricant are full. Spare tire, jack, hand tools and mats are designated positions.

PRELIMINARY CHECK

1. Check tires for improper air pressure and wear.
2. Check road wheels for runout.
3. Check wheel bearing axial end play.
4. Check ball joint axial end play of compression rod, upper link, and steering knuckle
5. Check shock absorber operation.
6. Check each mounting part of axle and suspension for looseness and deformation.
7. Check each link, rod and member for cracks, deformation and other damage.
8. Check vehicle posture.

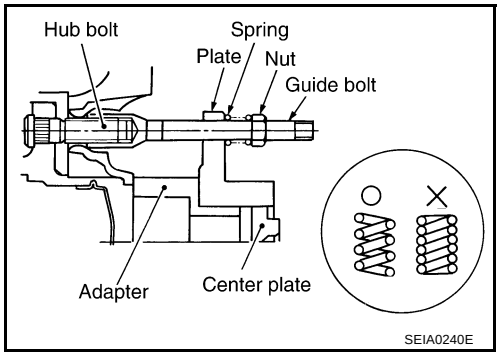
INSPECTION OF CAMBER, CASTER AND KINGPIN INCLINATION ANGLES

- Camber, caster, kingpin inclination angles cannot be adjusted.
- Before inspection, mount front wheels onto turning radius gauge. Mount rear wheels onto a stand that has same height so vehicle will remain horizontal.

Using a CCK Gauge

Install CCK gauge attachment (SST: KV991040S0) as following procedure in wheel, then measure wheel alignment.

1. Remove wheel nuts (2), and install a guide bolt to hub bolt.
2. Screw adapter into plate body until it contacts body tightly.
3. Screw center plate into plate.
4. Insert plate on guide bolt. Put spring in, and then evenly screw both guide bolt nut. When fastening guide bolt nut, do not completely compress spring.

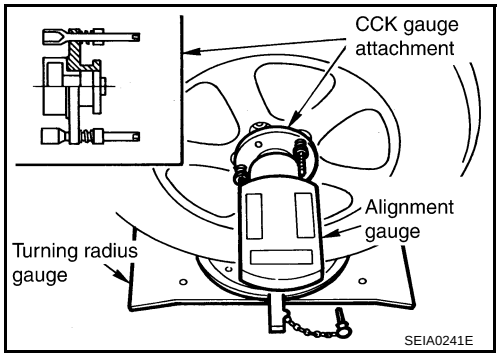


5. Place the dent of alignment gauge onto the projection of center plate and tightly contact them to measure.

   Standard value

   Camber, caster, kingpin inclination angles:

   Refer to FSU-21, "SERVICE DATA" .



CAUTION:

- **If camber, caster, or kingpin inclination angle is outside the standard, check front suspension parts for wear and damage, and replace suspect parts if necessary.**
- **King pin inclination angle is reference value, no inspection is required. (Due to the type of suspension, the kingpin inclination angle cannot be measured correctly using a normal alignment tester.)**

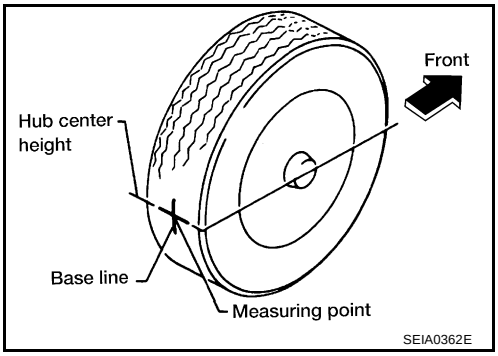
Toe-In Inspection

Measure toe-in using the following procedure.

WARNING:

- **Always perform the following procedure on a flat surface.**
- **Make sure that no person is in front of vehicle before pushing it.**

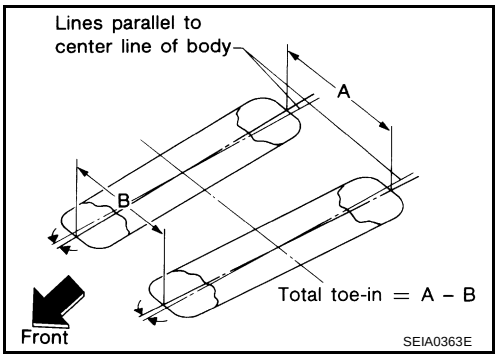
1. Bounce front of vehicle up and down to stabilize the posture.
2. Push vehicle straight ahead about 5 m (16 ft).
3. Put a mark on base line of the tread (rear side) of both tires at the same height of hub center. These are measuring points.



4. Measure distance “A” (rear side).
5. Push vehicle slowly ahead to rotate wheels 180 degrees (1/2 turn).
   If wheels have rotated more than 180 degrees (1/2 turn), try the above procedure again from the beginning. Never push vehicle backward.
6. Measure distance “B” (front side).

Standard value

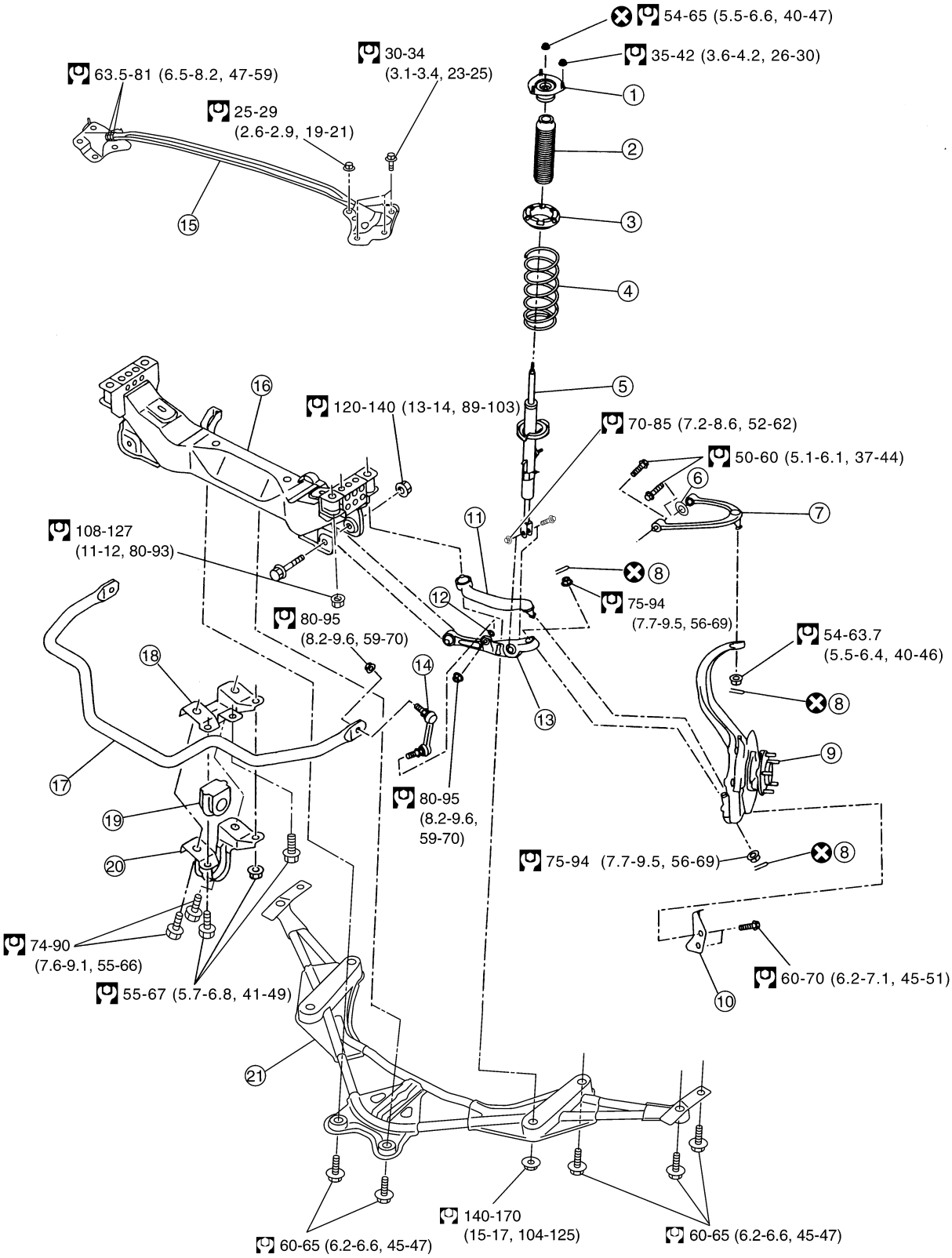
Total toe-in : Refer to FSU-21, "SERVICE DATA" .



Components

AES0002T

SEC.400・401・406



1. Mounting insulator
2. Bound bumper
3. Spring upper seat
4. Coil spring
5. Shock absorber
6. Stopper rubber
7. Upper link
8. Cotter pin
9. Front axle
10. Steering stopper bracket
11. Compression rod
12. Washer
13. Transverse link
14. Stabilizer connecting rod
15. Tower bar
16. Front suspension member
17. Stabilizer bar
18. Stabilizer clamp bracket
19. Stabilizer bushing
20. Stabilizer clamp
21. Front cross bar

Removal and Installation

AES000DM

REMOVAL

1. Remove tire with power tool.
2. Remove brake caliper with power tool. Hang it in a place where it will not interfere with work. Refer to BR-25, "FRONT DISC BRAKE (CLZ25VD TYPE)" , BR-31, "FRONT DISC BRAKE (OPB27VA TYPE)" .
3. Remove undercover with power tool.
4. Remove fixing bolts and nuts, then remove front cross bar from vehicle with power tool.
5. Remove steering hydraulic piping bracket from front suspension member. Refer to PS-34, "HYDRAULIC LINE" .
6. Remove steering gear and front suspension member attachment bolts and hang steering gear on vehicle. Refer to PS-17, "POWER STEERING GEAR AND LINKAGE" .
7. Set jack under engine.

   CAUTION:
   When setting jack to engine, use a wooden block or an equivalent for the setting.
8. Remove fixing bolt and nut between shock absorber and transverse link with power tool.
9. Remove cotter pin of upper link ball joint, then loosen mounting nut.
10. Use a ball joint remover (suitable tool) to remove upper link from steering knuckle. Be careful not to damage ball joint boot.

    CAUTION:
    Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (suitable tool) from coming off.
11. Remove fixing nut and washer located at the bottom of stabilizer connecting rod, and then remove stabilizer connecting rod from transverse link with power tool.
12. Remove fixing nuts between engine mounting insulator and front suspension member. Refer to EM-105, "ENGINE ASSEMBLY" .
13. Remove fixing nuts between front suspension member and body with power tool.
14. Remove front suspension assembly form vehicle.

INSTALLATION

- Refer to FSU-8, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of shock absorber lower side (rubber bushing) under unladen condition with tires on ground. Check wheel alignment. Refer to FSU-21, "SERVICE DATA" .

COIL SPRING AND SHOCK ABSORBER

PFP:54302

Removal and Installation

AES0002W

REMOVAL

1. Remove tire with power tool.
2. Remove undercover with power tool.
3. Remove harness of wheel sensor from shock absorber. Refer to BRC-83, "WHEEL SENSORS" (With TCS), BRC-143, "WHEEL SENSORS" (With VDC).

   CAUTION:
   Do not pull on wheel sensor harness.
4. Remove mounting nuts of brake hose from shock absorber.
5. Remove mounting bolt and nut between shock absorber and transverse link with power tool.
6. Remove tower bar. Refer to FSU-20, "TOWER BAR" .
7. Remove mounting nuts on mounting insulator with power tool, then remove shock absorber from vehicle.

INSTALLATION

- Refer to FSU-8, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of shock absorber lower side (rubber bushing) under unladen condition with tires on ground. Check wheel alignment. Refer to FSU-21, "SERVICE DATA" .

Disassembly and Assembly

AES0002X

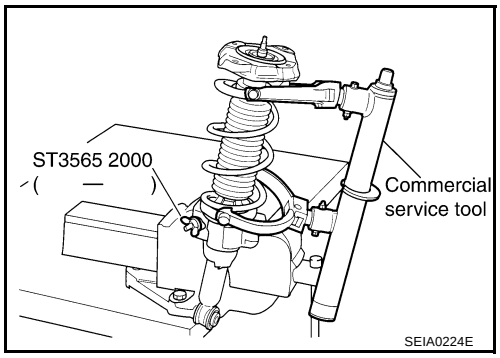
DISASSEMBLY

NOTE:
Make sure piston rod on shock absorber is not damaged when removing components from shock absorber.

1. Install strut attachment (SST) to shock absorber and fix it in a vise.

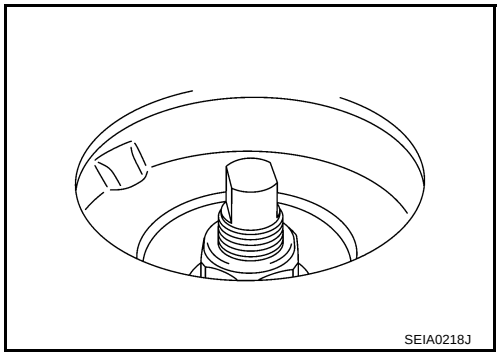
   CAUTION:
   When installing strut attachment (SST) to shock absorber, wrap a shop cloth around shock absorber to protect it from damage.
2. Using a spring compressor (commercial service tool), compress coil spring between spring upper seat and spring lower seat (on shock absorber) until coil spring is free.

   CAUTION:
   Be sure spring compressor (commercial service tool) is securely attached to coil spring. Compress coil spring.



3. Check that coil spring between spring upper seat and spring lower seat is free and then secure piston rod tip so that piston rod does not turn, and remove piston rod lock nut.
4. Remove mounting insulator, bound bumper, spring upper seat. Then remove coil spring from shock absorber.
5. Gradually release spring compressor (commercial service tool), and remove coil spring.

   CAUTION:
   Loosen while making sure coil spring attachment position does not move.
6. Remove strut attachment (SST) from shock absorber.



INSPECTION AFTER DISASSEMBLY

Shock Absorber Inspection

- Check shock absorber for deformation, cracks, damage, and replace if necessary.
- Check piston rod for damage, uneven wear, distortion, and replace if necessary.
- Check welded and sealed areas for oil leakage, and replace if necessary.

Mounting Insulator and Rubber Parts Inspection

Check mounting insulator for cracks and rubber parts for wear. Replace them if necessary.

Coil Spring Inspection

Check coil spring for cracks, wear or damage, and replace if necessary.

ASSEMBLY

NOTE:

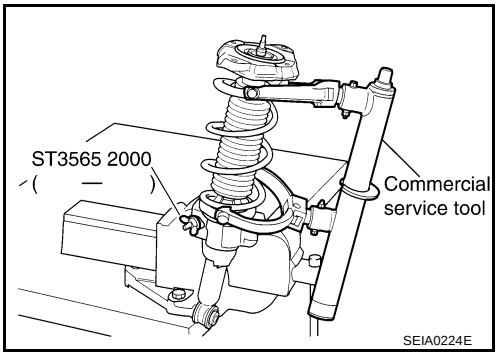
Make sure piston rod on shock absorber is not damaged when attaching components to shock absorber.

1. Install strut attachment (SST) to shock absorber and fix it in a vise.

   CAUTION:

   When installing strut attachment (SST) to shock absorber, wrap a shop cloth around shock absorber to protect it from damage.

2. Compress coil spring using a spring compressor (commercial service tool), and install it onto shock absorber.



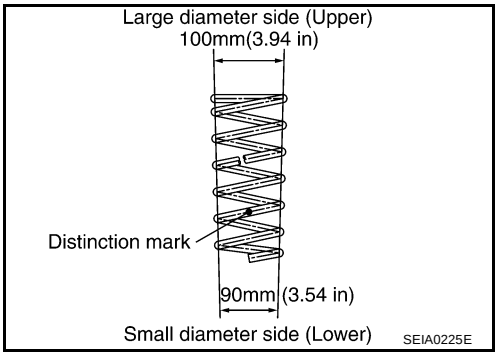
   CAUTION:

   - **Install coil spring as shown in the figure with large diameter side [100 mm (3.94 in)] up and small diameter side [90 mm (3.54 in)] down. (Identification paint is the 4th winding point from lower side.**
   - **Be sure spring compressor (commercial service tool) is securely attached to coil spring. Compress coil spring.**

3. Apply soapy water to bound bumper and insert into mounting insulator.

   CAUTION:

   Do not use machine oil.



4. Attach spring upper seat and mounting insulator as shown in the figure.

   CAUTION:

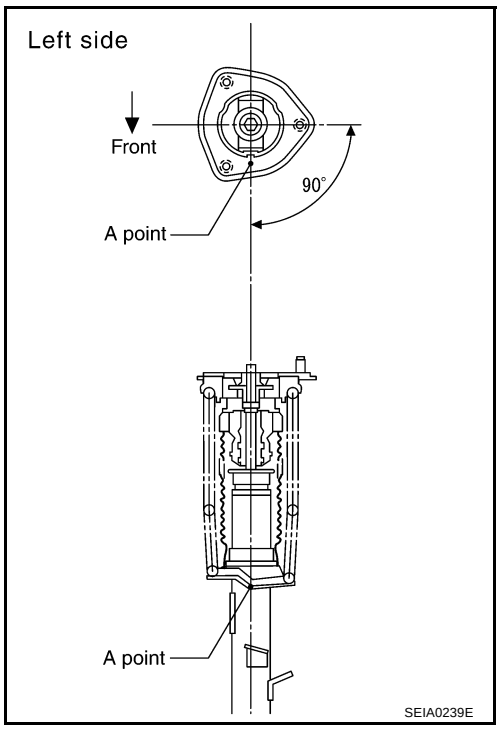
   - **Make sure coil spring is securely seated in spring mounting groove of spring upper seat.**
   - **The bottom part of spring should be at the position of A point of spring seat.**

5. Secure piston rod tip so that piston rod does not turn, and tighten the specified torque on piston rod lock nut.
6. Gradually release spring compressor (commercial service tool), and remove coil spring.

   CAUTION:

   Loosen spring compressor (commercial service tool) while making sure coil spring attachment position does not move.

7. Remove strut attachment (SST) from shock absorber.



TRANSVERSE LINK

PFP:54500

Removal and Installation

AES0002Y

REMOVAL

1. Remove tire with power tool.
2. Remove undercover with power tool.
3. Remove mounting nut and washer on lower portion of stabilizer connecting rod with power tool.
4. Remove mounting nut between transverse link and shock absorber on lower position.
5. Remove mounting nut between transverse link and front suspension member with power tool.
6. Remove transverse link from steering knuckle. Refer to FAX-4, "FRONT WHEEL HUB AND KNUCKLE" .
7. Remove transverse link from vehicle.

INSPECTION AFTER REMOVAL

Visual Inspection

Check transverse link and bushing for deformation, cracks, or damage. If any non-standard condition is found, replace it.

INSTALLATION

- Refer to FSU-8, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of front suspension member installation position and shock absorber lower side (rubber bushing) under unladen condition with tires on ground. Check wheel alignment. Refer to FSU-21, "SERVICE DATA" .

UPPER LINK

PFP:54524

Removal and Installation

AES00031

REMOVAL

1. Remove tire with power tool.
2. Remove undercover with power tool.
3. Remove shock absorber. Refer to FSU-10, "COIL SPRING AND SHOCK ABSORBER" .
4. Remove cotter pin of upper link ball joint, then loosen mounting nut.
5. Use a ball joint remover (suitable tool) to remove upper link from steering knuckle. Be careful not to damage ball joint boot.

   CAUTION:
   Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (suitable tool) from coming off.
6. Remove bolts holding upper link to body with power tool.
7. Remove upper link from vehicle.

INSPECTION AFTER REMOVAL

Visual Inspection

- Check upper link and bushing for deformation, cracks, or damage. If any non-standard condition is found, replace it.
- Check boot of ball joint for cracks, or other damage, and also for grease leakage. If any non-standard condition is found, replace it.

Ball Joint Inspection

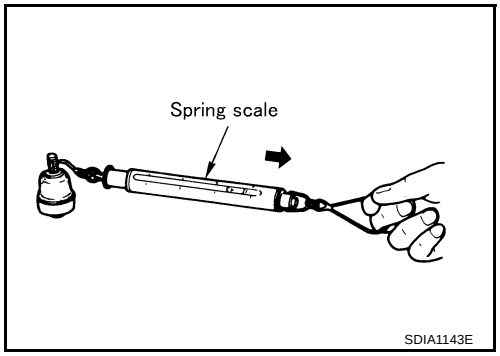
- Manually move ball stud to confirm it moves smoothly with no binding.

Swing Torque Inspection

NOTE:
Before measurement, move ball joint at least ten times by hand to check for smooth movement.

- Hook spring scale at ball stud. Confirm spring scale measurement value is within the specifications when ball stud begins moving.

  Standard value
  Swing torque:
  Less than 2.0 N·m (0.20 kg-m, 18 in-lb)
  Measured value of spring scale:
  Less than 34.8 N (3.5 kg, 7.8 lb)

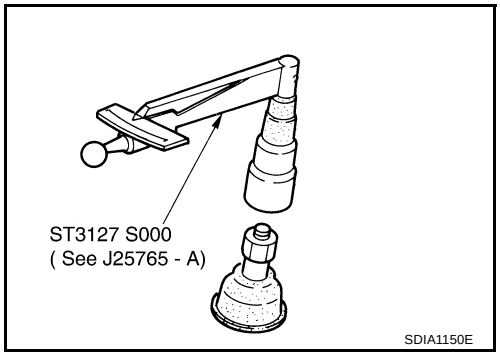


- If it is outside the specified range, replace upper link assembly.

Rotating Torque Inspection

- Attach mounting nut to ball stud. Check that rotating torque is within specifications with a preload gauge (SST).

  Standard value
  Rotating torque:
  Less than 2.0 N·m (0.20 kg-m, 18 in-lb)



- If it is outside the specified range, replace upper link assembly.

Axial End Play Inspection

- Move tip of ball joint in axial direction to check for looseness.

Standard value

Axial end play : 0 mm (0 in)

- If it is outside the specified range, replace upper link assembly.

INSTALLATION

- Refer to FSU-8, "Components" for tightening torque. Install in the reverse order of removal.

NOTE:
Refer to component parts location and do not reuse non-reusable parts.

- Perform final tightening of front suspension member installation position (rubber bushing) under unladen condition with tires on ground. Check wheel alignment. Refer to FSU-21, "SERVICE DATA" .

COMPRESSION ROD

PFP:54468

Removal and Installation

AES00032

REMOVAL

1. Remove tire with power tool.
2. Remove undercover with power tool.
3. Remove front cross bar from vehicle with power tool.
4. Remove cotter pin of compression rod ball joint, and loosen nut.
5. Use a ball joint remover (suitable tool) to remove compression rod from steering knuckle. Be careful not to damage ball joint boot.

   CAUTION:
   Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (suitable tool) from coming off.
6. Remove compression rod from vehicle.

INSPECTION AFTER REMOVAL

Visual Inspection

- Check compression rod and bushing for deformation, cracks, or damage. If any non-standard condition is found, replace it.
- Check boot of ball joint for cracks, or other damage, and also for grease leakage. If any non-standard condition is found, replace it.

Ball Joint Inspection

- Manually move ball stud to confirm it moves smoothly with no binding.

Swing Torque Inspection

NOTE:
Before measurement, move ball joint at least ten times by hand to check for smooth movement.

- Hook spring scale at ball stud. Confirm spring scale measurement value is within the specifications when ball stud begins moving.

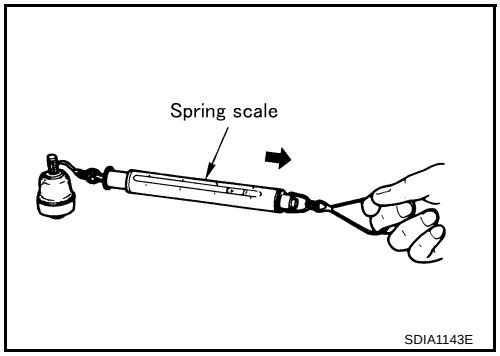
  Standard value

  Swing torque:

  0.147 - 2.45 N·m (0.02 - 0.24 kg-m, 2 - 21 in-lb)

  Measured value of spring scale:

  2.37 - 39.5 N (0.24 - 4.03 kg, 0.53 - 8.88 lb)



- If it is outside the specified range, replace compression rod assembly.

Rotating Torque Inspection

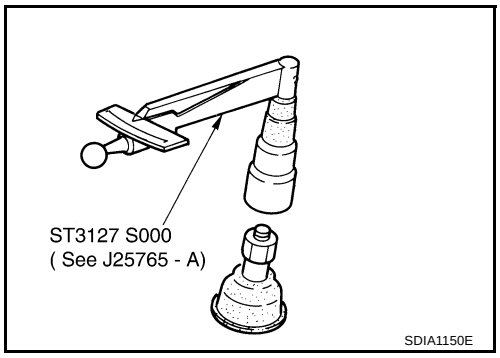
- Attach mounting nut to ball stud. Check that rotating torque is within the specifications with a preload gauge (SST).

  Standard value

  Rotating torque:

  0.147 - 2.45 N·m (0.02 - 0.24 kg-m, 2 - 21 in-lb)

- If it is outside the specified range, replace compression rod assembly.



AXIAL END PLAY INSPECTION

- Move tip of ball joint in axial direction to check for looseness.

  Standard value

  Axial end play : 0 mm (0 in)

- If it is outside the specified range, replace compression rod assembly.

INSTALLATION

- Refer to FSU-8, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.

- Perform final tightening of installation position between front suspension member and front cross bar (rubber bushing) under unladen condition with tires on ground. Check wheel alignment. Refer to FSU-21, "SERVICE DATA" .

STABILIZER BAR

PFP:54611

Removal and Installation

AES000C0

REMOVAL

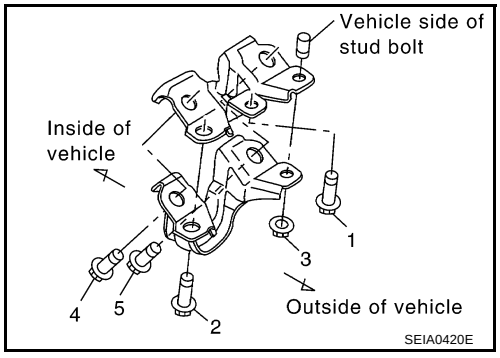
1. Remove tire with power tool.
2. Remove undercover with power tool.
3. Remove mounting nut on upper portion of stabilizer connecting rod with power tool.
4. Remove fixing bolts and nuts, then remove stabilizer clamp, stabilizer bushing, and stabilizer clamp bracket.
5. Remove stabilizer bar from vehicle.

INSPECTION AFTER REMOVAL

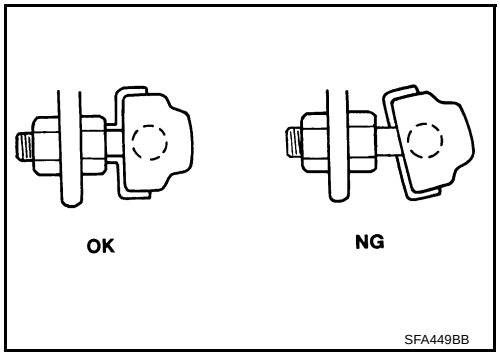
Check stabilizer bar, stabilizer connecting rod, stabilizer bushing, stabilizer clamp and stabilizer clamp bracket for deformation, cracks and damage, and replace if necessary.

INSTALLATION

- Refer to FSU-8, "Components" for tightening torque. Install in the reverse order of removal.
- Tighten each bolt and nut as shown in the figure for tightening stabilizer bracket and stabilizer clamp. Tightening order is as follows. 1 (fully tighten) → 2 (temporarily tighten) → 3 (temporarily tighten) → 2 (fully tighten) → 3 (fully tighten) → 4, 5 (temporarily tighten) → 4, 5 (fully tighten).



- Stabilizer bar uses pillow ball type connecting rod. Position ball joint with case on pillow ball head parallel to stabilizer bar.



FRONT SUSPENSION MEMBER

PFP:54401

Removal and Installation

AES000C1

REMOVAL

1. Remove tire with power tool.
2. Remove undercover with power tool.
3. Remove fixing bolts and nuts, then remove front cross bar from vehicle with power tool.
4. Remove steering hydraulic piping bracket from front suspension member. Refer to PS-34, "HYDRAULIC LINE" .
5. Remove steering gear and front suspension member attachment bolts and hang steering gear on vehicle. Refer to PS-17, "POWER STEERING GEAR AND LINKAGE" .
6. Remove transverse link from front suspension member with power tool. Refer to FSU-13, "TRANSVERSE LINK" .
7. Set jack under engine.

   CAUTION:
   When setting jack to engine, use a wooden block or an equivalent for the setting.
8. Remove fixing nuts between engine mounting insulator and front suspension member. Refer to EM-105, "ENGINE ASSEMBLY" .
9. Remove fixing nuts between front suspension member and body with power tool.
10. Remove front suspension member from vehicle.

INSPECTION AFTER REMOVAL

Check front suspension member for deformation, cracks, or any other damage. Replace if necessary.

INSTALLATION

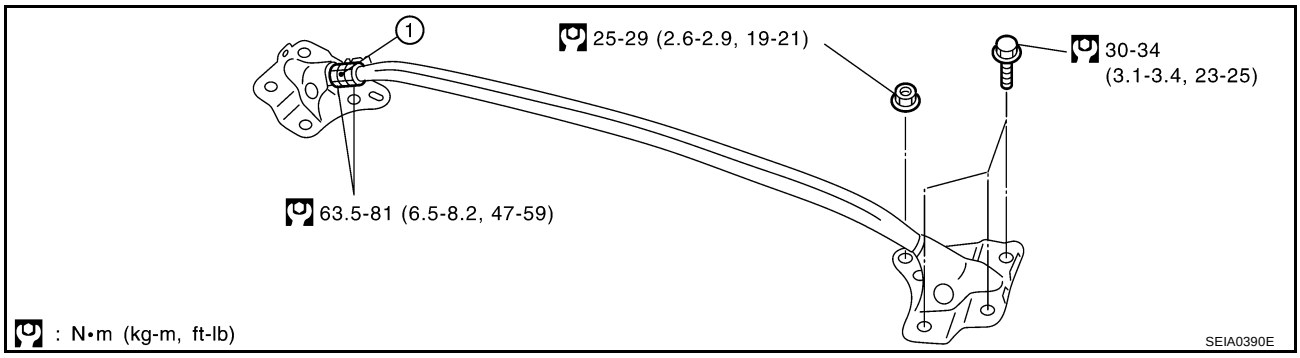
- Refer to FSU-8, "Components" for tightening torque. Install in the reverse order of removal.
- Perform final tightening of installation position between front suspension member and transverse link (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to FSU-21, "SERVICE DATA" .

TOWER BAR

PFP:544A2

Removal and Installation

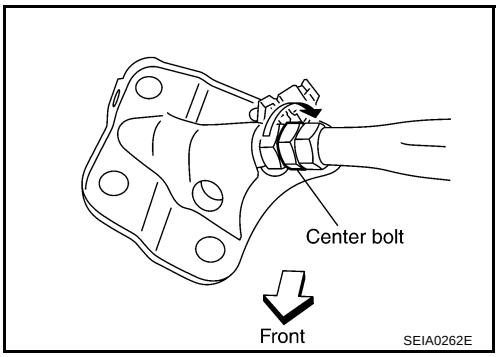
AES000DE



1. Center bolt

REMOVAL

1. Fix center bolt, and then loosen nut in the right and left side.
2. Loosen center bolt to the direction in the figure on 660° (Or turn bolt 1.7 times) to place the black mark of center bolt above.
3. Remove tower bar fixing bolts and nuts, and remove tower bar from vehicle with power tool.

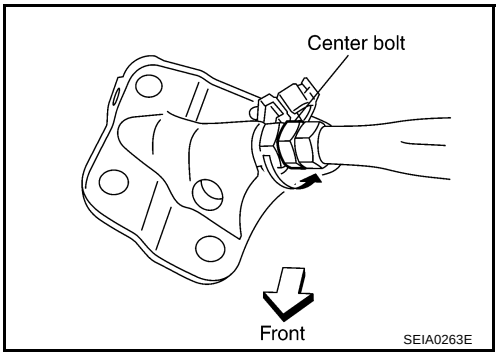


INSTALLATION

1. Install tower bar and tighten at the specified torque.

   NOTE:
   If it is hard to install tower bar, install it turning center bolt.
2. Tighten center bolt to the direction in the figure on 660° (Or turn bolt 1.7 times) to place the black mark of center bolt above.

   NOTE:
   The space between tower bar and engine collector should be between 10.0 mm (0.394 in) and 17.0 mm (0.669 in).
3. Tighten both nut of the right and left side of center bolt.



SERVICE DATA

PFP:00030

Wheel Alignment (Unladen)

AES00033

Camber Degree minute (Decimal degree)		Minimum	- 1° 20′ (- 1.33°)
		Nominal	- 0° 35′ (- 0.58°)
		Maximum	0° 10′ (0.17°)
		Left and right difference	45′ (0.75°)
Caster Degree minute (Decimal degree)		Minimum	7° 25′ (7.42°)
		Nominal	8° 10′ (8.17°)
		Maximum	8° 55′ (8.92°)
		Left and right difference	45′ (0.75°)
Kingpin inclination Degree minute (Decimal degree)		Minimum	4° 20′ (4.33°)
		Nominal	5° 05′ (5.08°)
		Maximum	5° 50′ (5.83°)
Total toe-in	Distance (A - B)	Minimum	0 mm (0 in)
		Nominal	1 mm (0.04 in)
		Maximum	2 mm (0.08 in)

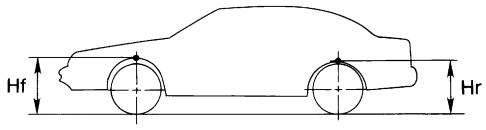
Ball Joint

AES00034

Swing torque	Less than 2.0 N·m (0.20 kg-m, 18 in-lb) (Upper link) 0.147 - 2.45 N·m (0.02 - 0.24 kg-m, 2 - 21 in-lb) (Compression rod)
Measurement on spring balance (cotter pinhole position)	Less than 34.8 N (3.5 kg, 7.8 lb) (Upper link) 2.37 - 39.5 N (0.24 - 4.03 kg, 0.53 - 8.88 lb) (Compression rod)
Rotating torque	Less than 2.0 N·m (0.20 kg-m, 18 in-lb) (Upper link) 0.147 - 2.45 N·m (0.02 - 0.24 kg-m, 2 - 21 in-lb) (Compression rod)
Axial end play	0 mm (0 in)

Wheelarch Height (Unladen*)

AES00035



SFA818A

Applied model	225/50R17 (Front) 235/50R17 (Rear)		225/45R18 (Front) 245/45R18 (Rear)	
	Coupe	Road star	Coupe	Road star
Front (Hf)	681 mm (26.81 in)	679 mm (26.73 in)	683 mm (26.89 in)	
Rear (Hr)	700 mm (27.56 in)	699 mm (27.52 in)	706 mm (27.80 in)	705 mm (27.76 in)

*: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.

SECTION RSU
REAR SUSPENSION

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PRECAUTIONS

PFP:00001

Cautions

AES00036

- When installing rubber bushings, final tightening must be carried out under unladen conditions with tires on ground. Oil will shorten the life of rubber bushings. Be sure to wipe off any spilled oil.
- Unladen conditions mean that fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.
- After servicing suspension parts, be sure to check wheel alignment.
- Caulking nuts are not reusable. Always use new ones when installing. Since new caulking nuts are pre-oiled, tighten as they are.

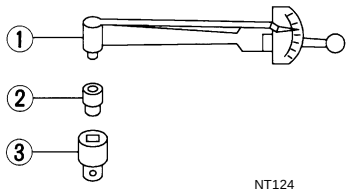
PREPARATION

PFP:00002

Special Service Tools (SST)

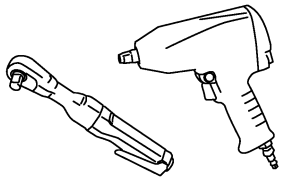
AES00037

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
ST3127 S000 (See J25742-1) Preload gauge 1. GG91030000 Torque wrench (J25765) 2. HT62940000 (—) Socket adapter (1/2″) 3. HT62900000 (—) Socket adapter (3/8″)  NT124	Measuring rotating torque of ball joint

Commercial Service Tools

AES00038

Tool name	Description
Power tool  PBIC0190E	● Removing wheel nuts ● Removing brake caliper assembly ● Removing rear suspension component parts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

AES00039

Use chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page			RSU-7	RSU-9	—	—	—	RSU-7	RSU-5	RSU-16	NVH in PR section.	NVH in RFD section.	NVH in FAX and FSU sections.	NVH in WT section.	NVH in WT section.	NVH in RAX section.	NVH in BR section.	NVH in PS section.
Possible cause and SUSPECTED PARTS			Improper installation, looseness	Shock absorber deformation, damage or deflection	Bushing or mounting deterioration	Parts interference	Spring fatigue	Suspension looseness	Incorrect wheel alignment	Stabilizer bar fatigue	PROPELLER SHAFT	DIFFERENTIAL	FRONT AXLE AND FRONT SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES	STEERING
Symptom	REAR SUSPENSION	Noise	×	×	×	×	×	×			×	×	×	×	×	×	×	×
		Shake	×	×	×	×		×			×		×	×	×	×	×	×
		Vibration	×	×	×	×	×				×		×	×		×		×
		Shimmy	×	×	×	×			×				×	×	×		×	×
		Judder	×	×	×								×	×	×		×	×
		Poor quality ride or handling	×	×	×	×	×		×	×			×	×	×			

×: Applicable

REAR SUSPENSION ASSEMBLY

PFP:55020

On-Vehicle Inspection and Service

AES0003B

Make sure the mounting conditions (looseness, back lash) of each component and component status (wear, damage) are normal.

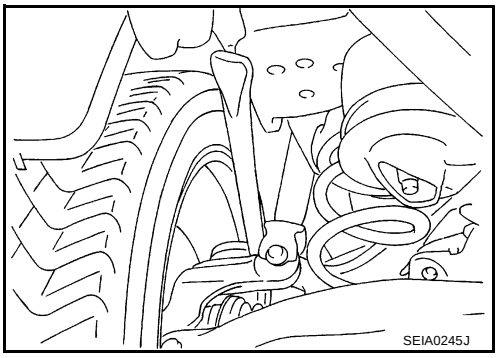
INSPECTION OF SUSPENSION ARM BALL JOINT END PLAY

- Measure axial end play by installing and moving up/down with an iron pry bar or something similar between suspension arm and axle.

  Standard value

  Axial end play : 0 mm (0 in)

  CAUTION:
  Be careful not to damage ball joint boot.


SEIA0245J

SHOCK ABSORBER INSPECTION

- Check shock absorber for oil leakage, damage and replace if necessary.

Wheel Alignment Inspection

AES0003C

DESCRIPTION

- Measure wheel alignment under unladen conditions. “Unladen conditions” means that fuel, engine coolant, and lubricant are full. Spare tire, jack, hand tools and mats in designated positions.

PRELIMINARY INSPECTION

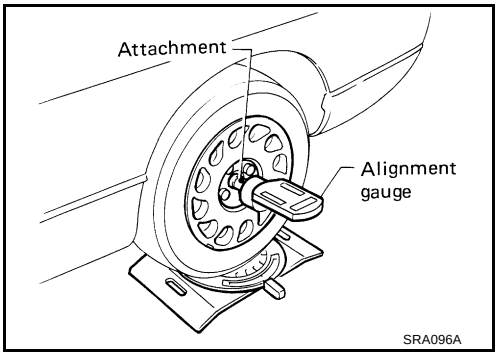
1. Check tires for improper air pressure and wear.
2. Check road wheels for runout.
3. Check wheel bearing axial end play.
4. Check ball joint axial end play of suspension arm.
5. Check shock absorber operation.
6. Check each mounting point of axle and suspension for looseness and deformation.
7. Check each link, arm and member for cracks, deformation, and other damage.
8. Check vehicle posture.

CAMBER INSPECTION

- Measure camber of both right and left wheels with a suitable alignment gauge and adjust in accordance with the following procedures.

  Standard value

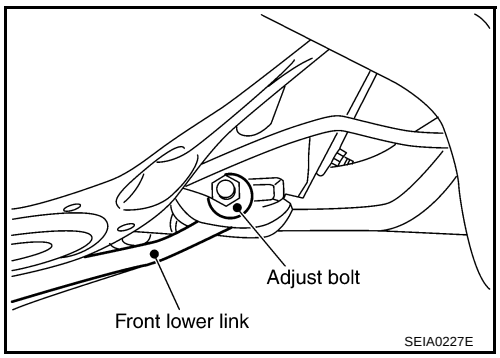
  Camber : Refer to RSU-18, "SERVICE DATA"
  .



SRA096A

If outside the standard value, adjust with adjusting bolt in front lower link.

NOTE:
After adjusting camber, be sure to check toe-in.



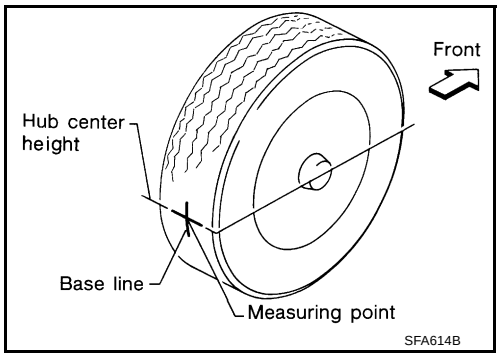
TOE-IN

Measure toe-in using following procedure. If out of the specification, inspect and replace any damaged or worn rear suspension parts.

WARNING:

- **Always perform following procedure on a flat surface.**
- **Make sure that no person is in front of vehicle before pushing it.**

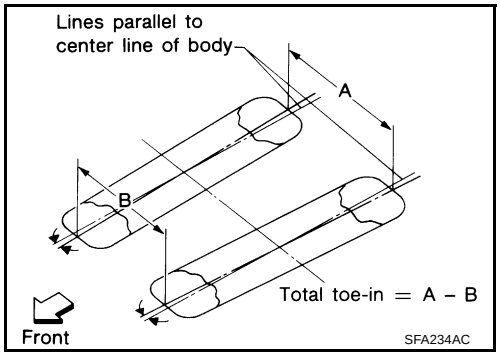
1. Bounce rear of vehicle up and down to stabilize the posture.
2. Push vehicle straight ahead about 5 m (16 ft).
3. Put a mark on base line of the tread (rear side) of both tires at the same height of hub center. These are measuring point.
4. Measure distance “A” (rear side).



5. Push vehicle slowly ahead to rotate wheels 180 degrees (1/2 turn).
   If wheels have rotated more than 180 degrees (1/2 turn), try the above procedure again from the beginning. Never push vehicle backward.
6. Measure distance “B” (front side).

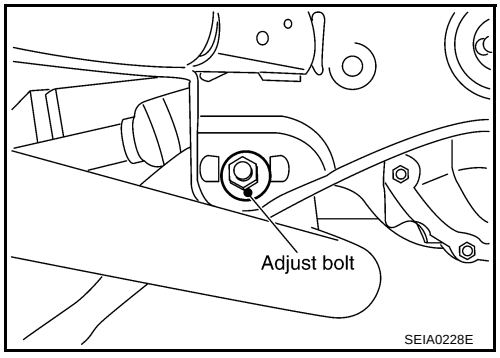
Standard value

Total toe-in : Refer to RSU-18, "SERVICE DATA" .



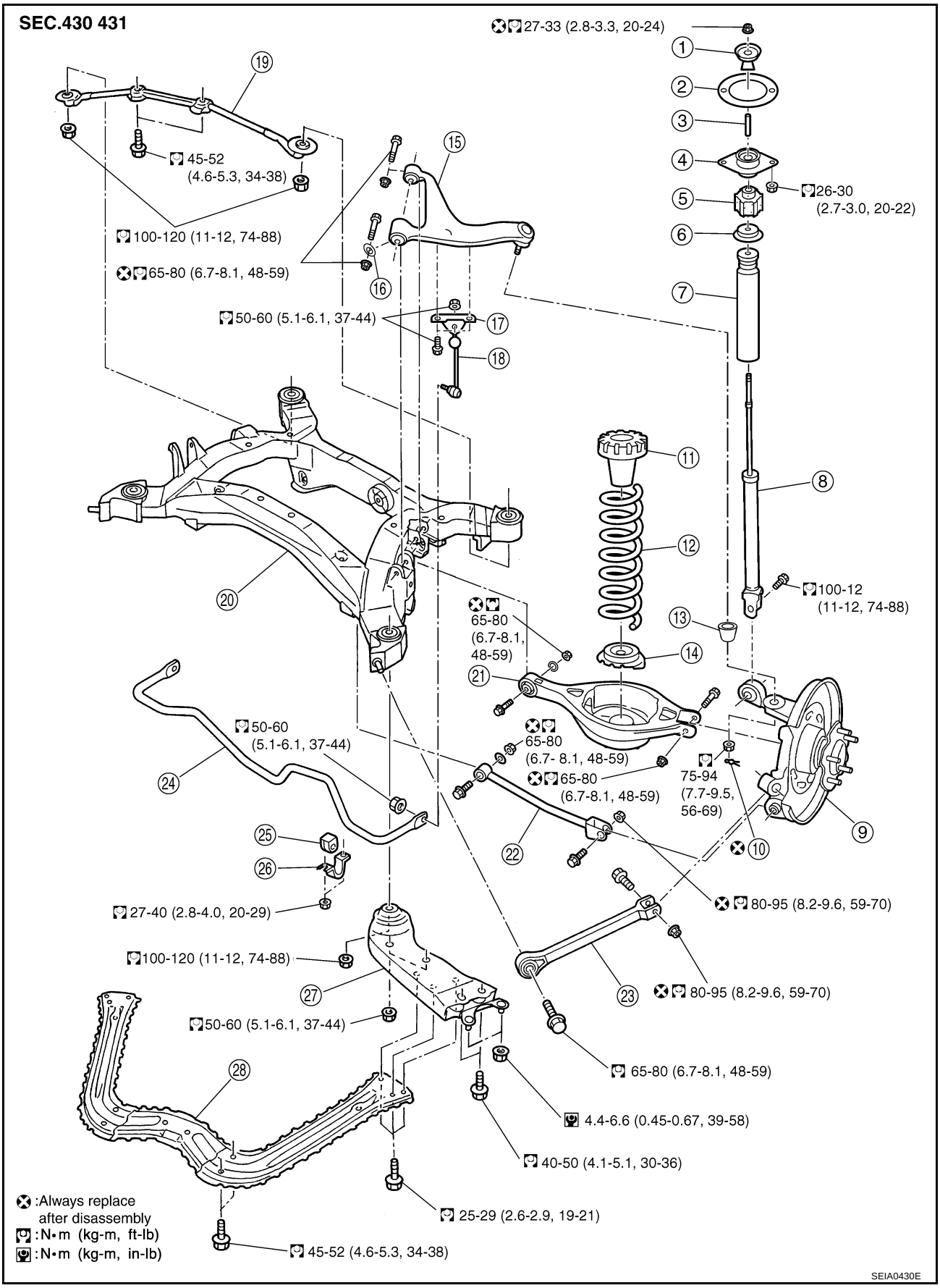
7. If outside the standard value, adjust with adjusting bolt in rear lower link.

CAUTION:
Be sure to adjust equally on RH and LH side with adjusting bolt.



Components

AES0003A



1. Bushing
2. Mounting seal
3. Distance tube
4. Mounting seal bracket
5. Bushing
6. Bound bumper cover
7. Bound bumper
8. Shock absorber
9. Axle
10. Cotter pin
11. Upper seat
12. Coil spring
13. Ball seat
14. Rubber seat
15. Suspension arm
16. Stopper rubber
17. Stabilizer connecting rod mounting bracket
18. Stabilizer connecting rod
19. Rear pin stay
20. Rear suspension member
21. Rear lower link
22. Front lower link
23. Radius rod
24. Stabilizer bar
25. Stabilizer bushing
26. Stabilizer clamp
27. Member stay
28. Tunnel stay

Removal and Installation

AES000DN

REMOVAL

1. Remove tire with power tool.
2. Remove brake caliper with power tool. Hang it in a place where it will not interfere with work. Refer to BR-38, "REAR DISC BRAKE (AD14VE TYPE)" , BR-44, "REAR DISC BRAKE (OPB13VB TYPE)" .

   NOTE:
   Avoid depressing brake pedal while brake caliper is removed.
3. Remove stabilizer bar. Refer to RSU-16, "STABILIZER BAR" .
4. Remove rear exhaust tube. Refer to EX-3, "EXHAUST SYSTEM" .
5. Remove rear propeller shaft. Refer to PR-5, "REAR PROPELLER SHAFT" .
6. Separate attachment bolts between parking brake cable and vehicle and rear suspension member. Refer to PB-3, "PARKING BRAKE CONTROL" .
7. Remove wheel sensor from rear final drive.
8. Remove rear lower link and coil spring. Refer to RSU-15, "REAR LOWER LINK & COIL SPRING" .
9. Remove fixing bolt in upper side of mounting seal bracket. Refer to RSU-9, "SHOCK ABSORBER" .
10. Set jack under rear final drive.
11. Remove tunnel stay and member stay from vehicle.
12. Remove fixing bolts and nuts of rear pin stay and then remove rear pin stay from vehicle.
13. Gradually lowering jack, remove rear suspension assembly.

INSTALLATION

- Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of installation position of links (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-18, "SERVICE DATA" .

SHOCK ABSORBER

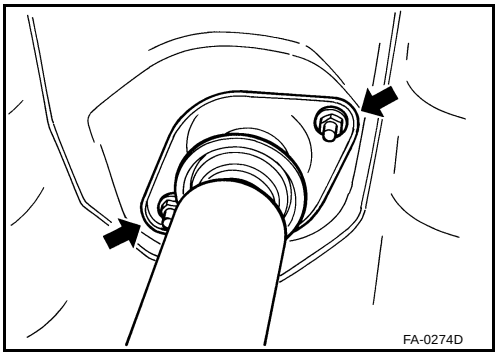
PFP:56210

Removal and Installation

AES0003E

REMOVAL

1. Remove tire with power tool.
2. Set jack under rear lower link.
3. Remove fixing bolt in lower side of shock absorber assembly with power tool.
4. Remove mounting seal bracket fixing nuts of shock absorber upper side with power tool and remove shock absorber from vehicle.



INSPECTION AFTER REMOVAL

- Check shock absorber assembly for deformation, cracks, damage, and replace if necessary.
- Check piston rod for damage, uneven wear or distortion, and replace if necessary.
- Check welded and sealed areas for oil leakage, and replace if necessary.

INSTALLATION

- Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of shock absorber assembly lower side (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-18, "SERVICE DATA" .

Disassembly and Assembly

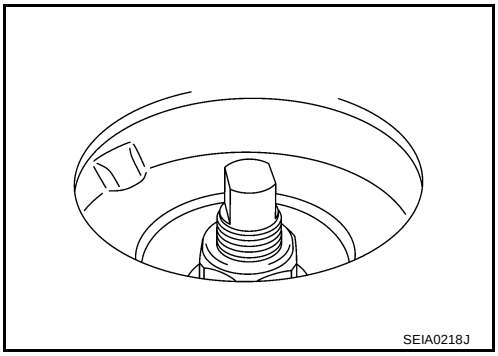
AES0003F

DISASSEMBLY

CAUTION:
Make sure piston rod on shock absorber is not damaged when removing components from shock absorber.

1. Remove mounting seal from mounting seal bracket.
2. Wrap a shop cloth around lower side of shock absorber and fix it in a vise.

   CAUTION:
   Do not set the cylindrical part of shock absorber in vise.
3. Secure piston rod tip so that piston rod does not turn, and remove piston rod lock nut.
4. Remove bushing (Upper side), distance tube, mounting seal bracket, bushing (Lower side), bound bumper cover and bound bumper from shock absorber.



INSPECTION AFTER DISASSEMBLY

Bound Bumper and Bushing

- Check bound bumper and bushing for cracks, deformation or other damage. Replace if necessary.

ASSEMBLY

- Refer to RSU-7, "Components" for tightening torque. Assembly in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.

  CAUTION:
  Make sure piston rod on shock absorber is not damaged when attaching components to shock absorber.

SUSPENSION ARM

PFP:55501

Removal and Installation

AES0003G

REMOVAL

1. Remove tire with power tool.
2. Remove drive shaft. Refer to RAX-10, "REAR DRIVE SHAFT" .
3. Remove fixing nuts and bolts between suspension arm and rear suspension member.
4. Remove cotter pin of suspension arm ball joint, and loosen nut.
5. Use a ball joint remover (suitable tool) to remove suspension arm from axle. Be careful not to damage ball joint boot.

   CAUTION:
   Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (suitable tool) from coming off.
6. Remove suspension arm and stopper rubber from vehicle.

INSPECTION AFTER REMOVAL

Visual Inspection

- Check suspension arm and bushing for deformation, cracks or damage. If any non-standard condition is found, replace it.
- Check boot of ball joint for cracks or damage, and also for grease leakage.

Ball Joint Inspection

- Manually move ball stud to confirm it moves smoothly with no binding.

Swing Torque Inspection

NOTE:
Before measuring, move ball joint at least ten times by hand to check for smooth movement.

- Hook spring scale at cotter pin mounting hole. Confirm spring scale measurement value is within specifications when ball stud begins moving.

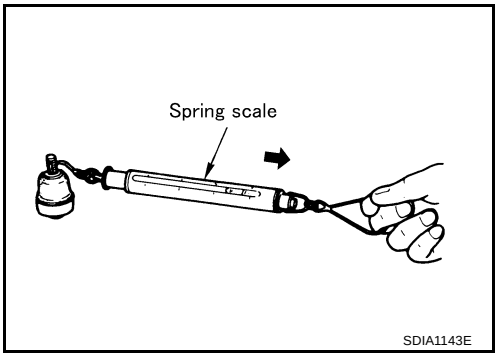
  Standard value

  Swing torque:

  0.5 - 3.4 N·m (0.06 - 0.34 kg-m, 5 - 30 in-lb)

  Measured value of spring scale:

  8.06 - 54.8 N (0.83 - 5.5 kg, 1.81 - 12.32 lb)



- If it is outside the specified range, replace suspension arm assembly.

Rotating Torque Inspection

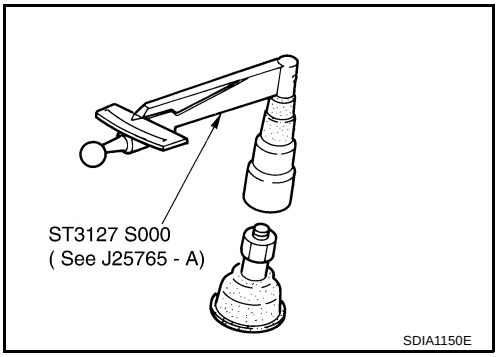
- Attach mounting nut to ball stud. Make sure that sliding torque is within the specifications with a preload gauge (SST).

  Standard value

  Rotating torque:

  0.5 - 3.4 N·m (0.06 - 0.34 kg-m, 5 - 30 in-lb)

- If it is outside the specified range, replace suspension arm assembly.



Axial End Play Inspection

- Move tip of ball joint in axial direction to check for looseness.

  Standard value

  Axial end play : 0 mm (0 in)

- If it is outside the specified range, replace suspension arm assembly.

INSTALLATION

- Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.

- Perform final tightening of rear suspension member installation position (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-18, "SERVICE DATA" .

RADIUS ROD

PFP:55110

Removal and Installation

AES0003H

REMOVAL

1. Remove tire with power tool.
2. Remove brake caliper with power tool. Hang it in a place where it will not interfere with work. Refer to BR-38, "REAR DISC BRAKE (AD14VE TYPE)" , BR-44, "REAR DISC BRAKE (OPB13VB TYPE)" .

   NOTE:
   Avoid depressing brake pedal while brake caliper is removed.
3. Remove fixing bolt and nut in axle side of radius rod with power tool.
4. Remove rear lower link and coil spring. Refer to RSU-15, "REAR LOWER LINK & COIL SPRING" .
5. Remove fixing bolt in lower side of shock absorber with power tool.
6. Remove fixing bolt and nut in axle side of front lower link with power tool.
7. Remove fixing bolt in rear suspension member side of radius rod with power tool, then remove radius rod from vehicle.

INSPECTION AFTER REMOVAL

- Check radius rod and bushing for any deformation, cracks, or damage. Replace if necessary.

INSTALLATION

- Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of rear suspension member and axle installation position (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-18, "SERVICE DATA" .

FRONT LOWER LINK

PFP:55110

Removal and Installation

AES0003I

REMOVAL

1. Remove tire with power tool.
2. Set jack under rear lower link.
3. Remove fixing nut and bolt between front lower link and rear suspension member with power tool.
4. Remove fixing nut and bolt between front lower link and axle with power tool.
5. Remove front lower link from vehicle.

INSPECTION AFTER REMOVAL

- Check front lower link and bushing for any deformation, cracks, or damage. Replace if necessary.

INSTALLATION

- Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of rear suspension member and axle installation position (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-7, "Components" .

REAR LOWER LINK & COIL SPRING

PFP:551B0

Removal and Installation

AES0003J

REMOVAL

1. Remove tire with power tool.
2. Set jack under rear lower link.
3. Loosen fixing bolt and nut of rear lower link in side of suspension member, and then remove fixing bolt and nut in side of axle with power tool.
4. Slowly lower jack, then remove upper seat, coil spring and rubber sheet from rear lower link.
5. Remove fixing bolt and nut in side of rear suspension member to remove rear lower link with power tool.

INSPECTION AFTER REMOVAL

- Check rear lower link, bushing and coil spring for deformation, cracks, and damage. Replace rear lower link and coil spring if necessary.

INSTALLATION

- Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.

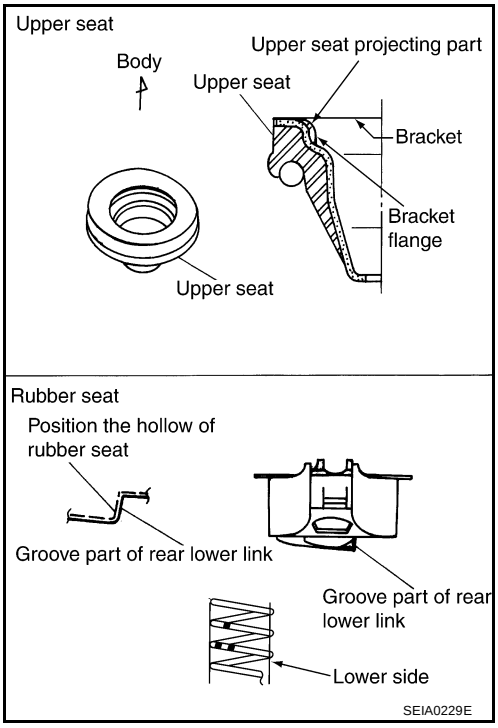
- Check that upper seat is attached as shown in the figure.

  NOTE:
  Insert bracket tabs (3) and the inside protrusion on upper seat into each other beforehand as shown in the figure.

- Match up rubber seat indentions and rear lower link grooves and attach.

  NOTE:
  Make sure spring is not up side down. The top and bottom are indicated by paint color.

- Perform final tightening of rear suspension member and axle installation position (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-18, "SERVICE DATA" .



STABILIZER BAR

PFP:56230

Removal and Installation

AES0003K

REMOVAL

1. Remove fixing bolts and remove stabilizer connecting rod mount bracket from suspension arm.
2. Remove lower side fixing nut on stabilizer connecting rod and remove stabilizer connecting rod from stabilizer bar with power tool.
3. Remove fixing nut on stabilizer clamp and remove stabilizer from vehicle with power tool.

INSPECTION AFTER REMOVAL

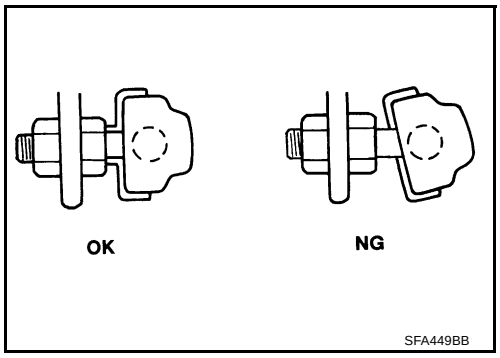
- Check stabilizer bar, stabilizer bushings, stabilizer clamp, stabilizer connecting rod, stabilizer connecting rod mounting bracket for any deformation, crack or damage. Replace if necessary.

INSTALLATION

- Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.

- Stabilizer bar uses pillow ball type connecting rod, position ball joint with case on pillow ball head parallel to stabilizer bar.



REAR SUSPENSION MEMBER

PFP:55501

Removal and Installation

AES000BV

REMOVAL

1. Remove tire with power tool.
2. Remove brake caliper with power tool. Hang it in a place where it will not interfere with work. Refer to BR-38, "REAR DISC BRAKE (AD14VE TYPE)" , BR-44, "REAR DISC BRAKE (OPB13VB TYPE)" .

   NOTE:
   Avoid depressing brake pedal while brake caliper is removed.
3. Remove rear exhaust tube. Refer to EX-3, "EXHAUST SYSTEM" .
4. Remove stabilizer bar. Refer to RSU-16, "STABILIZER BAR" .
5. Remove drive shaft. Refer to RAX-10, "REAR DRIVE SHAFT" .
6. Remove final drive. Refer to RFD-10, "REAR FINAL DRIVE ASSEMBLY" .
7. Separate the attachment between parking brake cable and vehicle and rear suspension member. Refer to PB-3, "PARKING BRAKE CONTROL" .
8. Remove rear lower link and coil spring. Refer to RSU-15, "REAR LOWER LINK & COIL SPRING" .
9. Remove fixing bolt in lower side of shock absorber.
10. Set jack under rear suspension member.
11. Remove fixing bolts and nuts tunnel stay and member stay from vehicle.
12. Remove fixing bolts and nuts of rear pin stay and then remove rear pin stay from vehicle.
13. Slowly lowering jack, then remove rear suspension member, suspension arm, radius rod, front lower link and axle from vehicle as a unit.
14. Remove fixing bolts and nuts, then remove suspension arm, front lower link, radius rod from rear suspension member.

INSPECTION AFTER REMOVAL

- Check rear suspension member for deformation, cracks, and other damage and replace if necessary.

INSTALLATION

- Refer to RSU-7, "Components" , for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of installation position of links (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-18, "SERVICE DATA" .

SERVICE DATA

PFP:00030

Wheel Alignment

AES0003L

Camber Degree minute (Decimal degree)		Minimum	- 2° 05′ (- 2.08°)
		Nominal	- 1° 35′ (- 1.58°)
		Maximum	- 1° 05′ (- 1.08°)
Total toe-in	Distance (A - B)	Minimum	0.2 mm (0.008 in) [17 inch tire] 1.1 mm (0.043 in) [18 inch tire]
		Nominal	1.0 mm (0.039 in) [17 inch tire] 1.9 mm (0.075 in) [18 inch tire]
		Maximum	1.8 mm (0.071 in) [17 inch tire] 2.7 mm (0.106 in) [18 inch tire]

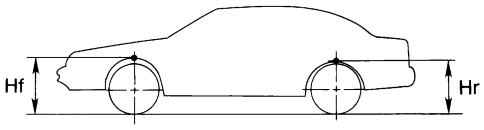
Ball Joint

AES0003M

Axial end play	0 mm (0 in)
Swing torque	0.5 - 3.4 N·m (0.06 - 0.34 kg-m, 5 - 30 in-lb)
Measurement on spring balance (cotter pinhole position)	8.06 - 54.8 N (0.83 - 5.5 kg, 1.81 - 12.32 lb)
Rotating torque	0.5 - 3.4 N·m (0.06 - 0.34 kg-m, 5 - 30 in-lb)

Wheelarch Height (Unladen*)

AES0003N



SFA818A

Applied model	225/50R17 (Front) 235/50R17 (Rear)		225/45R18 (Front) 245/45R18 (Rear)	
	Coupe	Road star	Coupe	Road star
Front (Hf)	681 mm (26.81 in)	679 mm (26.73 in)	683 mm (26.89 in)	
Rear (Hr)	700 mm (27.56 in)	699 mm (27.52 in)	706 mm (27.80 in)	705 mm (27.76 in)

*: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.

SECTION WT
ROAD WHEELS & TIRES

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PRECAUTIONS

PFP:00001

Precautions for Battery Service

AES000DR

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

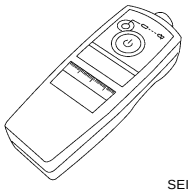
PREPARATION

PFP:00002

Special Service Tools

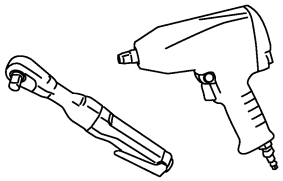
AES0004K

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
(J45295) Transmitter activation tool  SEIA0462E	ID registration

Commercial Service Tools

AES0004L

Tool name	Description
Power tool  PBIC0190E	Removing wheel nuts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

AES0004M

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page			FAX-4,FSU-5	WT-6	—	—	—	—	—	—	NVH in PR section.	NVH in RFD section.	NVH in FAX and FSU sections.	NVH in RAX and RSU sections.	Refer to TIRES in this chart.	Refer to ROAD WHEEL in this chart.	NVH in RAX section.	NVH in BR section.	NVH in PS section.
Possible cause and SUSPECTED PARTS			Improper installation, looseness	Out-of-round	Imbalance	Incorrect tire pressure	Uneven tire wear	Deformation or damage	Non-uniformity	Incorrect tire size	PROPELLER SHAFT	DIFFERENTIAL	FRONT AXLE AND FRONT SUSPENSION	REAR AXLE AND REAR SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKE	STEERING
Symptom	TIRES	Noise	×	×	×	×	×	×	×		×	×	×	×		×	×	×	×
		Shake	×	×	×	×	×	×		×	×		×	×		×	×	×	×
		Vibration				×				×	×		×	×			×		×
		Shimmy	×	×	×	×	×	×	×	×			×	×		×		×	×
		Judder	×	×	×	×	×	×		×			×	×		×		×	×
		Poor quality ride or handling	×	×	×	×	×	×		×			×	×		×			
	ROAD WHEEL	Noise	×	×	×			×			×	×	×	×	×		×	×	×
		Shake	×	×	×			×			×		×	×	×		×	×	×
		Shimmy, judder	×	×	×			×					×	×	×			×	×
		Poor quality ride or handling	×	×	×			×					×	×	×				

×: Applicable

ROAD WHEEL

PFP:40300

Inspection

AES000DH

ALUMINUM WHEEL

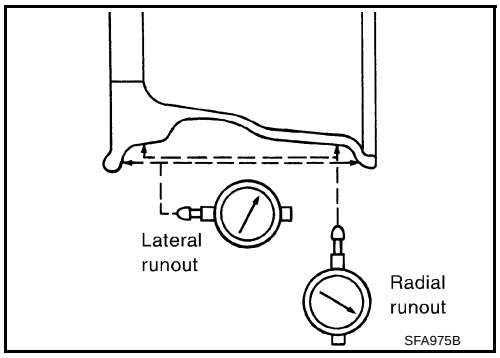
1. Check tires for wear and improper inflation.
2. Check wheels for deformation, cracks and other damage. If deformed, remove wheel and check wheel runout.

a. Remove tire from aluminum wheel and mount on a tire balance machine.

b. Set dial indicator as shown in the illustration.

Wheel runout (Dial indicator value):

Refer to WT-34, "SERVICE DATA"



STEEL WHEEL

1. Check tires for wear and improper inflation.
2. Check wheels for deformation, cracks and other damage. If deformed, remove wheel and check wheel runout.

a. Remove tire from steel wheel and mount wheel on a tire balance machine.

b. Set two dial indicators as shown in the illustration.

c. Set each dial indicator to 0.

d. Rotate wheel and check dial indicators at several points around the circumference of the wheel.

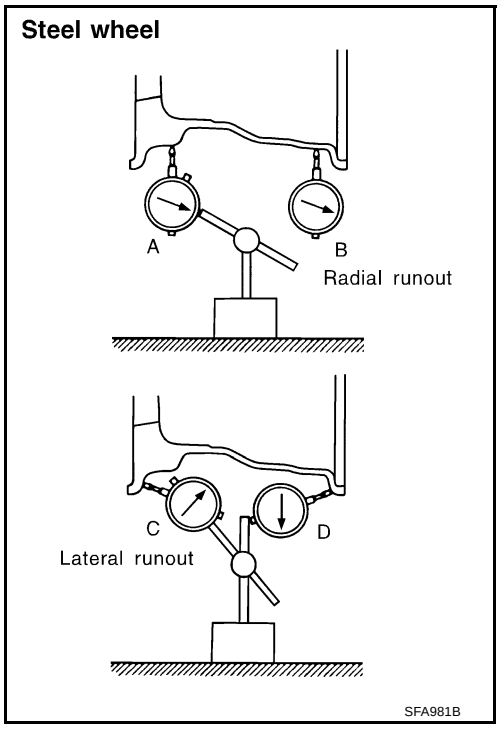
e. Calculate runout at each point as shown below.

Radial runout = (A+B)/2

Lateral runout = (C+D)/2

f. Select maximum positive runout value and the maximum negative value.
Add the two values to determine total runout.
In case a positive or negative value is not available, use the maximum value (negative or positive) for total runout.
If the total runout value exceeds the limit, replace steel wheel.

Wheel runout : Refer to WT-34, "SERVICE DATA"



ROAD WHEEL TIRE ASSEMBLY

PFP:40300

Balancing Wheels (Bonding Weight Type)

AES000DL

REMOVAL

1. Remove inner and outer balance weights from the road wheel.

   CAUTION:
   Be careful not to scratch the road wheel during removal.

2. Using releasing agent, remove double-faced adhesive tape from the road wheel.

   CAUTION:
   - **Be careful not to scratch the road wheel during removal.**
   - **After removing double-faced adhesive tape, wipe clean traces of releasing agent from the road wheel.**

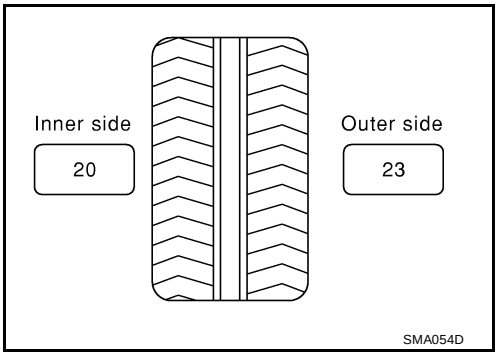
WHEEL BALANCE ADJUSTMENT

- If a tire balance machine has adhesion balance weight mode settings and drive-in weight mode setting, select and adjust a drive-in weight mode suitable for road wheels.

1. Set road wheel on wheel balancer using the center hole as a guide. Start the tire balance machine.
2. When inner and outer unbalance values are shown on the wheel balancer indicator, multiply outer unbalance value by 5/3 to determine balance weight that should be used. Select the outer balance weight with a value closest to the calculated value above and install it to the designated outer position of, or at the designated angle in relation to the road wheel.

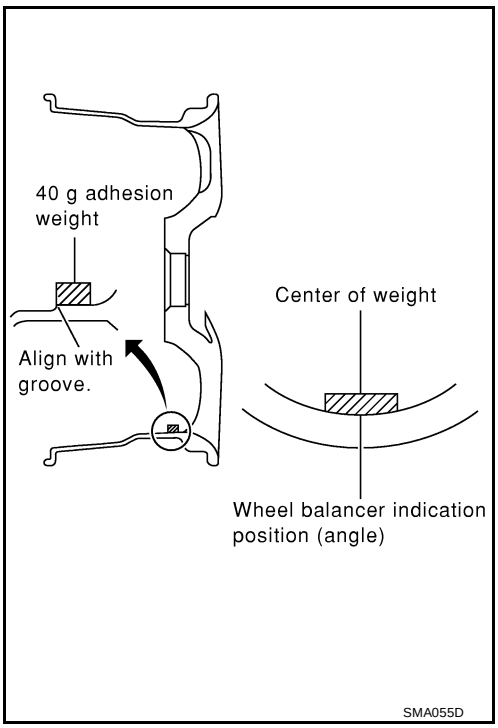
   CAUTION:
   - **Do not install the inner balance weight before installing the outer balance weight.**
   - **Before installing the balance weight, be sure to clean the mating surface of the road wheel.**

   Indicated unbalance value × 5/3 = balance weight to be installed
   Calculation example:
   23 g (0.81 oz) × 5/3 = 38.33 g (1.35 oz) = 40 g (1.41 oz) balance weight (closer to calculated balance weight value)
   Note that balance weight value must be closer to the calculated balance weight value.
   Example:
   37.4 = 35 g (1.23 oz)
   37.5 = 40 g (1.41 oz)



   a. Install balance weight in the position shown in the figure at left.
   b. When installing balance weight to road wheels, set it into the grooved area on the inner wall of the road wheel as shown in the figure so that the balance weight center is aligned with the wheel balancer indication position (angle).

   CAUTION:
   - **Always use genuine Nissan adhesion balance weights.**
   - **Balance weights are unreusable; always replace with new ones.**
   - **Do not install more than three sheets of balance weight.**



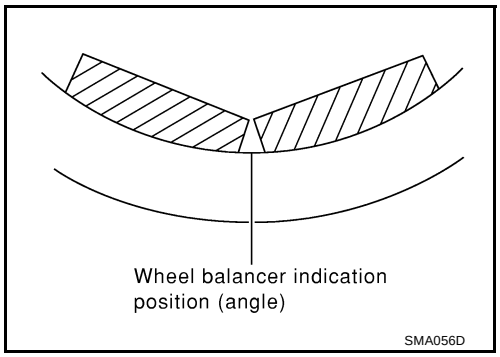
c. If calculated balance weight value exceeds 50 g (1.76 oz), install two balance weight sheets in line with each other (as shown in the figure).

CAUTION:
Do not install one balance weight sheet on top of another.

3. Start wheel balancer again.
4. Install drive-in balance weight on inner side of road wheel in the wheel balancer indication position (angle).

CAUTION:
Do not install more than two balance weights.

5. Start wheel balancer. Make sure that inner and outer residual unbalance values are 10 g (0.35 oz) each or below.
   - If either residual unbalance value exceeds 10 g (0.35 oz), repeat installation procedures.



Wheel balance (Maximum allowable unbalance):

Maximum allowable unbalance	Dynamic (At rim flange)	10 g (0.35 oz) (one side)
	Static (At rim flange)	20 g (0.71 oz)

Tire Rotation

AES000DJ

CAUTION:
Do not include the T-type spare tire when rotating the tires

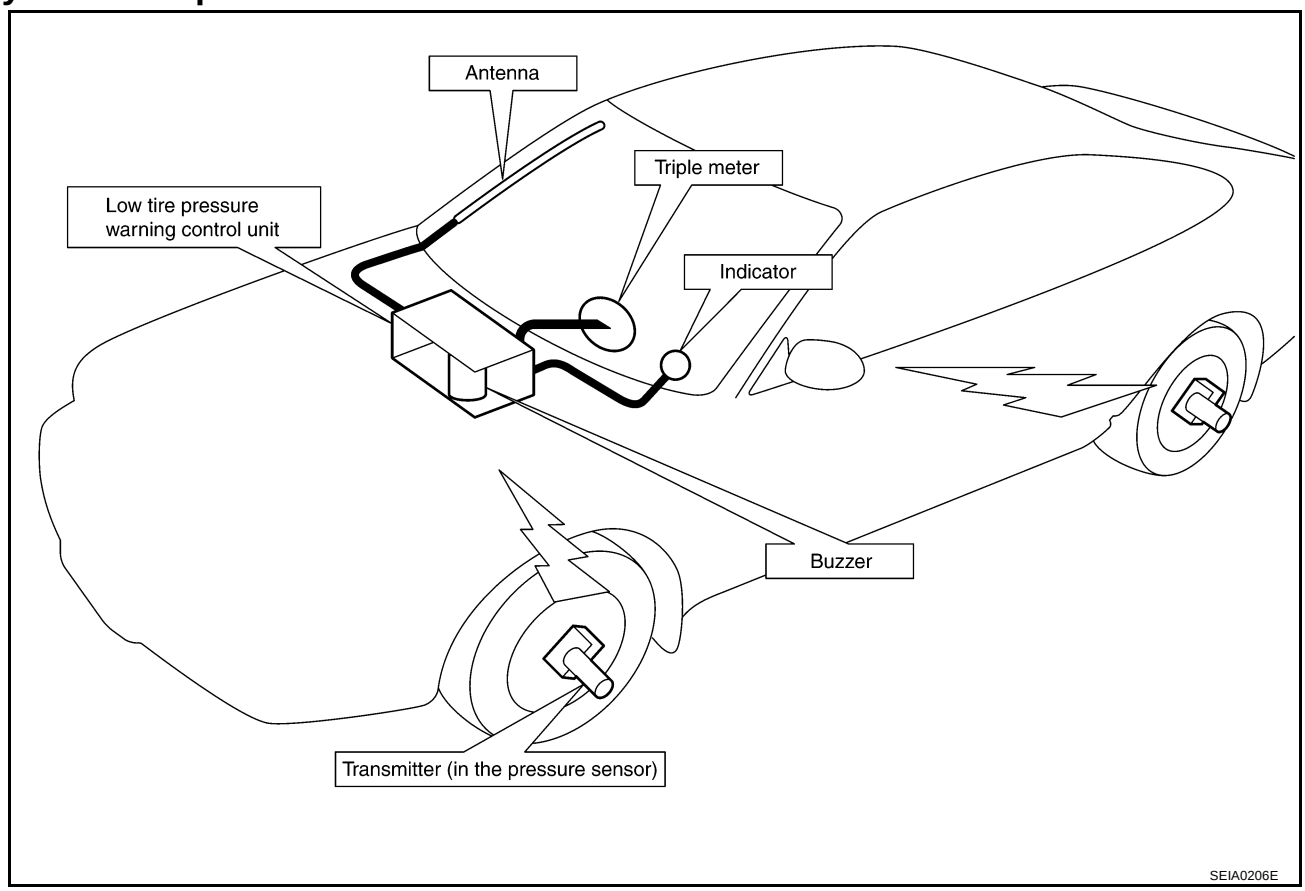
NOTE:
Tire cannot be rotated in vehicle, as front tire are different size from rear tire and the direction of wheel rotation is fixed in each tire.

LOW TIRE PRESSURE WARNING SYSTEM

PFP:40300

System Components

AES0004Q

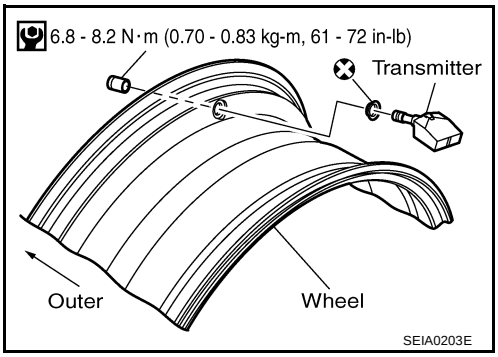


System Description

AES0004R

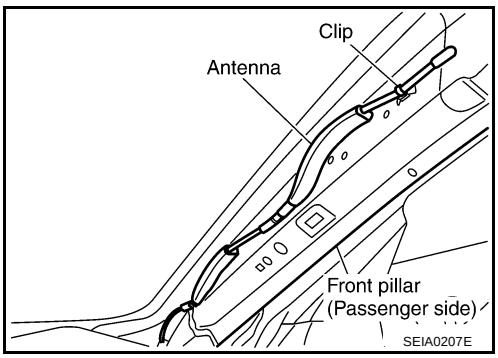
TRANSMITTER

A sensor-transmitter integrated with a valve is installed on a wheel, and transmits a detected air pressure signal in the form of a radio wave.



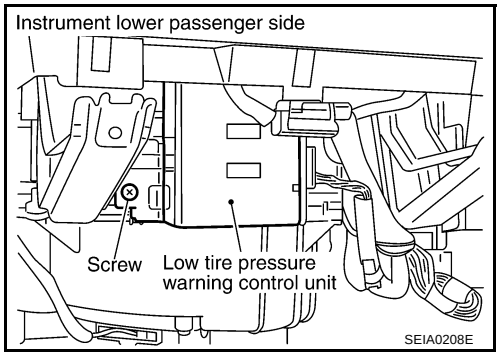
ANTENNA

Receives the radio wave signal transmitted by the transmitter.



LOW TIRE PRESSURE WARNING CONTROL UNIT

Reads the radio wave signal received by the antenna, and controls the warning lamp and the buzzer operations as shown below. It also has a judgement function to detect a system malfunction.

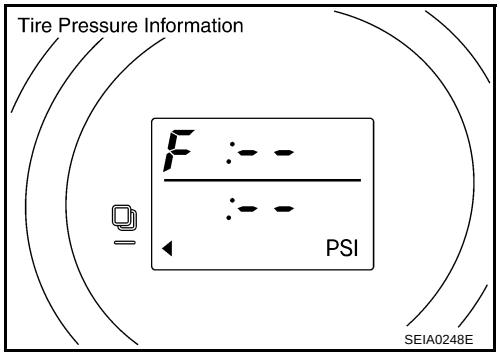


Condition	Warning lamp	Buzzer
Less than 200 kPa (2.0 kg/cm^2 , 28 psi) [Flat tire]	ON	Sounds for 10 sec.
System malfunction	ON	OFF

DISPLAY (TRIPLE METER)

Displays the air pressure of each tire.

- After the ignition switch is turned ON, the pressure values are not be displayed until the data of all four wheels stabilizes.



CAN COMMUNICATION

PFP:23710

System Description

AES000DF

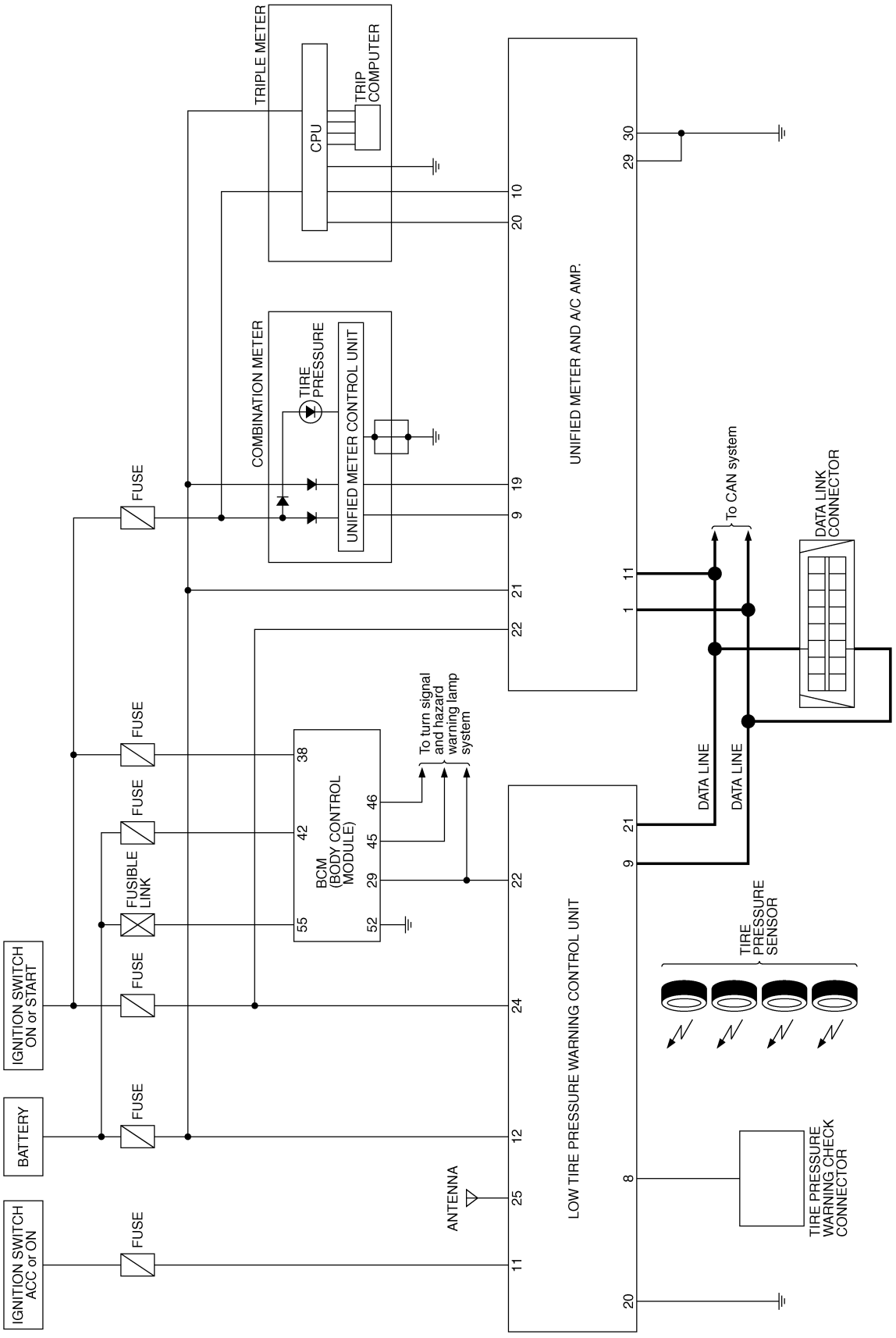
CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.
Refer to LAN-5, "CAN Communication Unit" .

TROUBLE DIAGNOSES

PFP:00004

Schematic

AES000AW

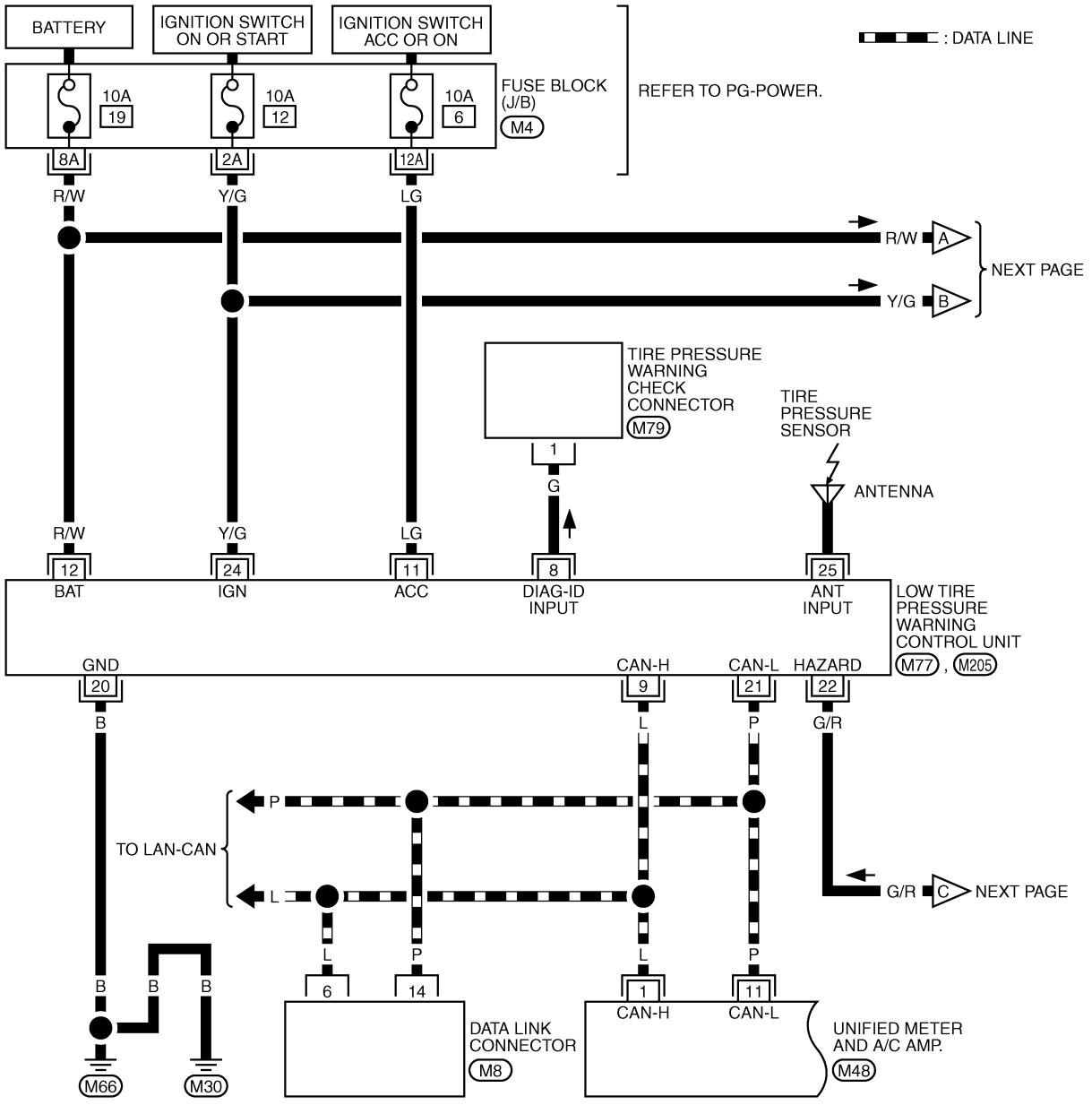


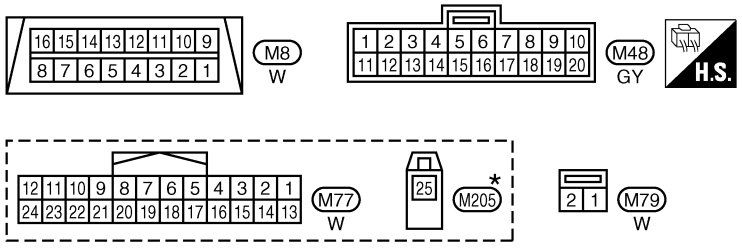
TEWT0014E

Wiring Diagram

AES000AH

WT-T/WARN-01



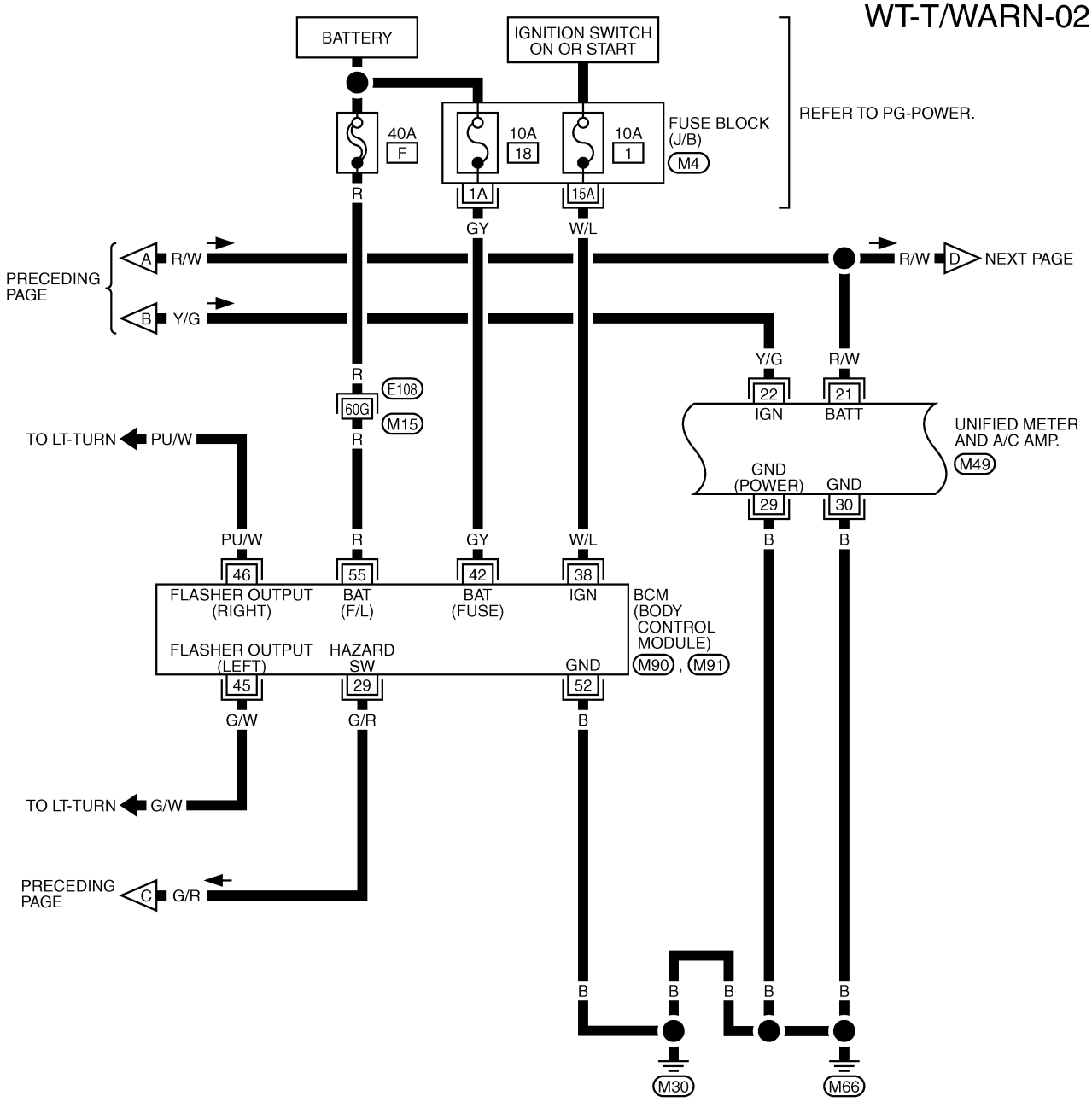


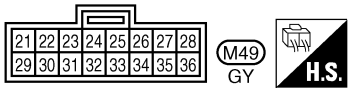
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TEWT0008E

WT-T/WARN-02





REFER TO THE FOLLOWING.

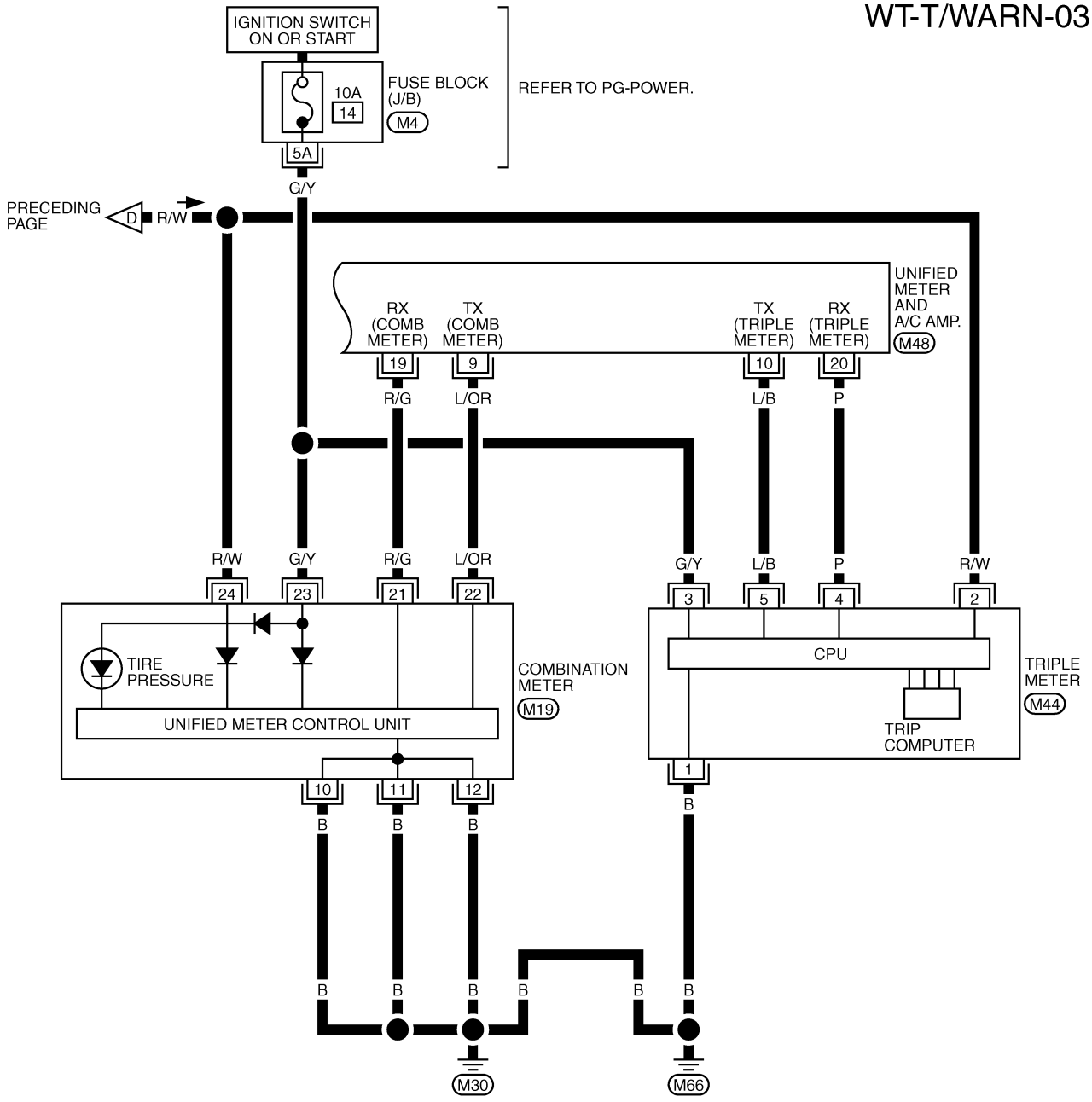
E108 -SUPER MULTIPLE JUNCTION (SMJ)

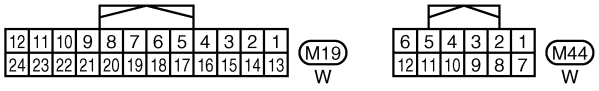
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

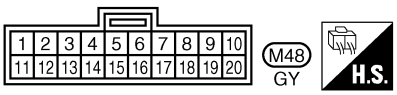
M90 , M91 -ELECTRICAL UNITS

TEWT0016E

WT-T/WARN-03







REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TEWT0004E

Control Unit Input/Output Signal Standard

AES000AV

Standards using a circuit tester and oscilloscope.

Measurement terminal		Measuring point	Standard value	
+	–			
8 (G)	Body ground	Tire pressure warning check switch	Always	Approx. 5V
9 (L)		Data line (CAN H)	—	—
11 (LG)		Ignition switch ON or ACC	Ignition switch ON	Battery voltage (Approx. 12V)
12 (R/W)		Battery power supply	Always	Battery voltage (Approx. 12V)
20 (B)		GND	—	Approx. 0V
21 (R)		Data line (CAN L)	—	—
22 (G/R)		Hazard	Hazard lamp switch OFF	Battery voltage (Approx. 12V)
			Hazard lamp switch ON	Approx. 0V
24 (Y/G)		Ignition switch ON or IGN		Battery voltage (Approx. 12V)
25		Antenna	—	—

( ) : Wire color

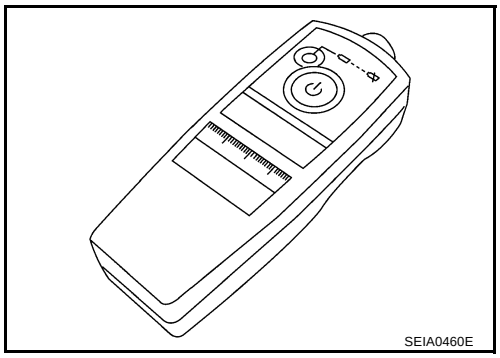
ID Registration Procedure

AES000AI

ID REGISTRATION WITH TRANSMITTER ACTIVATION TOOL

1. Turn ignition switch "OFF".
2. Connect CONSULT-II and CONSULT-II CONVERTER to data link connector.

   NOTE:
   If "AIR PRESSURE MONITOR" is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .
3. Touch “AIR PRESSURE MONITOR”, “WORK SUPPORT” and “ID REGIST”.
4. With the transmitter activation tool (J-45295) pushed against the front-left transmitter, press the button then keep 5 seconds.



5. Register the IDs in order from FR LH, FR RH, RR RH or RR LH. When ID registration of each wheel has been completed, a buzzer sounds and hazard warning lamp blinks.

Activation tire position		Buzzer	Hazard warning lamp	CONSULT-II
1	Front LH	Once	2 times flashing	“YET” ↓ “DONE”
2	Front RH	2 times		
3	Rear RH	3 times		
4	Rear LH	4 times		

6. After completing all ID registrations, press “END” to complete the procedure.

NOTE:
Be sure to register the IDs in order from FR LH, FR RH, RR RH, to RR LH, or the self-diagnostic results display will not function properly.

ID REGISTRATION WITHOUT TRANSMITTER ACTIVATION TOOL

1. Turn ignition switch "OFF".
2. Connect CONSULT-II and CONSULT-II CONVERTER to data link connector.

   NOTE:
   If "AIR PRESSURE MONITOR" is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .
3. Touch “AIR PRESSURE MONITOR”, “WORK SUPPORT” and “ID REGIST”.
4. Adjust the tire pressure to the values shown in the table below for ID registration, and drive the vehicle at 15 km/h (9.4 MPH) or more for a few minutes.

Tire position	Tire pressure kPa (kg/cm^2 , psi)
Front – Left	260 (2.6, 37)
Front – Right	240 (2.4, 34)
Rear – Right	220 (2.2, 31)
Rear – Left	200 (2.0, 28)

5. After completing all ID registrations, press “END” to complete the procedure.

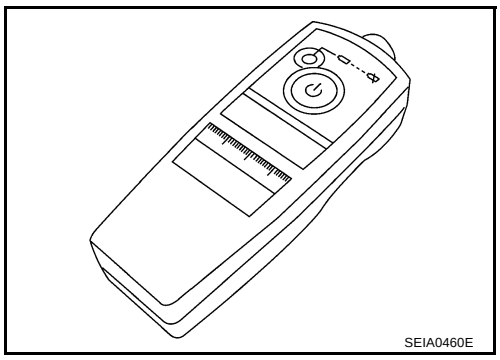
Activation tire position	CONSULT-II
Front LH	“YET” ↓ “DONE”
Front RH	
Rear RH	
Rear LH	

Transmitter Wake Up Operation

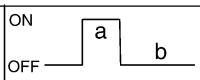
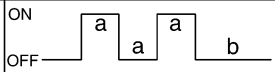
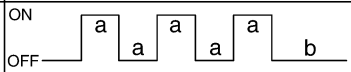
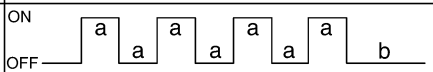
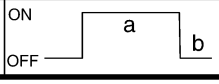
AES000DP

WITH TRANSMITTER ACTIVATION TOOL

1. With the transmitter activation tool (J-45295) pushed against the front-left transmitter, press the button then keep 5 seconds.
   - When ignition switch ON, then warning lamp is blinks as follow diagram transmitter must be waken up.


SEIA0460E

2. Register the IDs in order from FR LH, FR RH, RR RH or RR LH. When ID registration of each wheel has been completed, a hazard warning lamp blinks.

	Warning lamp blinking timing		Need to activation tire position	Hazard warning lamp
1		a : 0.3sec b : 1.3sec	Front LH	2 time flashing
2		a : 0.3sec b : 1.3sec	Front RH	
3		a : 0.3sec b : 1.3sec	Rear RH	
4		a : 0.3sec b : 1.3sec	Rear LH	
5		a : 2sec b : 0.2sec	All tire	

SEIA0351E

3. After completing wake up all transmitters, make sure tire pressure warning lamp go out.

Self-Diagnosis

AES000AX

DESCRIPTION

During driving, the low tire pressure warning system receives the signal transmitted from the transmitter installed in each wheel, and gives alarms when the tire pressure becomes low. The control unit of this system has pressure judgement and trouble diagnosis functions.

FUNCTION

When the low tire pressure warning system detects low inflation pressure or another unusual symptom, the warning lamps in the combination meter comes on. To start the self-diagnostic results mode, ground the self-diagnostic (check) terminal. The malfunction location is indicated by the warning lamp flashing and the buzzer sounds.

CONSULT-II

CONSULT-II Main Function

In a diagnosis function (main function), there are “WORK SUPPORT”, “SELF-DIAGNOSTIC RESULTS”, “DATA MONITOR”, “CAN DIAG SUPPORT MNTR”.

Diagnostic test mode	Function
WORK SUPPORT	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT-II.
SELF-DIAGNOSTIC RESULTS	Self-diagnostic results can be read and erased quickly.
DATA MONITOR	Input/Output data in the control unit can be read.
CAN DIAG SUPPORT MNTR	The results of transmit/receive diagnosis of communication can be read.

CONSULT-II Application to Low Tire Pressure Warning System

ITEM	SELF-DIAGNOSTIC RESULTS	DATA MONITOR
Front - Left transmitter	×	×
Front - Right transmitter	×	×
Rear - Left transmitter	×	×
Rear - Right transmitter	×	×
Warning lamp	—	×
Vehicle speed	×	×
Buzzer (in control unit)	—	×

× : Applicable
– : Not applicable

Self-Diagnostic Results Mode

Diagnostic item	Diagnostic item is detected when …
FLAT - TIRE - FL FLAT - TIRE - FR FLAT - TIRE - RR FLAT - TIRE - RL	Front-left tire pressure drops to 200 kPa(2.0 kg/cm^2 , 28 psi) or less Front-right tire pressure drops to 200 kPa(2.0 kg/cm^2 , 28 psi) or less Rear-right tire pressure drops to 200 kPa(2.0 kg/cm^2 , 28 psi) or less Rear-left tire pressure drops to 200 kPa(2.0 kg/cm^2 , 28 psi) or less
[NO-DATA] - FL [NO-DATA] - FR [NO-DATA] - RR [NO-DATA] - RL	Data from front-left transmitter cannot be received. Data from front-right transmitter cannot be received. Data from rear-right transmitter cannot be received. Data from rear-left transmitter cannot be received.
[CHECKSUM- ERR] - FL [CHECKSUM- ERR] - FR [CHECKSUM- ERR] - RR [CHECKSUM- ERR] - RL	Checksum data from front-left transmitter is malfunctioning. Checksum data from front-right transmitter is malfunctioning. Checksum data from rear-right transmitter is malfunctioning. Checksum data from rear-left transmitter is malfunctioning.
[PRESSDATA- ERR] - FL [PRESSDATA- ERR] - FR [PRESSDATA- ERR] - RR [PRESSDATA- ERR] - RL	Air pressure data from front-left transmitter is malfunctioning. Air pressure data from front-right transmitter is malfunctioning. Air pressure data from rear-right transmitter is malfunctioning. Air pressure data from rear-left transmitter is malfunctioning.
[CODE- ERR] - FL [CODE- ERR] - FR [CODE- ERR] - RR [CODE- ERR] - RL	Function code data from front-left transmitter is malfunctioning. Function code data from front-right transmitter is malfunctioning. Function code data from rear-right transmitter is malfunctioning. Function code data from rear-left transmitter is malfunctioning.
[BATT - VOLT - LOW] - FL [BATT - VOLT - LOW] - FR [BATT - VOLT - LOW] - RR [BATT - VOLT - LOW] - RL	Battery voltage of front-left transmitter drops. Battery voltage of front-right transmitter drops. Battery voltage of rear-right transmitter drops. Battery voltage of rear-left transmitter drops.
VHCL_SPEED_SIG_ERR	Vehicle speed signal is error.

NOTE:
Before performing the self-diagnosis, be sure to register the ID. Or, the actual malfunction location may be different from that displayed on CONSULT-II.

Data Monitor Mode

MONITOR	CONDITION	SPECIFICATION
VHCL SPEED SE	Drive vehicle.	Vehicle speed (km/h or MPH)
AIR PRESS FL AIR PRESS FR AIR PRESS RR AIR PRESS RL	● Drive vehicle for a few minutes. or ● Ignition switch ON and activation tool is transmitting activate signals.	Tire pressure (kPa or Psi)
ID REGST FL ID REGST FR ID REGST RR ID REGST RL	Ignition switch ON	Registration ID: DONE No registration ID: YET
WARNING LAMP		Warning lamp on: ON Warning lamp off: OFF
BUZZER		Buzzer in Low tire pressure warning control unit on: ON Buzzer in Low tire pressure warning control unit off: OFF

NOTE:
Before performing the self-diagnosis, be sure to register the ID. Or, the actual malfunction location may be different from that displayed on CONSULT-II.

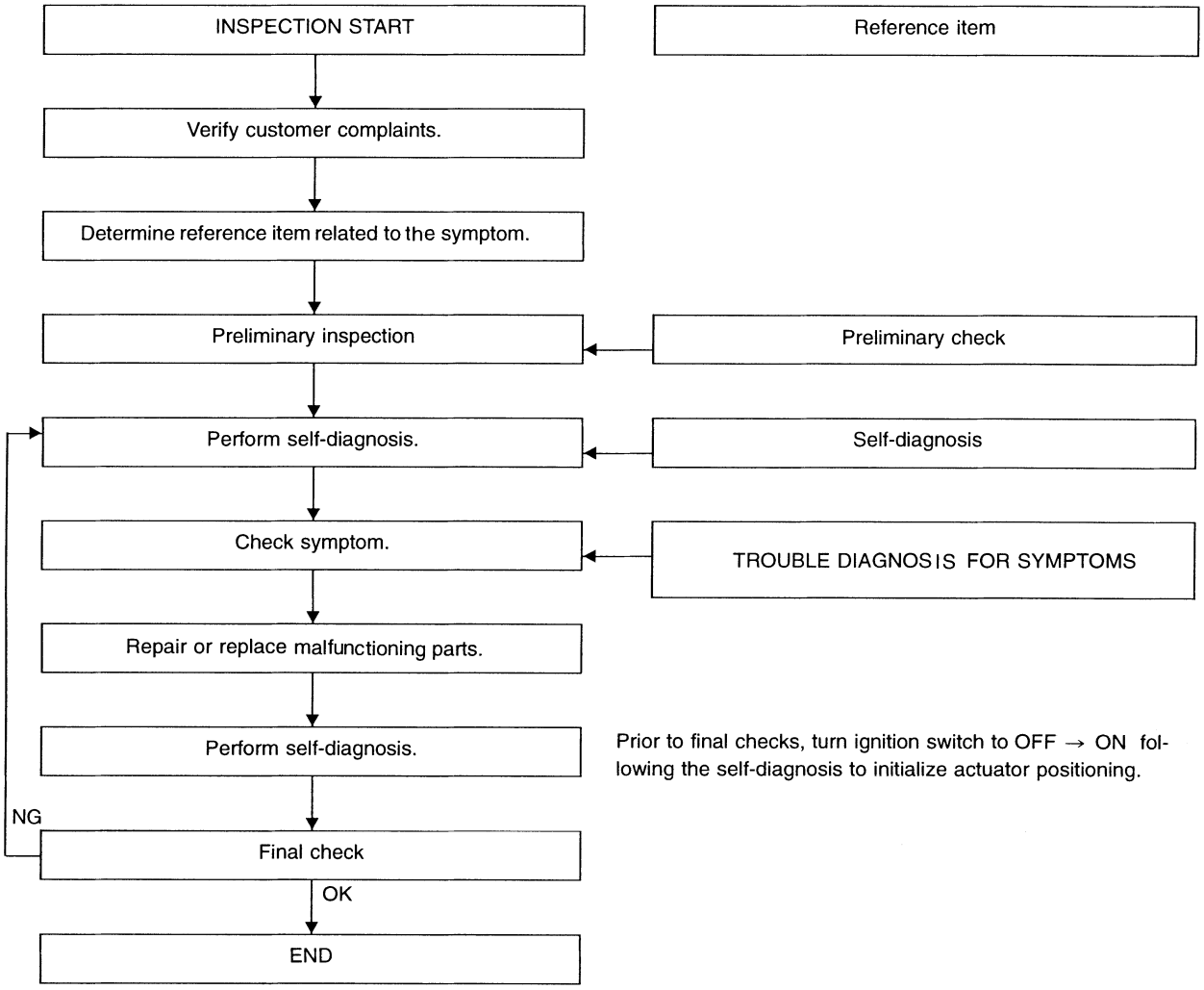
How to Perform Trouble Diagnosis for Quick and Accurate Repair

AES000AY

INTRODUCTION

- Before troubleshooting, verify customer complaints.
- If a vehicle problem is hard to reproduce, harnesses, harness connectors or terminals may often be malfunctioning. Hold and shake these parts by hand to make sure they are securely connected.
- When using a circuit tester to measure voltage or resistance of each circuit, be careful not to expand connector terminals.

WORK FLOW



SEIA0100E

Preliminary check : WT-22 Self-diagnosis : WT-19 Trouble diagnosis for symptoms : WT-27

Preliminary Check

AES000AZ

BASIC INSPECTION

1. CHECK ALL TIRES PRESSURES

- Check all tires pressures.

Tire pressure : 240 kPa (2.4 kg/cm^2 , 34 psi)

OK or NG?

OK >> GO TO 2.
NG >> Adjust tire pressure to specified value.

2. CHECK CONNECTOR

1. Disconnect low tire pressure warning control unit connector M77.
2. Check terminals for damage or loose connection.

Inspection results OK?

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. CHECK TRANSMITTER ACTIVATION TOOL

- Check transmitter tool battery.

OK or NG?

OK >> Carry out self-diagnosis.
NG >> Replace transmitter activation tool battery.

Malfunction Code/Symptom Chart

AES000B0

Code/Symptom	Malfunction part	Reference page
15 16 17 18	Front-left tire pressure drops to 200 kPa (2.0 kg/cm^2 , 28 psi) or less Front-right tire pressure drops to 200 kPa (2.0 kg/cm^2 , 28 psi) or less Rear-right tire pressure drops to 200 kPa (2.0 kg/cm^2 , 28 psi) or less Rear-left tire pressure drops to 200 kPa (2.0 kg/cm^2 , 28 psi) or less	—
21 22 23 24	Transmitter no data (front - left) Transmitter no data (front - right) Transmitter no data (rear - right) Transmitter no data (rear - left)	WT-24
31 32 33 34	Transmitter checksum error (front - left) Transmitter checksum error (front - right) Transmitter checksum error (rear - right) Transmitter checksum error (rear - left)	WT-25
35 36 37 38	Transmitter pressure data error (front - left) Transmitter pressure data error (front - right) Transmitter pressure data error (rear - right) Transmitter pressure data error (rear - left)	WT-25
41 42 43 44	Transmitter function code error (front - left) Transmitter function code error (front - right) Transmitter function code error (rear - right) Transmitter function code error (rear - left)	WT-25
45 46 47 48	Transmitter battery voltage low (front - left) Transmitter battery voltage low (front - right) Transmitter battery voltage low (rear - right) Transmitter battery voltage low (rear - left)	WT-25
52	Vehicle speed signal	WT-26
Warning lamp does not come on when ignition switch is turned on.	Fuse or unified meter and A/C amp. Low tire pressure warning control unit connector or circuit Low tire pressure warning control unit	WT-27
Warning lamp stays on when ignition switch is turned on.	Fuse or unified meter and A/C amp. Low tire pressure warning control unit connector or circuit Low tire pressure warning control unit	WT-28
Warning lamp blinks when ignition switch is turned on.	Low tire pressure warning control unit harness connector or circuit Low tire pressure warning control unit Transmitter's mode off ID registration not yet	WT-29
Hazard warning lamp blinks when ignition switch is turned on.	Low tire pressure warning control unit harness connector or circuit Low tire pressure warning control unit	WT-30
“TIRE PRESSURE” information in triple meter does not exist.	Fuse Triple meter Low tire pressure warning control unit	WT-30
ID registration can not be operated.	Transmitter Antenna harness connector or circuit Antenna	WT-31

TROUBLE DIAGNOSIS FOR SELF-DIAGNOSTIC ITEMS

PFP:00000

Inspection 1: Transmitter or Low Tire Pressure Warning Control Unit

AES000OF

MALFUNCTION CODE NO. 21, 22, 23 OR 24

1. CHECK CONTROL UNIT

- Drive for several minutes. Check all tires' pressure with CONSULT-II “DATA MONITOR ITEM”.

Are all tires' pressure displayed 0 kPa?

YES >> GO TO 2.
NO >> GO TO 3.

2. CHECK ANTENNA CONNECTOR

- Check antenna and feeder connector M205 for damage or loose connections.

OK or NG

OK >> Replace control unit, then GO TO 3.
NG >> Repair or replace antenna or feeder connector.

3. ID REGISTRATION

- Carry out ID registration of all transmitters.

Is there a tire that cannot register ID?

YES >> Replace transmitter of the tire, then GO TO 5.
NO >> GO TO 4.

4. VEHICLE DRIVING

- Drive at a speed of 40 km/h (25 MPH) or more for several minutes without stopping.
  Check all tires' pressure with CONSULT-II “DATA MONITOR ITEM” within 15 minutes after vehicle speed becomes 17 km/h (11 MPH).

Does “DATA MONITOR ITEM” displayed tire pressure as normal without any warning lamp?

YES >> INSPECTION END.
NO >> GO TO 5.

5. ID REGISTRATION AND VEHICLE DRIVING

1. Carry out ID registration of all transmitters.
2. Drive at a speed of 40 km/h (25 MPH) or more for 3 minutes, and then drive the vehicle at any speed for 10 minutes. Then check all tires' pressure with CONSULT-II “DATA MONITOR ITEM” within 5 minutes.

Does “DATA MONITOR ITEM” displayed tire pressure as normal without any warning lamp?

YES >> INSPECTION END.
NO >> GO TO the inspection applicable to DTC.

Inspection 2: Transmitter - 1

AES000OG

MALFUNCTION CODE NO. 31, 32, 33, 34, 41, 42, 43, 44, 45, 46, 47 OR 48

1. ID REGISTRATION (CORRECTION OF TRANSMITTER LOCATION)

1. Carry out ID registration of all transmitters.
2. Drive at a speed of 40 km/h (25 MPH) or more for 3 minutes, and then drive the vehicle at any speed for 10 minutes. Then check all tires' pressure with CONSULT-II “DATA MONITOR ITEM” within 5 minutes.

>> GO TO 2.

2. REPLACE TRANSMITTER

1. Check warning lamp for blink again, replace malfunctioning transmitter.
2. Carry out ID registration of all transmitter.

Can ID registration of all transmitters be completed?

YES >> GO TO 3.
NO >> GO TO the inspection 1.

3. VEHICLE DRIVING

- Drive at a speed of 40 km/h (25 MPH) or more for 3 minutes, and then drive the vehicle at any speed for 10 minutes. Then check all tires' pressure with CONSULT-II “DATA MONITOR ITEM” within 5 minutes.

Does “DATA MONITOR ITEM” displayed tire pressure as normal without any warning lamp?

YES >> INSPECTION END.
NO >> Replace malfunctioning transmitter, and perform “Step 3” again.

Inspection 3: Transmitter - 2

AES000OH

MALFUNCTION CODE NO. 35, 36, 37 OR 38

1. CHECK ALL TIRE PRESSURE

- Check all tire pressures.

Tire pressure : 240 kPa (2.4 kg/m^2 , 34 psi)

Are there any tires' which pressure is “64 psi” or more?

YES >> GO TO 2.
NO >> Adjust tire pressure to specified value.

2. VEHICLE DRIVING

1. Carry out ID registration of all transmitters.
2. Drive at a speed of 40 km/h (25 MPH) or more for several minutes without stopping.
   Check all tires' pressure with CONSULT-II “DATA MONITOR ITEM” within 15 minutes after vehicle speed become 17 km/h (11 MPH).

>> Replace transmitter with new one if “DATA MONITOR ITEM” displayed 64 psi or more. Then GO TO 3.

3. ID REGISTRATION AND VEHICLE DRIVING

1. Carry out ID registration of all transmitters.
2. Drive at a speed of 40 km/h (25 MPH) or more for 3 minutes, and then drive the vehicle at any speed for 10 minutes. Then check all tires' pressure with CONSULT-II “DATA MONITOR ITEM” within 5 minutes.

Does “DATA MONITOR ITEM” displayed tire pressure as normal without any warning lamp?

YES >> INSPECTION END.
NO >> GO TO the inspection applicable to DTC.

Inspection 4: Vehicle Speed Signal

AES000OI

MALFUNCTION CODE NO. 52

1. SELF-DIAGNOSIS RESULT CHECK

1. Connect CONSULT-II and CONSULT-II CONVERTER to data link connector.

   NOTE:
   If “AIR PRESSURE MONITOR” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .
2. Select “AIR PRESSURE MONITOR” on “SELECT SYSTEM” screen.
3. Select “SELF-DIAG RESULTS” on “SELECT DIAG MODE” screen.
4. Check display contents in self-diagnostic results.

Is ”CAN COMM CIRCUIT” displayed in the self-diagnosis display items?

YES >> Malfunction in CAN communication system. GO TO LAN-3, "Precautions When Using CONSULT-II" .

NO >> Check unified meter and A/C amp. self-diagnostic. Refer to DI-59, "SELF-DIAGNOSIS RESULTS" .

TROUBLE DIAGNOSIS FOR SYMPTOMS

PFP:00007

Inspection 1: Warning Lamp Does Not Come On When Ignition Switch Is Turned On.

AES000AR

Before carrying out the inspection on the following diagnostic procedure, perform the CAN communication line check. Refer to WT-31, "Inspection 7: CAN Communication Line" .

DIAGNOSTIC PROCEDURE

1. CHECK COMBINATION METER

- Check combination meter operation.

Inspection results OK?

OK >> GO TO 2.
NG >> Check combination meter. Refer to DI-4, "System Description" .

2. CHECK WARNING LAMP

- Disconnect low tire pressure warning control unit connector.

Does the warning lamp activate?

YES >> Replace low tire pressure warning control unit.
NO >> GO TO 3.

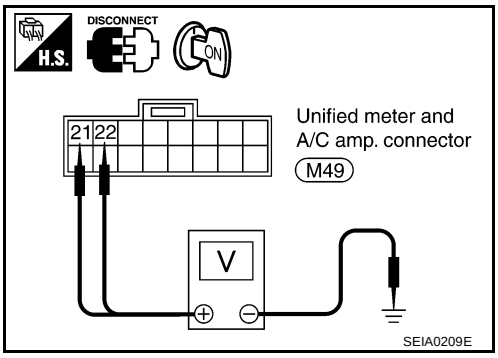
3. CHECK UNIFIED METER AND A/C AMP. POWER SUPPLY CIRCUIT

- Check voltage between unified meter and A/C amp. harness connector M49 terminal 21 (R/W), 22 (Y/G) and ground.

: Battery voltage should exist. (Approx. 12V)

OK or NG?

OK >> GO TO 4.
NG >> Check unified meter and A/C amp. power supply circuit for open or short.



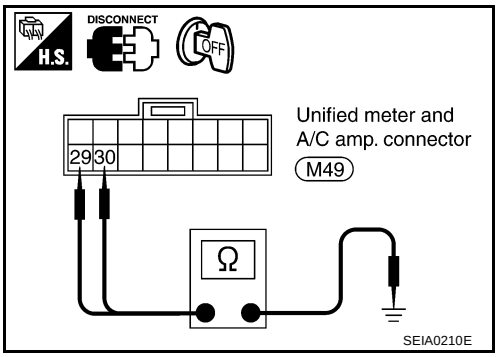
4. CHECK UNIFIED METER AND A/C AMP. GROUND CIRCUIT

- Check continuity between unified meter and A/C amp. connector M49 terminal 29 (B), 30 (B) and ground.

: Continuity should exist.

OK or NG?

OK >> Check unified meter and A/C amp. Refer to DI-59, "SELF-DIAGNOSIS RESULTS" .
NG >> Repair or replace unified meter and A/C amp. ground circuit.



Inspection 2: Warning Lamp Stays On When Ignition Switch Is Turned On. AES000AS

DIAGNOSTIC PROCEDURE

1. CHECK CONNECTOR

1. Disconnect low tire pressure warning control unit connector.
2. Check terminals for damage or loose connections.

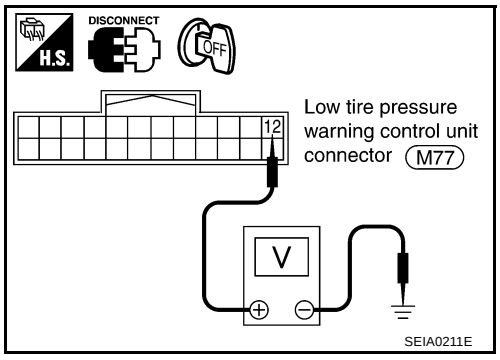
Inspection results OK?

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK POWER SUPPLY CIRCUIT 1

Check voltage between low tire pressure warning control unit connector M77 terminal 12 (R/W) and ground.

: Battery voltage should exist. (Approx. 12V)



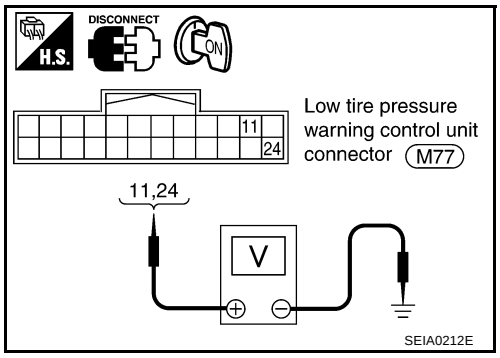
OK or NG?

OK >> GO TO 3.
NG >> Check low tire pressure warning control unit power supply circuit for open or short.

3. CHECK POWER SUPPLY CIRCUIT 2

1. Turn ignition switch ON.
2. Check voltage between low tire pressure warning control unit connector M77 terminals 11 (LG), 24 (Y/G) and ground.

: Battery voltage should exist. (Approx. 12V)



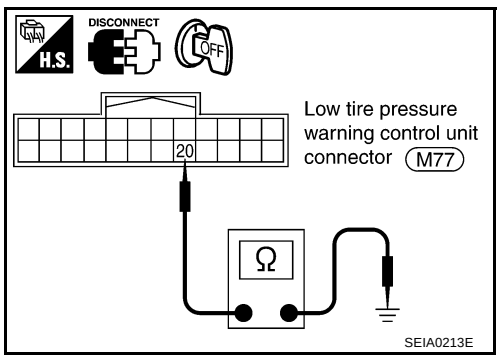
OK or NG?

OK >> GO TO 4.
NG >> Check low tire pressure warning control unit power supply circuit for open or short.

4. CHECK GROUND CIRCUIT

- Check continuity between low tire pressure warning control unit connector M77 terminal 20 (B) and ground.

: Continuity should exist.



OK or NG?

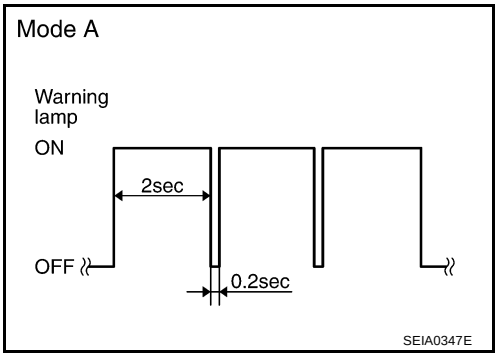
OK >> Replace low tire pressure warning control unit.
NG >> Repair or replace low tire pressure warning control unit ground circuit.

Inspection 3: Warning Lamp Blinks When Ignition Switch Is Turned On.

AES000DB

NOTE:
If warning lamp blink below, the system is normal.
Blink Mode A

- This mode shows transmitter status is OFF-mode.
  Carry out transmitter wake up operation. Refer to WT-18, "Transmitter Wake Up Operation" .



DIAGNOSTIC PROCEDURE

1. CHECK CONNECTOR

1. Disconnect low tire pressure warning control unit connector.
2. Check terminals for damage or loose connections.

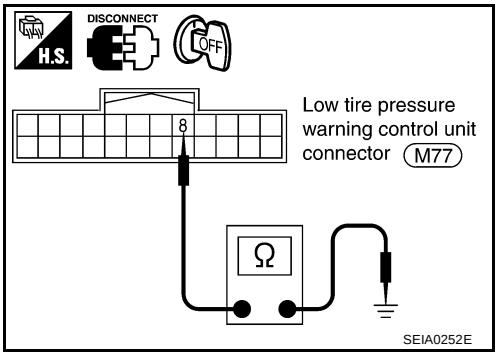
Inspection results OK?

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK GROUND CIRCUIT

- Check continuity between low tire pressure warning control unit harness connector M77 terminal 8 (G) and ground.

  : Continuity should exist.



OK or NG?

OK >> Replace low tire pressure warning control unit.
NG >> Repair or replace harness connector.

Inspection 4: Hazard Warning Lamp Blinks When Ignition Switch Is Turned On.

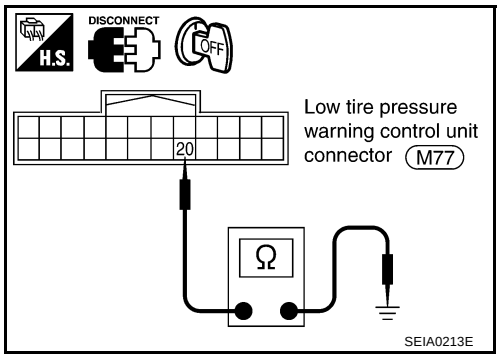
AES000DC

DIAGNOSTIC PROCEDURE

1. CHECK GROUND CIRCUIT

- Check continuity between low tire pressure warning control unit harness connector M77 terminal 20 (B) and ground.

: Continuity should exist.



OK or NG?

OK >> Replace low tire pressure warning control unit.
NG >> Repair or replace low tire pressure warning control unit ground circuit.

Inspection 5: “TIRE PRESSURE” Information In Triple Meter Does Not Exist.

AES000DA

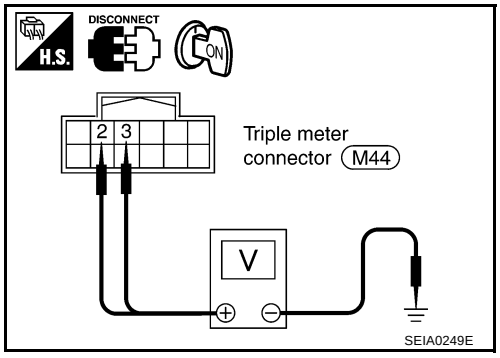
Before carrying out the inspection on the following diagnostic procedure, perform the CAN communication line check. Refer to WT-31, "Inspection 7: CAN Communication Line" .

DIAGNOSTIC PROCEDURE

1. CHECK TRIPLE METER POWER SUPPLY CIRCUIT

1. Disconnect triple meter connector.
2. Check voltage between triple meter harness connector M44 terminal 2 (R/W), 3 (G/Y) and ground.

: Battery voltage should exist. (Approx. 12V)



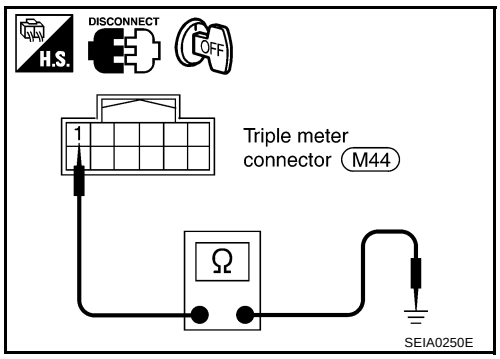
OK or NG?

OK >> GO TO 2.
NG >> Check triple meter power supply circuit for open or short.

2. CHECK TRIPLE METER GROUND CIRCUIT

- Check continuity between triple meter harness connector M44 terminal 1 (B) and ground.

: Continuity should exist.



OK or NG?

OK >> Check triple meter. Refer to DI-43, "Diagnosis Flow" .
NG >> Repair or replace triple meter ground circuit.

Inspection 6: ID Registration Can Not Be Completed

AES000AU

DIAGNOSTIC PROCEDURE

1. ID REGISTRATION (ALL)

- Carry out ID registration of all transmitter.
- Can ID registration of all transmitter be completed?

OK or NG?

YES >> INSPECTION END.
NO >> GO TO "TROUBLE DIAGNOSIS FOR SELF-DIAGNOSTIC ITEMS" .

Inspection 7: CAN Communication Line

AES000DD

DIAGNOSTIC PROCEDURE

1. SELF-DIAGNOSTIC RESULT CHECK

With CONSULT-II

1. Select "AIR PRESSURE MONITOR" on "SELECT SYSTEM" screen.
2. Select "SELF-DIAG RESULTS" on "SELECT DIAG MODE" screen.
3. Check display content in self-diagnostic results.

Is “CAN COMM CIRCUIT” displayed in the self-diagnosis display items?

YES >> Malfunction in CAN communication system. GO TO LAN-3, "Precautions When Using CONSULT-II" .
NO >> INSPECTION END.

REMOVAL AND INSTALLATION

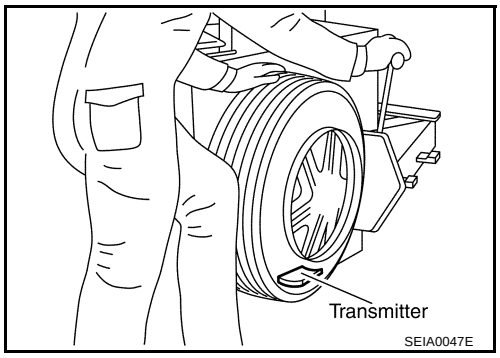
PFP:00000

Transmitter

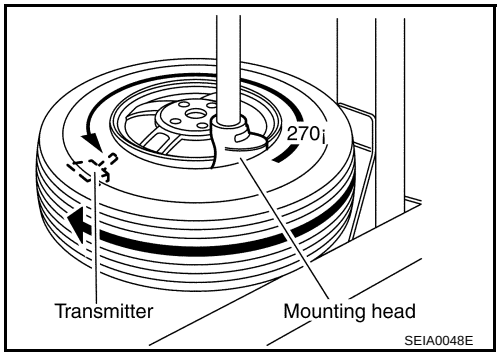
AES00057

REMOVAL

1. Deflate tire. Unscrew transmitter retaining nut and allow transmitter to fall into tire.
2. Gently bounce tire so that transmitter falls to bottom of tire. Place on tire changing machine and break both tire beads ensuring that the transmitter remains at the bottom of the tire.

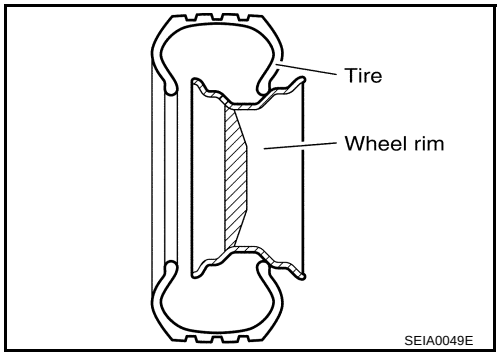


3. Turn tire so that valve hole is at bottom and bounce so that transmitter is near valve hole. Carefully lift tire onto turntable and position valve hole (and transmitter) 270 degree from mounting/ dismounting head.
4. Lubricate tire well and remove first side of the tire. Reach inside the tire and remove the transmitter. Remove second side of tire.

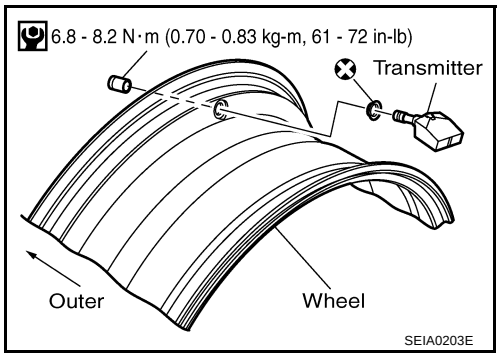


INSTALLATION

1. Put first side of tire onto rim.

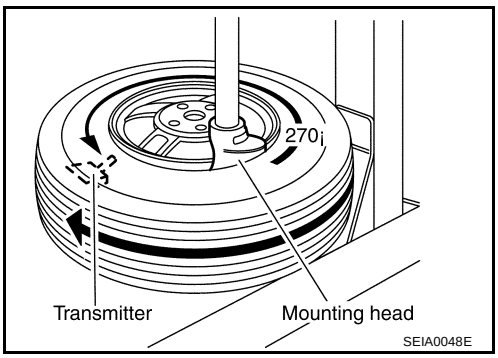


2. Mount transmitter on rim and tighten nut.



3. Place wheel on turntable of tire machine. Ensure that transmitter is 270 degree from mounting head when second side of tire is fitted.

   NOTE:
   Do not touch transmitter at mounting head.



4. Lubricate tire well and fit second side of tire as normal. Ensure that tire does not rotate relative to rim.
5. Inflate tire and fit to appropriate wheel position.

SERVICE DATA

PFP:00030

Road Wheel

AES00058

Kind of wheel		Aluminum	Steel for emergency use
Deflection limit	Lateral deflection	Less than 0.3 mm (0.012 in)	Less than 1.0mm (0.039 in)
	Vertical deflection	Less than 0.3mm (0.012 in)	Less than 1.2mm (0.047in)
Allowable quantity of residual unbalance	Dynamic (At rim flange)	Less than 10g (0.35oz) (per side)	
	Static (At rim flange)	Less than 20g (0.70oz)	

Tire

AES00059

Unit: kPa (kg/cm^2 , psi)

Tire size	Air pressure	
	Front wheel	Rear wheel
225/50R17 94W 225/45R18 91W	240 (2.4, 35)	—
235/50R17 06W 245/45R18 96W	—	240 (2.4, 35)
T145/96D16 T155/80R17	420 (4.2, 60)	420 (4.2, 60)

Tightening Torque

AES000DK

Wheel nut	98.1 - 127 N·m (10 - 12 kg-m, 73 - 93 ft-lb)

SECTION BR
BRAKE SYSTEM

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

AFS0027G

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

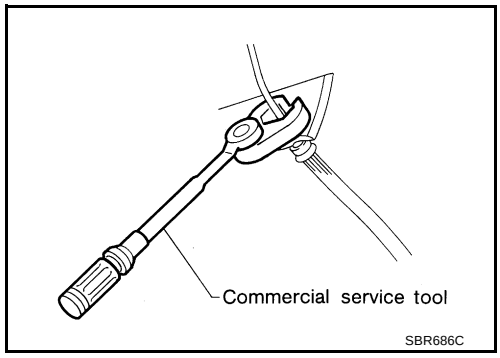
AFS0026R

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Brake System

AFS0007W

- Recommended fluid is brake fluid “DOT 3”.
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas.
- To clean or wash all parts of master cylinder and disc brake caliper, use clean brake fluid.
- Never use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use flare nut wrench when removing and installing brake tube.
- When installing brake piping, be sure to check torque.
- Before working, turn the ignition switch OFF and disconnect the connectors for the control unit or the battery negative terminal.
- Burnish the brake contact surfaces after refinishing or replacing drums or rotors, after replacing pads or linings, or if a soft pedal occurs at very low mileage.
  Refer to BR-30, "BRAKE BURNISHING PROCEDURE" .



WARNING:

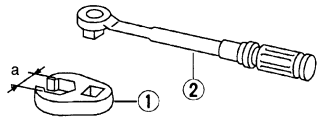
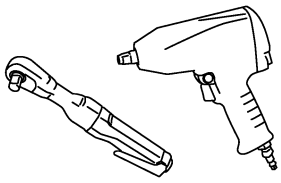
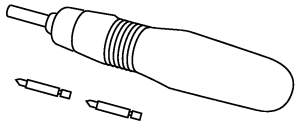
- **Clean brake pads and shoes with a waste cloth, then wipe with a dust collector.**

PREPARATION

PFP:00002

Commercial Service Tools

AFS0007X

Tool name		Description
1. Flare nut crowfoot a:10 mm (0.39 in)/12mm(0.47 in) 2. Torque wrench	 S-NT360	Removing and installing each brake piping
Power tool	 PBIC0190E  PBIC0191E	Removing front and rear caliper assembly, tires

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

AFS0007Y

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

			Reference page	BR-26,BR-32 ,BR-39 ,BR-45	BR-25,BR-31 ,BR-38 ,BR-44	BR-25,BR-31 ,BR-38 ,BR-44	—	—	BR-30,BR-36 ,BR-42 ,BR-49	—	—	—	BR-30,BR-36 ,BR-42 ,BR-49	—	NVH in PR section	NHV in RFD section	NVH in FAX, RAX and FSU, RSU section	NVH in WT section	NVH in WT section	NVH in RAX section	NVH in PS section
			Possible cause and SUSPECTED PARTS	Pads - damaged	Pads - uneven wear	Shims damaged	Rotor imbalance	Rotor damage	Rotor runout	Rotor deformation	Rotor deflection	Rotor rust	Rotor thickness variation	Drum out of round	PROPELLER SHAFT	DIFFERENTIAL	AXLE AND SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	STEERING
Symptom	BRAKE	Noise		×	×	×									×	×	×	×	×	×	×
		Shake					×								×		×	×	×	×	×
		Shimmy, Judder					×	×	×	×	×	×	×				×	×	×		×

×: Applicable

BRAKE PEDAL

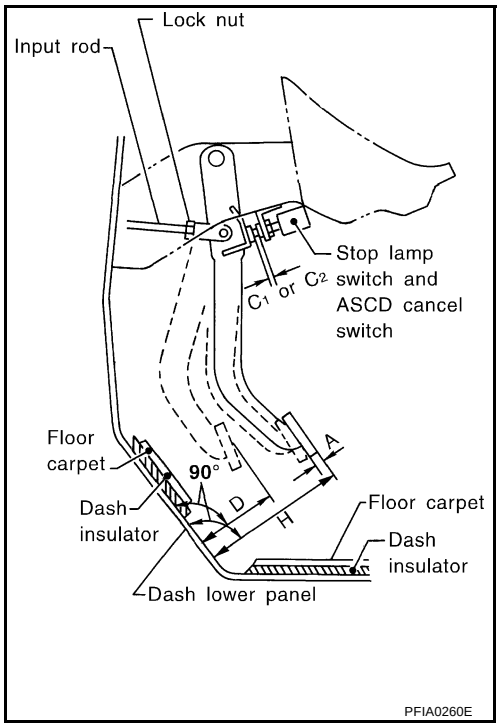
PFP:46501

Inspection and Adjustment

AFS0007Z

PLAY AND CLEARANCE BETWEEN THE BRAKE PEDAL AND FLOOR PANEL WITH PEDAL DEPRESSED

1. Check the brake pedal free height from the dash lower panel.
2. Adjust the height referring to the following specifications.



H	**Brake pedal height (from dash lower panel top surface)**	**M/T Model**	**154 - 164 mm (6.06- 6.46 in)**
		A/T model	**162 - 172 mm (6.38 - 6.77 in)**
D	**Depressed pedal height (under a force of 490 N (50 kg, 110 lb) with the engine running)**	**M/T Model**	**More than 90 mm (3.54 in)**
		A/T Model	**More than 95 mm (3.74 in)**
C_1 or C_2	**Clearance between the stopper rubber and the threaded end of the stop lamp switch and ASCD cancel switch.**		**0.74 - 1.96 mm (0.0291 - 0.0772 in)**
A	**Pedal play**		**3 - 11 mm (0.12 - 0.43 in)**

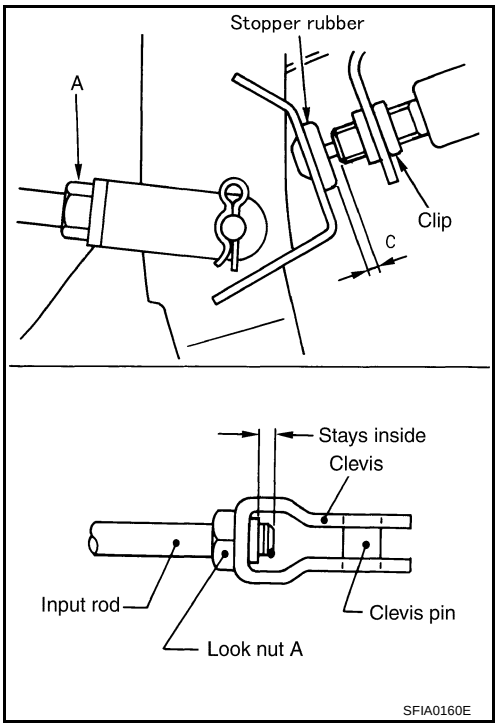
ADJUSTMENT

1. Loosen the stop lamp switch and ASCD cancel switch by rotating it counterclockwise by 45°.
2. Loosen the lock nut (A) on the input rod, then rotate the input rod to set the pedal to the specified height, and tighten the lock nut (A) to the specified torque. Refer to BR-22, "BRAKE BOOSTER" .

   CAUTION:
   Check that the threaded end of the input rod stays inside the clevis.
3. With the pedal pulled and held by hand, press the stop lamp switch and ASCD cancel switch until its threaded end contacts the stopper rubber.
4. With the threaded end of the stop lamp switch contacting the stopper rubber and ASCD cancel switch, rotate the switch clockwise by 45° to secure.

   CAUTION:
   Make sure that the clearance (C) between the stopper rubber and threaded end of the stop lamp switch and ASCD cancel switch is within the standard.
5. Check the pedal play.

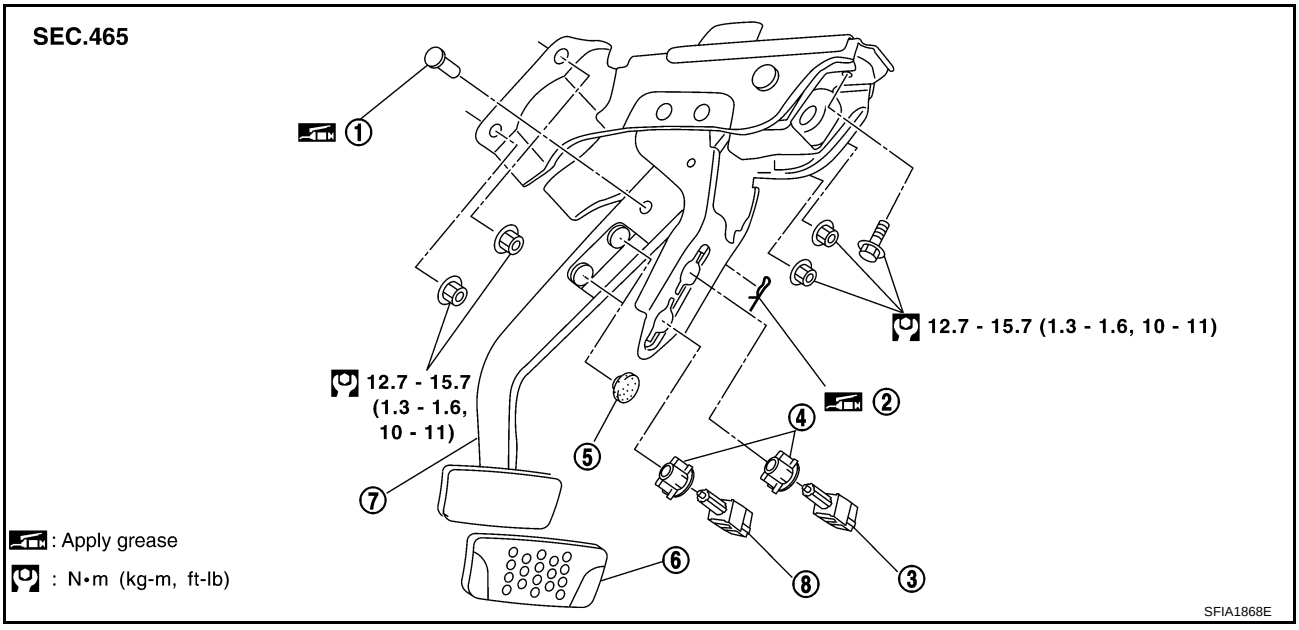
   CAUTION:
   Make sure that the stop lamps go off when the pedal is released.
6. Start the engine to check the brake pedal's depressed height.



Removal and Installation

AFS00080

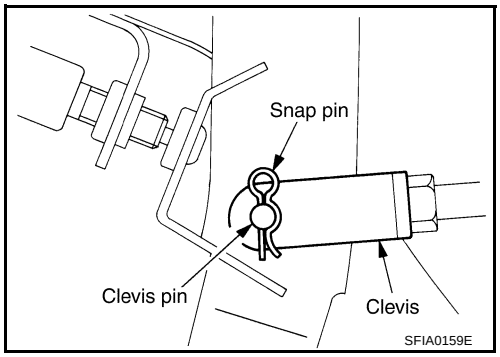
COMPONENT PARTS DRAWING



1. Clevis pin
2. Snap pin
3. ASCD cancel switch
4. Clip
5. Stopper rubber
6. Pedal pad
7. Brake pedal assembly
8. Stop lamp switch

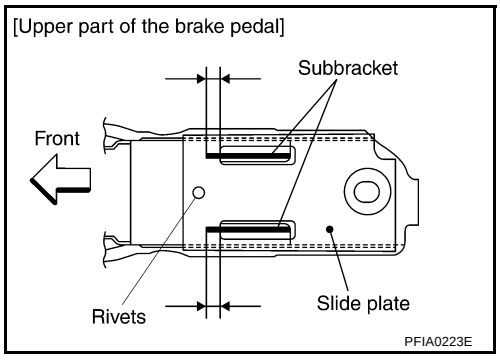
REMOVAL

1. Remove the lower driver-side instrument panel. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove the steering column. Refer to PS-10, "STEERING COLUMN" .
3. Remove the stop lamp switch and ASCD cancel switch from the pedal assembly.
4. Remove the snap pin and clevis pin from the brake booster clevis.
5. Remove the mounting nuts and bolt from the bracket, and remove the pedal assembly from the vehicle.

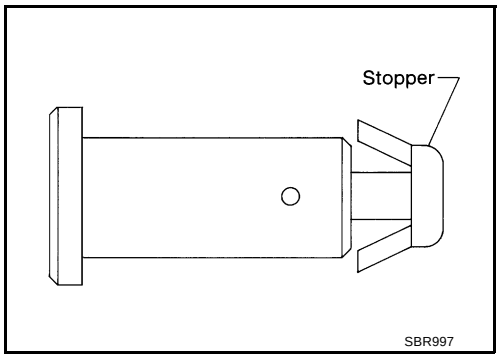


INSPECTION AFTER REMOVAL

- Check that the rivets in the upper part of the brake pedal are not deformed.
- Make sure the sub bracket and the slide plate are at least 4 mm (0.16 in) apart.



- Check the brake pedal for bend, damage, and cracks on the welded parts. Replace the applicable part if a failure is detected.
- Check the clevis pin and resin stopper for damage and deformation. If a failure is detected, replace the clevis pin.



INSTALLATION

Paying attention to the following items, install in the reverse order of removal.

- After installing the brake pedal assembly to the vehicle, adjust the brake pedal.

BRAKE FLUID

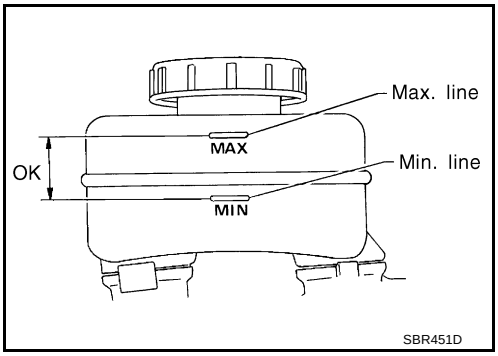
PFP:KN100

On-board Inspection

AFS000TY

LEVEL CHECK

- Check that the fluid level in the reservoir tank is within the standard (between MAX and MIN lines).
- Visually check around the reservoir tank for fluid leaks.
- If fluid level is excessively low, check brake system for leaks.
- If warning lamp remains illuminated after parking lever is released, check brake system for fluid leakage.



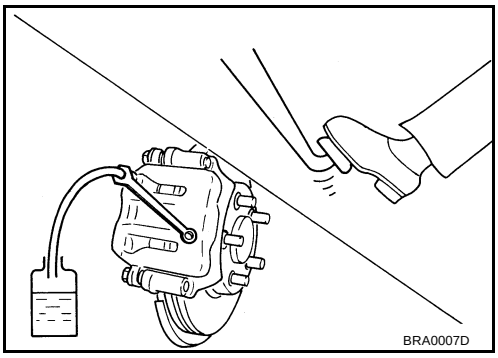
Drain and Refill

AFS000TZ

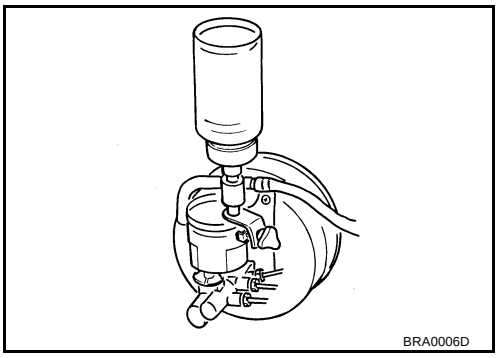
CAUTION:

- **Refill with new brake fluid “DOT3”.**
- **Never reuse drained brake fluid.**
- **Do not let brake fluid come in contact with painted surfaces on the body. This might damage the paint, so if it does come in contact, immediately wipe area and wash off with water.**

1. Connect a vinyl tube to bleed valve.
2. Depress the brake pedal, loosen the bleed valve, and gradually remove the brake fluid.
3. Turn the key switch to the off position and remove the battery negative terminal.



4. Make sure there is no foreign material in the reservoir tank, and refill with new brake fluid.
5. Rest foot on brake pedal. Loosen bleed valve. Slowly depress pedal until it stops. Tighten bleed valve. Release brake pedal. Repeat this process a few times, then pause to add new brake fluid to master cylinder. Continue until new brake fluid flows out. Bleed Air. Refer to BR-10, "Bleeding Brake System" .



Bleeding Brake System

AFS000U0

CAUTION:

While bleeding, pay attention to master cylinder fluid level.

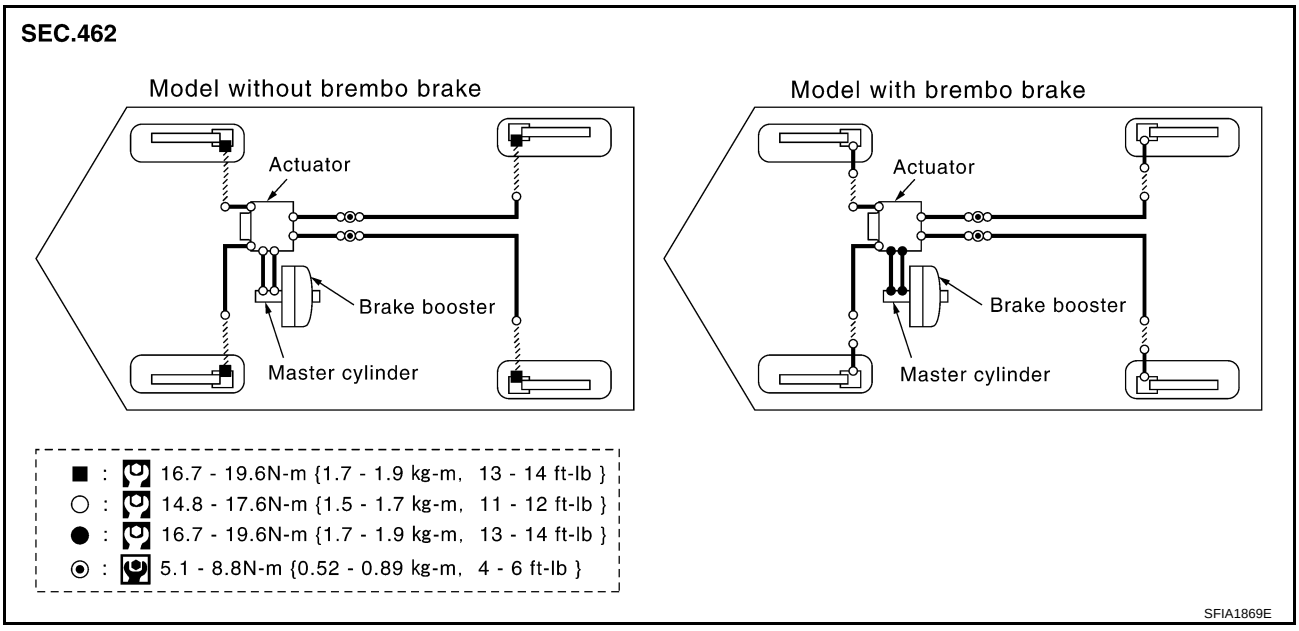
1. Turn the ignition switch to the OFF position.
2. Connect a vinyl tube to the rear right bleed valve.
3. Fully depress brake pedal 4 to 5 times.
4. With the brake pedal depressed, loosen the bleed valve to let the air out, and then tighten it immediately.
5. Repeat steps 3, 4 until no more air comes out.
6. Tighten the bleed valve to the specified torque. Refer to BR-25, "Components" ,BR-31, "Component" ,BR-38, "Components" ,BR-44, "Components" .
7. In steps 2 to 6 below, with the master cylinder reservoir tank filled at least half way, bleed air from the front left, rear left, and front right tires, in that order.

BRAKE PIPING AND HOSE

PFP:46210

Hydraulic Circuit

AFS000U1



CAUTION:

- **Make sure it does not twist or break when being attached.**
- **Make sure there is no interference with other parts when turning steering both clockwise and counterclockwise.**
- **The brake piping is an important safety part. If a brake fluid leak is detected, always disassemble the parts. Replace applicable part with a new one, if necessary.**
- **Do not let brake fluid come in contact with painted surfaces on the body. This might damage the paint, so if it does come in contact, immediately wipe area and wash off with water.**
- **Do not bend or twist brake hose sharply, or strongly pull it.**
- **When removing components, cover connections so that no dirt, dust, or other foreign matter gets in.**
- **Refill with new brake fluid " DOT 3 "**
- **Never reuse drained brake fluid.**

Removal and Installation of the Front Brake Piping Brake Hose (Vehicles With CLZ25VD Caliper)

AFS000U3

REMOVAL

1. Drain brake fluid. Refer to BR-9, "Drain and Refill" .
2. Using a flare nut wrench, remove brake tube from brake hose.
3. Remove union bolt and remove the brake hose from the caliper assembly.
4. Remove the lock plate and nut, and remove the brake hose from the vehicle.

INSTALLATION

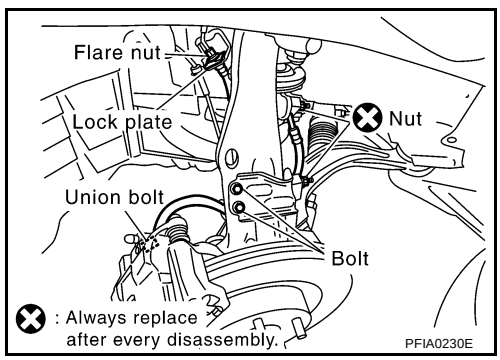
1. Attach the brake hose to the vehicle and tighten the nut to the specified torque.

   : 19.6 - 23.5 N·m (2.0 - 2.3 kg-m, 15 - 17 ft-lb)

   NOTE:
   When removed bracket attaching the bolt is tightened with provisions torque.

   : 10.8 - 15.6 N·m (1.1 - 1.5 kg-m, 8 - 11 ft-lb)

2. Install brake hose by aligning with the protrusion on caliper assembly, and tighten union bolts to the specified torque.



: 16.7 - 19.6 N·m (1.7 - 1.9 kg-m, 13 - 14 ft-lb)

CAUTION:
Do not reuse the copper washer.

3. Attach the brake hose to the brake tube, partially tighten the flare nut as far as possible by hand, then secure it to the bracket with the lock plate.
4. Using a flare nut wrench, tighten the flare nut to the specified torque.

: 14.8 - 17.6 (1.5 - 1.7 kg-m, 11 - 12 ft-lb)

5. Refill brake fluid and bleed air. Refer to BR-10, "Bleeding Brake System" .

Removal and Installation of the Front Brake Piping Brake Hose (Vehicles With Brembo OPB27VA Calipers)

AFS000XZ

REMOVAL

1. Drain brake fluid. Refer to BR-9, "Drain and Refill" .
2. Using a flare nut wrench, remove the brake tube from the brake hose.
3. Using a flare nut wrench, remove the caliper-side brake tube from the brake hose.
4. Remove the lock plate and nut, and remove the brake hose from the vehicle.

INSTALLATION

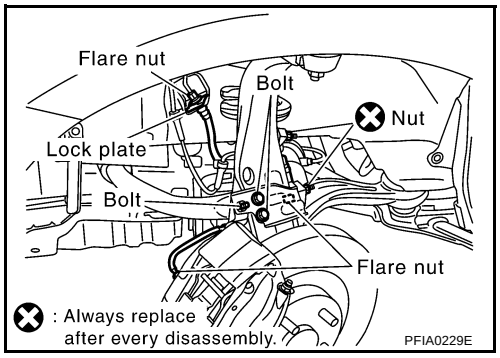
1. Attach the brake hose to the vehicle and tighten the nut to the specified torque.

Nut : 19.6 - 23.5 N·m (2.0 - 2.3 kg-m, 15 - 17 ft-lb)

Bolt : 10.8 - 15.6 N·m (1.1 - 1.5 kg-m, 8 - 11 ft-lb)

2. Attach the caliper-side brake tube to the brake hose, partially tighten the flare nut as far as possible by hand, then tighten it to the specified torque with flare nut torque wrench.

: 14.8 - 17.6 N·m (1.5 - 1.7 kg-m, 11 - 12 ft-lb)



3. Attach the brake hose to the brake tube, partially tighten the flare nut as far as possible by hand, then secure to the bracket with the lock plate.
4. Using a flare nut torque wrench, tighten the flare nut to the specified torque with flare nut torque.

: 14.8 - 17.6 N·m (1.5 - 1.7 kg-m, 11 - 12 ft-lb)

5. Refill brake fluid and bleed air. Refer to BR-10, "Bleeding Brake System"

Removal and Installation of the Rear Brake Piping Brake Hose (With AD14VE Calipers)

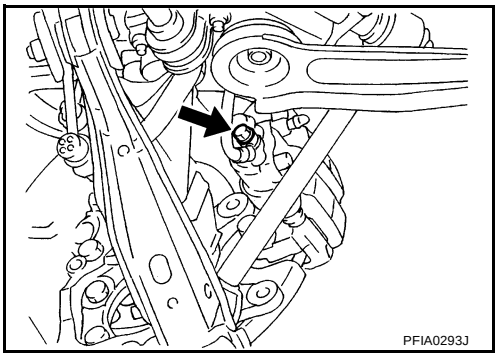
AFS000U4

REMOVAL

1. Drain brake fluid. Refer to BR-9, "Drain and Refill" .
2. Using a flare nut wrench, remove brake tube from brake hose.
3. Remove union bolts, and then remove brake hose from the caliper assembly.
4. Remove the lock plate and then remove the brake hose from the vehicle.

INSTALLATION

1. Attach the brake hose L-pin to the caliper assembly positioning hole and tighten the union bolt to the specified torque.



: 1 6.7 - 19.6 N·m (1.7 - 1.9 kg-m, 13 - 14 ft-lb)

CAUTION:
Do not reuse the copper washer.

2. After securing the brake hose to the vehicle with the lock plate, partially tighten the brake tube flare nut as far as possible by hand and then tighten to the specified torque with flare nut torque wrench.

: 14.8 - 17.6 N·m (1.5 - 1.7 kg-m, 11 - 12 ft-lb)

3. Refill brake fluid and bleed air. Refer to BR-10, "Bleeding Brake System" .

Removal and Installation of the Rear Brake Piping Brake Hose (With Brembo OPB13VB Calipers)

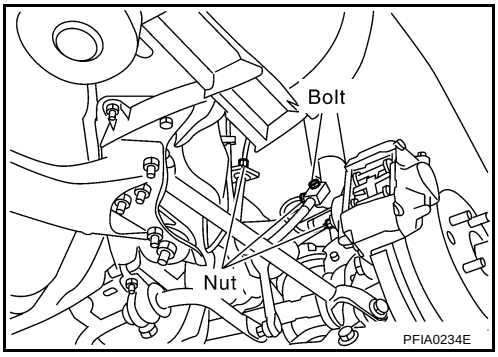
AFS000U5

REMOVAL

1. Drain brake fluid. Refer to BR-9, "Drain and Refill" .
2. Using a flare nut wrench, remove the brake tube from the brake hose.
3. Using a flare nut wrench, remove the caliper-side brake tube from the brake hose.
4. Remove the lock plate and bolt, and remove the brake hose from the vehicle.

INSTALLATION

1. Attach the brake hose to the vehicle and tighten the bolt to the specified torque.



: 19.6 - 23.5 N·m (2.0 - 2.3 kg-m, 15 - 17 ft-lb)

2. Attach the caliper-side brake tube to brake hose, partially tighten the flare nut as far as possible by hand, then tighten it to the specified torque with flare nut torque wrench.

: 14.8 - 17.6 N·m (1.5 - 1.7kg-m, 11 - 12 ft-lb)

3. Attach the brake hose to the brake tube, partially tighten the flare nut as far as possible by hand, then secure to the bracket with the lock plate.
4. Using a flare nut torque wrench, tighten the flare nut to the specified torque.

: 14.8 - 17.6 N·m (1.5 - 1.7 kg-m, 11 - 12 ft-lb)

5. Refill brake fluid and bleed air. Refer toBR-10, "Bleeding Brake System" .

Inspection After Installation

AFS000U6

CAUTION:
If a leak is detected at the connections, retighten it or, if necessary, replace the damaged part.

1. Check hose, tube, and connections for fluid leaks, damage, twist, deformation, contact with other parts, and loose connections.
2. While depressing pedal under a force of 785 N (80 kg, 177 lb) with engine running for approximately 5 seconds, check for fluid leakage from each part.

BRAKE MASTER CYLINDER

PFP:46010

On-board Inspection

AFS000U7

LEAK INSPECTION

- Check for leaking in the master cylinder installation surface, the reservoir tank installation surface, and the brake tube connections.

Removal and Installation

AFS000U8

CAUTION:

Do not let brake fluid come in contact with painted surfaces on the body. This might damage the paint, so if it does come in contact, immediately wipe area and wash off with water.

REMOVAL

1. Drain brake fluid. Refer to BR-9, "Drain and Refill" .
2. Remove the fluid surface sensor harness connector.
3. Using a flare nut wrench, disconnect master cylinder assembly and brake tube.
4. Remove the master cylinder assembly nut and remove the master cylinder assembly from the vehicle. Refer to BR-22, "Removal and Installation" .

INSTALLATION

CAUTION:

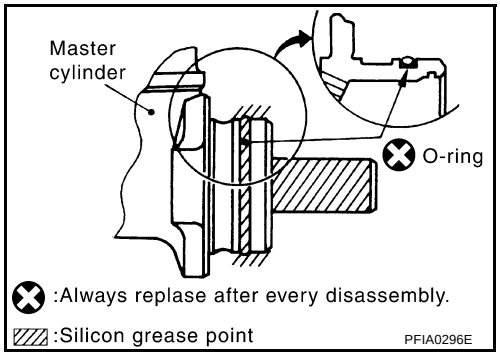
- **Refill with new brake fluid “DOT3”.**
- **Never reuse drained brake fluid.**

1. Attach the master cylinder assembly to the brake booster assembly and tighten the nut to the specified torque. BR-22, "Removal and Installation"

   CAUTION:

   Vehicles equipped with VDC require particular attention when conducting the following installation.

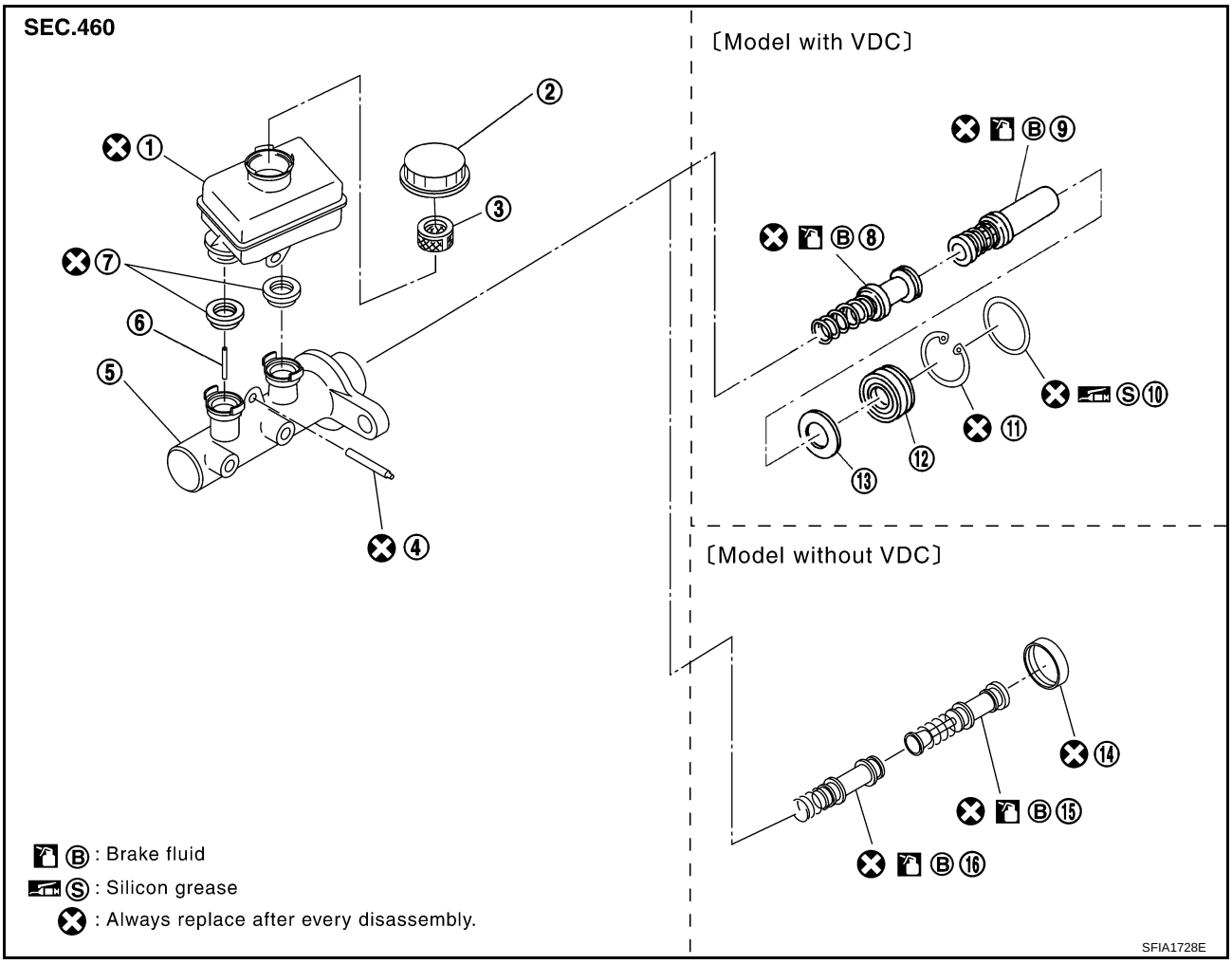
   - **Make sure the sliding surface of the primary piston rod is not damaged, and that no foreign matter become attached.**
   - **Do not reuse the O-ring on the rear end of the master cylinder as it is a non-reusable part.**
   - **Apply the silicon grease in the inner kit to and around the O-ring at the rear end of the master cylinder and to the inside of the booster.**



2. Install brake tube to master cylinder assembly and temporarily tighten flare nuts by hand.
3. Tighten the brake tube flare nut to the specified torque with flare nut torque wrench. Refer to BR-11, "Hydraulic Circuit" .
4. Refill brake fluid and bleed air. Refer to BR-10, "Bleeding Brake System" .

Components

AFS0010N



1.	Reservoir tank	2.	Reservoir cap	3.	Oil strainer
4.	Pin	5.	Cylinder body	6.	Piston stopper
7.	Grommet	8.	Secondary piston assembly	9.	Primary piston assembly
10.	O-ring	11.	Snap ring	12.	Guide assembly
13.	Plate	14.	Stopper cap	15.	Primary piston assembly
16.	Secondary piston assembly				

Disassembly and Assembly

AFS000U9

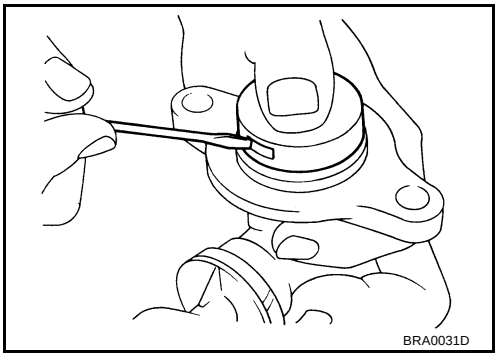
MODELS WITHOUT VDC

Disassembly

CAUTION:

Only remove the reservoir tank when absolutely necessary.

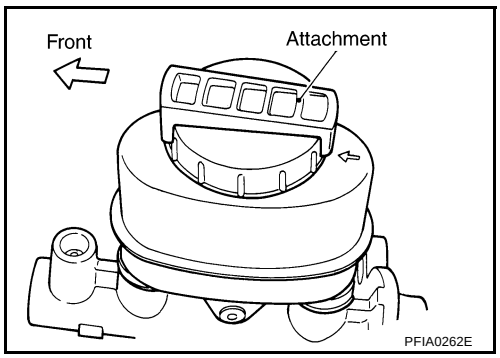
1. Using a flat-bladed screwdriver as shown in the figure, lift up the tabs on the stopper cap and remove it from the master cylinder. The piston inside the master cylinder might pop out when this is done, so hold the stopper cap down at the same time.



2. Attach the attachment in the inner kit to the reservoir cap as shown in the figure.

CAUTION:

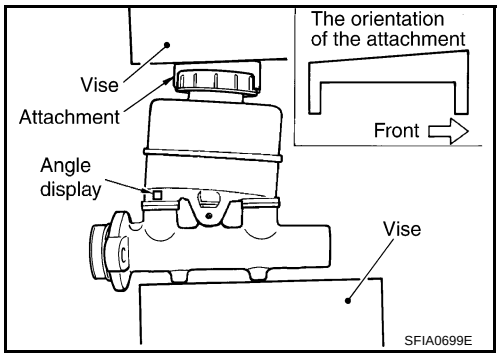
When attaching the attachment to the reservoir cap, make sure it is pointing in the right direction.



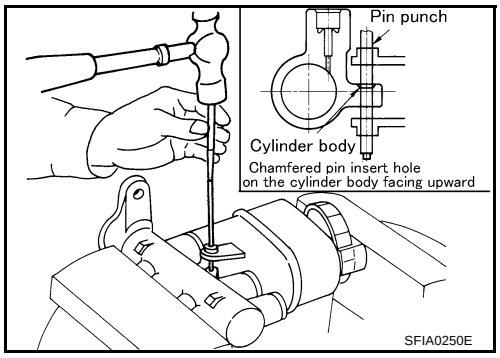
3. Place the side of the cylinder body with chamfering around the pin insertion hole facing up, and secure the master cylinder assembly with a vise.

CAUTION:

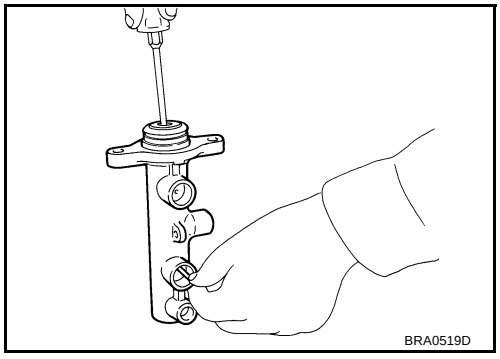
- **Tighten without letting the pin securing the reservoir tank and cylinder body come in contact with the pin insertion hole of the reservoir tank.**
- **When securing the master cylinder assembly with the vise, be sure not to over-tighten.**
- **When securing in a vise, use copper plates or cloth to protect the flange.**



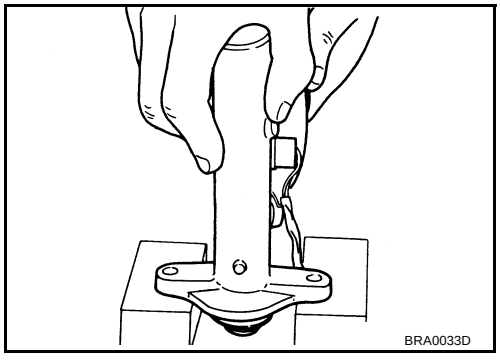
4. Using a pin punch [commercial service tool: diameter Approx. 4 mm (0.16 in)], remove mounting pins on the reservoir tank.
5. Remove master cylinder assembly from the vise.
6. Remove reservoir tank and grommet from cylinder body.



7. Using a Phillips flat-bladed screwdriver, push in the piston and remove the piston stopper from the cylinder body.
8. Carefully pull the primary piston assembly straight out to prevent cylinder inner wall from being damaged.



9. Tap flange using a soft block such as wood, and carefully pull the secondary piston assembly straight out to prevent cylinder inner wall from being damaged.



Inspection After Disassembly

Master cylinder

- Check that there is no damage, friction, rusting, or pinholes on the cylinder inner wall, and replace if there are any non-standard conditions.

Assembly

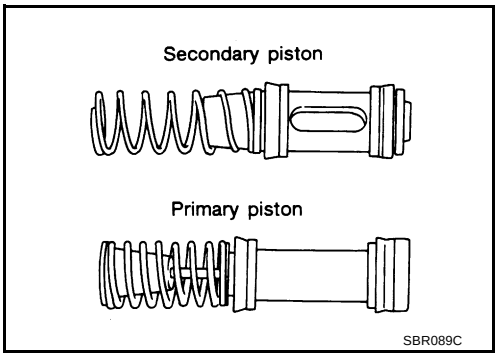
CAUTION:

- **Never use mineral oils such as kerosene, gasoline during the cleaning and assembly process.**
- **Make sure there is no foreign matter such as dirt or dust attached to the inner cylinder walls, the piston, or the cap seal, and use care to avoid damaging parts with the assembly tools.**
- **Do not drop parts. If a part is dropped, do not use it.**

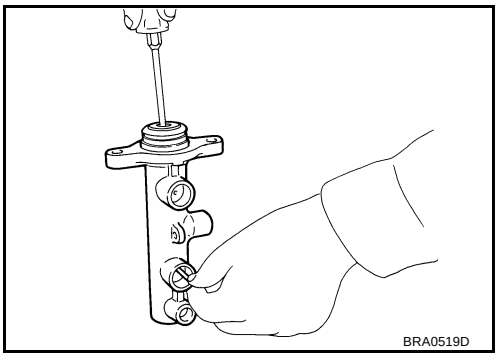
1. Apply fluid to cylinder inner wall body and contact surface of the piston assembly. Then insert secondary piston assembly and primary piston assembly into cylinder body in this order.

   CAUTION:

   - **Do not reuse the primary and secondary piston assemblies.**
   - **Be sure to replace the assembly without disassembling the new inner kit.**
   - **Pay attention to the orientation of the piston cup, and insert straight to prevent the cup from being caught by cylinder inner wall.**



2. Perform a visual inspection of the secondary piston slit through the tank boss hole on the secondary side of the cylinder body, and attach the piston stopper.



3. Holding down the piston with the stopper cap, push the stopper cap tabs so they are firmly into the cylinder grooves, then attach the stopper cap.

   CAUTION:

   Do not reuse the stopper cap.

4. Apply brake fluid the grommet and attach to the cylinder body.

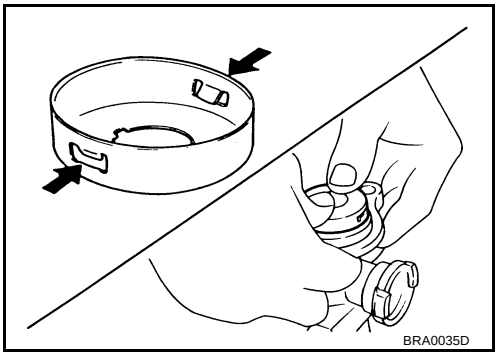
   CAUTION:

   Do not reuse the grommet.

5. Attach the attachment in the inner kit to the reservoir cap as described in disassembly step 2.

   CAUTION:

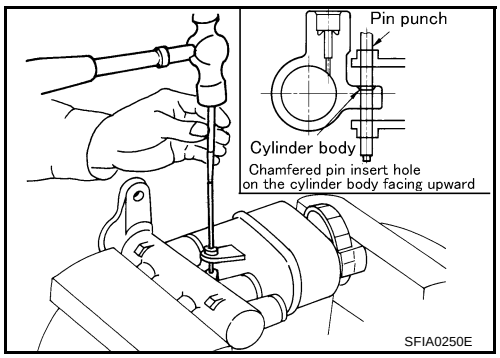
   Make sure the attachment is pointing in the right direction.



6. Master cylinder assembly is fixed in the vise as described in disassembly step 3.

7. Using a pin punch [commercial service tool: diameter Approx. 4 mm (0.16 in)], attach the reservoir tank mounting pin so that the attachment side and the opposite side are identical.

CAUTION:
Do not reuse reservoir tank and mounting pin.



MODELS WITH VDC

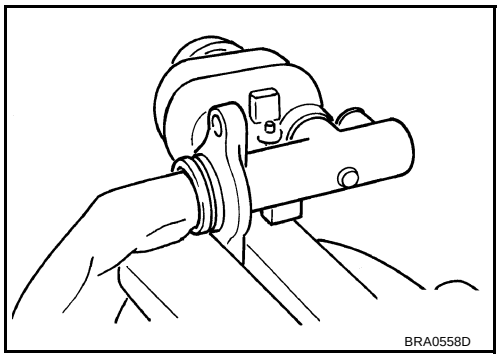
Disassembly

CAUTION:

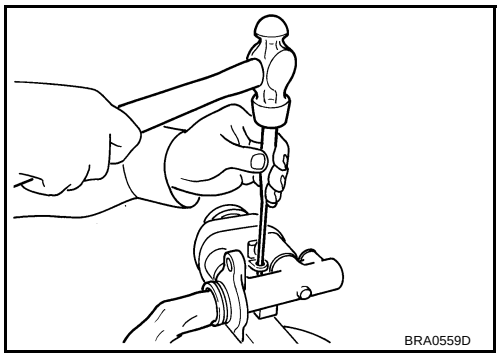
- **While working, cover the primary piston rod with cloth to prevent it from being damaged.**
- **Only remove the reservoir tank when absolutely necessary.**

1. Place the side of the cylinder body with chamfering around the pin insertion hole up, and secure the cylinder body flange section with a vise as shown in the figure.

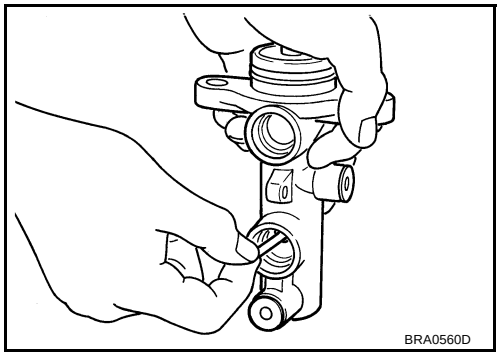
CAUTION:
When securing in a vise, use copper plates or cloth to protect the flange.



2. Using a pin punch [commercial service tool: diameter Approx 4 mm (0.16 in)], remove the reservoir tank mounting pin.
3. Remove master cylinder assembly from the vise.
4. Remove reservoir tank and grommet from cylinder body.

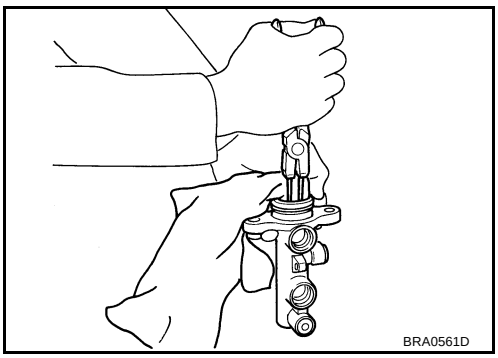


5. Push in the primary piston and remove the stopper pin from the cylinder body secondary-side tank boss hole.

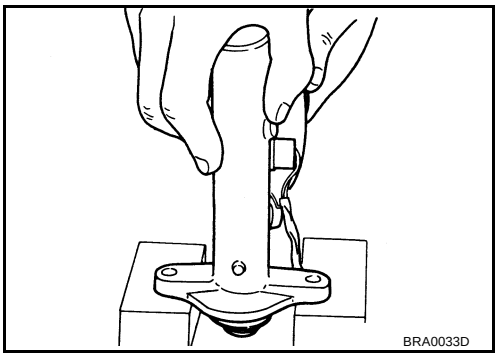


6. Remove the snap ring while pushing the primary piston in to prevent the piston from popping out.
7. Holding the primary piston rod, pull the primary piston assembly, the plate, and the guide straight out.
8. Remove the plate and guide from the primary piston.

CAUTION:
When removing the plate from the primary piston rod, make sure the inside of the plate does not damage the rod.


BRA0561D

9. Tap flange using a soft block such as wood, and carefully pull the secondary piston assembly straight out to prevent cylinder inner wall from being damaged.


BRA0033D

Inspection After Disassembly

Master cylinder

- Check that there is no damage, friction, rusting, or pinholes on the cylinder inner wall, and replace if there are any non-standard conditions.

Assembly

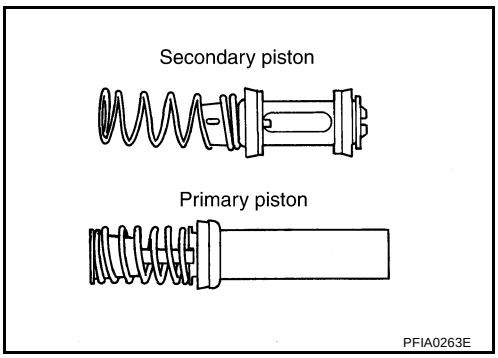
CAUTION:

- **Never use mineral oils such as kerosene, gasoline during the cleaning and assembly process.**
- **Make sure there is no foreign matter such as dirt or dust attached to the inner cylinder walls, the piston, or the cap seal, and use care to avoid damaging parts with the assembly tools.**
- **Do not drop parts. If a part is dropped, do not use it.**

1. Apply brake fluid to the inside surface of the cylinder body and the contact surface of the piston assembly, and apply the silicon grease in the inner kit to the primary piston rod.
2. Insert the secondary piston and the primary piston into the cylinder body.

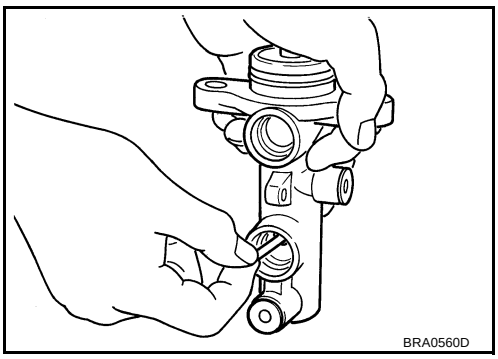
CAUTION:

- **Do not reuse the primary and secondary piston assemblies.**
- **Be sure to replace the assembly without disassembling the new inner kit.**
- **Pay attention to the orientation of the piston cup, and insert straight to prevent the cup from being caught by cylinder inner wall.**



PFIA0263E

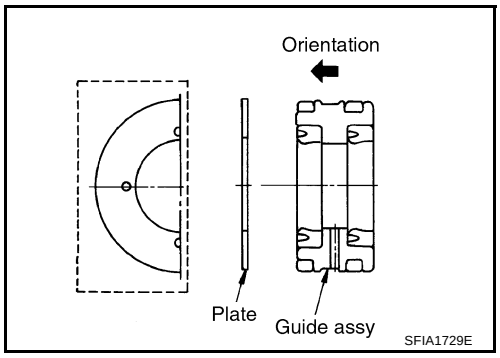
3. Visually inspect the secondary piston slit through the piston stopper mounting hole and then install the piston stopper while pushing in the primary piston.


BRA0560D

4. Insert the plate and guide into the cylinder body.

CAUTION:

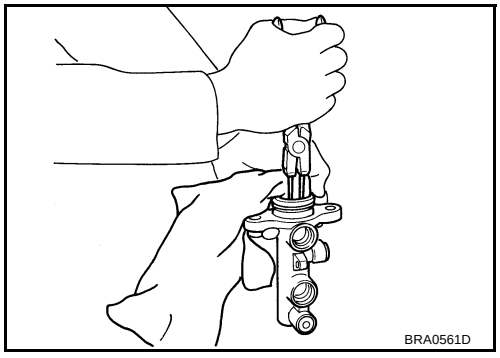
- **Make sure not to damage the primary piston rod.**
- **Pay attention to the direction of the guide.**
- **Do not drop the O-ring.**
- **Make sure the guide and/or plate are not inserted at an angle.**



5. Cover the primary piston rod with cloth to prevent it getting damaged, and attach the snap ring with the primary piston pushed in.

CAUTION:

- **Make sure the area around the snap ring is snug in the cylinder body bore groove.**
- **Do not reuse the snap ring.**



6. Place the side of the cylinder body with chamfering around the pin insertion hole up, and secure the cylinder body flange section with a vise.

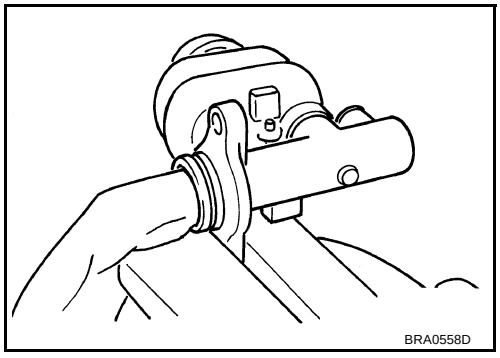
CAUTION:

When securing in a vise, use copper plates or cloth to protect the flange.

7. Apply brake fluid to the grommet and attach the reservoir tank to the master cylinder.

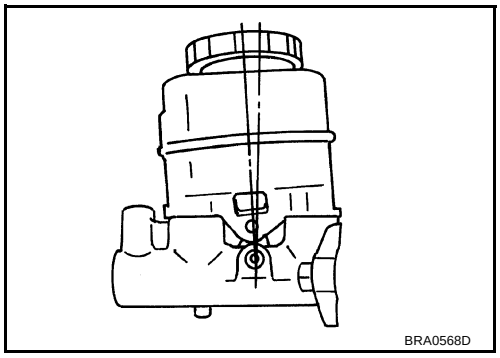
CAUTION:

Do not reuse the grommet.



NOTE:

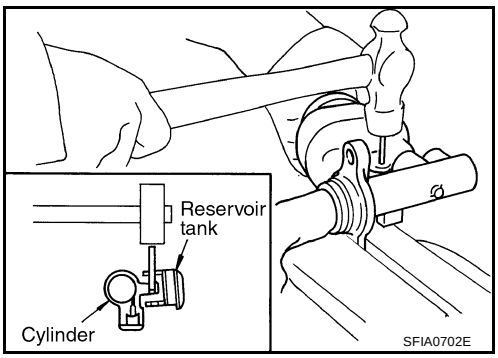
Attach the reservoir tank in the orientation shown in the figure.



8. Tilt the reservoir tank so that the mounting pin can be inserted as shown in the figure, and insert the mounting pin. When the mounting pin has passed the master cylinder pinhole, return the reservoir tank to a level position. Attach the mounting pin to the opposite mounting pin hole of the reservoir tank so that it is the same as the insertion side.

CAUTION:

- **Be sure to insert pin from the chamfered pinhole of cylinder body.**
- **Do not reuse reservoir tank and mounting pin.**



BRAKE BOOSTER

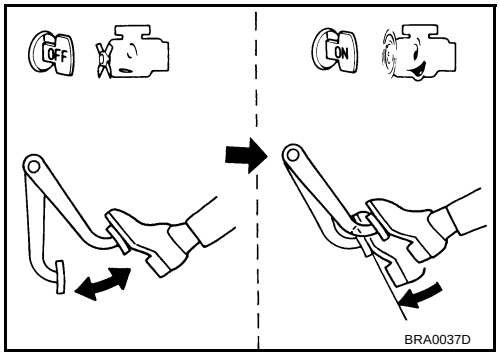
PFP:47200

On-Vehicle Service

AFS0008B

OPERATING CHECK

With the engine stopped, change the vacuum to the atmospheric pressure by depressing the brake pedal several times. Then with brake pedal fully depressed, start the engine and when the vacuum pressure reaches the standard, check that the clearance between the brake pedal and floor panel decreases.

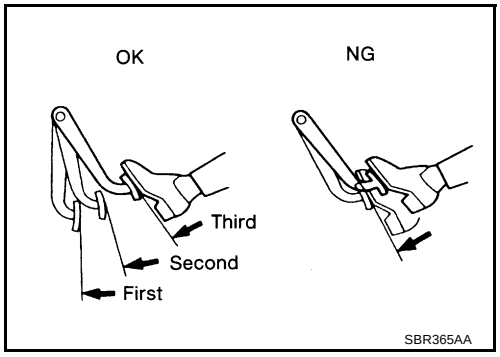


CAUTION:

Depressing pedal interval is approximately 5 seconds.

AIRTIGHT CHECK

- Run the engine at idle for approximately 1 minute, and stop it after applying vacuum to the booster. Depress the brake pedal normally to change the vacuum to the atmospheric pressure. Check that distance between the brake pedal and floor panel gradually increases.
- Depress brake pedal while engine is running, and stop engine with pedal depressed. The pedal stroke should not change after holding pedal down for 30 seconds.

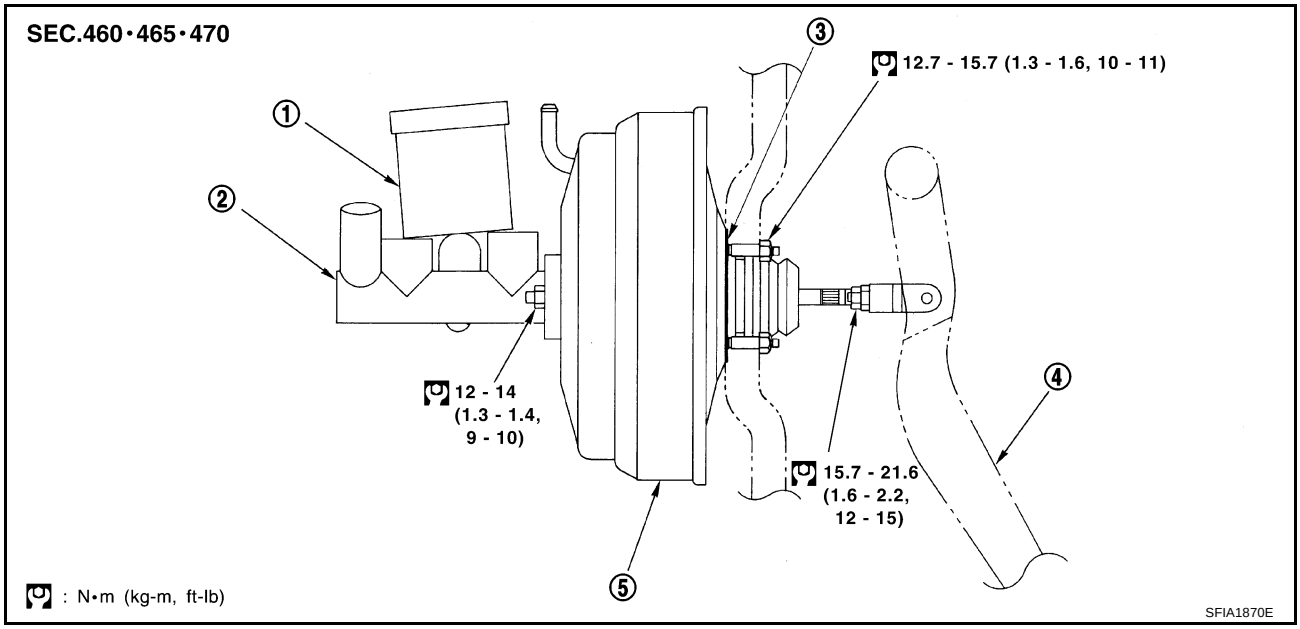


CAUTION:

Depressing pedal interval is approximately 5 seconds.

Removal and Installation

AFS000UA



1. Reservoir tank
2. Master cylinder
3. Gasket
4. Brake pedal
5. Brake booster

REMOVAL

CAUTION:

- **Be careful not to deform or bend brake piping while removing and installing the brake booster.**
- **Replace clevis pin if it is damaged.**
- **Be careful not to damage brake booster stud bolt threads. If brake booster is tilted or inclined during installation, the dash panel may damage the threads.**
- **Attach the check valve in the correct orientation.**

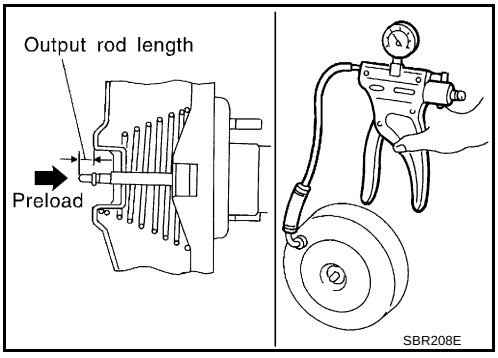
1. Remove vacuum hose from the brake booster. Refer to BR-24, "VACUUM LINES" .
2. Remove the brake master cylinder.BR-22, "Removal and Installation"
3. Remove the brake piping between brake master cylinder and ABS actuator and electric unit (control unit)/ VDC actuator. Refer to BR-11, "Hydraulic Circuit"

   CAUTION:
   For M/T vehicles with remove the brake piping after removing the clutch reservoir tank bolt.
4. Remove the brake pedal attachment snap pin and clevis pin from inside the vehicle.
5. Remove the nuts on the brake booster and brake pedal assembly.
6. Remove brake booster assembly from the engine compartment side.

INSPECTION AFTER REMOVAL

Output Rod Length Inspection

1. Using a handy vacuum pump, apply a vacuum of – 66.7 kPa (– 500 mmHg,19.69 inHg) to the brake booster.
2. Check output rod length.



Standard dimension when vacuum – 66.7 kPa (– 500 mmHg, – 19.69 inHg):

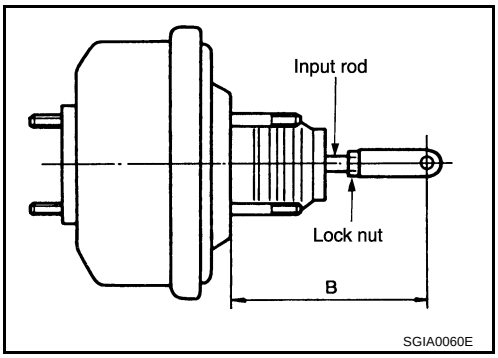
With TCS models : 10.4 mm (0.409 in)

With VDC models : – 6.2 mm (– 0.244 in)

INSTALLATION

1. Loosen the lock nut to adjust the input rod length so that the length B (in the figure on the right) satisfies the specified value.

   Length “B” : 125 mm (4.92 in)
2. After adjusting “B”, temporarily tighten the lock nut to install the booster assembly to the vehicle. At this time, make sure to install a gasket between the booster assembly and the vehicle.
3. Connect the brake pedal with the clevis of the input rod.
4. Install the pedal bracket mounting nuts and tighten them to the specified torque.
5. Install the brake piping between brake master cylinder and ABS actuator and electric unit (control unit) /VDC actuator. Refer to BR-11, "Hydraulic Circuit"
6. Install the master cylinder to the booster assembly.BR-22, "Removal and Installation"
7. Adjust the height and play of the brake pedal.
8. Tighten the lock nut of the input rod to the specified torque.
9. Refill new brake fluid and bleed air. Refer to BR-10, "Bleeding Brake System"

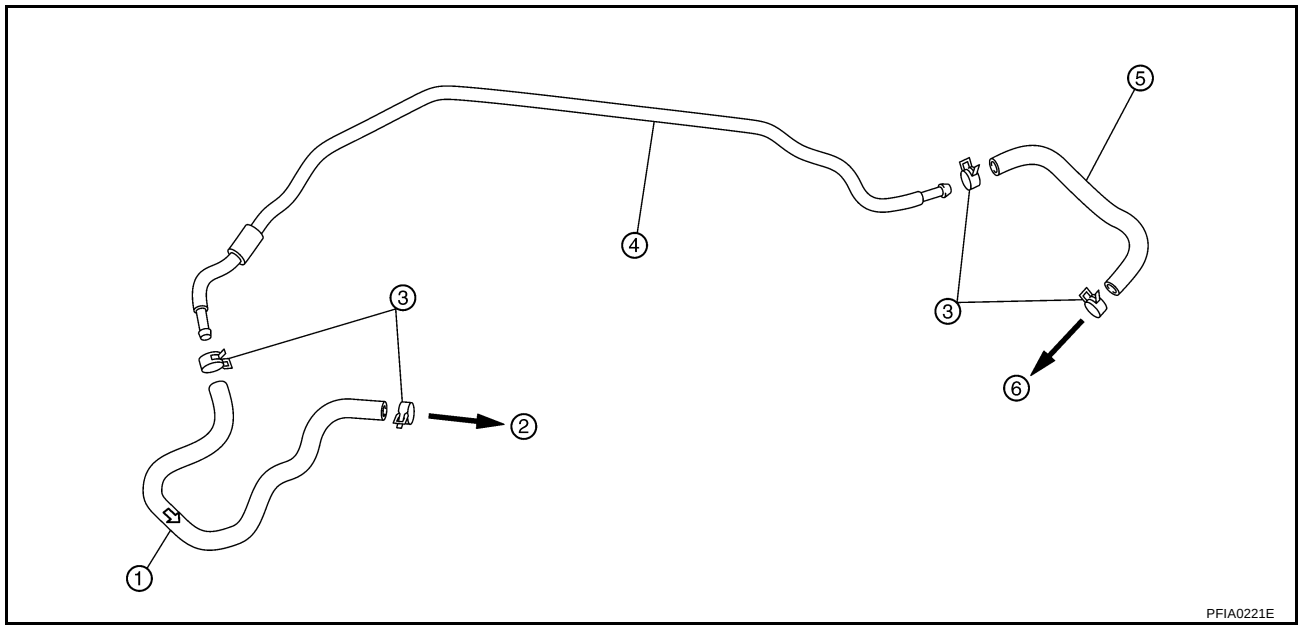


VACUUM LINES

PFP:41920

Removal and Installation

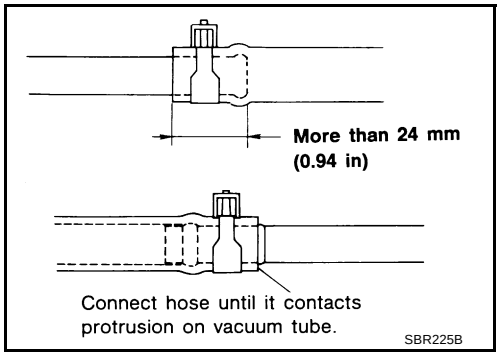
AFS0008D



1. Check valve inclusion position stamp
2. Intake manifold
3. Clamp
4. Vacuum piping
5. Vacuum hose
6. Brake booster

CAUTION:

- **Because vacuum hose contains a check valve, it must be installed in the correct orientation. Refer to the stamp or label to confirm correct installation. The brake booster will not operate normally if the hose is installed in the wrong direction.**
- **Insert the vacuum hose for at least 24 mm (0.94 in).**
- **Never use lubricating oil during assembly.**



Inspection

AFS0008E

VISUAL INSPECTION

Check for improper assembly, damage and deteriorate.

CHECK VALVE INSPECTION

Airtightness Inspection

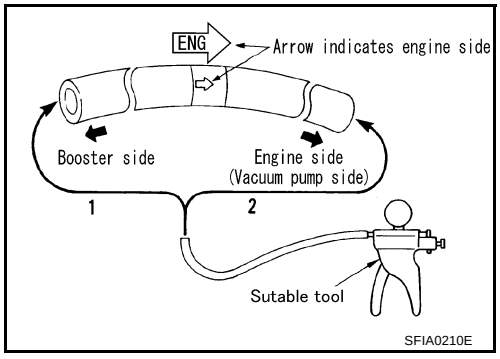
Use a hand-held vacuum pump to check.

When connected to booster side (1):

Vacuum decrease should be within 1.3 kPa (10 mmHg, 0.39 inHg) for 15 seconds under a vacuum of – 66.7 kPa (– 500 mmHg, – 19.69 inHg)

When connected to engine side (2):

No vacuum will be applied



FRONT DISC BRAKE (CLZ25VD TYPE)

PFP:41000

On-board Inspection

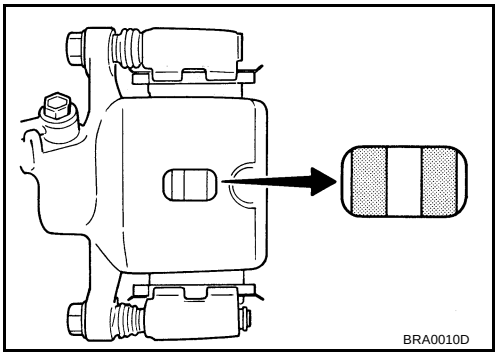
AFS00168

PAD WEAR INSPECTION

- Inspect the thickness of the pad through the cylinder body inspection hole. Use a scale for inspection if necessary.

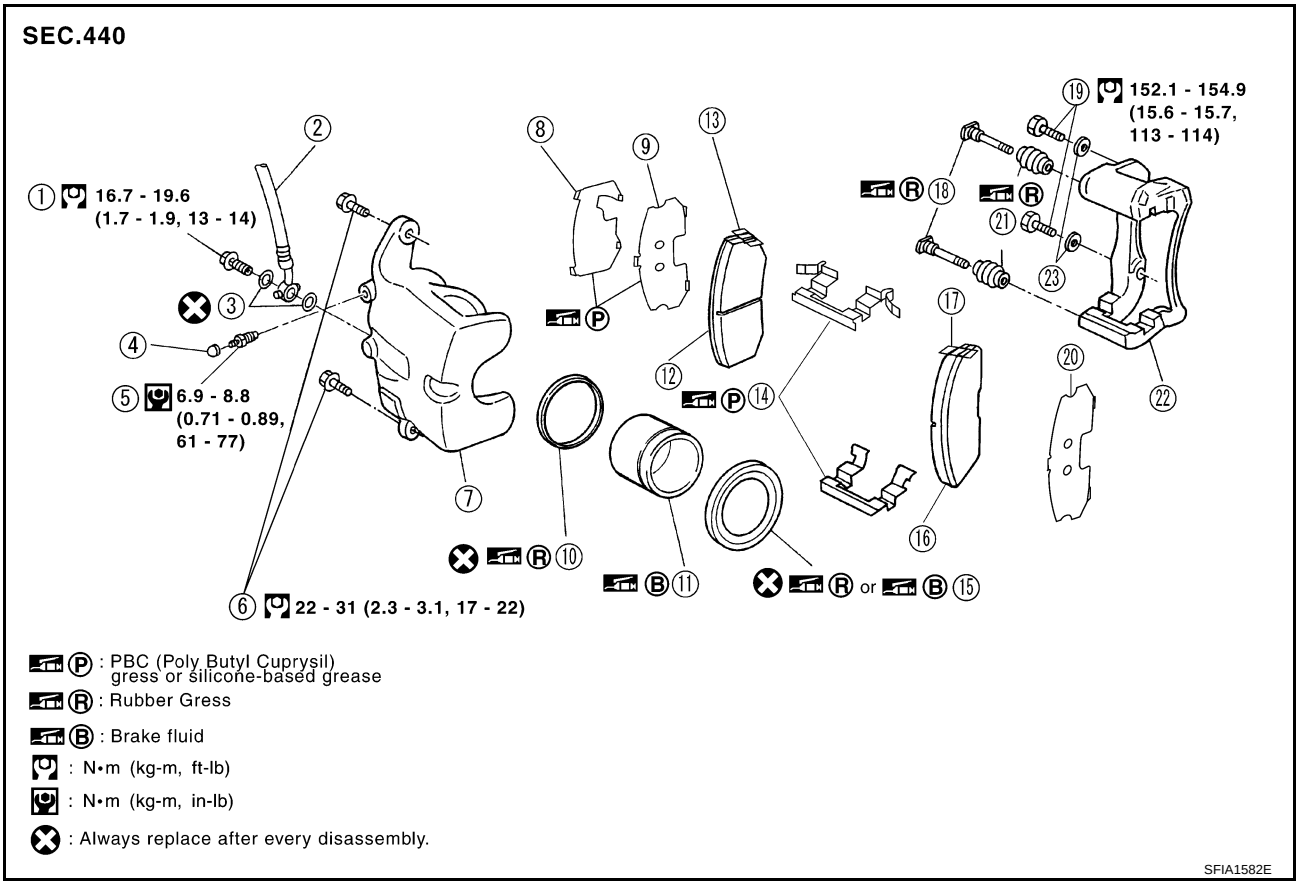
Standard

Standard thickness	**: 11.0 mm (0.433 in)**
Repair limit thickness	**: 2.0 mm (0.079 in)**



Components

AFS00169



1. Union bolt	2. Brake hose	3. Copper washer
4. Cap	5. Bleed valve	6. Sliding pin bolt
7. Cylinder body	8. Inner shim cover	9. Inner shim
10. Piston seal	11. Piston	12. Inner pad
13. Pad wear sensor	14. Pad retainer	15. Piston boot
16. Outer pad	17. Pad wear sensor	18. Sliding pin bolt
19. Torque member bolts	20. Outer shim	21. Slide pin boot
22. Torque member	23. Washer	

CAUTION:

- **Clean dust on caliper and brake pad with a vacuum dust collector. Do not blow with compressed air.**
- **While the brake pad and cylinder body are separated, the piston may suddenly jump out, so do not depress the brake pedal.**

- **It is not necessary to remove bolts on torque member and brake hose except for disassembly or replacement of the caliper assembly. In this case, hang cylinder body with a wire so that brake hose is not under tension.**
- **Do not damage piston boot.**
- **If any shim is subject to serious corrosion, replace it with a new one.**
- **Always replace shims and shim covers as a set when replacing brake pads.**
- **Keep the rotor clean of brake fluid.**

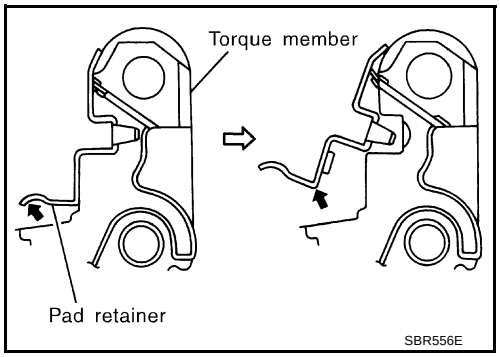
Removal and Installation of Brake Pad

AFS0016A

REMOVAL

1. Remove tires from vehicle with power tool.
2. Remove lower sliding pin bolt (1).
3. Hang the cylinder body with a wire and remove the pad and shim from the torque member.

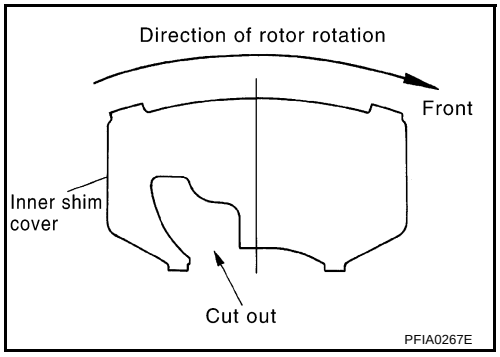
   CAUTION:
   When removing the pad retainer from the torque member, lift the pad retainer in the direction shown by the arrow (shown in the figure) so as not to deform it.



INSTALLATION

1. Apply PBC (Poly Butyl Cuprysil) grease or silicone -based grease between inner shim cover and inner shim.
2. Attach the inner shim and shim cover to the inner pad and the outer shim to the outer pad.

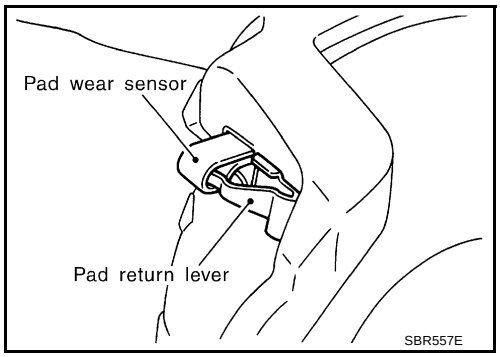
   CAUTION:
   Attach the inner shim cover in the direction shown in the figure.



3. Apply PBC (Poly Butyl Cuprysil) grease or silicone -based grease to the contact surface of the pad retainer and attach the pad retainer and pad to the torque member.

   CAUTION:
   Since both the inner and outer pads have pad return mechanisms on the upper pad retainer, when attaching a pad, make sure the pad return lever is firmly attached to the pad wear sensor.
4. Push the piston in so that the pad is firmly attached and attach the cylinder body to the torque member.

   NOTE:
   Using a disc brake piston tool (commercial service tool), etc., makes it easier to push in the piston.

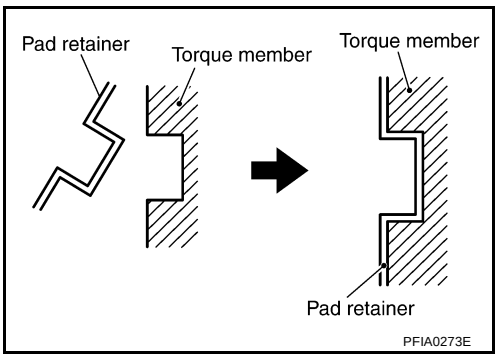


CAUTION:

- **By pushing in the piston, the brake fluid returns to the master cylinder reservoir tank. Watch the level of the surface of the reservoir tank.**

- **When attaching the pad retainer, attach it firmly so that it does not float up higher than the torque member, as shown in the figure.**

5. Install lower sliding pin bolt (1), and tighten it to the specified torque.
6. Check brake for drag.
7. Attach the tires to the vehicle.



AFS0016B

Removal and Installation of Caliper Assembly

REMOVAL

1. Remove tires from vehicle with power tool.(Commercial service tool)
2. Drain brake fluid. Refer toBR-9, "Drain and Refill" .
3. Remove union bolts and torque member bolts, and remove caliper assembly.
4. Remove disc rotor.

INSTALLATION

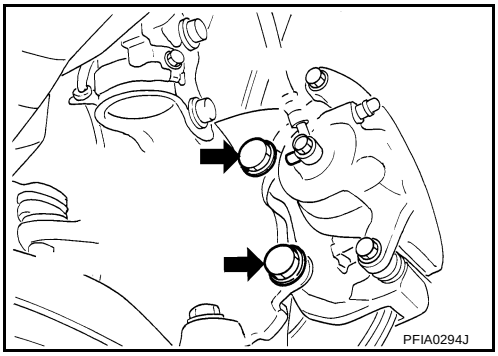
CAUTION:

- **Refill with new brake fluid “DOT3”**
- **Never reuse drained brake fluid.**

1. Install disc rotor.
2. Install caliper assembly to the vehicle, and tighten bolts to the specified torque.

   : 152.1 - 154.9 N·m (15.6 - 15.7 kg-m, 113 - 114 ft - lb)

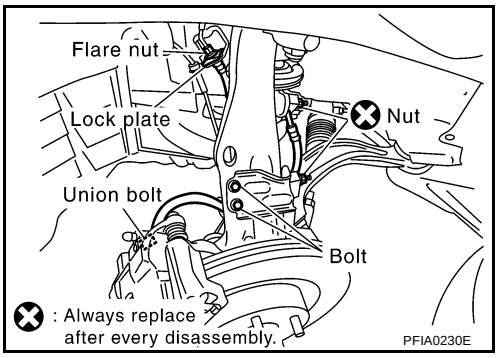
   CAUTION:
   - **Do not allow the knuckle attachment surface, caliper attachment surface, the screws, the bolts, or the washers to come in contact with oil or water.**



3. Install brake hose to the caliper assembly, and tighten union bolts to the specified torque.

   : 16.7 - 19.6 N·m (1.7 - 1.9 kg-m, 13 - 14 ft-lb)

   CAUTION:
   - **Do not reuse the copper washer for union bolts.**
   - **Attach the brake hose to the protrusion on the caliper assembly attachment part.**



4. Refill new brake fluid and bleed air. Refer toBR-10, "Bleeding Brake System" .
5. Attach the tires to the vehicle.

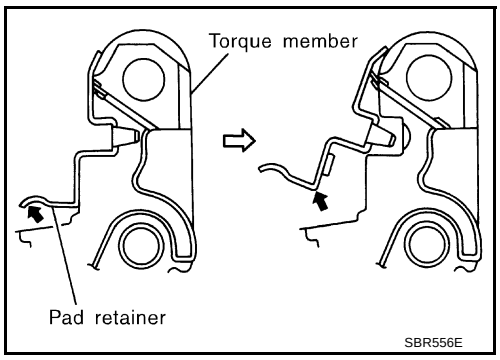
Disassembly and Assembly of Caliper Assembly

AFS0016C

DISASSEMBLY

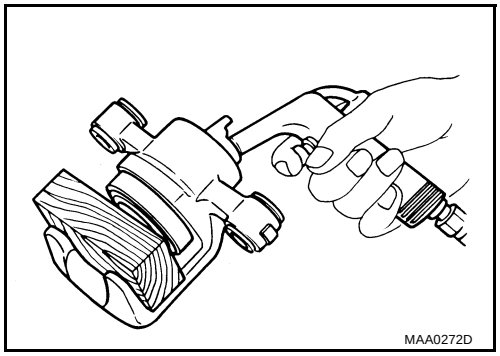
1. Remove the slide pin bolt, and then remove the pad, shim, shim cover, and pad retainer from the torque member.

   CAUTION:
   When removing the pad retainer from the torque member, lift it in the direction indicated by the arrow in the figure so that it does not deform.



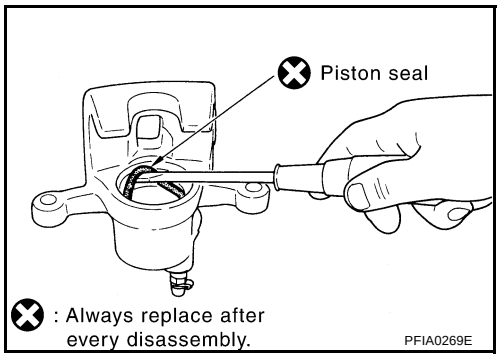
2. Remove sliding pins and sliding pin boots from torque member.
3. Place a wooden block as shown in the figure, and blow air from union bolt mounting hole to remove pistons and piston boots.

   CAUTION:
   Do not get your fingers caught in the piston.



4. Using a flat-bladed screwdriver, remove the piston seal from the cylinder body.

   CAUTION:
   Be careful not to damage cylinder inner wall.



CALIPER INSPECTION

Cylinder Body

CAUTION:

- **Use new brake fluid to clean. Never use mineral oils such as gasoline or kerosene.**
- **Check for corrosion, wear, or damage to the cylinder inner wall, and replace the caliper if there are any non-standard conditions.**
- **Minor flaws caused by corrosion or a foreign material can be removed by polishing the surface with a fine sandpaper. Replace the cylinder body, if necessary.**

Torque Member

Check for wear, cracks, and damage. If damage or deformation is present, replace the affected part.

Piston

CAUTION:

- **Since the piston surface is plated, do not repair using sandpaper.**
- **Check piston surface for corrosion, wear, and damage. If any non-standard condition is detected, replace applicable part.**

Sliding Pins, Sliding Pin Bolts, and Sliding Pin Boots

Check sliding pin and sliding pin boot for wear, damage, and cracks. If damage or deformation is present, replace the affected part.

ASSEMBLY

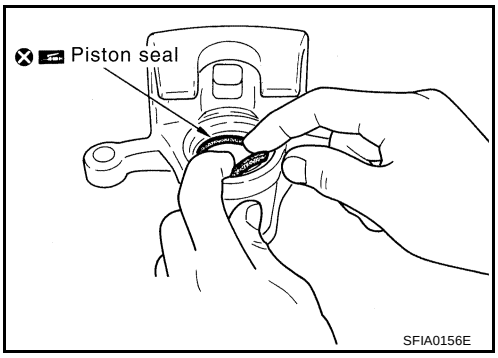
CAUTION:

Do not use Nissan Rubber Grease (KRE00 00010, KRE00 00010 01) when assembling.

1. Apply rubber grease to the piston seal and attach to cylinder body.

   CAUTION:

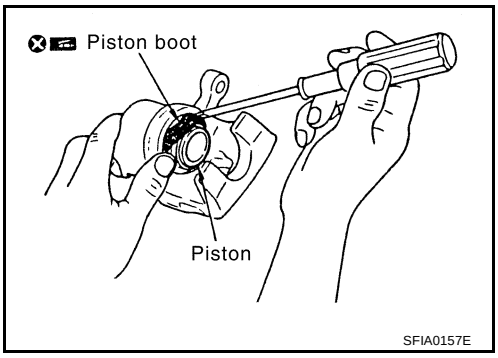
   Do not reuse the piston seals.



2. Apply brake fluid or rubber grease to the piston boot, place it on the piston, and firmly insert the piston boot cylinder-side lip into the cylinder body groove.

   CAUTION:

   Do not reuse the piston boot.

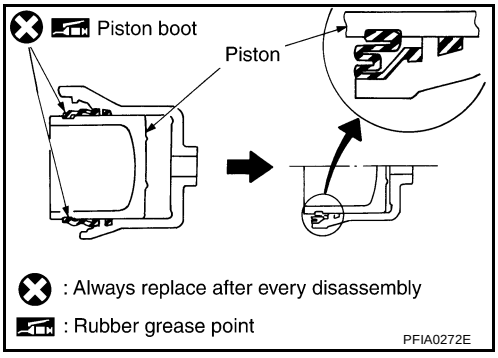


3. Apply brake fluid or rubber grease to the piston, insert into the cylinder body by hand and firmly attach the piston boot piston-side lip into the piston groove.

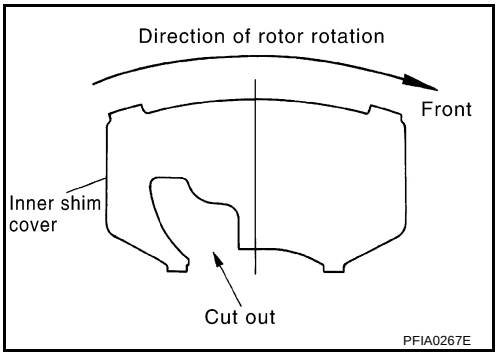
   CAUTION:

   Press the piston evenly and vary the pressing point to prevent cylinder inner wall from being rubbed.

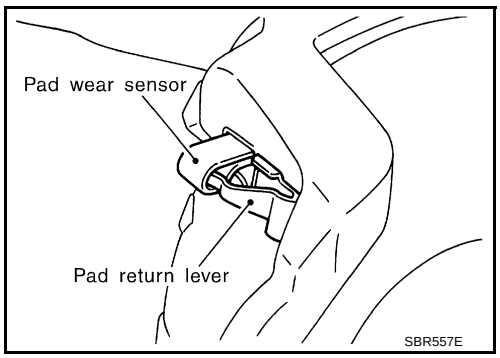
4. Install sliding pins and sliding pin boots to torque member.



5. Apply PBC (Poly Butyl Cuprysil) grease or silicone -based grease between inner shim cover and inner shim.
6. Attach the inner shim and shim cover to the inner pad and the outer shim to the outer pad.



7. Apply PBC (Poly Butyl Cuprysil) grease or silicone -based grease to the contact surface of the pad retainer and attach the pad retainer and pad to the torque member.
8. Install cylinder body. Tighten sliding pin bolt to the specified torque.



DISC ROTOR INSPECTION

Visual Inspection

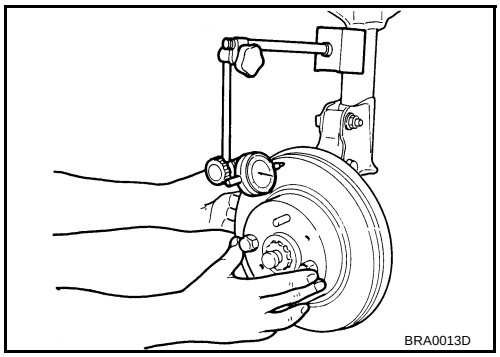
Check surface of the disc rotor for uneven wear, cracks, and serious damage. If any non-standard condition is detected, replace applicable part.

Runout Inspection

1. Using wheel nuts, fix disc rotor to the wheel hub. (2 or more positions)
2. Inspect runout using a dial gauge.

Standard value
(measured at 10 mm (0.39 in) inside the disc edge)

Runout limit (with it attached to the vehicle)	**: 0.035 mm (0.0014 in) or less**
Runout limit (just the disc rotor)	**: 0.020 mm (0.0008 in) or less**



NOTE:
Make sure that wheel bearing axial endplay is with in the specifications before measuring runout. Refer to FAX-4, "On-Vehicle Inspection and Service" .

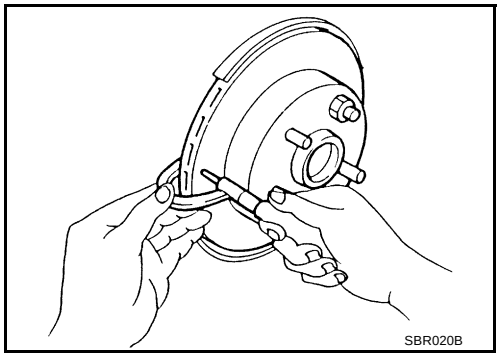
3. If runout is outside the limit, find the minimum runout point by shifting mounting positions of the disc rotor and wheel hub by one hole.

Thickness Inspection

Using a micrometer, check thickness of the disc rotor. If thickness is outside the standard, replace disc rotor.

Standard

Standard thickness	**: 24.0 mm (0.945 in)**
Wear limit	**: 22.0 mm (0.866 in)**
Maximum uneven wear (measured at 8 positions)	**: 0.015 mm (0.0006 in) or less**



BRAKE BURNISHING PROCEDURE

Burnish the brake contact surface according to the following procedure after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage.

CAUTION:
Only perform this procedure under safe road and traffic conditions. Use extreme caution.

1. **Drive the vehicle on a straight smooth road at 50 km/h (31 MPH).**
2. **Use medium brake pedal /foot effort to bring the vehicle to a complete stop from 50 km/h (31 MPH). Adjust brake pedal /foot pressure such that vehicle stopping time equals 3 to 5 seconds.**
3. **To cool the brake system, drive the vehicle at 50 km/h (31 MPH) for 1 minute without stopping.**
4. **Repeat steps 1 to 3, 10times or more to complete the burnishing procedure.**

FRONT DISC BRAKE (OPB27VA TYPE)

PFP:41000

On-board Inspection

AFS000Y6

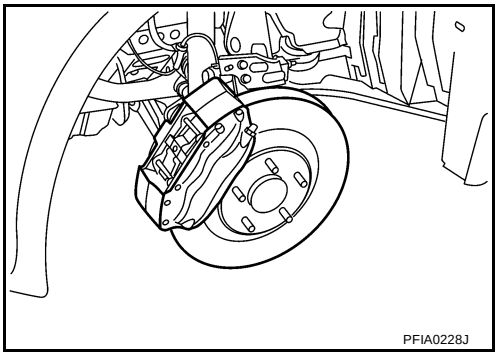
PAD WEAR INSPECTION

- Inspect the thickness of the pad through the caliper inspection hole. Use a scale for inspection if necessary.

Standard

Standard thickness : 9.3 mm (0.366 in)

Repair limit thickness : 2.0 mm (0.079 in)

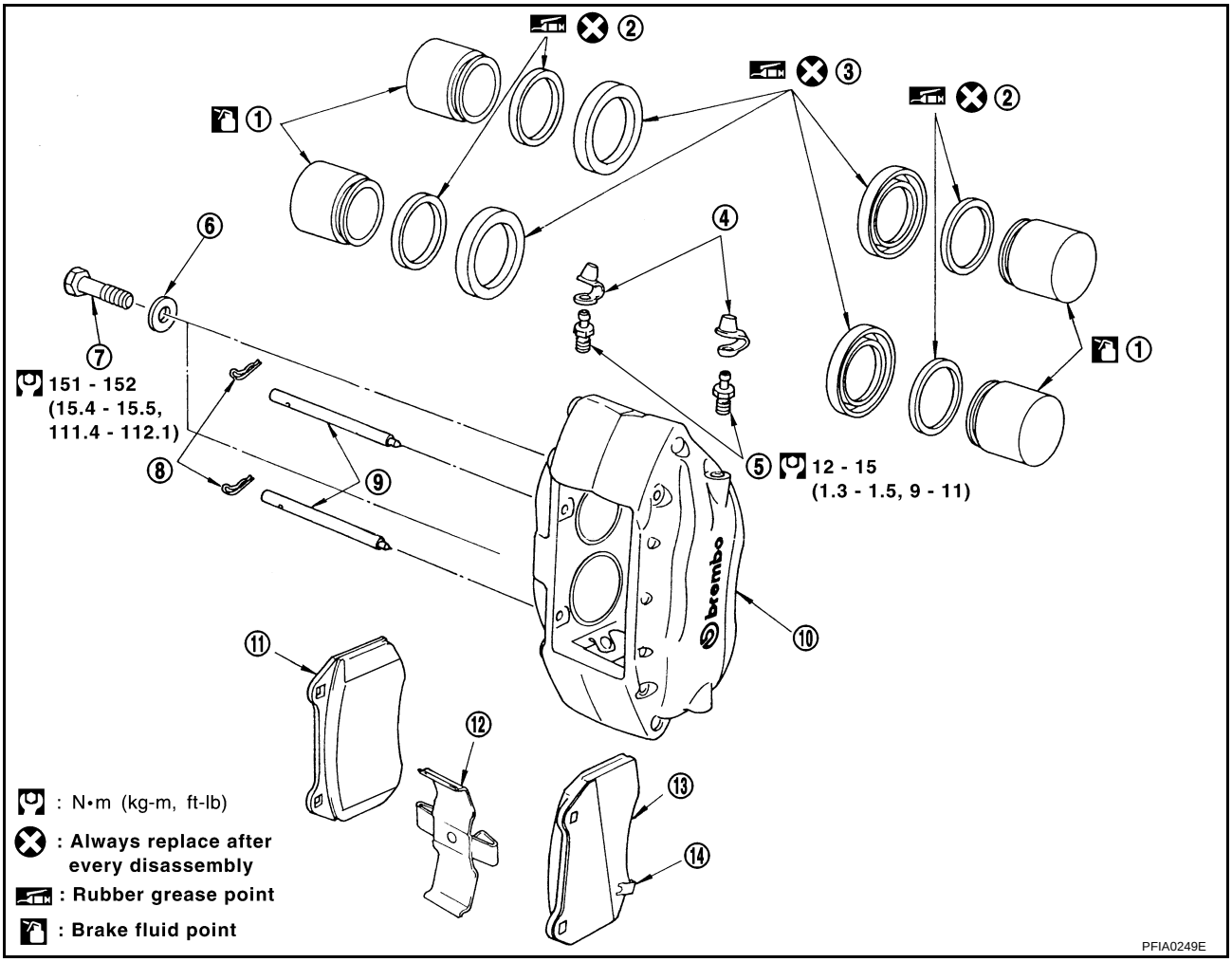


Component

AFS000Y7

NOTE:

Refer to BR-33, "HOW TO APPLY GREASE TO THE BRAKE PAD" for how to apply grease to brake pads.



1. Piston	2. Piston seal	3. Piston boot
4. Cap	5. Bleed valve	6. Washer
7. Bolt	8. Clips	9. Pad pins
10. Caliper	11. Inner pad	12. Cross spring
13. Outer pad	14. Pad wear sensor	

CAUTION:

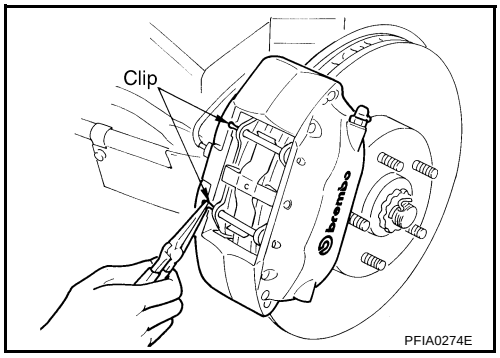
- **Clean dust on caliper and brake pad with a vacuum dust collector. Do not blow with compressed air.**
- **While the brake pad and cylinder body are separated, the piston may suddenly jump out, so do not depress the brake pedal.**
- **Apart from caliper assembly, disassembly or replacement, there is no need to remove caliper bolts or brake hose or tube.**
- **Do not damage piston boot.**
- **Keep the rotor clean of brake fluid.**

Removal and Installation of Brake Pad

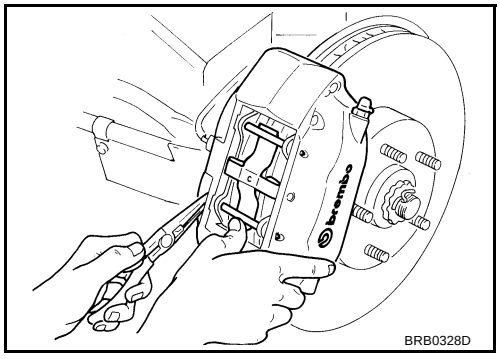
AFS000Y8

REMOVAL

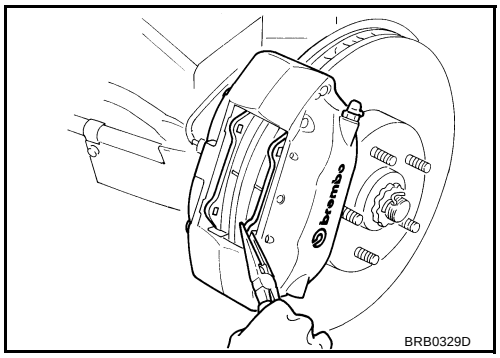
1. Remove tires from vehicle with power tool.(Commercial service tool)
2. Remove the clip from the pad pin.



3. Remove the pad pin while holding down the cross spring, then remove the cross spring from the caliper.



4. Using pliers, remove the pad from the caliper.



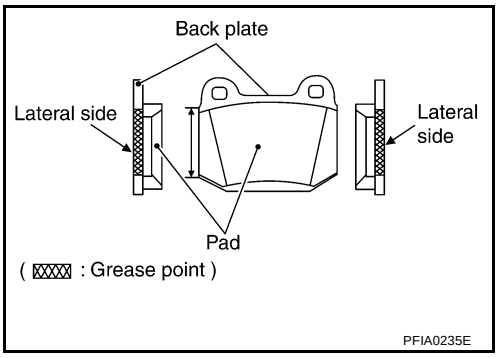
HOW TO APPLY GREASE TO THE BRAKE PAD

Pad Side

Apply PBC (Poly Butyl Cuprysil) grease or silicone-based grease about 0.5 g (0.018 oz) per surface equally to back plate side of Inner Pad and Outer Pad. (Refer to the figure)

CAUTION:

Make sure no foreign matter attaches itself to the grease.



INSTALLATION

1. Insert the piston to the position where the pad is attached.

   NOTE:

   Using a disc brake piston tool (commercial service tool), etc., makes it easier to push in the piston.

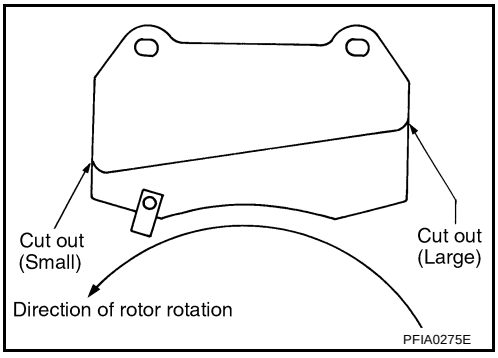
   CAUTION:

   By pushing in the piston, the brake fluid returns to the master cylinder reservoir tank. Watch the level of the surface of the reservoir tank.

2. Attach pad.

   CAUTION:

   - **Attach the pad with wear sensor to the outer side.**
   - **The side of the shim with the larger cutouts should be on the entry side of the disc rotor spin.**

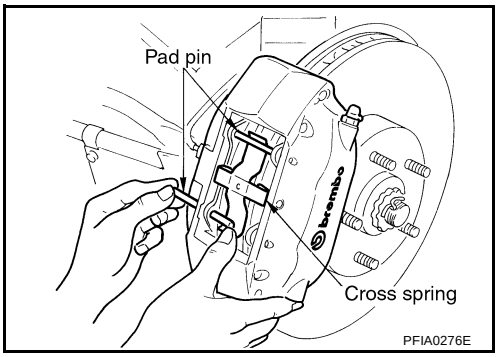


3. Insert the upper pad pin from the inner cylinder side, then insert firmly to the outer cylinder side through the hole in the top of the pad.
4. As shown in the figure, place the top of the cross spring over the top pad pin, press in the cross spring, push the lower pad pin from the inner cylinder side to the outer cylinder side, and secure the cross spring.
5. Insert the clip in the small hole at the end of the pad pin.

   CAUTION:

   If the clip is not fully attached, the pad pin or the pad could fall out while the vehicle is in motion.

6. Attach the tires to the vehicle.

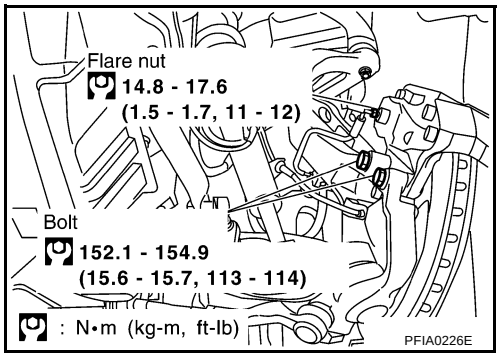


Removal and Installation of Caliper Assembly

AFS000Y9

REMOVAL

1. Remove tires from vehicle with power tool.
2. Drain brake fluid. Refer to BR-9, "Drain and Refill" .
3. Remove the brake pad. Refer to BR-32, "Removal and Installation of Brake Pad" .
4. Remove the brake tube flare nut using a flare wrench.
5. Remove the brake tube bracket from the knuckle spindle.



6. Remove the caliper bolt and remove the caliper assembly from the vehicle.
7. Remove disc rotor.

INSTALLATION

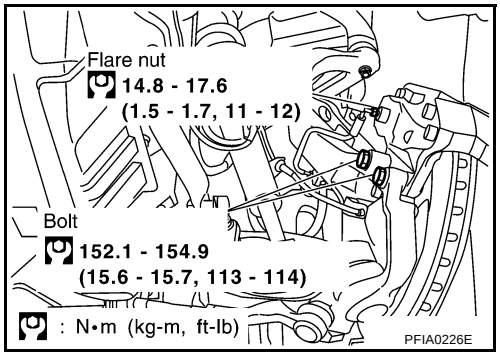
CAUTION:

- **Refill with new brake fluid “DOT3”**
- **Never reuse drained brake fluid.**

1. Install disc rotor.
2. Install caliper assembly to the vehicle, and tighten bolts to the specified torque.

CAUTION:

When attaching the caliper assembly to the vehicle, wipe any oil off the knuckle spindle washers and caliper assembly attachment surfaces.



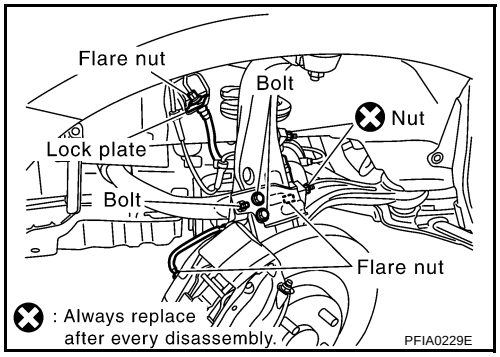
3. Attach the brake tube to the caliper assembly and partially tighten the flare nut.
4. Attach the brake tube bracket to the knuckle spindle and tighten to the specified torque.

   : 10.8 - 15.6 N·m (1.1 -1.5 kg-m, 8 - 11 ft-lb)

5. Using a flare nut torque wrench, tighten the caliper assembly and brake tube connection flare nut to the specified torque.

   : 14.8 - 17.6 N·m (1.5 - 1.7 kg-m, 11 - 12 ft-lb)

6. Attach brake pad. Refer to BR-32, "Removal and Installation of Brake Pad" .
7. Refill new brake fluid and bleed air. Refer to BR-10, "Bleeding Brake System" .
8. Attach the tires to the vehicle.



Disassembly and Assembly of Caliper Assembly

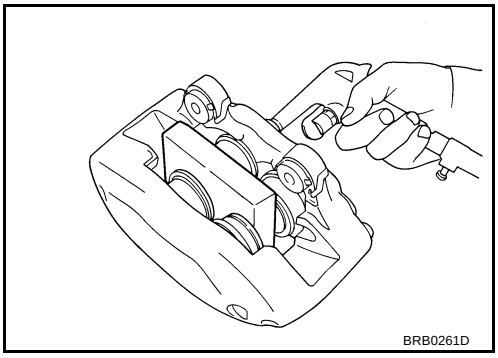
AFS000YA

DISASSEMBLY

1. Insert a piece of wood as shown in the figure, blow air in through the flare nut mounting hole, and remove the piston and piston boot. If the four pistons do not all come out at the same time, press the piston(s) that have come out a ways into the cylinder body and blow air in again.

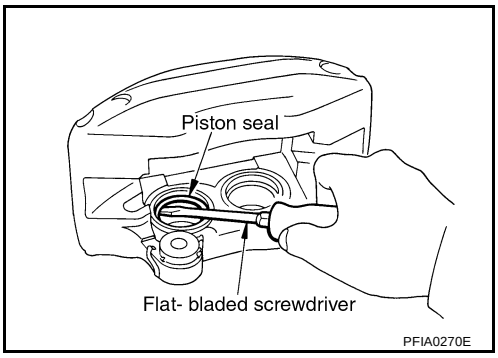
   CAUTION:
   Do not get your fingers caught in the piston.

2. Remove the piston boot from the piston.



3. Using a flat-bladed screwdriver, remove the piston seal.

   CAUTION:
   - **Be careful not to damage cylinder inner wall.**
   - **Never remove the four bolts from the inner and outer sides of the caliper. Do not tighten them further, either.**



CALIPER INSPECTION

Caliper

CAUTION:
- **Use new brake fluid to clean. Never use mineral oils such as gasoline or kerosene.**
- **Check for corrosion, wear, or damage to the cylinder inner wall, and replace the caliper if there are any non-standard conditions.**

Piston

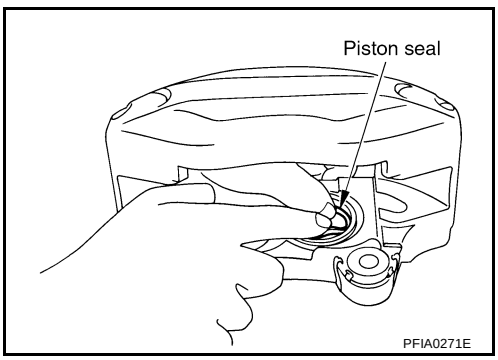
CAUTION:
- **Since the piston surface is plated, do not repair using sandpaper.**
- **Check piston surface for corrosion, wear, and damage. If any non-standard condition is detected, replace applicable part.**

ASSEMBLY

CAUTION:
Do not use Nissan Rubber Grease (KRE00 00010, KRE00 00010 01) when assembling.

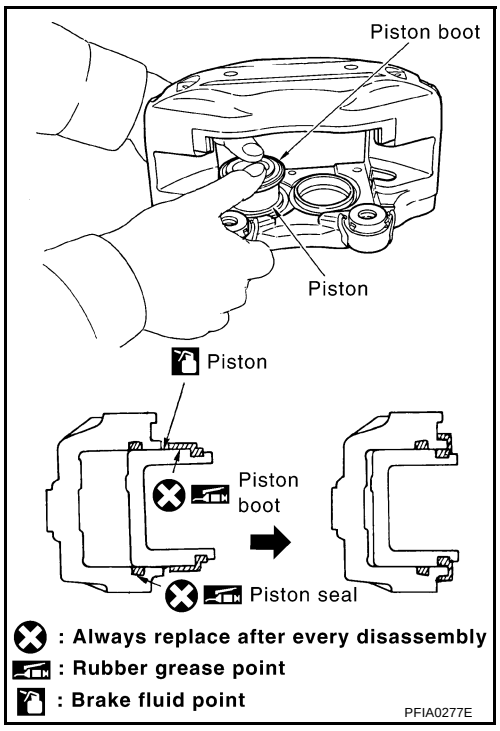
1. Apply a rubber grease to the piston seal and attach to cylinder body.

   CAUTION:
   Do not reuse the piston seals.



2. Apply brake fluid or rubber grease to the piston boot, place it on the piston, and firmly insert the piston boot cylinder-side lip into the cylinder body groove.
3. Insert the piston into the cylinder body by hand and firmly attach the piston boot piston-side lip into the piston groove.

   CAUTION:
   Press the piston evenly and vary the pressing point to prevent cylinder inner wall from being rubbed.



4. Attach the shim and shim cover to the pad and attach to the caliper.

DISC ROTOR INSPECTION

Visual Inspection

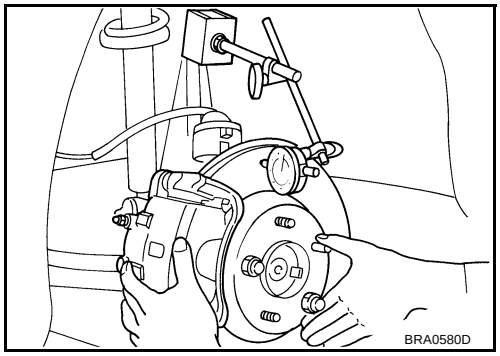
Check surface of the disc rotor for uneven wear, cracks, and serious damage. If any non-standard condition is detected, replace applicable part.

Runout Inspection

1. Using wheel nuts, fix disc rotor to the wheel hub. (2 or more positions)
2. Inspect runout using a dial gauge.

   Standard value
   (measured at 10 mm (0.39 in) inside the disc edge)

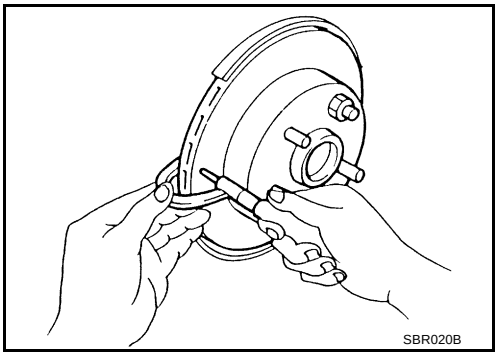
Runout limit (with it attached to the vehicle)	**: 0.050 mm (0.0020 in) or less**
Runout limit (just the disc rotor)	**: 0.040 mm (0.0016 in) or less**



   NOTE:
   Make sure that wheel bearing axial endplay is with in the specifications before measuring runout. Refer to FAX-4, "On-Vehicle Inspection and Service" .
3. If runout is outside the limit, find the minimum runout point by shifting mounting positions of the disc rotor and wheel hub by one hole.

Thickness Inspection

Using a micrometer, check thickness of the disc rotor. If thickness is outside the standard, replace disc rotor.



Standard

Standard thickness	**: 30.0 mm (1.181 in)**
Wear limit	**: 28.4 mm (1.118 in)**
Maximum uneven wear (measured at 8 positions)	**: 0.015 mm (0.0006 in) or less**

BRAKE BURNISHING PROCEDURE

Refer to BR-30, "BRAKE BURNISHING PROCEDURE" .

REAR DISC BRAKE (AD14VE TYPE)

PFP:44000

On-board Inspection

AFS000YC

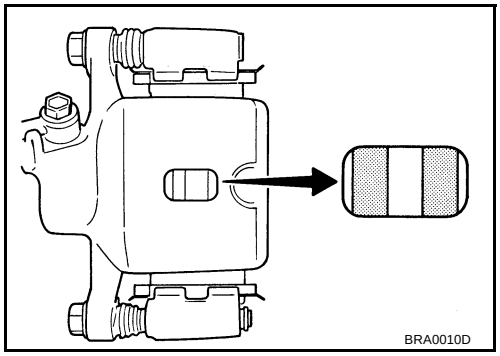
PAD WEAR INSPECTION

- Inspect the thickness of the pad through the cylinder body inspection hole. Use a scale for inspection if necessary.

Standard

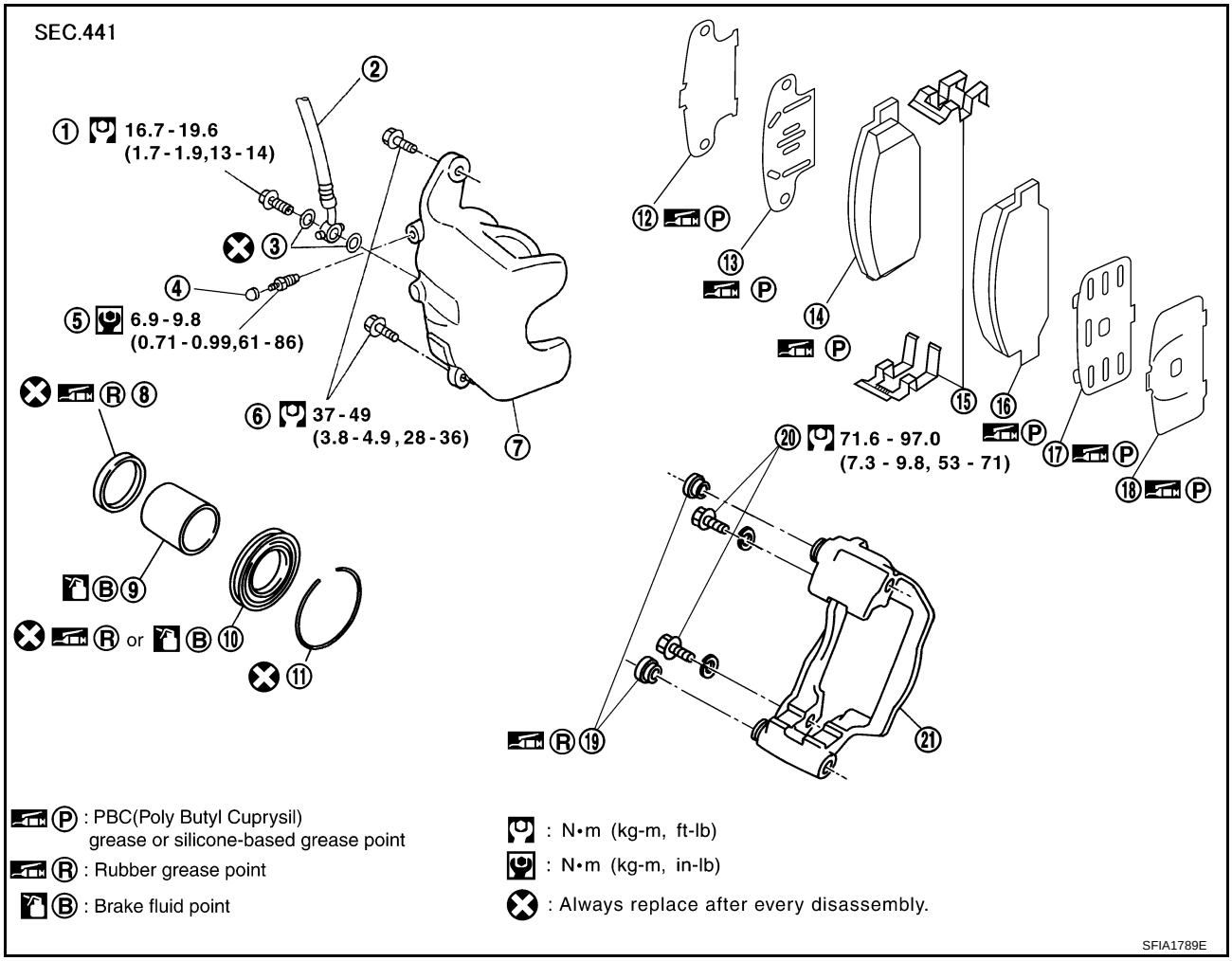
Standard thickness : 8.5 mm (0.335 in)

Repair limit thickness : 2.0 mm (0.079 in)



Components

AFS000YD



1.	Union bolt	2.	Brake hose	3.	Copper washer
4.	Cap	5.	Bleed valve	6.	Sliding pin bolt
7.	Cylinder body	8.	Piston seal	9.	Piston
10.	Piston boot	11.	Retaining ring	12.	Inner shim cover
13.	Inner shim	14.	Inner pad	15.	Pad retainer
16.	Outer pad	17.	Outer shim	18.	Outer shim cover
19.	Slide pin boot	20.	Torque member bolts	21.	Torque member

CAUTION:

- **Clean dust on caliper and brake pad with a vacuum dust collector. Do not blow with compressed air.**
- **While removing cylinder body, never depress the brake pedal because the piston will pop out.**
- **It is not necessary to remove bolts on torque member and brake hose except for disassembly or replacement of the caliper assembly. In this case, hang cylinder body with a wire so that brake hose is not under tension.**
- **Do not damage piston boot.**
- **Always replace shims and shim covers as a set when replacing brake pads.**
- **Keep the rotor clean of brake fluid.**

Removal and Installation of Brake Pad

AFS000YE

REMOVAL

1. Remove tires from vehicle with power tool.(Commercial service tool)
2. Remove sliding pin bold (one on top).
3. Hang cylinder body with a wire, and remove pads, pad retainers, shims from torque member.

INSTALLATION

1. Apply PBC (Poly Butyl Cuprysil) grease or silicon- based grease to the rear of the pad and to both sides of the shim, and attach the inner shim and shim cover to the inner pad, and the outer shim and outer shim cover to the outer pad.
2. Attach the pad retainer and pad to the torque member.
3. Push the piston in so that the pad is firmly attached and attach the cylinder body to the torque member.

   NOTE:
   Using a disc brake piston tool (commercial service tool), etc., makes it easier to push in the piston.

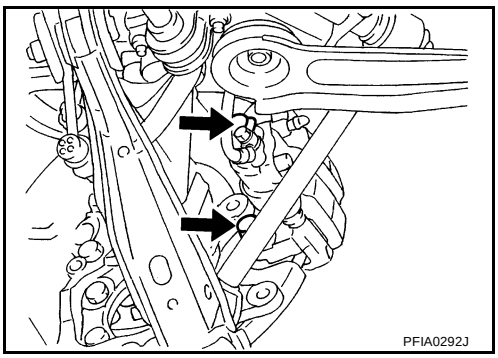
   CAUTION:
   By pushing in the piston, the brake fluid returns to the master cylinder reservoir tank. Watch the level of the surface of the reservoir tank.
4. Attach the sliding pin bolt (one on top) and tighten to the specified torque.
5. Check brake for drag.
6. Attach the tires to the vehicle.

Removal and Installation of Caliper Assembly

AFS000YF

REMOVAL

1. Remove tires from vehicle with power tool.
2. Drain brake fluid. Refer to BR-9, "Drain and Refill" .
3. Remove union bolts and torque member bolts, and remove caliper assembly.
4. Remove disc rotor.



INSTALLATION

CAUTION:

- **Refill with new brake fluid “DOT 3”.**
- **Never reuse drained brake fluid.**

1. Install disc rotor.
2. Install caliper assembly to the vehicle, and tighten bolts to the specified torque.

   CAUTION:
   Before installing caliper assembly to the vehicle, wipe off oil and grease on washer seats on axle assembly and mounting surface of caliper assembly.
3. Install brake hose to caliper assembly and tighten union bolts to the specified torque.

CAUTION:

- **Do not reuse the copper washer for union bolts.**
- **Securely attach brake hose to protrusion on caliper assembly.**

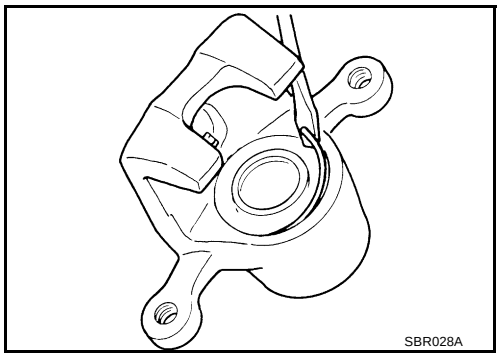
4. Insert new brake fluid and bleed air. Refer to BR-10, "Bleeding Brake System" .
5. Attach the tires to the vehicle.

Disassembly and Assembly of Caliper Assembly

AFS000YG

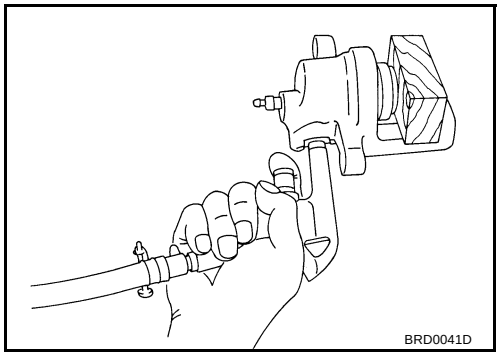
DISASSEMBLY

1. Remove the slide pin bolt, and then remove the pad, shim, shim cover, and pad retainer from the torque member and cylinder.
2. Remove sliding pin boot from torque member.
3. As shown in the figure, using a flat-bladed screwdriver, remove the retaining ring from the cylinder body.



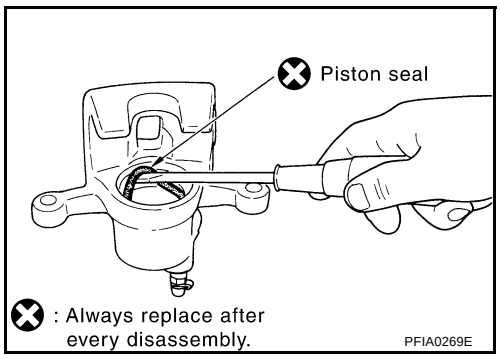
4. Place a wooden block as shown in the figure, and blow air from union bolt mounting hole to remove pistons and piston boots.

   CAUTION:
   Do not get your fingers caught in the piston.



5. Using a flat-bladed screwdriver, remove piston seals from cylinder body.

   CAUTION:
   Be careful not to damage cylinder inner wall.



CALIPER INSPECTION

Cylinder Body

CAUTION:

- **Use new brake fluid to clean. Never use mineral oils such as gasoline or kerosene.**
- **Check inner wall of cylinder for corrosion, wear, and damage. If any non-standard condition is detected, replace cylinder body.**
- **Minor flaws caused by corrosion or a foreign material can be removed by polishing the surface with a fine sandpaper. Replace the cylinder body, if necessary.**

Torque Member

Check for wear, cracks, and damage. If damage or deformation is present, replace the affected part.

Piston

CAUTION:

Since the piston surface is plated, do not repair using sandpaper.

Check piston surface for corrosion, wear, and damage. If any non-standard condition is detected, replace applicable part.

Sliding Pin Bolts and Sliding Pin Boots

Check that there is no wear, damage, or cracks in the sliding pin bolts and sliding pin boots, and if there are, replace them.

ASSEMBLY

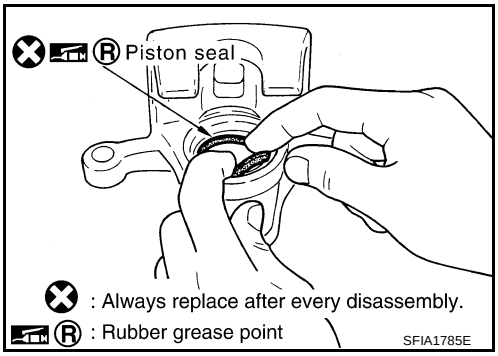
CAUTION:

Do not use Nissan Rubber Grease (KRE00 00010, KRE00 00010 01) when assembling.

1. Apply a rubber grease to the piston seal and attach to cylinder body.

   CAUTION:

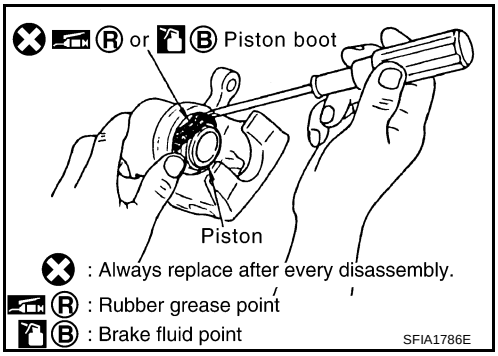
   Do not reuse the piston seals.



2. Apply brake fluid or rubber grease to the piston boot, place it on the piston, and firmly insert the piston boot cylinder-side lip into the cylinder body groove.

   CAUTION:

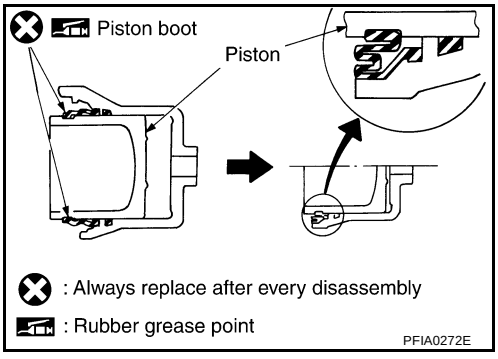
   Do not reuse the piston boot.



3. Apply a brake fluid to the piston, insert into the cylinder body by hand and firmly attach the piston boot piston-side lip into the piston groove.

   CAUTION:

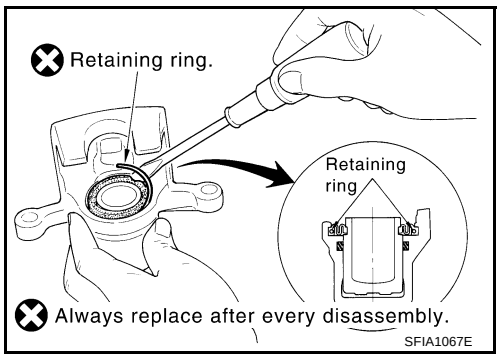
   Press the piston evenly and vary the pressing point to prevent cylinder inner wall from being rubbed.



4. Fix piston boot with retaining ring.

CAUTION:

- **Make sure the boot is firmly in the cylinder body groove.**
- **Do not reuse the retaining ring.**

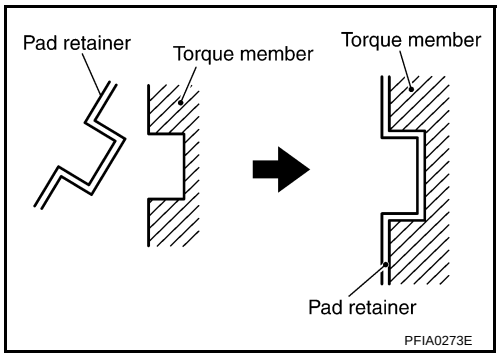


5. Attach the sliding pin bolt and sliding pin boot to the torque member.
6. Apply PBC (Poly Butyl Cuprysil) grease or silicon- based grease to the rear of the pad and to both sides of the shim, and attach the inner shim and shim cover to the inner pad, and the outer shim and outer shim cover to the outer pad.
7. Attach the pad retainer and pad to the torque member.

CAUTION:

When attaching the pad retainer, attach it firmly so that it does not float up higher than the torque member, as shown in the figure.

8. After assembling shims and shim covers to pad, install it to the torque member.
9. Install cylinder body. Tighten sliding pin bolts to the specified torque.



DISC ROTOR INSPECTION

Visual Inspection

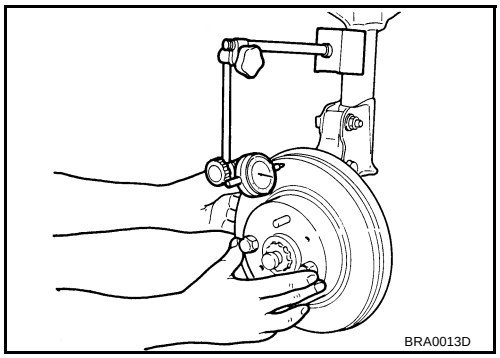
Check surface of the disc rotor for uneven wear, cracks, and serious damage. If any non-standard condition is detected, replace applicable part.

Runout Inspection

1. Using wheel nuts, fix disc rotor to the wheel hub. (2 or more positions)
2. Inspect runout using a dial gauge.

Standard value
(measured at 10 mm (0.39 in) inside the disc edge)

Measurement position	**: At a point 10 mm (0.39 in) from outer edge of the disc.**
Runout limit (with it attached to the vehicle)	**: 0.10 mm (0.0039 in) or less**
Runout limit (just the disc rotor)	**: 0.07 mm (0.0028 in) or less**



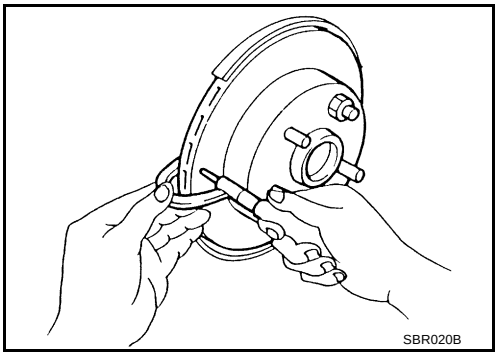
NOTE:

Make sure that wheel bearing axial endplay is with in the specification before measuring runout. Refer toRAX-6, "On-Vehicle Inspection and Service" .

3. If runout is outside the limit, find the minimum runout point by shifting mounting positions of the disc rotor and wheel hub by one hole.

Thickness Inspection

Using a micrometer, check thickness of the disc rotor. If thickness is outside the standard, replace disc rotor.



Standard

Standard thickness	**: 16.0 mm (0.630 in)**
Wear limit	**: 14.0 mm (0.551 in)**
Maximum uneven wear (measured at 8 positions)	**: 0.015 mm (0.0006 in) or less**

REAR DISC BRAKE (OPB13VB TYPE)

PFP:44000

On-board Inspection

AFS000YI

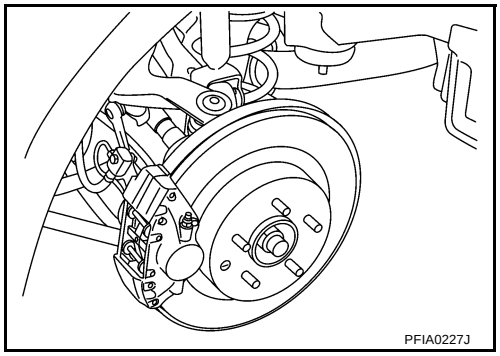
PAD WEAR INSPECTION

- Inspect the thickness of the pad through the caliper inspection hole. Use a scale for inspection if necessary.

Standard

Standard thickness : 9.1 mm (0.358 in)

Repair limit thickness : 2.0 mm (0.079 in)

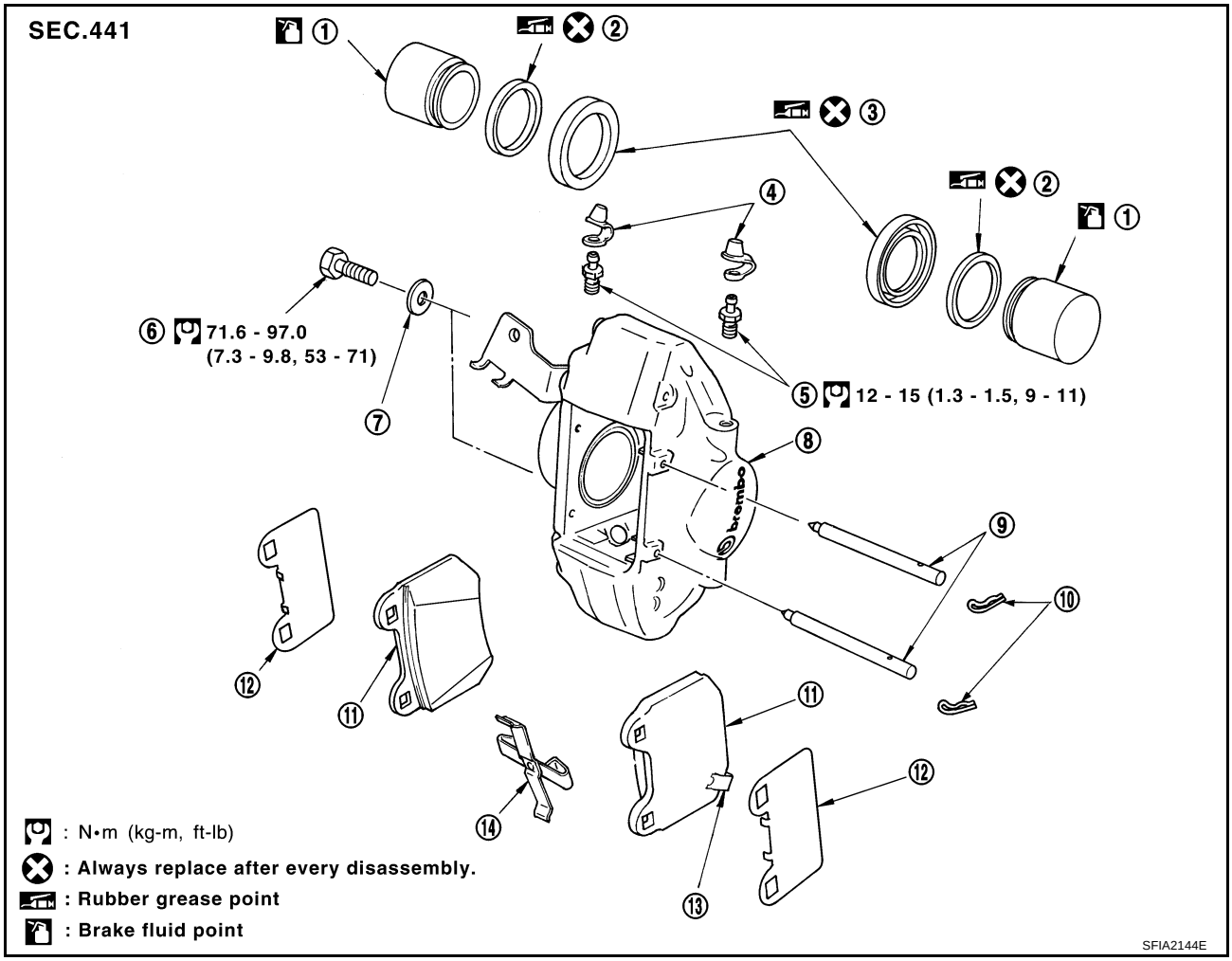


Components

AFS000YJ

NOTE:

Refer to BR-46, "HOW TO APPLY GREASE TO THE BRAKE PAD" for how to apply grease to brake pads.



1. Piston	2. Piston seal	3. Piston boot
4. Cap	5. Bleed valve	6. Bolt
7. Washer	8. Caliper	9. Pad pins
10. Clips	11. Brake pad	12. Shim cover
13. Pad wear sensor	14. Cross spring	

CAUTION:

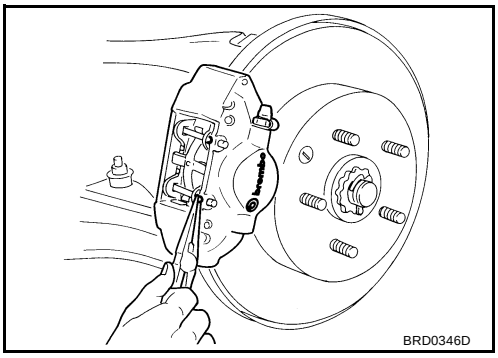
- **Clean dust on caliper and brake pad with a vacuum dust collector. Do not blow with compressed air.**
- **While removing cylinder body, never depress the brake pedal because the piston will pop out.**
- **Apart from caliper assembly, disassembly or replacement, there is no need to remove caliper bolts or brake hose or tube.**
- **Do not damage piston boot.**
- **Always replace shim cover as a set when replacing brake pads.**
- **Keep the rotor clean of brake fluid.**

Removal and Installation of Brake Pad

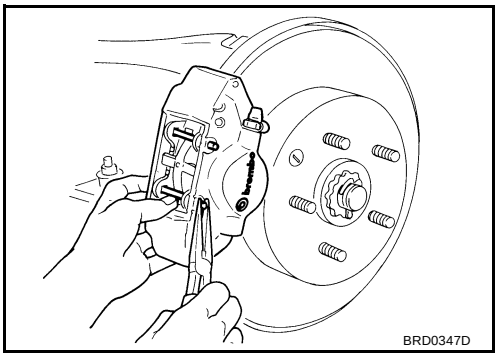
AFS000YK

REMOVAL

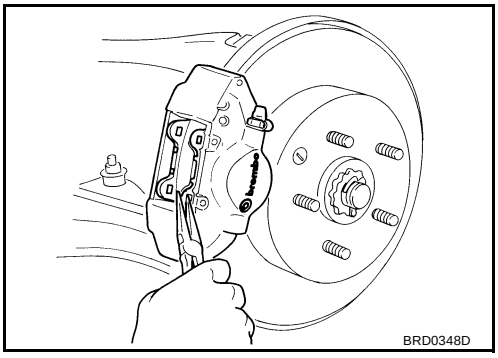
1. Remove tires from vehicle with power tool.
2. Remove the clip from the pad pin.



3. Remove the pad pin while holding down the cross spring, then remove the cross spring from the caliper.



4. Using pliers, remove the pad from the caliper.

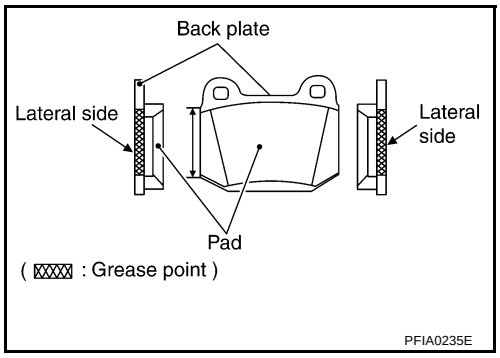


HOW TO APPLY GREASE TO THE BRAKE PAD

Pad Side

Apply PBC (Poly Butyl Cuprysil) grease or silicone-based grease about 0.5 g (0.018 oz) per surface equally to back plate side of Inner Pad and Outer Pad. (Refer to the figure)

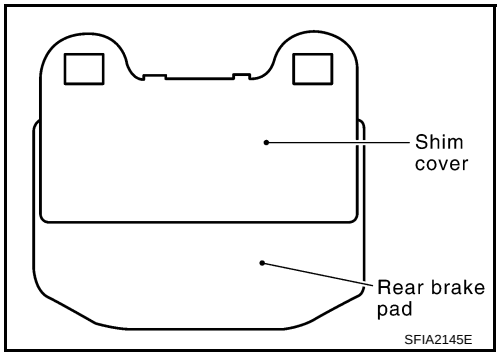
CAUTION:
Make sure no foreign matter attaches itself to the grease.



Pad Rear

Apply approximately 1.5 g (0.053 oz) of PBC (Poly Butyl Cuprysil) grease or silicone -based grease between shim cover and pad.

CAUTION:
Make sure no foreign matter attaches itself to the grease.



INSTALLATION

1. Insert the piston to the position where the pad is attached.

   NOTE:
   Using a disc brake piston tool (commercial service tool), etc., makes it easier to push in the piston.

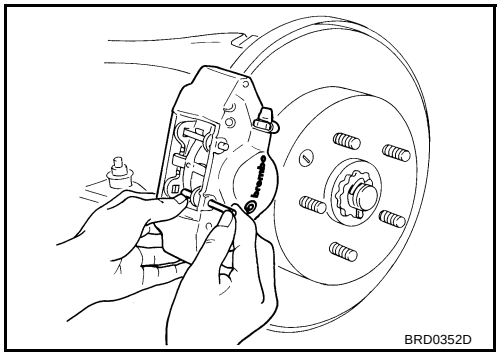
   CAUTION:
   Pushing the piston in will make the brake fluid return to the master cylinder reservoir tank, so watch the level of the surface of the reservoir tank.

2. Attach pad and shim cover.

   CAUTION:
   Attach the pad with wear sensor to the outer side.

3. Insert the upper pad pin from the outer cylinder side, then insert firmly to the inner cylinder side through the hole in the top of the pad.
4. As shown in the figure, place the top of the cross spring over the top pad pin, press in the cross spring, push the lower pad pin from the outer cylinder side to the inner cylinder side, and secure the cross spring.
5. Insert the clip in the small hole at the end of the pad pin.

   CAUTION:
   If the clip is not fully attached, the pad pin or the pad could fall out while the vehicle is in motion.



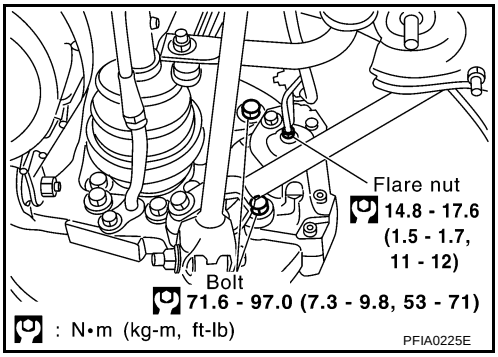
6. Attach the tires to the vehicle.

Removal and Installation of Caliper Assembly

AFS000YL

REMOVAL

1. Remove tires from vehicle with power tool.
2. Drain brake fluid. Refer to BR-9, "Drain and Refill" .
3. Remove the brake pad. Refer to BR-45, "Removal and Installation of Brake Pad" .
4. Remove the brake tube flare nut using a flare wrench.
5. Remove the brake hose bolt, move the brake hose, and remove the caliper assembly from the vehicle.
6. Remove disc rotor.

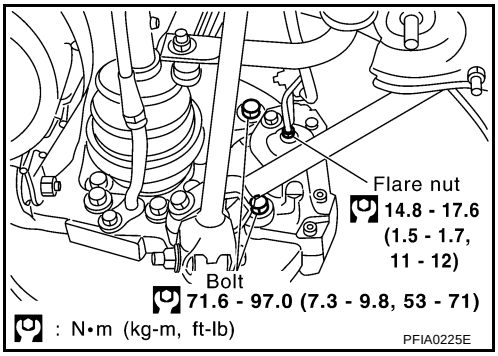


INSTALLATION

CAUTION:

- **Refill with new brake fluid “DOT3”.**
- **Never reuse drained brake fluid.**

1. Install disc rotor.
2. Attach the brake tube to the caliper assembly and partially tighten the flare nut.
3. Attach the caliper assembly to the vehicle and tighten the bolt to the specified torque.
4. Tighten the flare nut to the specified torque.
5. Attach brake pad. Refer to BR-46, "INSTALLATION" .
6. Refill new brake fluid and bleed air. Refer to BR-10, "Bleeding Brake System" .
7. Attach the tires to the vehicle.



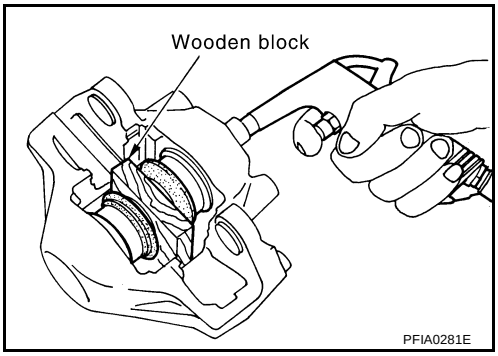
Disassembly and Assembly of Caliper Assembly

AFS000YM

DISASSEMBLY

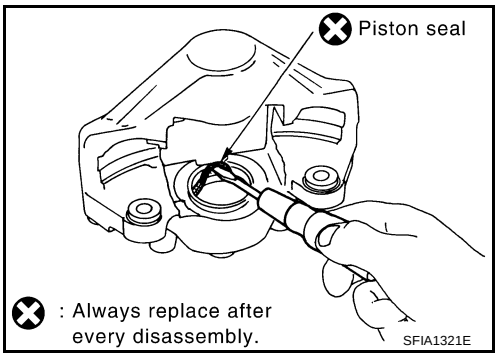
1. Insert a piece of wood as shown in the figure, blow air in through the flare nut mounting hole, and remove the piston and piston boot.

   CAUTION:
   Do not get your fingers caught in the piston.
2. Remove the piston boot from the piston.



3. Using a flat-bladed screwdriver, remove the piston seal.

   CAUTION:
   - **Be careful not to damage cylinder inner wall.**
   - **Never remove the four bolts from the inner and outer sides of the caliper. Do not tighten them further, either.**



CALIPER INSPECTION

Caliper

CAUTION:

- **Use new brake fluid to clean. Never use mineral oils such as gasoline or kerosene.**
- **Check for corrosion, wear, or damage to the cylinder inner wall, and replace the caliper if there are any non-standard conditions.**

Piston

CAUTION:

- **Since the piston surface is plated, do not repair using sandpaper.**
- **Check piston surface for corrosion, wear, and damage. If any non-standard condition is detected, replace applicable part.**

ASSEMBLY

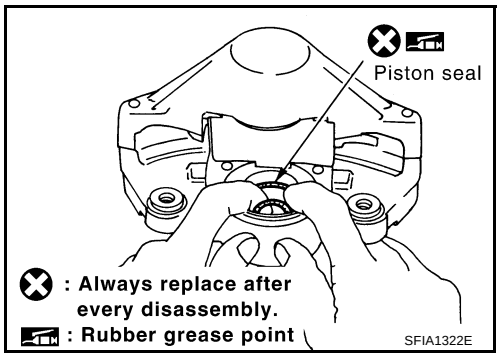
CAUTION:

Do not use Nissan rubber grease (KRE00 00010, KRE00 00010 01) during assembly.

1. Apply a rubber grease to the piston seals, and install them to cylinder body.

   CAUTION:

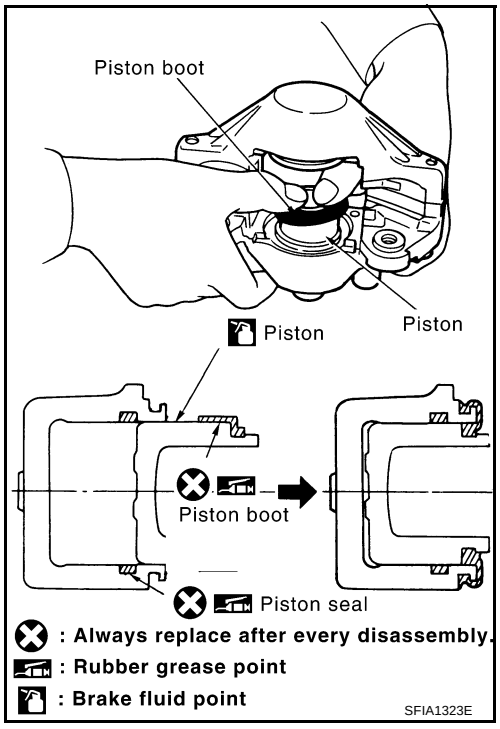
   Do not reuse the piston seals.



2. Apply brake fluid or rubber grease to the piston boot, place it on the piston, and firmly insert the piston boot cylinder-side lip into the cylinder body groove.
3. Insert the piston into the cylinder body by hand and firmly attach the piston boot piston-side lip into the piston groove.

   CAUTION:

   Press the piston evenly and vary the pressing point to prevent cylinder inner wall from being rubbed.



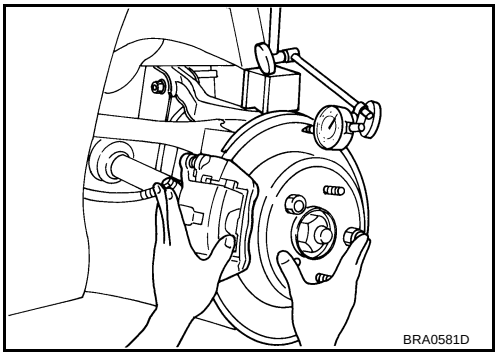
DISC ROTOR INSPECTION

Visual Inspection

Check surface of the disc rotor for uneven wear, cracks, and serious damage. If any non-standard condition is detected, replace applicable part.

Runout Inspection

1. Using wheel nuts, fix disc rotor to the wheel hub. (2 or more positions)
2. Inspect runout using a dial gauge.



Standard value (measured at 10 mm (0.39 in) inside the disc edge)

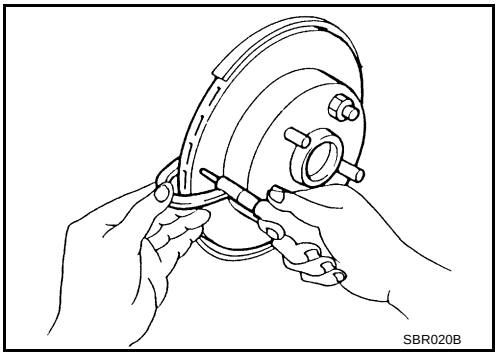
Runout limit (with it attached to the vehicle)	**: 0.070 mm (0.0028 in) or less**
Runout limit (just for disc rotor)	**: 0.050 mm (0.0020 in) or less**

NOTE:
Make sure that wheel bearing axial endplay is with in the specification before measuring runout. Refer toRAX-6, "On-Vehicle Inspection and Service" .

3. If runout is outside the limit, find the minimum runout point by shifting mounting positions of the disc rotor and wheel hub by one hole.

Thickness Inspection

Using a micrometer, check thickness of the disc rotor. If thickness is outside the standard, replace disc rotor.



Standard

Standard thickness	**: 22.0 mm (0.866 in)**
Wear limit	**: 20.2 mm (0.795 in)**
Maximum uneven wear (measured at 8 positions)	**: 0.015 mm (0.0020 in) or less**

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

AFS0008Q

Unit: mm (in)

Front brake	Brake model		CLZ25VD	OPB27VA
	Rotor outer diameter × thickness		296 × 24.0 (11.65 × 0.945)	324 × 30.0 (12.76 × 1.181)
	Pad Length × width × thickness		125.6 × 46.0 × 11.0 (4.94 × 1.811 × 0.433)	117.1 × 53.3 × 9.3 (4.61 × 2.098 × 0.366)
	Cylinder bore diameter		57.2 (2.252)	38 (1.50) × 2 + 44 (1.73) × 2
Rear brake	Brake model		AD14VE	OPB13VB
	Rotor outer diameter × thickness		292 × 16 (11.50 × 0.63)	332 × 22 (13.07 × 0.87)
	Pad Length × width × thickness		83.0 × 33.0 × 8.5 (3.268 × 1.299 × 0.335)	76.6 × 45 × 9.1 (3.016 × 1.77 × 0.358)
	Cylinder bore diameter		42.86 (1.6874)	40.0 × 2 (1.575)
Master cylinder	Cylinder bore diameter		26.99 (1.0626)	
Control valve	Valve model		Electric brake force distribution	
Brake booster	Booster model	Coupe	V255	M215T
		Roadster	M215T	–
	Diaphragm diameter	Coupe	255 (10.04)	Pri:230(9.06) Sec:205(8.07)
		Roadstar	Pri: 230 (9.06) Sec: 205 (8.07)	
Recommended brake fluid			DOT 3	

Brake Pedal

AFS0008R

Brake pedal height (from dash lower panel top surface)	M/T model	154 - 164 mm (6.06 - 6.46 in)
	A/T model	162 - 172 mm (6.38 - 6.77 in)
Depressed pedal height (under a force of 490 N (50 kg, 110 lb) with the engine running)	M/T model	More than 90 mm (3.54 in)
	A/T model	More than 95 mm (3.74 in)
Clearance between the stopper rubber and the threaded end of the stop lamp switch and ASCD cancel switch.		0.74 - 1.96 mm (0.0291 - 0.0772 in)
Pedal play		3 - 11 mm (0.12 - 0.43 in)

Brake Booster

AFS0008T

Vacuum type

Vacuum leakage [at vacuum of – 66.7 kPa (– 500 mmHg, –19.69 inHg)]	Within 3.3 kPa (25 mmHg, 0.98 inHg) of vacuum for 15 seconds
Input rod installation standard dimension	125 mm (4.92 in)

Check Valve

AFS0008S

Vacuum leakage [at vacuum of – 66.7 kPa(– 500 mmHg, – 19.69 inHg)]	within 1.3 kPa (10 mmHg, 0.39 inHg) of vacuum for 15 seconds

Front Disc Brake

AFS0008U

Brake model		CLZ25VD	OPB27VA
Brake pad	Standard thickness (new)	11.0 mm (0.433 in)	9.3 mm (0.366 in)
	Repair limit thickness	2.0 mm (0.079 in)	2.0 mm (0.079 in)

Brake model		CLZ25VD	OPB27VA
Disc rotor	Standard thickness (new)	24.0 mm (0.945 in)	30.0mm (1.181 in)
	Repair limit thickness	22.0 mm (0.866 in)	28.4mm (1.118 in)
	Maximum uneven wear (measured at 8 positions)	0.015mm (0.0006 in) or less	0.015 mm (0.0006 in) or less
	Runout limit (with it attached to the vehicle)	0.035 mm (0.0014 in) or less	0.050 mm (0.0020 in) or less
	Runout limit (just the disc rotor)	0.020 mm (0.0008 in) or less	0.040 mm (0.0016 in) or less

Rear Disc Brake

AFS0008V

Brake model		AD14VE	OPB13VB
Brake pad	Standard thickness (new)	8.5 mm (0.335 in)	9.1 mm (0.358 in)
	Repair limit thickness	2.0 mm (0.079 in)	2.0 mm (0.079 in)
Disc rotor	Standard thickness (new)	16.0 mm (0.630 in)	22.0 mm (0.866 in)
	Repair limit thickness	14.0 mm (0.551 in)	20.2 mm (0.795 in)
	Maximum uneven wear (measured at 8 positions)	0.015 mm (0.0006 in) or less	0.015 mm (0.0006 in) or less
	Runout limit (with it attached to the vehicle)	0.10 mm (0.0039 in) or less	0.07 mm (0.0028 in) or less
	Runout limit (just the disc rotor)	0.07 mm (0.0028 in) or less	0.050 mm (0.0020 in) or less

SECTION PB
PARKING BRAKE SYSTEM

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PARKING BRAKE SYSTEM

PFP:36010

On-Vehicle Service

AFS0008Y

LEVER STROKE

- When parking brake lever is operated with a force of 196 N (20 kg, 44 lb), check that the stroke is within the specified number of notches. (Check it by listening and counting the ratchet clicks.)

Lever stroke : 6 to 7 notches

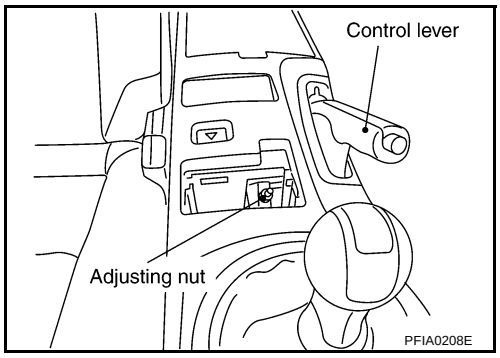
INSPECT COMPONENTS

- Make sure the components are attached properly (check for looseness, backlash, etc.).
- Check parking lever assembly for bend, damage and cracks, and replace if necessary.
- Check that there is no wear or damage to the cable, and replace if there is.
- Inspecting parking brake warning lamp switch is inspected and exchange if there is a faulty.

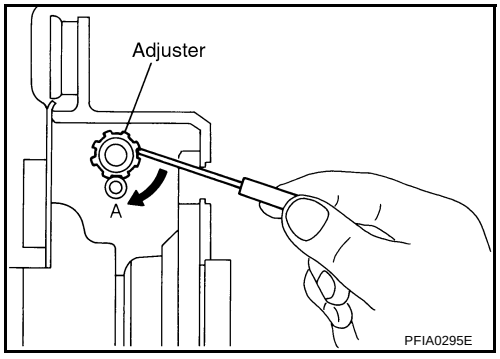
ADJUSTMENT

- To perform adjustment operations, remove tire from the vehicle with power tool.

1. Remove ashtray. Insert a deep socket wrench to rotate adjusting nut and loosen the cable sufficiently. Then, return the lever.
2. Using wheel nuts, fix the disc to the hub and prevent it from tilting.



3. Remove adjusting hole plug installed on the disc. Using a flat-bladed screwdriver, turn the disc in direction A as shown in the figure until the disc is locked. After locking, turn the adjuster in the opposite direction by 5 or 6 notches.
4. Rotate the disc to make sure there is no drag. Install the adjusting hole plug.
5. Adjust cable as follows:



a. Operate lever 10 or more times with a force of 294 N (30 kg, 66 lb).
b. Rotate adjusting nut with deep socket to adjust lever stroke.

CAUTION:
Do not reuse the adjusting nut after removing it.

c. When parking brake lever is operated with a force of 196 N (20 kg, 44 lb), check that the stroke is within the specified number of notches. (Check it by listening and counting the ratchet clicks.)

Lever stroke : 6 to 7 notches

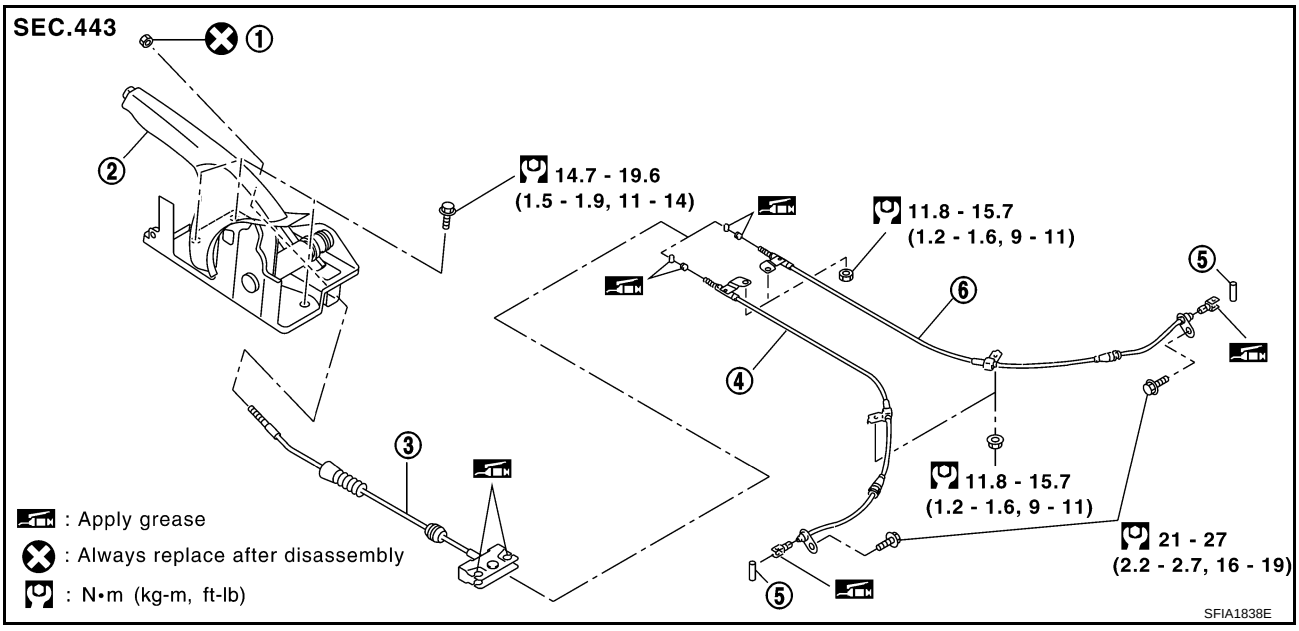
d. With the lever completely returned, make sure there is no drag on the rear brake.

PARKING BRAKE CONTROL

PFP:36010

Components

AFS000UZ



1.	Adjusting nut	2.	Device assembly	3.	Front cable
4.	Rear left cable	5.	Pin	6.	Rear right cable

Removal and Installation

AFS0010L

REMOVAL

1. Remove the center console. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove adjusting nut from the device assembly.
3. Remove the exhaust center muffler. Refer to EX-3, "EXHAUST SYSTEM" .
4. Remove the propeller shaft. Refer to PR-5, "REAR PROPELLER SHAFT" .

   CAUTION:
   Do not impact or damage propeller shaft tube.
5. Remove the rear disc caliper and disc rotors. Refer to BR-38, "REAR DISC BRAKE (AD14VE TYPE)" ,BR-44, "REAR DISC BRAKE (OPB13VB TYPE)" .
6. Remove the parking brake shoe, and remove the rear cable from the toggle lever. Refer to PB-4, "PARKING BRAKE SHOE" .
7. Remove cable nuts and bolts.
8. Remove right and left rear cables.
9. Remove front cable.
10. Remove the device assembly bolts and remove the device assembly from the vehicle.

INSTALLATION

1. Refer to “Component Parts Location” for tightening torque. Install in the reverse order of removal.

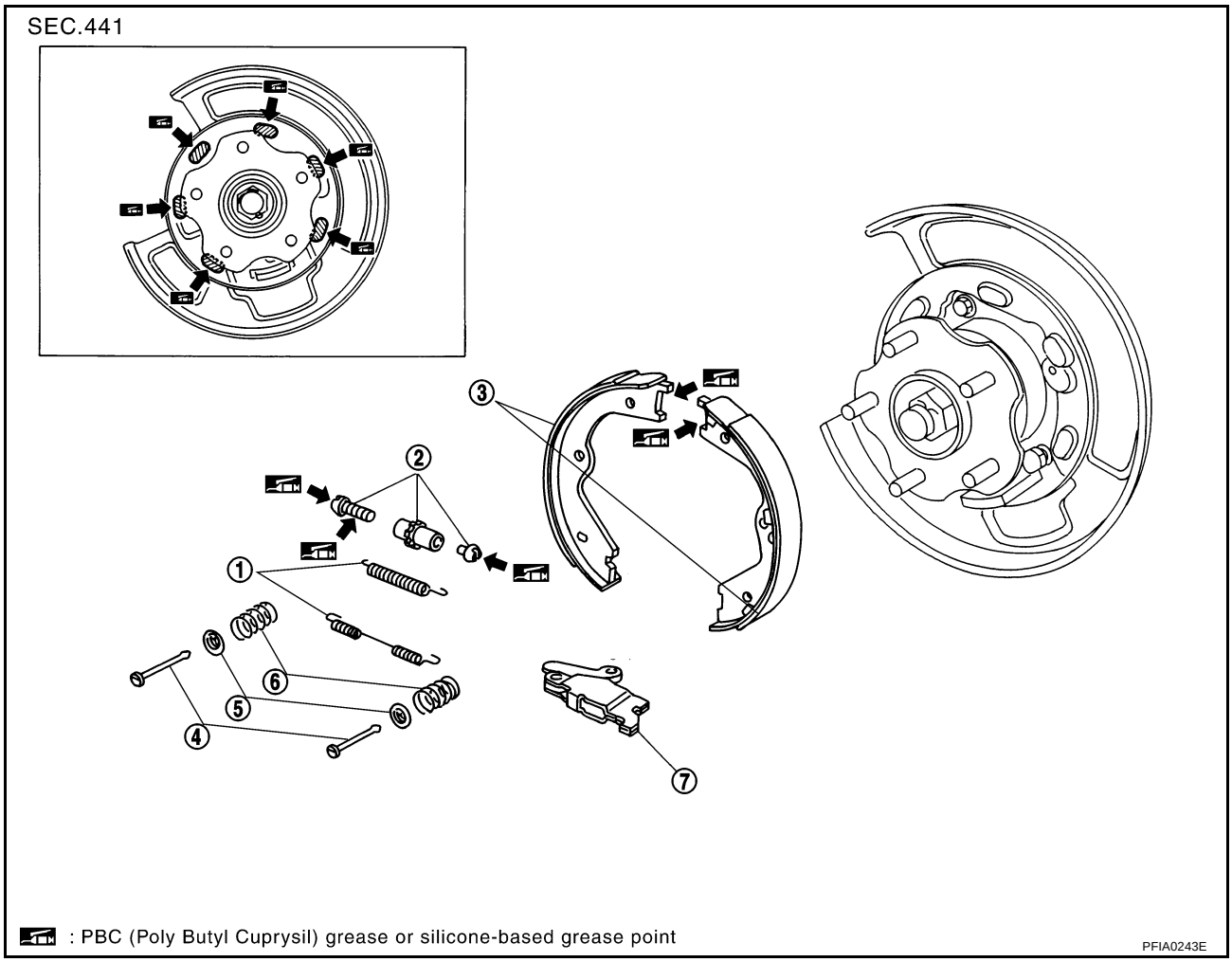
   CAUTION:
   Since the adjusting nut is not a reusable part, do not reuse it.
2. Adjust the parking brake. Refer to PB-2, "ADJUSTMENT" .

PARKING BRAKE SHOE

PFP:44060

Components

AFS000V0



1. Return spring
2. Adjuster assembly
3. Shoe
4. Anti-rattle pin
5. Retainer
6. Anti-rattle spring
7. Toggle lever

Removal and Installation

AFS0010M

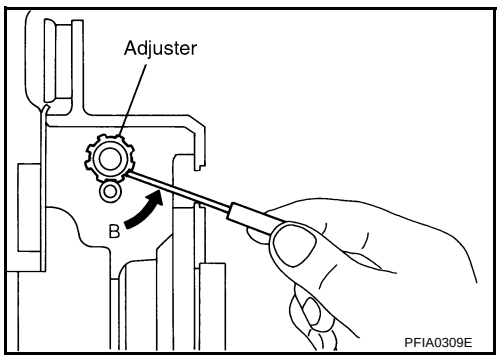
REMOVAL

CAUTION:

Clean dust on the disc and back plate with a vacuum dust collector. Do not blow with compressed air.
Be careful of the following:

- Remove the disc rotor only with the parking brake lever completely in the returned position.
- If disc rotor cannot be removed, remove as follows:

1. Fix the disc rotor in place with wheel nuts and remove disc rotor plug. Using a flat-bladed screwdriver, rotate star wheel on the adjuster assembly in direction B to retract and loosen brake shoes.



INSPECTION AFTER REMOVAL

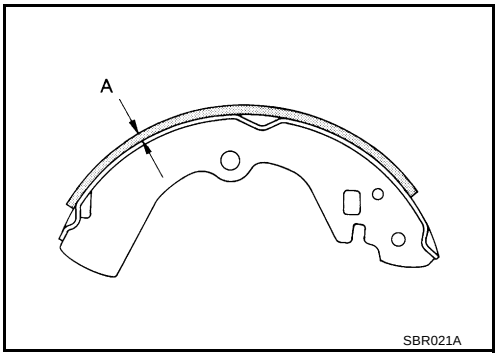
Lining Thickness Inspection

- Check the thickness of the lining.

Standard

Standard thickness (A) : 3.2 mm (0.126 in)

Repair limit thickness (A) : 1.5 mm (0.059 in)



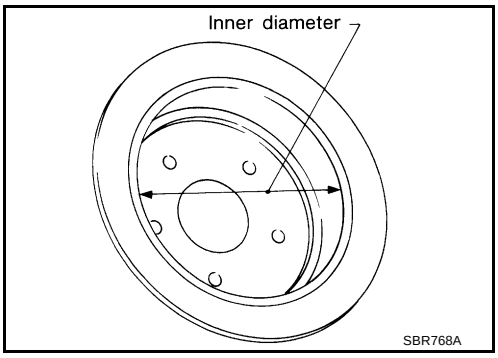
Drum Inner Diameter Inspection

- Check the inner diameter of the drum.

Standard

Standard inner diameter : 172 mm (6.77 in) dia.

Maximum inner diameter : 173 mm (6.81 in) dia.



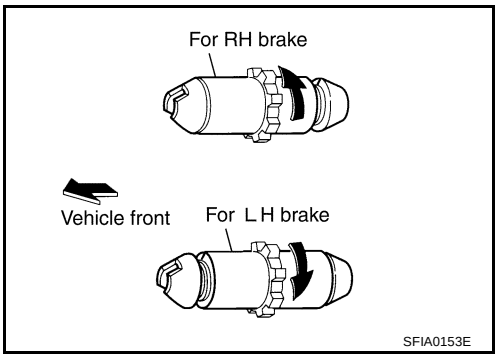
Other Inspections

- Check shoe sliding surface for excessive wear and damage.
- Check anti-rattle pin for excessive wear and corrosion.
- Check return spring for sagging.
- Does the adjustor move smoothly?
- Check either visually or with a vernier caliper to see if there is any excessive wear, cracks, or damage inside the drum.

INSTALLATION

Be careful of the following:

- Refer to “Component Parts Location” and apply brake grease to the specified points during assembly.
- Orientation of the adjuster is different from left to right. Assemble the adjuster so that threaded part expands when rotating it in the direction shown by the arrow.
- Collapse the adjuster to assemble
- When disassembling the adjuster, apply PBC (Poly Butyl Cupry-sil) grease or silicone based grease to the threads.
- After replacing brake shoes or disc rotors, or if brakes do not function well, perform break-in operation as follows.



1. Adjust the parking brake lever stroke to the specified stroke.
2. Perform parking brake break-in (drag run) operation by driving the vehicle under the following conditions:

Drive forward

- **Perform the following.**
- **Vehicle speed approx. 40 km/h (25 MPH) set (forward)**
- **Parking brake operating force approx. 100 N (10 kg, 45 lb) set**
- **Distance approx. 100 m (328 ft)**

3. After break-in operation, check lever stroke of the parking brake. Readjust if it is no longer at the specified stroke.
   - To prevent the lining from getting too hot, allow a cool off period of approximately 5 minutes after every break-in operation.
   - Do not perform excessive break-in operations, because it may cause uneven or early wear of the lining.

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Parking Drum Brake

AFS00095

Type		DS17HG
Brake lining	Standard thickness (new)	3.2 mm (0.126 in)
	Wear limit thickness	1.5 mm (0.059 in)
Drum (disc)	Standard inner diameter (new)	172 mm (6.77 in)
	Wear limit of inner diameter	173 mm (6.81 in)

Parking Brake Control

AFS00096

Control type	Center lever
Number of notches [under force of 196 N (20 kg,44 lb)]	6 - 7 notches
Number of notches when warning lamp switch comes on	1 notches

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BRAKE CONTROL SYSTEM

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PRECAUTIONS

PFP:00001

Precautions for Battery Service

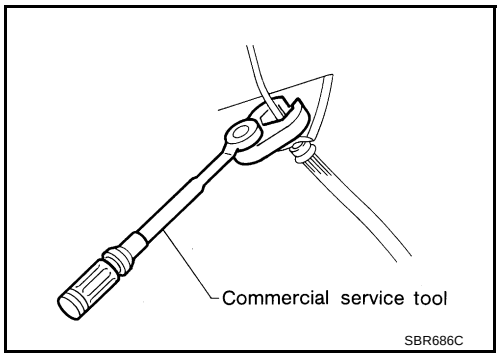
AFS0028N

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Brake System

AFS0028O

- Recommended fluid is brake fluid “DOT 3”.
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas such as body. If brake fluid is splashed, wipe it off and flush area with water immediately.
- Never use mineral oils such as gasoline or kerosene to clean. They will ruin rubber parts and cause improper operation.
- Using a flare nut torque wrench, securely tighten brake tube flare nuts.
- Brake system is an important safety part. If a brake fluid leak is detected, always disassemble the affected part. If a malfunction is detected, replace part with a new one.
- Before working, turn ignition switch OFF.
- When installing brake piping, be sure to check torque.



Precautions for Brake Control

AFS0028P

- During ABS operation, brake pedal lightly vibrates and a mechanical noise may be heard. This is normal.
- Just after starting vehicle after ignition switch ON, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without ABS when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.
- When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for simple causes before starting diagnostic servicing. Besides electrical system inspection, check booster operation, brake fluid level, and oil leaks.
- If tire size and type are used in an improper combination, or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- If there is a radio, antenna, or antenna lead-in wire (including wiring) near control module, ABS function may have a malfunction or error.
- If aftermarket parts (car stereo, CD player, etc.) Have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.

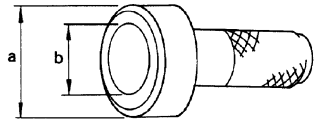
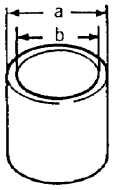
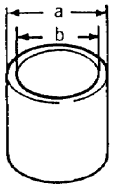
PREPARATION

PFP:00002

Special Service Tools

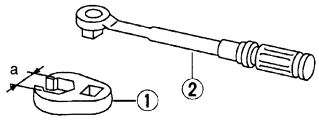
AFS0028R

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
ST3072 0000 (J 25405) Drift a: 77 mm (0.03 in) dia. b: 55 mm (2.17 in) dia.	 ZZA0701D	Installation rear sensor rotor
ST2786 3000 (—) Drift a: 75 mm (2.95 in) dia. b: 62 mm (2.44 in) dia.	 ZZA0832D	
KV401 04710 (—) Drift a: 76 mm (2.99 in) dia. b: 68.5 mm (2.697in) dia.	 ZZA0832D	

Commercial Service Tools

AFS0028S

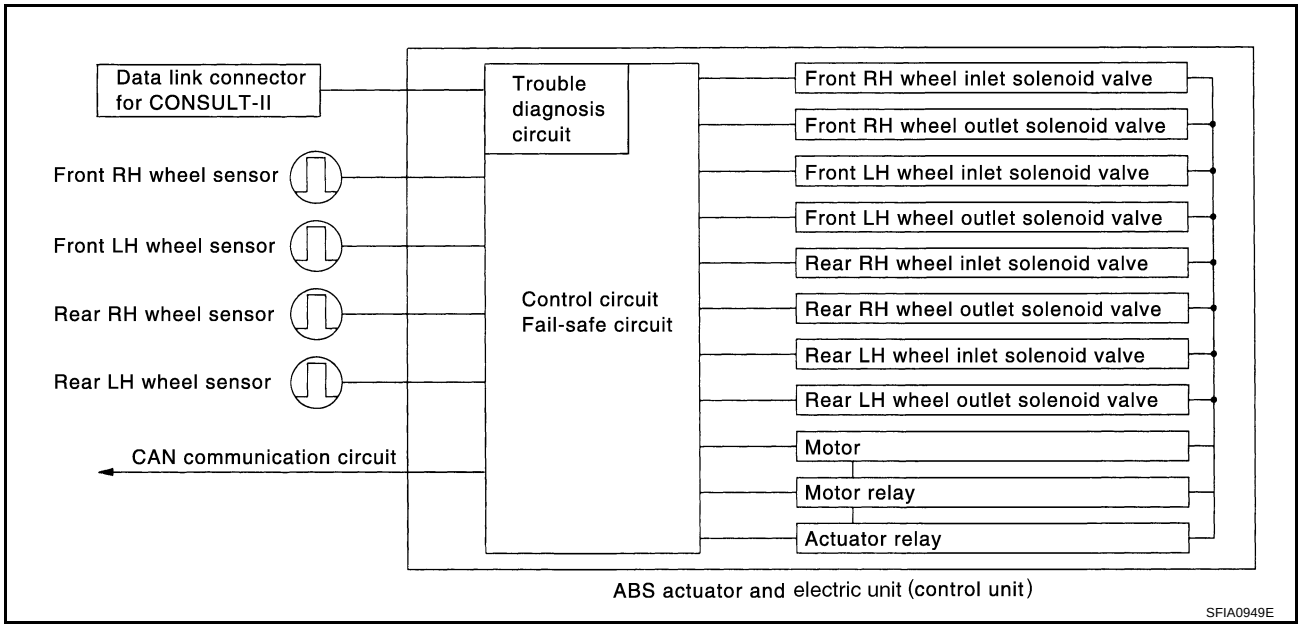
Tool name		Description
1. Flare nut crowfoot a: 10 mm (0.39 in)/12 mm (0.47 in) 2. Torque wrench	 S-NT360	Removing and installing each brake piping

SYSTEM DESCRIPTION

PFP:00000

System Diagram

AFS0028T



ABS Function

AFS0028U

- The Anti-Lock Brake System is a function that detects wheel revolution while braking, and it improves handling stability during sudden braking by electrically preventing 4 wheel lock. Maneuverability is also improved for avoiding obstacles.
- If the electrical system breaks down, then the Fail-Safe function starts, the ABS becomes inoperative, and the ABS warning lamp turns on.
- Electrical System Diagnosis by CONSULT-II is available.

EBD Function

AFS0028V

- Electronic Brake Distributor is a function that detects subtle slippages between the front and rear wheels during braking, and it improves handling stability by electronically controlling the Brake Fluid Pressure which results in reduced rear wheel slippage.
- In case of electrical system break down, the Fail-Safe function is activated, the EBD and ABS becomes inoperative, and the ABS warning lamp and brake warning lamp are turned on.
- Electrical System Diagnosis by CONSULT-II is available.

Fail-Safe Function

AFS0028W

ABS, EBD SYSTEM

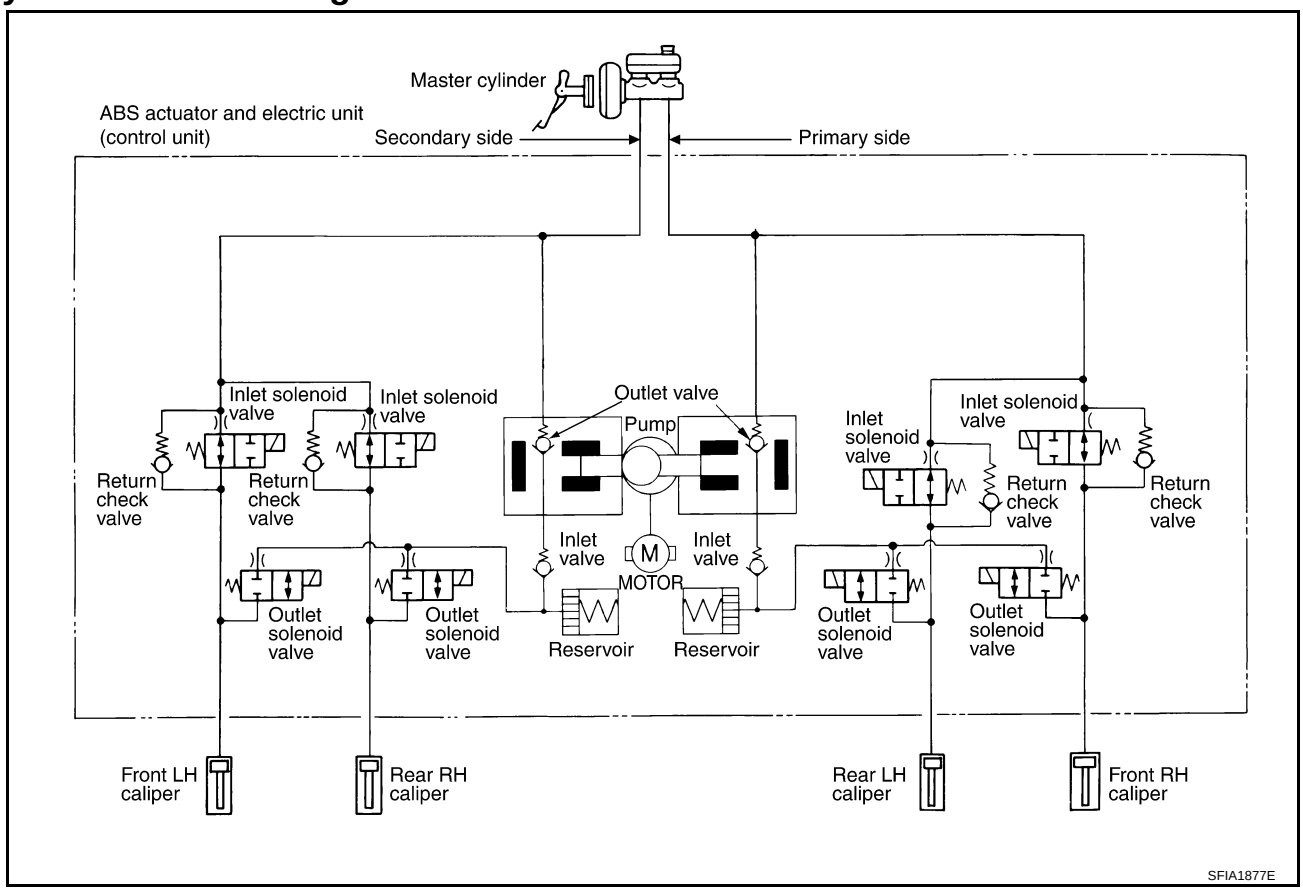
In case of electrical problems with the ABS, the ABS warning lamp will turn on. In case of electrical problem with the EBD, Brake warning lamp, ABS warning lamp will turn on. Simultaneously, the ABS become one of the following conditions of the Fail-Safe function.

1. For ABS trouble, only the EBD is activated and the condition of the vehicle is the same condition of vehicles without ABS equipment.
2. For EBD trouble, the EBD and ABS become inoperative, and the condition of the vehicle is the same as the condition of vehicles without ABS, EBD equipment.

NOTE:
In condition 1 described above, an ABS Self Diagnosis sound may be heard. That is a normal condition because a self diagnosis for “Key Switch ON” and “the First Starting” are being performed.

Hydraulic Circuit Diagram

AFS0028X



CAN COMMUNICATION

PFP:23710

System Description

AFS0028Y

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. Refer to LAN-5, "CAN Communication Unit" .

TROUBLE DIAGNOSIS

PFP:00004

How to Proceed with Diagnosis

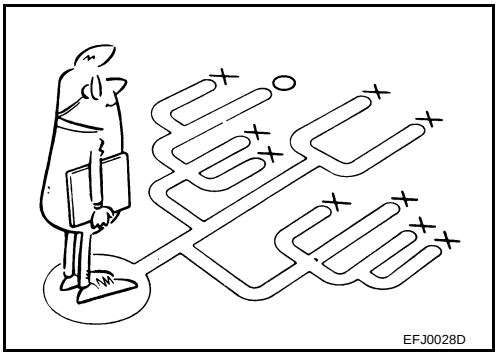
AFS00290

BASIC CONCEPT

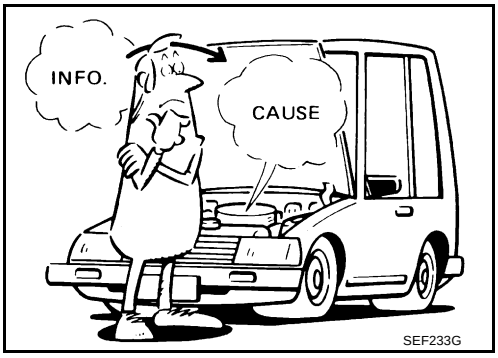
- Most important point to perform diagnosis is to understand systems (control and mechanism) in vehicle thoroughly.

- It is also important to clarify customer complaints before inspection.
  First of all, reproduce symptom, and understand it fully.
  Ask customer about his/her complaints carefully. In some cases, it will be necessary to check symptom by driving vehicle with customer.

  NOTE:
  Customers are not professionals. Do not assume “maybe customer means...” or “maybe customer mentioned this symptom”.


EFJ0028D

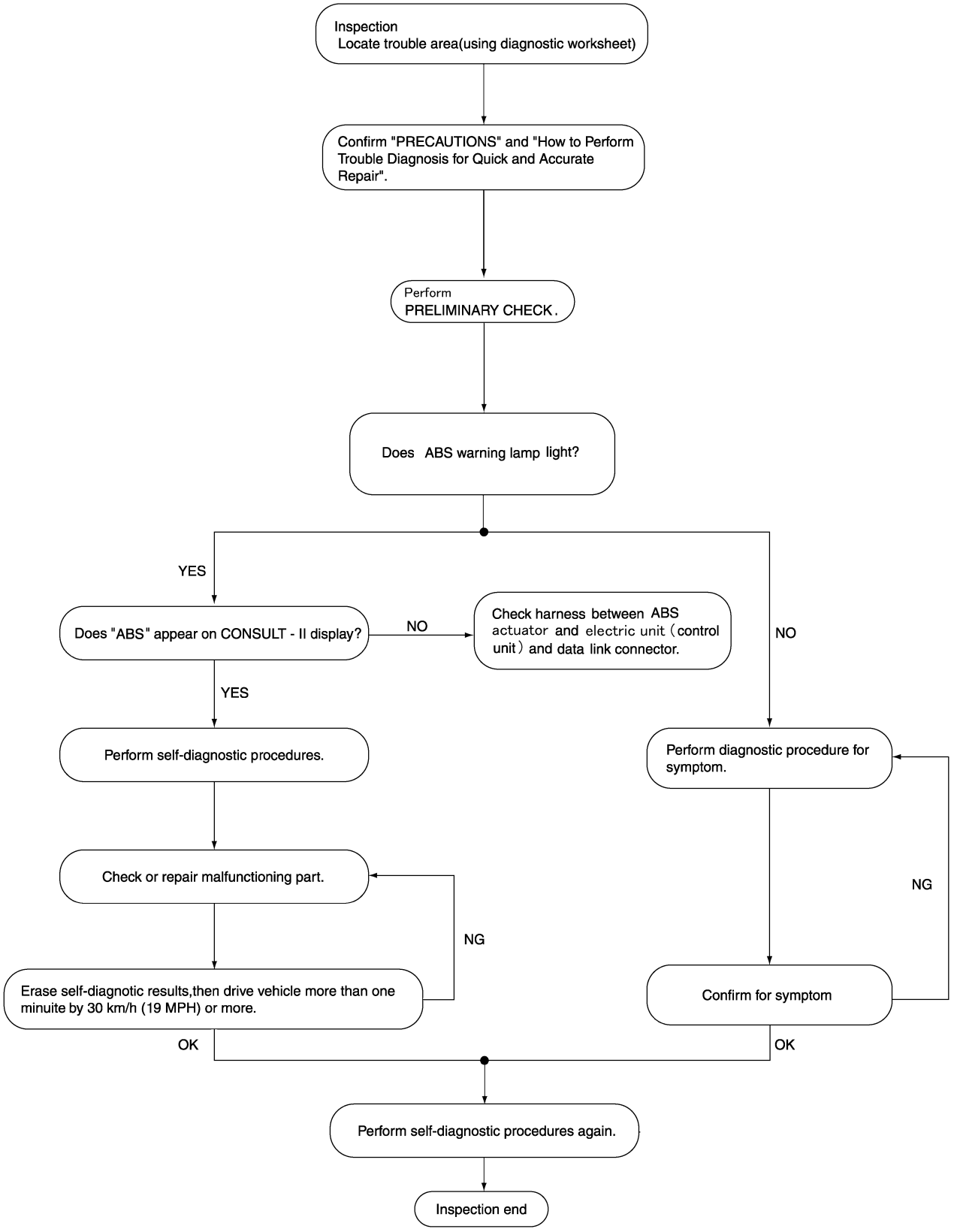
- It is essential to check symptoms right from beginning in order to repair a malfunction completely.
  For an intermittent malfunction, it is important to reproduce symptom based on interview with customer and past examples. Do not perform inspection on ad hoc basis. Most intermittent malfunctions are caused by poor contacts. In this case, it will be effective to shake suspected harness or connector by hand. When repairs are performed without any symptom check, no one can judge if malfunction has actually been eliminated.
- After diagnosis, make sure to carry out “erase memory”. Refer to BRC-21, "Operation Procedure" .
- For an intermittent malfunction, move harness or harness connector by hand to check poor contact or false open circuit.



SEF233G

- Always read “GI General Information” to confirm general precautions. Refer to GI-4, "General Precautions" .

DIAGNOSIS FLOWCHART



SFIA0953E

ASKING COMPLAINTS

- Complaints against malfunction vary depending on each person. It is important to clarify customer complaints.
- Ask customer about what symptoms are present and under what conditions. Use information to reproduce symptom while driving.
- It is also important to use diagnosis sheet so as not to miss information.

KEY POINTS

WHAT ..... Vehicle model
WHEN ..... Date, Frequencies
WHERE ..... Road conditions
HOW ..... Operating conditions, Weather conditions, Symptoms

SBR339B

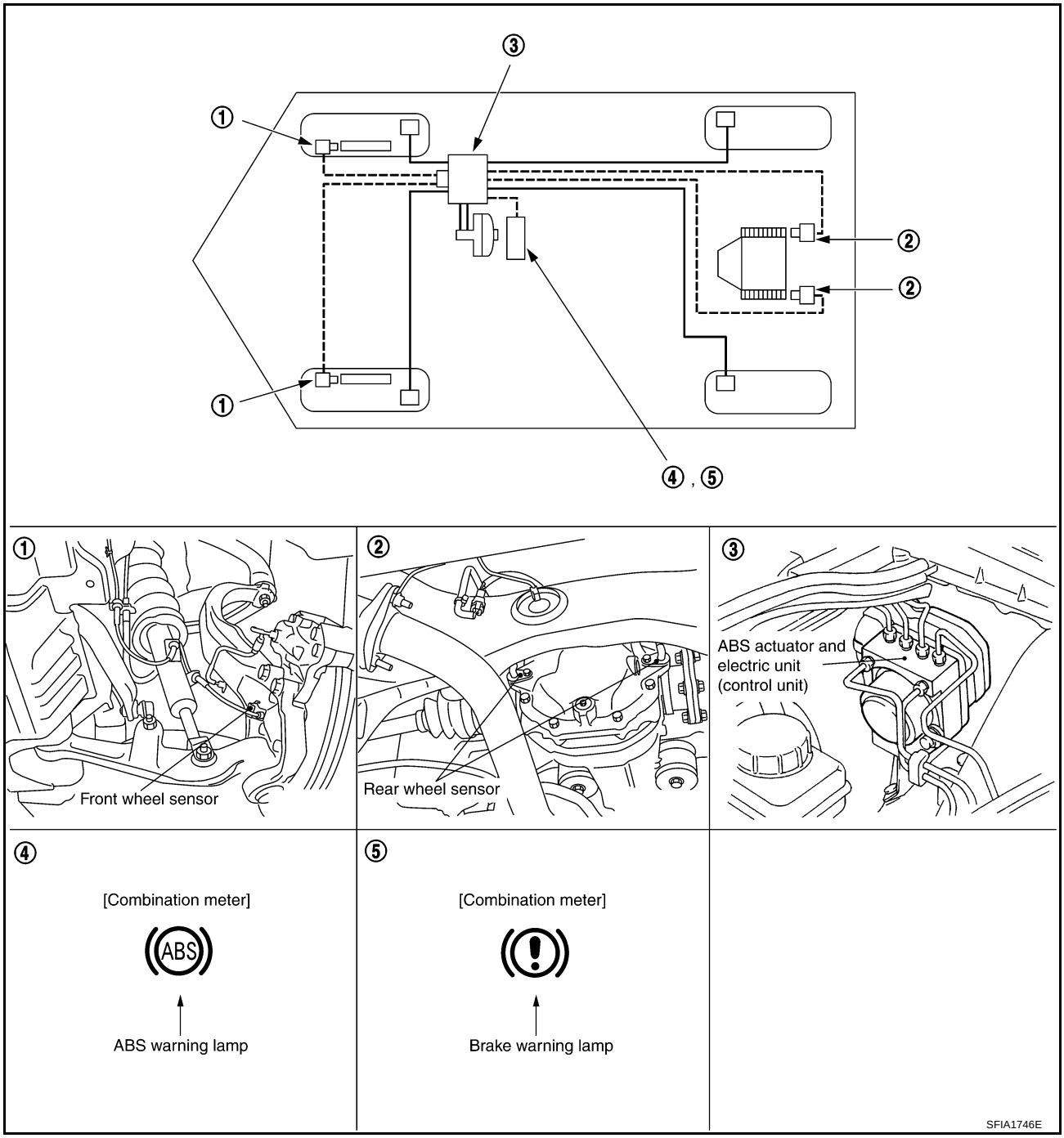
EXAMPLE OF DIAGNOSIS SHEET

Customer name MR/MS	Model & Year		VIN
Engine #	Trans.		Mileage
Incident Date	Manuf. Date		In Service Date
Symptoms	☐ Noise and vibration (from engine compartment) ☐ Noise and vibration (from axle)	☐ Warning / Indicator activate	☐ Firm pedal operation Large stroke pedal operation
	☐ TCS does not work (Rear wheels slip when accelerating)	☐ ABS does not work. (wheels slip when braking)	☐ Lack of sense of acceleration
Engine conditions	☐ When starting ☐ After starting		
Road conditions	☐ Low friction road (☐Snow ☐Gravel ☐Other) ☐ Bumps / potholes		
Driving conditions	☐ Full-acceleration ☐ High speed cornering ☐ Vehicle speed: Greater than 10 km/h (6 MPH) ☐ Vehicle speed: 10 km/h (6 MPH) or less ☐ Vehicle is stopped		
Applying brake conditions	☐ Suddenly ☐ Gradually		
Other conditions	☐ Operation of electrical equipment ☐ Shift change ☐ Other descriptions		

SFIA0791E

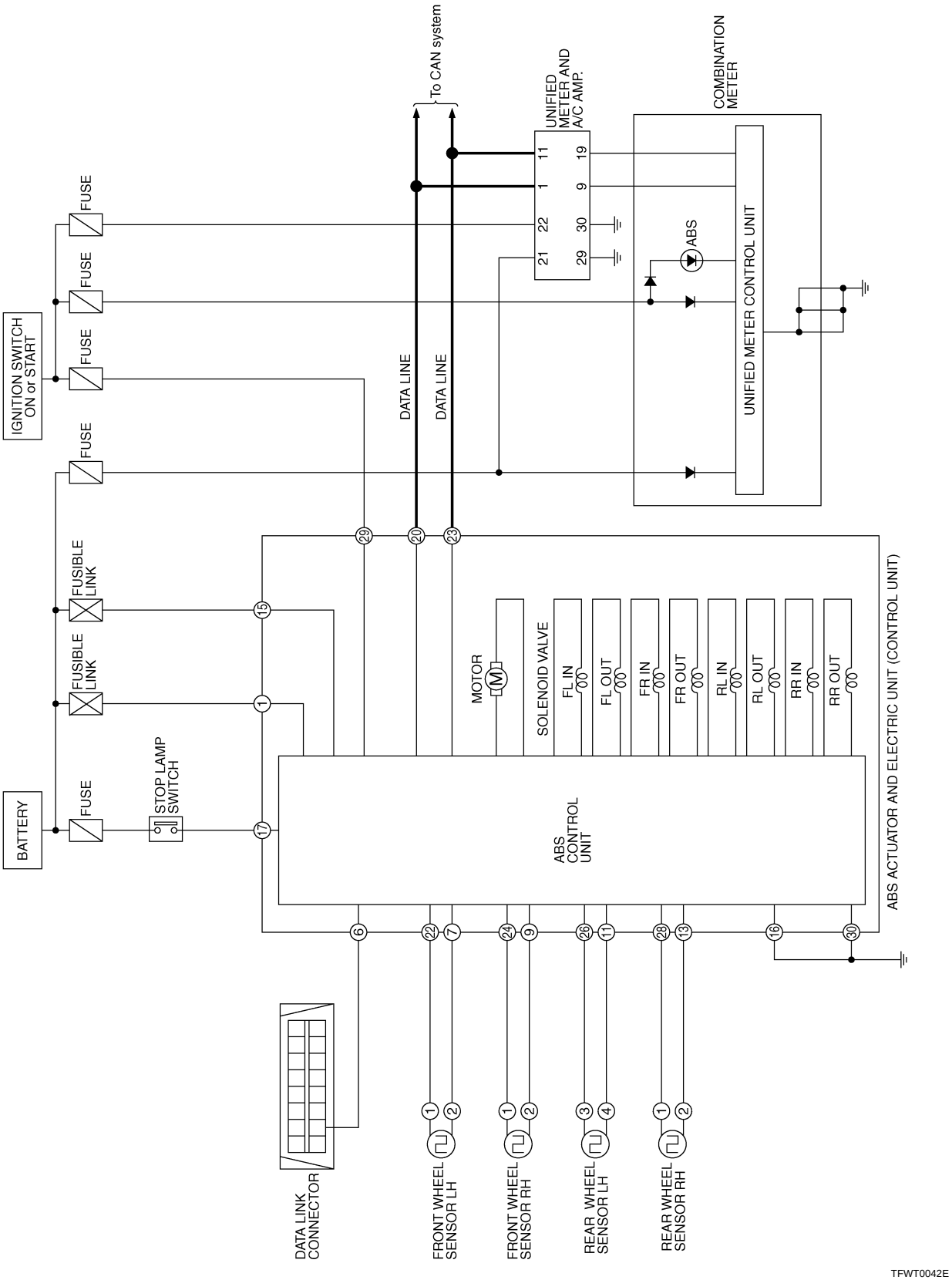
Component Parts Location

AFS00291



Schematic — ABS —

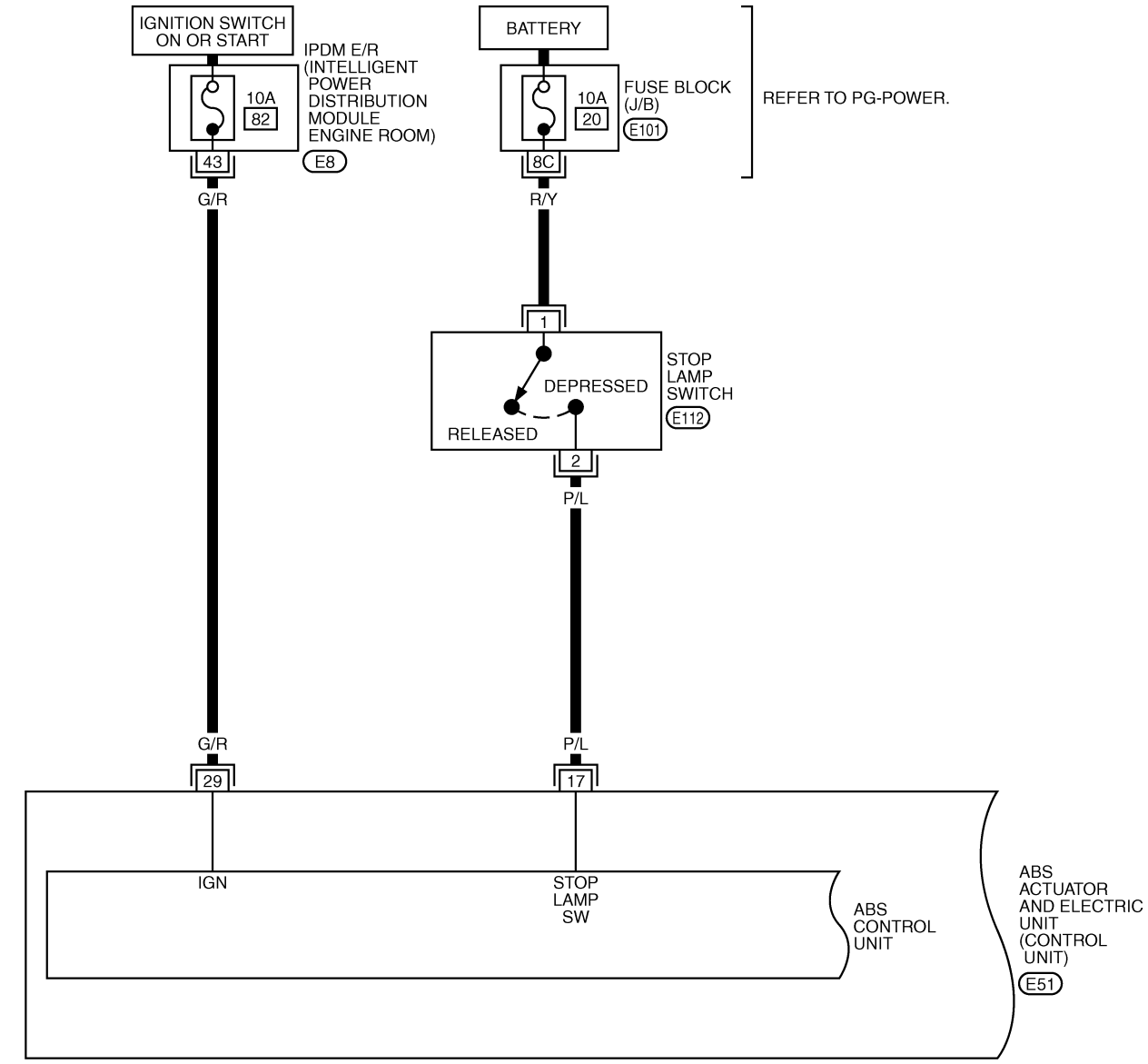
AFS00292

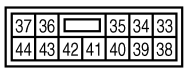


Wiring Diagram — ABS —

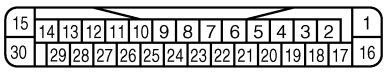
AFS00293

BRC-ABS-01

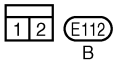




E8
W



E51
GY

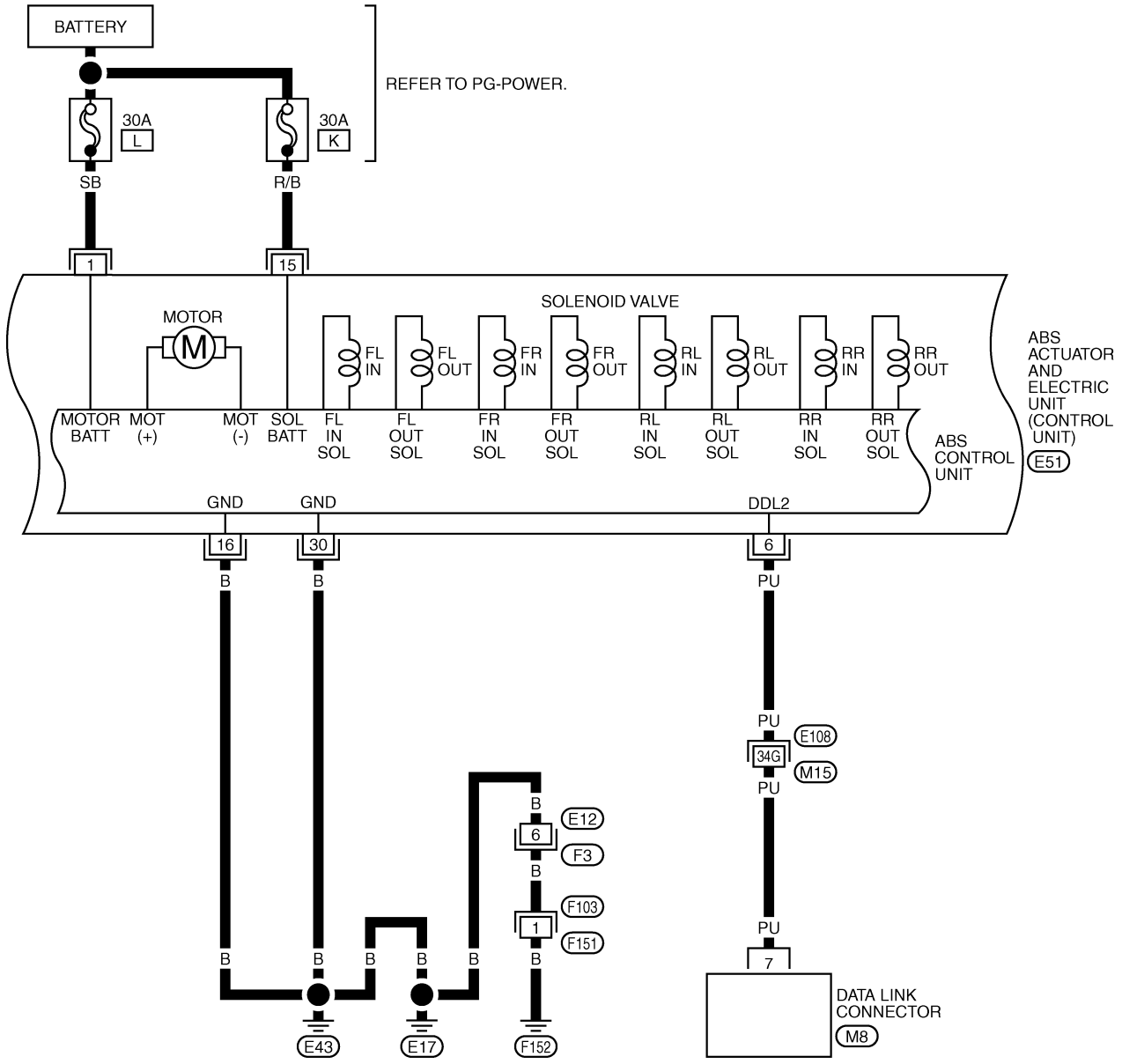


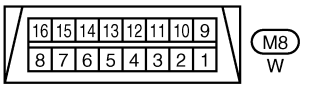
E112
B

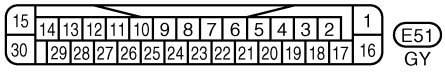
REFER TO THE FOLLOWING.
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

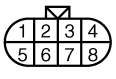
TFWT0153E

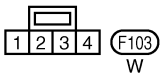
BRC-ABS-02







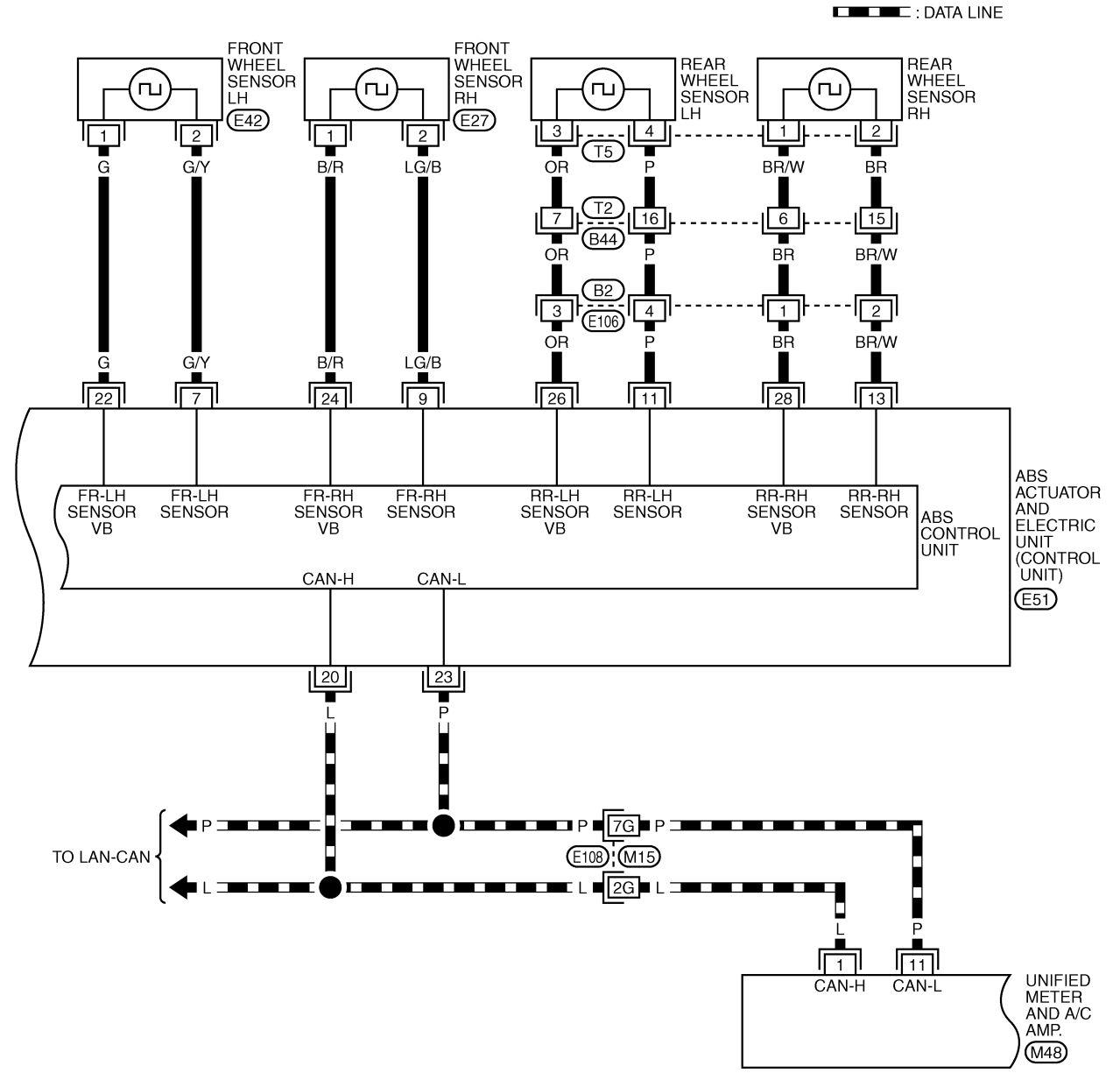


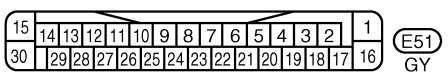


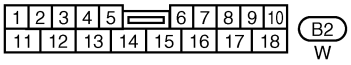
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

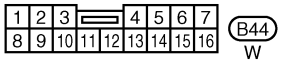
TFWT0154E

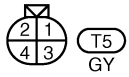
BRC-ABS-03







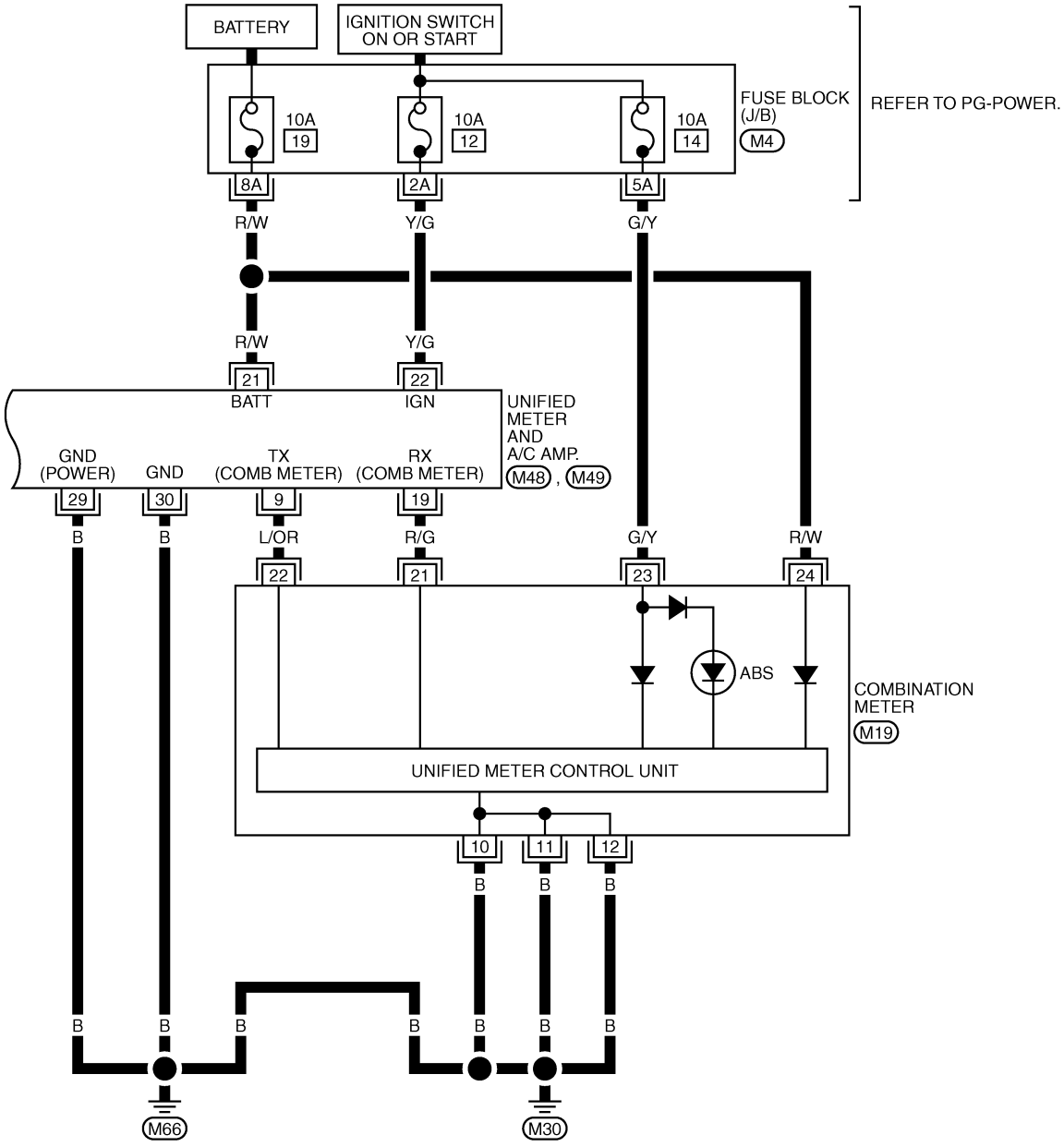


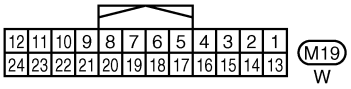


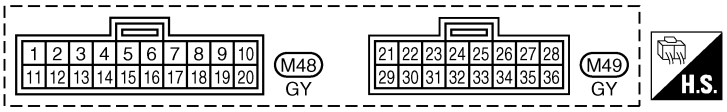
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TFWT0165E

BRC-ABS-04







REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWT0046E

Control Unit Input/Output Signal Standard

AFS00294

REFERENCE VALUE FROM CONSULT-II

CAUTION:

The display shows the control unit calculation data, so a normal value might be displayed even in the event the output circuit (harness) is open or short - circuited.

Monitor item	Display Content	Data monitor		Reference: Error inspection checklist
		Condition	Reference values for normal operation	
WHEEL SENSOR	Wheel speed calculated using signals from all four wheel sensors	Vehicle stopped	0 km/h (0 MPH)	BRC-29, "Inspection 1 Wheel Sensor System"
		While driving (Note 1)	Nearly matches the speedometer display (± 10% or less)	
IN ABS S/V OUT ABS S/V	Operation status of all solenoids	When the actuator solenoid operates or during a fail-safe	ON	—
		When the actuator relay operates and the actuator solenoid does not operate	OFF	
EBD WARNING LAMP	Brake warning lamp on condition (Note 2)	Brake warning lamp ON	ON	—
		Brake warning lamp OFF	OFF	
STOP LAMP SWITCH	Brake pedal operation	Brake pedal depressed	ON	BRC-34, "Inspection 6 Stop Lamp Switch System"
		Brake pedal not depressed	OFF	
ABS MOTOR RELAY	Motor and motor relay operation status	When the motor relay and motor are operating	ON	BRC-33, "Inspection 5 ABS Actuator Relay or ABS Motor Relay Power System"
		When the motor relay and motor are not operating	OFF	
ABS ACTUATOR RELAY	Actuator relay operation status	When the actuator relay is operating	OFF	BRC-33, "Inspection 5 ABS Actuator Relay or ABS Motor Relay Power System"
		When the actuator relay is not operating	ON	
ABS WARNING LAMP	ABS warning lamp on condition (Note 2)	ABS warning lamp ON	ON	—
		ABS warning lamp OFF	OFF	
POWER SUPPLY VOLTAGE	Battery voltage supplied to TCS/ABS control unit	Ignition switch ON	10 - 16V	BRC-31, "Inspection 4 ABS Actuator and Electric Unit (Control Unit) Power and Ground Systems"
GEAR	Determined gear shift position from the A/T PNP switch signal	Driving	M/T vehicles are always left in 1.	—
ENGINE SPEED	Engine running	With engine stopped	0 rpm	Engine speed signal system
		With engine running	Almost in accordance with tachometer display	
FAIL SIGNAL	Fail signal status	During ABS fail-safe During EBD fail-safe	ON	ABS system EBD system

Note 1: Confirm tire pressure is normal.

Note 2: ABS warning lamp ON/OFF timing

ON: For approximately 1 second after the ignition switch is turned on or when an error is detected.

OFF: Approximately 1 second after the ignition switch is turned on (when system is normal).

CONSULT- II Functions

AFS00295

CONSULT-II MAIN FUNCTION

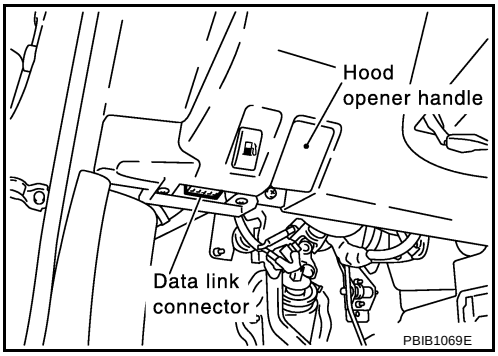
In a diagnosis function (main function), there are “SELF-DIAGNOSTIC RESULTS”, “DATA MONITOR”, “CAN DIAG SUPPORT MNTR”, “ACTIVE TEST”, “FUNCTION TEST”, “ECU PART NUMBER”.

Diagnostic test mode	Function	Reference
SELF-DIAG-NOSTIC RESULTS	Self-diagnostic results can be read and erased quickly.	BRC-21, "SELF-DIAGNOSIS"
DATA MONI-TOR	Input/Output data in the ABS actuator and electric unit (control unit) can be read.	BRC-23, "DATA MONITOR"
CAN DIAG SUPPORT MNTR	The results of transmit/receive diagnosis of communication can be read.	—
ACTIVE TEST	Diagnostic Test Mode in which CONSULT-II drives some actuators apart from the ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range.	BRC-25, "ACTIVE TEST"
FUNCTION TEST	Conducted by CONSULT-II instead of a technician to determine whether each system is “OK” or “NG”.	—
ECU PART NUMBER	ABS actuator and electric unit (control unit) part number can be read.	—

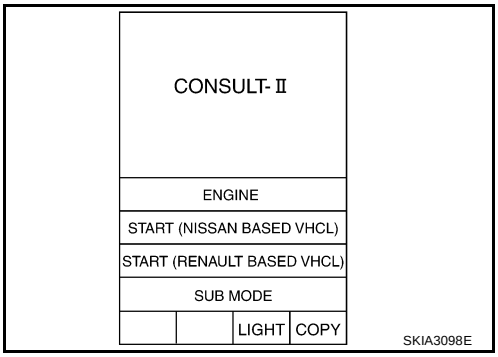
CONSULT-II BASIC OPERATION PROCEDURE

1. Turn ignition switch OFF.
2. Connect CONSULT-II and CONSULT-II CONVERTER to the data link connector.

   CAUTION:
   If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

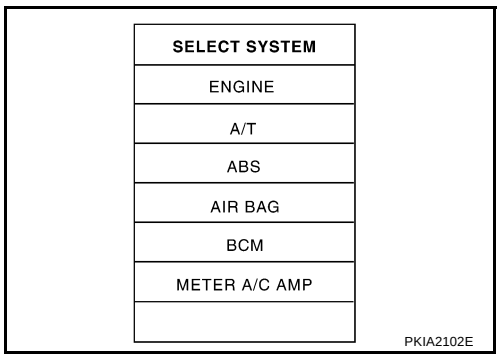


3. Turn ignition switch ON.
4. Touch “START (NISSAN BASED VHCL)”.

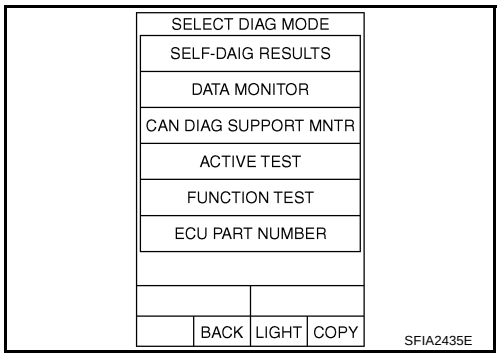


5. Touch “ABS” in the “SELECT SYSTEM” screen.

If “ABS” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



6. Select the required diagnostic location from the “SELECT SYSTEM” screen.
For further information, see the CONSULT-II Operation Manual.



SELF-DIAGNOSIS

Description

If an error is detected in the system, ABS warning lamp on the combination meter turn on. In this case, perform self-diagnosis as follows:

Operation Procedure

1. Turn ignition switch OFF.
2. Connect CONSULT-II and CONSULT-II CONVERTER to the data link connector.

   CAUTION:
   If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.
3. Turn ignition switch ON.
4. Start engine and drive at approximately 30 km/h (19 MPH) or more for approximately 1 minute.
5. After stopping the vehicle, with the engine running, touch “START (NISSAN BASED VHCL)”, “ABS”, “SELF-DIAG RESULTS” in order on the CONSULT-II screen.
   If “ABS” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .

   CAUTION:
   If “START (NISSAN BASED VHCL)” is touched immediately after starting the engine or turning on the ignition switch, “ABS” might not be displayed in the System Selection screen. In this case, repeat the operation from step 1.
6. The self-diagnostic results are displayed. (If necessary, the self-diagnostic results can be printed out by touching “PRINT”.)
   - When “NO FAILURE” is displayed, check the ABS warning lamp.
7. Conduct the appropriate inspection from the display item list, and repair or replace the malfunctioning component.
8. Start engine and drive at approximately 30 km/h (19 MPH) or more for approximately 1 minute.

   CAUTION:
   - **When a wheel sensor “short-circuit” is detected, if the vehicle is not driven at 30 km/h (19 MPH) or more for at least 1 minute, the ABS warning lamp will not turn off even if everything is normal.**
9. Turn ignition switch OFF to prepare for erasing the memory.
10. Start the engine and touch “START (NISSAN BASED VHCL)”, “ABS”, “SELF-DIAG RESULTS”, “ERASE MEMORY” in order on the CONSULT-II screen to erase the error memory.

    CAUTION:
    If the error memory is not erased, re-conduct the operation from step 5.
11. For the final inspection, drive at approximately 30 km/h (19 MPH) or more for approximately 1 minute and confirm that the ABS warning lamp a off.

Display Item List

Suspect Systems	Malfunction is detected when	Inspection system
RR RH SENSOR-1	When the circuit in the rear RH wheel sensor is open.	BRC-29, "Inspection 1 Wheel Sensor System"(Note 1)
FR LH SENSOR-1	When the circuit in the front LH wheel sensor is open.	
FR RH SENSOR-1	When the circuit in the front RH wheel sensor is open.	
RR LH SENSOR-1	When the circuit in the rear LH wheel sensor is open.	
FR LH SENSOR-2	When the circuit in the front LH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
RR RH SENSOR-2	When the circuit in the rear RH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
FR RH SENSOR-2	When the circuit in the front RH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
RR LH SENSOR-2	When the circuit in the rear LH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
MAIN RELAY	When the control unit detects an error in the actuator relay system.	BRC-33, "Inspection 5 ABS Actuator Relay or ABS Motor Relay Power System"
STOP LAMP SW	When a stop lamp switch open-circuit is detected.	BRC-34, "Inspection 6 Stop Lamp Switch System"
FR LH IN ABS SOL	When the control unit detects an error in the front left inlet solenoid system.	—
FR LH OUT ABS SOL	When the control unit detects an error in the front left outlet solenoid system.	
RR RH IN ABS SOL	When the control unit detects an error in the rear right inlet solenoid system.	
RR RH OUT ABS SOL	When the control unit detects an error in the rear right outlet solenoid system.	
FR RH IN ABS SOL	When the control unit detects an error in the front right inlet solenoid system.	
FR RH OUT ABS SOL	When the control unit detects an error in the front right outlet solenoid system.	
RR LH IN ABS SOL	When the control unit detects an error in the rear left inlet solenoid system.	
RR LH OUT ABS SOL	When the control unit detects an error in the rear left outlet solenoid system.	
LOW POWER VOLTAGE	When the ABS actuator and electric unit (control unit) power voltage is lower than normal.	BRC-31, "Inspection 4 ABS Actuator and Electric Unit (Control Unit) Power and Ground Systems"
EMERGENCY BRAKE	When the ABS actuator and electric unit (control unit) malfunctions (pressure increase is too much or too little).	BRC-35, "Inspection 7 ABS Actuator and Electric Unit (Control Unit) 2"

Suspect Systems	Malfunction is detected when	Inspection system
ABS CONTROLLER	When there is an internal error in the ABS actuator and electric unit (control unit).	BRC-31, "Inspection 3 ABS Actuator and Electric Unit (Control Unit)"
CAN COMM CIRCUIT	When there is an error in the CAN communication system.	BRC-35, "Inspection 8 CAN Communication System" (Note 2)
ENGINE SIGNAL	When there is an error in an engine system main component	BRC-31, "Inspection 2 Engine System"

Note 1: After completing repairs of the shorted sensor circuit, when ignition switch is turned ON, ABS warning lamp turns on. Check that ABS warning lamp turns off while driving the vehicle at approximately 30 km/h (19 MPH) or more for approximately 1 minute according to self-diagnosis procedure. In addition, if wheel sensor 2 is displayed for the wheels, check the wheel sensor circuit and also check the control unit power voltage.
Note 2: When errors are detected in several systems, including the CAN communication system [U1000], troubleshoot the CAN communication system.

DATA MONITOR

Operation Procedure

1. After turning OFF the ignition switch, connect CONSULT-II and the CONVERTER to the data link connector.

   CAUTION:
   If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

2. Touch “START (NISSAN BASED VHCL)”, “ABS”, “DATA MONITOR” in order on the CONSULT-II screen. If “ABS” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .

   CAUTION:
   When “START (NISSAN BASED VHCL)” is touched immediately after starting the engine or turning on the ignition switch, “ABS” might not be displayed in the system selection screen. In this case, repeat the operation from step 2.

3. Return to the Monitor Item Selection screen, and touch “ECM INPUT SIGNALS”, “MAIN SIGNALS” or “SELECTION FROM MENU”. Refer to the following information.
4. When “START” is touched, the data monitor screen is displayed.

Display Item List

Item (Unit)	Monitor item selection			Remarks
	ECM INPUT SIGNALS	MAIN SIGNALS	SELECTION MENU	
FR LH SENSOR [km/h (MPH)]	×	×	×	Wheel speed calculated by front LH wheel sensor signal is displayed.
FR LH SENSOR [km/h (MPH)]	×	×	×	Wheel speed calculated by front RH wheel sensor signal is displayed.
RR LH SENSOR [km/h (MPH)]	×	×	×	Wheel speed calculated by rear LH wheel sensor signal is displayed.
RR RH SENSOR [km/h (MPH)]	×	×	×	Wheel speed calculated by rear RH wheel sensor signal is displayed.
FR LH IN SOL (ON/OFF)	–	×	×	Front left inlet ABS solenoid valve (ON/OFF) status is displayed.

Item (Unit)	Monitor item selection			Remarks
	ECM INPUT SIGNALS	MAIN SIGNALS	SELECTION MENU	
FR LH OUT SOL (ON/OFF)	–	×	×	Front left outlet ABS solenoid valve (ON/OFF) status is displayed.
RR RH IN SOL (ON/OFF)	–	×	×	Rear right inlet ABS solenoid valve (ON/OFF) status is displayed.
RR RH OUT SOL (ON/OFF)	–	×	×	Rear right outlet ABS solenoid valve (ON/OFF) status is displayed.
FR RH IN SOL (ON/OFF)	–	×	×	Front right inlet ABS solenoid valve (ON/OFF) status is displayed.
FR RH OUT SOL (ON/OFF)	–	×	×	Front right outlet ABS solenoid valve (ON/OFF) status is displayed.
RR LH IN SOL (ON/OFF)	–	×	×	Rear left wheel inside ABS solenoid valve (ON/OFF) status is displayed.
RR LH OUT SOL (ON/OFF)	–	×	×	Rear left outlet ABS solenoid valve (ON/OFF) status is displayed.
EBD WARN LAMP (ON/OFF)	–	×	×	Brake warning lamp (ON/OFF) status is displayed.
STOP LAMP SW (ON/OFF)	×	×	×	Stop lamp switch (ON/OFF) status is displayed.
MOTOR RELAY (ON/OFF)	–	×	×	ABS motor relay (ON/OFF) condition is displayed.
ACTUATOR RLY (ON/OFF)	–	×	×	ABS actuator relay (ON/OFF) status is displayed.
ABS WARN LAMP (ON/OFF)	–	×	×	ABS warning lamp (ON/OFF) status is displayed.
BATTERY VOLT (V)	×	×	×	The voltage supplied to the ABS control unit is displayed.
EBD SIGNAL (ON/OFF)	–	–	×	EBD operation (ON/OFF) status is displayed.
ABS SIGNAL (ON/OFF)	–	–	×	ABS operation (ON/OFF) status is displayed.
EBD FAIL SIG (ON/OFF)	–	–	×	EBD fail-safe signal (ON/OFF) status is displayed.
ABS FAIL SIG (ON/OFF)	–	–	×	ABS fail-safe signal (ON/OFF) status is displayed.

×: Applicable
–: Not applicable

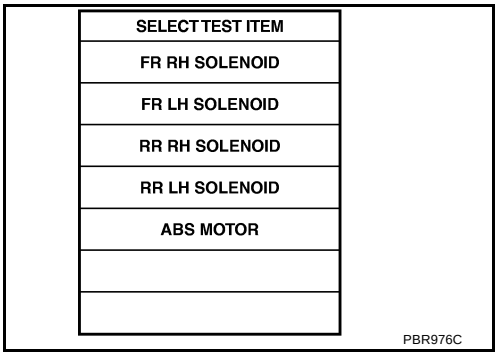
ACTIVE TEST

CAUTION:

- **Do not perform active test while driving.**
- **Make sure to completely bleed air from the brake system.**
- **The ABS and brake warning lamps turn on during the active test.**

Operation Procedure

1. Connect the CONSULT-II and CONVERTER to the data link connector and start the engine.
   CAUTION:
   If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.
2. Touch “START (NISSAN BASED VHCL) ” on the display screen.
3. Touch “ABS”.
   If “ABS” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit"
4. Touch “ACTIVE TEST”.
5. The test item selection screen is displayed.
6. Touch necessary test item.



7. With the “MAIN ITEM” display shown in reverse, touch “START”.
8. The “Active Test” screen will be displayed, so conduct the following test.

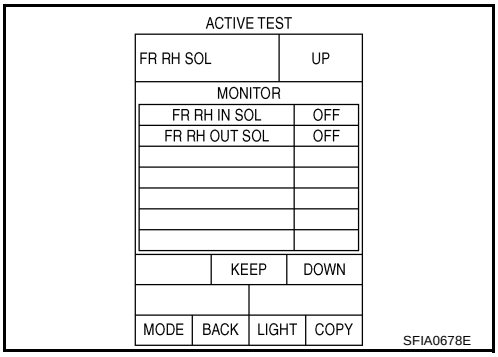
Test Item

Solenoid valve

CAUTION:

The example shown is for the front right wheel. The procedure for the other wheels is the same as given below.

1. For ABS solenoid valve, touch “UP”, “KEEP”, and “DOWN”.Then use screen monitor to check that solenoid valve operates as shown in Solenoid Valve Operation Chart. Refer to “Solenoid Valve Operation Chart”.



Operation		ABS solenoid valve		
		UP	KEEP	DOWN
Front RH ABS S/V	ABS inlet S/VAR-FR	OFF	ON	ON
	ABS outlet S/VAR-FR	OFF	OFF	ON*
Front LH ABS S/V	ABS inlet S/VAL-FL	OFF	ON	ON
	ABS outlet S/VAL-FL	OFF	OFF	ON*

Operation		ABS solenoid valve		
		UP	KEEP	DOWN
Rear RH ABS S/V	ABS inlet S/VAR-RR	OFF	ON	ON
	ABS outlet S/V-RR	OFF	OFF	ON*
Rear LH ABS S/V	ABS inlet S/V-RL	OFF	ON	ON
	ABS outlet S/V-RL	OFF	OFF	ON*

*: ON for 1 to 2 seconds after the touch, and then OFF

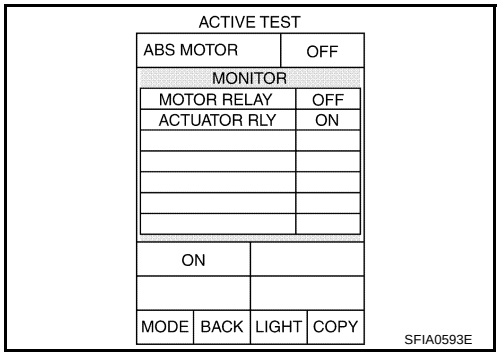
NOTE:

- When the active test is conducted while depressing the pedal, the pedal depression amount will change, but this is normal.
- Approximately 10 seconds after the operation is begun, “TEST STOP” will be displayed.
- To conduct retest after “TEST STOP” is displayed touch “BACK”

ABS Motor

Touch “ON”, “OFF” on the display screen and make sure the ABS motor relay is operating as shown in the table below.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON



NOTE:

- When the active test is conducted while depressing the pedal, the pedal depression amount will change, but this is normal.
- Approximately 10 seconds after the operation is begun, “TEST STOP” will be displayed.
- To conduct a retest after “TEST STOP” is displayed, touch “BACK” and conduct the test from the step6.

Correct and Quick Diagnosis

AFS00296

DIAGNOSIS PRECAUTIONS

- Before performing the trouble diagnosis, always read the general information (GI) to confirm the general precautions. Refer to
- After completing service, always erase the self-diagnosis results. Refer to BRC-19, "CONSULT- II Functions" .
- When inspection of the continuity or voltage between units is performed, check connector terminals for disconnection, looseness, bend, or collapse. If any non-standard condition is detected, repair or replace applicable part.
- Intermittent errors may be caused by a poor connection in the harness, connector, or terminal. Move harnesses, harness connectors, or terminals by hand to make sure all connections are solid and undamaged.
- If a circuit tester is used for the check, be careful not to forcibly extend any connector terminal.
- ABS is a system that uses electronic control to perform brake control and engine power control. Therefore, phenomena like those shown in the following table may occur, but this is because the system is working normally.

Symptom	Symptom description	Result
Motor operation noise	This is the sound of the motor operating inside ABS actuator, and there may be some low sounds while the TCS or ABS is operating.	Normal
	Just after the engine starts, the motor operating noise may be heard. This is a normal status of the system operation check.	
System operation check noise	When the engine is started, you may barely be able to hear a slight thudding sound from the engine room, but this sound is made by the system operation check and is normal.	Normal
ABS operation (longer stopping distance)	Stopping distance may be longer for vehicles with ABS when the vehicle drives on rough or snow-covered roads. Use lower speeds when driving on these kinds of roads.	Normal

ABS Warning Lamp, TCS OFF Indicator Lamp, SLIP Indicator Lamp On/Off Timing

×: ON –: OFF

Condition	ABS warning lamp	Remarks
Ignition switch OFF	–	—
For approximately “1” second after ignition switch ON	×	—
After approximately “1” second after ignition switch ON. (When system is normal)	–	Turns off 2 second after engine start
ABS error	×	When there is an ABS actuator and electric unit error (power or ground error)

×: Applicable
–: Not applicable

Basic Inspection

AFS00297

BASIC INSPECTION 1 BRAKE FLUID AMOUNT, LEAKS, AND BRAKE PADS INSPECTION

1. Check fluid level in the brake reservoir tank. If fluid level is low, refill the brake fluid.
2. Check the brake piping and around the ABS actuator for leaks. If there is leaking or oozing fluid, check the following items.
   - If ABS actuator connection is loose, tighten the piping to the specified torque and re-conduct the leak inspection to make sure there are no leaks.
   - If there is damage to the connection flare nut or ABS actuator screw, replace the damaged part and re-conduct the leak inspection to make sure there are no leaks.
   - When there is fluid leaking or oozing from a part other than ABS actuator connection, if the fluid is just oozing out, use a clean cloth to wipe off the oozing fluid and re-check for leaks. If fluid is still oozing out, replace the damaged part.
   - When there is fluid leaking or oozing at ABS actuator, if the fluid is just oozing out, use a clean cloth to wipe off the oozing fluid and re-check for leaks. If fluid is still oozing out, replace ABS actuator body.

     CAUTION:
     ABS actuator body cannot be disassembled.
3. Check the brake pad degree of wear. Refer to BR-26, "Removal and Installation of Brake Pad" or BR-32, "Removal and Installation of Brake Pad" in “Front Disc Brake” and BR-39, "Removal and Installation of Brake Pad" or BR-45, "Removal and Installation of Brake Pad" in “Rear Disc Brake”.

BASIC INSPECTION 2 POWER SYSTEM TERMINAL LOOSENESS AND BATTERY INSPECTION

Make sure the battery positive cable, negative cable and ground connection are not loose. In addition, check the battery voltage to make sure it has not dropped.

BASIC INSPECTION 3 ABS WARNING LAMP INSPECTION

1. Make sure ABS warning lamp turned on approximately 1 second when the ignition switch is turned ON. Check CAN communications. Refer to BRC-35, "Inspection 8 CAN Communication System" .
2. Make sure lamp turns off approximately 1 second after the ignition switch is turned on. If the lamp does not turn off, conduct self-diagnosis.
3. Make sure the ABS warning lamp turn off 2 seconds after the engine is started. If ABS warning lamp has not turned off 10 seconds after the engine has been started, conduct self-diagnosis of the ABS actuator and electric unit.
4. After conducting the self-diagnosis, be sure to erase the error memory. Refer to BRC-19, "CONSULT- II Functions"

Inspection 1 Wheel Sensor System

AFS00298

INSPECTION PROCEDURE

After using the CONSULT-II SELF-DIAG RESULTS to determine the location of the malfunctioning wheel sensor, check all areas to determine the component to be replaced.

CAUTION:

- **Do not measure the resistance value and also voltage between the sensor terminal with tester etc., because the sensor is an active sensor.**
- **Do not expand the terminal of the connector with a/the tester terminal stick, when it does the inspection with the tester.**

1. TIRE INSPECTION

Check air pressure, wear, and size.

Are the air pressure, wear, and size within the standard values?

YES >> GO TO 2.
NO >> Adjust air pressure, or replace tire.

2. SENSOR AND SENSOR ROTOR INSPECTION

- Check the condition of the sensor mount (for looseness, etc.).
- Check the surface of the front sensor rotor rubber for damage.
- Check the rear sensor rotor for damage.

OK or NG

OK >> GO TO 3.
NG >> Repair the sensor mount or replace the sensor rotor.

3. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
FR RH SENSOR -1, -2
FR LH SENSOR-1, - 2
RR RH SENSOR-1, -2
RR LH SENSOR-1, -2

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 4.
NO >> Inspection End

4. CONNECTOR INSPECTION

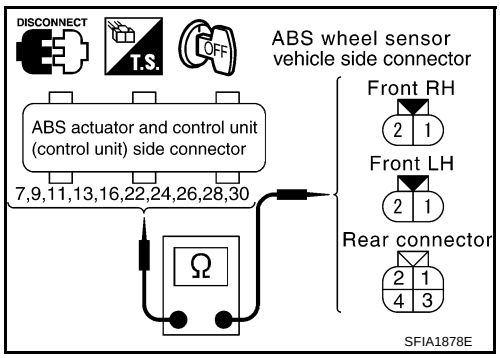
1. Disconnect ABS control unit connector and the malfunctioning wheel sensor connector E42 (FR - LH) or E27 (FR - RH) or T5 (RR - RH, LH). Check the terminal to see if it is deformed, disconnected, loose, etc., and replace it if any non-standard condition is found.
2. Reconnect the connector, drive at a speed of approximately 30 km/h (19 MPH) or more for approximately 1 minute, and conduct self-diagnosis.

OK or NG

OK >> The connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 5.

5. WHEEL SENSOR HARNESS INSPECTION

1. Turn ignition switch OFF and disconnect the wheel sensor connector E42 (FR - LH) or E27 (FR - RH) or T5 (RR - RH, LH) and ABS control unit (control unit) connector.
2. Check the continuity between terminals. (Also check the continuity when the steering wheel is turned right and left and when the sensor harness inside the wheel well is moved.)



	Power system		Signal system		Ground system	
Wheel	ABS actuator and electric unit (control unit) (harness connector E51)	Wheel sensor (harness connector)	ABS actuator and electric unit (control unit) (harness connector E51)	Wheel sensor (harness connector)	ABS actuator and electric unit (control unit) (signal) (harness connector E51)	ABS actuator and electric unit (control unit) (GND) (harness connector E51)
Front RH	24 (B/R)	1 (B/R)	9 (LG/B)	2 (LG/B)	9 (LG/B), 24 (G)	16 (B), 30(B)
Front LH	22 (G)	1 (G)	7 (G/Y)	2 (G/Y)	7 (G/Y), 22 (G)	16(B), 30(B)
Rear RH	28 (BR)	1 (BR/W)	13 (BR/W)	2 (BR)	13 (BR/W), 28 (BR)	16 (B), 30(B)
Rear LH	26 (OR)	3 (OR)	11(P)	4 (P)	11 (P), 26 (OR)	16 (B), 30(B)

Power system : Continuity should exist.
Signal system : Continuity should exist.
Ground system : Continuity should not exist.

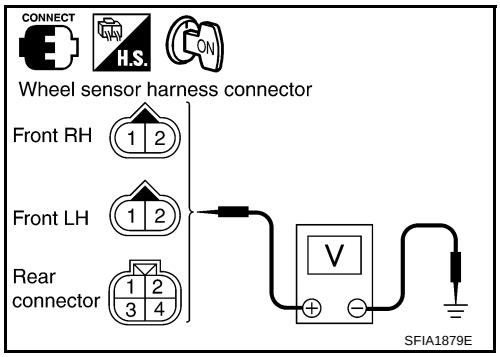
OK or NG

OK >> GO TO 6.
NG >> Repair harness and connector between control unit and wheel sensor.

6. WHEEL SENSOR POWER CIRCUIT INSPECTION

1. Connect the wheel sensor connector E42 (FR - LH) or E27 (FR - RH) or T5 (RR - RH, LH) and ABS control unit connector E51.
2. Turn on the ignition switch and check the voltage between the power terminal and the ground.

Voltage		
Front RH	**1 (B/R) - Ground**	**: 8V or more**
Front LH	**1 (G) - Ground**	**: 8V or more**
Rear RH	**1 (BR/W) - Ground**	**: 8V or more**
Rear LH	**3 (OR) - Ground**	**: 8V or more**



OK or NG

OK >> Replace wheel sensor.
NG >> Replace the control unit.

Inspection 2 Engine System

AFS00299

INSPECTION PROCEDURE

1. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
ENGINE SIGNAL 1
ENGINE SIGNAL 2
ENGINE SIGNAL 3
ENGINE SIGNAL 4
ENGINE SIGNAL 5
ENGINE SIGNAL 6

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> Inspection End

2. ENGINE SYSTEM INSPECTION

1. Conduct an ECM self-diagnosis and repair or replace any non-standard items. Re-conduct ECM self-diagnosis.
2. Re-conduct ABS control unit self-diagnosis.

OK or NG

OK >> Inspection End
NG >> Repair or replace any non-standard items. Re-conduct the self-diagnosis.

Inspection 3 ABS Actuator and Electric Unit (Control Unit)

AFS0029A

INSPECTION PROCEDURE

1. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
ABS CONTROLLER

Is the above displayed in the self-diagnosis display items?

YES >> Replace the ABS actuator and electric unit (control unit). Re-conduct ABS actuator and electric unit (control unit) self-diagnosis.
NO >> Inspection End

Inspection 4 ABS Actuator and Electric Unit (Control Unit) Power and Ground Systems

AFS0029B

INSPECTION PROCEDURE

1. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
LOW BATTERY VOLTAGE

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> Inspection End

2. CONNECTOR INSPECTION

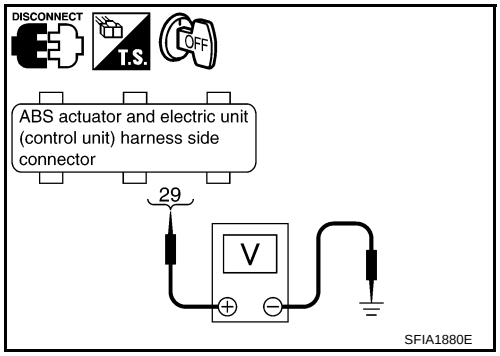
1. Disconnect the ABS actuator and electric unit (control unit) control unit connector and check the terminal for deformation, disconnection, looseness, and so on, If there is an error, repair or replace the terminal.
2. Securely reconnect the connector and re-conduct self-diagnosis.

OK o r NG

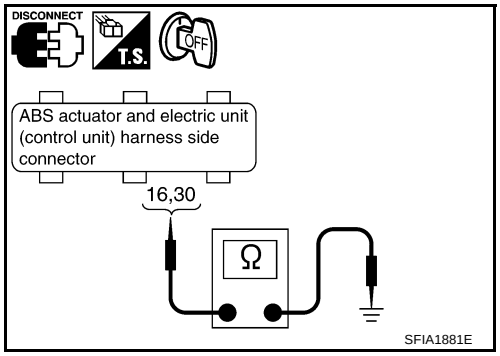
OK >> The connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 3.

3. ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER AND GROUND CIRCUIT INSPECTION

Disconnect ABS actuator and electric unit (control unit) connector. Check continuity and voltage between connector terminals and ground.



Terminal number	Signal name	Measuring condition	Measured value
29 (G/R)	Power supply	Ignition switch ON	Battery voltage (approx. 12V)
		Ignition switch OFF	Approx. 0V



Terminal number	Signal name	Measuring condition	Measured value
30 (B) 16 (B)	Ground	Ignition switch OFF	Continuity should exist.

OK or NG

OK >> Check battery (terminal looseness, power drop, etc.) Error. If there is an error, make repairs.
NG >> Corresponding harness circuit error. Repair the circuit.

Inspection 5 ABS Actuator Relay or ABS Motor Relay Power System

AFS0029C

INSPECTION PROCEDURE

1. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
IN ABS SOL
OUT ABS SOL
MAIN RELAY

Is the above displayed in the self-diagnosis item?

YES >> GO TO 2.
NO >> Inspection End

2. CONNECTOR INSPECTION

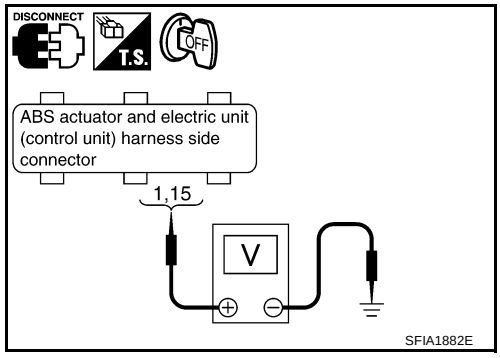
1. Disconnect the ABS actuator and electric unit (control unit) connector E51, check the terminal to see if it is deformed, disconnected, loose, etc., and if there is an error, repair or replace the terminal.
2. Securely reconnect the connector and conduct self-diagnosis.

OK or NG

OK >> The connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 3.

3. ABS ACTUATOR RELAY OR ABS MOTOR RELAY POWER CIRCUIT INSPECTION

1. Disconnect the ABS actuator and electric unit (control unit) connector E51.
2. For the ABS actuator relay, measure the voltage between the connector terminal 1 (SB) and the ground. For the ABS motor relay, measure the voltage between the connector terminal 15 (R/B) and the ground.



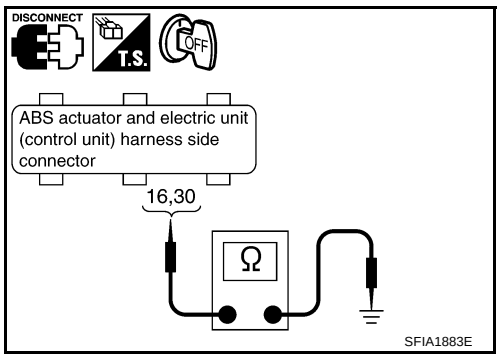
ABS actuator and electric unit (control unit) (Harness connector E51)	Ground	Voltage
1 (SB)	—	Battery voltage (approx. 12V)
15 (R/B)	—	Battery voltage (approx. 12V)

OK or NG

OK >> GO TO 4
NG >> Error in the circuit between the battery and the ABS actuator and electric unit (control unit). Repair the circuit.

4. ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT INSPECTION

Check the ABS actuator and electric unit (control unit) ground circuit.



ABS actuator and electric unit (control unit) (Harness connector E51)	Ground	Continuity
16 (B) and 30 (B)	—	Continuity should exist.

OK or NG

OK >> Replace the ABS actuator and electric unit (control unit).
NG >> Open or short in harness. Repair or replace the harness.

Inspection 6 Stop Lamp Switch System

AFS0029D

INSPECTION PROCEDURE

1. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
STOP LAMP SW

Is the above displayed in the self-diagnosis display item?

YES >> GO TO 2.
NO >> Inspection End

2. CONNECTOR INSPECTION

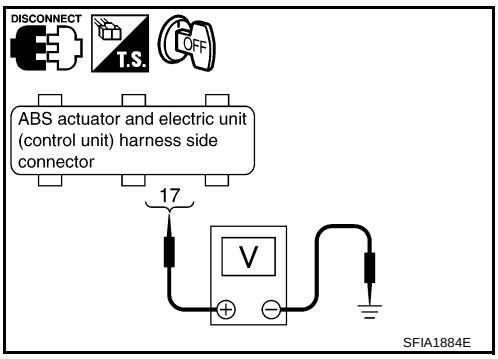
1. Disconnect the ABS actuator and electric unit (control unit) connector E51 and stop lamp switch connector E112, check the terminal for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connector and conduct self-diagnosis.
3. Start engine.
4. Repeat Pumping brake pedal carefully several times, then perform self-diagnosis again.

OK or NG

OK >> The connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 3.

3. STOP LAMP SWITCH CIRCUIT INSPECTION

1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E51.
2. Check the voltage between the ABS actuator and electric unit (control unit) connector terminal and the ground.



ABS actuator and electric unit (control unit) (Harness connector E51)	Ground	Measuring condition	Voltage
17 (P/L)	–	Brake pedal depressed	Battery voltage (approx. 12V)
		Brake pedal not depressed	0V

OK or NG

OK >> Inspection End
NG >> Open or short in harness between the ABS actuator and electric unit and the stop lamp switch. Repair or replace the harness.

Inspection 7 ABS Actuator and Electric Unit (Control Unit) 2

AFS0029E

INSPECTION PROCEDURE

1. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
EMERGENCY BRAKE

When any item other than “emergency brake” is indicated in self-diagnosis display, follow the instructions below.

CAUTION:
“Emergency brake” is indicated when control unit itself is detected as an error. If this display item is indicated, replace control unit.

Is the above displayed in the self-diagnosis display items?

YES >> Replace the ABS actuator and electric unit (control unit).
NO >> Inspection End

Inspection 8 CAN Communication System

AFS0029F

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn ignition switch OFF, disconnect the ABS actuator and electric unit (control unit) connector, and check the terminal for deformation, disconnection, looseness, and so on. If there is a malfunction, repair or replace the terminal.
2. Reconnect connector to perform self-diagnosis.

Is “CAN COMM CIRCUIT” displayed in the self-diagnosis display items?

YES >> Print out the self-diagnostic results, and refer to LAN-3, "Precautions When Using CONSULT-II" .
NO >> Connector terminal connector is loose, damaged, open, or shorted.

Symptom 1 Excessive ABS Function Operation Frequency

AFS0029G

1. INSPECTION START

Check brake force distribution.

OK or NG

OK >> GO TO 2.
NG >> Check brake system.

2. FRONT AND REAR AXLE INSPECTION

Make sure there is no excessive play in the front and rear axles.

OK or NG

OK >> GO TO 3.
NG >> Repair.

3. WHEEL SENSOR INSPECTION

Wheel Sensor Inspection

- Sensor mount and damage inspection
- Sensor rotor mount and damage inspection
- Sensor connector connection inspection
- Sensor harness inspection

OK or NG

OK >> GO TO 4.
NG >> Sensor or sensor rotor replacement

4. ABS WARNING LAMP DISPLAY CHECK

Make sure the warning lamp turns off approximately 1 second after the ignition switch is turned on or when driving.

OK or NG

OK >> Normal
NG >> Perform self-diagnosis. Refer to BRC-21, "SELF-DIAGNOSIS" .

Symptom 2 Unexpected Pedal Reaction

AFS0029H

1. BRAKE PEDAL STROKE INSPECTION

Check brake pedal stroke.

Is the stroke too big?

YES >>
- Bleed air from the brake piping.
- Check the brake pedal, brake booster, and master cylinder mount for play, looseness, and brake system for fluid leaks, etc. If any malfunctions are found, make repairs.

NO >> GO TO 2.

2. PERFORMANCE CHECK

Disconnect the ABS actuator and electric unit (control unit) connector, and make sure the braking force is sufficient when the ABS is not operating. After the inspection, reconnect the connector.

OK or NG

OK >> GO TO 3.WHEEL SENSOR INSPECTION in BRC-36, "Symptom 1 Excessive ABS Function Operation Frequency" .
NG >> Check brake system.

Symptom 3 The Braking Distance is Long

AFS0029I

CAUTION:
On slippery road surfaces, the stopping distance might be longer with the ABS operating than when the ABS is not operating.

1. PERFORMANCE CHECK

Disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. In this condition, check stopping distance. After inspection, connect connector.

OK or NG

OK >> ● Bleed air from the brake piping.
● Check brake system.

NG >> GO TO 3.WHEEL SENSOR INSPECTION in BRC-36, "Symptom 1 Excessive ABS Function Operation Frequency" .

Symptom 4 The ABS Function Does Not Operate

AFS0029J

CAUTION:
The ABS does not operate when the speed is 10 km/h (6 MPH) or less.

1. ABS WARNING LAMP DISPLAY CHECK

Make sure the warning lamp turns off approximately 1 second after the ignition switch is turned on or when driving.

OK or NG

OK >> GO TO 3.WHEEL SENSOR INSPECTION in BRC-36, "Symptom 1 Excessive ABS Function Operation Frequency" .

NG >> Perform self-diagnosis. Refer to BRC-21, "SELF-DIAGNOSIS" .

Symptom 5 Pedal Vibration or ABS Operation Sound Occurs

AFS0029K

CAUTION:
Under the following conditions, when brake pedal is lightly depressed (just place a foot on it), ABS is activated and vibration is felt. However, this is normal.

- **When shifting gears**
- **When driving on slippery road**
- **During cornering at high speed**
- **When passing over bumps or grooves [50 mm (1.97 in) or more]**
- **When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher]**

1. SYMPTOM CHECK 1

Check if pedal vibration or operation sound occurs when the engine is started.

OK or NG

OK >> GO TO 2.

NG >> Perform self-diagnosis. Refer to BRC-21, "SELF-DIAGNOSIS" .

2. SYMPTOM CHECK 2

Check the symptom when electrical component (headlamps, etc.) Switches are operated.

Does the symptom occur when the electrical component (head lamp, etc.) Switches are operated?

YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit (or its wiring), and if there is, move it farther away.

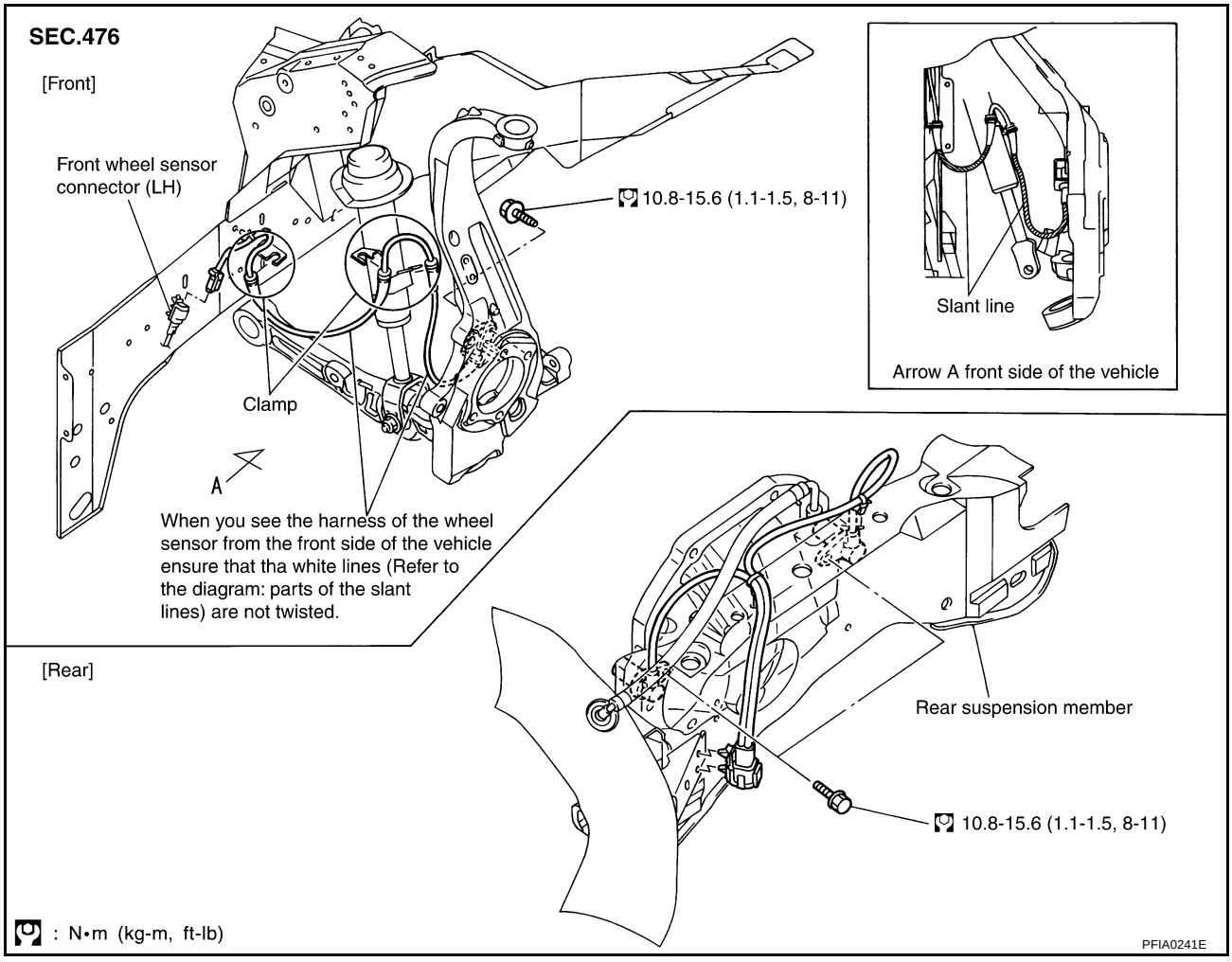
NO >> GO TO 3.WHEEL SENSOR INSPECTION in BRC-36, "Symptom 1 Excessive ABS Function Operation Frequency"

WHEEL SENSORS

PFP:47910

Removal and Installation

AFS0029L



REMOVAL

Pay attention to the following when removing sensor.

CAUTION:

- **As much as possible, avoid rotating sensor when removing it. Pull sensors out without pulling on sensor harness.**
- **Take care to avoid damaging sensor edges or rotor teeth. Remove wheel sensor first before removing front or rear wheel hub. This is to avoid damage to sensor wiring and loss of sensor function.**

INSTALLATION

Pay attention to the following when installing sensor. Tighten installation bolts and nuts to specified torques.

- When installing, check that there is no foreign material such as iron chips on pick-up and mounting hole of the sensor. Check that no foreign material has been caught in the sensor rotor motor. Remove any foreign material and clean the mount.
- When installing front sensor, be sure to press rubber grommets in until they lock at the three locations shown in diagram (2 at shock absorbers and 1 at body panel). When installed, harness must not be twisted. White line on harness (shaded part) must be visible from front.

SENSOR ROTOR

PFP:47970

Removal and Installation

AFS0029M

REMOVAL

Front

Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-4, "Removal and Installation" in “Front Axle/Drive Shaft” in “FAX” section.

Rear

- Follow procedure below to remove rear sensor rotor.
  - Remove side flange. Refer to RFD-8, "SIDE OIL SEAL" in “Rear Final Drive” in “RFD” section.
  - Using a bearing replacer (special service tool) and puller (commercial service tool), remove sensor rotor from the companion flange.

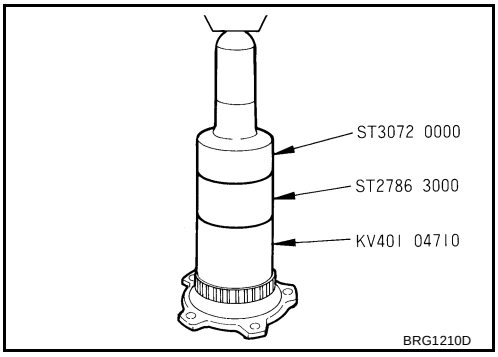
INSTALLATION

Front

Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-4, "Removal and Installation" in “Front Axle/Drive Shaft” in “FAX” section.

Rear

- Follow procedure below to install rear sensor rotor.
  - Using a drift (special service tool), press rear sensor rotor onto the side flange.
  - Install side flange. Refer to RFD-8, "SIDE OIL SEAL" in “Rear Final Drive” in “RFD” section.

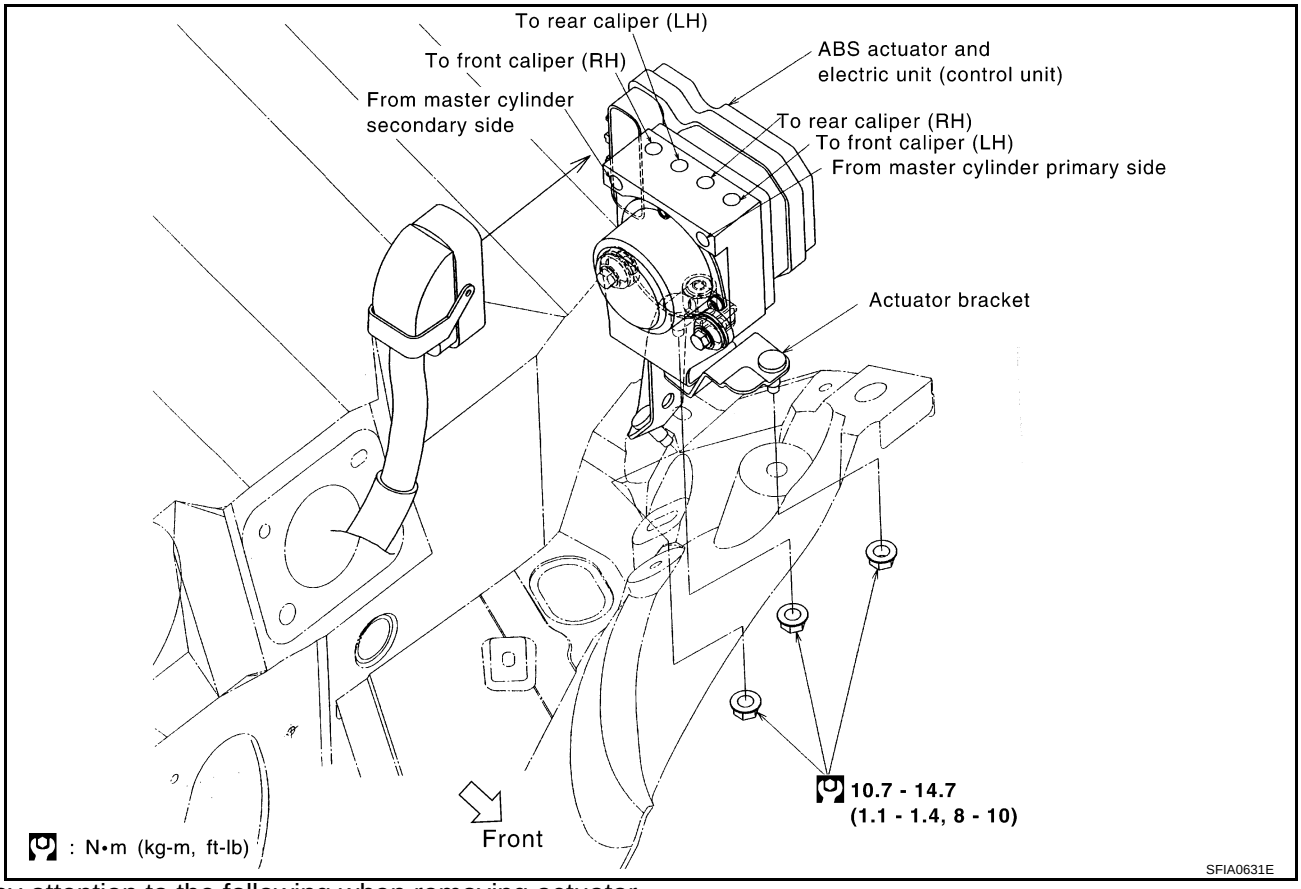


ABS ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

PFP:47660

Removal and Installation

AFS0029N



Pay attention to the following when removing actuator.

CAUTION:

- **Before servicing, disconnect battery cables.**
- **To remove brake tube, use flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut wrench (commercial service tool).**
- **Do not remove and install actuator by holding harness.**
- **After work is completed, bleed air from brake piping. Refer to BR-10, "Bleeding Brake System" .**
- **Be sure to securely connect the ground cable.**

PRECAUTIONS

PFP:00001

Precautions for Battery Service

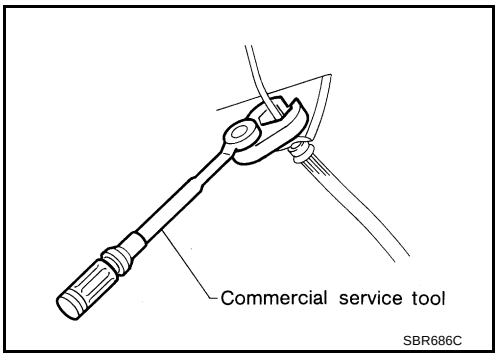
AFS0016F

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Brake System

AFS00097

- Recommended fluid is brake fluid “DOT 3”.
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas such as body. If brake fluid is splashed, wipe it off and flush area with water immediately.
- Never use mineral oils such as gasoline or kerosene to clean. They will ruin rubber parts and cause improper operation.
- Using a flare nut torque wrench, securely tighten brake tube flare nuts.
- Brake system is an important safety part. If a brake fluid leak is detected, always disassemble the affected part. If a malfunction is detected, replace part with a new one.
- Before working, turn ignition switch OFF and disconnect electrical connectors of ABS actuator and control module or battery negative terminal.
- When installing brake piping, be sure to check torque.



Precautions for Brake Control

AFS00098

- During ABS operation, brake pedal lightly vibrates and a mechanical noise may be heard. This is normal.
- Just after starting vehicle after ignition switch ON, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without ABS when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.
- When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for simple causes before starting diagnostic servicing. Besides electrical system inspection, check booster operation, brake fluid level, and oil leaks.
- If tire size and type are used in an improper combination, or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- If there is a radio, antenna, or antenna lead-in wire (including wiring) near control module, ABS function may have a malfunction or error.
- If aftermarket parts (car stereo, CD player, etc.) Have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.

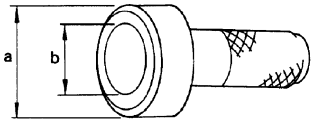
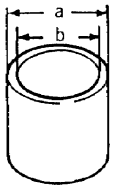
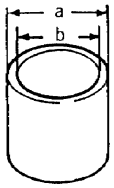
PREPARATION

PFP:00002

Special Service Tools

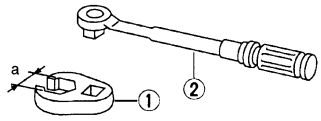
AFS0014X

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
ST3072 0000 (J 25405) Drift a: 77 mm (0.03 in) dia. b: 55 mm (2.17 in) dia.	 ZZA0701D	Installation rear sensor rotor
ST2786 3000 (—) Drift a: 75 mm (2.95 in) dia. b: 62 mm (2.44 in) dia.	 ZZA0832D	
KV401 04710 (—) a: 76 mm (2.99 in) dia. b: 68.5 mm (2.697 in) dia.	 ZZA0832D	

Commercial Service Tools

AFS0009B

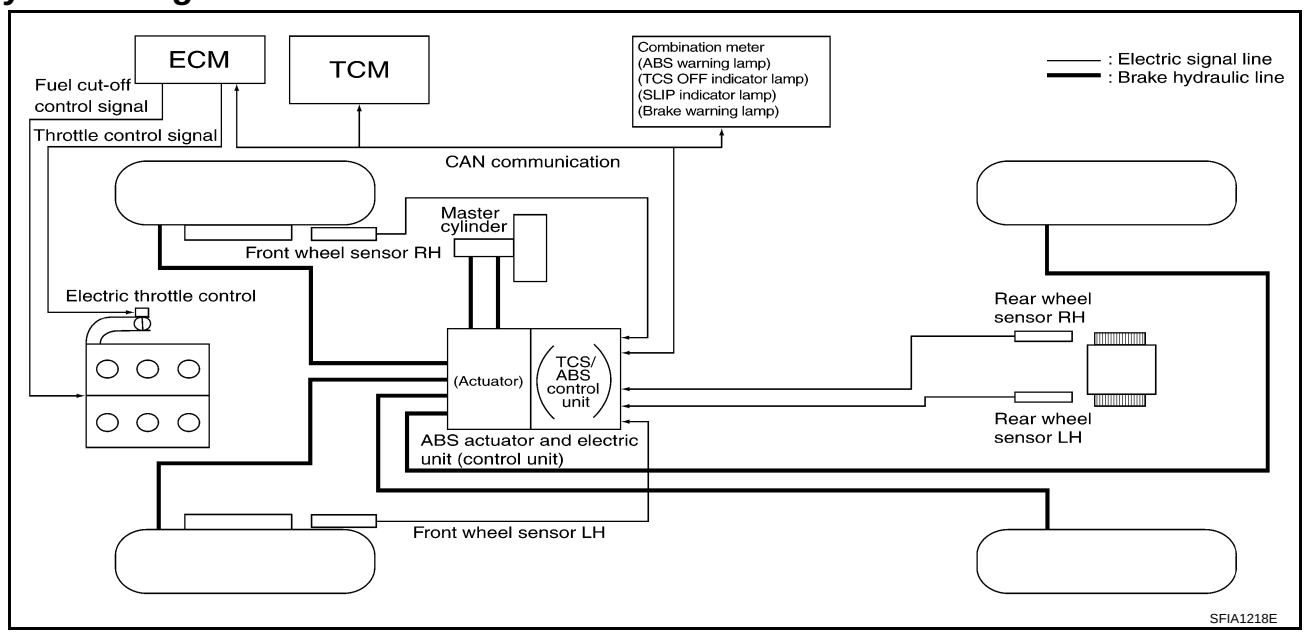
Tool name		Description
1. Flare nut crowfoot a: 10 mm (0.39 in)/12mm (0.47 in) 2. Torque wrench	 S-NT360	Removing and installing each brake piping

SYSTEM DESCRIPTION

PFP:00000

System Diagram

AFS000YN



TCS Function

AFS000YP

- The wheel spin occurrence of the drive wheels is detected by the ABS actuator and electric unit (control unit) using the wheel speed signals from all four wheels, so when wheel spin occurs, the amount of wheel spin is reduced by controlling the hydraulic brakes on the right and left rear wheels, cutting the fuel to the engine, and partially closing the throttle valve to reduce the engine torque. The throttle opening is also controlled to obtain the optimum engine torque.
- Depending on road circumstances, the driver may have a sluggish feel. This is normal, because the optimum traction has the highest priority under TCS operation.
- TCS may be activated any time the vehicle suddenly accelerates, suddenly downshifts, or is driven on a road with a varying surface friction coefficient.
- During TCS operation, it informs a driver of system operation by flashing SLIP indicator lamp.

ABS Function

AFS000YQ

- The Anti-Lock Brake System is a function that detects wheel revolution while braking, and it improves handling stability during sudden braking by electrically preventing 4 wheel lock. Maneuverability is also improved for avoiding obstacles.
- If the electrical system breaks down, then the Fail-Safe function starts, the ABS becomes inoperative, and the ABS warning lamp turns on.
- Electrical System Diagnosis by CONSULT-II is available.

EBD Function

AFS0010E

- Electronic Brake Distributor is a function that detects subtle slippages between the front and rear wheels during braking, and it improves handling stability by electronically controlling the Brake Fluid Pressure which results in reduced rear wheel slippage.
- In case of electrical system break down, the Fail-Safe function is activated, the EBD and ABS becomes inoperative, and the ABS warning lamp and brake warning lamp are turned on.
- Electrical System Diagnosis by CONSULT-II is available.

Fail-Safe Function

AFS000YR

TCS SYSTEM

In case of Throttle Control System trouble, the TCS OFF indicator lamp and SLIP indicator lamp are turned on, and the condition of the vehicle is the same as the condition of vehicles without TCS equipment. In case of trouble to the Throttle Control System, the ABS control continues to operate normally without TCS control.

CAUTION:
If the Fail-Safe function is activated, then perform the Self Diagnosis for TCS/ABS control system.

ABS, EBD SYSTEM

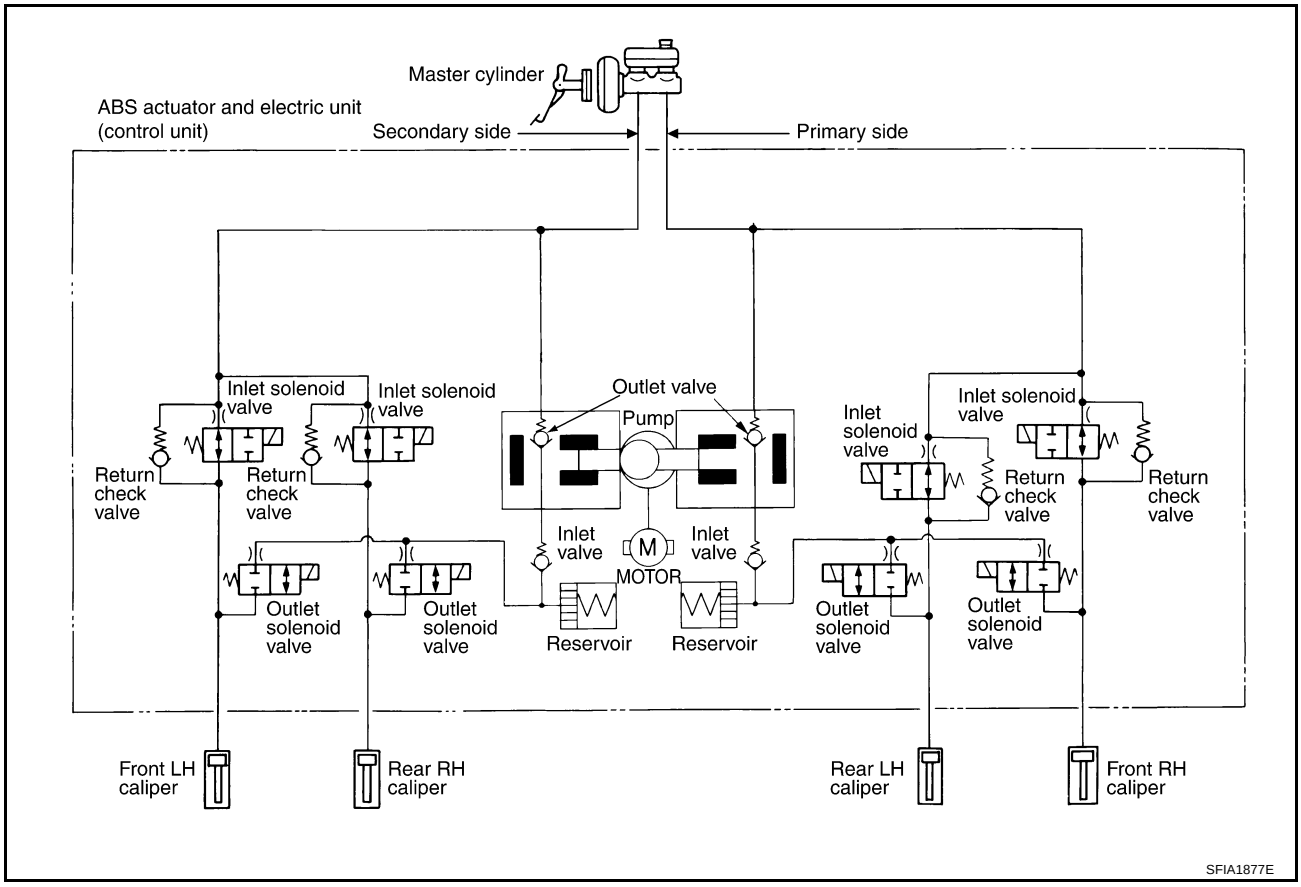
In case of electrical problems with the ABS, the ABS warning lamp, TCS OFF indicator lamp and SLIP indicator lamp will turn on. In case of electrical problem with the EBD, Brake warning lamp, ABS warning lamp, TCS OFF indicator lamp and SLIP indicator lamp will turn on. Simultaneously, the TCS/ABS become one of the following conditions of the Fail-Safe function.

1. For ABS trouble, only the EBD is activated and the condition of the vehicle is the same condition of vehicles without TCS/ABS equipment.
2. For EBD trouble, the EBD and ABS become inoperative, and the condition of the vehicle is the same as the condition of vehicles without TCS/ABS, EBD equipment.

NOTE:
In condition 1 described above, an ABS Self Diagnosis sound may be heard. That is a normal condition because a self diagnosis for “Key Switch ON” and “the First Starting” are being performed.

Hydraulic Circuit Diagram

AFS000YS



CAN COMMUNICATION

PFP:23710

System Description

AFS0010A

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. Refer to LAN-5, "CAN Communication Unit" .

TROUBLE DIAGNOSIS

PFP:00004

How to Proceed with Diagnosis

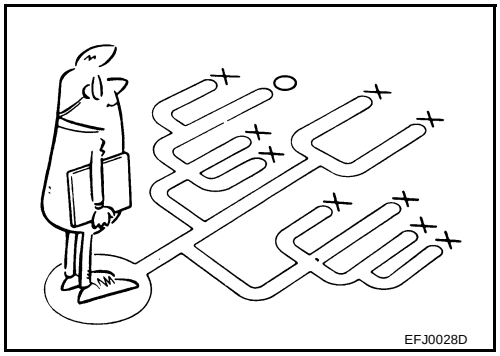
AFS0009J

BASIC CONCEPT

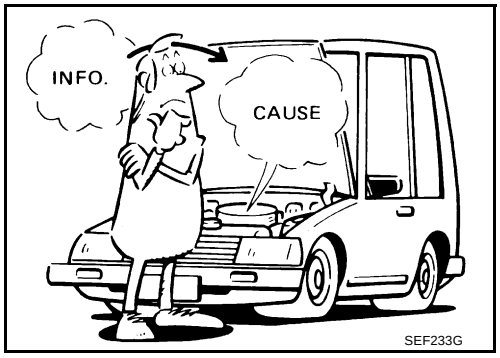
- Most important point to perform diagnosis is to understand systems (control and mechanism) in vehicle thoroughly.

- It is also important to clarify customer complaints before inspection.
  First of all, reproduce symptom, and understand it fully.
  Ask customer about his/her complaints carefully. In some cases, it will be necessary to check symptom by driving vehicle with customer.

  NOTE:
  Customers are not professionals. Do not assume “maybe customer means...” or “maybe customer mentioned this symptom”.


EFJ0028D

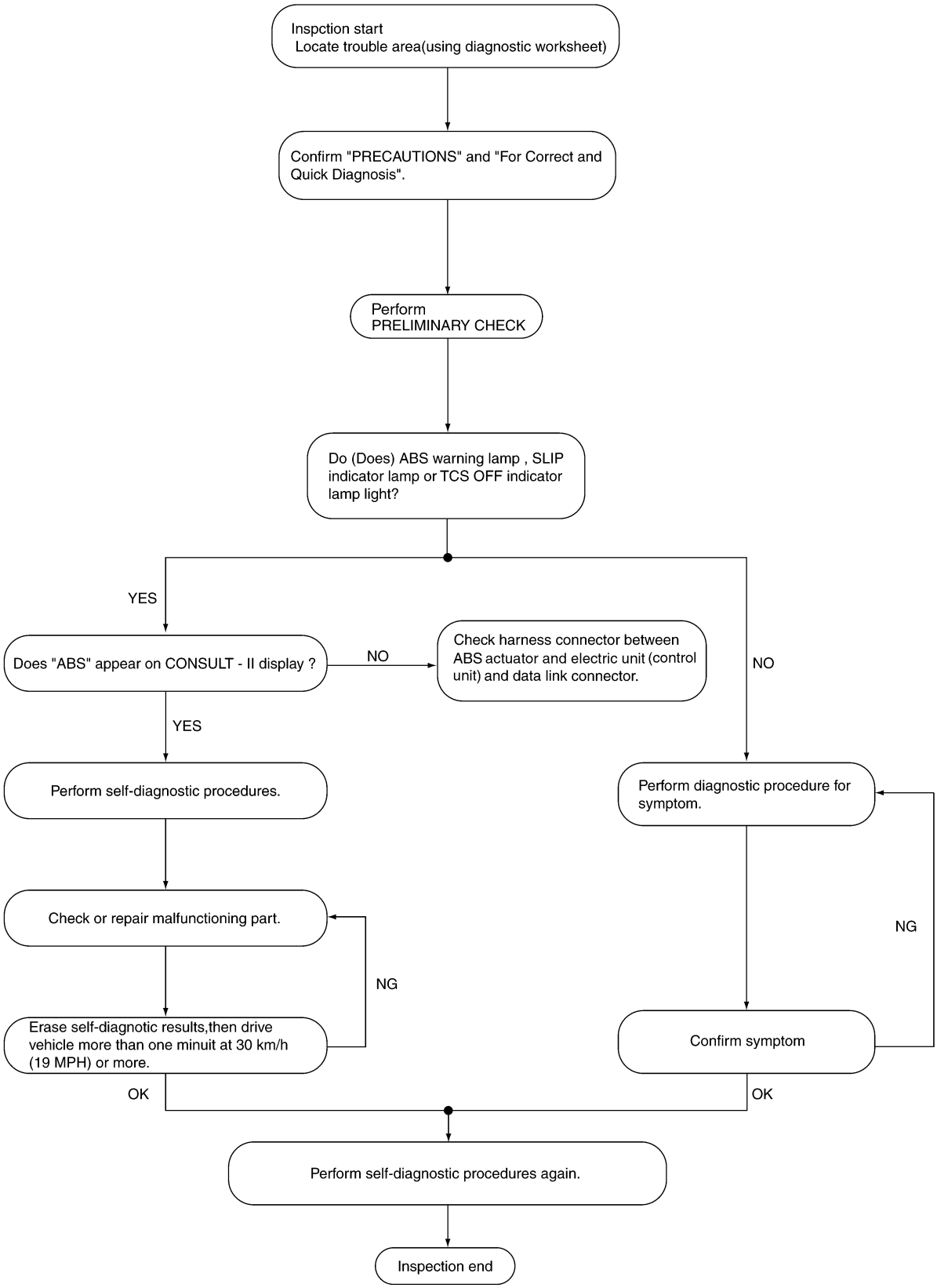
- It is essential to check symptoms right from beginning in order to repair a malfunction completely.
  For an intermittent malfunction, it is important to reproduce symptom based on interview with customer and past examples. Do not perform inspection on ad hoc basis. Most intermittent malfunctions are caused by poor contacts. In this case, it will be effective to shake suspected harness or connector by hand. When repairs are performed without any symptom check, no one can judge if malfunction has actually been eliminated.
- After diagnosis, make sure to carry out “erase memory”. Refer to BRC-63, "Operation Procedure" .
- For an intermittent malfunction, move harness or harness connector by hand to check poor contact or false open circuit.



SEF233G

- Always read “GI General Information” to confirm general precautions. Refer to GI-4, "General Precautions"

DIAGNOSIS FLOWCHART



SFIA0952E

ASKING COMPLAINTS

- Complaints against malfunction vary depending on each person. It is important to clarify customer complaints.
- Ask customer about what symptoms are present and under what conditions. Use information to reproduce symptom while driving.
- It is also important to use diagnosis sheet so as not to miss information.

KEY POINTS

WHAT ..... Vehicle model
WHEN ..... Date, Frequencies
WHERE ..... Road conditions
HOW ..... Operating conditions, Weather conditions, Symptoms

SBR339B

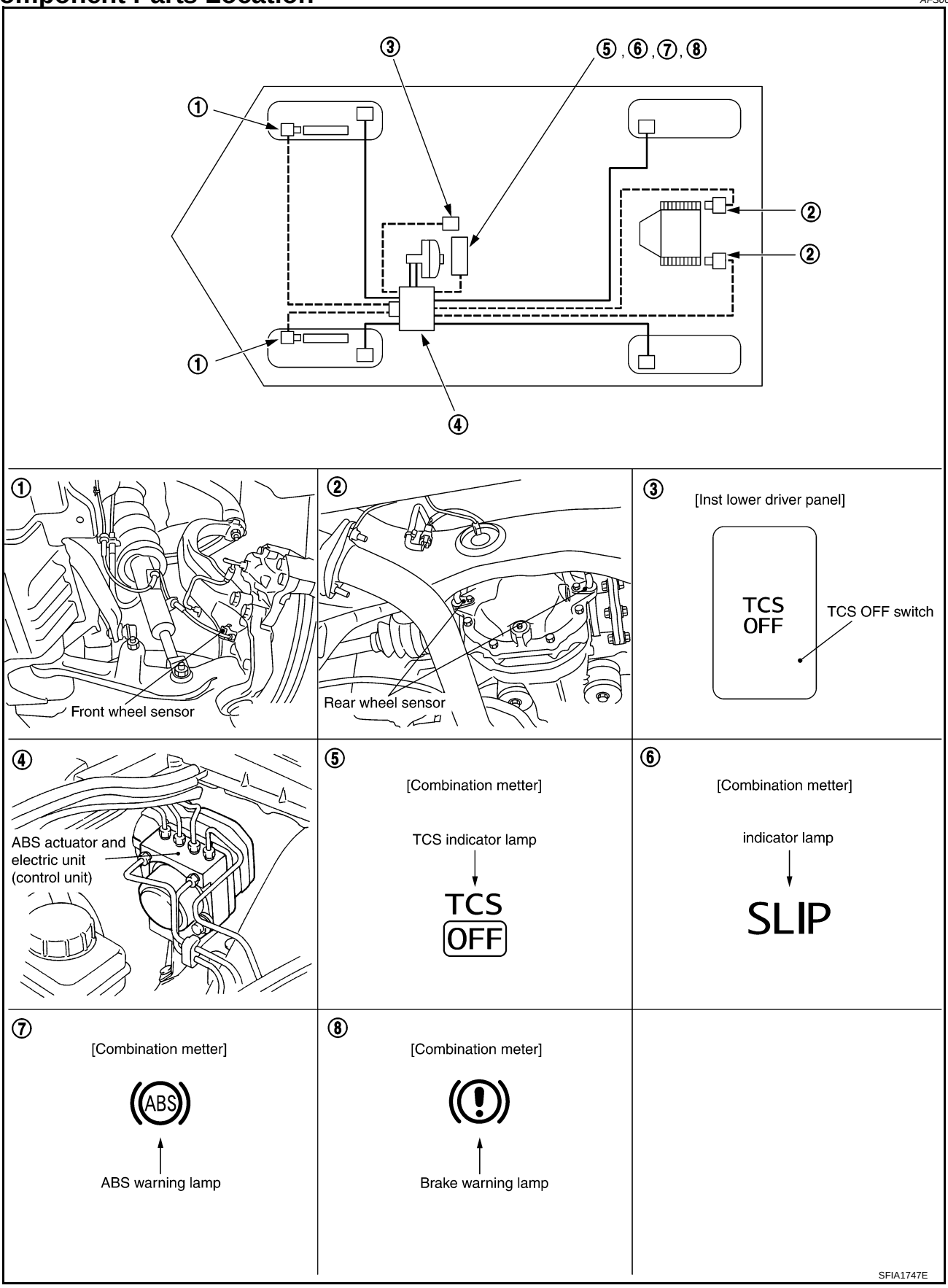
EXAMPLE OF DIAGNOSIS SHEET

Customer name MR/MS	Model & Year		VIN
Engine #	Trans.		Mileage
Incident Date	Manuf. Date		In Service Date
Symptoms	☐ Noise and vibration (from engine compartment) ☐ Noise and vibration (from axle)	☐ Warning / Indicator activate	☐ Firm pedal operation Large stroke pedal operation
	☐ TCS does not work (Rear wheels slip when accelerating)	☐ ABS does not work. (wheels slip when braking)	☐ Lack of sense of acceleration
Engine conditions	☐ When starting ☐ After starting		
Road conditions	☐ Low friction road (☐Snow ☐Gravel ☐Other) ☐ Bumps / potholes		
Driving conditions	☐ Full-acceleration ☐ High speed cornering ☐ Vehicle speed: Greater than 10 km/h (6 MPH) ☐ Vehicle speed: 10 km/h (6 MPH) or less ☐ Vehicle is stopped		
Applying brake conditions	☐ Suddenly ☐ Gradually		
Other conditions	☐ Operation of electrical equipment ☐ Shift change ☐ Other descriptions		

SFIA0791E

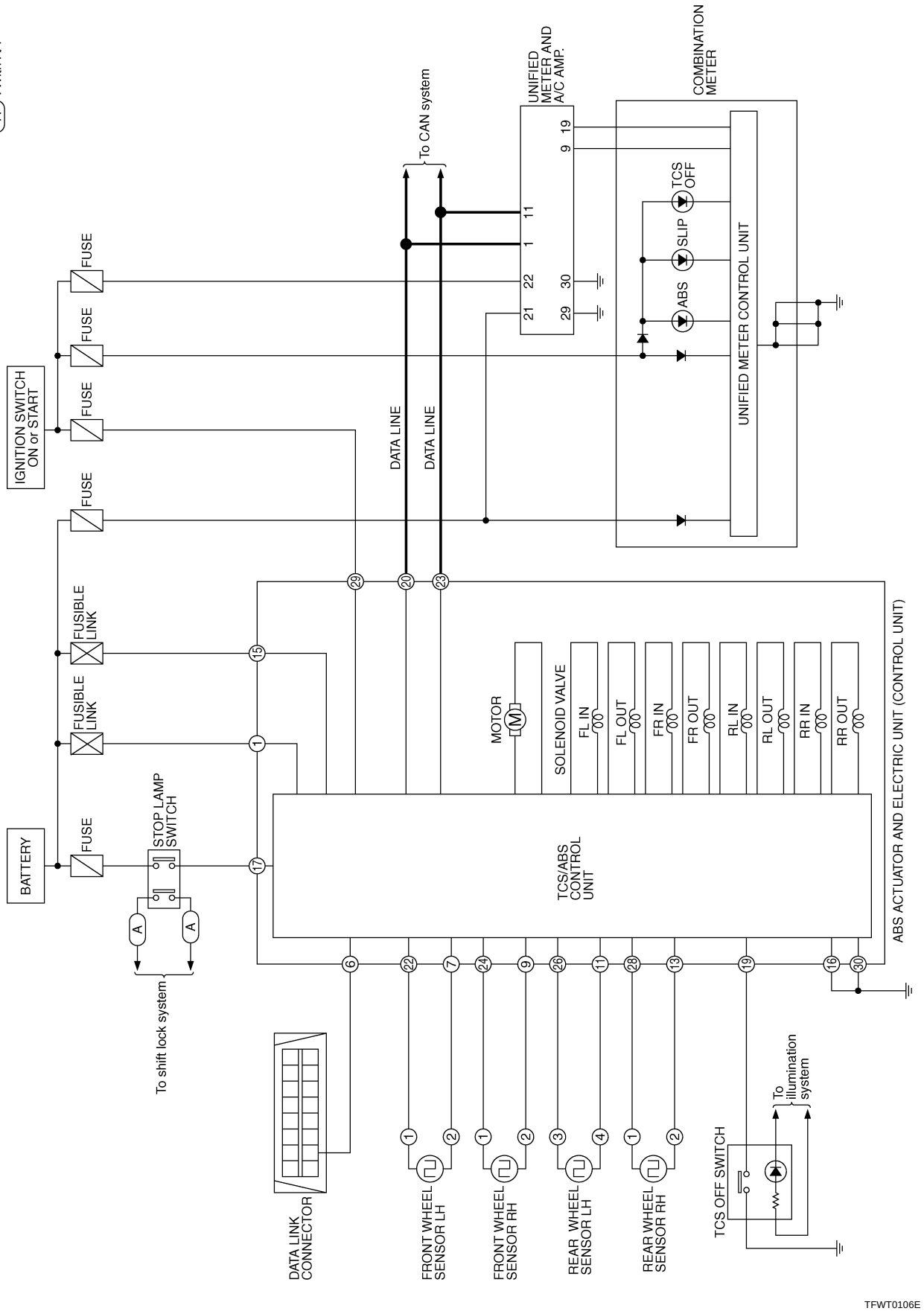
Component Parts Location

AFS0009K



Schematic — TCS —

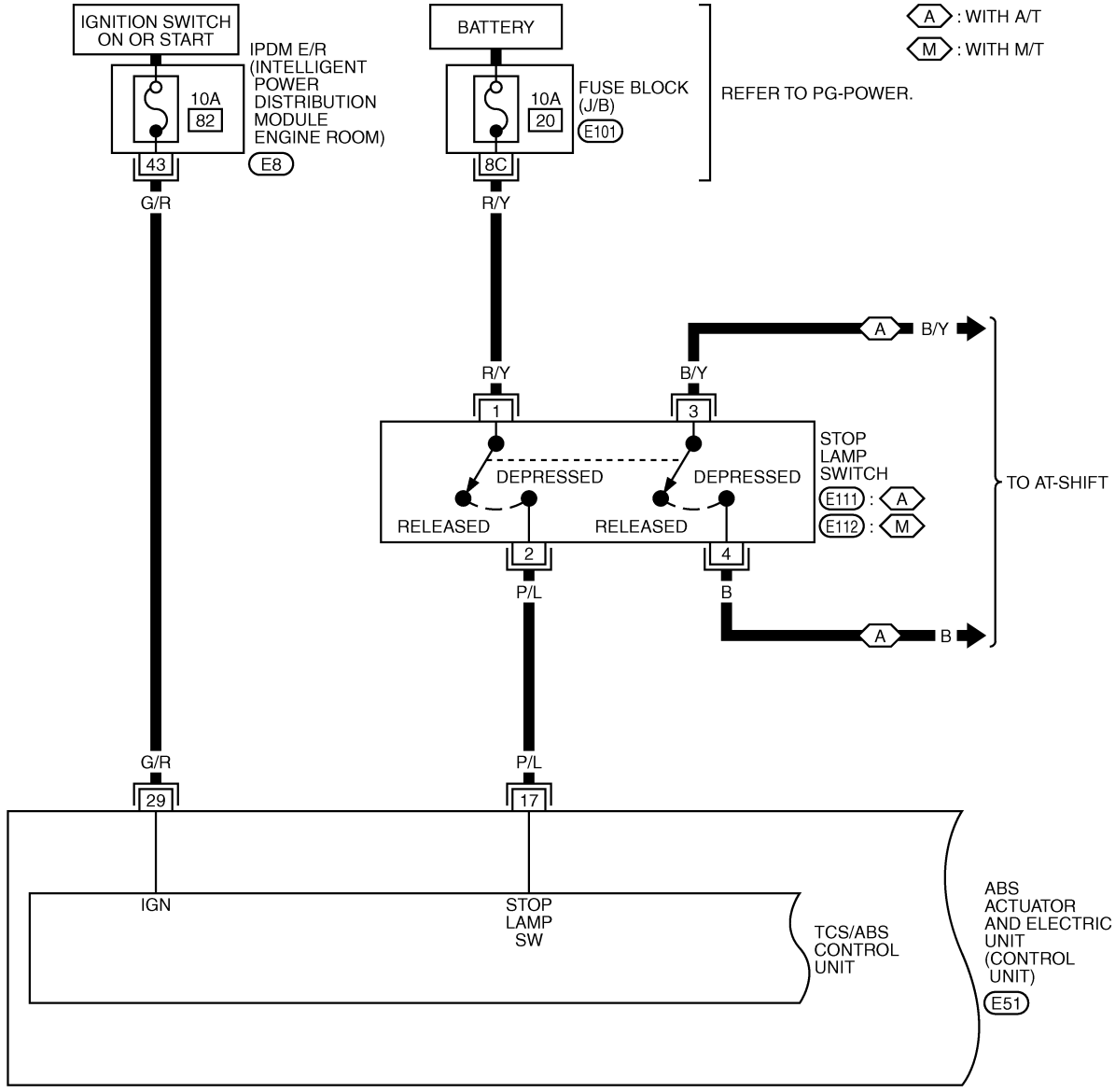
AFS000XQ

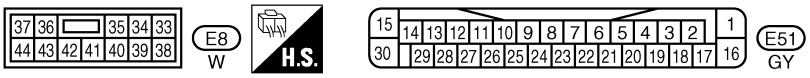


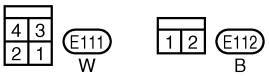
Wiring Diagram — TCS —

AFS000XR

BRC-TCS-01



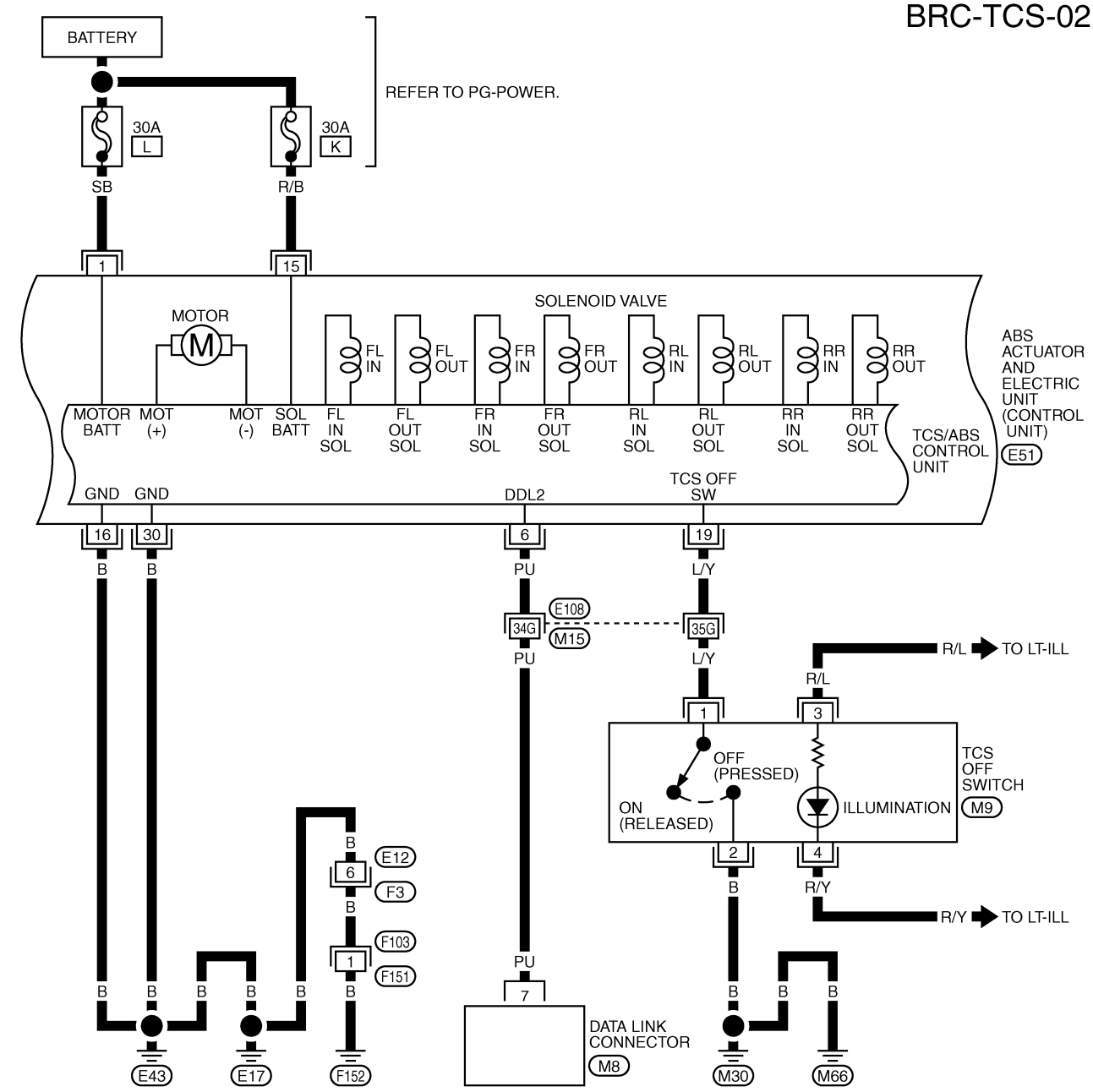


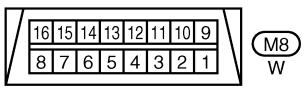


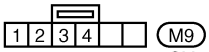
REFER TO THE FOLLOWING.
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

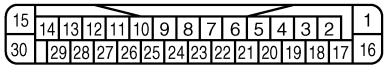
TFWT0155E

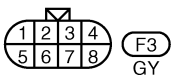
BRC-TCS-02

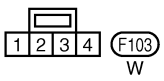








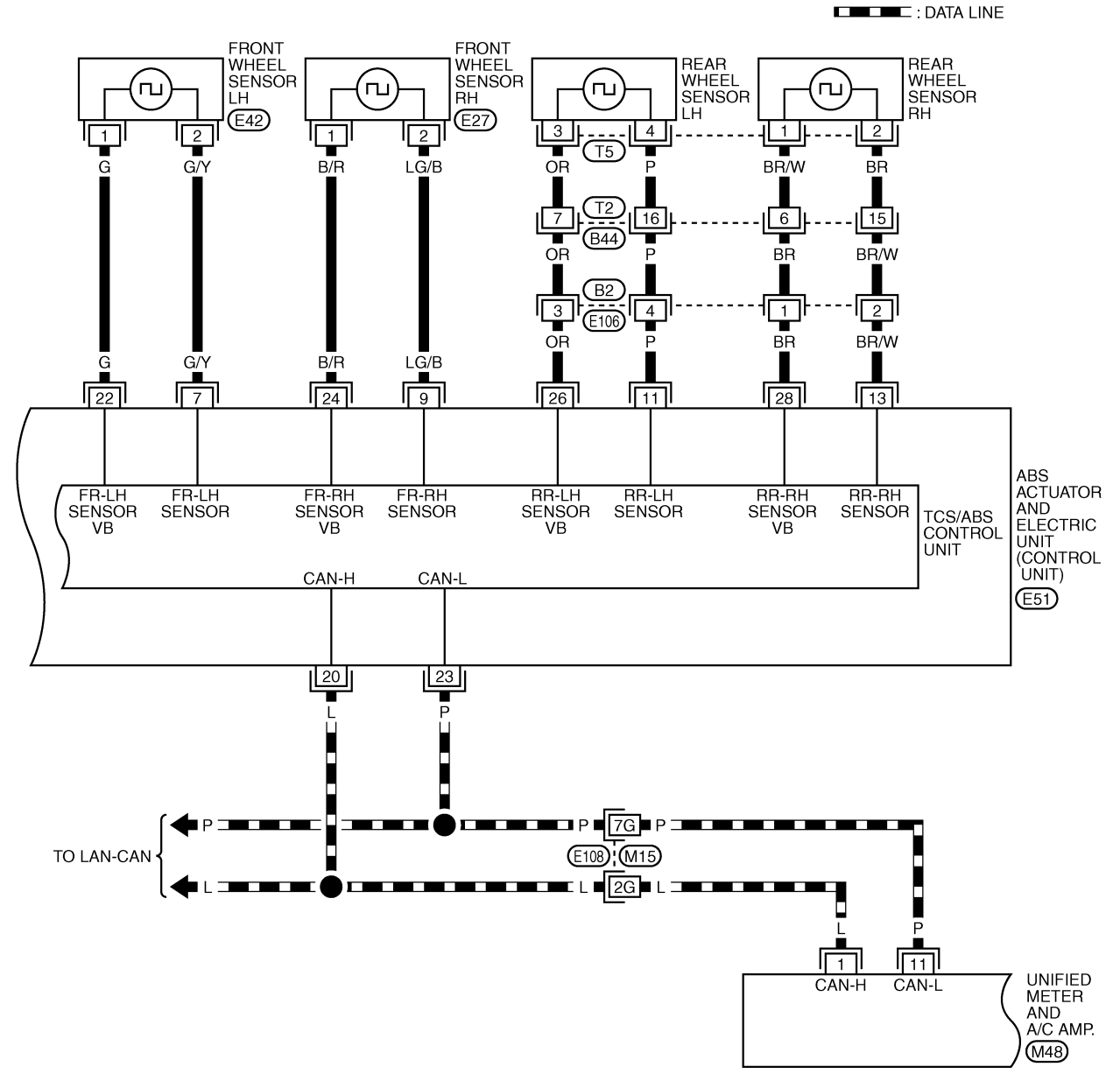


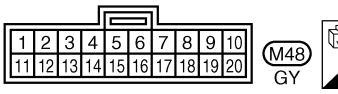


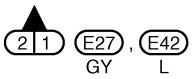
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

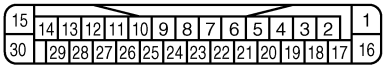
TFWT0156E

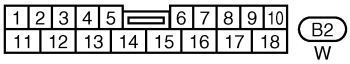
BRC-TCS-03

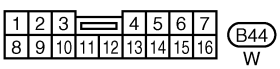








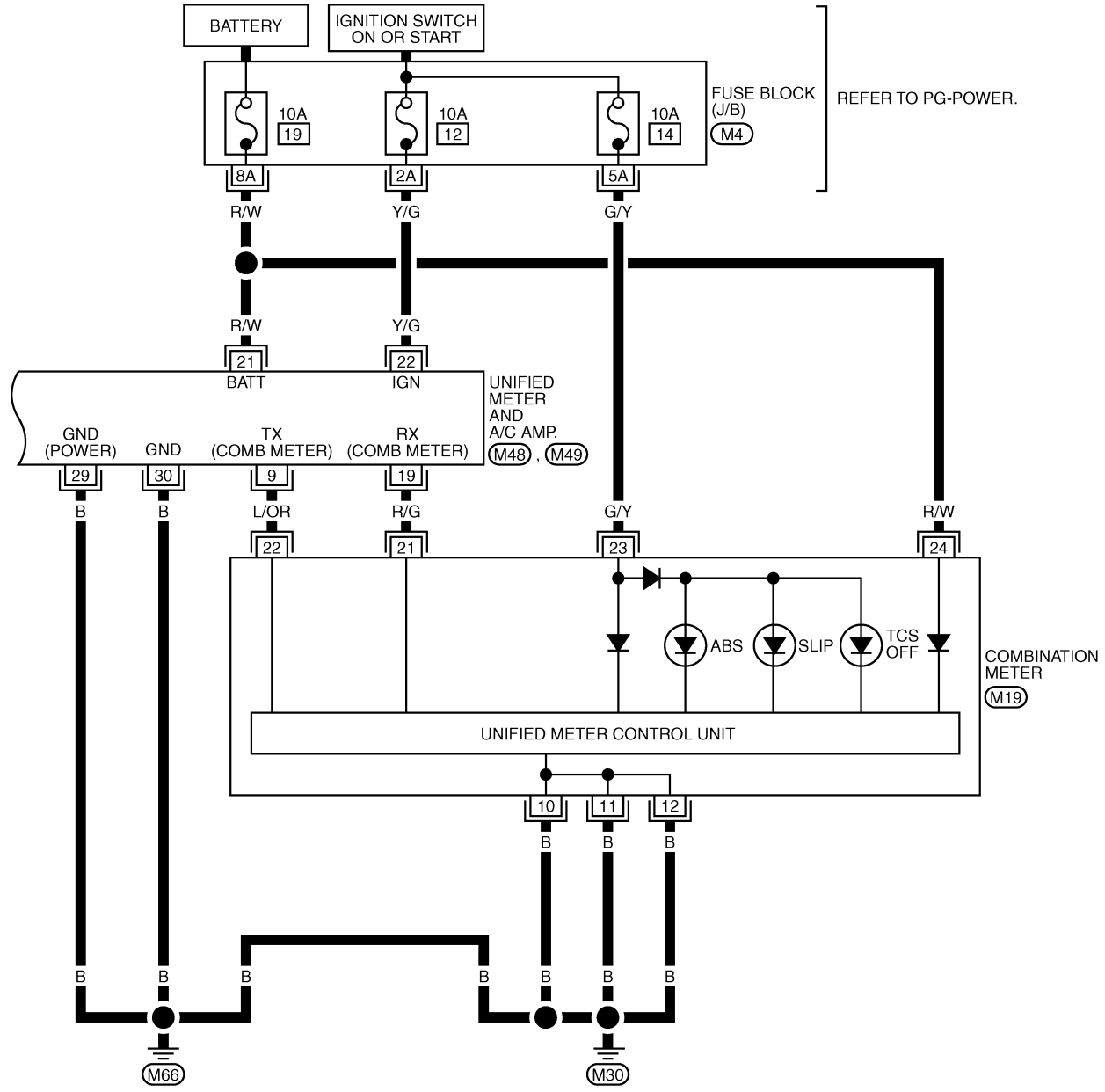


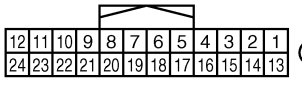


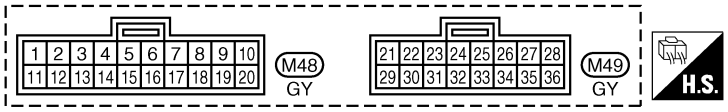
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TFWT0157E

BRC-TCS-04







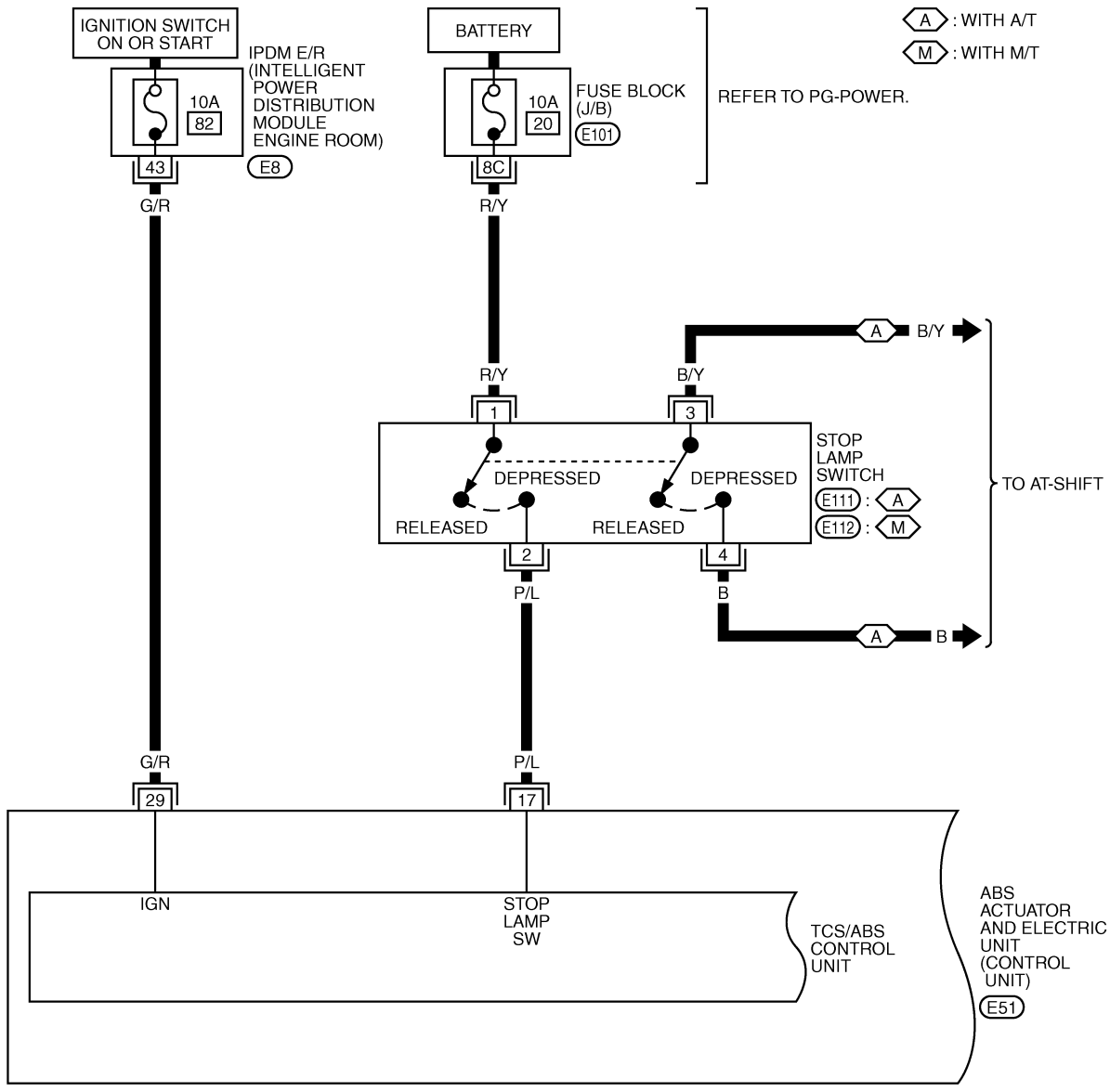
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

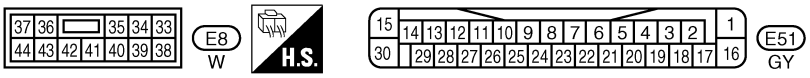
TFWT0041E

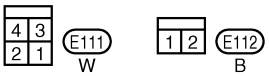
Wiring Diagram — TCS — ROAD STAR

AFS0026F

BRC-TCS-05



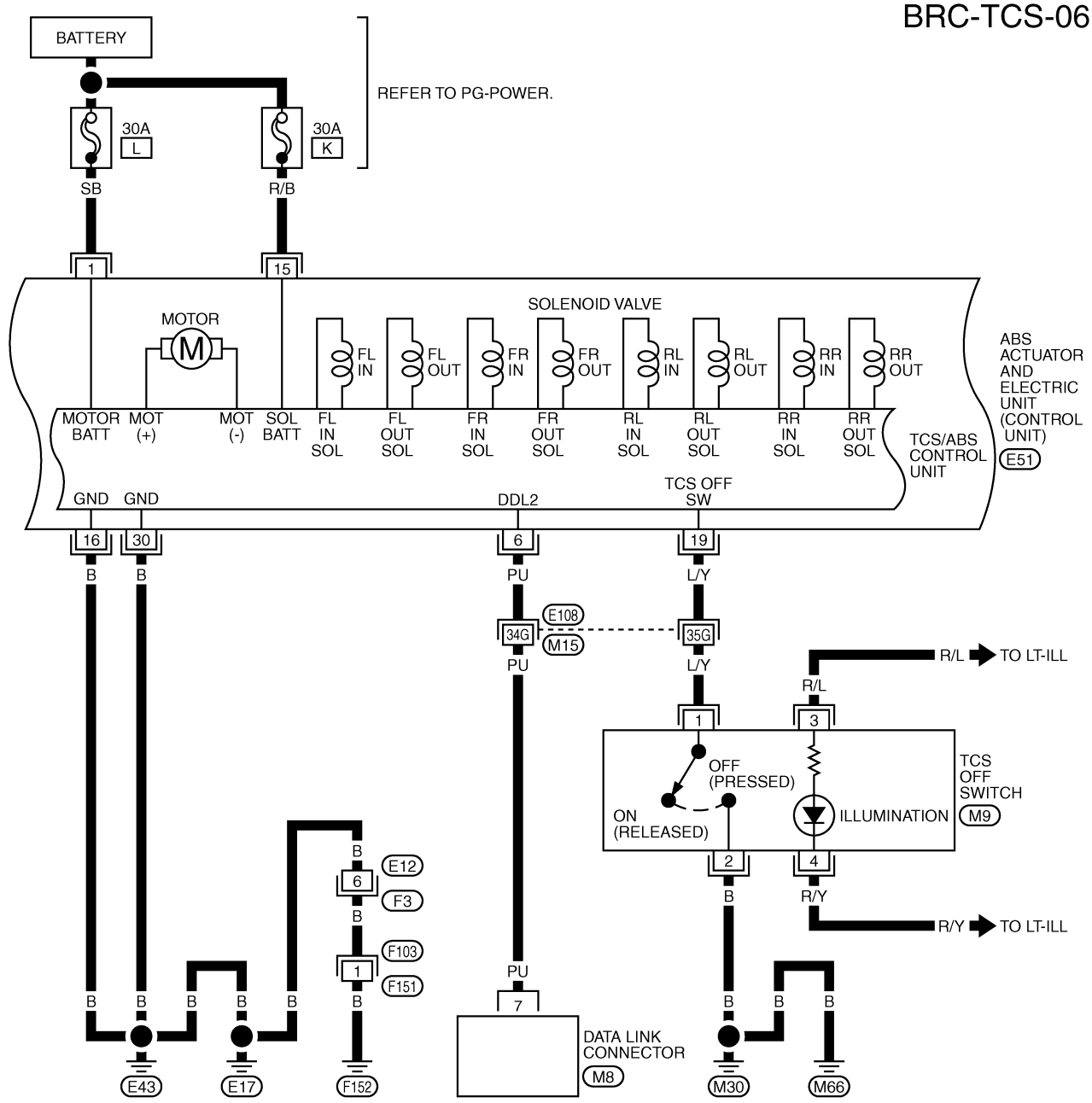


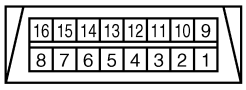


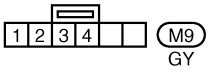
REFER TO THE FOLLOWING.
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

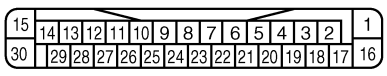
TFWT0158E

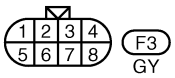
BRC-TCS-06

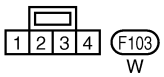








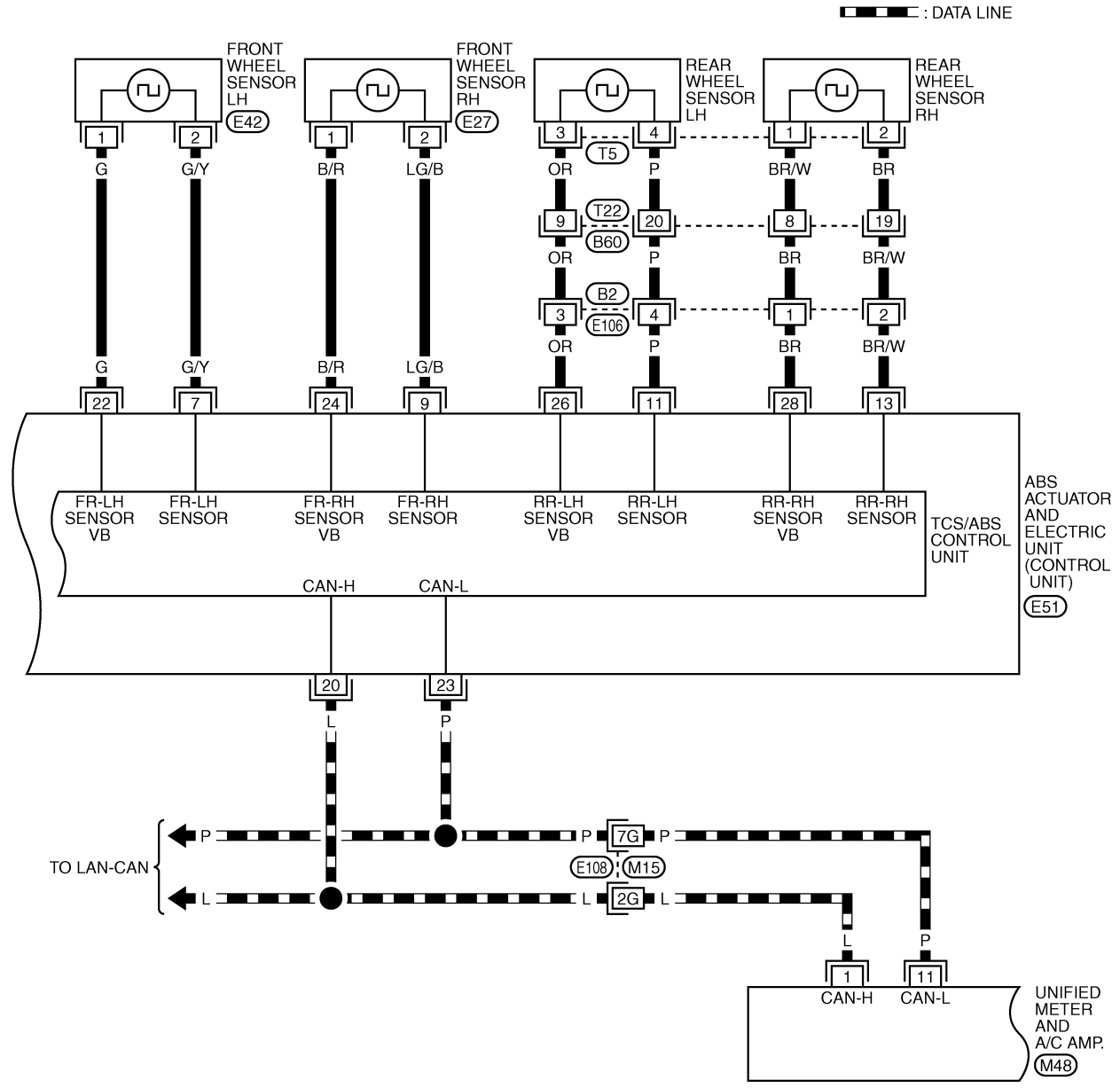


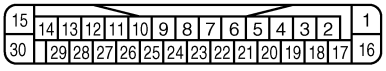


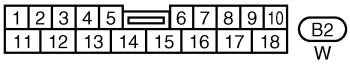
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

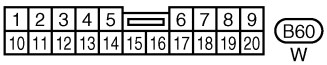
TFWT0159E

BRC-TCS-07









REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TFWT0160E

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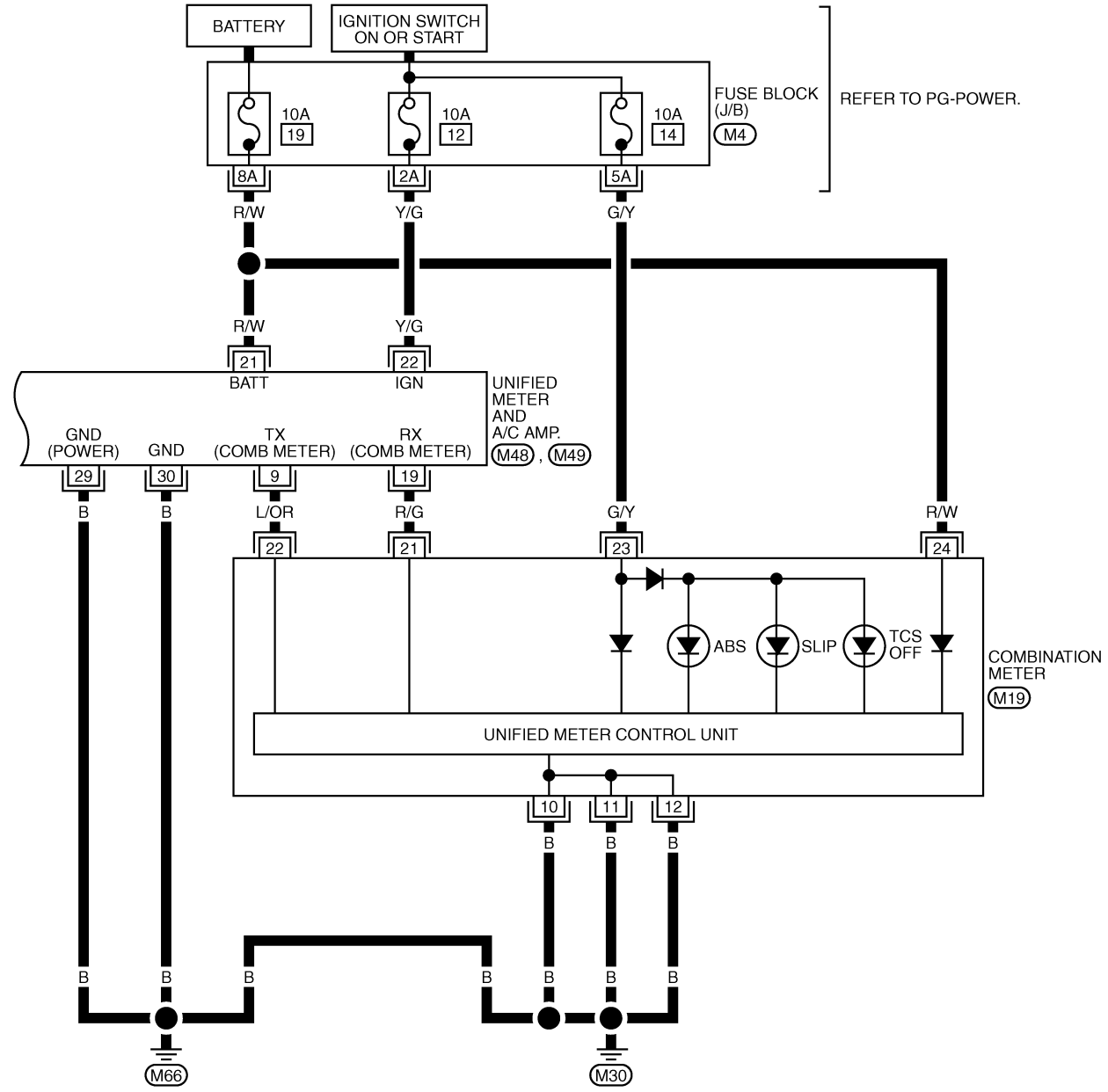
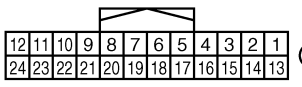
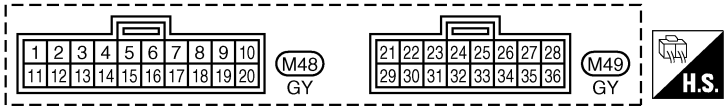






REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWT0161E

Control Unit Input/Output Signal Standard

AFS000YT

REFERENCE VALUE FROM CONSULT-II

CAUTION:

The display shows the control unit calculation data, so a normal value might be displayed even in the event the output circuit (harness) is open or short - circuited.

Monitor item	Display Content	Data monitor		Reference: Error inspection checklist
		Condition	Reference values for normal operation	
WHEEL SENSOR	Wheel speed calculated using signals from all four wheel sensors	Vehicle stopped	0 km/h (0 MPH)	BRC-72, "Inspection 1 Wheel Sensor System"
		While driving (Note 1)	Nearly matches the speedometer display (±10% or less)	
IN ABS S/V OUT ABS S/V	Operation status of all solenoids	When the actuator solenoid operates or during a fail-safe	ON	—
		When the actuator relay operates and the actuator solenoid does not operate	OFF	
EBD WARNING LAMP	Brake warning lamp on condition (Note 2)	Brake warning lamp ON	ON	BRC-71, "BASIC INSPECTION 3 ABS WARNING LAMP, TCS OFF INDICATOR LAMP, SLIP INDICATOR LAMP INSPECTION"
		Brake warning lamp OFF	OFF	
STOP LAMP SWITCH	Brake pedal operation	Brake pedal depressed	ON	BRC-77, "Inspection 6 Stop Lamp Switch System"
		Brake pedal not depressed	OFF	
ABS MOTOR RELAY	Motor and motor relay operation status	When the motor relay and motor are operating	ON	BRC-75, "Inspection 5 ABS Actuator Relay or ABS Motor Relay Power System"
		When the motor relay and motor are not operating	OFF	
ABS ACTUATOR RELAY	Actuator relay operation status	When the actuator relay is operating	OFF	BRC-75, "Inspection 5 ABS Actuator Relay or ABS Motor Relay Power System"
		When the actuator relay is not operating	ON	
ABS WARNING LAMP	ABS warning lamp on condition (Note 2)	ABS warning lamp ON	ON	BRC-71, "BASIC INSPECTION 3 ABS WARNING LAMP, TCS OFF INDICATOR LAMP, SLIP INDICATOR LAMP INSPECTION"
		ABS warning lamp OFF	OFF	
OFF LAMP	TCS OFF indicator lamp on condition (Note 3)	TCS OFF indicator lamp ON	ON	BRC-71, "BASIC INSPECTION 3 ABS WARNING LAMP, TCS OFF INDICATOR LAMP, SLIP INDICATOR LAMP INSPECTION"
		TCS OFF indicator lamp OFF	OFF	
OFF SWITCH	TCS switch ON-OFF status	TCS OFF switch ON (TCS OFF indicator lamp ON)	ON	BRC-78, "TCS OFF SWITCH"
		TCS OFF switch OFF (TCS OFF indicator lamp OFF)	OFF	

Monitor item	Display Content	Data monitor		Reference: Error inspection checklist
		Condition	Reference values for normal operation	
SLIP LAMP	SLIP indicator lamp on condition (Note 4)	SLIP indicator lamp ON	ON	BRC-71, "BASIC INSPECTION 3 ABS WARNING LAMP, TCS OFF INDICATOR LAMP, SLIP INDICATOR LAMP INSPECTION"
		SLIP indicator lamp OFF	OFF	
BATTERY VOLTAGE	Battery voltage supplied to TCS/ABS control unit	Ignition switch ON	10 - 16V	BRC-74, "Inspection 4 ABS Actuator and Electric Unit (Control Unit) Power and Ground Systems"
GEAR	Determined gear shift position from the A/T PNP switch signal	Driving	1 - 5 ● Differs depending on the transmission status. (M/T vehicles are always left in 1.)	—
ENGINE SPEED	Engine running	With engine stopped	0 rpm	Engine speed signal system
		With engine running	Almost in accordance with tachometer display	
N POSITION SIGNAL	Determined gear shift position from the A/T PNP switch signal (Note 5)	N position	ON	—
		Other than N position	OFF	
P POSITION SIGNAL	Determined gear shift position from the A/T PNP switch signal (Note5)	P position	ON	—
		Other than P position	OFF	
FAIL SIGNAL	Fail signal status	During TCS fail-safe During ABS fail-safe During EBD fail-safe	ON	TCS system ABS system EBD system
ACCELERATOR POSITION SIGNAL	Open/close condition of throttle valve (linked with accelerator pedal).	Accelerator pedal not depressed (ignition switch is ON)	0 %	Communication circuit between TCS/ABS control unit and ECM
		Depress accelerator pedal (ignition switch is ON)	0 to 100 %	

Note 1: Confirm tire pressure is normal.
Note 2: ABS warning lamp ON/OFF timing
ON: For approximately 1 second after the ignition switch is turned on or when an error is detected.
OFF: Approximately 1 second after the ignition switch is turned on (when system is normal).
Note 3: TCS OFF indicator lamp ON/OFF timing
ON: For approximately 1 second after the ignition switch is turned on, when an error is detected, or when the TCS OFF switch is on.
OFF: Approximately 1 second after the ignition switch is turned on (when system is normal), when TCS OFF switch is off.
Note 4: SLIP indicator lamp ON/OFF timing
ON: For approximately 1 second after the ignition switch is turned on or when an error is detected.
OFF: Approximately 1 second after the ignition switch is turned on (when system is normal), when TCS function is not operating
Flash: When the TCS function is operating during driving.
Note 5: A/T model.

CONSULT- II Functions

AFS000YU

CONSULT-II MAIN FUNCTION

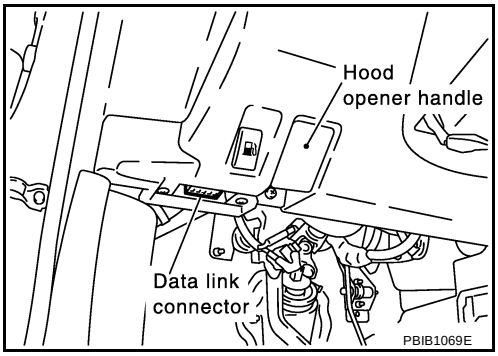
In a diagnosis function (main function), there are “SELF-DIAGNOSTIC RESULTS”, “DATA MONITOR”, “CAN DIAG SUPPORT MNTR”, “ACTIVE TEST”, “FUNCTION TEST”, “ECU PART NUMBER”.

Diagnostic test mode	Function	Reference
SELF-DIAG-NOSTIC RESULTS	Self-diagnostic results can be read and erased quickly.	BRC-63, "SELF-DIAGNOSIS"
DATA MONI-TOR	Input/Output data in the ABS actuator and electric unit (control unit) can be read.	BRC-65, "DATA MONITOR"
CAN DIAG SUPPORT MNTR	The results of transmit/receive diagnosis of communication can be read.	—
ACTIVE TEST	Diagnostic Test Mode in which CONSULT-II drives some actuators apart from the ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range.	BRC-68, "ACTIVE TEST"
FUNCTION TEST	Conducted by CONSULT-II instead of a technician to determine whether each system is “OK” or “NG”.	—
ECU PART NUMBER	ABS actuator and electric unit (control unit) part number can be read.	—

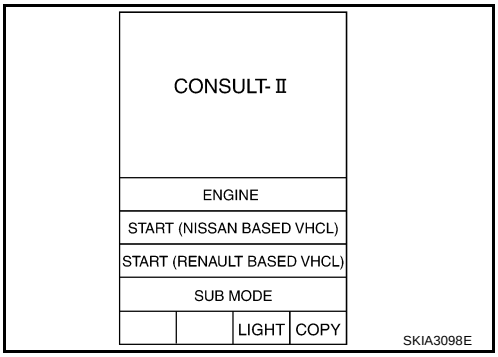
CONSULT-II BASIC OPERATION PROCEDURE

1. Turn ignition switch OFF.
2. Connect CONSULT-II and CONSULT-II CONVERTER to the data link connector.

   CAUTION:
   If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

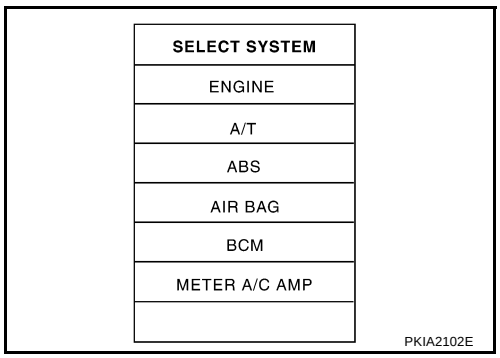


3. Turn ignition switch ON.
4. Touch “START (NISSAN BASED VHCL)”.

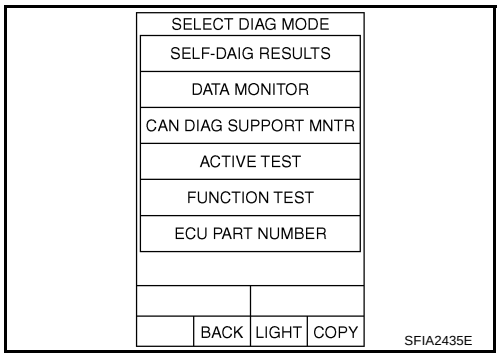


5. Touch “ABS” in the “SELECT SYSTEM” screen.

If “ABS” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



6. Select the required diagnostic location from the “SELECT SYSTEM” screen.
For further information, see the CONSULT-II Operation Manual.



SELF-DIAGNOSIS

Description

If an error is detected in the system, ABS warning lamp, TCS OFF indicator lamp and SLIP indicator lamp on the combination meter turn on. In this case, perform self-diagnosis as follows:

Operation Procedure

1. Turn ignition switch OFF.
2. Connect CONSULT-II and CONSULT-II CONVERTER to the data link connector.

   CAUTION:
   If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.
3. Turn ignition switch ON.
4. Start engine and drive at approximately 30 km/h (19 MPH) or more for approximately 1 minute.
5. After stopping the vehicle, with the engine running, touch “START (NISSAN BASED VHCL)”, “ABS”, “SELF-DIAG RESULTS” in order on the CONSULT-II screen.

   CAUTION:
   If “START (NISSAN BASED VHCL)” is touched immediately after starting the engine or turning on the ignition switch, “ABS” might not be displayed in the System Selection screen. In this case, repeat the operation from step 1.
6. The self-diagnostic results are displayed. (If necessary, the self-diagnostic results can be printed out by touching “PRINT”.)
   - When “NO FAILURE” is displayed, check the ABS warning lamp, TCS OFF indicator lamp, and SLIP indicator lamp.
7. Conduct the appropriate inspection from the display item list, and repair or replace the malfunctioning component.
8. Start engine and drive at approximately 30 km/h (19 MPH) or more for approximately 1 minute.

   CAUTION:
   - **When a wheel sensor “short-circuit” is detected, if the vehicle is not driven at 30 km/h (19 MPH) or more for at least 1 minute, the ABS warning lamp will not turn off even if everything is normal.**
9. Turn ignition switch OFF to prepare for erasing the memory.
10. Start the engine and touch “START (NISSAN BASED VHCL)”, “ABS”, “SELF-DIAG RESULTS”, “ERASE MEMORY” in order on the CONSULT-II screen to erase the error memory.
    If “ABS” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .

    CAUTION:
    If the error memory is not erased, re-conduct the operation from step 5.
11. For the final inspection, drive at approximately 30 km/h (19 MPH) or more for approximately 1 minute and confirm that the ABS warning lamp, TCS OFF indicator lamp, and SLIP indicator lamp are off.

Display Item List

Suspect Systems	Malfunction is detected when	Inspection system
RR RH SENSOR-1	When the circuit in the rear RH wheel sensor is open.	BRC-72, "Inspection 1 Wheel Sensor System"(Note 1)
RR LH SENSOR-1	When the circuit in the rear LH wheel sensor is open.	
FR RH SENSOR-1	When the circuit in the front RH wheel sensor is open.	
FR LH SENSOR-1	When the circuit in the front LH wheel sensor is open.	
FR LH SENSOR-2	When the circuit in the front LH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
RR RH SENSOR-2	When the circuit in the rear RH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
FR RH SENSOR-2	When the circuit in the front RH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
RR LH SENSOR-2	When the circuit in the rear LH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
MAIN RELAY	When the ABS actuator and electric unit (control unit) detects an error in the actuator relay system.	BRC-75, "Inspection 5 ABS Actuator Relay or ABS Motor Relay Power System"
STOP LAMP SW	When a stop lamp switch open-circuit is detected.	BRC-77, "Inspection 6 Stop Lamp Switch System"
FR LH IN ABS SOL	When the ABS actuator and electric unit (control unit) detects an error in the front left inlet solenoid system.	—
FR LH OUT ABS SOL	When the ABS actuator and electric unit (control unit) detects an error in the front left outlet solenoid system.	
RR RH IN ABS SOL	When the ABS actuator and electric unit (control unit) detects an error in the rear right inlet solenoid system.	
RR RH OUT ABS SOL	When the ABS actuator and electric unit (control unit) detects an error in the rear right outlet solenoid system.	
FR RH IN ABS SOL	When the ABS actuator and electric unit (control unit) detects an error in the front right inlet solenoid system.	
FR RH OUT ABS SOL	When the ABS actuator and electric unit (control unit) detects an error in the front right outlet solenoid system.	
RR LH IN ABS SOL	When the ABS actuator and electric unit (control unit) detects an error in the rear left inlet solenoid system.	
RR LH OUT ABS SOL	When the ABS actuator and electric unit (control unit) detects an error in the rear left outlet solenoid system.	
LOW POWER VOLTAGE	When the ABS actuator and electric unit (control unit) power voltage is lower than normal.	BRC-74, "Inspection 4 ABS Actuator and Electric Unit (Control Unit) Power and Ground Systems"
EMERGENCY BRAKE	When the ABS actuator and electric unit (control unit) malfunctions (pressure increase is too much or too little).	BRC-78, "Inspection 7 ABS Actuator and Electric Unit (Control Unit) 2"

Suspect Systems	Malfunction is detected when	Inspection system
PUMP MOTOR, MOTOR RELAY SYSTEM	When the ABS actuator and electric unit (control unit) detects an error in the motor or motor relay.	BRC-75, "Inspection 5 ABS Actuator Relay or ABS Motor Relay Power System"
ABS CONTROLLER	When there is an internal error in the ABS actuator and electric unit (control unit).	BRC-74, "Inspection 3 ABS Actuator and Electric Unit (Control Unit)"
CAN COMM CIRCUIT	When there is an error in the CAN communication system.	BRC-78, "Inspection 8 CAN Communication System" (Note 2)
ENGINE SIGNAL	When there is an error in an engine system main component	BRC-74, "Inspection 2 Engine System"

Note 1: After completing repairs of the shorted sensor circuit, when ignition switch is turned ON, ABS warning lamp turns on. Check that ABS warning lamp turns off while driving the vehicle at approximately 30 km/h (19 MPH) or more for approximately 1 minute according to self-diagnosis procedure. In addition, if wheel sensor 2 is displayed for the wheels, check the wheel sensor circuit and also check the control unit power voltage.
Note 2: When errors are detected in several systems, including the CAN communication system [U1000], troubleshoot the CAN communication system.

DATA MONITOR

Operation Procedure

1. After turning OFF the ignition switch, connect CONSULT-II and the CONVERTER to the data link connector.

   CAUTION:
   If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

2. Touch “START (NISSAN BASED VHCL)”, “ABS”, “DATA MONITOR” in order on the CONSULT-II screen. If “ABS” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .

   CAUTION:
   When “START (NISSAN BASED VHCL)” is touched immediately after starting the engine or turning on the ignition switch, “ABS” might not be displayed in the system selection screen. In this case, repeat the operation from step 2.

3. Return to the Monitor Item Selection screen, and touch“ECU INPUT SIGNALS” or “MAIN SIGNALS” or “SELECTION FROM MENU”. Refer to the following information.
4. When “START” is touched, the data monitor screen is displayed.

Display Item List

Item (Unit)	Monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
FR LH SENSOR [km/h (MPH)]	×	×	×	Wheel speed calculated by front LH wheel sensor signal is displayed.
FR RH SENSOR [(km/h (MPH)]	×	×	×	Wheel speed calculated by front RH wheel sensor signal is displayed.
RR LH SENSOR [km/h (MPH)]	×	×	×	Wheel speed calculated by Rear LH wheel sensor signal is displayed.
RR RH SENSOR [km/h (MPH)]	×	×	×	Wheel speed calculated by Rear RH wheel sensor signal is displayed.
FR LH IN SOL (ON/OFF)	–	×	×	Front left inlet ABS solenoid valve (ON/OFF) status is displayed.

Item (Unit)	Monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
FR LH OUT SOL (ON/OFF)	–	×	×	Front left outlet ABS solenoid valve (ON/OFF) status is displayed.
RR RH IN SOL (ON/OFF)	–	×	×	Rear right inlet ABS solenoid valve (ON/OFF) status is displayed.
RR RH OUT SOL (ON/OFF)	–	×	×	Rear right outlet ABS solenoid valve (ON/OFF) status is displayed.
FR RH IN SOL (ON/OFF)	–	×	×	Front right inlet ABS solenoid valve (ON/OFF) status is displayed.
FR RH OUT SOL (ON/OFF)	–	×	×	Front right outlet ABS solenoid valve (ON/OFF) status is displayed.
RR LH IN SOL (ON/OFF)	–	×	×	Rear left rear wheel inside ABS solenoid valve (ON/OFF) status is displayed.
RR LH OUT SOL (ON/OFF)	–	×	×	Rear left outlet ABS solenoid valve (ON/OFF) status is displayed.
EBD WARN LAMP (ON/OFF)	–	×	×	Brake warning lamp (ON/OFF) status is displayed.
STOP LAMP SW (ON/OFF)	×	×	×	Stop lamp switch (ON/OFF) status is displayed.
MOTOR RELAY (ON/OFF)	–	×	×	ABS motor relay (ON/OFF) condition is displayed.
ACTUATOR RLY (ON/OFF)	–	×	×	ABS actuator relay (ON/OFF) status is displayed.
ABS WARN LAMP (ON/OFF)	–	×	×	ABS warning lamp (ON/OFF) status is displayed.
OFF LAMP (ON/OFF)	–	×	×	TCS OFF indicator lamp (ON/OFF) status is displayed.
OFF SW (ON/OFF)	×	×	×	TCS OFF switch (ON/OFF) status is displayed.
SLIP LAMP (ON/OFF)	–	×	×	SLIP indicator lamp (ON/OFF) status is displayed.
BATTERY VOLT (V)	×	×	×	The voltage supplied to the ABS actuator and electric unit (control unit) is displayed.
GEAR (Note1)	×	×	×	The gear position determined from the A/T PNP switch signal is displayed.
ENGINE SPEED (rpm) (Note2)	×	×	×	Engine speed status determined from the CAN communication signal is displayed.
N POSI SIG (ON/OFF) (Note1)	–	–	×	Shift position determined from the A/T PNP switch signal is displayed.
P POSI SIG (ON/OFF) (Note1)	–	–	×	Shift position determined from the A/T PNP switch signal is displayed.

Item (Unit)	Monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
ACCEL POS SIG (%)	×	–	×	Throttle position status determined from the CAN communication signal is displayed.
EBD SIGNAL (ON/OFF)	–	–	×	EBD operation (ON/OFF) status is displayed.
ABS SIGNAL (ON/OFF)	–	–	×	ABS operation (ON/OFF) status is displayed.
TCS SIGNAL (ON/OFF) (Note2)	–	–	×	TCS operation (ON/OFF) status is displayed.
EBD FAIL SIG (ON/OFF)	–	–	×	EBD fail-safe signal (ON/OFF) status is displayed.
ABS FAIL SIG (ON/OFF)	–	–	×	ABS fail-safe signal (ON/OFF) status is displayed.
TCS FAIL SIG (ON/OFF) (Note2)	–	–	×	TCS fail-safe signal (ON/OFF) status is displayed.
CRANKING SIG (ON/OFF) (Note2)	–	–	×	Ignition switch START position signal input status is displayed.
ASCD SIGNAL (ON/OFF)	–	–	×	ASCD (ON/OFF) status is displayed.

×: Applicable
–: Not applicable
(Note1): A/T model.

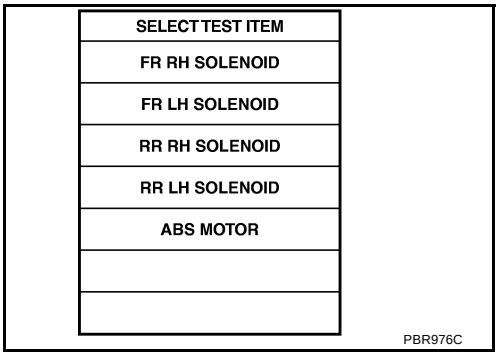
ACTIVE TEST

CAUTION:

- **Do not perform active test while driving.**
- **Make sure to completely bleed air from the brake system.**
- **The ABS and brake warning lamps turn on during the active test.**

Operation Procedure

1. Connect the CONSULT-II and CONVERTER to the data link connector and start the engine.
   CAUTION:
   If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.
2. Touch “START (NISSAN BASED VHCL) ” on the display screen.
3. Touch “ABS”.
   If “ABS” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .
4. Touch “ACTIVE TEST”.
5. The test item selection screen is displayed.
6. Touch necessary test item.



7. With the “MAIN SIGNALS” display shown in reverse, touch “START”.
8. The Active Test screen will be displayed, so conduct the following test.

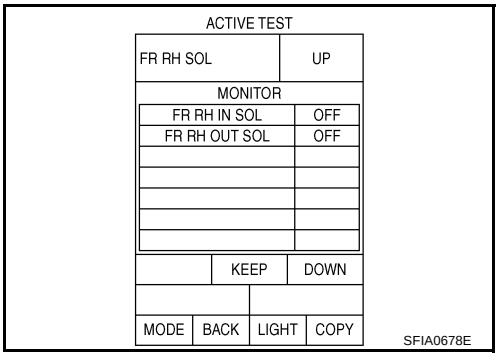
Test Item

Solenoid valve

CAUTION:

The example shown is for the front right wheel. The procedure for the other wheels is the same as given below.

1. For ABS solenoid valve, touch “UP”, “KEEP”, and “DOWN”.Then use screen monitor to check that solenoid valve operates as shown in Solenoid Valve Operation Chart. Refer to “Solenoid Valve Operation Chart”.



Operation		ABS solenoid valve		
		UP	KEEP	DOWN
Front RH ABS S/V	ABS inlet S/VAR-FR	OFF	ON	ON
	ABS outlet S/VAR-FR	OFF	OFF	ON*
Front LH ABS S/V	ABS inlet S/VAL-FL	OFF	ON	ON
	ABS outlet S/VAL-FL	OFF	OFF	ON*

Operation		ABS solenoid valve		
		UP	KEEP	DOWN
Rear OH ABS S/V	ABS inlet S/VAR-RR	OFF	ON	ON
	ABS outlet S/V-RR	OFF	OFF	ON*
Rear LH ABS S/V	ABS inlet S/V-RL	OFF	ON	ON
	ABS outlet S/V-RL	OFF	OFF	ON*

*: ON for 1 to 2 seconds after the touch, and then OFF

NOTE:

- When the active test is conducted while depressing the pedal, the pedal depression amount will change, but this is normal.
- Approximately 10 seconds after the operation is begun, “TEST STOP” will be displayed.
- To conduct a retest after “TEST STOP” is displayed, touch “BACK” and conduct the from the step 6.

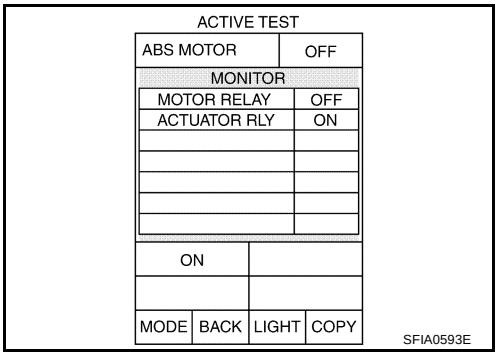
ABS Motor

Touch “ON”, “OFF” on the display screen and make sure the ABS motor relay is operating as shown in the table below.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON

NOTE:

- When the active test is conducted while depressing the pedal, the pedal depression amount will change, but this is normal.
- Approximately 10 seconds after the operation is begun, “TEST STOP” will be displayed.



Correct and Quick Diagnosis

AFS000YW

DIAGNOSIS PRECAUTIONS

- Before performing the trouble diagnosis, always read the general information (GI) to confirm the general precautions. Refer to GI-4, "General Precautions" .
- After completing service, always erase the self-diagnosis results. Refer to BRC-61, "CONSULT- II Functions" .
- When inspection of the continuity or voltage between units is performed, check connector terminals for disconnection, looseness, bend, or collapse. If any non-standard condition is detected, repair or replace applicable part.
- Intermittent errors may be caused by a poor connection in the harness, connector, or terminal. Move harnesses, harness connectors, or terminals by hand to make sure all connections are solid and undamaged.
- If a circuit tester is used for the check, be careful not to forcibly extend any connector terminal.
- TCS/ABS is a system that uses electronic control to perform brake control and engine power control. Therefore, phenomena like those shown in the following table may occur, but this is because the system is working normally.

Symptom	Symptom description	Result
Motor operation noise	This is the sound of the motor operating inside ABS actuator and electric unit (control unit), and there may be some low sounds while TCS or ABS is operating.	Normal
	Just after the engine starts, the motor operating noise may be heard. This is a normal status of the system operation check.	
System operation check noise	When the engine is started, you may barely be able to hear a slight thudding sound from the engine room, but this sound is made by the system operation check and is normal.	Normal
TCS operation (SLIP indicator lamp ON)	TCS may be activated any time the vehicle suddenly accelerates, suddenly downshifts, or is driven on a road with a varying surface friction coefficient.	Normal When conducting the inspection on a chassis dynamometer, cancel the TCS function.
	When inspecting the speedometer, etc., press TCS OFF switch to turn off TCS function before conducting the work.	
	When accelerator pedal is depressed on a chassis dynamometer (front wheel fixing type), the vehicle speed will not increase. This is normal, because TCS is activated by the stationary front wheels. The warning lamp may also turn on to show “sensor system error” in this case. This is not a malfunction either, because the stationary front wheels are detected. Restart engine, and drive the vehicle at 30 km/h (19 MPH) or more or higher to check that the warning lamp no longer turns on.	
ABS operation (longer stopping distance)	Stopping distance may be longer for vehicles with ABS when the vehicle drives on rough or snow-covered roads. Use lower speeds when driving on these kinds of roads.	Normal
Sluggish feel	Depending on road circumstances, the driver may have a sluggish feel. This is normal, because under TCS operation optimum traction has the highest priority (safety first). Sometimes the driver has a slight sluggish feel in response to substantial accelerator pedal operation.	Normal

ABS Warning Lamp, TCS OFF Indicator Lamp, SLIP Indicator Lamp On/Off Timing

×: ON –: OFF

Condition	ABS warning lamp	TCS OFF indicator lamp	SLIP indicator lamp	Remarks
Ignition switch OFF	–	–	–	—
For approximately “1” second after ignition switch ON	×	×	×	—
After approximately “1” second after ignition switch ON (When system is normal)	–	–	–	Turns off 2 second after engine start
When the TCS OFF switch is turned on (TCS function off)	–	×	–	—

Condition	ABS warning lamp	TCS OFF indicator lamp	SLIP indicator lamp	Remarks
TCS/ABS error	×	×	×	—
	×	×	–	When there is an ABS actuator and electric unit (control unit) error (power or ground error)
TCS error	–	×	×	—

Basic Inspection

AFS000YX

BASIC INSPECTION 1 BRAKE FLUID AMOUNT, LEAKS, AND BRAKE PADS INSPECTION

1. Check fluid level in the brake reservoir tank. If fluid level is low, refill the brake fluid.
2. Check the brake piping and around the ABS actuator and electric unit (control unit) for leaks. If there is leaking or oozing fluid, check the following items.
   - If ABS actuator and electric unit (control unit) connection is loose, tighten the piping to the specified torque and re-conduct the leak inspection to make sure there are no leaks.
   - If there is damage to the connection flare nut or ABS actuator and electric unit (control unit) screw, replace the damaged part and re-conduct the leak inspection to make sure there are no leaks.
   - When there is fluid leaking or oozing from a part other than ABS actuator and electric unit (control unit) connection, if the fluid is just oozing out, use a clean cloth to wipe off the oozing fluid and re-check for leaks. If fluid is still oozing out, replace the damaged part.
   - When there is fluid leaking or oozing at ABS actuator and electric unit (control unit), if the fluid is just oozing out, use a clean cloth to wipe off the oozing fluid and re-check for leaks. If fluid is still oozing out, replace the ABS actuator and electric unit (control unit) body.

     CAUTION:
     ABS actuator body cannot be disassembled.
3. Check the brake pad degree of wear. Refer to BR-26, "Removal and Installation of Brake Pad" or BR-32, "Removal and Installation of Brake Pad" in “Front Disc Brake” and BR-39, "Removal and Installation of Brake Pad" or BR-45, "Removal and Installation of Brake Pad" in “Rear Disc Brake”.

BASIC INSPECTION 2 POWER SYSTEM TERMINAL LOOSENESS AND BATTERY INSPECTION

Make sure the battery positive cable, negative cable and ground connection are not loose. In addition, check the battery voltage to make sure it has not dropped.

BASIC INSPECTION 3 ABS WARNING LAMP, TCS OFF INDICATOR LAMP, SLIP INDICATOR LAMP INSPECTION

1. Make sure ABS warning lamp, TCS OFF indicator lamp (when TCS OFF switch is OFF), and SLIP indicator lamp turns ON approximately 1 second when the ignition switch is turned ON. If they do not, check the TCS OFF indicator lamp and then TCS OFF switch. Refer to BRC-78, "TCS OFF SWITCH" . Check CAN communications. Refer to “CAN Communication Inspection”. If there are no errors with TCS OFF switch and CAN communication system, check combination meter. Refer to DI-4, "COMBINATION METERS" .
2. Make sure the lamp turns off approximately 1 second after the ignition switch is turned on. If the lamp does not turn off, conduct self-diagnosis.
3. With the engine running, make sure TCS OFF indicator lamp turns on and off when TCS OFF switch is turned on and off. If the indicator lamp status does not correspond to switch operation, check the TCS OFF switch system. Refer to BRC-78, "TCS OFF SWITCH" .
4. Make sure ABS warning lamp, TCS OFF indicator lamp, and SLIP indicator lamp turn off 2 seconds after the engine is started. If ABS warning lamp, TCS OFF indicator lamp, and SLIP indicator lamp have not turned off 10 seconds after the engine has been started, conduct self-diagnosis of the ABS actuator and electric unit.
5. After conducting the self-diagnosis, be sure to erase the error memory. Refer to BRC-61, "CONSULT- II Functions"

Inspection 1 Wheel Sensor System

AFS000YY

INSPECTION PROCEDURE

After using the CONSULT-II SELF-DIAG RESULTS to determine the location of the malfunctioning wheel sensor, check all areas to determine the component to be replaced.

CAUTION:

- **Do not measure the resistance value and also voltage between the sensor terminal with tester etc., because the sensor is an active sensor.**
- **Do not expand the terminal of the connector with a/the tester terminal stick, when it does the inspection with the tester.**

1. TIRE INSPECTION

Check air pressure, wear, and size.

Are the air pressure, wear, and size within the standard values?

YES >> GO TO 2.
NO >> Adjust air pressure, or replace tire.

2. SENSOR AND SENSOR ROTOR INSPECTION

- Check the condition of the sensor mount (for looseness, etc.).
- Check the surface of the front sensor rotor rubber for damage.
- Check the rear sensor rotor for damage.

OK or NG

OK >> GO TO 3.
NG >> Repair the sensor mount or replace the sensor rotor.

3. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
FR RH SENSOR -1, -2
FR LH SENSOR-1, - 2
RR RH SENSOR-1, -2
RR LH SENSOR-1, -2

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 4.
NO >> Inspection End

4. CONNECTOR INSPECTION

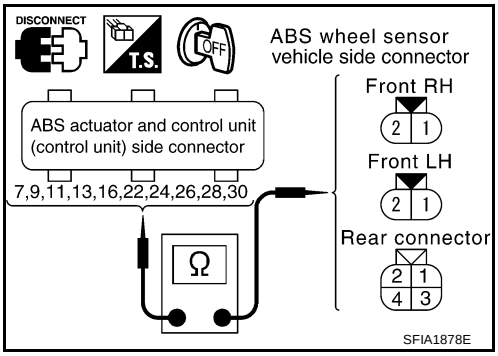
1. Disconnect TCS/ABS control unit connector and the malfunctioning wheel sensor connector E42 (FR - LH) or E27 (FR - RH) or T5 (RR - RH, LH). Check the terminal to see if it is deformed, disconnected, loose, etc., and replace it if any non-standard condition is found.
2. Reconnect the connector, drive at a speed of approximately 30 km/h (19 MPH) or more for approximately 1 minute, and conduct self-diagnosis.

OK or NG

OK >> The connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 5.

5. WHEEL SENSOR HARNESS INSPECTION

1. Turn ignition switch OFF and disconnect the wheel sensor connector E42 (FR - LH) or E27 (FR - RH) or T5 (RR - RH, LH) and ABS actuator and electric unit (control unit) connector.
2. Check the continuity between terminals. (Also check the continuity when the steering wheel is turned right and left and when the sensor harness inside the wheel well is moved.)



	Power system		Signal system		Ground system	
Wheel	ABS actuator and electric unit (control unit) (harness connector E51)	Wheel sensor (harness connector)	ABS actuator and electric unit (control unit) (harness connector E51)	Wheel sensor (harness connector)	ABS actuator and electric unit (control unit) (Signal) (harness connector E51)	ABS actuator and electric unit (control unit) (GND) (harness connector E51)
Front RH	24 (B/R)	1 (B/R)	9 (LG/B)	2 (LG/B)	9 (LG/B), 24 (B/R)	16 (B), 30(B)
Front LH	22 (G)	1 (G)	7 (G/Y)	2 (G/Y)	7 (G/Y), 22 (G)	16(B), 30(B)
Rear RH	28 (BR)	1 (BR/W)	13 (BR/W)	2 (BR)	13 (BR/W), 28 (BR)	16 (B), 30(B)
Rear LH	26 (OR)	3 (OR)	11(P)	4 (P)	11 (P), 26 (OR)	16 (B), 30(B)

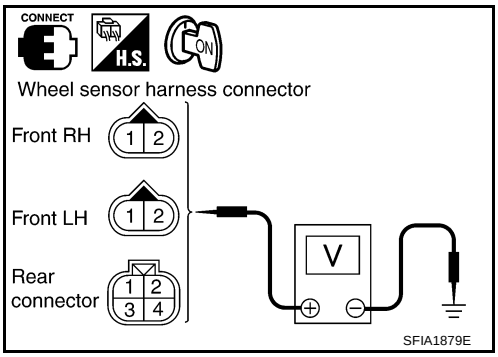
Power system : Continuity should exist.
Signal system : Continuity should exist.
Ground system : Continuity should not exist.

OK or NG

OK >> GO TO 6.
NG >> Repair harness and connector between control unit and wheel sensor.

6. WHEEL SENSOR POWER CIRCUIT INSPECTION

1. Connect the wheel sensor connector E42 (FR - LH) or E27 (FR - RH) or T5 (RR - RH, LH) and ABS actuator and electric unit (control unit) connector.
2. Turn on the ignition switch ON and check the voltage between the power terminal and the ground.



Voltage		
Front RH	**1 (B/R) - Ground**	**: 8V or more**
Front LH	**1 (G) - Ground**	**: 8V or more**
Rear RH	**1 (BR/W) - Ground**	**: 8V or more**
Rear LH	**3 (OR) - Ground**	**: 8V or more**

OK or NG

OK >> Replace wheel sensor.
NG >> Replace the control unit.

Inspection 2 Engine System

AFS000YZ

INSPECTION PROCEDURE

1. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
ENGINE SIGNAL 1
ENGINE SIGNAL 2
ENGINE SIGNAL 3
ENGINE SIGNAL 4
ENGINE SIGNAL 5
ENGINE SIGNAL 6

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> Inspection End

2. ENGINE SYSTEM INSPECTION

1. Conduct an ECM self-diagnosis and repair or replace any non-standard items. Re-conduct ECM self-diagnosis.
2. Re-conduct ABS actuator and electric unit (control unit) self-diagnosis.

OK or NG

OK >> Inspection End
NG >> Repair or replace any non-standard items. Re-conduct the self-diagnosis.

Inspection 3 ABS Actuator and Electric Unit (Control Unit)

AFS000Z0

INSPECTION PROCEDURE

1. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
ABS CONTROLLER

Is the above displayed in the self-diagnosis display items?

YES >> Replace ABS actuator and electric unit (control unit). Re-conduct the self-diagnosis.
NO >> Inspection End

Inspection 4 ABS Actuator and Electric Unit (Control Unit) Power and Ground Systems

AFS000Z1

INSPECTION PROCEDURE

1. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
LOW BATTERY VOLTAGE

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> Inspection End

2. CONNECTOR INSPECTION

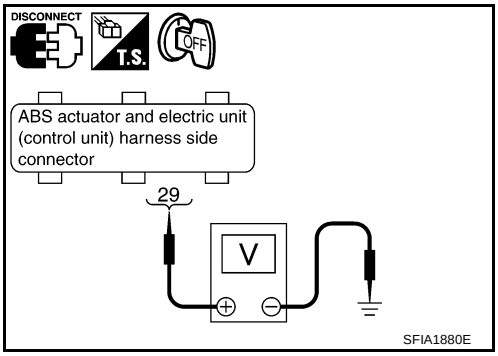
1. Disconnect the ABS actuator and electric unit (control unit) connector, check the terminal to see if it is deformed, disconnected, loose, etc., and if there is an error, repair or replace the terminal.
2. Securely reconnect the connector and conduct self-diagnosis.

OK or NG

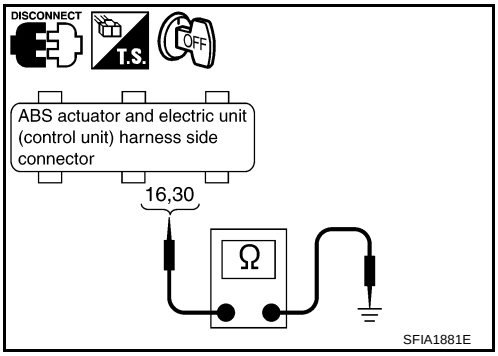
OK >> The connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 3.

3. ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER AND GROUND CIRCUIT INSPECTION

Disconnect ABS actuator and electric unit connector. Check continuity and voltage between connector terminals and ground.



Terminal number	Signal name	Measuring condition	Measured value
29 (G/R)	Power supply	Ignition switch ON	Battery voltage (approx. 12V)
		Ignition switch OFF	Approx. 0V



Terminal number	Signal name	Measuring condition	Measured value
30 (B), 16 (B)	Ground	Ignition switch OFF	Continuity should exist.

OK or NG

OK >> Check battery (terminal looseness, power drop, etc.) Error. If there is an error, make repairs.
NG >> Corresponding harness circuit error. Repair the circuit.

Inspection 5 ABS Actuator Relay or ABS Motor Relay Power System

AFS000Z2

INSPECTION PROCEDURE

1. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Is the above displayed in the self-diagnosis item?

YES >> GO TO 2.
NO >> Inspection End

2. CONNECTOR INSPECTION

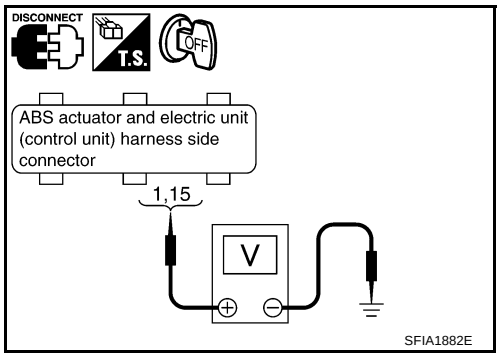
1. Disconnect the ABS actuator and electric unit (control unit) connector, check the terminal to see if it is deformed, disconnected, loose, etc., and if there is an error, repair or replace the terminal.
2. Securely reconnect the connector and conduct self-diagnosis.

OK or NG

OK >> The connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 3.

3. ABS ACTUATOR RELAY OR ABS MOTOR RELAY POWER CIRCUIT INSPECTION

1. Disconnect the ABS actuator and electric unit (control unit) connector.
2. For the ABS actuator relay, measure the voltage between the connector terminal 1 (SB) and the ground. For the ABS motor relay, measure the voltage between the connector terminal 15 (R/B) and the ground.



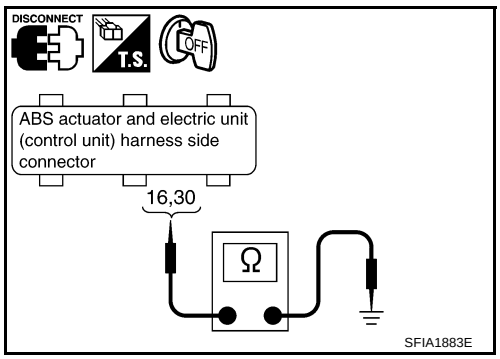
ABS actuator and electric unit (control unit) (Harness connector)	Ground	Voltage
1 (SB)	—	Battery voltage (approx. 12V)
15 (R/B)	—	Battery voltage (approx. 12V)

OK or NG

OK >> GO TO 4
NG >> Error in the circuit between the battery and the ABS actuator and electric unit (control unit). Repair the circuit.

4. ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT INSPECTION

Check the ABS actuator and electric unit (control unit) ground circuit.



ABS actuator and electric unit (control unit) (Harness connector)	Ground	Continuity
16 (B) 30 (B)	—	Continuity should exist.

OK or NG

OK >> Replace the ABS actuator and electric unit (control unit).
NG >> Open or short in harness. Repair or replace the harness.

Inspection 6 Stop Lamp Switch System

AFS000Z3

INSPECTION PROCEDURE

1. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
STOP LAMP SW

Is the above displayed in the self-diagnosis display item?

YES >> GO TO 2.
NO >> Inspection End

2. CONNECTOR INSPECTION

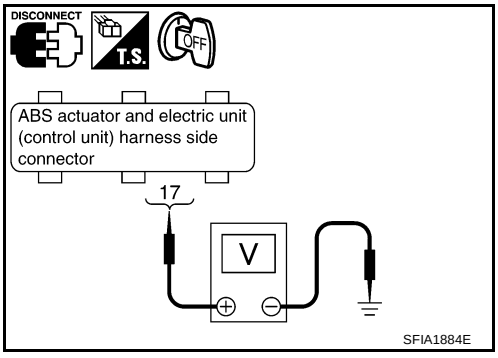
1. Disconnect the ABS actuator and electric unit (control unit) connector and stop lamp switch connector E112 (M/T model) or E111 (A/T model), check the terminal for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connector and conduct self-diagnosis.
3. Start engine
4. Repeat pumping brake pedal carefully several time, then perform self-diagnosis again

OK or NG

OK >> The connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 3.

3. STOP LAMP SWITCH CIRCUIT INSPECTION

1. Turn off the ignition switch and disconnect ABS actuator and electric unit (control unit) connector.
2. Check the voltage between the ABS actuator and electric unit (control unit) connector terminal and the ground.



ABS actuator and electric unit (control unit) (Harness connector)	Ground	Measuring condition	Voltage
17 (P/L)	–	Brake pedal depressed	Battery voltage (approx. 12V)
		Brake pedal not depressed	0V

OK or NG

OK >> Inspection End
NG >> Open or short in harness between the ABS actuator and electric unit (control unit) and the stop lamp switch. Repair or replace the harness.

Inspection 7 ABS Actuator and Electric Unit (Control Unit) 2

AFS000Z4

INSPECTION PROCEDURE

1. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
EMERGENCY BRAKE

When any item other than “emergency brake” is indicated in self-diagnosis display, follow the instructions below.

CAUTION:

“Emergency brake” is indicated when control unit itself is detected as an error. If this display item is indicated, replace control unit.

Is the above displayed in the self-diagnosis display items?

YES >> Replace the ABS actuator and electric unit (control unit).
NO >> Inspection End

Inspection 8 CAN Communication System

AFS000Z5

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn ignition switch OFF, disconnect the ABS actuator and electric unit (control unit) connector, and check the terminal for deformation, disconnection, looseness, and so on. If there is a malfunction, repair or replace the terminal.
2. Reconnect connector to perform self-diagnosis.

Is “CAN COMM CIRCUIT” displayed in the self-diagnosis display items?

YES >> Print out the self-diagnostic results, and refer to LAN-3, "Precautions When Using CONSULT-II" .
NO >> Connector terminal connection is loose, damaged, open, or shorted.

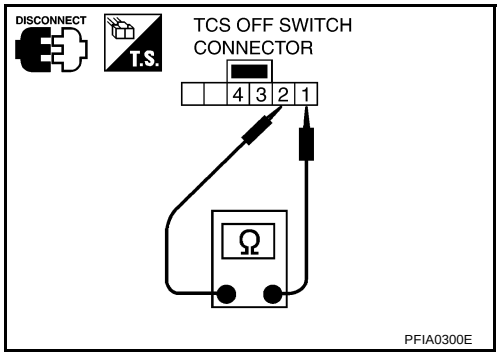
Component Inspection

AFS000Z6

TCS OFF SWITCH

- Turn ignition switch OFF, disconnect the TCS OFF switch connector M9, and check the continuity between terminals 1 and 2.

1 - 2 : Continuity should exist when pushing the switch.
: Continuity should not exist when releasing the switch.



Symptom 1 Excessive ABS Function Operation Frequency

AFS000Z7

1. INSPECTION START

Check brake force distribution.

OK or NG

OK >> GO TO 2.
NG >> Check brake system.

2. FRONT AND REAR AXLE INSPECTION

Make sure there is no excessive play in the front and rear axles.

OK or NG

OK >> GO TO 3.
NG >> Repair.

3. WHEEL SENSOR INSPECTION

Wheel Sensor Inspection

- Sensor mount and damage inspection
- Sensor rotor mount and damage inspection
- Sensor connector connection inspection
- Sensor harness inspection

OK or NG

OK >> GO TO 4.
NG >> Sensor or sensor rotor replacement

4. ABS WARNING LAMP DISPLAY CHECK

Make sure the warning lamp turns off approximately 1 second after the ignition switch is turned on or when driving.

OK or NG

OK >> Normal
NG >> Perform self-diagnosis. Refer to BRC-63, "SELF-DIAGNOSIS" .

Symptom 2 Unexpected Pedal Reaction

AFS000Z8

1. BRAKE PEDAL STROKE INSPECTION

Check brake pedal stroke.

Is the stroke too big?

YES >>
- Bleed air from the brake piping.
- Check the brake pedal, brake booster, and master cylinder mount for play, looseness, and brake system for fluid leaks, etc. If any malfunctions are found, make repairs.

NO >> GO TO 2.

2. PERFORMANCE CHECK

Disconnect the ABS actuator and electric unit (control unit) connector, and make sure the braking force is sufficient when the ABS is not operating. After the inspection, reconnect the connector.

OK or NG

OK >> GO TO 3.WHEEL SENSOR INSPECTION in BRC-78, "Symptom 1 Excessive ABS Function Operation Frequency" .
NG >> Check brake system.

Symptom 3 The Braking Distance Is Long

AFS000Z9

CAUTION:
On slippery road surfaces, the stopping distance might be longer with the ABS operating than when the ABS is not operating.

1. PERFORMANCE CHECK

Disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. In this condition, check stopping distance. After inspection, connect connector.

OK or NG

OK >> ● Bleed air from the brake piping.
● Check brake system.

NG >> GO TO 3.WHEEL SENSOR INSPECTION in BRC-78, "Symptom 1 Excessive ABS Function Operation Frequency" .

Symptom 4 The ABS Function Does Not Operate

AFS000ZA

CAUTION:
The ABS does not operate when the speed is 10 km/h (6 MPH) or less.

1. ABS WARNING LAMP DISPLAY CHECK

Make sure the warning lamp turns off approximately 1 second after the ignition switch is turned on or when driving.

OK or NG

OK >> GO TO 3.WHEEL SENSOR INSPECTION in BRC-78, "Symptom 1 Excessive ABS Function Operation Frequency" .
NG >> Perform self-diagnosis. Refer to BRC-61, "CONSULT- II Functions" .

Symptom 5 Pedal Vibration or ABS Operation Sound Occurs

AFS000ZB

CAUTION:
Under the following conditions, when brake pedal is lightly depressed (just place a foot on it), ABS is activated and vibration is felt. However, this is normal.

- **When shifting gears**
- **When driving on slippery road**
- **During cornering at high speed**
- **When passing over bumps or grooves [50 mm (1.97 in) or more]**
- **When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher]**

1. SYMPTOM CHECK 1

Check if pedal vibration or operation sound occurs when the engine is started.

OK or NG

OK >> GO TO 2.
NG >> Perform self-diagnosis. Refer to BRC-63, "SELF-DIAGNOSIS" .

2. SYMPTOM CHECK 2

Check the symptom when electrical component (headlamps, etc.) Switches are operated.

Does the symptom occur when the electrical component (head lamp, etc.) Switches are operated?

YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit (or its wiring), and if there is, move it farther away.
NO >> GO TO 3.WHEEL SENSOR INSPECTION in BRC-78, "Symptom 1 Excessive ABS Function Operation Frequency"

Symptom 6 The Vehicle Jerks Around During TCS/ABS Control

AFS000ZC

1. ENGINE SPEED SIGNAL INSPECTION

Conduct CONSULT-II ABS actuator and electric unit (control unit) “Data Monitor”.

Is the speed during idling 400 rpm or higher?

YES >> GO TO 3.
NO >> GO TO 2.

2. ECM SELF-DIAGNOSIS RESULT ITEM CHECK

Perform ECM self-diagnosis.

Are self-diagnosis items displayed?

YES >> Check the corresponding items. Refer to EC-72, "TROUBLE DIAGNOSIS" in “Engine Control (EC section)”.
NO >> GO TO 3.

3. SYMPTOM CHECK 1

Check if the vehicle jerks during TCS/ABS control.

OK or NG

OK >> Inspection End
NG >> GO TO 4.

4. A/T SELF-DIAGNOSIS RESULT ITEM CHECK

Perform A/T self-diagnosis.

OK or NG

OK >> GO TO 5.
NG >> Check the corresponding items. Refer toAT-41, "TROUBLE DIAGNOSIS" in “A/T”.

5. SYMPTOM CHECK 2

Check if the vehicle jerks during TCS/ABS control.

OK or NG

OK >> Inspection End
NG >> GO TO 6.

6. SELF-DIAGNOSIS RESULT ITEM INSPECTION 1

Conduct self-diagnosis of the ABS actuator and electric unit (control unit).

Are self-diagnosis items displayed?

YES >> Check the corresponding items, make repairs, and re-conduct the ABS actuator and electric unit (control unit) self-diagnosis.
NO >> GO TO 7.

7. CONNECTOR INSPECTION

1. Disconnect the ABS actuator and electric unit (control unit) connector and the ECM connectors, check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the connector.
2. Securely reconnect the connector and conduct self-diagnosis.

OK or NG

OK >> If the connector terminal contact is loose, damaged, open or shorted, repair or replace the connector terminal.
NG >> GO TO 8.

8. SELF-DIAGNOSIS RESULT ITEM INSPECTION 2

Re-conduct the ABS actuator and electric unit (control unit) self-diagnosis.

Are self-diagnosis items displayed?

YES >> Repair or replace any non-standard items.
NO >> GO TO 9.

9. INSPECTION OF CIRCUIT BETWEEN ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) AND THE ECM

Check the CAN communication system. Refer to BRC-78, "Inspection 8 CAN Communication System" .

OK or NG

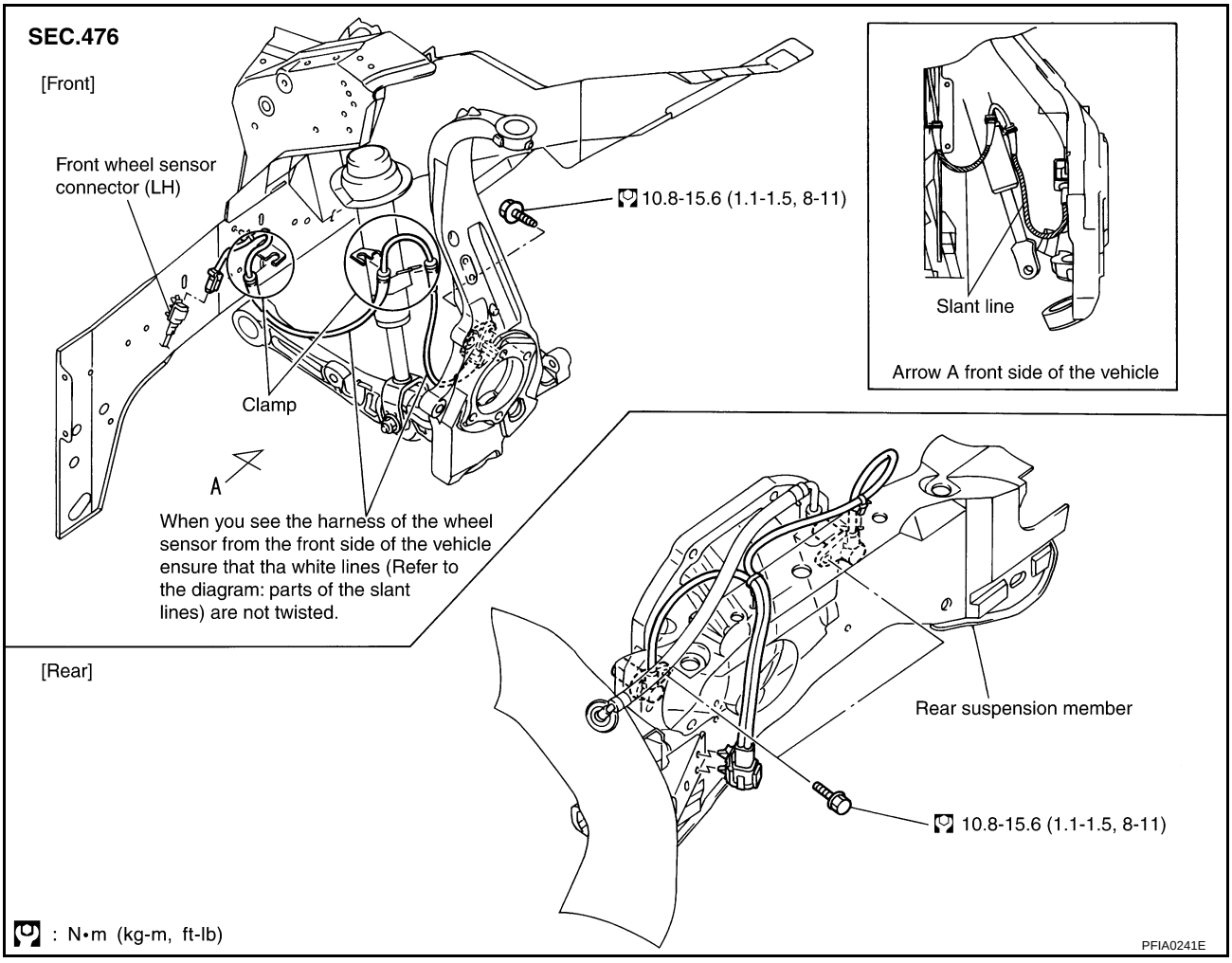
OK >> Inspection End
NG >> Connect the connector and re-conduct the ABS actuator and electric unit (control unit) self-diagnosis.

WHEEL SENSORS

PFP:47910

Removal and Installation

AFS000A9



REMOVAL

Pay attention to the following when removing sensor.

CAUTION:

- **As much as possible, avoid rotating sensor when removing it. Pull sensors out without pulling on sensor harness.**
- **Take care to avoid damaging sensor edges or rotor teeth. Remove wheel sensor first before removing front or rear wheel hub. This is to avoid damage to sensor wiring and loss of sensor function.**

INSTALLATION

Pay attention to the following when installing sensor. Tighten installation bolts and nuts to specified torques.

- When installing, check that there is no foreign material such as iron chips on pick-up and mounting hole of the sensor. Check that no foreign material has been caught in the sensor rotor motor. Remove any foreign material and clean the mount.
- When installing front sensor, be sure to press rubber grommets in until they lock at the three locations shown in diagram (2 at shock absorbers and 1 at body panel). When installed, harness must not be twisted. White line on harness (shaded part) must be visible from front.

SENSOR ROTOR

PFP:47970

Removal and Installation

AFS0011V

REMOVAL

Front

Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-4, "Removal and Installation" in “Front Axle/Drive Shaft” in “FAX” section.

Rear

- Follow procedure below to remove rear sensor rotor.
  - Remove side flange. Refer to RFD-8, "SIDE OIL SEAL" in “Rear Final Drive” in “RFD” section.
  - Using a bearing replacer (special service tool) and puller (commercial service tool), remove sensor rotor from the side flange.

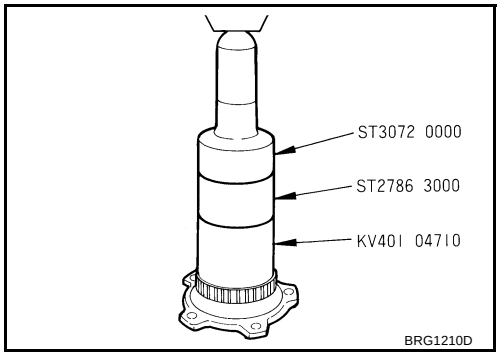
INSTALLATION

Front

Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-4, "Removal and Installation" in “Front Axle/Drive Shaft” in “FAX” section.

Rear

- Follow procedure below to install rear sensor rotor.
  - Using a drift (special service tool), press rear sensor rotor onto the side flange.
  - Install side flange. Refer to RFD-8, "SIDE OIL SEAL" in “Rear Final Drive” in “RFD” section.

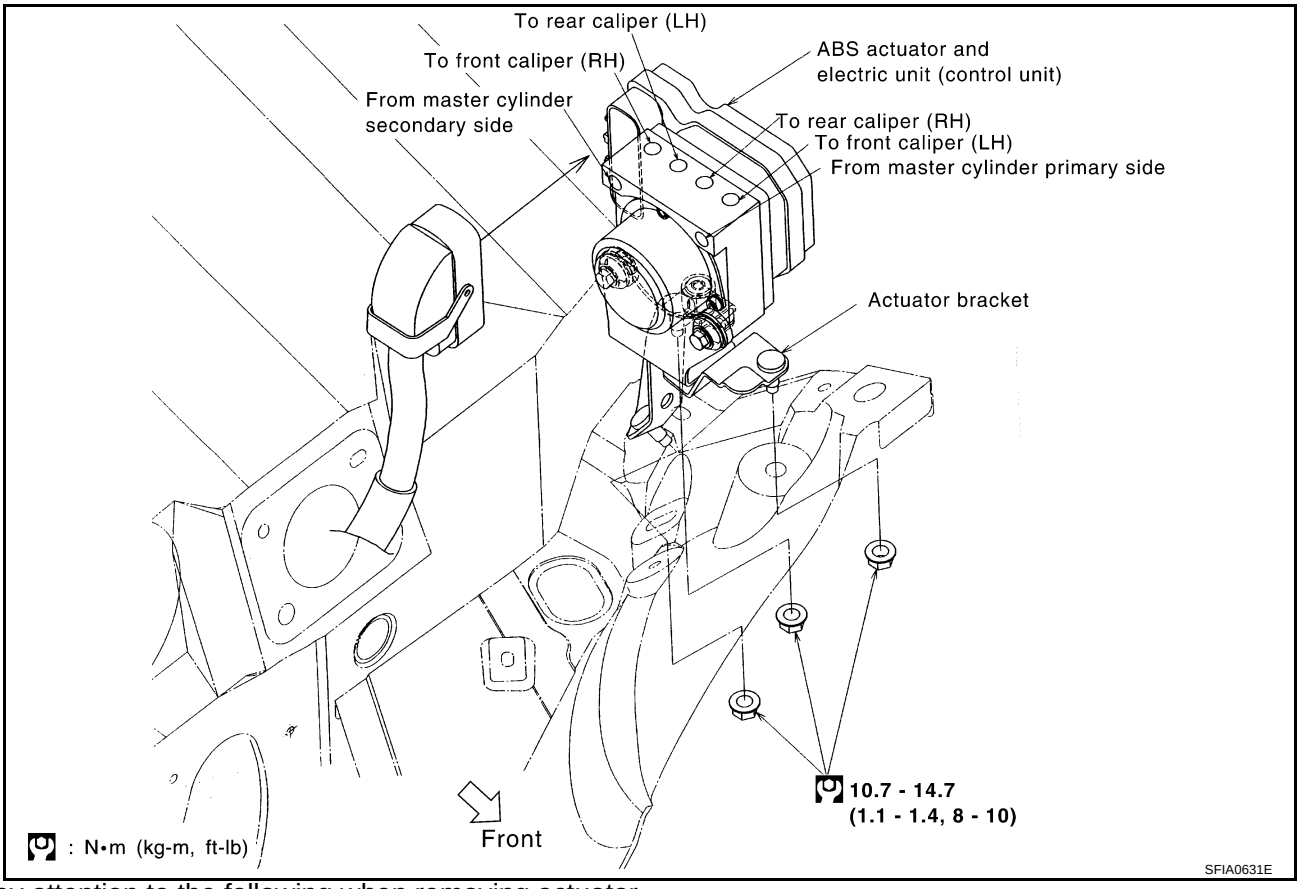


ABS ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

PFP:47660

Removal and Installation

AFS000AB



Pay attention to the following when removing actuator.

CAUTION:

- **Before servicing, disconnect battery cables.**
- **To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut wrench (commercial service tool).**
- **Do not remove and install actuator by holding harness.**
- **After work is completed, bleed air from brake piping. Refer toBR-10, "Bleeding Brake System" .**
- **Be sure to securely connect the ground cable.**

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

AFS00275

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

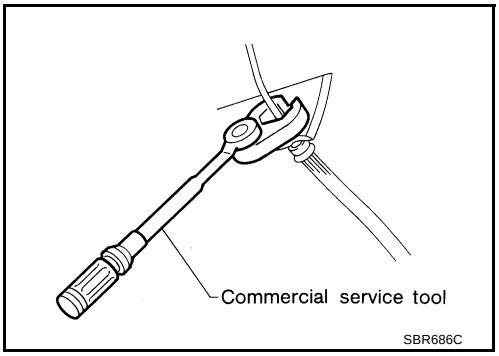
AFS00276

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Brake System

AFS000AD

- Recommended fluid is brake fluid “DOT 3”.
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas such as body. If brake fluid is splashed, wipe it off and flush area with water immediately.
- Never use mineral oils such as gasoline or kerosene to clean. They will ruin rubber parts and cause improper operation.
- Using a flare nut torque wrench, securely tighten brake tube flare nuts.
- Brake system is an important safety part. If a brake fluid leak is detected, always disassemble the affected part. If a malfunction is detected, replace part with a new one.
- Before working, turn ignition switch OFF and disconnect electrical connectors of VDC/TCS/ABS control unit or battery negative terminal.
- When installing brake piping, be sure to check torque.



Precautions for Brake Control

AFS000AE

- During ABS operation, brake pedal lightly vibrates and a mechanical noise may be heard. This is normal.
- Just after starting vehicle after ignition switch ON, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without ABS when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.
- When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for simple causes before starting diagnostic servicing. Besides electrical system inspection, check booster operation, brake fluid level, and oil leaks.
- If tire size and type are used in an improper combination, or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- If there is a radio, antenna, or antenna lead-in wire (including wiring) near control module, ABS function may have a malfunction or error.
- If aftermarket parts (car stereo, CD player, etc.) Have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.
- If the following components are replaced with non-genuine components or converted, the VDC OFF indicator lamp and SLIP indicator lamp may turn on or the VDC system may not operate properly. Components related to suspension (Shock Absorber, Strut, Spring, Bush, etc.), Tires, wheels (exclude specified size), components related to brake (Pad, Rotor, Caliper, etc.), Components related to engine (Muffler, ECM, etc.), Components related to body reinforcement (Roll bar, Tower bar, etc.).
- Driving in the condition of breakage or excessive wear of the suspension, tires or components related to the brakes may cause the VDC OFF indicator lump and the SLIP indicator lamp to turn on, and the VDC system may not operate properly.
- When the TCS or VDC is activated by sudden acceleration or sudden turn, some noise may occur if the brake pedal is used. The noise is a result of the normal operation of the TCS and VDC.
- When driving on roads which have extreme slopes (such as mountainous roads) or high banks (such as sharp carves on a freeway), the VDC may not operate normally, or the VDC warning lamp may turn on. However, this is not a problem if normal operation can be resumed after restarting the engine.
- Sudden turns (such as spin turns, acceleration turns), drifting, etc. When VDC function is OFF (VDC SW ON) may cause the yaw rate/side G -sensor system indicate a problem. However this is not a problem if normal operation can be resumed after restarting the engine.

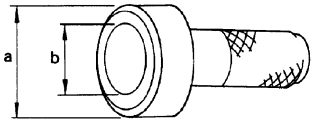
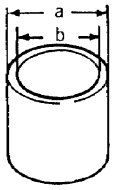
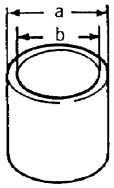
PREPARATION

PFP:00002

Special Service Tools

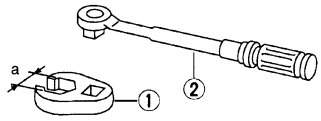
AFS0014Z

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
ST3072 0000 (J 25405) Drift a: 77 mm (0.03 in) dia. b: 55 mm (2.17 in) dia.	 ZZA0701D	Installation rear sensor rotor
ST2786 3000 (—) Drift a: 75 mm (2.95 in) dia. b: 62 mm (2.44 in) dia.	 ZZA0832D	
kV401 04710 (—) a: 76 mm (2.99 in) dia. b: 68.5 mm (2.697 in) dia.	 ZZA0832D	

Commercial Service Tools

AFS000AH

Tool name		Description
1. Flare nut crowfoot a: 10mm (0.39 in) /12mm (0.47 in) 2. Torque wrench	 S-NT360	Removing and installing each brake piping

ON-VEHICLE SERVICE

PFP:00000

Adjustment of Steering Angle Sensor Neutral Position

AFS0026C

In case of doing work that applies to the list below, make sure to adjust neutral position of steering angle sensor before running vehicle.

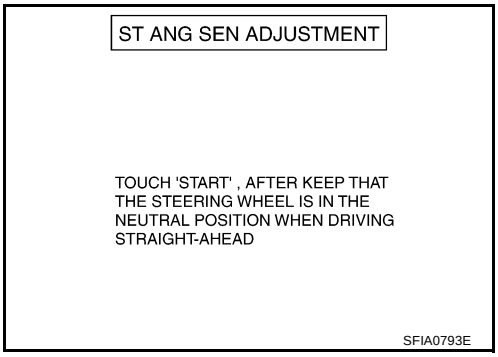
Situation	Adjustment of Steering Angle Sensor Neutral Position
Removing/Installing VDC/TCS/ABS control unit	–
Replacing VDC/TCS/ABS control unit	–
Removing/Installing steering angle sensor	×
Removing/Installing steering components	×
Removing/Installing suspension components	×
Change 4 tires to new ones	–
Tire rotation	–
Adjusting wheel alignment	×

×: Required
–: Not required

1. Stop vehicle with front wheels in straight-ahead position.
2. Connect the CONSULT-II and converter to the vehicle side DDL2 diagnosis connectors. Refer to BRC-108, "CONSULT-II Functions" .
3. Turn the ignition switch on and in the following order touch “ABS” “WORK SUPPORT” “ANGLE SENSOR ADJUSTMENT” in the CONSULT-II screen. Refer to BRC-108, "CONSULT-II Functions" .
4. Touch “START”.

   CAUTION:
   Do not touch steering wheel while adjusting steering angle sensor.
5. After approximately 10 seconds, touch “END”. (After approximately 60 seconds, it ends automatically.)
6. Turn ignition switch OFF, then turn it ON again.

   CAUTION:
   Be sure to carry out above operation.
7. Run vehicle with front wheels in straight-ahead position, then stop.



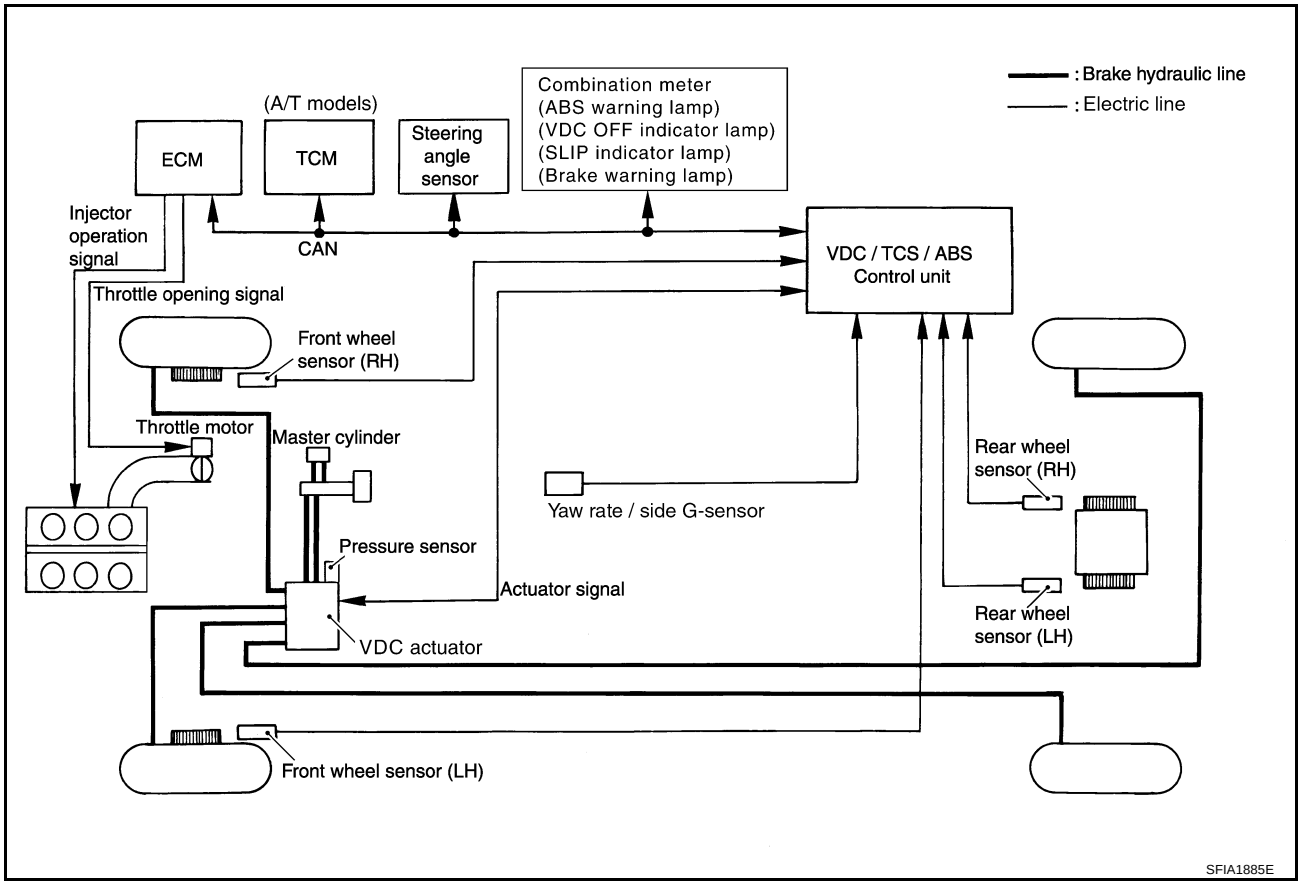
8. Select “DATA MONITOR”, “CONTROL MODULE INPUT ITEM”, and “STEERING ANGLE SIGNAL” on CONSULT-II screen. Then check that “STEERING ANGLE SIGNAL” is within 0±2.5 deg. If value is more than specification, repeat steps 1 to 5.
9. Erase memory of VDC/TCS/ABS control unit and ECM.
10. Turn ignition switch to OFF.

SYSTEM DESCRIPTION

PFP:00000

System Diagram

AFS000ZD



VDC Function

AFS000ZF

- In addition to the TCS/ABS function, the driver steering amount and brake operation amount are detected from the steering angle sensor and pressure sensor, and the vehicle's driving status (amount of under-steering / over-steering) is determined from information from the yaw rate sensor/side G sensor, wheel sensor, etc., and this information is used to improve vehicle stability by controlling the braking and engine power to all four wheels.
- The SLIP indicator lamp flashes to inform the driver of VDC operation.
- During VDC operation, the body and brake pedal lightly vibrate and mechanical noises may be heard. This is normal.
- The ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp might turn on when the vehicle is subject to strong shaking or large vibration, such as when the vehicle is on a turn table or a ship while the engine is running. In this case, restart the engine on a normal road, and if the ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp turn off, there is no problem.

TCS Function

AFS000ZG

- The wheel spin of the drive wheels is detected by the VDC/TCS/ABS control unit from the wheel speed signals from the four wheels, so if wheel spin occurs, the rear wheel right and left brake fluid pressure control and engine fuel cut are conducted while the throttle value is restricted to reduce the engine torque and decrease the amount of wheel spin. In addition, the degree the throttle is opened is controlled to achieve the optimum engine torque.
- Depending on road circumstances, the driver may have a sluggish feel. This is normal, because the optimum traction has the highest priority under TCS operation.
- TCS may be activated any time the vehicle suddenly accelerates, suddenly downshifts, or is driven on a road with a varying surface friction coefficient.
- During TCS operation, it informs a driver of system operation by flashing SLIP indicator lamp.

ABS Function

AFS0010J

- The Anti-Lock Brake System is a function that detects wheel revolution while braking, and it improves handling stability during sudden braking by electrically preventing 4 wheel lock. Maneuverability is also improved for avoiding obstacles.
- If the electrical system breaks down, then the Fail-Safe function starts, the ABS becomes inoperative, and the ABS warning lamp turns on.
- Electrical System Diagnosis by CONSULT-II is available.

EBD Function

AFS0010K

- Electronic Brake Distributor is a function that detects subtle slippages between the front and rear wheels during braking, and it improves handling stability by electronically controlling the Brake Fluid Pressure which results in reduced rear wheel slippage.
- In case of electrical system break down, the Fail-Safe function is activated, the EBD and ABS becomes inoperative, and the ABS warning lamp and brake warning lamp are turned on.
- Electrical System Diagnosis by CONSULT-II is available.

Fail-Safe Function

AFS0010F

VDC / TCS SYSTEM

In case of Throttle Control System trouble, the VDC OFF indicator lamp and SLIP indicator lamp are turned on, and the condition of the vehicle is the same as the condition of vehicles without VDC / TCS equipment. In case of trouble to the Throttle Control System, the ABS control continues to operate normally without VDC / TCS control.

CAUTION:

If the Fail-Safe function is activated, then perform the Self Diagnosis for VDC/TCS/ABS control system.

ABS, EBD SYSTEM

In case of electrical problems with the ABS, the ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp will turn on. In case of electrical problem with the EBD, Brake warning lamp, ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp will turn on. Simultaneously, the VDC/ TCS/ABS become one of the following conditions of the Fail-Safe function.

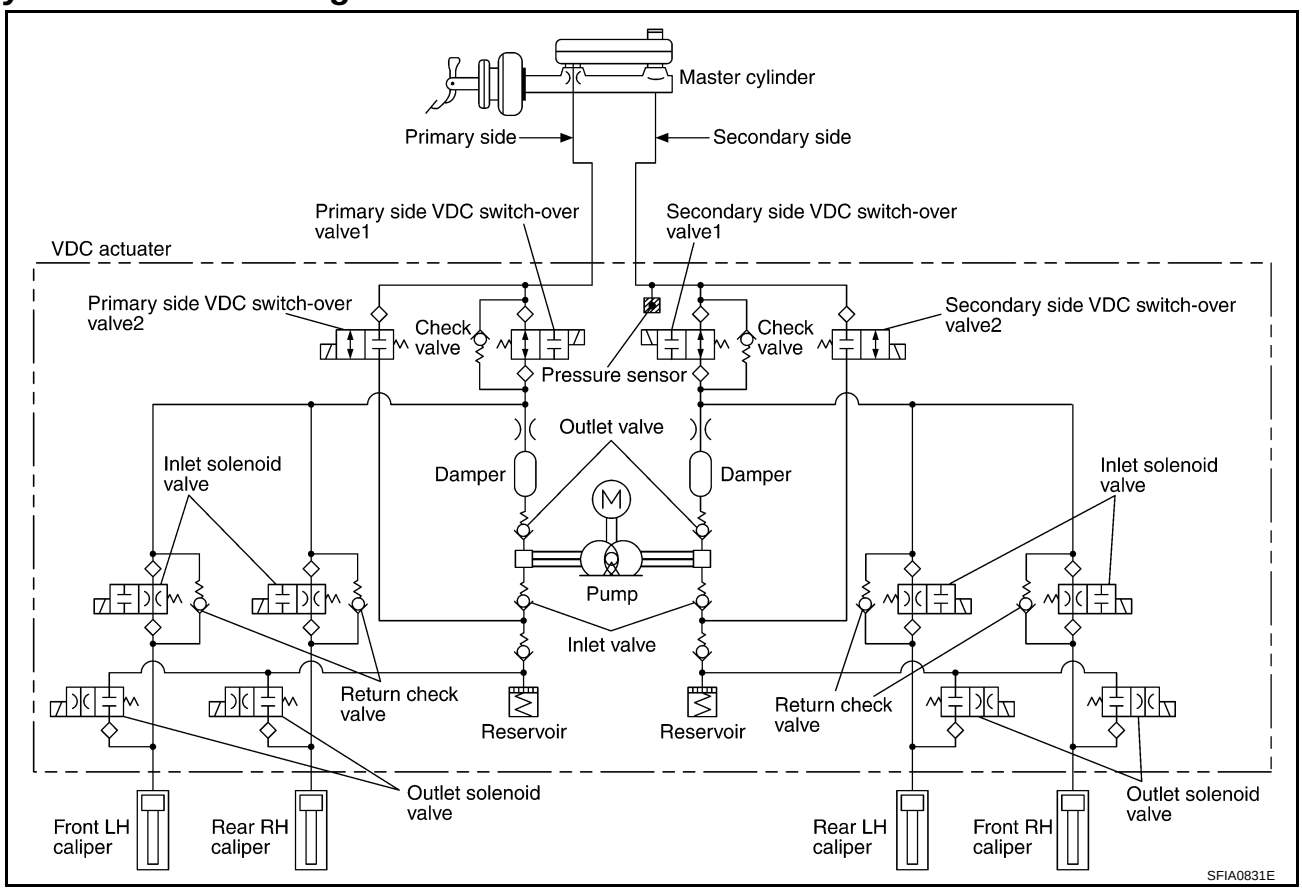
1. For ABS trouble, only the EBD is activated and the condition of the vehicle is the same condition of vehicles without TCS/ABS equipment.
2. For EBD trouble, the EBD and ABS become inoperative, and the condition of the vehicle is the same as the condition of vehicles without TCS/ABS, EBD equipment.

NOTE:

In condition 1 described above, an ABS Self Diagnosis sound may be heard. That is a normal condition because a self diagnosis for “Key Switch ON” and “the First Starting” are being performed.

Hydraulic Circuit Diagram

AFS0010G



CAN COMMUNICATION

PFP:23710

System Description

AFS0010H

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. Refer to LAN-5, "CAN Communication Unit" .

TROUBLE DIAGNOSIS

PFP:00004

How to Proceed With Diagnosis

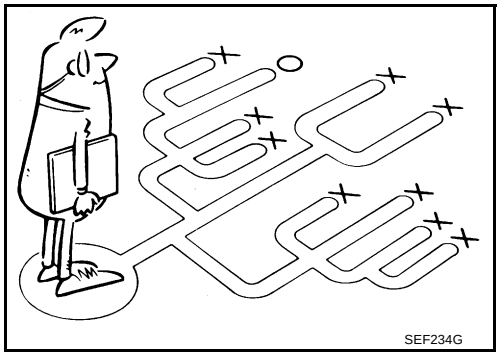
AFS000AR

BASIC CONCEPT

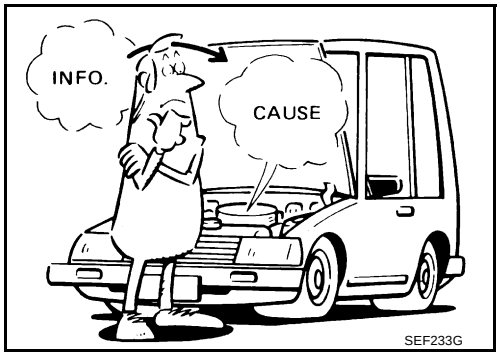
- Most important point to perform diagnosis is to understand systems (control and mechanism) in vehicle thoroughly.

- It is also important to clarify customer complaints before inspection.
  First of all, reproduce symptom, and understand it fully.
  Ask customer about his/her complaints carefully. In some cases, it will be necessary to check symptom by driving vehicle with customer.

  NOTE:
  Customers are not professionals. Do not assume “maybe customer means...” or “maybe customer mentioned this symptom”.


SEF234G

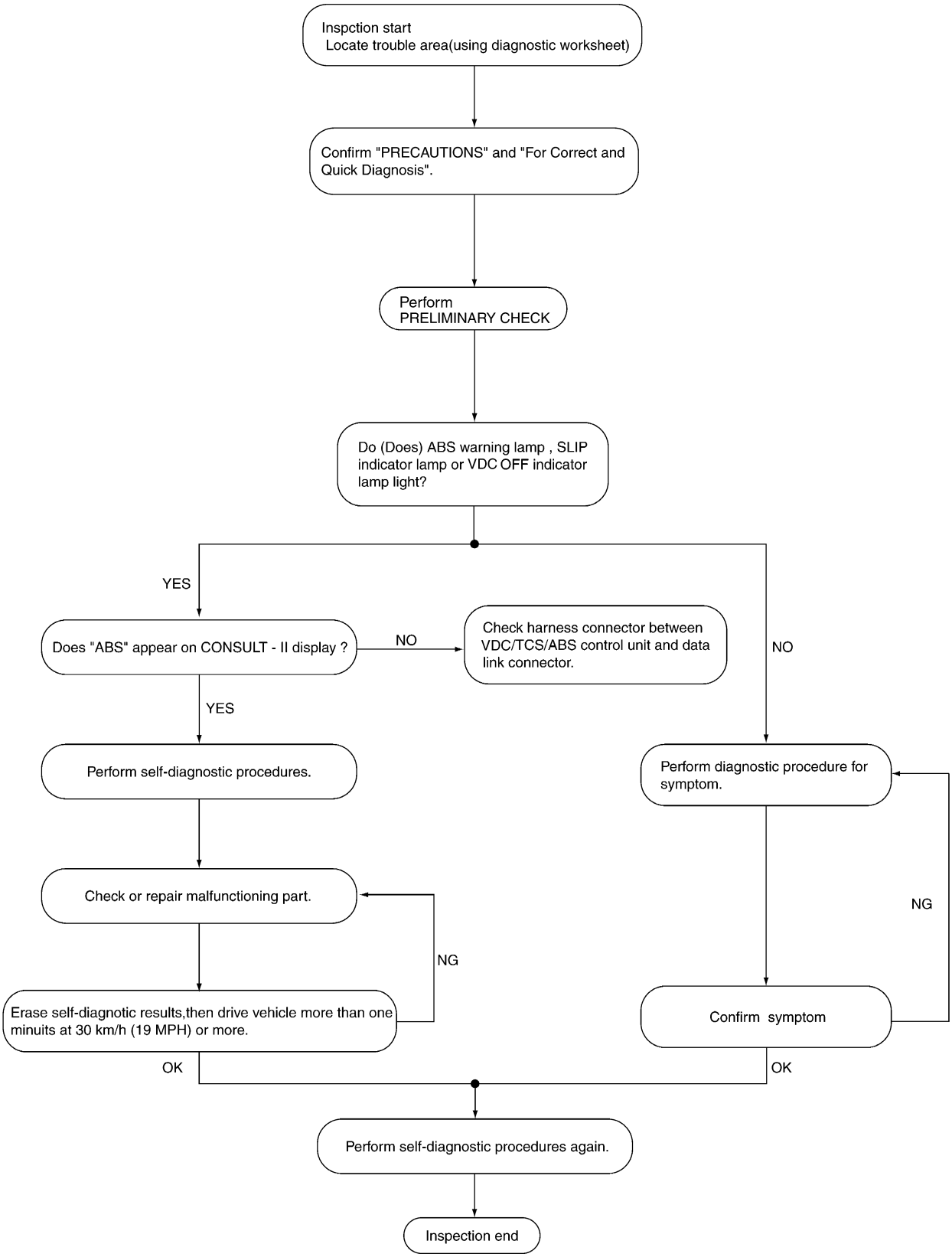
- It is essential to check symptoms right from beginning in order to repair a malfunction completely.
  For an intermittent malfunction, it is important to reproduce symptom based on interview with customer and past examples. Do not perform inspection on ad hoc basis. Most intermittent malfunctions are caused by poor contacts. In this case, it will be effective to shake suspected harness or connector by hand. When repairs are performed without any symptom check, no one can judge if malfunction has actually been eliminated.
- After diagnosis, make sure to carry out “erase memory”. Refer to BRC-109, "SELF-DIAGNOSIS" .
- For an intermittent malfunction, move harness or harness connector by hand to check poor contact or false open circuit.



SEF233G

- Always read “GI General Information” to confirm general precautions. Refer to GI-4, "General Precautions"

DIAGNOSIS FLOWCHART



SFIA0951E

ASKING COMPLAINTS

- Complaints against malfunction vary depending on each person. It is important to clarify customer complaints.
- Ask customer about what symptoms are present and under what conditions. Use information to reproduce symptom while driving.
- It is also important to use diagnosis sheet so as not to miss information.

KEY POINTS

WHAT ..... Vehicle model
WHEN ..... Date, Frequencies
WHERE ..... Road conditions
HOW ..... Operating conditions, Weather conditions, Symptoms

SBR339B

EXAMPLE OF DIAGNOSIS SHEET

Customer name MR/MS	Model & Year		VIN
Engine #	Trans.		Mileage
Incident Date	Manuf. Date		In Service Date
Symptoms	☐ Noise and vibration (from engine compartment) ☐ Noise and vibration (from axle)	☐ Warning / Indicator activate	☐ Firm pedal operation Large stroke pedal operation
	☐ TCS does not work (Rear wheels slip when accelerating)	☐ ABS does not work. (wheels slip when braking)	☐ Lack of sense of acceleration
Engine conditions	☐ When starting ☐ After starting		
Road conditions	☐ Low friction road (☐Snow ☐Gravel ☐Other) ☐ Bumps / potholes		
Driving conditions	☐ Full-acceleration ☐ High speed cornering ☐ Vehicle speed: Greater than 10 km/h (6 MPH) ☐ Vehicle speed: 10 km/h (6 MPH) or less ☐ Vehicle is stopped		
Applying brake conditions	☐ Suddenly ☐ Gradually		
Other conditions	☐ Operation of electrical equipment ☐ Shift change ☐ Other descriptions		

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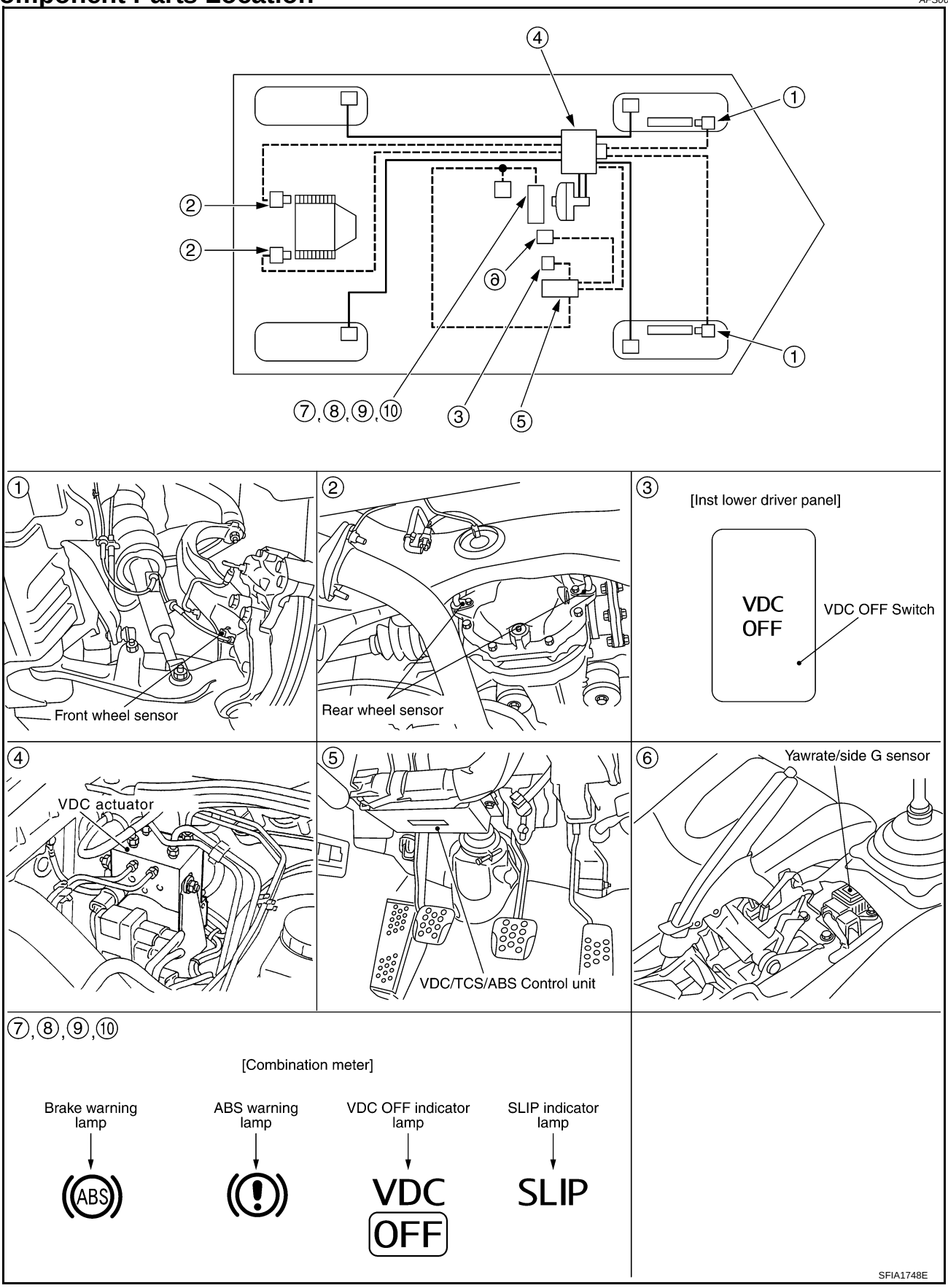
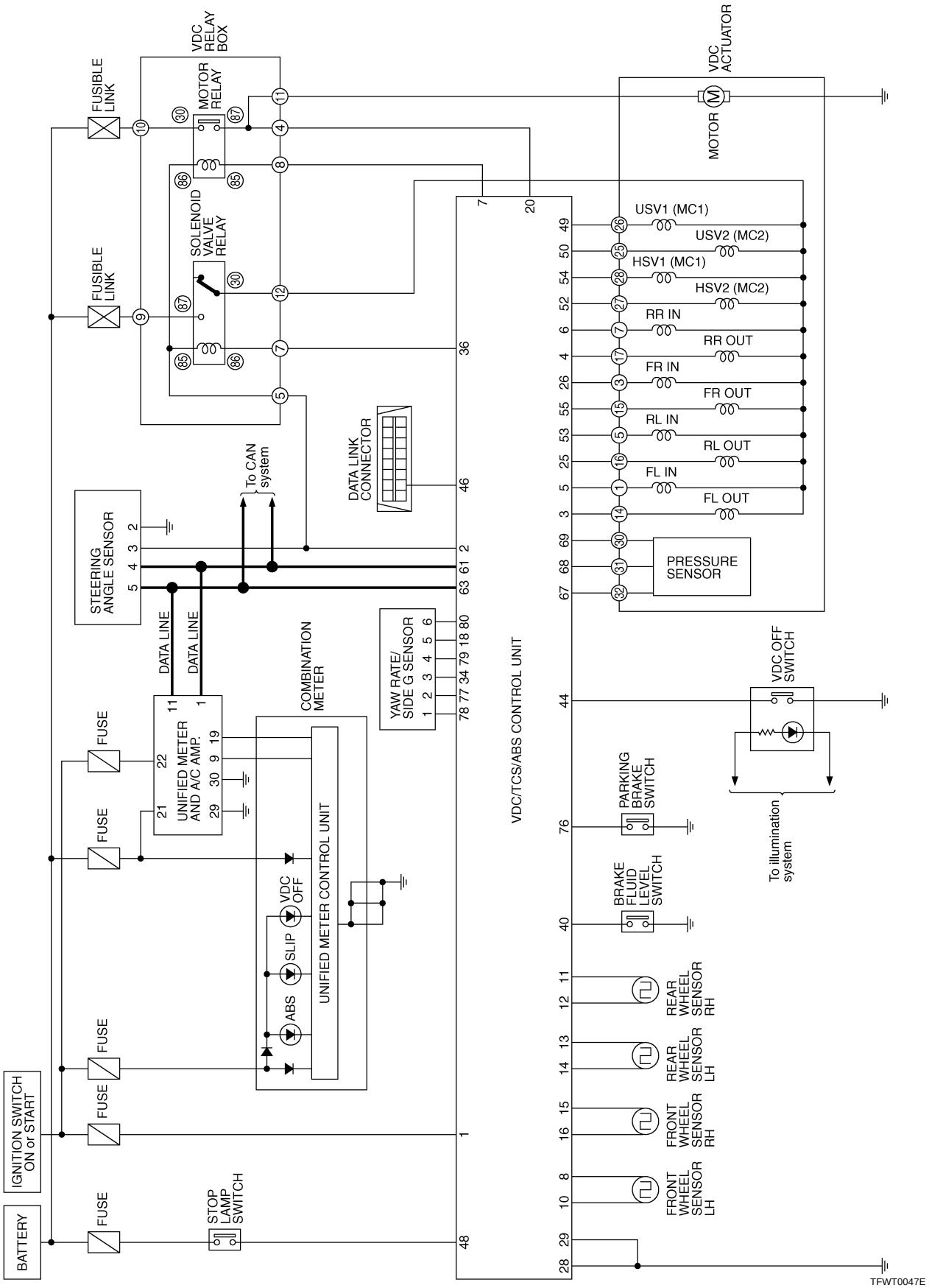
Component Parts Location

AFS000AS



Schematic

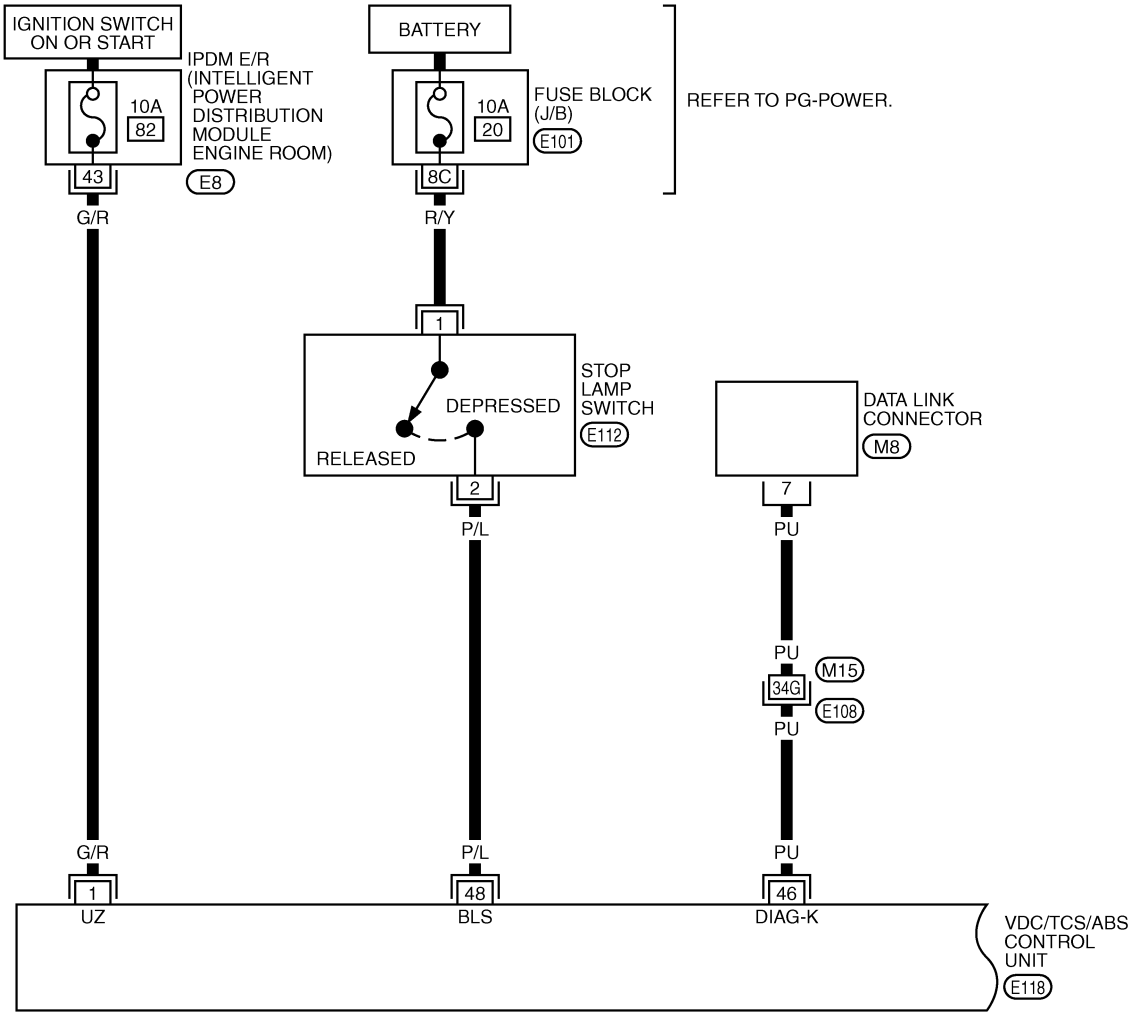
AFS000AT

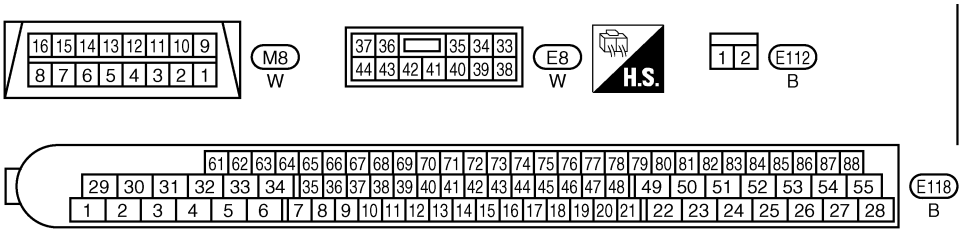


Wiring Diagram — VDC —

AFS000AU

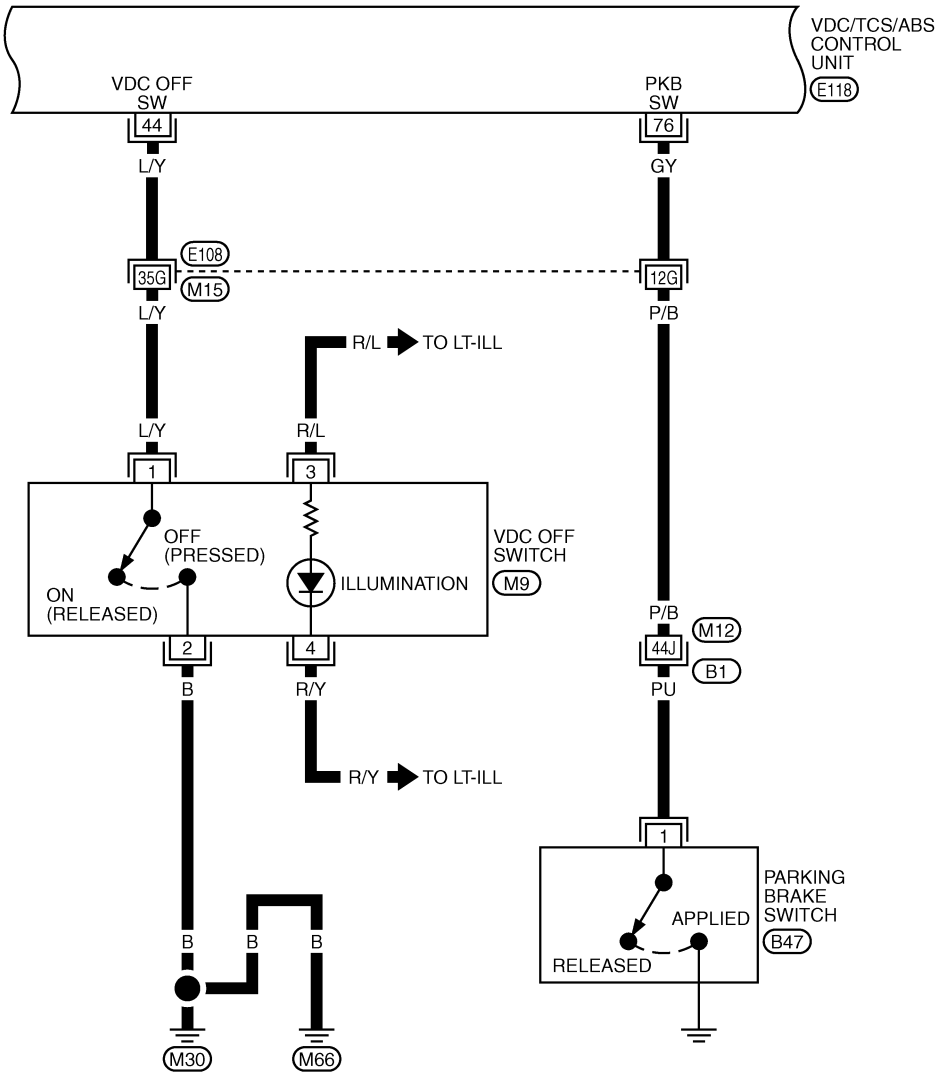
BRC-VDC-01

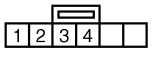




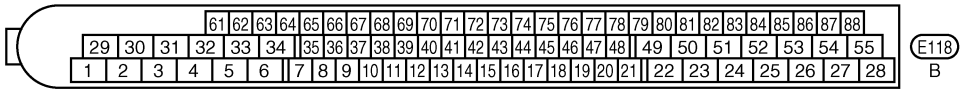
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWT0162E





REFER TO THE FOLLOWING.
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)



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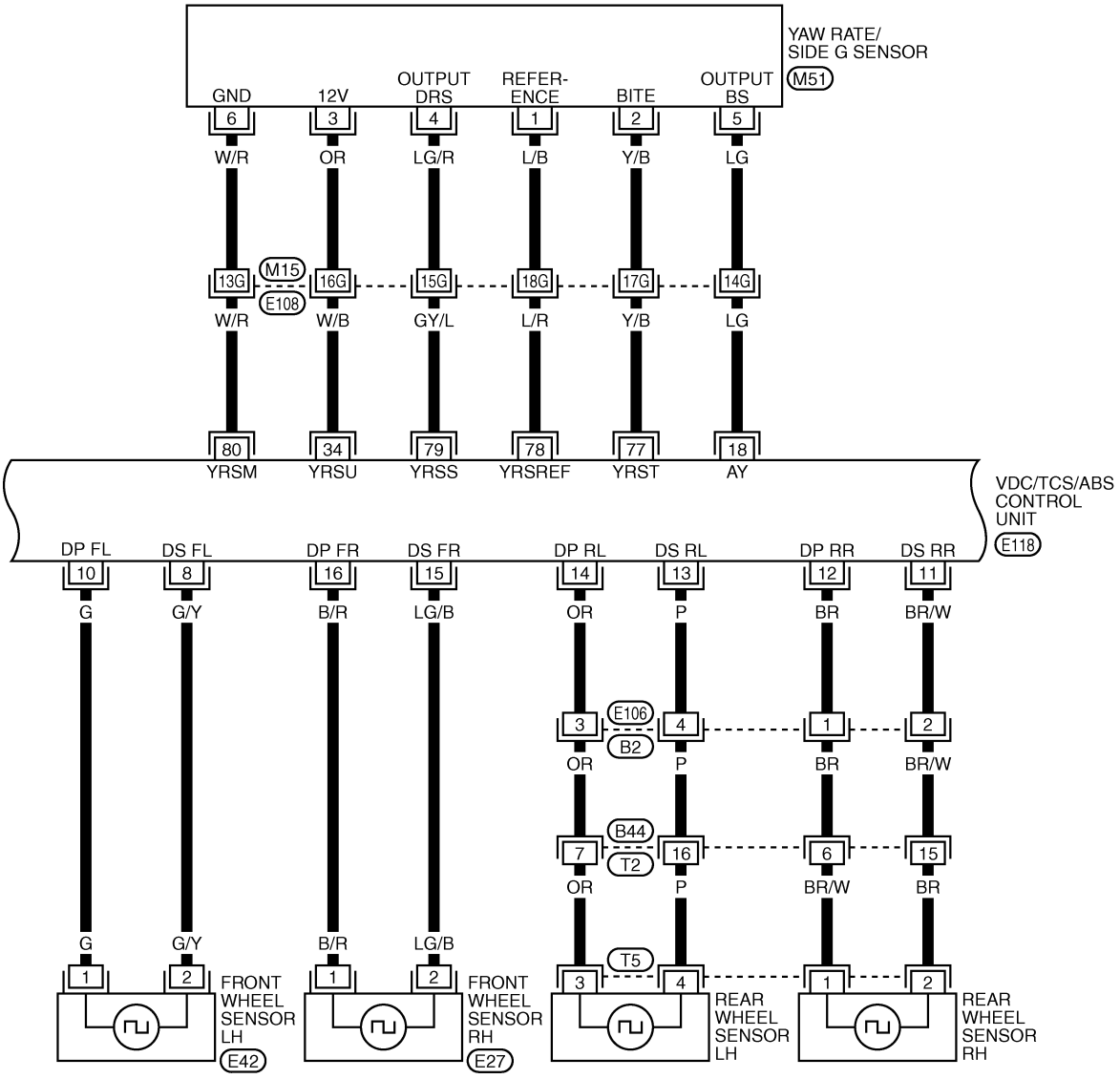
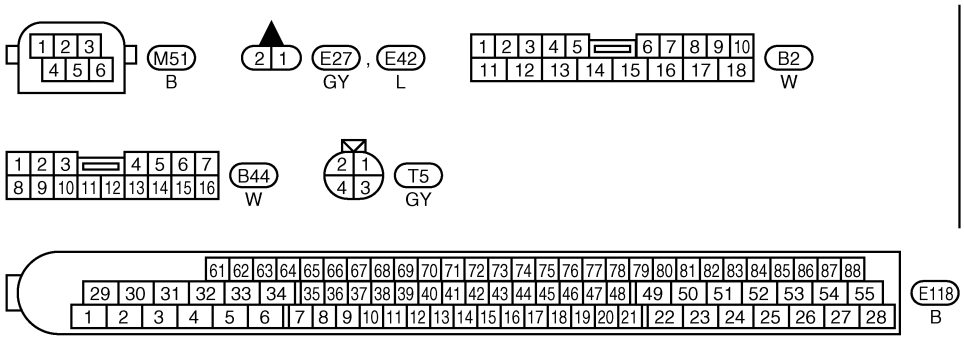
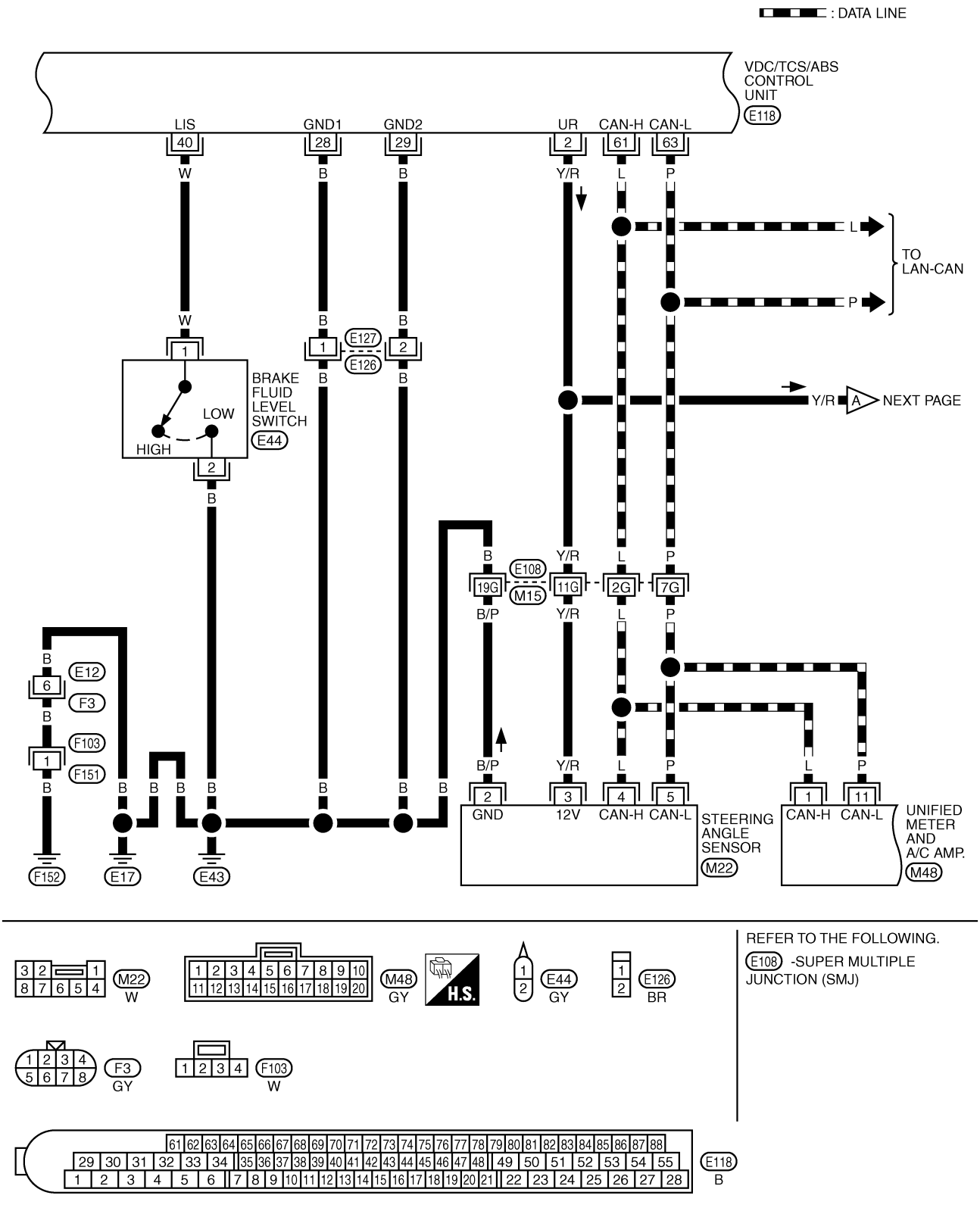




REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TFWT0166E

BRC-VDC-04



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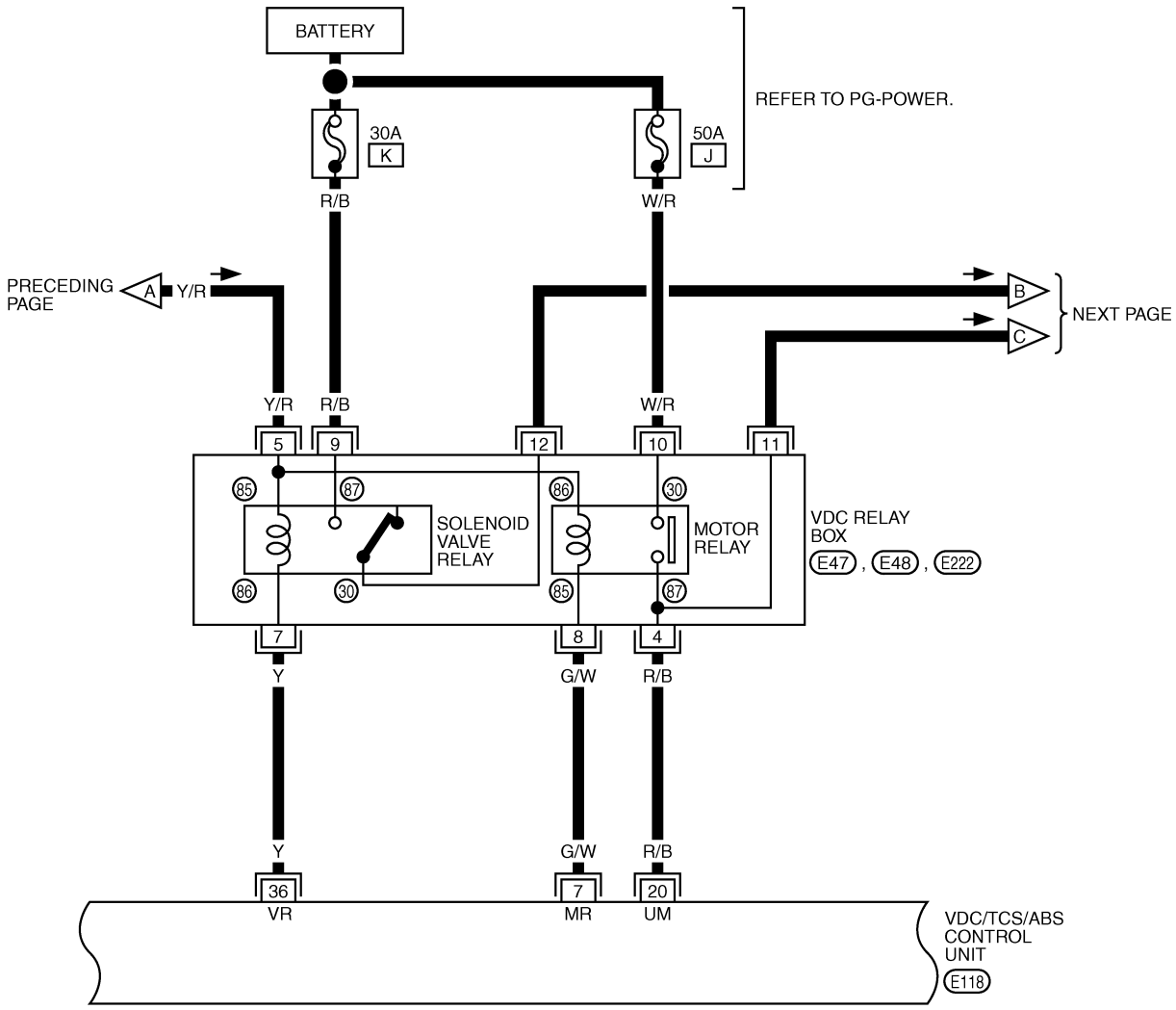
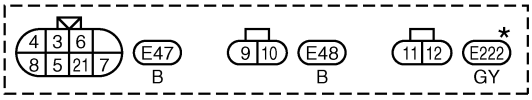
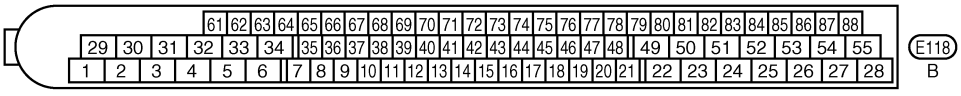


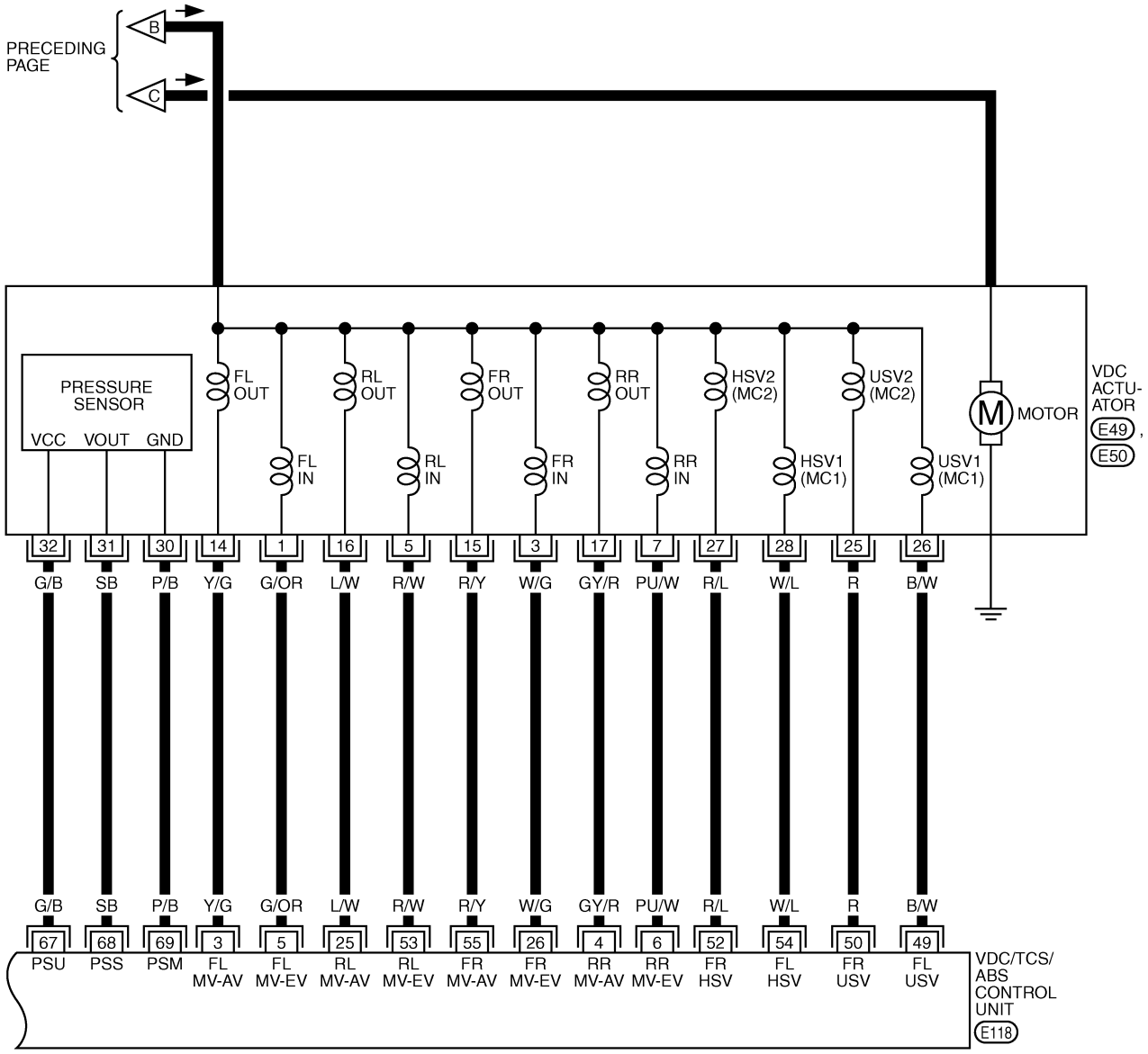


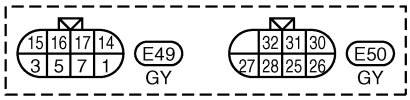


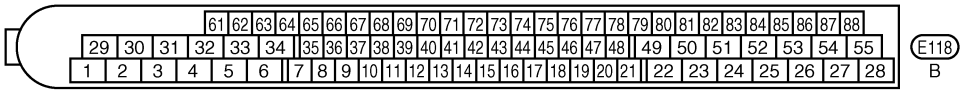
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TFWT0052E

BRC-VDC-06







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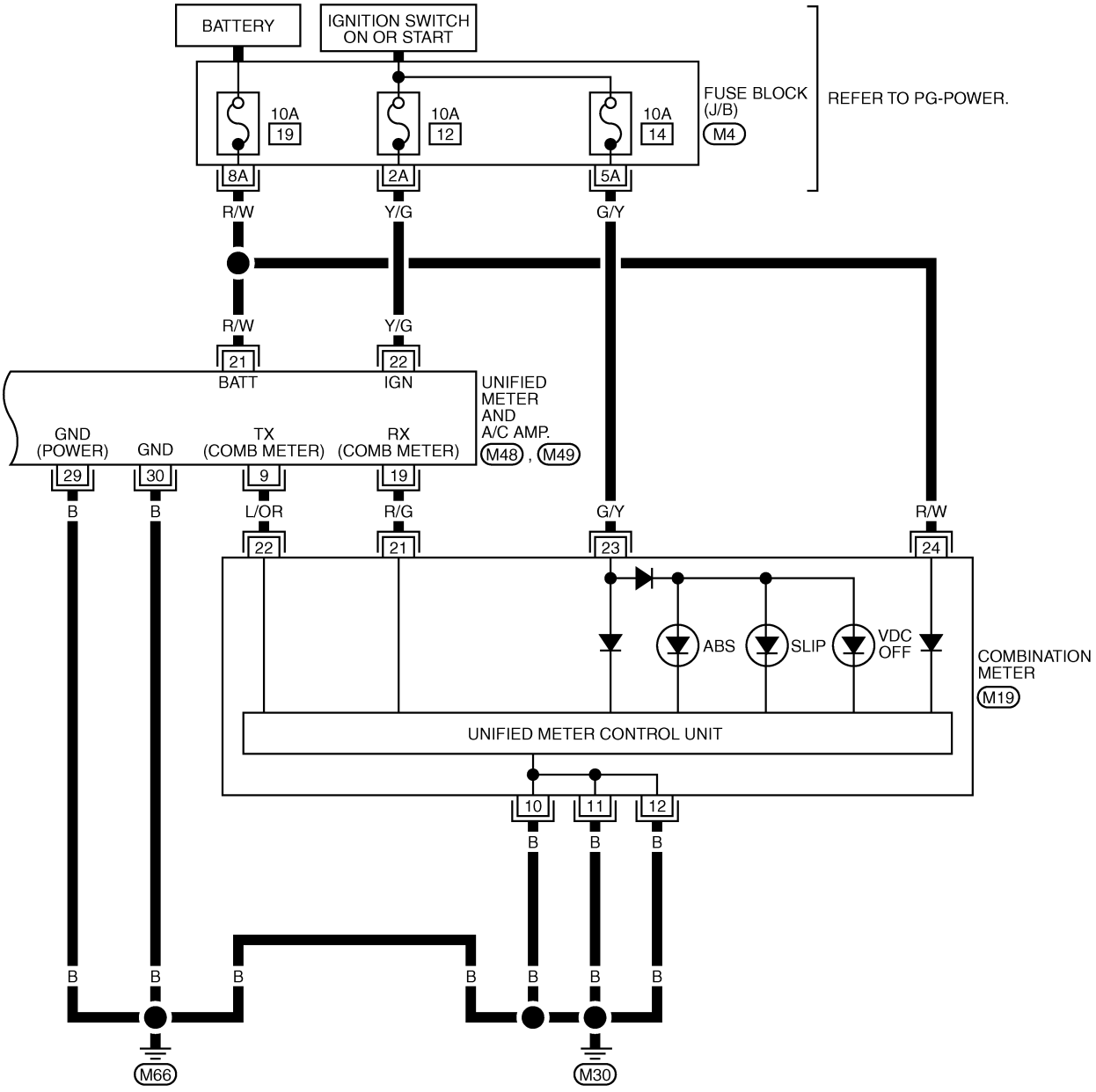

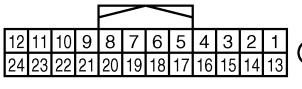

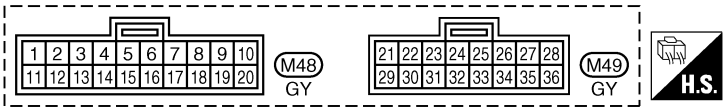

REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWT0054E

Control Unit Input/Output Signal Standard

AFS000ZK

REFERENCE VALUE FROM CONSULT-II

CAUTION:

The display shows the control unit calculation data, so a normal value might be displayed even in the event the output circuit (harness) is open or short - circuited.

Monitor item	Display Content	Data monitor		Reference: Error inspection checklist
		Condition	Reference values for normal operation	
WHEEL SENSOR	Vehicle speed calculated using signals from all four wheel sensors	Vehicle stopped	0 km/h (0 MPH)	BRC-119, "Inspection 1 Wheel Sensor System"
		While driving (Note 1)	Nearly matches the speedometer display (±10% or less)	
In ABS S/V Out ABS S/V	Operation status of all solenoids	When the actuator solenoid operates or during a fail-safe	ON	BRC-127, "Inspection 7 Solenoid and VDC Change-Over Valve System"
		When the actuator relay operates and the actuator solenoid does not operate	OFF	
STOP LAMP SWITCH	Brake pedal operation	Brake pedal depressed	ON	BRC-133, "Inspection 10 Stop Lamp Switch System"
		Brake pedal not depressed	OFF	
ABS MOTOR RELAY	Motor and motor relay operation status	When the motor relay and motor are operating	ON	BRC-129, "Inspection 8 ABS Motor and Motor Relay System"
		When the motor relay and motor are not operating	OFF	
ABS ACTUATOR RELAY	Actuator relay operation status	When the actuator relay is operating	OFF	BRC-132, "Inspection 9 Actuator Relay System"
		When the actuator relay is not operating	ON	
ABS WARNING LAMP	ABS warning lamp on condition (Note 2)	ABS warning lamp ON	ON	BRC-119, "BASIC INSPECTION 3 ABS WARNING LAMP, VDC OFF INDICATOR LAMP, SLIP INDICATOR LAMP INSPECTION"
		ABS warning lamp OFF	OFF	
OFF LAMP	VDC OFF indicator lamp on condition (Note 3)	When the VDC OFF indicator lamp on	ON	BRC-119, "BASIC INSPECTION 3 ABS WARNING LAMP, VDC OFF INDICATOR LAMP, SLIP INDICATOR LAMP INSPECTION"
		When the VDC OFF indicator lamp off	OFF	
OFF SWITCH	VDC OFF switch ON-OFF status	VDC OFF switch ON (When the VDC OFF indicator lamp on)	ON	BRC-137, "VDC OFF SWITCH"
		When VDC OFF switch OFF (When the VDC OFF indicator lamp off)	OFF	
SLIP LANP	SLIP indicator lamp on condition (Note 4)	When SLIP indicator lamp is ON	ON	BRC-119, "BASIC INSPECTION 3 ABS WARNING LAMP, VDC OFF INDICATOR LAMP, SLIP INDICATOR LAMP INSPECTION"
		When SLIP indicator lamp is OFF	OFF	
POWER SUPPLY VOLTAGE	Battery voltage supplied to VDC/TCS/ABS control unit	Ignition switch ON	10 - 16V	BRC-134, "Inspection 11 VDC/TCS/ABS Control Unit Power and Ground Systems"

Monitor item	Display Content	Data monitor		Reference: Error inspection checklist
		Condition	Reference values for normal operation	
GEAR	Determined gear shift position from the A/T PNP switch signal	Always	1 (M/T vehicles normally remain at 1)	—
POSITION	Shift position determined by the A/T PNP switch signal	Always	## (M/T vehicles normally remain at ##)	—
YAW RATE SENSOR	Yaw rate detected by yaw rate sensor	Vehicle stopped	Approx. 0 d/s	BRC-125, "Inspection 6 Yaw Rate Sensor /Side G Sensor System"
		While driving	-70 - 70d/s	
THROTTLE POSITION	Throttle open/close status (linked to the accelerator pedal)	Do not step on the accelerator pedal (When ignition switch is on)	0%	Communication system between VDC/TCS/ABS control unit and ECM
		Step on the Brake pedal (When ignition switch is on)	0 to 100%	
SIDE G SENSOR	Side G detected by side G sensor	Vehicle stopped	Approx. 0 m/s^2	BRC-125, "Inspection 6 Yaw Rate Sensor /Side G Sensor System"
		While driving	-24.3 - 24.1 m/s^2	
STEERING ANGLE SIGNAL	Steering angle detected by steering angle sensor	Straight-ahead condition	Approx. 0 deg.	BRC-124, "Inspection 5 Steering Angle Sensor System"
		Steering wheel turned	-720 - 720 deg.	
PRESSURE SENSOR	Brake fluid pressure detected by pressure sensor	Do not step on the Brake pedal (When ignition switch is on)	Approx. 0 bar	BRC-122, "Inspection 4 Pressure Sensor System"
		Step on the accelerator pedal (When ignition switch is on)	-40 - 300 bar	
ENGINE SPEED	Engine running	With engine stopped	0rpm	Engine speed signal system
		Engine running	Almost in accordance with tachometer display	
SNOW MODE SWITCH	Snow mode switch ON/OFF condition	Snow mode switch ON	ON	—
		Snow mode switch OFF	OFF	
CONTROL BOOSTER	Boost control status	When control booster is operating	ON	—
		When control booster is not operating	OFF	
M MODE	A/T manual mode status	Always	OFF (M/T vehicles normally remain OFF)	—
OD CANSEL SWITCH	A/T OD switch status	Always	OFF (M/T vehicles normally remain OFF)	—
P BRAKE SWITCH	Parking brake status	Parking brake depressed	ON	Parking brake switch and system
		Parking brake not depressed	OFF	
USV HSV	VDC switch-over valve status	During actuator change-over valve operation or during a fail-safe	ON	BRC-127, "Inspection 7 Solenoid and VDC Change-Over Valve System"
		When the actuator relay operates and the actuator change-over valve does not operate	OFF	—

Monitor item	Display Content	Data monitor		Reference: Error inspection checklist
		Condition	Reference values for normal operation	
V/R POWER	Actuator relay activated (ON/OFF)	When actuator relay is active (engine is running).	ON	BRC-132, "Inspection 9 Actuator Relay System"
		When actuator relay is not active (before engine starts and in fail-safe mode).	OFF	
M/R OUTPUT	Actuator motor and motor relay status (ON/OFF)	When actuator motor and motor relay are active (“ACTIVE TEST” with CONSULT-II).	ON	BRC-129, "Inspection 8 ABS Motor and Motor Relay System"
		When the actuator motor and motor relay are not operating	OFF	
BRAKE FLUID LEVEL SWITCH	Brake fluid level sensor ON/OFF status	When brake fluid level sensor is on	ON	BRC-136, "Inspection 13 Brake Fluid Level Sensor System"
		When the brake fluid level sensor is off	OFF	
FAIL SIGNAL	Fail signal status	During VDC fail-safe During TCS fail-safe During ABS fail-safe During EBD fail-safe	ON	VDC system TCS system ABS system EBD system

Note 1: Confirm tire pressure is normal.
Note 2: ON/OFF timing of ABS warning lamp
ON: Approximately 1 sec. After turning on the ignition switch or when an error is detected.
OFF: Approximately 1 sec. After the ignition switch is turned on (when system is normal).
Note 3: VDC OFF indicator lamp ON/OFF timing
ON: Approximately 1 sec. After the ignition switch is turned on, an error is detected, or the VDC OFF switch is on
OFF: Approximately 1 sec. After the ignition switch is turned on (when system is normal) and the VDC OFF switch is off
Note 4: SLIP indicator lamp ON/OFF timing
ON: Approximately 1 sec. After turning on the ignition switch or when an error is detected.
OFF: Approximately 1 sec. After the ignition switch is turned on (when system is normal) and the VDC/TCS function is not operating
Flashing: VDC/TCS function is active during driving

CONSULT-II Functions

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CONSULT-II MAIN FUNCTION

In a diagnosis function (main function), there are “WORK SUPPORT”, “SELF-DIAGNOSTIC RESULTS”, “DATA MONITOR”, “CAN DIAG SUPPORT MNTR”, “ACTIVE TEST”, “FUNCTION TEST”, “ECU PART NUMBER”.

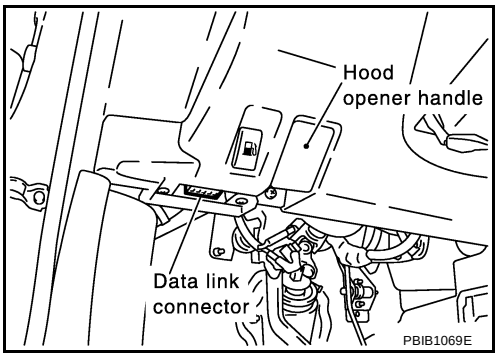
Diagnostic test mode	Function	Reference
WORK SUPPORT	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT-II.	BRC-89, "Adjustment of Steering Angle Sensor Neutral Position"
SELF-DIAGNOSTIC RESULTS	Self-diagnostic results can be read and erased quickly.	BRC-109, "SELF-DIAGNOSIS"
DATA MONITOR	Input/Output data in the ABS actuator and electric unit (control unit) can be read.	BRC-112, "DATA MONITOR"
CAN DIAG SUPPORT MNTR	The results of transmit/receive diagnosis of communication can be read.	—
ACTIVE TEST	Diagnostic Test Mode in which CONSULT-II drives some actuators apart from the ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range.	BRC-116, "ACTIVE TEST"

FUNCTION TEST	Conducted by CONSULT-II instead of a technician to determine whether each system is “OK” or “NG”.	—
ECU PART NUMBER	ABS actuator and electric unit (control unit) part number can be read.	—

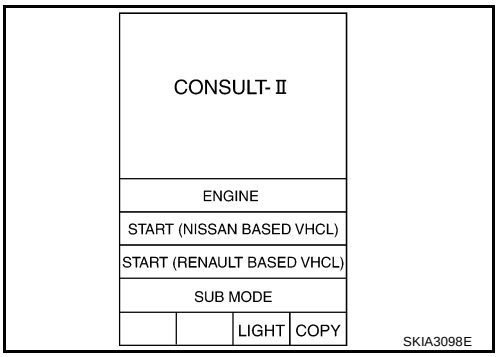
CONSULT-II BASIC OPERATION PROCEDURE

1. Turn ignition switch OFF.
2. Connect CONSULT-II and CONSULT-II CONVERTER to the data link connector.

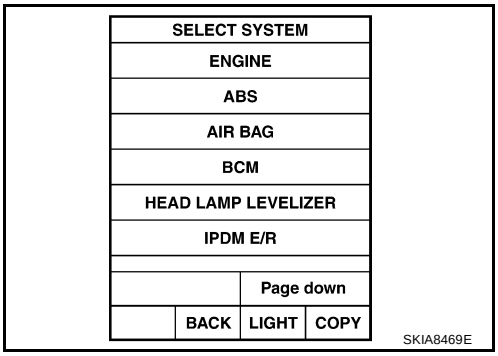
   CAUTION:
   If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.
3. Turn ignition switch ON.



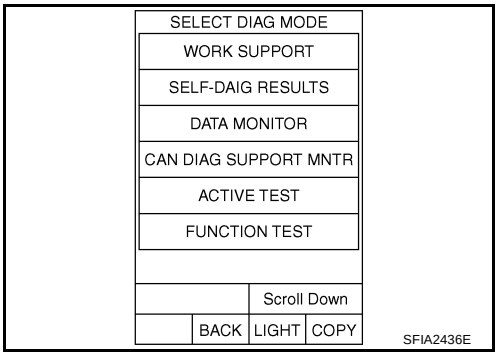
4. Touch “START (NISSAN BASED VHCL)”.



5. Touch “ABS” in the “SELECT SYSTEM” screen.
   If “ABS” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



6. Select the required diagnostic location from the “SELECT SYSTEM”screen.
   For further information, see the CONSULT-II Operation Manual.



SELF-DIAGNOSIS

Description

If an error is detected in the system, ABS warning lamp on the combination meter turn on. In this case, perform self-diagnosis as follows:

Operation Procedure

1. Turn ignition switch OFF.
2. Connect CONSULT-II and CONSULT-II CONVERTER to the data link connector.

   CAUTION:
   If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

3. Turn ignition switch ON.
4. Start engine and drive at approximately 30 km/h (19 MPH) or more for approximately 1 minute.
5. After stopping the vehicle, with the engine running, touch “START (NISSAN BASED VHCL)”, “ABS”, “SELF-DIAG RESULTS” in order on the CONSULT-II screen.

   CAUTION:
   If “START (NISSAN BASED VHCL)” is touched immediately after starting the engine or turning on the ignition switch, “ABS” might not be displayed in the System Selection screen. In this case, repeat the operation from step 1.
6. The self-diagnostic results are displayed. (If necessary, the self-diagnostic results can be printed out by touching “PRINT”.)
   - When “NO FAILURE” is displayed, check the ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp.
7. Conduct the appropriate inspection from the display item list, and repair or replace the malfunctioning component.
8. Start engine and drive at approximately 30 km/h (19 MPH) or more for approximately 1 minute.

   CAUTION:
   - **When a wheel sensor “short-circuit” is detected, if the vehicle is not driven at 30 km/h (19 MPH) for at least 1 minute, the ABS warning lamp will not turn off even if everything is normal.**
9. Turn ignition switch OFF to prepare for erasing the memory.
10. Start the engine and touch “START (NISSAN BASED VHCL)”, “ABS”, “SELF-DIAG RESULTS”, “ERASE MEMORY” in order on the CONSULT-II screen to erase the error memory.
    If “ABS” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .

    CAUTION:
    If the error memory is not erased, re-conduct the operation from step 5.
11. For the final inspection, drive at approximately 30 km/h (19 MPH) or more for approximately 1 minute and confirm that the ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp are off.

Display Item List

Suspect Systems	Malfunction is detected when	Inspection system
FR LH SENSOR - 1	When the circuit in the front LH wheel sensor is open.	BRC-119, "Inspection 1 Wheel Sensor System" (Note 1)
RR RH SENSOR -1	When the circuit in the rear RH wheel sensor is open.	
FR RH SENSOR - 1	When the circuit in the front RH wheel sensor is open.	
RR LH SENSOR - 1	When the circuit in the rear LH wheel sensor is open.	
FR LH SENSOR - 2	When the circuit in the front LH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
RR RH SENSOR -2	When the circuit in the rear RH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
FR RH SENSOR -2	When the circuit in the front RH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
RR LH SENSOR - 2	When the circuit in the rear LH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
MAINE RELAY	When the control unit detects an error in the actuator relay system.	BRC-132, "Inspection 9 Actuator Relay System"
STOP LAMP SW	When a stop lamp switch open-circuit is detected.	BRC-133, "Inspection 10 Stop Lamp Switch System"
PRESS SEN CIRCUIT	Pressure sensor open-circuit. When a short-circuit is detected. Or, when a pressure sensor error is detected.	BRC-122, "Inspection 4 Pressure Sensor System"
ST ANG CIRCUIT	When the steering angle sensor neutral point has deviated. Or, when a steering angle sensor error is detected.	BRC-124, "Inspection 5 Steering Angle Sensor System"
YAW RATE SENSOR	When a yaw rate sensor error is detected. Or, when the yaw rate sensor circuit is open. When a short-circuit is detected.	BRC-125, "Inspection 6 Yaw Rate Sensor /Side G Sensor System"
FR LH IN ABS SOL	When the VDC/TCS/ABS control unit detects an error in the front left inlet solenoid system.	BRC-127, "Inspection 7 Solenoid and VDC Change-Over Valve System"
FR LH OUT ABS SOL	When the VDC/TCS/ABS control unit detects an error in the front left outlet solenoid system.	
RR RH IN ABS SOL	When the VDC/TCS/ABS control unit detects an error in the rear left inlet solenoid system.	
RR RH OUT ABS SOL	When the VDC/TCS/ABS control unit detects an error in the rear right outlet solenoid system.	
FR RH IN ABS SOL	When the VDC/TCS/ABS control unit detects an error in the front right inlet solenoid system.	
FR RH OUT ABS SOL	When the VDC/TCS/ABS control unit detects an error in the front right outlet solenoid system.	
RR LH IN ABS SOL	When the VDC/TCS/ABS control unit detects an error in the rear left inlet solenoid system.	
RR LH OUT ABS SOL	When the VDC/TCS/ABS control unit detects an error in the rear left outlet solenoid system.	

Suspect Systems	Malfunction is detected when	Inspection system
PRIMARY SIDE USV CIRCUIT	When the primary side VDC change-over valve 1 circuit is open or short-circuited.	BRC-127, "Inspection 7 Solenoid and VDC Change-Over Valve System"
SECONDARY SIDE USV CIRCUIT	When the secondary side VDC change-over valve 1 circuit is open or short-circuited.	
PRIMARY SIDE HSV CIRCUIT	When the primary side VDC change-over valve 2 circuit is open or short-circuited.	
SECONDARY SIDE HSV CIRCUIT	When the secondary side VDC change-over valve 2 circuit is open or short-circuited.	
PUMP MOTOR, MOTOR RELAY SYSTEM	When the control unit detects an error in the motor or motor relay.	BRC-129, "Inspection 8 ABS Motor and Motor Relay System"
LOW POWER VOLTAGE	When the VDC/TCS/ABS power voltage is lower than normal.	BRC-134, "Inspection 11 VDC/TCS/ABS Control Unit Power and Ground Systems"
STEERING ANGLE SENSOR HAS NOT BEEN CORRECTED	Neutral position correction of steering angle sensor is not finished.	BRC-89, "Adjustment of Steering Angle Sensor Neutral Position"
STEERING ANGLE SENSOR COMMUNICATION LINE	CAN communication line or steering angle sensor has generated an error.	BRC-137, "Inspection 14 CAN Communication System"
SIDE G - SENSOR	When there is an error in the side G sensor. Or, when the side G sensor circuit is open or short-circuited.	BRC-125, "Inspection 6 Yaw Rate Sensor /Side G Sensor System"
EMERGENCY BRAKE	When the VDC/TCS/ABS control unit is malfunctioning (excessive pressure increase or insufficient pressure increase).	BRC-136, "Inspection 12 VDC/TCS/ABS Control Unit 2"
ABS CONTROLLER	When there is an internal error in the VDC/TCS/ABS control unit.	BRC-122, "Inspection 3 VDC/TCS/ABS Control Unit 1"
CAN COMM CURUIT	When there is an error in the CAN communication system.	BRC-137, "Inspection 14 CAN Communication System" (Note 2)
LOW FLUID LEVEL	The brake fluid level has dropped. Or, when there is a short to ground in the circuit between the VDC/TCS/ABS control unit and the fluid level sensor.	BRC-136, "Inspection 13 Brake Fluid Level Sensor System"
ENGINE SIGNAL	When there is an error in an engine system main component	BRC-122, "Inspection 2 Engine System"

Note 1: After completing repairs of the shorted sensor circuit, when ignition switch is turned ON, ABS warning lamp turns on. Check that ABS warning lamp turns off while driving the vehicle at approximately 30 km/h (19 MPH) for approximately 1 minute according to self-diagnosis procedure. In addition, if wheel sensor 2 is displayed for the wheels, check the wheel sensor circuit and also check the control unit power voltage.
Note 2: When errors are detected in several systems, including the CAN communication system [U1000], troubleshoot the CAN communication system.

DATA MONITOR

Operation Procedure

1. After turning OFF the ignition switch, connect CONSULT-II and the CONVERTER to the data link connector.

   CAUTION:
   If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

2. Touch “START (NISSAN BASED VHCL)”, “ABS”, “DATA MONITOR” in order on the CONSULT-II screen. If “ABS” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .

CAUTION:
When "START (NISSAN BASED VHCL)" is touched immediately after starting the engine or turning on the ignition switch, "ABS" might not be displayed in the system selection screen. In this case, repeat the operation from step 2.

3. Return to the Monitor Item Selection screen, and touch "ECU INPUT SIGNALS", "MAIN SIGNALS" or "SELECTION FROM MENU". Refer to the following information.
4. When "START" is touched, the data monitor screen is displayed.

Display Item List

Item (Unit)	Monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
FR LH SENSOR [km/h (MPH)]	x	x	x	Wheel speed calculated by front LH wheel sensor signal is displayed.
FR RH SENSOR [km/h (MPH)]	x	x	x	Wheel speed calculated by front RH wheel sensor signal is displayed.
RR RH SENSOR [km/h (MPH)]	x	x	x	Wheel speed calculated by Rear RH wheel sensor signal is displayed.
RR LH SENSOR [km/h (MPH)]	x	x	x	Wheel speed calculated by Rear LH wheel sensor signal is displayed.
FR LH IN SOL (ON/OFF)	–	x	x	Front left inlet ABS solenoid valve (ON/OFF) status is displayed.
FR LH OUT SOL (ON/OFF)	–	x	x	Front left outlet ABS solenoid valve (ON/OFF) status is displayed.
RR RH IN SOL (ON/OFF)	–	x	x	Rear right inlet ABS solenoid valve (ON/OFF) status is displayed.
RR RH OUT SOL (ON/OFF)	–	x	x	Rear right outlet ABS solenoid valve (ON/OFF) status is displayed.
FR RH IN SOL (ON/OFF)	–	x	x	Front right inlet ABS solenoid valve (ON/OFF) status is displayed.
FR RH OUT SOL (ON/OFF)	–	x	x	Front right outlet ABS solenoid valve (ON/OFF) status is displayed.
RR LH IN SOL (ON/OFF)	–	x	x	Rear left inlet ABS solenoid valve (ON/OFF) status is displayed.
RR LH OUT SOL (ON/OFF)	–	x	x	Rear left outlet ABS solenoid valve (ON/OFF) status is displayed.
STOP LAMP SW (ON/OFF)	x	x	x	Stop lamp switch (ON/OFF) status is displayed.
MOTOR RELAY (ON/OFF)	–	x	x	ABS motor relay (ON/OFF) condition is displayed.
ACTUATOR REL (ON/OFF)	–	x	x	ABS actuator relay (ON/OFF) status is displayed.
ABS WARN LAMP (ON/OFF)	–	x	x	ABS warning lamp (ON/OFF) status is displayed.
OFF LAMP (ON/OFF)	–	x	x	VDC OFF indicator lamp (ON/OFF) status is displayed.

Item (Unit)	Monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
OFF SW (ON/OFF)	x	x	x	VDC OFF switch (ON/OFF) status is displayed.
SLIP LAMP (ON/OFF)	–	x	x	SLIP indicator lamp (ON/OFF) status is displayed.
BATTERY VOLT (V)	x	x	x	The voltage supplied to the VDC/ TCS/ABS control unit is displayed.
GEAR	x	x	x	The gear position determined from the A/T PNP switch signal is displayed.
SLCT LVR POSI (For A/T models)	x	x	x	Shift position determined from the A/T PNP switch signal is displayed.
YAW RATE SEN (d/s)	x	x	x	Yaw rate detected by the yaw rate sensor is displayed.
ACCEL POS SIG (%)	x	–	x	Throttle position status determined from the CAN communication signal is displayed.
SIDE G SENSOR (m/s^2)	x	–	x	Side G detected by the side G sensor is displayed.
STR ANGLE SIG (deg)	x	–	x	Steering angle detected by the steering angle sensor is displayed.
PRESS SENSOR (bar)	x	–	x	Brake hydraulic pressured detected by the pressure sensor is displayed.
ENGINE RPM (rpm)	x	–	x	The engine speed status determined from the CAN communication signal is displayed.
SNOW MODE SW (ON/OFF)	–	–	x	Snow mode switch (ON/OFF) status determined from the CAN communication signal is displayed.
BST OPER SIG (ON/OFF)	–	–	x	Control booster operation signal (ON/OFF) status determined from the CAN communication signal is displayed.
M - MODE SIG (ON/OFF)	–	–	x	M mode (ON/OFF) status determined from the CAN communication signal is displayed.
OD OFF SW (ON/OFF)	–	–	x	OD cancel switch (ON/OFF) status determined from the CAN communication signal is displayed.
EBD SIGNAL (ON/OFF)	–	–	x	EBD operation (ON/OFF) status is displayed.
ABS SIGNAL (ON/OFF)	–	–	x	ABS operation (ON/OFF) status is displayed.
TCS SIGNAL (ON/OFF)	–	–	x	TCS operation (ON/OFF) status is displayed.
VDC SIGNAL (ON/OFF)	–	–	x	VDC operation (ON/OFF) status is displayed.
EBD FAIL SIG (ON/OFF)	–	–	x	EBD fail-safe signal (ON/OFF) status is displayed.

Item (Unit)	Monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
ABS FAIL SIG (ON/OFF)	–	–	x	ABS fail-safe signal (ON/OFF) status is displayed.
TCS FAIL SIG (ON/OFF)	–	–	x	TCS fail-safe signal (ON/OFF) status is displayed.
VDC FAIL SIG (ON/OFF)	–	–	x	The VDC fail-safe signal (ON/OFF) status is displayed.
CRANKING SIG (ON/OFF)	–	–	x	Ignition switch START position signal input status is displayed.
ASCD SIGNAL (ON/OFF)	–	–	x	ASCD (ON/OFF) status is displayed.
FLUID LEV (ON/OFF)	x	–	x	Brake fluid level sensor (ON/OFF) status is displayed.
PARKING BRAKE SW (ON/OFF)	x	–	x	Parking brake switch (ON/OFF) status is displayed.
USV FL-RR (ON/OFF)	–	–	x	Primary side USV solenoid valve (ON/OFF) status is displayed.
USV FR-RL (ON/OFF)	–	–	x	Secondary side USV solenoid valve (ON/OFF) status is displayed.
HSV FL-RR (ON/OFF)	–	–	x	Primary side HSV solenoid valve (ON/OFF) status is displayed.
HSV FR-RL (ON/OFF)	–	–	x	Secondary side HSV solenoid valve (ON/OFF) status is displayed.
V/R OUTPUT (ON/OFF)	–	–	x	Valve relay operation signal (ON/OFF) status is displayed.
M/R OUTPUT (ON/OFF)	–	–	x	Monitor relay operation signal (ON/OFF) status is displayed.

×: Applicable
–: Not applicable

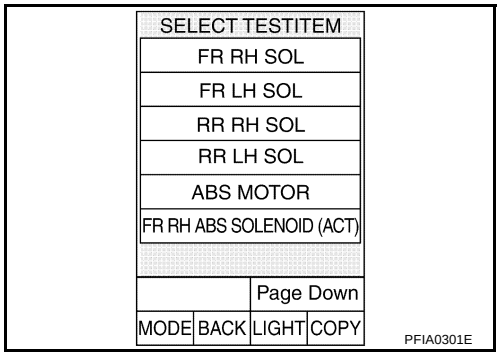
ACTIVE TEST

CAUTION:

- **Do not perform active test while driving.**
- **Make sure to completely bleed air from the brake system.**
- **The ABS and brake warning lamps turn on during the active test.**

Operation Procedure

1. Connect the CONSULT-II and CONVERTER to the data link connector and start the engine.
   CAUTION:
   If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.
2. Touch “START (NISSAN BASED VHCL) ” on the display screen.
3. Touch “ABS”.
   If “ABS” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .
4. Touch “ACTIVE TEST”.
5. The test item selection screen is displayed.
6. Touch necessary test item.



7. With the “MAIN ITEM” display shown in reverse, touch “START”.
8. The Active Test screen will be displayed, so conduct the following test.

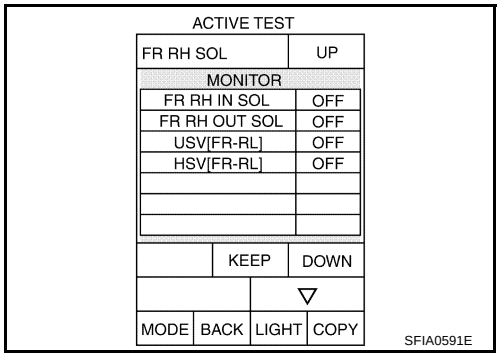
Test Item

Solenoid valve

CAUTION:

The example shown is for the front right wheel. The procedure for the other wheels is the same as given below.

- When conducting an active test of the ABS function, select the main item for each test item. In addition, when conducting an active test of the VDC/TCS function, select the item menu for each test item.
- For the ABS solenoid valve, touch “UP”, “KEEP”, “DOWN” on the display screen.
  For the ABS solenoid valve (ACT), touch “UP”, “ACT UP”, “ACT KEEP” and confirm that the solenoid valves (in, out, USV, HSV) operate as shown in the table below.



Operation	ABS solenoid valve			ABS solenoid valve (ACT)		
	UP	KEEP	DOWN	UP	ACT UP	ACT KEEP
IN ABS/VFR	OFF	ON	ON	OFF	OFF	OFF
OUT ABS S/VFR	OFF	OFF	ON*	OFF	OFF	OFF

Operation	ABS solenoid valve			ABS solenoid valve (ACT)		
	UP	KEEP	DOWN	UP	ACT UP	ACT KEEP
USV [FR - RL]	OFF	OFF	OFF	OFF	ON	ON
HSV [FR - RR]	OFF	OFF	OFF	OFF	ON*	OFF

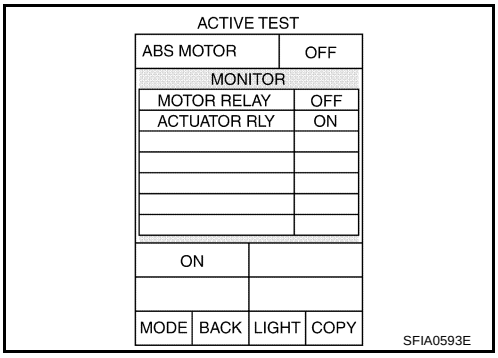
*: ON for 1 to 2 seconds after the touch, and then OFF

NOTE:
- When the active test is conducted while depressing the pedal, the pedal depression amount will change, but this is normal.
- Approximately 10 seconds after the operation is begun, “TEST STOP” will be displayed.
- To conduct a retest after “TEST STOP” is displayed, touch “BACK” and conduct the test from the step 6.

ABS Motor

Touch “ON”, “OFF” on the display screen and make sure the ABS motor relay is operating as shown in the table below.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON



NOTE:
- When the active test is conducted while depressing the pedal, the pedal depression amount will change, but this is normal.
- Approximately 10 seconds after the operation is begun, “TEST STOP” will be displayed.

Correct and Quick Diagnosis

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DIAGNOSIS PRECAUTIONS

- Before performing the trouble diagnosis, always read the general information (GI) to confirm the general precautions. Refer to GI-4, "General Precautions" .
- When replacing steering angle sensor, steering system components or suspension system components, and when adjusting the alignment, be sure to adjust the steering angle sensor neutral position before driving. Refer to BRC-89, "Adjustment of Steering Angle Sensor Neutral Position" .
- After completing service, always erase the self-diagnosis results. Refer to BRC-109, "SELF-DIAGNOSIS" .
- When inspection of the continuity or voltage between units is performed, check connector terminals for disconnection, looseness, bend, or collapse. If any non-standard condition is detected, repair or replace applicable part.
- Intermittent errors may be caused by a poor connection in the harness, connector, or terminal. Move harnesses, harness connectors, or terminals by hand to make sure all connections are solid and undamaged.
- If a circuit tester is used for the check, be careful not to forcibly extend any connector terminal.
- VDC/TCS/ABS is a system that uses electronic control to perform brake control and engine power control. Therefore, phenomena like those shown in the following table may occur, but this is because the system is working normally.

Symptom	Symptom description	Result
Motor operation noise	The is a motor operation sound inside VDC/TCS/ABS actuator, and sometimes there is a slight sound when VDC, TCS, or ABS operates.	Normal
	Just after the engine starts, the motor operating noise may be heard. This is a normal status of the system operation check.	
System operation check noise	When the engine is started, you may barely be able to hear a slight thudding sound from the engine room, but this sound is made by the system operation check and is normal.	Normal

Symptom	Symptom description	Result
TCS operation (SLIP indicator lamp ON)	TCS may be activated any time the vehicle suddenly accelerates, suddenly downshifts, or is driven on a road with a varying surface friction coefficient.	Normal Cancel the VDC/TCS function for the inspection on a chassis dynamometer.
	When inspecting the speedometer, etc., press VDC OFF switch to turn off TCS function before conducting the work.	
	When accelerator pedal is depressed on a chassis dynamometer (front wheel fixing type), the vehicle speed will not increase. This is normal, because TCS is activated by the stationary front wheels. The warning lamp may also turn on to show “sensor system error” in this case. This is not a malfunction either, because the stationary front wheels are detected. Restart engine, and drive the vehicle at 30 km/h (19 MPH) or higher to check that the warning lamp no longer turns on.	
ABS operation (longer stopping distance)	Stopping distance may be longer for vehicles with ABS when the vehicle drives on rough or snow-covered roads. Use lower speeds when driving on these kinds of roads.	Normal
Sluggish feel	Depending on road circumstances, the driver may have a sluggish feel. This is normal, because under TCS operation optimum traction has the highest priority (safety first). Sometimes the driver has a slight sluggish feel in response to substantial accelerator pedal operation.	Normal

ON and OFF Timing for ABS Warning Lamp, VDC OFF Indicator Lamp, SLIP Indicator Lamp, Brake Warning Lamp

×: ON –: OFF

Condition	ABS warning lamp	VDC OFF indicator lamp	SLIP indicator lamp	Brake warning lamp [Note 1]	Remarks
Ignition SW OFF.	–	–	–	—	—
Approx. Within 1 seconds after ignition SW is turned ON.	×	×	×	× [Note 1]	—
Approx. 1 seconds after ignition switch ON.	—	—	—	× [Note 1]	Turns OFF 2 seconds after engine starts.
VDC OFF SW is turned ON. (VDC function is OFF.)	—	×	—	—	—
VDC/TCS/ABS error.	×	×	—	—	There is a malfunction in VDC/TCS/ABS control unit, SLIP indicator lamp turns off (when the power supply or ground circuits return an error).
	×	×	×	—	—
When VDC/TCS is not functioning normally.	—	×	×	—	—
EBD error.	×	×	×	×	—

NOTE:

1. Brake warning lamp will turn on in case of operating parking brake (switch turned on) or of actuating brake fluid level switch (brake fluid is insufficient).

Basic Inspection

AFS000ZO

BASIC INSPECTION 1 BRAKE FLUID AMOUNT, LEAKS, AND BRAKE PADS INSPECTION

1. Check fluid level in the brake reservoir tank. If fluid level is low, refill the brake fluid.
2. Check the brake piping and around the VDC actuator for leaks. If there is leaking or oozing fluid, check the following items.
   - If VDC actuator connection is loose, tighten the piping to the specified torque and re-conduct the leak inspection to make sure there are no leaks.

- If there is damage to the connection flare nut or VDC actuator screw, replace the damaged part and re-conduct the leak inspection to make sure there are no leaks.
- When there is fluid leaking or oozing from a part other than VDC actuator connection, if the fluid is just oozing out, use a clean cloth to wipe off the oozing fluid and re-check for leaks. If fluid is still oozing out, replace the damaged part.
- When there is fluid leaking or oozing at VDC actuator, if the fluid is just oozing out, use a clean cloth to wipe off the oozing fluid and re-check for leaks. If fluid is still oozing out, replace the VDC actuator body.

CAUTION:
VDC actuator body cannot be disassembled.

3. Check the brake pad degree of wear. Refer to BR-26, "Removal and Installation of Brake Pad" or BR-32, "Removal and Installation of Brake Pad" in “Front Disc Brake” and BR-39, "Removal and Installation of Brake Pad" or BR-45, "Removal and Installation of Brake Pad" in “Rear Disc Brake”.

BASIC INSPECTION 2 POWER SYSTEM TERMINAL LOOSENESS AND BATTERY INSPECTION

Make sure the battery positive cable, negative cable and ground connection are not loose. In addition, check the battery voltage to make sure it has not dropped.

BASIC INSPECTION 3 ABS WARNING LAMP, VDC OFF INDICATOR LAMP, SLIP INDICATOR LAMP INSPECTION

1. Make sure ABS warning lamp, VDC OFF indicator lamp (when VDC OFF switch is OFF), and SLIP indicator lamp turns ON approximately 1 second when the ignition switch is turned ON. If they do not, check the VDC OFF indicator lamp and then VDC OFF switch. Refer to BRC-137, "VDC OFF SWITCH" . Check CAN communications. Refer to “CAN Communication Inspection”. If there are no errors with VDC OFF switch and CAN communication system, check combination meter. Refer to DI-4, "COMBINATION METERS" .
2. Make sure the lamp turns off approximately 1 second after the ignition switch is turned on. If the lamp does not turn off, conduct self-diagnosis.
3. With the engine running, make sure VDC OFF indicator lamp turns on and off when VDC OFF switch is turned on and off. If the indicator lamp status does not correspond to switch operation, check the VDC OFF switch system. Refer to BRC-137, "VDC OFF SWITCH" .
4. Make sure ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp turn off 2 seconds after the engine is started. If ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp have not turned off 10 seconds after the engine has been started, conduct self-diagnosis of the ABS actuator and electric unit.
5. After conducting the self-diagnosis, be sure to erase the error memory. Refer to BRC-108, "CONSULT-II Functions"

Inspection 1 Wheel Sensor System

AFS000ZP

INSPECTION PROCEDURE

After using the CONSULT-II SELF-DIAG RESULTS to determine the location of the malfunctioning wheel sensor, check all areas to determine the component to be replaced.

CAUTION:

- **Do not measure the resistance value and also voltage between the sensor terminal with tester etc., because the sensor is an active sensor.**
- **Do not expand the terminal of the connector with a/the tester terminal stick, when it does the inspection with the tester.**

1. TIRE INSPECTION

Check air pressure, wear, and size.

Are air pressure, wear, and size within the standard values?

YES >> GO TO 2.
NO >> Adjust air pressure, or replace tire.

2. SENSOR AND SENSOR ROTOR INSPECTION

- Check the condition of the sensor mount (for looseness, etc.).
- Check the surface of the front sensor rotor rubber for damage.
- Check the rear sensor rotor for damage.

OK or NG

OK >> GO TO 3.
NG >> Repair the sensor mount or replace the sensor rotor.

3. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
FR RH SENSOR-1,-2
FR LH SENSOR- 1,-2
RR RH SENSOR-1,-2
RR LH SENSOR-1,- 2

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 4.
NO >> Inspection End

4. CONNECTOR INSPECTION

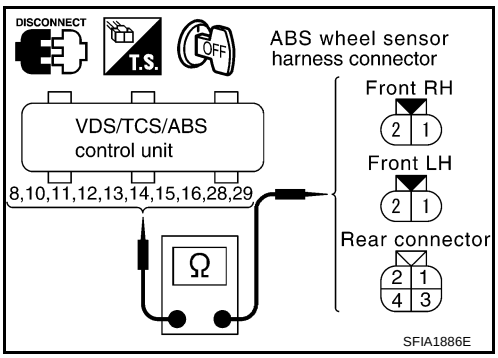
1. Disconnect VDC/TCS/ABS control unit connector and the malfunctioning wheel sensor connector E42 (FR - LH) or E27 (FR - RH) or T5 (RR - RH, LH). Check the terminal to see if it is deformed, disconnected, loose, etc., and replace it if any non-standard condition is found.
2. Reconnect the connectors, drive at a speed of approximately 30 km/h (19 MPH) or more for approximately 1minute, and conduct self-diagnosis.

OK or NG

OK >> The connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 5.

5. WHEEL SENSOR HARNESS INSPECTION

1. Turn ignition switch OFF and disconnect the wheel sensor connector E42 (FR - LH), E27 (FR - RH), T5 (RR - RH, LH) and VDC/TCS/ABS control unit connector.
2. Check the continuity between terminals. (Also check the continuity when the steering wheel is turned right and left and when the sensor harness inside the wheel well is moved.)



	Power system		Signal system		Ground system	
Wheel	VDC/TCS/ABS control unit (harness connector E118)	Wheel sensor (harness connector)	VDC/TCS/ABS control unit (harness connector E118)	Wheel sensor (harness connector)	VDC/TCS/ABS control unit (signal)	VDC/TCS/ABS control unit (ground)
Front RH	16 (B/R)	1 (B/R)	15 (LG/B)	2(LG/B)	16(B/R),15(LG/B)	28(B), 29(B)
Front LH	10 (G)	1 (G)	8 (G/Y)	2(G/Y)	10 (G), 8 (G/Y)	
Rear RH	12 (BR)	1 (BR/W)	11 (BR/W)	2(BR)	12 (BR), 11 (BR/W)	
Rear LH	14 (OR)	3 (OR)	13 (P)	4 (P)	14 (OR), 13 (P)	

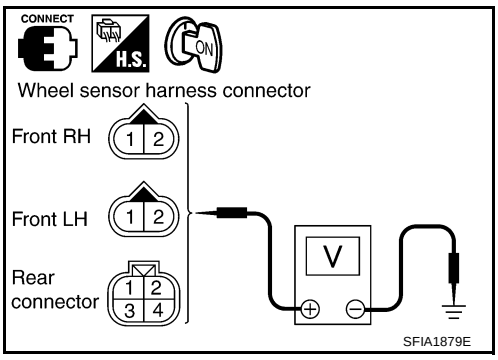
Power system : Continuity should exist.
Signal system : Continuity should exist.
Ground system : Continuity should not exist.

OK or NG

OK >> GO TO 6.
NG >> Repair harness and connector between control unit and wheel sensor.

6. WHEEL SENSOR POWER CIRCUIT INSPECTION

1. Connect the wheel sensor connector E42 (FR - LH), E27 (FR - RH), T5 (RR - RH, LH) and VDC/TCS/ABS control unit connector.
2. Turn on the ignition switch and check the voltage between the power terminal and the ground.



Voltage		
Front RH	1 (B/R) - Ground	: 8V or more
Front LH	1 (G) - Ground	: 8V or more
Rear RH	1 (BR/W) - Ground	: 8V or more
Rear LH	3 (OR) - Ground	: 8V or more

OK or NG

OK >> Replace wheel sensor.
NG >> Replace the VDC/TCS/ABS control unit.

Inspection 2 Engine System

AFS000ZQ

INSPECTION PROCEDURE

1. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
ENGINE SIGNAL 1
ENGINE SIGNAL 2
ENGINE SIGNAL 3
ENGINE SIGNAL 4
ENGINE SIGNAL 5
ENGINE SIGNAL 6

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> Inspection End

2. ENGINE SYSTEM INSPECTION

1. Conduct an ECM self-diagnosis and repair or replace any non-standard items. Re-conduct the ECM self-diagnosis.
2. Re-conduct the VDC/TCS/ABS control unit self-diagnosis.

OK or NG

OK >> Inspection End
NG >> Repair or replace any non-standard items. Re-conduct the self-diagnosis.

Inspection 3 VDC/TCS/ABS Control Unit 1

AFS000ZR

INSPECTION PROCEDURE

1. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
ABS CONTROLLER

Is the above displayed in the self-diagnosis display items?

YES >> Replace VDC/TCS/ABS control unit. Re-conduct the self-diagnosis.
NO >> Inspection End

Inspection 4 Pressure Sensor System

AFS000ZS

INSPECTION PROCEDURE

1. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
PRESS SEN SYSTEM

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> Inspection End

2. CONNECTOR INSPECTION

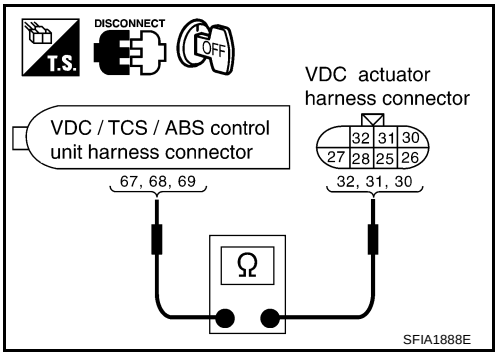
1. Disconnect pressure sensor connector E50 and VDC/TCS/ABS control unit connector, check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Reconnect the connectors and Re-conduct VDC/TCS/ABS control unit self-diagnosis.

OK or NG

OK >> The connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 3.

3. PRESSURE SENSOR HARNESS INSPECTION

1. Turn ignition switch OFF and disconnect Pressure sensor connector E50 and VDC/TCS/ABS control unit connector.
2. Check the continuity between VDC/TCS/ABS control unit connector and pressure sensor connector.



VDC/TCS/ABS control unit (Harness connector E118)	Pressure sensor (Harness connector E50)	Continuity
69 (P/B)	30 (P/B)	Continuity should exist.
68 (S/B)	31 (S/B)	Continuity should exist.
67 (G/B)	32 (G/B)	Continuity should exist.

OK or NG

OK >> GO TO 4.
NG >> If the open or short in harness, repair or replace the harness.

4. PRESSURE SENSOR INSPECTION

1. Connect pressure sensor and VDC/TCS/ABS control unit connectors.
2. Use “Data Monitor” to check the pressure sensor value.

Condition	Data monitor display
When brake pedal is depressed.	Positive value
When brake pedal is released.	Approx. 0 bar

OK or NG

OK >> Inspection End
NG >> If the pressure sensor is damaged or malfunctioning, replace the VDC actuator (pressure sensor it built in).

Inspection 5 Steering Angle Sensor System

AFS000ZT

INSPECTION PROCEDURE

1. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
Steering angle sensor system

Is the above displayed in the self-diagnosis item?

YES >> GO TO 2.
NO >> Inspection End

2. CONNECTOR INSPECTION

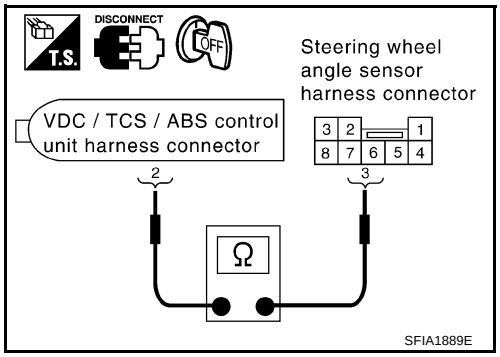
1. Disconnect the steering angle sensor connector and VDC/TCS/ABS control unit connector and check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Reconnect the connectors and Re-conduct a VDC/TCS/ABS control unit self-diagnosis.

OK or NG

OK >> The connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 3.

3. STEERING ANGLE SENSOR HARNESS INSPECTION

1. Check the CAN communication system. Refer to BRC-137, "Inspection 14 CAN Communication System" .
2. Turn ignition switch OFF and disconnect the steering angle sensor connector M22 and VDC/TCS/ABS control unit connector.
3. Check the continuity between VDC/TCS/ABS control unit connector terminal 2 (Y/R) and steering angle sensor connector terminal 3 (Y/R).



VDC/TCS/ABS control unit (Harness connector E118)	Steering angle sensor (Harness connector M22)	Continuity
2 (Y/R)	3 (Y/R)	Continuity should exist.

OK or NG

OK >> GO TO 4.
NG >> If the open or short in harness, repair or replace the harness.

4. DATA MONITOR CHECK

1. Connect the steering angle sensor and VDC/TCS/ABS control unit connectors.
2. Conduct “Data Monitor” of the “STEERING ANGLE SIGNAL” to check if the status is normal.

Steering condition	Data monitor
Straight-ahead	-5deg - +5deg
Turn wheel to the right by 90°.	Approx. + 90deg
Turn wheel to the left by 90°.	Approx. -90deg

OK or NG

OK >> Re-conduct the VDC/TCS/ABS control unit self-diagnosis.
NG >> Replace spiral cable (steering angle sensor) and adjust neutral position of steering angle sensor. Refer to BRC-89, "Adjustment of Steering Angle Sensor Neutral Position" .

Inspection 6 Yaw Rate Sensor /Side G Sensor System

AFS000ZU

CAUTION:
Sudden turns (such as spin turns, acceleration turns), drifting, etc. When VDC function is OFF (VDC SW ON) may cause the yaw rate/side G - sensor system indicate a problem. However this is not a problem if normal operation can be resumed after restarting the engine.

INSPECTION PROCEDURE

1. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
YAW RATE SENSOR
SIDE G SENSOR

CAUTION:
When on a turntable, such as at a parking structure entrance, or when on a moving object with the engine running, the VDC OFF indicator lamp might turn on and the self-diagnosis using the CONSULT-II the yaw rate sensor system might be displayed, but in this case there is no problem with the yaw rate sensor system. As soon as the vehicle leaves the turntable or moving object, restart the engine to return the system to normal.

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> Inspection End

2. CONNECTOR INSPECTION

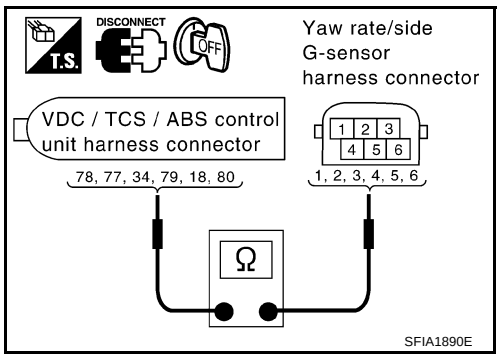
1. Disconnect yaw rate/side G sensor connector and VDC/TCS/ABS control unit connector and check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Reconnect the connectors and Re-conduct a VDC/TCS/ABS control unit self-diagnosis.

OK or NG

OK >> The connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 3.

3. YAW RATE SENSOR/SIDE G SENSOR HARNESS INSPECTION

1. Turn ignition switch OFF and disconnect yaw rate sensor/side G sensor connector and VDC/TCS/ABS control unit connector.
2. Check the continuity between the VDC/TCS/ABS control unit vehicle side connector and the yaw rate/side G sensor vehicle side connector.



VDC/TCS/ABS control unit (Harness connector E118)	Yaw rate/side G sensor (Harness connector M51)	Continuity
18 (LG)	5 (LG)	Continuity should exist.
34 (W/B)	3 (OR)	Continuity should exist.
77 (Y/B)	2 (Y/B)	Continuity should exist.
78 (L/R)	1 (L/B)	Continuity should exist.
79 (GY/L)	4 (LG/R)	Continuity should exist.
80 (W/R)	6 (W/R)	Continuity should exist.

OK or NG

OK >> GO TO 4.
NG >> If the open or short in harness, repair or replace the harness.

4. YAW RATE SENSOR/SIDE G SENSOR INSPECTION

1. Connect the yaw rate sensor/side G sensor and VDC/TCS/ABS control unit connectors.
2. Use “Data Monitor” to check if the yaw rate sensor/side G sensor are normal.

Vehicle status	Yaw rate sensor (Data monitor standard)	Side G sensor (Data monitor standard)
When stopped	- 4 to +4deg/s	- 1.1 to +1.1 m/s^2
Right turn	Negative value	Negative value
Left turn	Positive value	Positive value

OK or NG

OK >> Inspection End
NG >> Replace the malfunctioning yaw rate sensor/side G sensor, and then re-conduct the VDC/TCS/ABS control unit self-diagnosis.

Inspection 7 Solenoid and VDC Change-Over Valve System

AFS000ZV

INSPECTION PROCEDURE

1. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
FR LH IN ABS SOL
FR LH OUT ABS SOL
RR RH IN ABS SOL
RR RH OUT ABS SOL
FR RH IN ABS SOL
FR RH OUT ABS SOL
RR LH IN ABS SOL
RR LH OUT ABS SOL
Primary side USV circuit
Secondary side USV circuit
Primary side HSV circuit
Secondary side HSV circuit

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> Inspection End

2. CONNECTOR INSPECTION

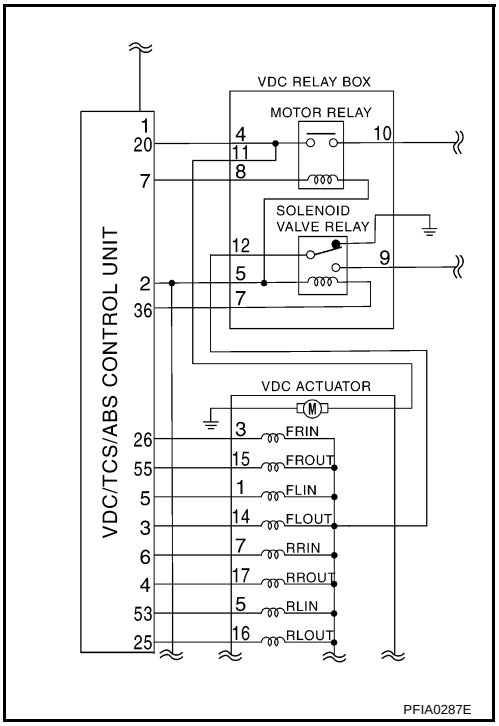
1. Disconnect the VDC/TCS/ABS control unit connector and solenoid connector E49, E50 and check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connectors and conduct self-diagnosis.

OK or NG

OK >> The connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 3.

3. SOLENOID INPUT SIGNAL INSPECTION

1. Turn ignition switch OFF and disconnect the VDC/TCS/ABS control unit connector.
2. Check the resistance between the VDC/TCS/ABS control unit connector and the ground.



VDC/TCS/ABS control unit (Harness connector E118)	Body ground	Resistance value
26 (W/G)	—	6.0 - 11Ω
5 (G/OR)	—	6.0 - 11Ω
6 (PU/W)	—	6.0 - 11Ω
53 (R/W)	—	6.0 - 11Ω
55 (R/Y)	—	3.0 - 5.0Ω
3 (Y/G)	—	3.0 - 5.0Ω
4 (GY/R)	—	3.0 - 5.0Ω
25 (L/W)	—	3.0 - 5.0Ω
49(B/W)	—	6.0 - 11Ω
50(R)	—	6.0 - 11Ω
54(W/L)	—	3.0 - 5.0Ω
52(R/L)	—	3.0 - 5.0Ω

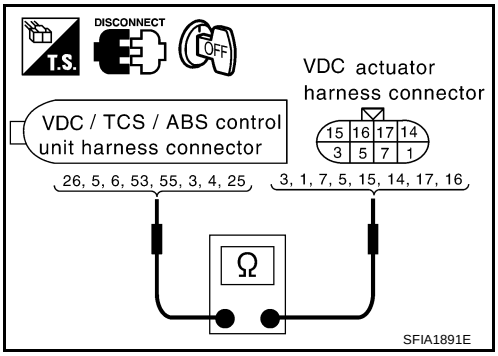
OK or NG

OK >> Check the VDC/TCS/ABS control unit power system. Refer to BRC-134, "Inspection 11 VDC/TCS/ABS Control Unit Power and Ground Systems" .

NG >> GO TO 4.

4. SOLENOID HARNESS INSPECTION

1. Disconnect VDC actuator connector.
2. Check the continuity between the VDC/TCS/ABS control unit connector and the VDC actuator connector.



VDC/TCS/ABS control unit (Harness connector E118)	VDC actuator (Harness connector E49)	Continuity
26 (W/G)	3 (W/G)	Continuity should exist.
5 (G/OR)	1 (G/OR)	Continuity should exist.
6 (PU/W)	7 (PU/W)	Continuity should exist.
53 (R/W)	5 (R/W)	Continuity should exist.
55 (R/Y)	15 (R/Y)	Continuity should exist.
3 (Y/G)	14 (Y/G)	Continuity should exist.
4 (GY/R)	17 (GY/R)	Continuity should exist.
25 (L/W)	16 (L/W)	Continuity should exist.
49(B/W)	26(B/W)	Continuity should exist.
50(R)	25(R)	Continuity should exist.
54(W/L)	28(W/L)	Continuity should exist.
52(R/L)	27(R/L)	Continuity should exist.

OK or NG

OK >> Replace VDC/TCS/ABS actuator assembly.
NG >> Open or short in harness. Repair or replace the harness.

Inspection 8 ABS Motor and Motor Relay System

AFS000ZW

INSPECTION PROCEDURE

1. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
Pump motor, motor relay system

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> Inspection End

2. CONNECTOR INSPECTION

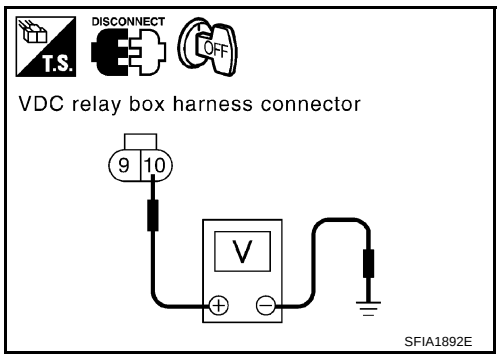
1. Disconnect the relay box connector E47, E48, E222 and VDC/TCS/ABS control unit connector and check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connectors and conduct self-diagnosis.

OK or NG

OK >> The connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 3.

3. ABS MOTOR AND MOTOR RELAY POWER SYSTEM INSPECTION

1. Disconnect the VDC relay box connectors E48.
2. Check the voltage between the VDC relay box connector and the ground.



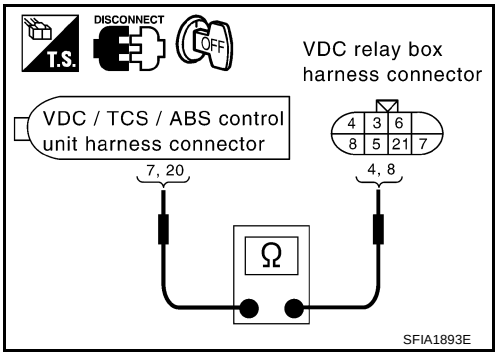
VDC relay box (Harness connector E48)	Body ground	Voltage
10 (W/R)	—	Battery voltage (approx. 12V)

OK or NG

OK >> GO TO 4.
NG >> The circuit between the battery and the VDC relay box terminal 9 is open or shorted. Repair the circuit.

4. ABS MOTOR AND MOTOR RELAY HARNESS INSPECTION

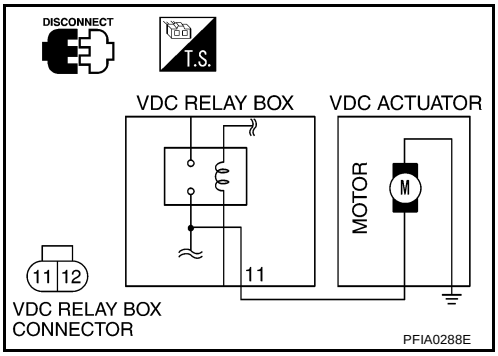
1. Turn ignition switch OFF and disconnect the VDC/TCS/ABS control unit connector and VDC relay box connector E47.
2. Check the continuity between the VDC/TCS/ABS control unit connector and the VDC relay box vehicle side connector.



VDC/TCS/ABS control unit (Harness connector E118)	VDC relay box (Harness connector E47)	Continuity
20 (R/B)	4 (R/B)	Continuity should exist.
7 (G/W)	8 (G/W)	Continuity should exist.

3. Check if the actuator motor operates when a 12V voltage is applied to the VDC relay box connector E222 terminal 12.

CAUTION:
Operate the actuator motor for 4 seconds or less to prevent heat generation.



OK or NG

OK >> GO TO 5.
NG >> The actuator motor or actuator motor circuit open or short in harness. Repair or replace the actuator motor or actuator motor circuit harness.

5. ABS MOTOR RELAY INSPECTION

ABS motor relay independent inspection. Refer toBRC-138, "ABS MOTOR RELAY AND ACTUATOR RELAY"
.

OK or NG

OK >> Replace VDC actuator assembly.
NG >> Replace the VDC relay box.

Inspection 9 Actuator Relay System

AFS000ZX

INSPECTION PROCEDURE

1. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
Actuator relay circuit

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> Inspection End

2. CONNECTOR INSPECTION

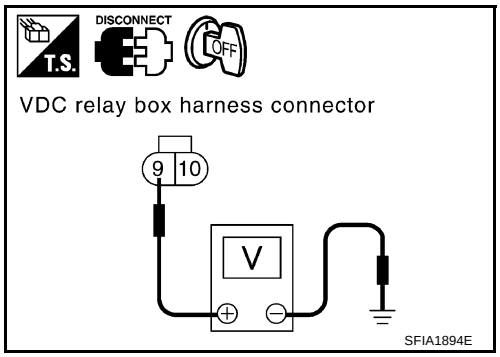
1. Disconnect the relay box connector E47, E48, E222 and VDC/TCS/ABS control unit connector and check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connectors and Re-conduct self-diagnosis.

OK or NG

OK >> The connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 3.

3. ACTUATOR RELAY POWER SYSTEM INSPECTION

1. Turn ignition switch OFF and disconnect the VDC relay box connector E48.
2. Check the voltage between the VDC relay box connector and the ground.



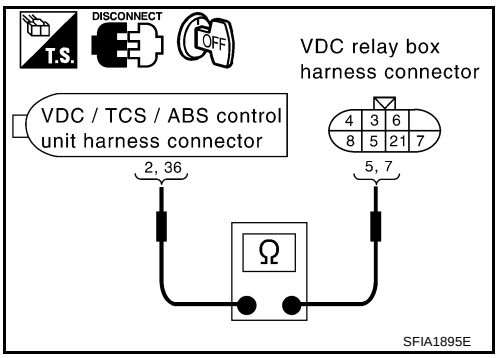
VDC relay box (Harness Connector E48)	Body ground	Voltage
9 (R/B)	—	Battery voltage (approx. 12V)

OK or NG

OK >> GO TO 4.
NG >> The circuit between the battery and VDC relay box harness connector E48 terminal 9 is open or shorted. Repair the circuit.

4. ACTUATOR RELAY HARNESS INSPECTION

1. Disconnect the VDC/TCS/ABS control unit connector E47.
2. Check the continuity between the VDC/TCS/ABS control unit connector E118 and the VDC relay box connector E47.



VDC/TCS/ABS control unit (Harness connector E118)	VDC relay box (Harness connector E47)	Continuity
2 (Y/R)	5 (Y/R)	Continuity should exist.
36 (Y)	7 (Y)	Continuity should exist.

OK or NG

OK >> GO TO 5.
NG >> Open or short in harness. Repair or replace the harness.

5. ACTUATOR RELAY INSPECTION

Independently check the VDC actuator relay. Refer to BRC-138, "ABS MOTOR RELAY AND ACTUATOR RELAY" .

OK or NG

OK >> Replace VDC actuator assembly.
NG >> Replace the VDC relay box.

Inspection 10 Stop Lamp Switch System

AFS000ZY

INSPECTION PROCEDURE

1. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
STOP LAMP SW

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> Inspection End

2. CONNECTOR INSPECTION

1. Disconnect the stop lamp switch connector and VDC/TCS/ABS control unit connector and check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connectors.
3. Start engine.
4. Repeat pumping brake pedal carefully several times, then perform self-diagnosis again.

OK or NG

OK >> The connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 3.

3. STOP LAMP SWITCH INSPECTION

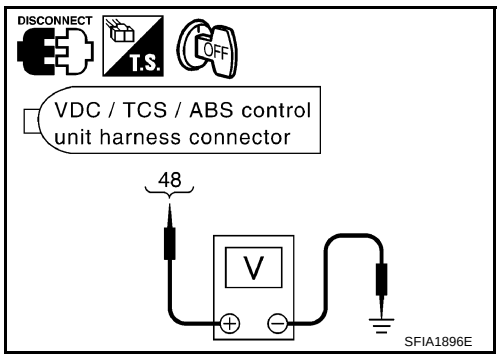
1. Turn ignition switch OFF and disconnect the VDC/TCS/ABS control unit connector.
2. Check the voltage between the VDC/TCS/ABS control unit connector E118 terminal 48 (P/L) and the ground.

48 (P/L) - Ground

Brake pedal depressed:

Battery voltage (approx. 12V)

Brake pedal not depressed : Approx. 0V



OK or NG

OK >> Connect the connectors and conduct a VDC/TCS/ABS control unit self-diagnosis.
NG >> Open or short in harness. Repair or replace the harness.

Inspection 11 VDC/TCS/ABS Control Unit Power and Ground Systems

AFS000ZZ

INSPECTION PROCEDURE

1. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
LOW POWER VOLTAGE

Is the above displayed in the self-diagnosis item?

YES >> GO TO 2.
NO >> Inspection End

2. CONNECTOR INSPECTION

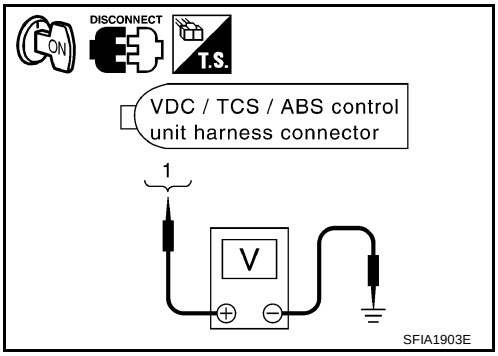
1. Disconnect the VDC/TCS/ABS control unit connector and check the terminal for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connector and Re-conduct self-diagnosis.

OK or NG

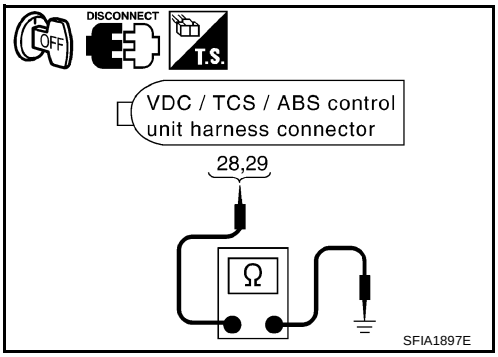
OK >> The connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 3.

3. VDC/TCS/ABS CONTROL UNIT POWER AND GROUND CIRCUIT INSPECTION

1. Disconnect VDC/TCS/ABS control unit connector.
2. With the ignition switch turned on and off, check the voltage and continuity between the VDC/TCS/ABS control unit connector E118 and the ground.



Signal name	VDC/TCS/ABS control unit (Harness connector E118)	Ground	Measured value
Power supply	1 (G/R)	—	Battery voltage (Approx. 12V)



Signal name	VDC/TCS/ABS control unit (Harness connector E118)	Ground	Measured value
Ground	28 (B)	—	Continuity should exist.
	29 (B)	—	Continuity should exist.

OK or NG

OK >> Check the battery (terminal looseness, low voltage, etc.) For any non-standard condition. If any non-standard condition exists, recharge or replace the battery as necessary.

NG >> The corresponding harness circuit is open or shorted. Repair the circuit.

Inspection 12 VDC/TCS/ABS Control Unit 2

AFS00100

INSPECTION PROCEDURE

1. SELF-DIAGNOSIS RESULT CHECK

Check self-diagnosis results.

Self-diagnosis results
EMERGENCY BRAKE

When any item other than “emergency brake” is indicated in self-diagnosis display, follow the instructions below.

CAUTION:

“Emergency brake” is indicated when control unit itself is detected as an error. If this display item is indicated, replace control unit.

Is the above displayed in the self-diagnosis display items?

YES >> Replace the VDC/TCS/ABS control unit and re-conduct the self-diagnosis.
NO >> Inspection End

Inspection 13 Brake Fluid Level Sensor System

AFS00101

INSPECTION PROCEDURE

1. SELF-DIAGNOSIS RESULT CHECK

1. Check the brake reservoir tank fluid level. If the level is low, add brake fluid.
2. Erase the self-diagnosis results and check the self-diagnosis results.

Self-diagnosis results
Brake fluid level switch

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> Inspection End

2. CONNECTOR INSPECTION

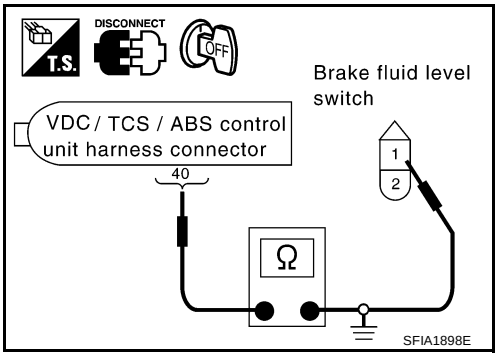
1. Disconnect the brake fluid level sensor connector and VDC/TCS/ABS control unit connector and check the terminal for deformation, disconnection, looseness, and so on. If there is any non-standard condition, repair or replace the terminal.
2. Securely reconnect the connectors and Re-conduct self-diagnosis.

OK or NG

OK >> The connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 3.

3. CHECK THE HARNESS BETWEEN THE BRAKE FLUID LEVEL SENSOR AND THE VDC/TCS/ABS CONTROL UNIT

1. Turn ignition switch OFF and disconnect the brake fluid level sensor connector, VDC/TCS/ABS control unit, connectors.
2. Check the continuity between the brake fluid level sensor connector E44 and the VDC/TCS/ABS control unit connector E118.



VDC/TCS/ABS control unit (Harness connector E118)	Brake fluid level switch (Harness connector E44)	Continuity
40 (W)	1 (W)	Continuity should exist.
40 (W)	Ground	Continuity should not exist.
Ground	2 (B)	continuity should exist.

OK or NG

OK >> Connect the connectors and conduct a VDC/TCS/ABS control unit self-diagnosis.
NG >> If the open or short in harness, repair or replace the harness.

Inspection 14 CAN Communication System

AFS00102

1. CHECK CONNECTOR

1. Turn ignition switch OFF, disconnect the VDC/TCS/ABS control unit connector, and check the terminal for deformation, disconnection, looseness, and so on. If there is a malfunction, repair or replace the terminal.
2. Reconnect connector to perform self-diagnosis.

Is “CAN COMM CIRCUIT” displayed in the self-diagnosis display items?

YES >> Print out the self-diagnostic results, and refer to LAN-3, "Precautions When Using CONSULT-II" .
NO >> Connector terminal connection is loose, damaged, open, or shorted.

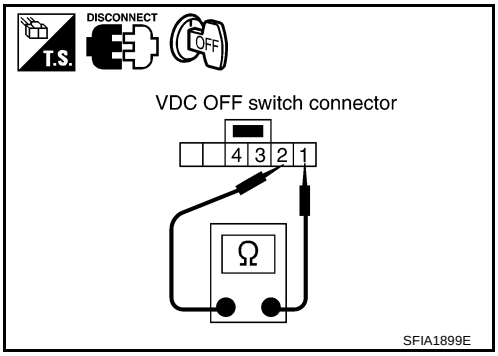
Component Inspection

AFS00103

VDC OFF SWITCH

- Turn ignition switch OFF, and disconnect the VDC OFF switch connector M9, and check the continuity between terminals 1 (L/Y) and 2.

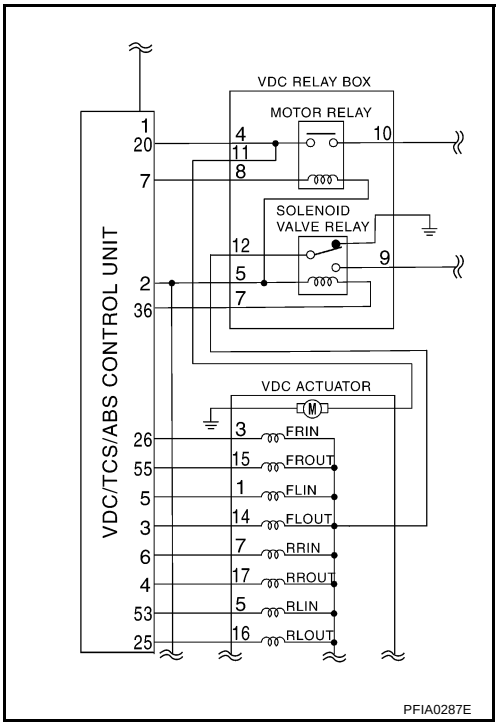
1 - 2 :Continuity should exist when pushing the switch.
continuity should not exist when releasing the switch.



ABS MOTOR RELAY AND ACTUATOR RELAY

- Turn ignition switch OFF and disconnect the VDC relay box connector E47, E48, E222.
- Apply a voltage of 12V between the ABS motor relay terminal 8 (G/W) and the actuator relay terminal 7 (Y/R) and then check the continuity between the following terminals.

ABS motor relay	Between terminal 4 to 10	Continuity should exist.
Actuator relay	Between terminal 9 to 12	Continuity should exist.



VDC/TCS/ABS ACTUATOR

Actuator Operation Inspection

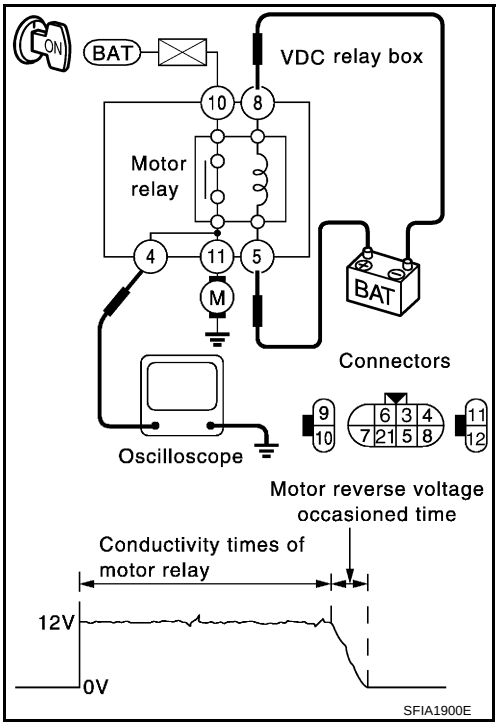
1. Turn ignition switch ON, apply a voltage of 12V between the relay box terminal 5 and 8, use an oscilloscope to measure the motor voltage at this time (between terminal 11 and the ground), and check the motor reverse voltage occurrence time when operation is stopped.

Motor counter-electromotive force duration:

0.1 second or more

CAUTION:

- **The above check should be performed after motor relay unit inspection to make sure relay operates normally.**
- **To prevent overheating, do not drive actuator motor more than 4 seconds.**
- **The motor reverse voltage occurrence time is standard when the battery voltage is 12V and the air temperature is 20°C (68°F), and this time is a little shorter when the battery voltage is low or the air temperature is low.**



Symptom 1 Excessive ABS Function Operation Frequency

AFS00104

1. INSPECTION START

Check brake force distribution.

OK or NG

OK >> GO TO 2.
NG >> Check brake system

2. FRONT AND REAR AXLE INSPECTION

Make sure there is no excessive play in the front and rear axles.

OK or NG

OK >> GO TO 3.
NG >> Repair.

3. WHEEL SENSOR INSPECTION

Wheel Sensor Inspection

- Sensor mount and damage inspection
- Sensor rotor mount and damage inspection
- Sensor connector connection inspection
- Sensor harness inspection

OK or NG

OK >> GO TO 4.
NG >> Sensor or sensor rotor replacement

4. ABS WARNING LAMP DISPLAY CHECK

Make sure the warning lamp turns off approximately 1 sec. After the ignition switch is turned on or when driving.

OK or NG

OK >> Normal
NG >> Perform self-diagnosis. Refer to BRC-109, "SELF-DIAGNOSIS" .

Symptom 2 Unexpected Pedal Reaction

AFS00105

1. BRAKE PEDAL STROKE INSPECTION

Check brake pedal stroke.

Is the stroke too big?

YES >>
- Bleed air from the brake piping.
- Check the brake pedal, brake booster, and master cylinder mount for play, looseness, and brake system for fluid leaks, etc. If any malfunctions are found, make repair.

NO >> GO TO 2.

2. PERFORMANCE CHECK

Disconnect the VDC/TCS/ABS control unit connector and make sure the braking force is sufficient when the ABS in not operating. After the inspection, reconnect the connector.

OK or NG

OK >> GO TO 3. Refer to BRC-138, "Symptom 1 Excessive ABS Function Operation Frequency" .
NG >> Check brake system.

Symptom 3 The Braking Distance Is Long

AFS00106

CAUTION:
On slippery road surfaces, the stopping distance might be longer with the ABS operating than when the ABS is not operating.

1. PERFORMANCE CHECK

Disconnect VDC/TCS/ABS control unit connector to deactivate ABS. In this condition, check stopping distance. After inspection, connect connector.

OK or NG

OK >>
- Bleed air from the brake piping.
- Check brake system.

NG >> GO TO 3. Refer to BRC-138, "Symptom 1 Excessive ABS Function Operation Frequency" .

Symptom 4 The ABS Function Does Not Operate

AFS00107

CAUTION:

The ABS does not operate when the speed is 10 km/h (6 MPH) or less.

1. ABS WARNING LAMP DISPLAY CHECK

Make sure the warning lamp turns off approximately 1 second after the ignition switch is turned on or when driving.

OK or NG

OK >> GO TO 3. Wheel Sensor Inspection in BRC-138, "Symptom 1 Excessive ABS Function Operation Frequency" .

NG >> Perform self-diagnosis. Refer to BRC-108, "CONSULT-II Functions" .

Symptom 5 Pedal Vibration or ABS Operation Sound Occurs

AFS00108

CAUTION:
Under the following conditions, when brake pedal is lightly depressed (just place a foot on it), ABS is activated and vibration is felt. However, this is normal.

- **When shifting gears**
- **When driving on slippery road**
- **During cornering at high speed**
- **When passing over bumps or grooves [50 mm (1.97 in) or more]**
- **When pulling away just after starting engine (at approximately 10 km/h (6MPH) or higher)**

1. SYMPTOM CHECK 1

Check if pedal vibration or operation sound occurs when the engine is started.

OK or NG

OK >> GO TO 2.
NG >> Perform self-diagnosis. Refer to BRC-109, "SELF-DIAGNOSIS" .

2. SYMPTOM CHECK 2

Check the symptom when electrical component (headlamps, etc.) Switches are operated.

Does the symptom occur when the electrical component (head lamp, etc.) Switches are operated?

YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit (or its wiring), and if there is, move it farther away.
NO >> GO TO 3. Wheel Sensor Inspection in BRC-138, "Symptom 1 Excessive ABS Function Operation Frequency" .

Symptom 6 Vehicle Jerks During VDC/TCS/ABS Control

AFS00109

1. ENGINE SPEED SIGNAL INSPECTION

Conduct CONSULT-II VDC/TCS/ABS control unit “Data Monitor”.

Is engine speed at idle 400 rpm or higher?

YES >> GO TO 3.
NO >> GO TO 2.

2. ECM SELF-DIAGNOSIS RESULT ITEM CHECK

Perform ECM self-diagnosis.

Are self-diagnosis items displayed?

YES >> Check the corresponding items. Refer to EC-72, "TROUBLE DIAGNOSIS" in “Engine Control (EC section)”.
NO >> GO TO 3.

3. SYMPTOM CHECK 1

Check if the vehicle jerks during VDC/TCS/ABS control.

OK or NG

OK >> Inspection End
NG >> GO TO 4.

4. A/T SELF-DIAGNOSIS RESULTS ITEM CHECK

Perform A/T self-diagnosis.

OK or NG

OK >> GO TO 5.
NG >> Check the corresponding items. Refer to AT-41, "TROUBLE DIAGNOSIS" in “A/T”.

5. SYMPTOM CHECK 2

Check if the vehicle jerks during VDC/TCS/ABS control.

OK or NG

OK >> Inspection End
NG >> GO TO 6.

6. SELF-DIAGNOSIS RESULT ITEM INSPECTION 1

Conduct self-diagnosis of the VDC/TCS/ABS control unit.

Are self-diagnosis items displayed?

YES >> Check the corresponding items, make repairs, and re-conduct the VDC/TCS/ABS control unit self-diagnosis.
NO >> GO TO 7.

7. CONNECTOR INSPECTION

1. Disconnect the VDC/TCS/ABS control unit and the ECM connectors, check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the connector.
2. Securely reconnect the connector and conduct self-diagnosis.

OK or NG

OK >> If the connector terminal contact is loose, damaged, open or shorted, repair or replace the connector terminal.
NG >> GO TO 8.

8. SELF-DIAGNOSIS RESULT ITEM INSPECTION 2

Re-conduct the VDC/TCS/ABS control unit self-diagnosis.

Are self-diagnosis items displayed?

YES >> Repair or replace any non-standard items.
NO >> GO TO 9.

9. INSPECTION OF CIRCUIT BETWEEN VDC/TCS/ABS CONTROL UNIT AND THE ECM

Check the CAN communication system. Refer to BRC-137, "Inspection 14 CAN Communication System" .

OK or NG

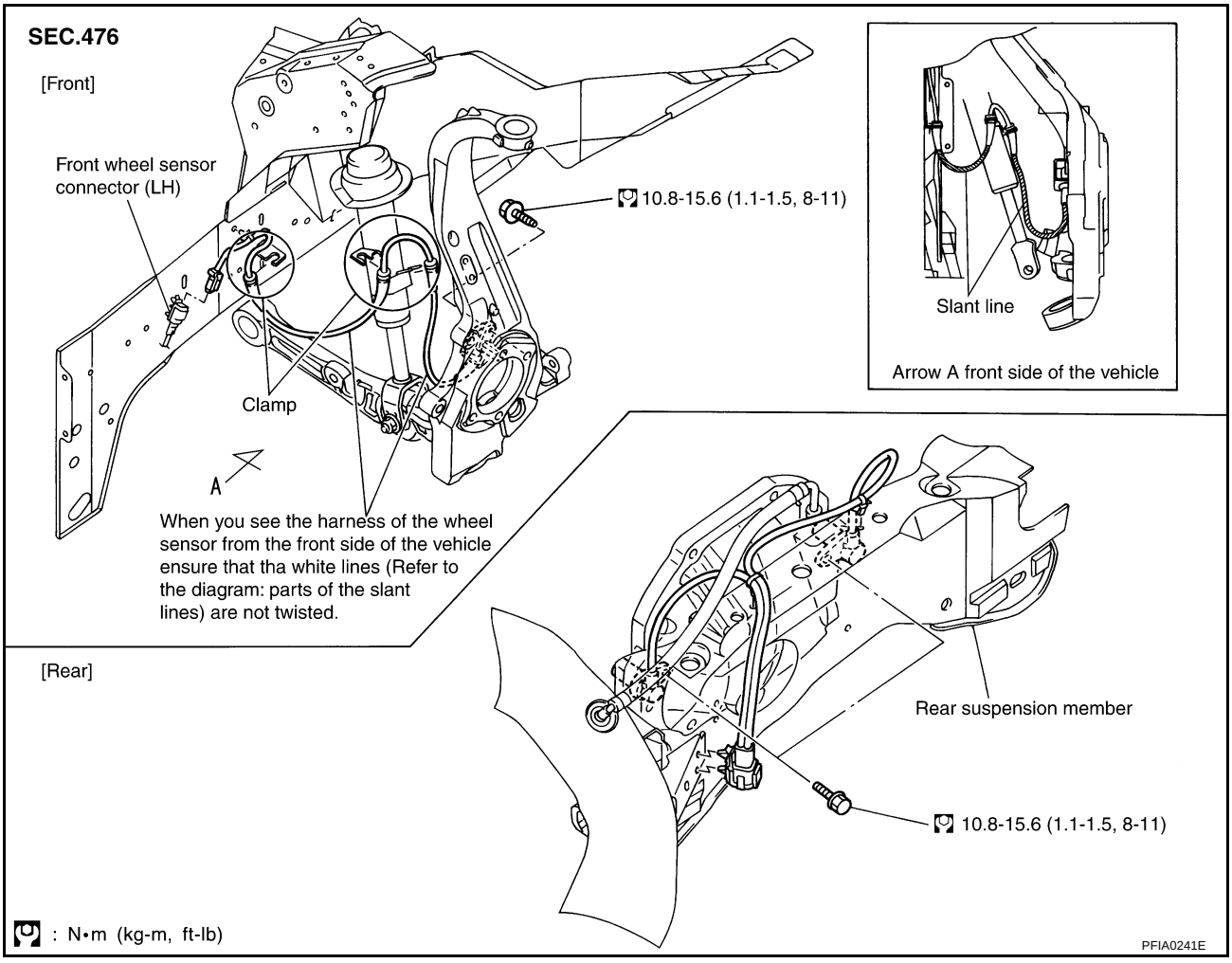
OK >> Inspection End
NG >> Connect the connectors, and re-conduct the VDC/TCS/ABS control unit self-diagnosis.

WHEEL SENSORS

PFP:47910

Removal and Installation

AFS0010O



REMOVAL

Pay attention to the following when removing sensor.

CAUTION:

- **As much as possible, avoid rotating sensor when removing it. Pull sensors out without pulling on sensor harness.**
- **Take care to avoid damaging sensor edges or rotor teeth. Remove wheel sensor first before removing front or rear wheel hub. This is to avoid damage to sensor wiring and loss of sensor function.**

INSTALLATION

Pay attention to the following when installing sensor. Tighten installation bolts and nuts to specified torques.

- When installing, check that there is no foreign material such as iron chips on pick-up and mounting hole of the sensor. Check that no foreign material has been caught in the sensor rotor motor. Remove any foreign material and clean the mount.
- When installing front sensor, be sure to press rubber grommets in until they lock at the three locations shown in diagram (2 at shock absorbers and 1 at body panel). When installed, harness must not be twisted. White line on harness (shaded part) must be visible from front.

VDC/TCS/ABS CONTROL UNIT

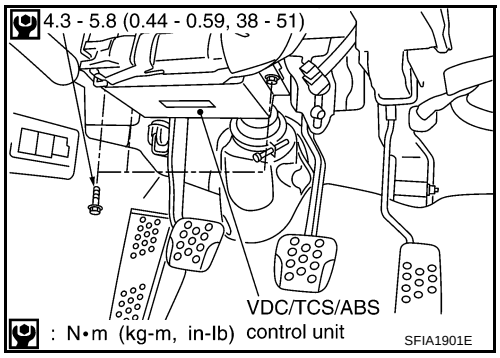
PFP:47660

Removal and Installation

AFS000BP

REMOVAL

1. Remove driver-side lower instrument panel. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove VDC/TCS/ABS control unit.



INSTALLATION

Install in the reverse order of removal.

SENSOR ROTOR

PFP:47970

Removal and Installation

AFS0011W

REMOVAL

Front

Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-4, "Removal and Installation" in “Front Axle/Drive Shaft” in “FAX” section.

Rear

- Follow procedure below to remove rear sensor rotor.
  - Remove side flange. Refer to RFD-8, "SIDE OIL SEAL" in “Rear Final Drive” in “RFD” section.
  - Using a bearing replacer (special service tool) and puller (commercial service tool), remove sensor rotor from the companion flange.

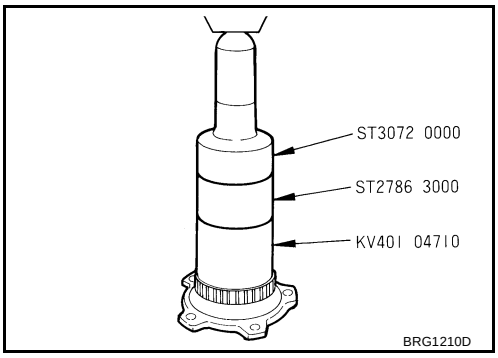
INSTALLATION

Front

Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-4, "Removal and Installation" in “Front Axle/Drive Shaft” in “FAX” section.

Rear

- Follow procedure below to install rear sensor rotor.
  - Using a drift (special service tool), press rear sensor rotor onto the side flange.
  - Install side flange. Refer to RFD-8, "SIDE OIL SEAL" in “Rear Final Drive” in “RFD” section.

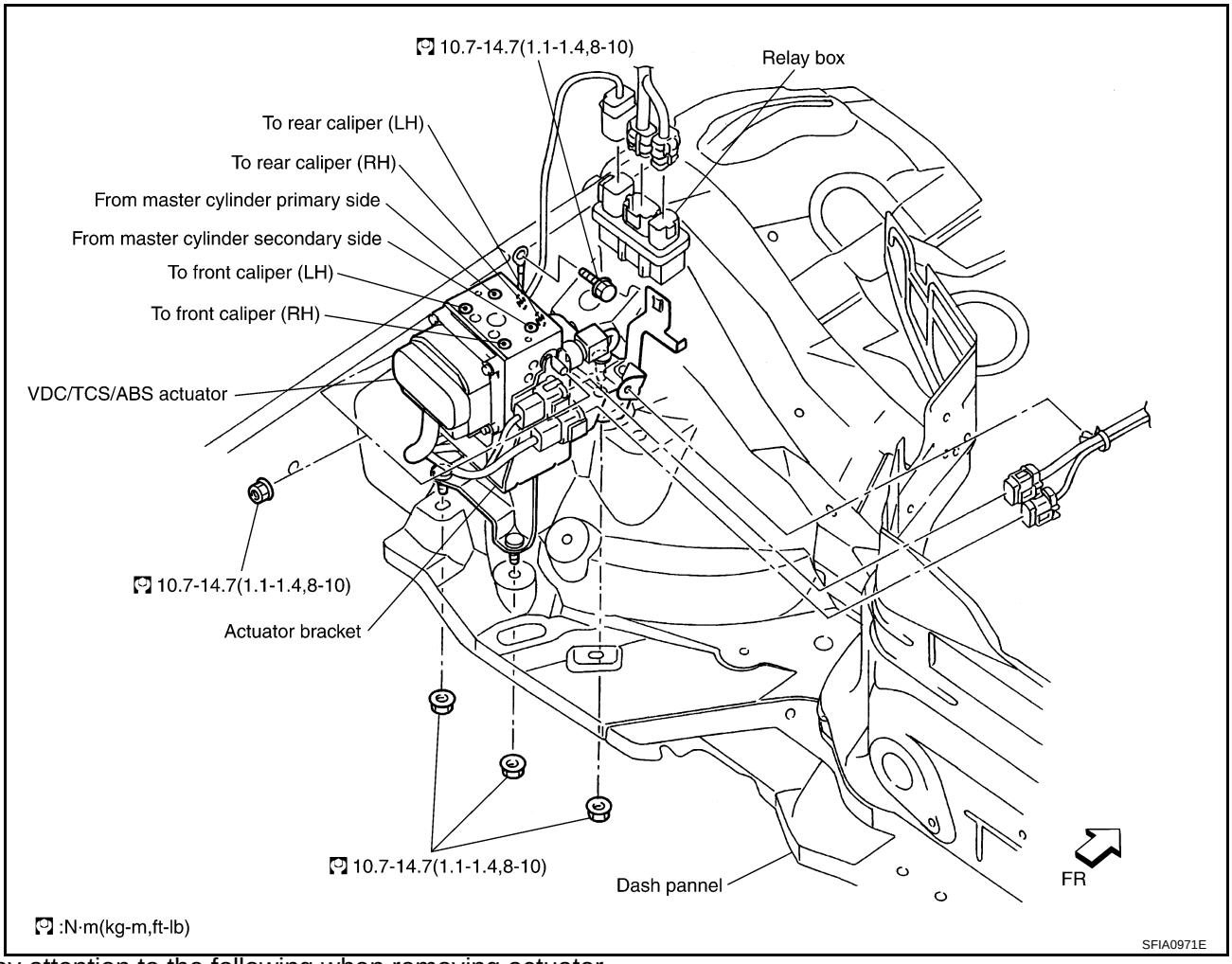


VDC/TCS/ABS ACTUATOR

PFP:47660

Removal and Installation

AFS000BR



Pay attention to the following when removing actuator.

CAUTION:

- **Before servicing, disconnect battery cables.**
- **To remove brake tube, use flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut wrench (commercial service tool).**
- **Do not remove and install actuator by holding harness.**
- **After work is completed, bleed air from brake piping. Refer to BR-10, "Bleeding Brake System" .**
- **Be sure to securely connect the ground cable.**

G SENSOR

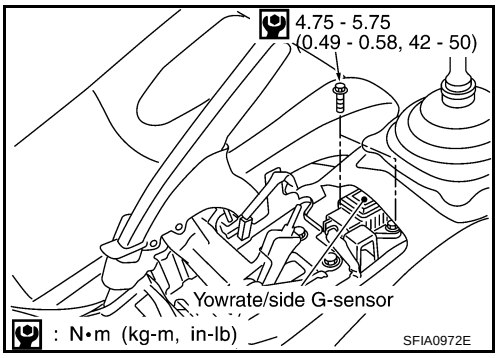
PFP:47930

Removal and Installation

AFS000BS

REMOVAL

1. Install center console. Refer to IP-16, "CENTER CONSOLE" .
2. Remove harness connector.
3. Remove installation bolts. Remove yaw rate/side G-sensor.



CAUTION:

- **Do not drop or strike the yaw rate/side G-sensor, because it has little endurance to impact.**
- **Do not use power tool etc., because Yaw rate / Side G sensor is weak for the impact.**

INSTALLATION

To install, follow procedure for removal in reverse order.

CAUTION:

- **Do not drop or strike the yaw rate/side G-sensor, because it has little endurance to impact.**

STEERING ANGLE SENSOR

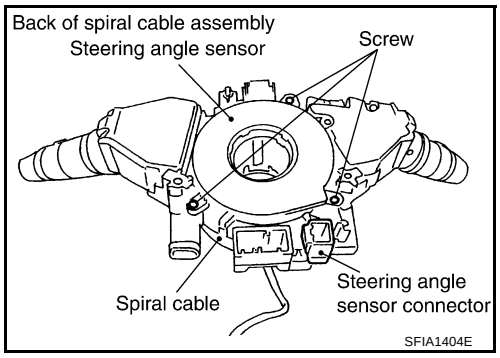
PFP:25554

Removal and Installation

AFS0026D

REMOVAL

1. Remove spiral cable assembly. Refer to SRS-43, "SPIRAL CABLE" .
2. Remove steering angle sensor.



INSTALLATION

Install in the reverse order of removal.

NOTE:

After work, make sure to adjust neutral position of steering angle sensor. Refer to BRC-89, "Adjustment of Steering Angle Sensor Neutral Position" .

SECTION PS
POWER STEERING SYSTEM

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

AGS00084

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

AGS000A9

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Steering System

AGS000II

- Before disassembly, thoroughly clean the outside of the unit.
- Disassembly should be done in a clean work area. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.
- For easier and proper assembly, place disassembled parts in order on a parts rack.
- Use nylon cloth or paper towels to clean the parts; common shop rags can leave lint that might interfere with their operation.
- Before inspection or reassembly, carefully clan all parts in order on a parts rack.
- Before assembly, apply a coat of recommended Genuine NISSAN PSF or equivalent to hydraulic parts. Petroleum jelly may be applied to O-rings and seals. Do not use any grease.
- Replace all gaskets, seals and O-rings. Avoid damaging O-rings, seals and gaskets during installation. Perform functional tests whenever designated.

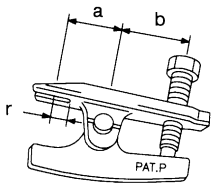
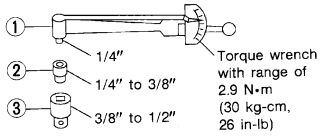
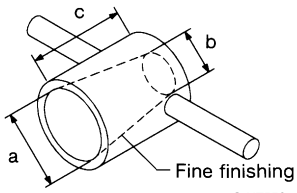
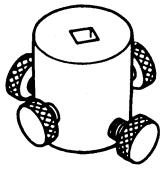
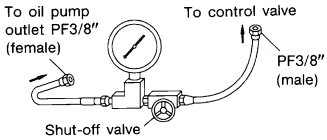
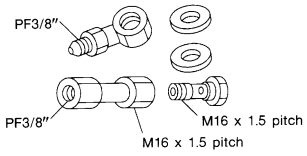
PREPARATION

PFP:00002

Special Service Tools (SST)

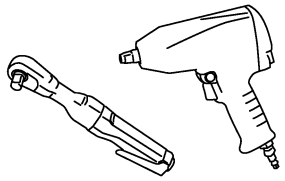
AGS000IJ

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
HT72520000 (J25730-A) Ball joint remover a: 33 mm (1.30 in) b: 50 mm (1.97 in) r: 11.5 mm (0.453 in)	 NT546	Removing outer socket ball joint
ST3127S000 (See J25765-A) Preload gauge 1. GG9103000 (J25765-A) Torque wrench 2. HT62940000 (–) Socket adapter 3. HT62900000 (–) Socket adapter	 S-NT541	Inspecting of sliding torque, steering torque, and rotating torque for ball joint
KV48104400 (–) Teflon ring installation tool a: 50 mm (1.97 in) dia. b: 36 mm (1.42 in) dia. c: 100 mm (3.94 in)	 S-NT550	Installing of rack Teflon ring
KV48103404 (–) Torque adapter	 ZZA0824D	Inspecting rotating torque
KV48103500 (J26357) Pressure gauge	 NT547	Measuring oil pump relief pressure
KV48102500 (J33914) Pressure gauge adapter	 NT542	Measuring oil pump relief pressure

Commercial Service Tools

AGS000IK

Tool name	Description
Power tool  PBIC0190E	Removing oil pump and wheel nuts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

AGS000IL

Use chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

		Reference page	PS-6	PS-6	PS-22	PS-22	PS-22	PS-6	PS-8	PS-22	EM-12	PS-8	PS-15	PS-17	PS-10	PS-10	PS-17	NVH in PR section	NVH in RFD section	NVH in FAX, RAX, FSU, RSU section	NVH in WT section	NVH in WT section	NVH in RAX section	NVH in BR section
		Possible cause and suspected parts	Fluid level	Air in hydraulic system	Outer socket ball joint swinging force	Outer socket ball joint sliding torque	Outer socket ball joint end play	Steering fluid leakage	Steering wheel play	Steering gear rack sliding force	Drive belt looseness	Improper steering wheel	Improper installation or looseness of tilt lock lever	Mounting rubber deterioration	Steering column deformation or damage	Improper installation or looseness of steering column	Steering linkage looseness	PROPELLER SHAFT	DIFFERENTIAL	AXLE and SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES
Symptom	Noise		×	×	×	×	×	×	×	×	×							×	×	×	×	×	×	×
	Shake											×	×	×				×		×	×	×	×	×
	Vibration											×	×	×	×	×		×		×	×		×	
	Shimmy											×	×	×			×			×	×	×		×
	Judder													×			×			×	×	×		×

×: Applicable

POWER STEERING FLUID

PFP:KLF20

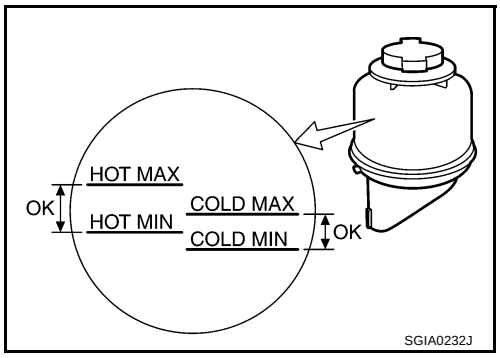
Checking Fluid Level

AGS000IM

- Stop engine before performing a fluid level check.
- Ensure that fluid level is between the MAX range and MIN level.
- Because fluid level differs within the HOT range and the COLD range, check it carefully.

HOT : Fluid temperatures from 50 to 80 °C (122 to 176°F)

COLD : Fluid temperatures from 0 to 30°C (32 to 86°F)



CAUTION:

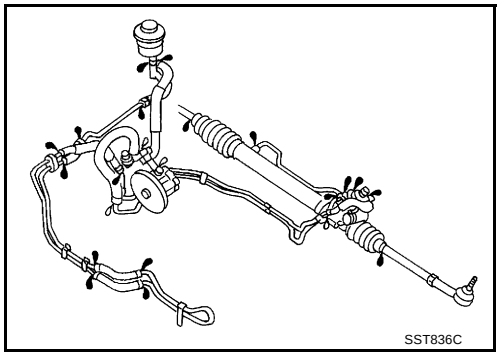
- **Do not overfill the MAX level.**
- **Do not reuse any used power steering fluid.**
- **Recommended fluid is Genuine NISSAN PSF or equivalent.**

Checking Fluid Leakage

AGS000IN

Check that hydraulic piping lines for improper attachment and for leaks, cracks, damage, loose connections, chafing or deterioration.

1. Run engine until fluid temperature reaches 50 to 80° C (122 to 176°F) in reservoir tank. Keep engine speed idle.
2. Turn steering wheel right-to-left several times.
3. Hold steering wheel at each “lock” position for five seconds to check fluid leakage.



CAUTION:

Do not hold steering wheel in a locked position for more than 10 seconds. (There is the possibility that oil pump may be damaged.)

4. If fluid leakage at connections is noticed, then loosen flare nut and then retighten. Do not over tighten connector as this can damage O-ring, washer and connector.
5. If fluid leakage at the connectors is noticed, then loosen the flare nut and retighten it.
6. Check steering gear boots for accumulation of fluid indicating a from steering gear.

Air Bleeding Hydraulic System

AGS000IO

Incomplete air bleeding causes the following. When this happens, bleed air again.

- Generation of air bubbles in reservoir tank
- Generation of clicking noise in oil pump
- Excessive buzzing in oil pump

NOTE:

When vehicle is stationary or while steering wheel is being turned slowly, some noise may be heard from oil pump or gear. This noise is normal and does not affect any system.

1. Stop engine, and then turn steering wheel fully to right and left several times.

CAUTION:

Do not allow steering fluid reservoir tank to go below the low-level line. Check tank frequenter and add fluid as needed.

2. Run engine at idle speed. Turn steering wheel fully to the right and then fully to the left, and keep for about three seconds. Then check whether a fluid leakage has occurred.
3. Repeat the 2nd procedure several times at about three seconds intervals.

CAUTION:

Do not hold steering wheel in the locked position more than 10 seconds. (There is the possibility that oil pump may be damaged.)

4. Check generation of air bubbles and cloud in fluid.
5. If air bubbles and the cloud don't fade, stop engine, hold air bleeding until air bubbles and the cloud fade. Perform the 2nd and the 3rd procedures again.

6. Stop engine, check fluid level.

STEERING WHEEL

PFP:48430

On-Vehicle Inspection and Service

AGS000IP

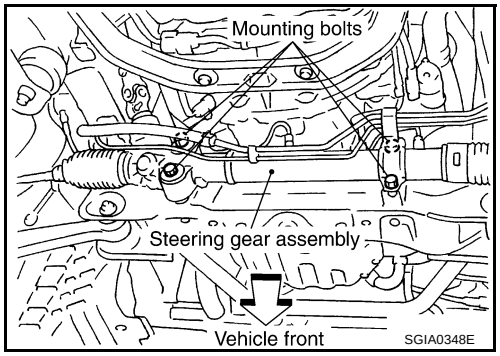
CHECKING CONDITION OF INSTALLATION

- Check installation condition of steering gear assembly, front suspension, axle and steering column.
- Check if movement exists when steering wheel is moved up and down, to the left and right and to the axial direction.

End play of the axle direction for steering wheel:

0 mm (0 in)

- Check if the mounting bolts for steering gear assembly are loose or not. Refer to PS-17, "POWER STEERING GEAR AND LINKAGE" .



CHECKING STEERING WHEEL PLAY

1. Set tires to the straight ahead, start engine, then turn steering wheel to the left and right lightly, and measure steering wheel movement on the outer circumference when steering wheel is turned up to the point where tires start moving.

Steering wheel play on the outer circumference : 0 - 35 mm (0 - 1.38 in)

CHECKING NEUTRAL POSITION ON STEERING WHEEL

- Check neutral position on steering wheel after confirming that front wheel alignment is correct. Refer to PS-36, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

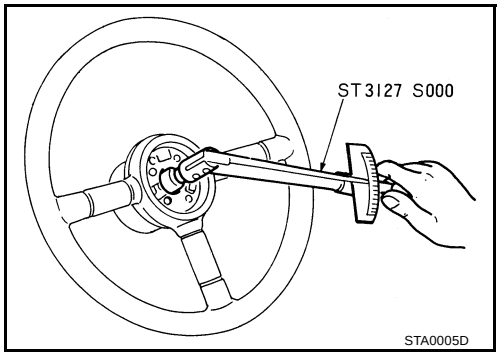
1. Set the vehicle to the straight ahead-direction, check if steering wheel is in the neutral position.
2. If it is not in the neutral position, remove steering wheel and reinstall it correctly.
3. If the neutral position cannot adjust in the two teeth of steering gear assembly, loosen tie-rod lock nuts of steering outer sockets, then adjust tie-rods by the same amount in the opposite direction.

CHECKING STEERING WHEEL TURNING FORCE

1. Park vehicle on a level and dry surface, set parking brake.
2. Remove driver air bag module from steering wheel. Refer to SRS-41, "DRIVER AIR BAG MODULE" .
3. Start engine at idle, make steering fluid reach to normal operating temperature [50 to 80°C (122 to 176°F)], then check steering wheel turning torque with pre-load gauge (SST).

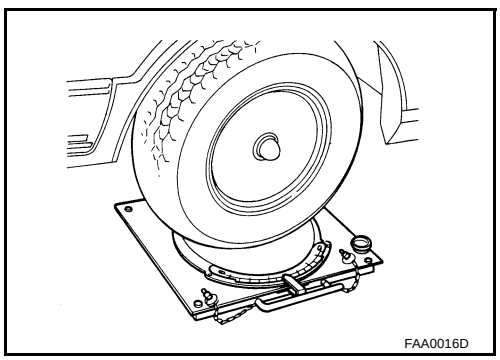
Turning torque : 7.45 N·m (0.76 kg-m, 66 in-lb)

4. If steering wheel turning force is out of the specification, check relief hydraulic pressure of oil pump. Refer to PS-29, "POWER STEERING OIL PUMP" .



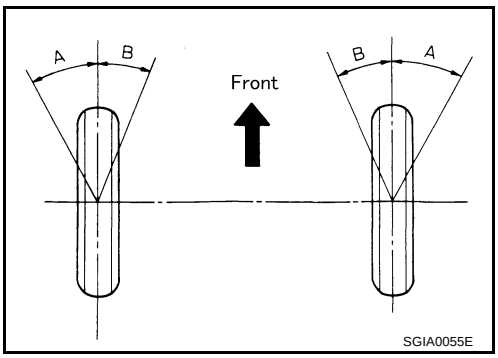
CHECKING FRONT WHEEL TURNING ANGLE

- Check front wheel turning angle after the toe-in inspection. Place front wheels on turning radius gauges and rear wheels on stands so that vehicle can be level. Check the maximum inner and outer wheel turning angles for LH and RH road wheels.



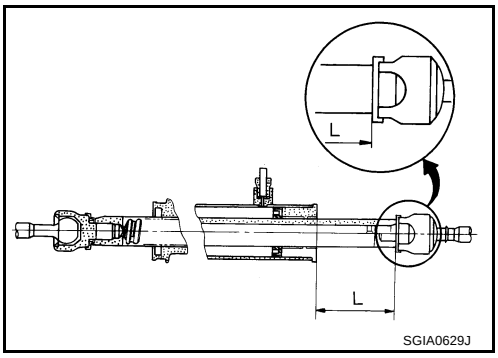
- Start engine and run at idle, turn steering wheel all the way right and left, measure the turning angle.

Inner wheel (Angle: A)	Minimum	35° 55' (35.9°)
	Nominal	38° 55' (38.9°)
	Maximum	39° 55' (39.9°)
Outer wheel (Angle: B)	Nominal	30° 40' (30.7°)



- If it is not within specification, measure rack strokes.

Rack stroke "L" : 64.5 mm (2.54 in)



- If rack stroke is out of specification, disassemble steering gear assembly to check rack stroke.
- Any turning angles are not adjustable. If any of steering angles are out of the specification, check if the following parts are wear or damaged.
  - Steering gear
  - Steering column
  - Front suspension components

  If found that they are worn or damaged, replace them with new ones respectively.

Removal and Installation

AGS000IQ

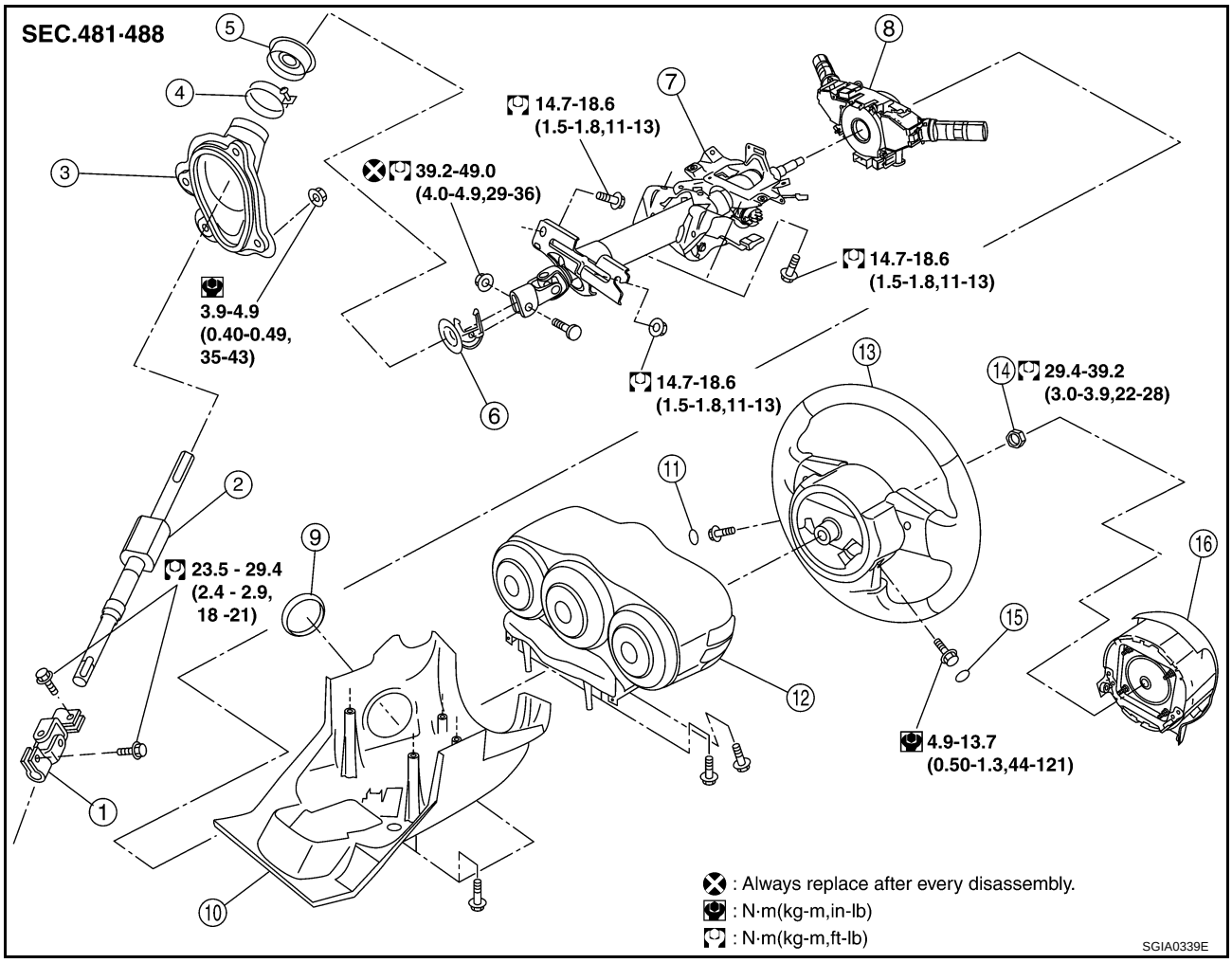
Refer to PS-10, "STEERING COLUMN" .

STEERING COLUMN

PFP:48810

Removal and Installation

AGS000IR



1. Lower joint	2. Lower shaft	3. Hole cover
4. Clamp	5. Hole cover seal	6. Collar
7. Steering column assembly	8. Combination switch & spiral cable	9. Escutcheon
10. Column lower cover	11. Right lid	12. Combination meter & column upper cover
13. Steering wheel	14. Steering wheel lock nut	15. Left lid
16. Driver air bag module		

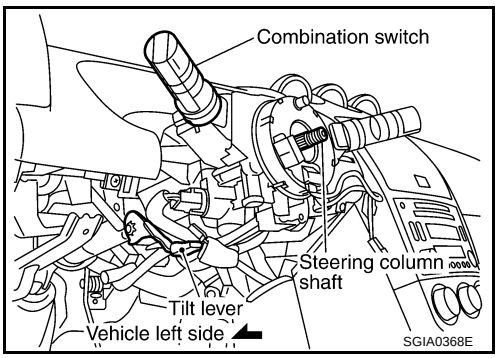
CAUTION:

- **Care must be taken not to give axial impact to steering column assembly during removal and installation.**
- **Care must be taken not to move steering gear during removal of steering column assembly.**

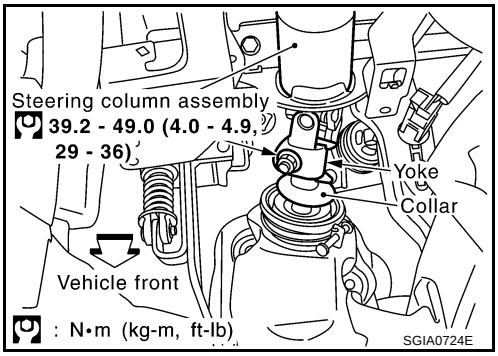
REMOVAL

1. Set vehicle to the straight ahead-direction.
2. Remove driver air bag module from steering wheel. Refer to SRS-41, "DRIVER AIR BAG MODULE" .
3. Disconnect steering switch connector, remove steering wheel lock nut, then remove steering wheel. Refer to PS-8, "STEERING WHEEL" .
4. Remove dash side finisher (LH). Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
5. Remove instrument driver panel lower. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
6. Remove column lower cover and combination meter (which is connected with steering column upper cover) from steering column assembly. Refer to DI-28, "Removal and Installation for Combination Meter" .

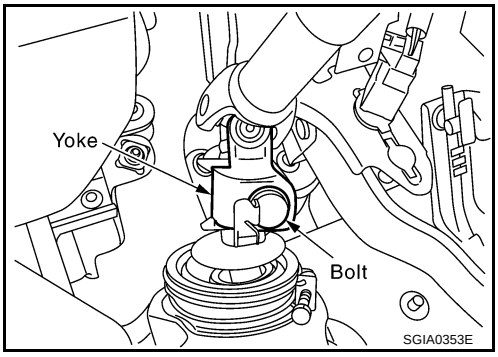
7. Remove combination switch & spiral cable from steering column assembly. Refer to SRS-43, "Removal and Installation" .
8. Disconnect the following connector from steering column assembly.
   - Steering lock harness connector
   - Ignition switch harness connector
   - Key switch harness connector
9. Remove control unit with VDC/TCS/ABS control unit. Refer to BRC-144, "VDC/TCS/ABS CONTROL UNIT" .
10. Disconnect brake switch harness connector.
11. Remove steering column shaft from lower shaft in the following procedure.



a. Remove lock nut from yoke.



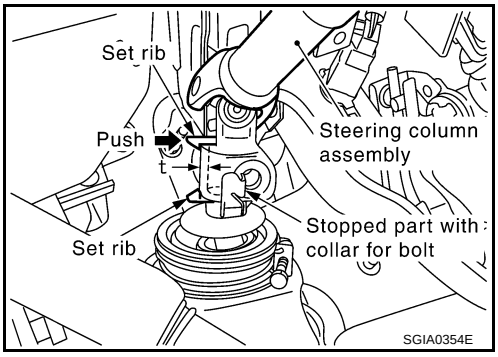
b. Turn steering wheel to the right to appear the head of bolt.
c. Remove the fixed part of collar for bolt to the outside of its head, remove bolt.



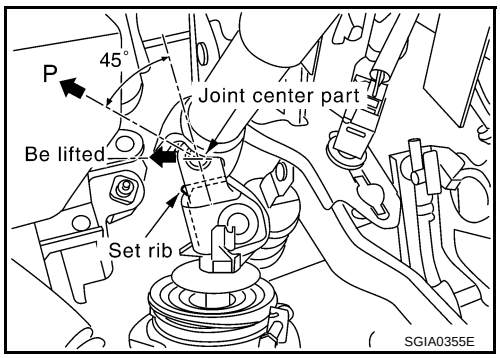
d. Remove the set lib of steering column assembly side from yoke, push it equal to the thick part of yoke.

NOTE:

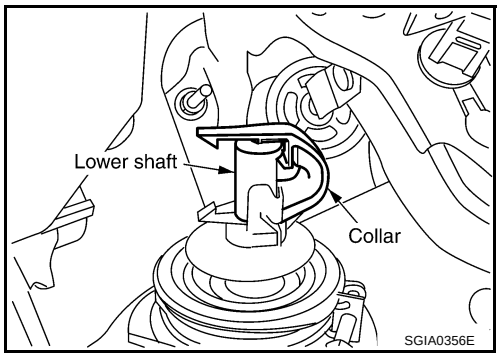
- Because collar is set in lower shaft, if the set lib is pushed (action), joint center will be lifted in the opposite direction (reaction), and then the set lib will be in squeezed to the thick part of yoke.



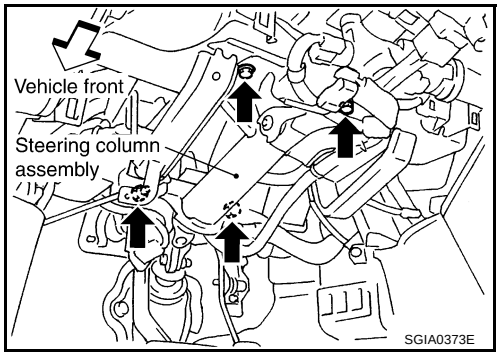
e. Yoke will be removed from collar, when steering column assembly is lifted about 45° oblique upward.



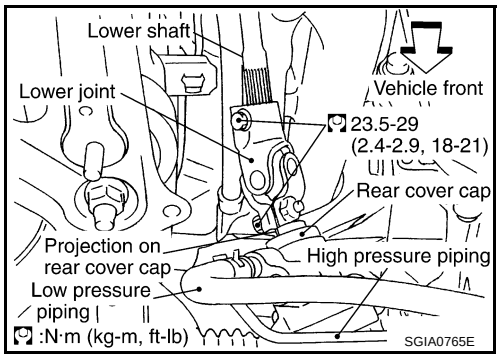
f. Collar remains on lower shaft.



12. Remove bolts and nut from steering member, remove steering column assembly from steering member.
13. Remove collar from lower shaft.
14. Remove hole cover seal from lower shaft.
15. Remove mounting bolts, then remove hole cover from panel.

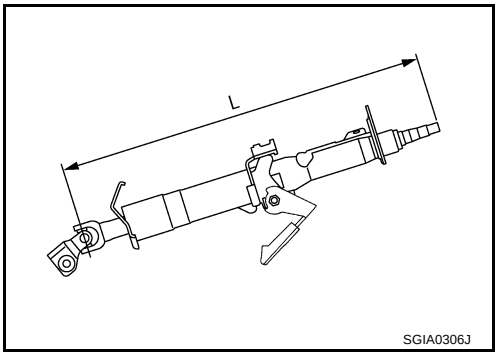


16. Raise vehicle, then loosen bolt for lower yoke of lower joint and remove joint together with lower shaft.



INSPECTION AFTER REMOVAL

- Check if there is something wrong with jacket tube of steering column assembly and collar etc. And then if they are damaged, replace with new one.
- If vehicle has a collision light shocked, check column length “L” as shown in the figure. Then if it is out of the specified value, replace with new one.



Specified value

Steering column length “L”:

568 mm (22.36 in)

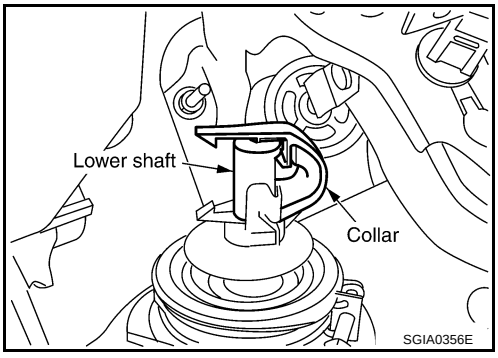
- Check the turning torque of steering column with preload gauge (SST). If it is out of the specified value, repair it or replace with new one.

Specified value

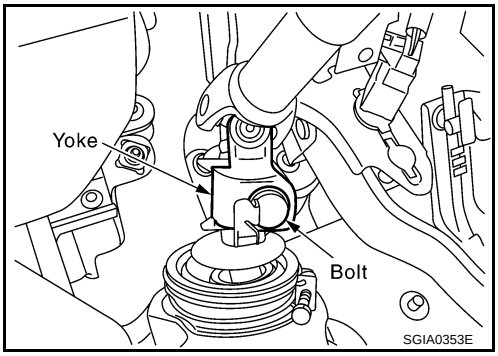
Turning torque : 0 - 0.2 N·m (0 - 0.021 kg-m, 0 - 1 in-lb)

INSTALLATION

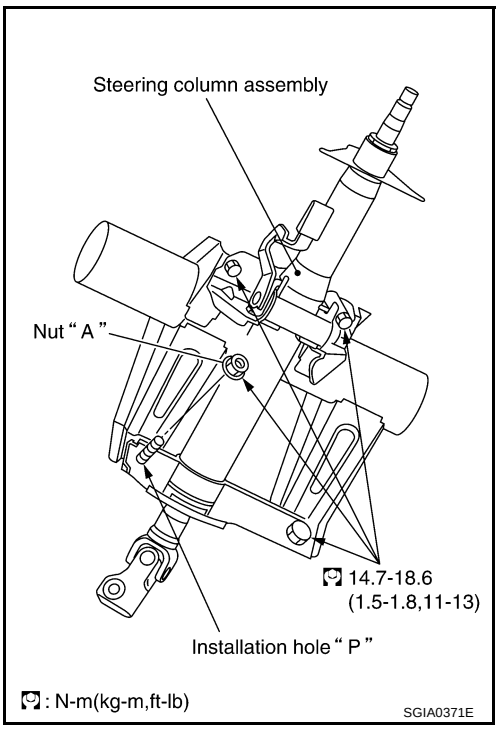
1. Install collar to lower shaft.



2. Install yoke of column shaft to collar, tack bolt and nut.

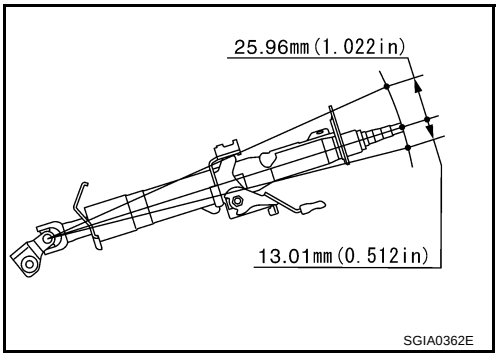


3. Put steering column assembly (installation hole “P”) on bolt for steering member side and install nut “A” then tighten it together with the other bolts at the specified torque.
4. Connect yoke and collar with bolt, tighten nut at the specified torque.



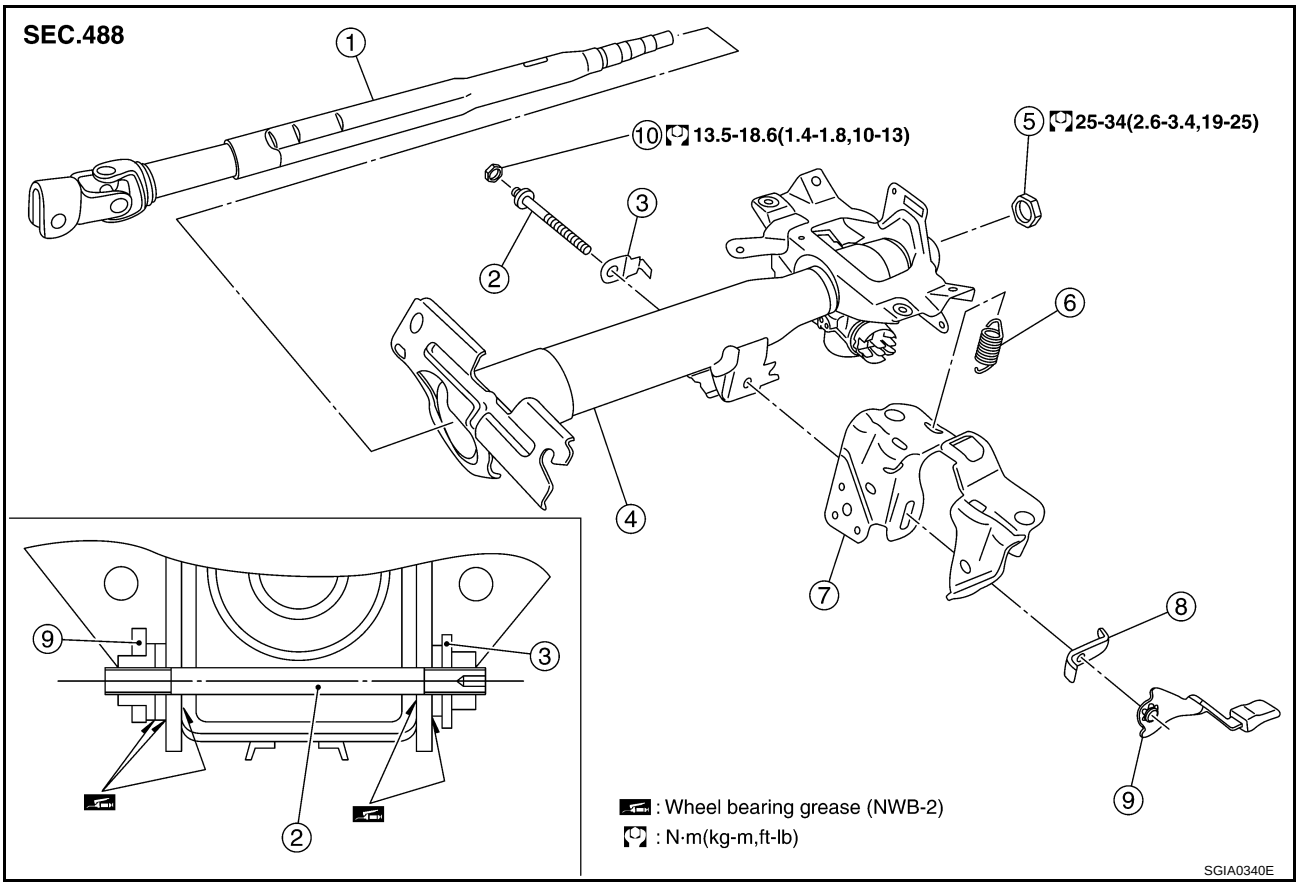
INSPECTION AFTER INSTALLATION

- After installing steering column to vehicle, check tilt device and its operation range. Ranges of operation are shown in the figure.
- Check if steering operation can turn to the end of the left and right smoothly.



Disassembly and Assembly

AGS000IS



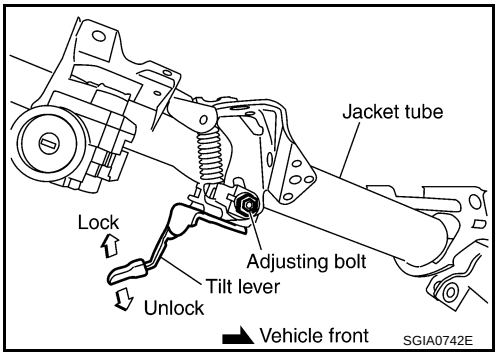
1. Steering column shaft
2. Adjusting bolt
3. Adjusting stopper
4. Jacket tube
5. Steering column shaft lock nut
6. Spring
7. Column mounting bracket
8. Tilt lever stopper
9. Tilt lever
10. Lock nut

DISASSEMBLY

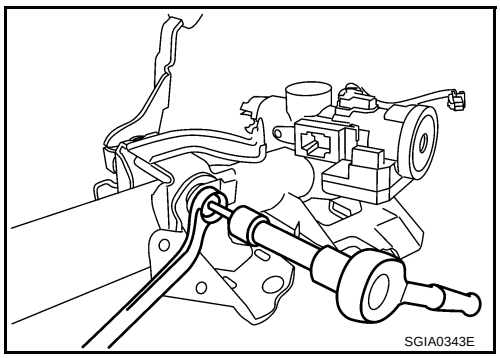
1. Remove steering column shaft lock nut, then remove steering column shaft from front side of jacket tube.
2. Remove tilt device from jacket tube.
3. Remove lock nut and adjusting stopper according to the following procedure.

a. Turn tilt lever to the unlock side.

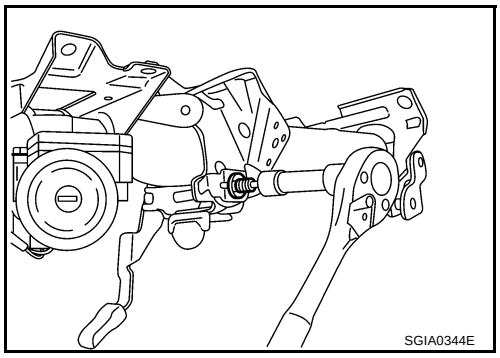
b. Remove spring from column mounting bracket.



c. Lock adjusting bolt, then remove lock nut.



d. Remove adjusting bolt, adjusting stopper, column mounting bracket, tilt lever stopper and tilt lever from jacket tube.



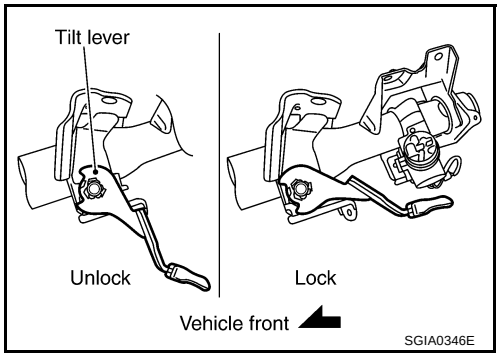
INSPECTION AFTER DISASSEMBLY

- Check if there is something wrong with steering column shaft and bearing. And then if they are damaged, replace with new one.
- Check if there is something wrong with the component of tilt device. And then if it is damaged, replace with new one.

ASSEMBLY

1. Install tilt device to jacket tube. Refer to PS-15, "Disassembly and Assembly" .

   NOTE:
   - Turn tilt lever to unlock side while at work to make it easier.
   - That can avoid column shaft's sudden descent when tilt lever is operated on vehicle.

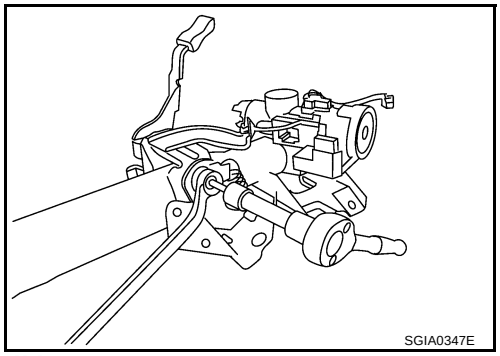


2. When tilt lever is in the locked position (operation range is about 40°), tighten lock nut at the specified torque to make tilt lever locked.

   Tightening torque:

   13.5 - 18.6 N·m (1.4 - 1.8 kg-m, 10 - 13 ft-lb)

3. Apply grease to the part shown in the figure of component. Refer to PS-15, "Disassembly and Assembly" .
4. Install steering column shaft to jacket tube, tighten steering column shaft lock nut at the specified torque.



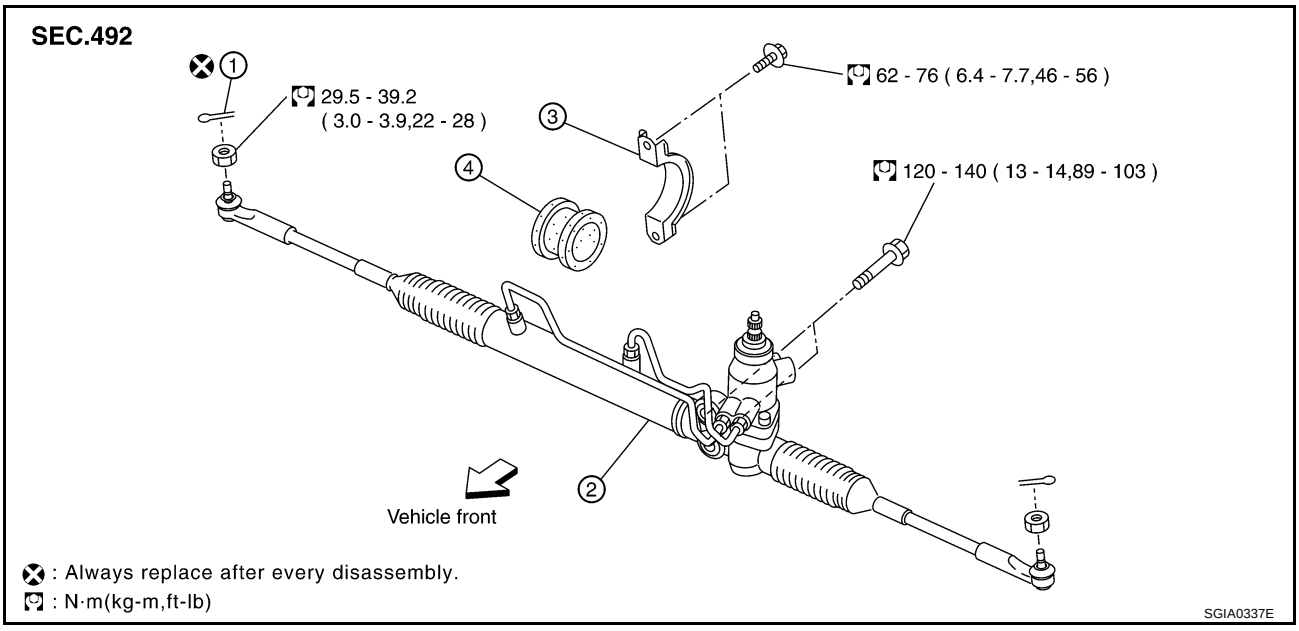
Tightening torque : 25 - 34 N·m (2.6 - 3.4 kg-m, 19 - 25 ft-lb)

POWER STEERING GEAR AND LINKAGE

PFP:49001

Removal and Installation

AGS000IT

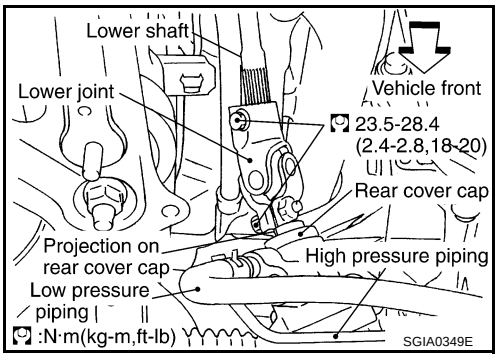


1. Cotter pin
2. Steering gear assembly
3. Rack mounting bracket
4. Rack mounting insulator

CAUTION:
Spiral cable may snap due to steering operation if steering column is separated from steering gear assembly. Therefore fix steering wheel with a string to avoid turns.

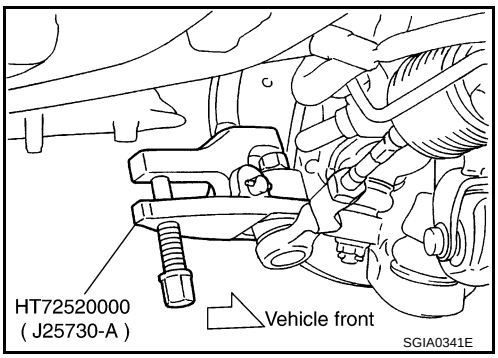
REMOVAL

1. Set wheels in the straight-ahead position.
2. Remove undercover and tires from vehicle with power tool.
3. Remove front crossbar. Refer to FSU-8, "Components" .
4. Confirm slit of lower joints fits with the projection on rear cover cap, furthermore marking position on steering gear assembly nearly fits with the projection on rear cover cap.
5. Remove cotter pin at steering outer socket, then loosen mounting nut.

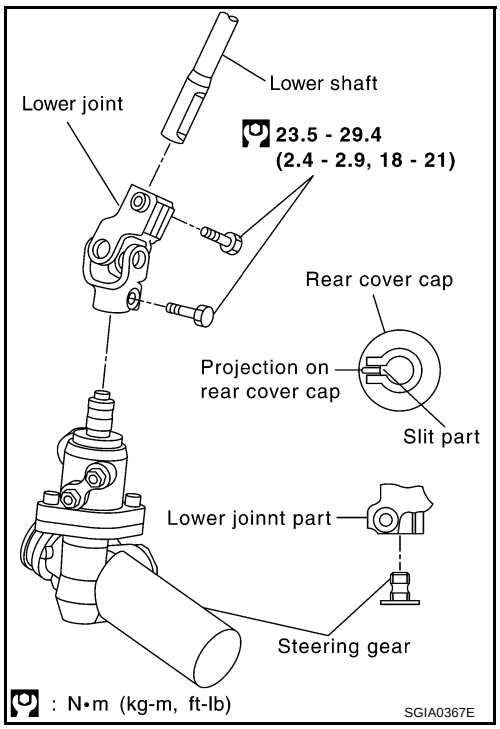


6. Use a ball joint remover (SST) to remove steering outer socket from steering knuckle. Be careful not to damage ball joint boot.

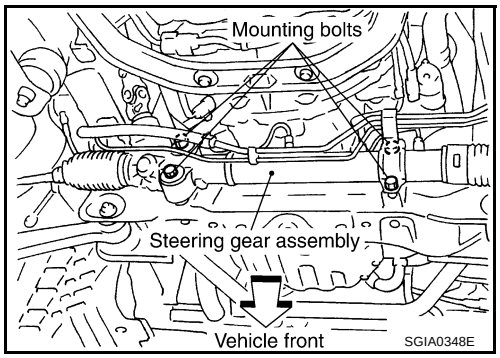
   CAUTION:
   Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (SST) from coming off.
7. Remove oil pipings (high pressure side and low pressure side) from steering gear assembly, then drain fluid from pipings.



8. Loosen bolt on upper yoke of lower joint and remove bolt on lower yoke of joint, then slide lower joint into lower shaft. Separate steering gear assembly from lower shaft.
9. Tack bolt on upper yoke of lower joint, fix lower joint to lower shaft.



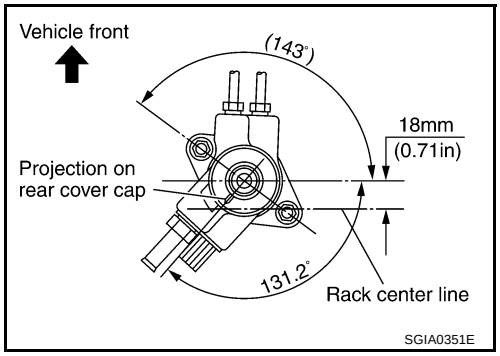
10. Remove the fixing bolt and remove steering gear assembly, rack mounting bracket and insulator from vehicle.



INSTALLATION

- Refer to PS-17, "Removal and Installation" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- After removing/installing or replacing steering components, check wheel alignment. Refer to FSU-6, "Wheel Alignment Inspection" .
- When steering wheel is set in the straight ahead direction, confirm slit of lower joint fits with the projection on rear cover cap, furthermore marking position on steering gear assembly nearly fits with the projection on rear cover cap.
- After installation, bleed air from piping. Refer to PS-6, "Air Bleeding Hydraulic System" .



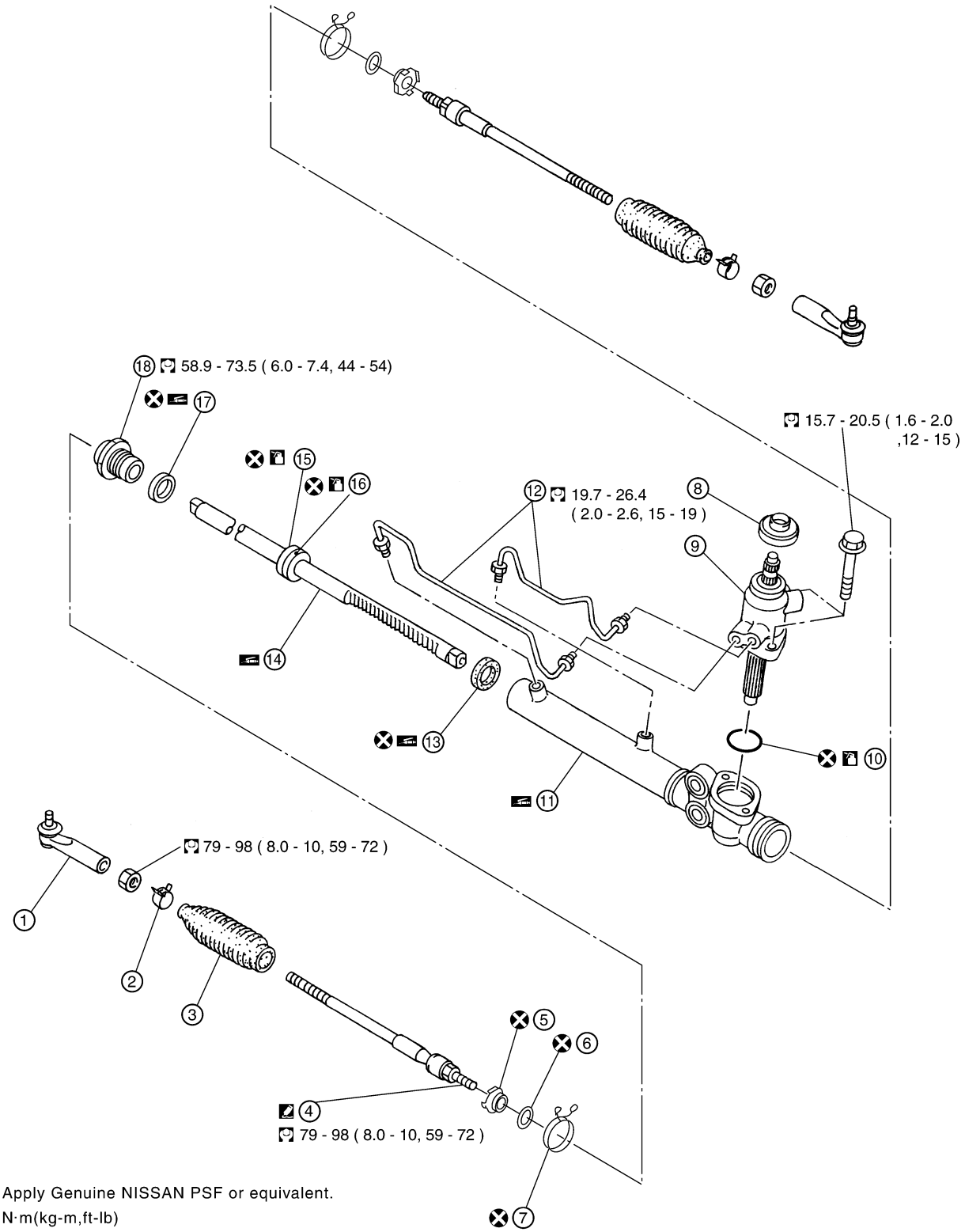
POWER STEERING GEAR

PFP:49001

Component

AGS000IU

SEC.492



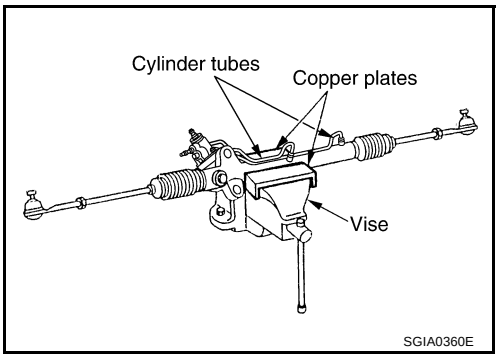
: Apply Genuine NISSAN PSF or equivalent.
: N·m(kg-m,ft-lb)
: Three Bond TB1111B
: Multi-purpose grease or equivalent.
: Always replace after every disassembly.

SGIA0743E

1. Outer socket
2. Boot clamp
3. Boot
4. Inner socket
5. Lock plate
6. Spacer ring
7. Boot clamp
8. Rear cover cap
9. Gear sub assembly
10. O-ring
11. Gear housing assembly
12. Cylinder tubes
13. Rack oil seal
14. Rack
15. Rack Teflon ring
16. O-ring
17. Rack oil seal
18. End cover assembly

CAUTION:

- **Secure steering gear assembly with a vise, using copper plates or something similar to prevent it from being damaged. Do not grip cylinder with a vise.**
- **Before performing disassembly, clean steering gear assembly with kerosene. Be careful not to bring any kerosene into contact with the discharge and return port connectors.**



Disassembly and Assembly

AGS000IV

DISASSEMBLY

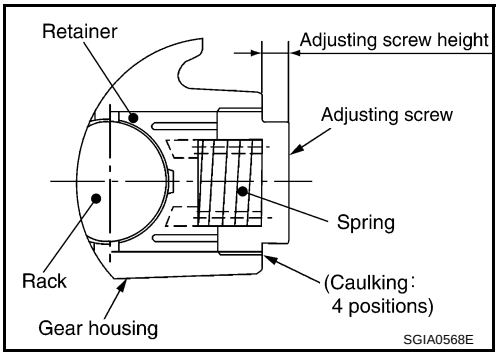
1. Remove cylinder tubes from gear housing assembly.
2. Remove rear cover cap from gear sub-assembly.
3. Measure adjusting screw height from gear housing assembly, then loosen adjusting screw.

   CAUTION:

   - **Do not turn adjusting screw more than twice.**
   - **Replace steering gear assembly when adjusting screw is removed or more than twice.**
4. Remove fixing bolt of gear sub-assembly and remove gear sub-assembly from gear housing assembly.

   CAUTION:

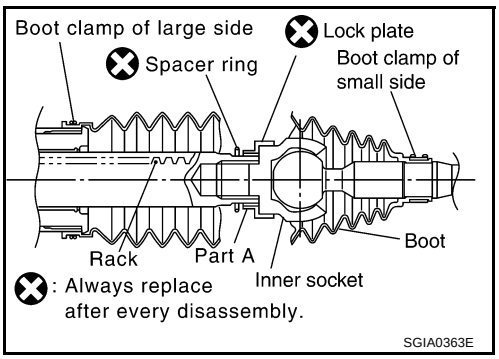
   In order to protect oil seal from any damage, pull sub-gear assembly out straightly.



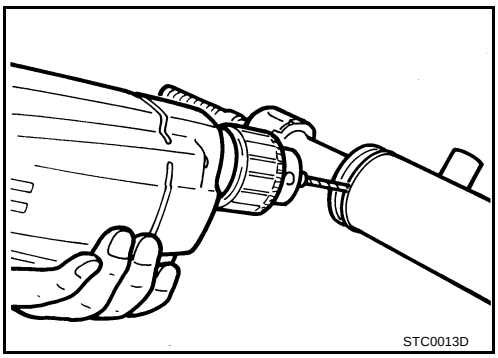
5. Loosen lock nut of outer socket, and remove outer socket.
6. Remove boot clamps of the small diameter side and the large diameter side, then remove boots.

   CAUTION:

   On removing boots, be careful not to damage the inner socket and the gear housing assembly. If they are is damaged, change them to avoid oil leaks.
7. Move spacer ring to rack side, raise caulking part (at two points of part A) of lock plate and loosen inner socket, then remove inner socket from rack.

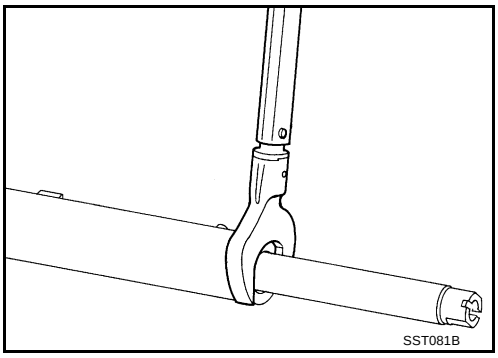


8. Drill out the clinching part of cylinder outer rim with a 3 mm (0.12 in) drill in 1.5 mm (0.059 in) depth.



9. Remove end cover assembly with a 42 mm (1.65 in) open head (suitable tool).

CAUTION:
Be careful not to damage rack. If it is damaged, replace rack. Otherwise, oil leaks may result.

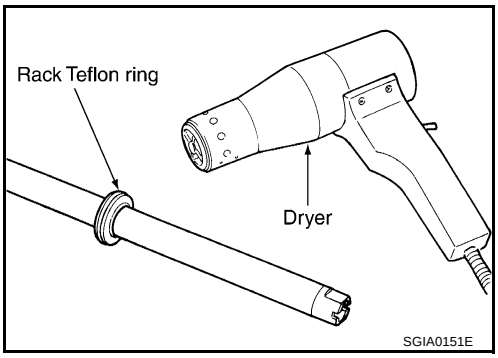


10. Pull rack with rack oil seal out of gear housing assembly.

CAUTION:
Be careful not to damage cylinder. If it is damaged, replace gear housing assembly. Otherwise, oil leaks may result.

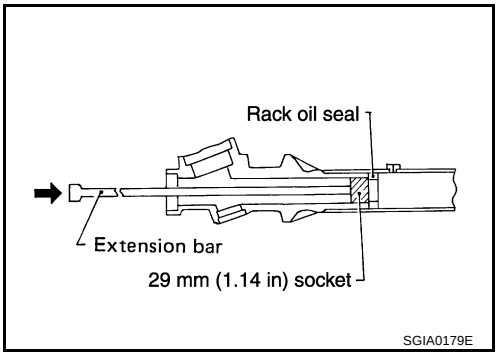
11. Heat rack Teflon ring to approximately. 40°C (104°F) with a dryer, then remove it and O-ring from rack.

CAUTION:
Be careful not to damage rack. If it is damaged, change to a new one to avoid oil leaks.



12. Use a taped 29 mm (1.14 in) socket and an extension bar. Remove rack oil seal from gear housing assembly.

CAUTION:
Be careful not to damage gear housing assembly and cylinder inner wall. If it is damaged, gear housing assembly must be replaced. Otherwise, oil leaks will result.



INSPECTION AFTER DISASSEMBLY

Boot

Check boot for cracks and deformation. Replace it, if necessary.

Rack

Check rack for damage and wear. Replace it, if necessary.

Gear Sub-Assembly

- Check pinion gear for damage and wear. Replace it, if necessary.
- Check bearing while rotating it. Replace bearing if bearing ball race was dent, worn, or damaged.

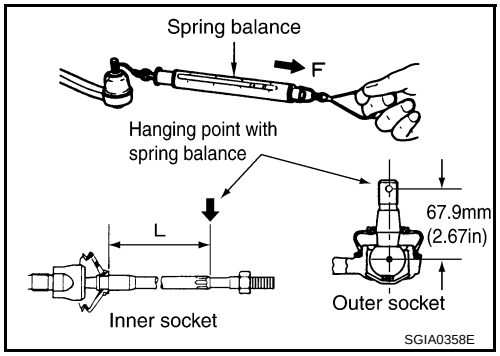
Gear Housing Assembly

Check gear housing assembly for damage and scratches (inner wall). Replace it, if necessary.

Outer Socket and Inner Socket

Swing Torque

- Hook a spring balance at the point shown in the figure. Confirm if the reading is within the specification. When ball stud and inner socket start moving the measured value must be within the specification. If the reading is outside the specification, replace socket.



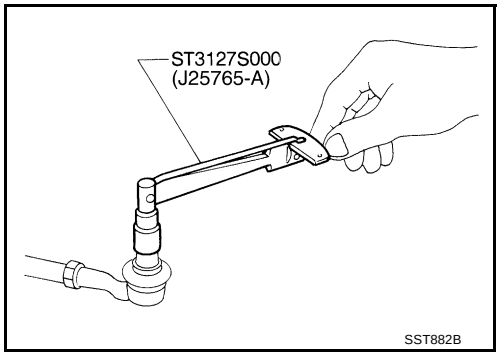
Specified value

Item	Outer socket	Inner socket
Measuring point	Cotter-pin hole of stud	shown as L: 48.5 mm (1.91 in)
Swing torque	0.3 - 2.9 N·m (0.03 - 0.29 kg-m, 3 - 25 in-lb)	1.0 - 7.8 N·m (0.11 - 0.79 kg-m, 9 - 69 in-lb)
Measuring value	4.42 - 42.7 N (0.45 - 4.4 kg, 1.0 - 9.7 lb)	10 - 78 N (1.1 - 7.9 kg, 2.25 - 17.5 lb)

Rotating Torque

- Using a preload gauge (SST), check if reading is within the value specified below. If the value is outside the standard, replace outer sockets.

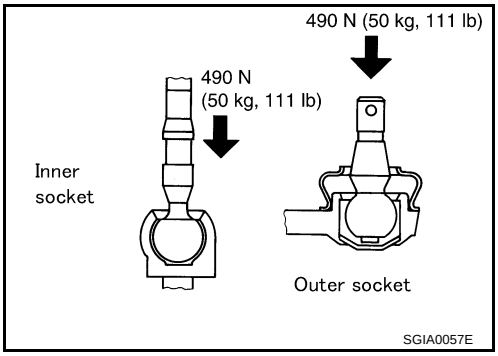
Rotating torque	0.3 - 2.9 N·m (0.03 - 0.29 kg-m, 3 - 25 in-lb)



Axial End Play

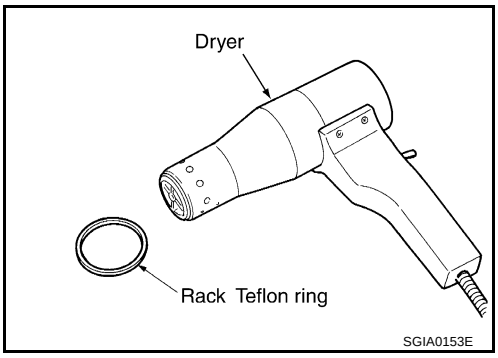
- Apply load of 490 N (50 kg,110 lb) to ball stud axially. Use a dial-gauge to measure the amount of the movement that the stud makes. Check if the reading is within the specified below. If the value is outside the standard, replace outer and inner sockets.

Outer socket	0.5 mm (0.020 in) or less
Inner socket	0.2 mm (0.008 in) or less

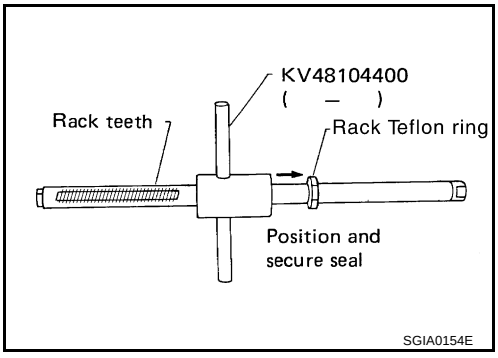


ASSEMBLY

1. Apply Genuine NISSAN PSF or equivalent to O-ring. Put an O-ring into rack Teflon ring.
   NOTE:
   Do not reuse O-ring.
2. Heat rack Teflon ring to approximately 40°C (104°F) with a dryer. Assemble it to mounting groove of rack.
   NOTE:
   Do not reuse rack Teflon ring.

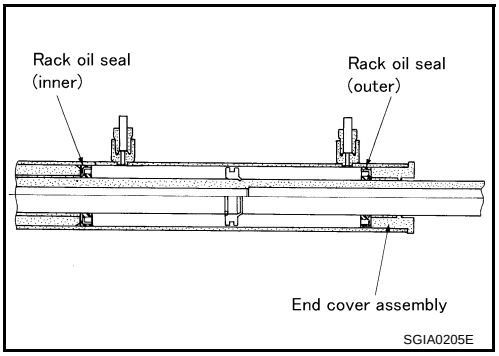


3. To fit rack Teflon ring on rack, use rack Teflon ring installation tool (SST) from tooth side. Compress rim of ring with the tool.

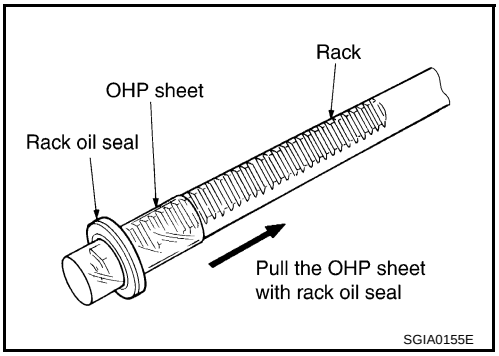


4. Apply Multi-purpose grease or equivalent to rack oil seal. Insert rack oil seal, then insert rack to gear housing assembly.
   NOTE:
   Do not reuse rack oil seal.
   CAUTION:
   - **When inserting rack, do not damage retainer sliding part. If it is damaged, replace gear housing assembly.**
   - **When unstring rack, do not damage cylinder inner wall. If it is damaged, It may cause oil leaks. Replace gear housing assembly.**

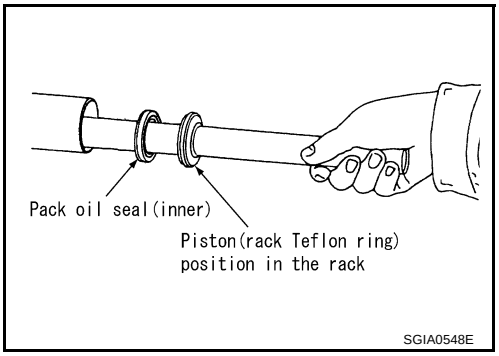
- **Attach rack oil seal. Both inner lip and outer lip should face each other.**



a. To avoid damaging inner rack oil seal, wrap an OHP sheet [approximately. 70 mm (2.76 in) × 100 mm (3.94 in)] around rack tooth. Place oil seal on sheet. Then, pull oil seal along with OHP sheet until they pass the toothed section of rack, then remove it.

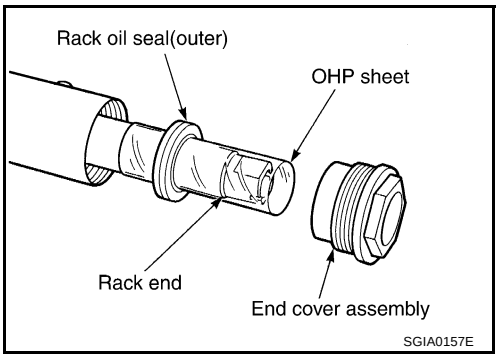


b. Insert rack oil seal (inner) to piston (rack Teflon ring) position and push retainer to adjust screw side with fingers lightly, and then make rack move in gear housing assembly, install rack oil seal (inner) to fit in with gear housing assembly.



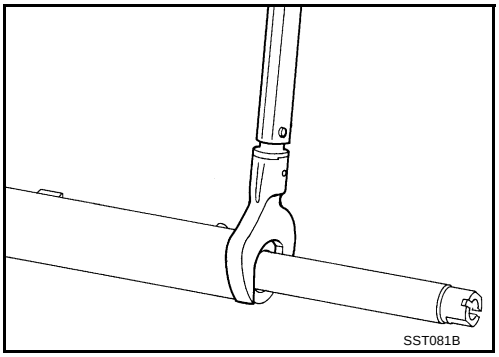
c. When installing outer rack oil seal, cover the end of rack with an OHP sheet [70 mm (2.76 in) × 100 mm (3.94 in)]. It will avoid damaging rack oil seal. Then place oil seal on sheet. Pull rack oil seal along with OHP sheet until they pass rack end. Then remove OHP sheet.

d. Install end cover assembly to rack, move it to gear housing assembly.



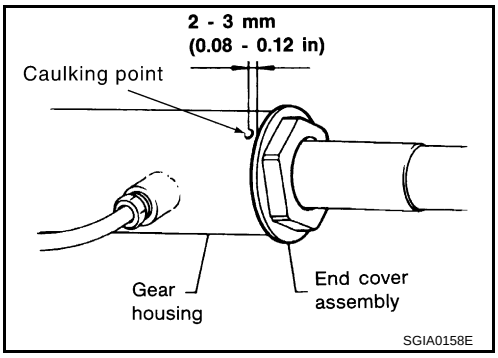
5. Using a 42 mm (1.65 in) open head (suitable tool), tighten end cover assembly at the specified torque.

CAUTION:
Do not damage rack surface. If it is damaged, it may cause oil leaks. Replace rack assembly.

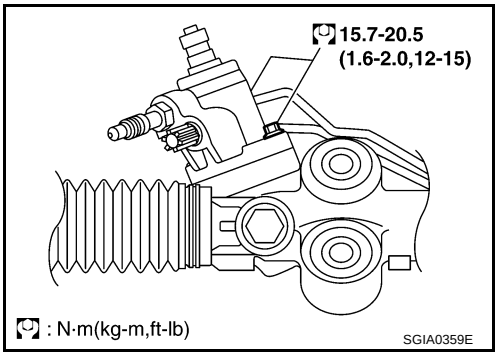


6. After tightening end cover assembly, caulk cylinder at one point as shown in the figure using a punch. This will prevent end cover from getting loose.
7. Apply Genuine NISSAN PSF or equivalent to O-ring. Install O-ring to gear housing assembly.

   NOTE:
   Do not reuse O-ring.



8. Install gear sub-assembly to gear housing assembly.



9. Attach lock plate to rack.

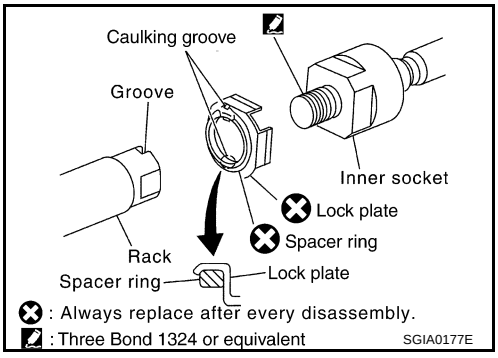
   NOTE:
   Do not reuse lock plate.

a. Tack spacer ring to rack.

   NOTE:
   Do not reuse spacer ring.

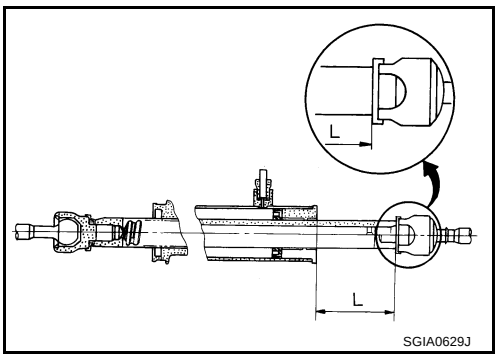
b. Install lock plate to inner socket.
c. Apply thread lock adhesive (Three Bond 1324 or equivalent) to the thread of inner socket. Screw inner socket into rack and tighten at the specified torque.
d. Caulk lock plate at two points on rack slit.
e. Install spacer ring to lock plate as shown in the figure.

   CAUTION:
   When installing spacer ring, avoid damaging it.

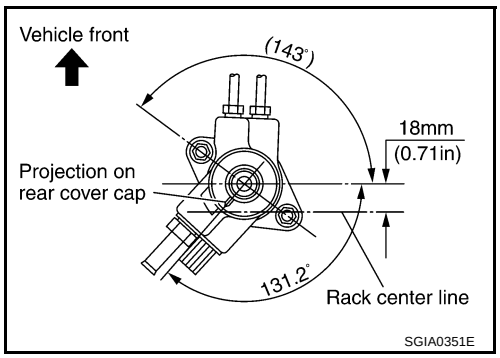


10. Decide neutral position of rack gear.

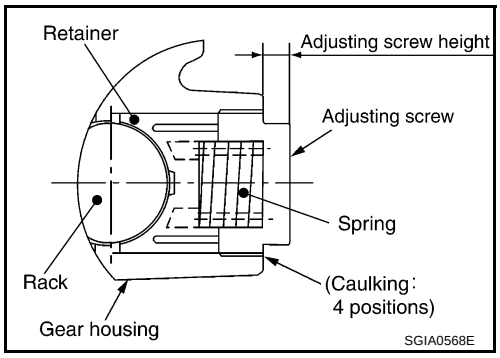
    Rack stroke “L” : 64.5 mm (2.54 in)



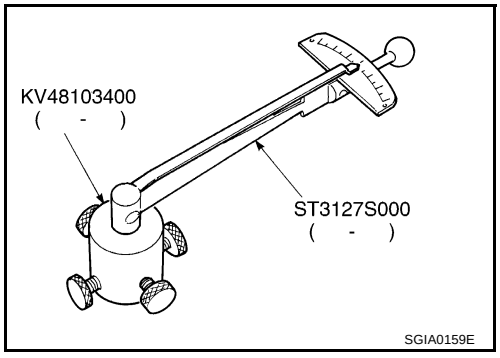
11. Install the projection part (Tip) of rear cover cap to gear sub-assembly as shown in the figure.



12. Apply thread locking adhesive (Three Bond TB1111B or equivalent) to the thread of adjusting screw to the adjusting screw height from gear housing assembly. The adjusting screw height is the same as it was measured in the overhaul in advance.
13. Rotate pinion ten times whole range of rack so that parts get to fit with each other.



14. Measure pinion rotating torque within from –180° to + 180° make preload gauge (SST) and torque adapter (SST) in rack neutral position, then hold preload gauge (SST) at maximum torque.
15. After loosening adjusting screw once, tighten it again with torque of 4.9 - 5.9 N·m (0.50 - 0.60 kg-m, 44 - 52 in-lb). After that loosen it within from 20° to 40°.



16. Measure pinion rotating torque with torque adapter (SST) and preload gauge (SST), then confirm whether its reading is within the specified value. If the reading is not within the specified value, readjust screw angle with adjusting screw. Change gear assembly to new one, if the reading is still not within the specified value or the rotating torque of adjusting screw is less than 5 N·m (0.51kg-m, 44 in-lb)

Pinion rotation torque:

Around neutral position (within ±100°)

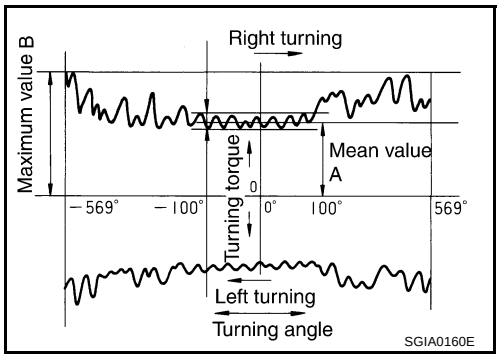
Average "A":

0.8 - 2.0 N·m (0.09 - 0.20 kg-m, 7 - 17 in-lb)

Other than above (more than ±100°)

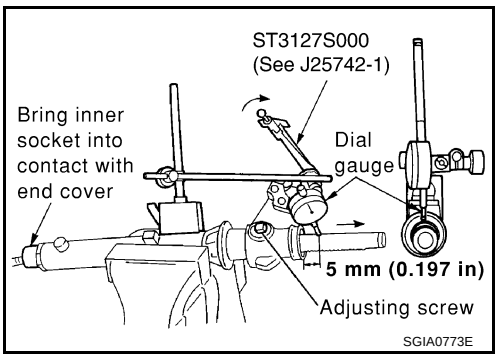
Maximum variation "B":

2.3 N·m (0.23 kg-m, 20 in-lb)



17. Turn pinion fully to the end of the left with tie-rods to rack.

18. Set dial gauge to rack as shown in the figure. Measure vertical movement of rack when pinion is turned counterclockwise with torque of 19.6 N·m (2.0 kg-m, 14 ft-lb). Check reading is within the specified value. If reading is outside of the specification, readjust screw angle with adjusting screw. If reading is still outside of specification, or if the rotating torque of adjusting screw is less than 5 N·m (0.51 kg-m, 44 in-lb), replace steering gear assembly.

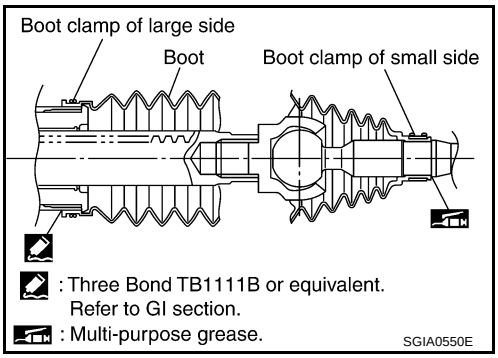


Specified value

Amount of vertical movement with rack	Less than 0.265 mm (0.010 in)	
Measuring point	Axial direction of rack	5 mm (0.197 in) away from end of gear housing
	Radius direction of rack	Shaft direction of adjusting screw

19. Install large-diameter side of boot to gear housing assembly.
20. Install small-diameter side of boot to the mounting groove of inner socket boot.
21. Install boot clamp to the small-diameter side of boot.
22. Install boot clamp to the large-diameter side of boot.

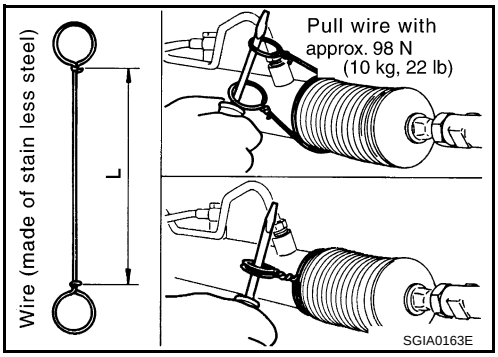
NOTE:
Do not reuse boot clamp.



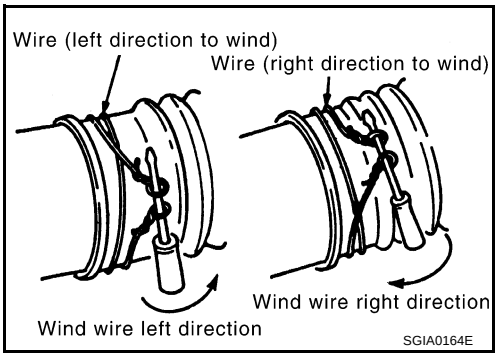
a. Tighten large-diameter side of RH/LH boot with boot clamp (stainless wire).

Wire length "L" : 370 mm (14.567 in)

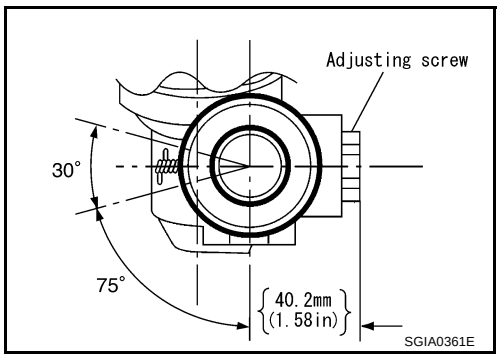
b. After wrapping clamp around boot groove for two turns, insert screwdriver in loop on both ends of wire. Twist 4 to 4.5 turns while pulling with a force of approx. 98 N (10 kg, 22.1 lb).



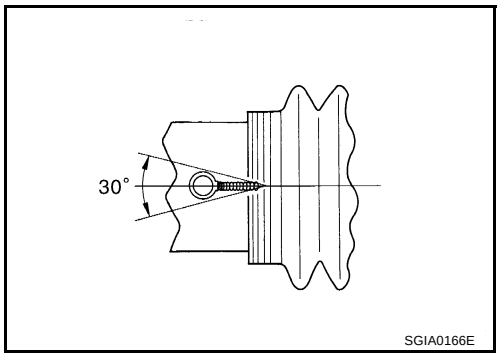
c. Twist boot clamp as shown in the figure, pay attention to relationship between winding and twisting directions.



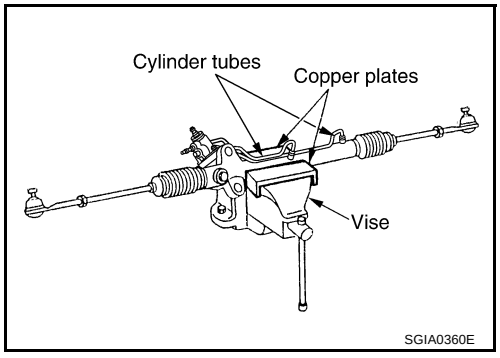
d. Confirm the twisted point with clamp faces in the opposite direction to adjusting screw within 30° as shown in the figure.



e. After twisting wire 4 to 4.5 turns, bend cut end of wire. Cut end of wire should not touch boot. Be sure wire end is at least 5 mm (0.20 in) away from clearance for tube.



23. Install cylinder tubes to gear housing assembly.

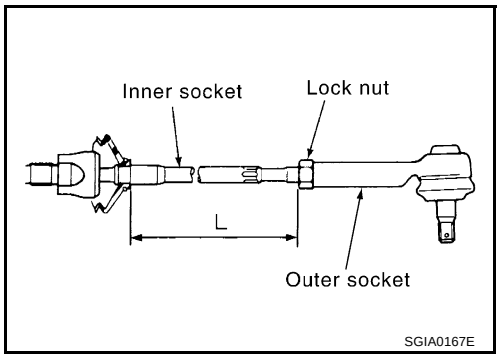


24. Tighten lightly inner socket in specified length “L”, then tighten lock nut at specified torque. Refer to PS-20, "Disassembly and Assembly" . Reconfirm if inner socket length is within limit of specified length “L”.

Inner socket length “L” : 107.7 mm (4.240 in)

CAUTION:

Perform toe-in adjustment after this procedure. Length achieved after toe-in adjustment is not necessarily value given here.



POWER STEERING OIL PUMP

PFP:49110

On-Vehicle Inspection and Service

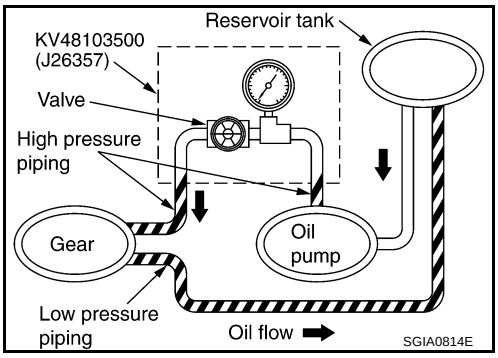
AGS000IW

CHECKING RELIEF OIL PRESSURE

CAUTION:

Before starting work, confirm belt tension is proper.

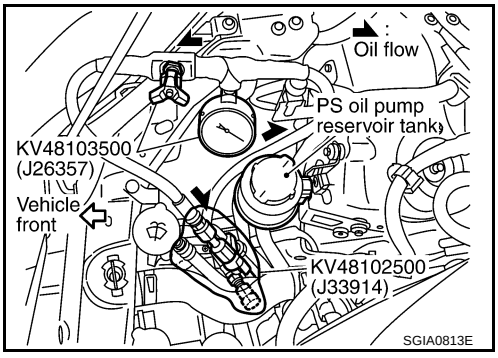
1. Connect oil pressure gauge (SST) and oil pressure gauge adapter (SST) between oil pump discharge connector and high pressure hose and then bleed air from the hydraulic circuit.



2. Start engine. Allow engine to run until tank temperature reaches 50 to 80°C (122 to 176°F).

   CAUTION:

   - **Warm up engine with shut-off valve fully opened. If engine is started with shut-off valve closed, fluid pressure in power steering pump increases to maximum. This will raise fluid temperature excessively.**
   - **Be careful not to contact hose with belt when engine is started.**



3. With engine at idle, close shut-off valve and read the relief oil pressure.

   Relief oil pressure:

   9,600 - 10,200 kPa (98 - 104 kg/cm^2 , 1,390 - 1,480 psi)

   CAUTION:

   Do not close shut-off valve of pressure gauge for more than 10 seconds.

4. After measurement, open shut-off valve slowly.
   - If relief oil pressure is outside the specification, disassemble and repair oil pump. Refer to PS-30, "Disassembly and Assembly" .
5. After inspection, disconnect oil pressure gauge (SST) and oil pressure gauge adapter (SST) from hydraulic circuit, connect oil pump discharge connector and high pressure hose. Add fluid and bleed air from hydraulic circuit thoroughly. Refer to PS-6, "Air Bleeding Hydraulic System" .

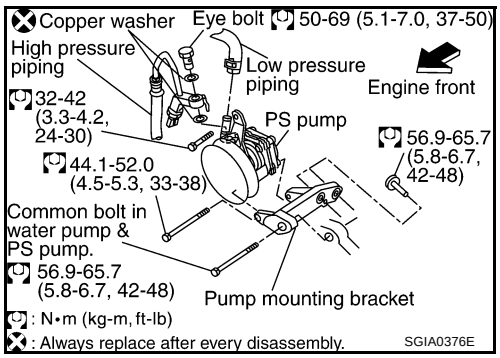
Removal and Installation

AGS000IX

REMOVAL

1. Remove engine cover.
2. Remove air cleaner box.
3. Drain water from radiator upper tank, then remove radiator upper hose.
4. Remove radiator fan shroud. Refer to CO-12, "Removal and Installation" .

5. Loosen idler pulley, then remove belt.
6. Drain power steering fluid from reservoir tank.
7. Remove piping of high pressure and low pressure (drain fluid from their pipings)
8. Remove bolt common to water pump and power steering pump.
9. Remove bolt then remove power steering pump.



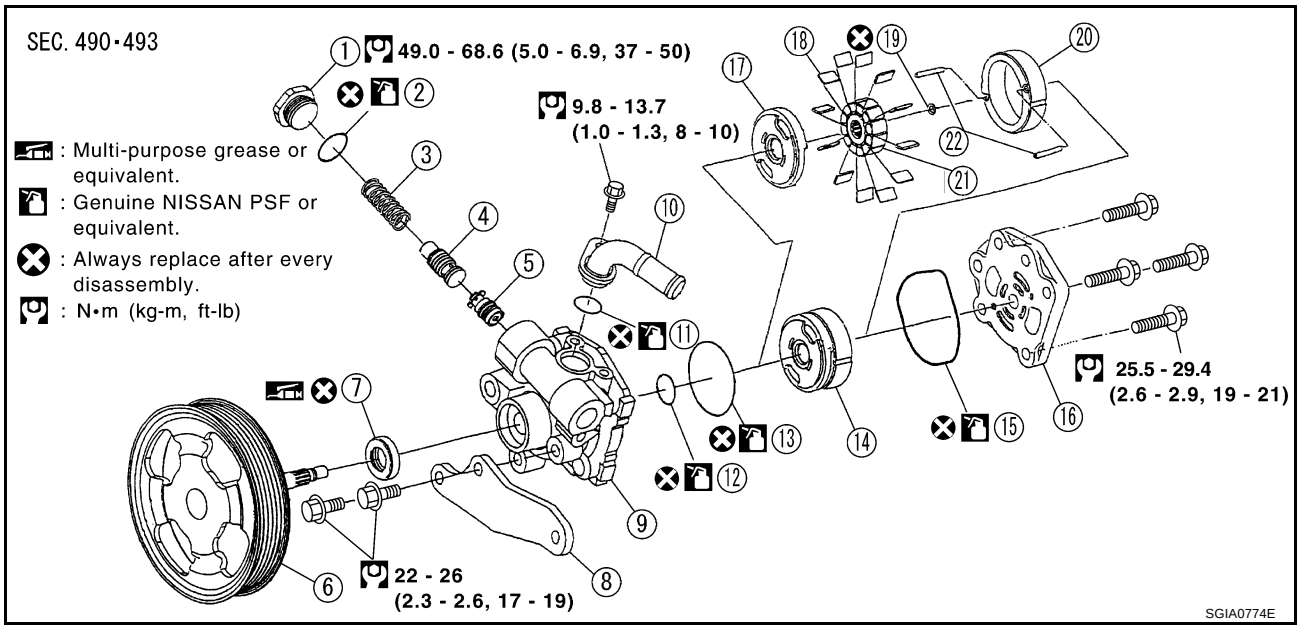
INSTALLATION

Refer to PS-34, "HYDRAULIC LINE" for tightening torque. Install in the reverse order of removal.

- After installation, adjust belt tension. Refer to EM-12, "DRIVE BELTS" .
- After installation, bleed air. Refer to PS-6, "Air Bleeding Hydraulic System" .

Disassembly and Assembly

AGS000IY

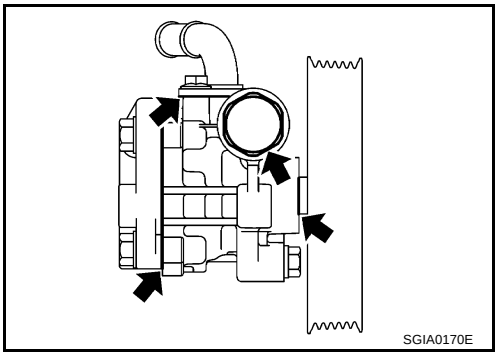


1. Plug
2. O-ring D
3. Flow control valve spring
4. Relief valve assembly
5. Flow control valve assembly
6. Shaft kit
7. Oil seal
8. Bracket
9. Body assembly
10. Suction connector assembly
11. O-ring E
12. O-ring C
13. O-ring B
14. Cartridge assembly
15. O-ring A
16. Cover assembly
17. Side plate
18. Vane
19. Rotor snap ring
20. Cam ring
21. Rotor
22. Dowel pin

INSPECTION BEFORE DISASSEMBLY

Disassemble power steering oil pump only if the following items are found.

- Oil leakage from oil pump
- Deformed or damaged pulley
- Poor performance



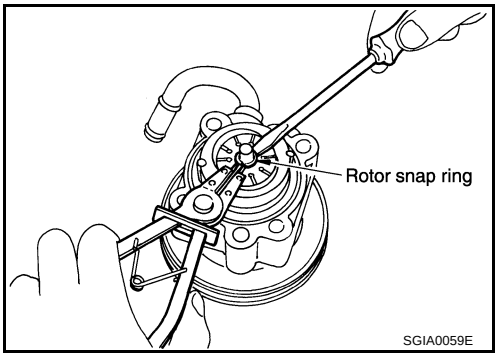
DISASSEMBLY

NOTE:
Fix oil pump in vise as the occasion demands.

CAUTION:
When retaining drive shaft in a vise, always use copper or aluminium plates between vise and shaft.

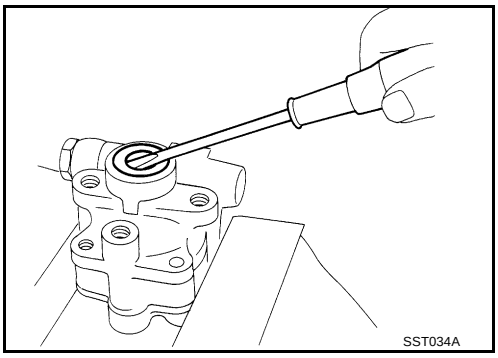
1. Unscrew two front bracket bolts and remove bracket from body assembly.
2. Unscrew four cover assembly bolts and remove cover assembly from body assembly.
3. Remove O-ring A from body assembly.
4. Remove rotor snap ring with snap ring pliers, and remove shaft kit from body assembly.

   CAUTION:
   When removing rotor snap ring, be careful not to damage pulley shaft of shaft kit.



5. Using a screwdriver, remove oil seal for body assembly.
6. Remove cam ring, rotor, vane, side plate, O-ring B and O-ring C from body assembly.
7. Remove plug, then remove O-ring D, flow control valve spring, relief valve assembly and flow control value assembly from body assembly.

   CAUTION:
   Be careful not to drop and deform relief valve assembly and flow control valve assembly.
8. Remove fixing bolt of suction connector assembly, then remove suction connector assembly and O-ring E from body assembly.



INSPECTION AFTER DISASSEMBLY

Body Assembly and Cover Assembly Inspection

- Check body assembly and cover assembly for damage. If any damage is found, replace with new part for cover assembly, and replace with new power steering pump assembly for body assembly.

Cartridge Assembly Inspection

- Check cam ring, side plate, rotor and vane for damage. If any damage is found, replace cartridge assembly with new one.

Relief Valve Assembly Inspection

- Check relief valve assembly for damage. If any damage is found, replace it with new one.

Flow Control Valve Assembly Inspection

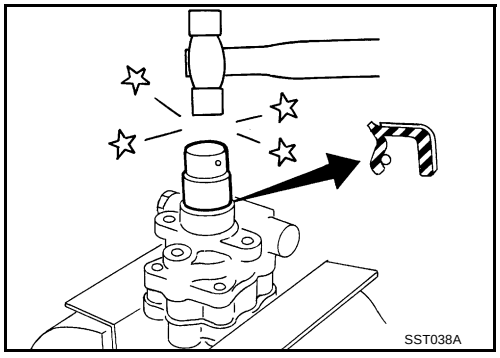
- Check flow control valve assembly for damage. If any damage is found, replace it with new one.

ASSEMBLY

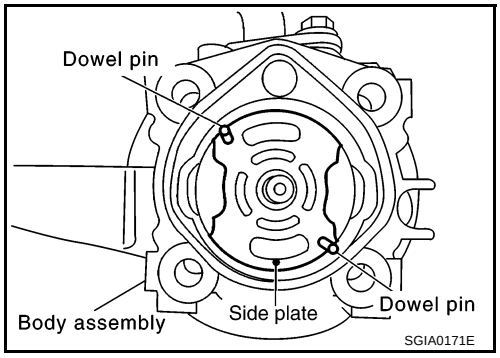
NOTE:
Fix oil pump in vise as occasion demands.

CAUTION:
When retaining drive shaft in a vise, always use copper or aluminium plates between vise and shaft.

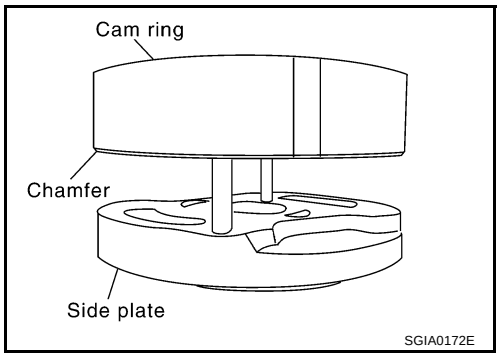
1. Apply a coat of Multi-purpose grease or equivalent to oil seal lip and to the circumference of oil seal. Using proper tool such as hand press machine, install it to the body assembly.
   NOTE:
   Do not reuse oil seal.
2. Install shaft kit to body assembly.
3. Apply a coat of NISSAN PSF or equivalent to O-ring B and O-ring C, then install O-ring B and O-ring C to body assembly.
   NOTE:
   Do not reuse O-ring B and O-ring C.

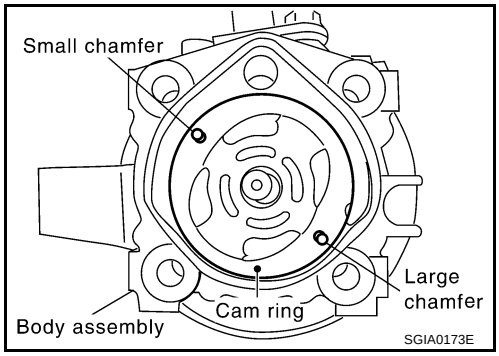


4. Set dowel pin at the illustration position (The position is the same regardless of right or left direction), and install side plate to body assembly.



5. Install cam ring on side plate as follows;
   - Turn chamfered edge side of cam ring to side plate as shown in the figure.
   - Position large chamfered side of cam ring as shown in the figure.

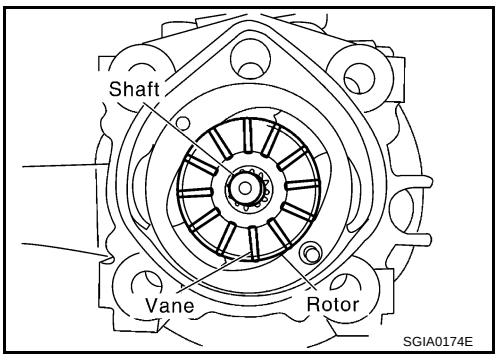




6. Install rotor to shaft of shaft kit (rotor direction is the same regardless of the front and back).
7. Install vane to rotor (vane direction is the same regardless of inside and outside).
8. Install rotor snap ring to shaft of shaft kit.

   NOTE:
   - Do not reuse rotor snap ring.

   CAUTION:
   Be careful not to damage rotor and pulley shaft.



9. Apply a coat of NISSAN PSF or equivalent to O-ring A, then install O-ring A to body assembly.

   NOTE:
   Do not reuse O-ring A.
10. Attach cover assembly to body assembly and tighten fixing bolts diagonally at the specified torque.
11. Install flow control valve assembly, relief valve assembly and flow control valve spring to body assembly.
12. Apply a coat of NISSAN PSF or equivalent to O-ring D and install to plug, then tighten plug at the specified torque.

    NOTE:
    Do not reuse O-ring D.
13. Apply a coat NISSAN PSF or equivalent to O-ring E and install to suction connector assembly, then install suction connector to body assembly.

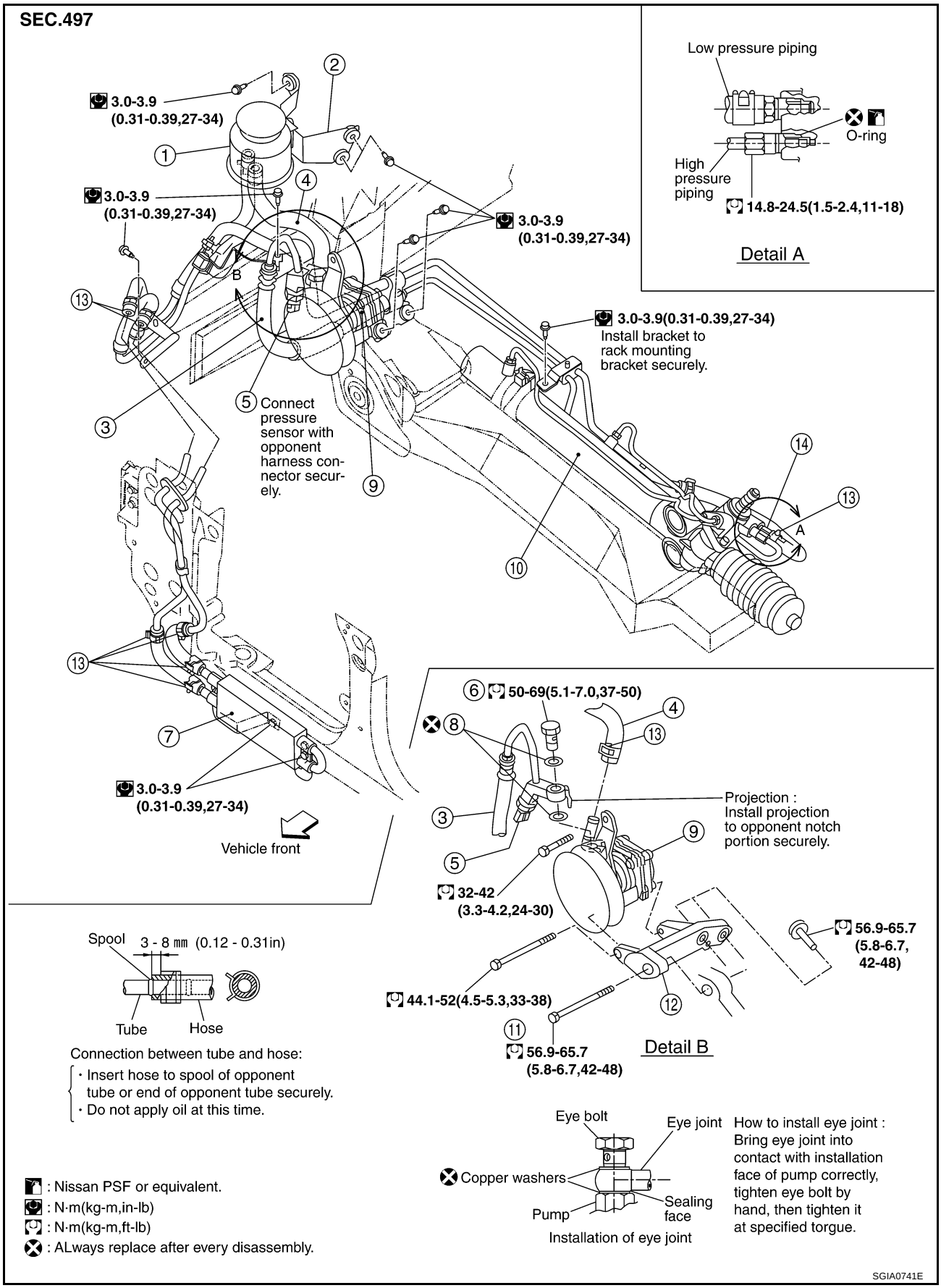
    NOTE:
    Do not reuse O-ring E.
14. Install bracket to body assembly, and tighten mounting bolts at the specified torque.

HYDRAULIC LINE

PFP:49721

Removal and Installation

AGS000IZ



1. Reservoir tank
2. Reservoir tank bracket
3. Hose & tube assembly
4. Suction hose
5. Oil pressure sensor
6. Eye bolt
7. Oil cooler
8. Copper washer
9. Power steering oil pump
10. Steering gear assembly
11. Common bolt
12. Oil pump bracket
13. Clip

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Steering Wheel

AGS000J0

End play of the axle direction for steering wheel	0 mm (0 in)
Steering wheel play on the outer circumference	0 - 35 mm (0 - 1.38 in) or less

Steering Angle

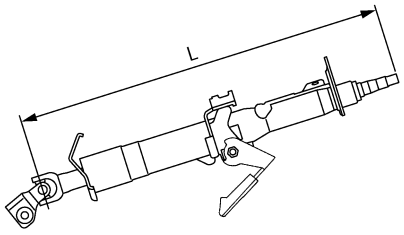
AGS000J1

Inner wheel Degree minute (Decimal degree)	Minimum	35°55' (35.9°)
	Nominal	38°55' (38.9°)
	Maximum	39°55' (39.9°)
Outer wheel Degree minute (Decimal degree)	Nominal	30°40' (30.7°)

Steering Column

AGS000J2

Steering column length “L”	568 mm (22.36 in)

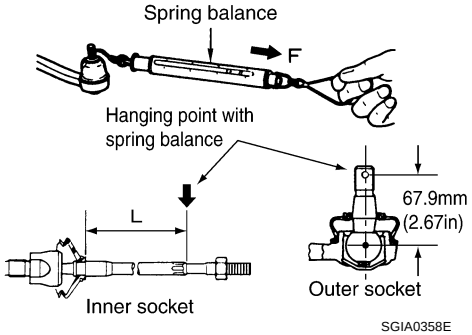


SGIA0306J

Steering Outer Socket and Inner Socket

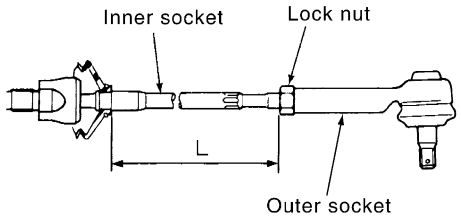
AGS000J3

Steering gear type		PR26AD
Outer socket ball joint outer socket	Swinging torque	0.3 - 2.9 N·m (0.03 - 0.29 kg-m, 3 - 25 in-lb)
	Measurement on spring balance ● Measuring point: stud cotter pin hole	4.42 - 42.7 N (0.45 - 4.4 kg, 1.0 - 9.7 lb)
	Rotating torque	0.3 - 2.9 N·m (0.03 - 0.29 kg-m, 3 - 25 in-lb)
	Axial end play	0.5 mm (0.02 in) or less
Inner socket ball joint inner socket	Swinging torque	1.0 - 7.8 N·m (0.11 - 0.79 kg-m, 9 - 69 in-lb)
	Measurement on spring balance ● Measuring point: L mark see below, L=48.5 mm (1.91 in).	10 - 78 N (1.1 -7.9 kg, 2.43 - 17.44 lb)
	Axial end play	0.2 mm (0.08 in) or less



SGIA0358E

Inner socket length “L”	107.7 mm (4.240 in)

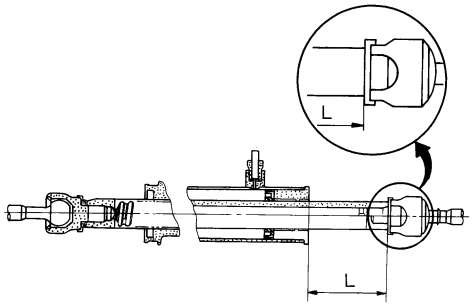


SGIA0167E

Steering Gear

AGS000J4

Steering gear model	PR26AD
Rack neutral position, dimension “L” (rack stroke)	64.5 mm (2.54 in)



SGIA0629J

Rack sliding force	At the neutral point: Range within ±11.5 mm (±0.453in) from the neutral position (in power ON)	Area average value	147 - 211 N (14.99 - 21.52 kg, 33.1 - 47.52 lb)
		Allowable variation	98 N (10 kg, 22 lb) or less
	Whole area (in power OFF)	Peak value	294 N (30.0 kg, 66 lb) or less
		Allowable variation	147 N (16 kg, 35 lb) or less

Oil Pump

AGS000J5

Oil pump relief hydraulic pressure	9,600 - 10,200 kPa (98 - 104 kg/cm^2 , 1,390 - 1,480 psi)

Steering Fluid

AGS000J6

Fluid capacity	Approx. 1.0 ℓ (1-1/8 US qt, 7/8 Imp qt)

SECTION SB
SEAT BELTS

CONTENTS

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AFTER A COLLISION 2
Precautions for Battery Service 3
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SEAT BELT RETRACTOR OFF-VEHICLE CHECK 9

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

AHS0001C

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precaution for Seat Belt Service

AHS0001D

CAUTION:

- **Before removing the seat belt pre-tensioner assembly, turn the ignition switch off, disconnect the both battery cables and wait at least 3 minutes.**
- **Do not use electrical test equipment for seat belt pre-tensioner connector.**
- **After replacing or reinstalling seat belt pre-tensioner assembly, or reconnecting front seat belt pre-tensioner connector, check the system function. Refer to SRS-22, "SRS Operation Check" .**
- **Deploy seat belt pre-tensioner assembly before disposing. Refer to SRS-54, "DISPOSAL OF AIR BAG MODULE AND SEAT BELT PRE-TENSIONER" .**
- **Do not use disassemble buckle or seat belt assembly.**
- **Replace anchor bolts if they are deformed or worn out.**
- **Never oil tongue and buckle.**
- **If any component of seat belt assembly is questionable, do not repair. Replace the whole seat belt assembly.**
- **If webbing is cut, frayed, or damaged, replace seat belt assembly.**
- **When replacing seat belt assembly, use a genuine NISSAN seat belt assembly.**

AFTER A COLLISION

WARNING:

Inspect all seat belt assemblies including retractors and attaching hardware after any collision. NISSAN recommends that all seat belt assemblies in use during a collision be replaced unless the collision was minor and the belts show no damage and continue to operate properly. Failure to do so could result in serious personal injury in an accident. Seat belt assemblies not in use during a collision should also be replaced if either damage or improper operation is noted. Seat belt pre-tensioner should be replaced even if the seat belts are not in use during a frontal collision in which the air bags are deployed.

Replace any seat belt assembly (including anchor bolts) if:

- The seat belt was in use at the time of a collision (except for minor collisions and the belts, retractors and buckles show no damage and continue to operate properly).
- The seat belt was damaged in an accident. (i.e. torn webbing, bent retractor or guide).
- The seat belt attaching point was damaged in an accident. Inspect the seat belt attaching area for damage or distortion and repair as necessary before installing a new seat belt assembly.
- Anchor bolts are deformed or worn out.

- The seat belt pre-tensioner should be replaced even if the seat belts are not in use during the collision in which the air bags are deployed.

Precautions for Battery Service

AHS000N3

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

SEAT BELTS

PFP:86884

System Description

AHS0001E

SEAT BELT WARNING CHIME

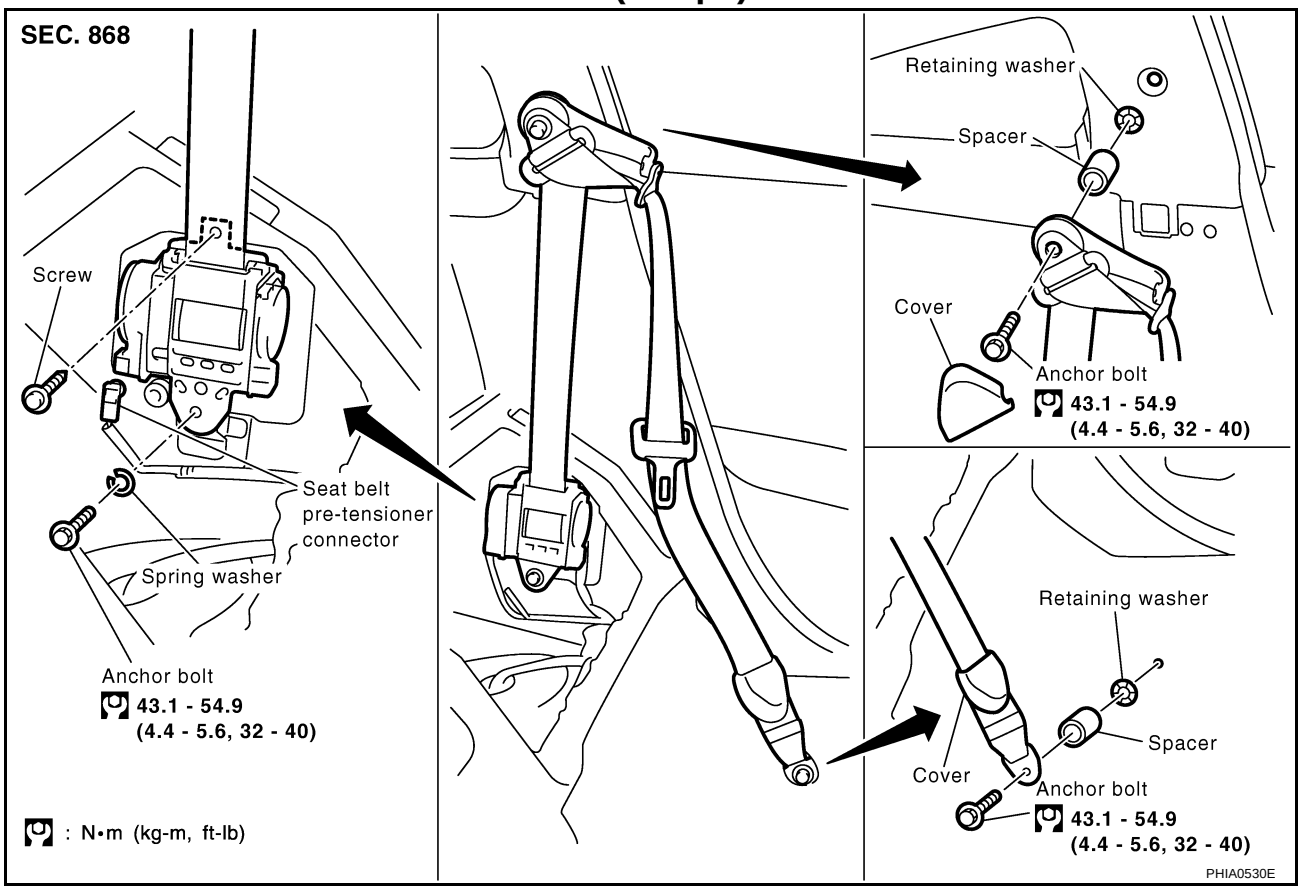
- With ignition switch turned ON and seat belt unfastened (seat belt switch ON), warning chime will sound for approximately 6 seconds.
- If warning chime does not sound. Refer to DI-94, "Seat Belt Warning Chime Does Not Operate" .

SEAT BELT WARNING LAMP

- Fasten driver's seat belt.
- The seat belt warning lamp should go out.
- If the seat belt warning lamp does not go out. Refer to DI-63, "Wiring Diagram — WARN —" .

Removal and Installation of Seat Belt (Coupe)

AHS0001F



CAUTION:

Before servicing SRS, turn the ignition switch OFF, disconnect both battery cables and wait at least 3 minutes.

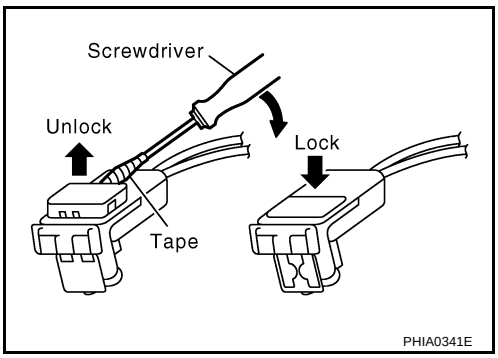
REMOVAL OF SEAT BELT RETRACTOR

1. Remove the shoulder anchor cover on the seat belt anchor.
2. Remove the anchor bolt.
3. Slide up outer anchor cover, and remove the anchor bolt.
4. Remove the rear side finisher and rear pillar finisher. Refer to EI-35, "Removal and Installation (for Coupe Models)" .
5. Remove the center console. Refer to IP-10, "Component Parts Drawing" .
6. Remove the luggage floor finisher lower. Refer to EI-39, "Removal and Installation (for Coupe Models)" .
7. Remove the woofer and woofer amp. (BOSE system) bracket mounting bolts. Refer to AV-43, "Removal and Installation of Woofer and Woofer Amp. (BOSE System)" .
8. Remove the rear floor box. Refer to EI-39, "Removal and Installation (for Coupe Models)" .

9. Disconnect the seat belt pre-tensioner connector.

CAUTION:

- **For installing/removing pre-tensioner seat belt connector, insert screwdriver wrapped in tape into notch, lift lock and remove connector.**
- **Install connector with lock raised, and push lock into connector.**



10. Remove the seat belt pre-tensioner retractor fixing screw and anchor bolt, and then remove the seat belt retractor.

INSTALLATION OF SEAT BELT RETRACTOR

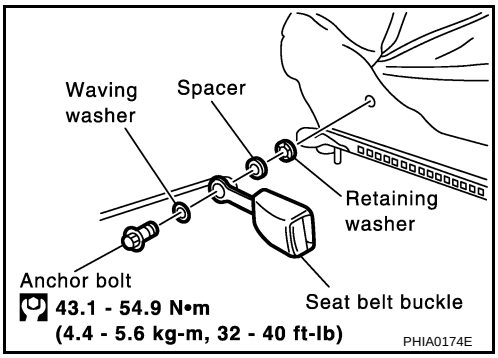
CAUTION:

Before servicing SRS, turn the ignition switch OFF, disconnect both battery cables and wait at least 3 minutes.

Install in the reverse order of removal.

REMOVAL OF SEAT BELT BUCKLE

1. Remove the seat. Refer to SE-70, "REMOVAL" .
2. Remove the screws, and remove the seat cushion inner finisher.
3. Remove the anchor bolt, and remove the buckle.

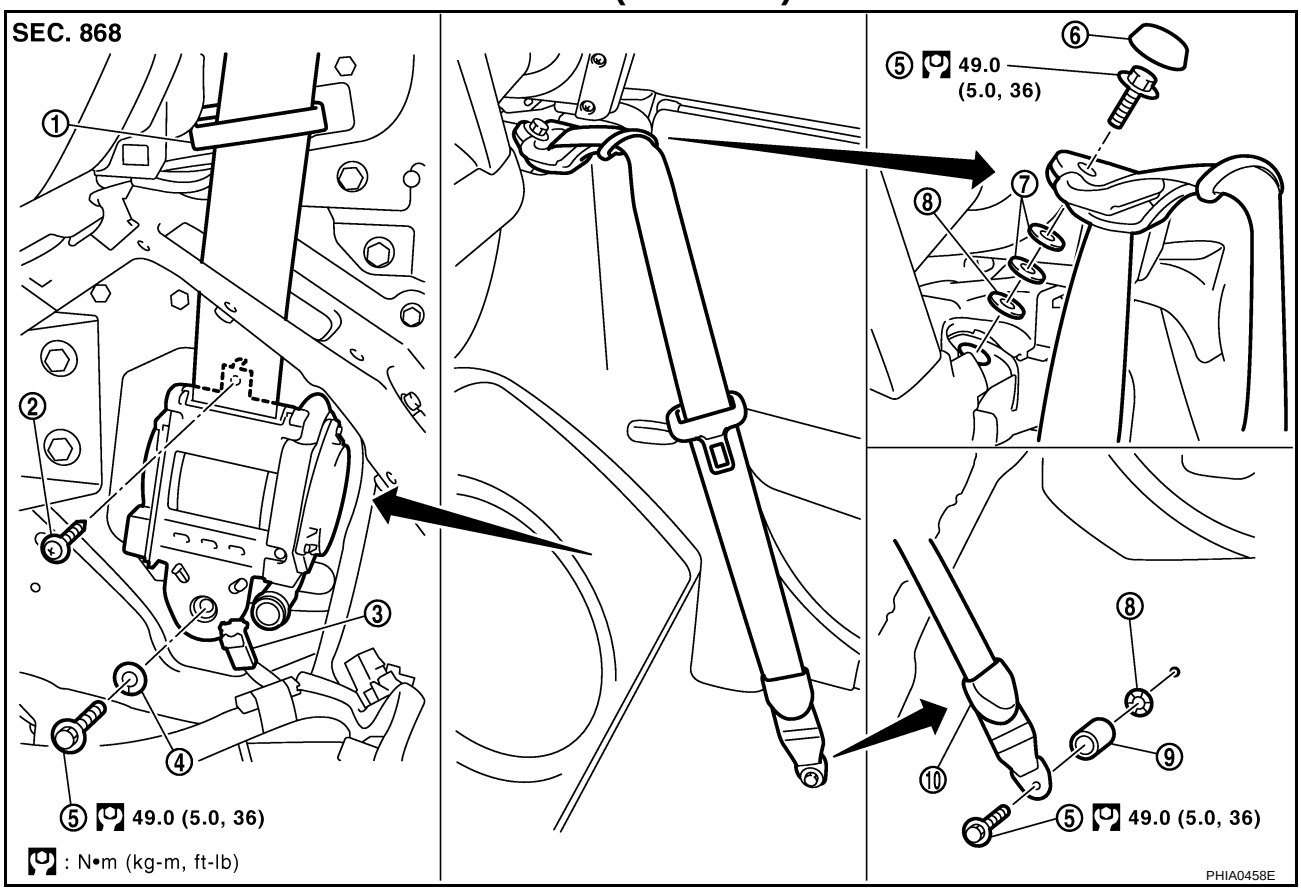


INSTALLATION OF SEAT BELT BUCKLE

Install in the reverse order of removal.

Removal and Installation of Seat Belt (Roadster)

AHS000JM



1. Sash guide
2. Screw
3. Seat belt pre-tensioner connector
4. Spring washer
5. Anchor bolt
6. Shoulder anchor cover
7. Spacer
8. Retaining washer
9. Spacer
10. Outer anchor cover

CAUTION:

Before servicing SRS, turn the ignition switch OFF, disconnect both battery cables and wait at least 3 minutes.

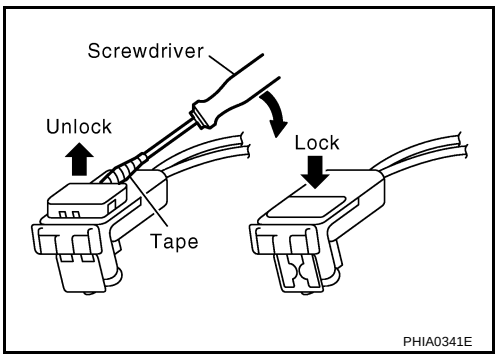
REMOVAL OF SEAT BELT RETRACTOR

1. Remove the shoulder anchor cover on the seat belt anchor.
2. Remove the anchor bolt.
3. Slide up outer anchor cover, and remove the anchor bolt.
4. Remove the rear side finisher. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
5. Remove the center console. Refer to IP-10, "Component Parts Drawing" .
6. Remove the luggage floor finisher lower. Refer to EI-41, "Removal and Installation (for Roadster Models)" .
7. Remove the woofer and woofer amp. (BOSE system) bracket mounting bolts. Refer to AV-43, "Removal and Installation of Woofer and Woofer Amp. (BOSE System)" .
8. Remove the rear floor box. Refer to EI-41, "Removal and Installation (for Roadster Models)" .

9. Disconnect the seat belt pre-tensioner connector.

CAUTION:

- **For installing/removing pre-tensioner seat belt connector, insert screwdriver wrapped in tape into notch, lift lock and remove connector.**
- **Install connector with lock raised, and push lock into connector.**



10. Remove the seat belt pre-tensioner retractor fixing screw and anchor bolt, and then remove the seat belt retractor.
11. Remove the sash guide and then remove the seat belt assembly.

INSTALLATION OF SEAT BELT RETRACTOR

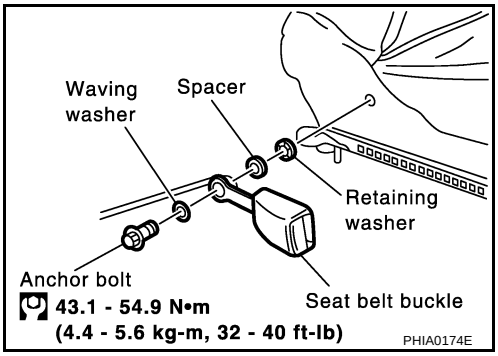
CAUTION:

Before servicing SRS, turn the ignition switch OFF, disconnect both battery cables and wait at least 3 minutes.

Install in the reverse order of removal.

REMOVAL OF SEAT BELT BUCKLE

1. Remove the seat. Refer to SE-70, "REMOVAL" .
2. Remove the screws, and remove the seat cushion inner finisher.
3. Remove the anchor bolt, and remove the buckle.



INSTALLATION OF SEAT BELT BUCKLE

Install in the reverse order of removal.

Seat Belt Inspection

AHS0001H

AFTER A COLLISION

WARNING:

Inspect all seat belt assemblies including retractors and attached hardware after any collision. NISSAN recommends that all seat belt assemblies in use during a collision be replaced unless the collision was minor and the belts show no damage and continue to operate properly. Failure to do so could result in serious personal injury in an accident. Seat belt assemblies not in use during a collision should also be replaced if either damage or improper operation is noted. Seat belt pre-tensioner should be replaced even if the seat belts are not in use during a frontal collision in which the air bags are deployed.

Replace any seat belt assembly (including anchor bolts) if:

- The seat belt was in use at the time of a collision (except for minor collisions and the belts, retractors and buckles show no damage and continue to operate properly).
- The seat belt was damaged in an accident. (i.e. torn webbing, bent retractor or guide).
- The seat belt attaching point was damaged in an accident. Inspect the seat belt attaching area for damage or distortion and repair as necessary before installing a new seat belt assembly.
- Anchor bolts are deformed or worn out.
- The seat belt pre-tensioner should be replaced even if the seat belts are not in use during the collision in which the air bags are deployed.

PRELIMINARY CHECKS

1. Check the seat belt warning lamp/chime for proper operation as follows:

a. Switch ignition ON. The seat belt warning lamp should illuminate. Also, the seat belt warning chime should sound for about 6 seconds.

b. Fasten driver's seat belt. The seat belt warning lamp should go out and the chime (if sounding) should stop.

2. If the air bag warning lamp is blinking, conduct self-diagnosis using CONSULT-II, and confirm with air bag warning lamp. Refer to SRS-22, "SRS Operation Check" .

3. Make sure that the seat belt retractor, seat belt anchor and buckle bolts are securely attached.

4. Check the shoulder seat belt guide for seats. Ensure guide swivels freely and that webbing lays flat and does not bind in guide. Ensure height adjuster operates properly and holds securely.

5. Check retractor operation:

a. Fully extend the seat belt webbing and check for twists, tears or other damage.

b. Allow the seat belt to retract. Ensure that webbing returns smoothly and completely into the retractor. If the seat belt does not return smoothly, wipe the inside of the loops with a clean paper cloth, because dirt built up in the loops of the upper anchors can cause the seat belts to retract slowly.

c. Fasten the seat belt. Check the seat belt returns smoothly and completely to the retractor. If the webbing does not return smoothly, the cause may be an accumulation of dust or dirt. Use the “SEAT BELT TAPE SET” and perform the following steps.

   Inspect the seat belt through-anchor:

   1. Pull the seat belt out to a length of 500 mm (19.69 in) or more.
   2. Use a clip or other device to the fix the seat belt at the rear side finisher webbing opening.
   3. Pass a thin wire through the through-anchor webbing opening. Hold both ends of the wire and pull taut while moving it up and down several times along the webbing opening surface to remove dirt.
   4. Any dirt that cannot be removed with the wire can be removed by cleaning the opening with a clean cloth.
   5. Apply tape at the point where the webbing contacts the through-anchor webbing opening.

      NOTE:
      Apply the tape so that there is no looseness or wrinkling.

   6. Remove the clip fixing the seat belt and make sure that the webbing returns smoothly.
   7. Repeat steps above as necessary to check the other seat belts.

SEAT BELT RETRACTOR ON-VEHICLE CHECK

Emergency Locking Retractors (ELR)

NOTE:
All seat belt retractors are of the Emergency Locking Retractors (ELR) type. In an emergency (sudden stop) the retractor will lock and prevent the webbing from extending any further.
Check the seat belt retractors using the following test(s) to determine if a retractor assembly is operating properly.

ELR Function Stationary Check

Grasp the shoulder webbing and pull forward quickly. The retractor should lock and prevent the belt from extending further.

ELR Function Moving Check

WARNING:
Perform the following test in a safe, open area clear of other vehicles and obstructions (for example, a large, empty parking lot). Road surface must be paved and dry. Do Not perform the following test on wet or gravel roads or on public streets and highways. This could result in an accident and serious personal injury. The driver and passenger must be prepared to brace themselves in the event the retractor does not lock.

1. Fasten driver's seat belt. Buckle a passenger into the seat for the belt that is to be tested.
2. Proceed to the designated safe area.
3. Drive the vehicle at approximately 16 km/h (10 MPH). Notify any passengers of a pending sudden stop. The driver and passenger must be prepared to brace themselves in the event the retractor does not lock. Apply brakes firmly and make a very hard stop.

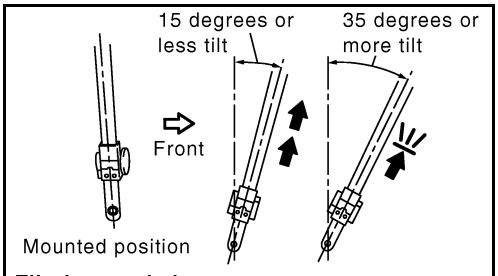
While stopping, seat belts should lock and not be extended. If the seat belt retractor assembly does not lock, perform the retractor off-vehicle check.

SEAT BELT RETRACTOR OFF-VEHICLE CHECK

1. Remove the seat belt retractor assembly.
2. Slowly pull out webbing while tilting the retractor assembly forward from the mounted position without twisting the retractor assembly as shown in the figure.

   15 degrees or less tilt : Webbing can be pulled out.
   35 degrees or more tilt : Webbing locks and cannot be pulled out.

   If NG, replace the retractor assembly.



Tilt the seat belt retractor forward from the mounted position without twisting the retractor.
PHIA0175E

SECTION SRS
SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

AHS0001K

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for SRS “AIR BAG” and “SEAT BELT PRE-TENSIONER” Service

AHS000JX

- Do not use electrical test equipment to check SRS circuits unless instructed in this Service Manual.
- Before servicing the SRS, turn ignition switch OFF, and disconnect both battery cables. Then wait at least 3 minutes.
  For approximately 3 minutes after the cables are removed, it is still possible for the air bag and seat belt pre-tensioner to deploy. Therefore, do not work on any SRS connectors or wires until at least 3 minutes have passed.
- Diagnosis sensor unit must always be installed with their arrow marks “⇐” pointing towards the front of the vehicle for proper operation. Also check diagnosis sensor unit for cracks, deformations or rust before installation and replace if required.
- The spiral cable must be set to the neutral position since its rotations are limited. Do not attempt to turn steering wheel or column, if steering gear was disconnected from the column shaft.
- Handle air bag module carefully. Always put a driver air bag module with the pad side facing upward.
- Conduct self-diagnosis to check entire SRS for proper function after replacing any components.
- After an air bag deployemented, the front instrument panel assembly should be replaced if damaged.
- Always replace instrument panel pad following front passenger air bag deployment.

Precautions for Battery Service

AHS000NY

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Wiring Diagrams and Trouble Diagnosis

AHS0001M

When you read wiring diagrams, refer to the following:

- GI-15, "How to Read Wiring Diagrams" in GI section
- PG-4, "POWER SUPPLY ROUTING CIRCUIT" in PG section

When you perform trouble diagnosis, refer to the following:

- GI-11, "HOW TO FOLLOW TEST GROUPS IN TROUBLE DIAGNOSES" in GI section
- GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident" in GI section

Check for any service bulletins before servicing the vehicle.

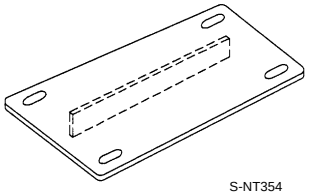
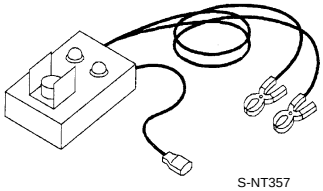
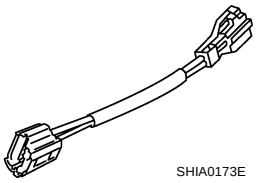
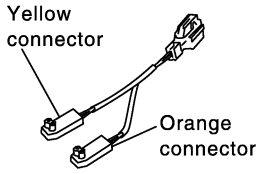
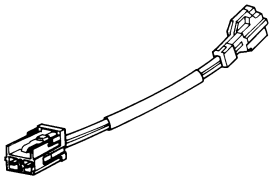
PREPARATION

PFP:00002

Special Service Tools

AHS0001N

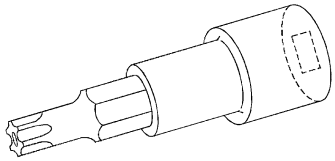
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
KV99105300 (J41246) Air bag module bracket	 S-NT354	Anchoring air bag module
KV99106400 (J38381) Deployment tool	 S-NT357	Disposing of air bag module and front seat belt pre-tensioner
KV99110200 (J38381-65) Deployment tool adapter for front passenger air bag module	 SHIA0173E	Connecting between the deployment tool and front passenger air bag module
KV99110500 (J38381-80) ● Deployment tool adapter for driver air bag module (Yellow and orange connectors) ● Deployment tool adapter for front seat belt pre-tensioner (Yellow connector) ● Deployment tool adapter for side curtain air bag module*(Yellow connector)	 PHIA0184E	● Connecting between the deployment tool and driver air bag module ● Connecting between the deployment tool and front seat belt pre-tensioner ● Connecting between the deployment tool and side curtain air bag module*
KV99108300 (J38381-35) Deployment tool adapter for front side air bag module	 ZZA1166D	Connecting between the deployment tool and front side air bag module

*: For Coupe

Commercial Service Tools

AHS0001O

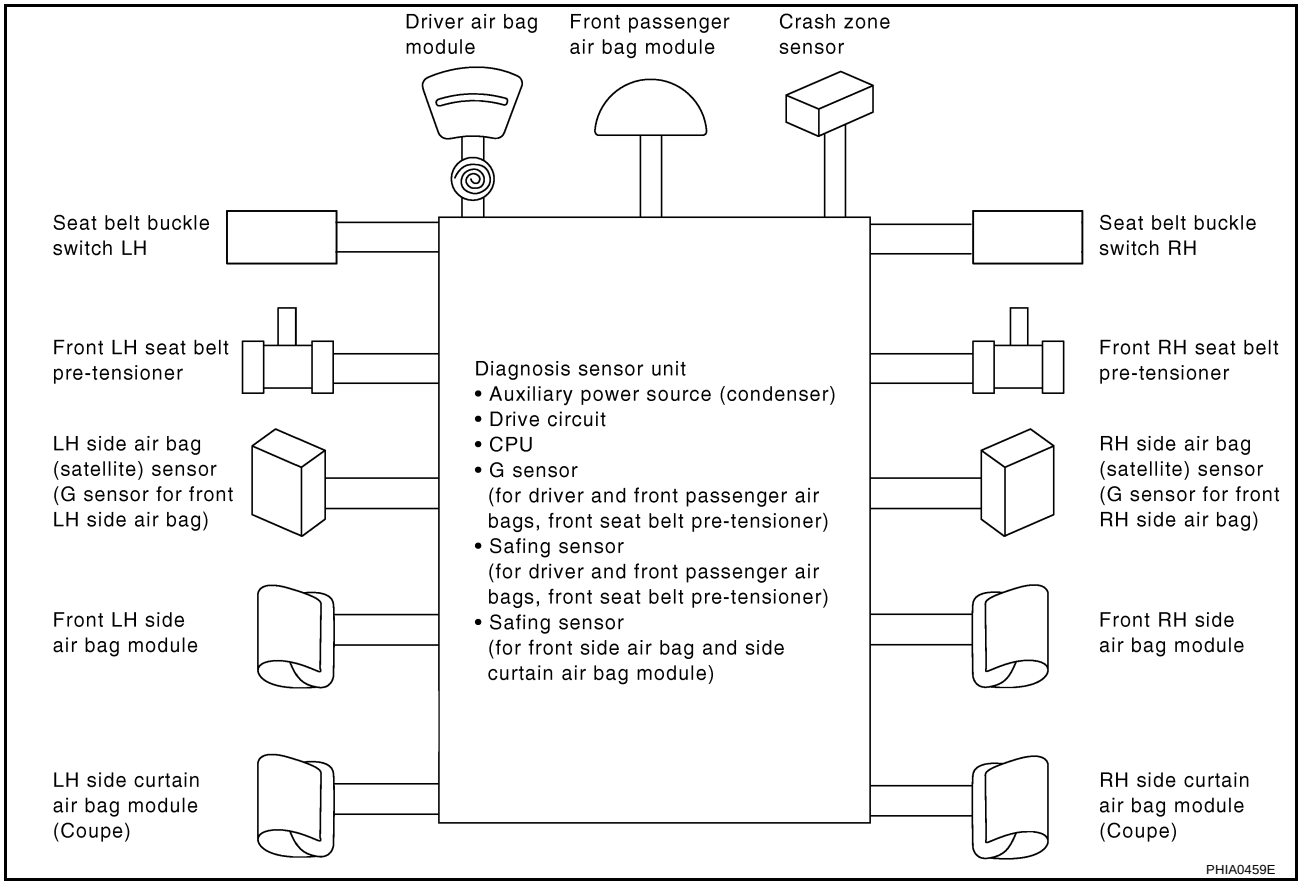
Tool name	Application
Tamper resistant TORX bit  S-NT757	Size: T30

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

PFP:28556

SRS Configuration

AHS0001P



The air bag deploys if the diagnosis sensor unit activates while the ignition switch is in the ON or START position.
The collision modes for which supplemental restraint systems are activated are different among the SRS systems. For example, the driver air bag module and front passenger air bag module are activated in a frontal collision but not in a side collision.
SRS configurations which are activated for some collision modes are as follows;

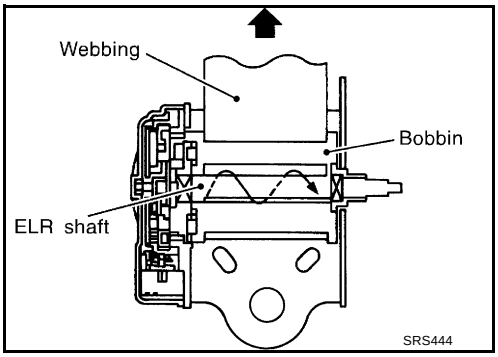
SRS configuration	Frontal collision	Left side collision	Right side collision
Driver air bag module	×	—	—
Front passenger air bag module	×	—	—
Front LH seat belt pre-tensioner	×	—	—
Front RH seat belt pre-tensioner	×	—	—
Front LH side air bag module	—	×	—
Front RH side air bag module	—	—	×
LH side curtain air bag module*	—	×	—
RH side curtain air bag module*	—	—	×

*: For Coupe

Front Seat Belt Pre-tensioner with Load Limiter

AHS0001Q

The seat belt pre-tensioner system with load limiter is installed for both the driver's seat and the front passenger seat. It operates simultaneously with the SRS air bag system in the event of a frontal collision with an impact exceeding a specified level.
When the frontal collision with an impact exceeding a specified level occurs, seat belt slack resulting from clothing or other factors is immediately taken up by the pre-tensioner. Vehicle passengers are securely restrained.
When passengers in a vehicle are thrown forward in a collision and the restraining force of the seat belt exceeds a specified level, the load limiter permits the specified extension of the seat belt by the twisting of the ELR shaft, and a relaxation of the chest-area seat belt web tension while maintaining force.



Front Side Air Bag

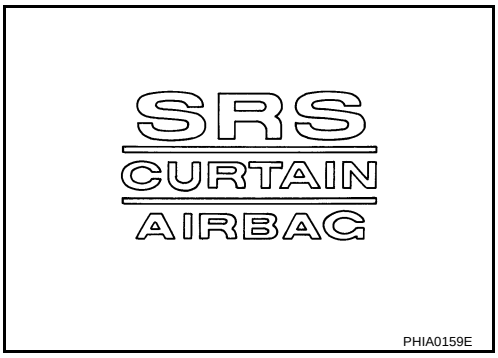
AHS0001R

Front side air bag is built-in type.
The front seatbacks with built-in type side air bag have the labels as shown.

Side Curtain Air Bag/For Coupe

AHS0001S

The side curtain air bags have the labels as shown.



TROUBLE DIAGNOSIS

PFP:00004

Trouble Diagnosis Introduction

AHS0001T

CAUTION:

- **Do not use electrical test equipment on any circuit related to the SRS unless instructed in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**
- **Do not repair, splice or modify the SRS wiring harness. If the harness is damaged, replace it with a new one.**
- **Keep ground portion clean.**

DIAGNOSIS FUNCTION

The SRS self-diagnostic results can be read by using “AIR BAG” warning lamp and/or CONSULT-II.
The User mode is exclusively prepared for the customer (driver). This mode warns the driver of a system malfunction through the operation of the “AIR BAG” warning lamp.
The Diagnosis mode allows the technician to locate and inspect the malfunctioning part.
The mode applications for the “AIR BAG” warning lamp and CONSULT-II are as follows:

	User mode	Diagnosis mode	Display type
“AIR BAG” warning lamp	X	X	ON-OFF operation
CONSULT-II	—	X	Monitoring

HOW TO PERFORM TROUBLE DIAGNOSES FOR QUICK AND ACCURATE REPAIR

A good understanding of the malfunction conditions can make troubleshooting faster and more accurate.
In general, each customer feels differently about a malfunction. It is important to fully understand the symptoms or conditions for a customer complaint.

Information from Customer

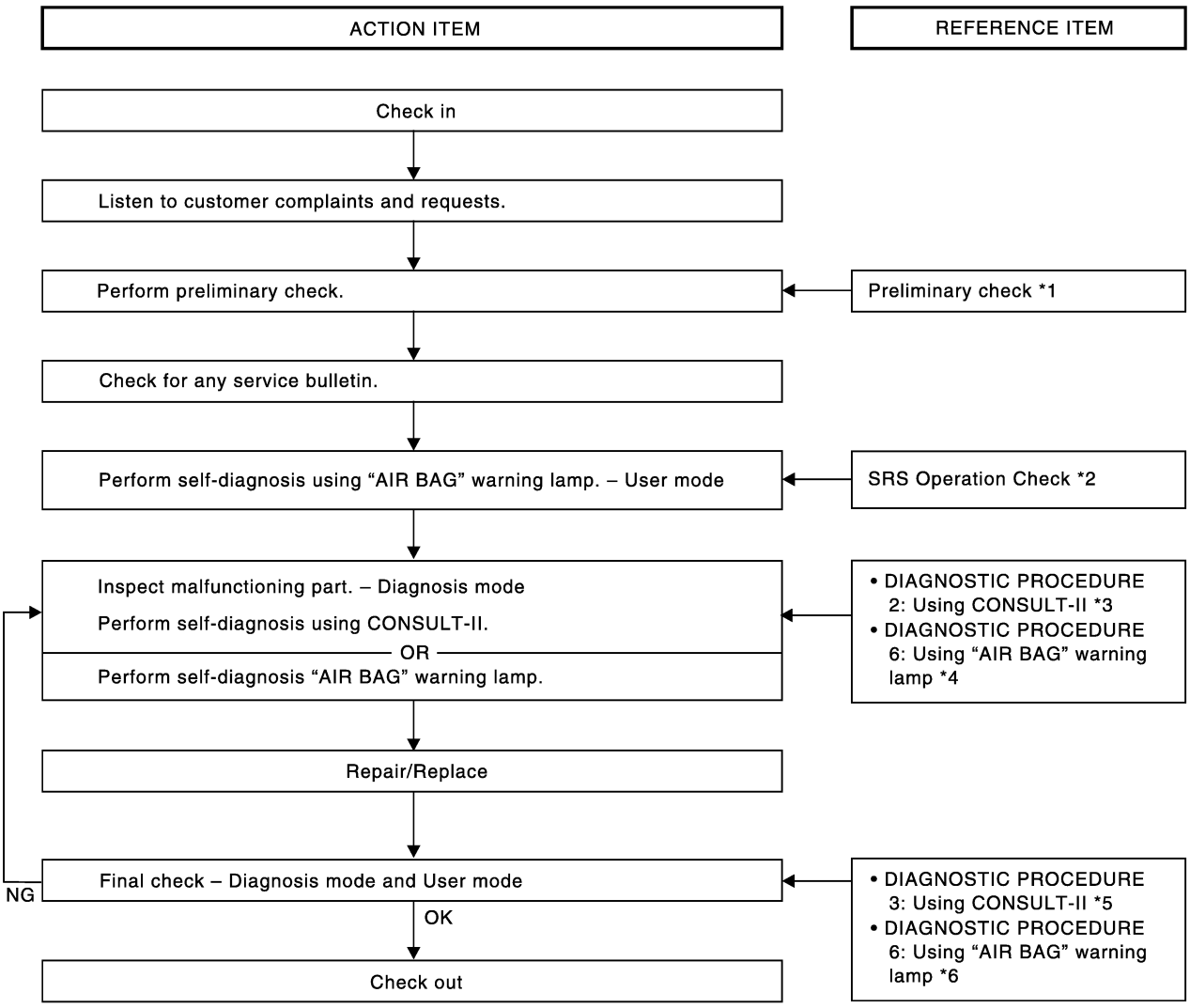
WHAT..... Vehicle model
WHEN..... Date, Frequencies
WHERE..... Road conditions
HOW..... Operating conditions, Symptoms

Preliminary Check

Make sure that the following parts are in good order.

- Battery (Refer to SC-4, "How to Handle Battery" .)
- Fuse (Refer to SRS-12, "Wiring Diagram — SRS —/For Coupe" or SRS-16, "Wiring Diagram — SRS —/For Roadster" .)
- System component-to-harness connections

WORK FLOW



PHIA0217E

*1: SRS-8, "Preliminary Check".

*2: SRS-22, "SRS Operation Check".

*3: SRS-24, "DIAGNOSTIC PROCEDURE 2".

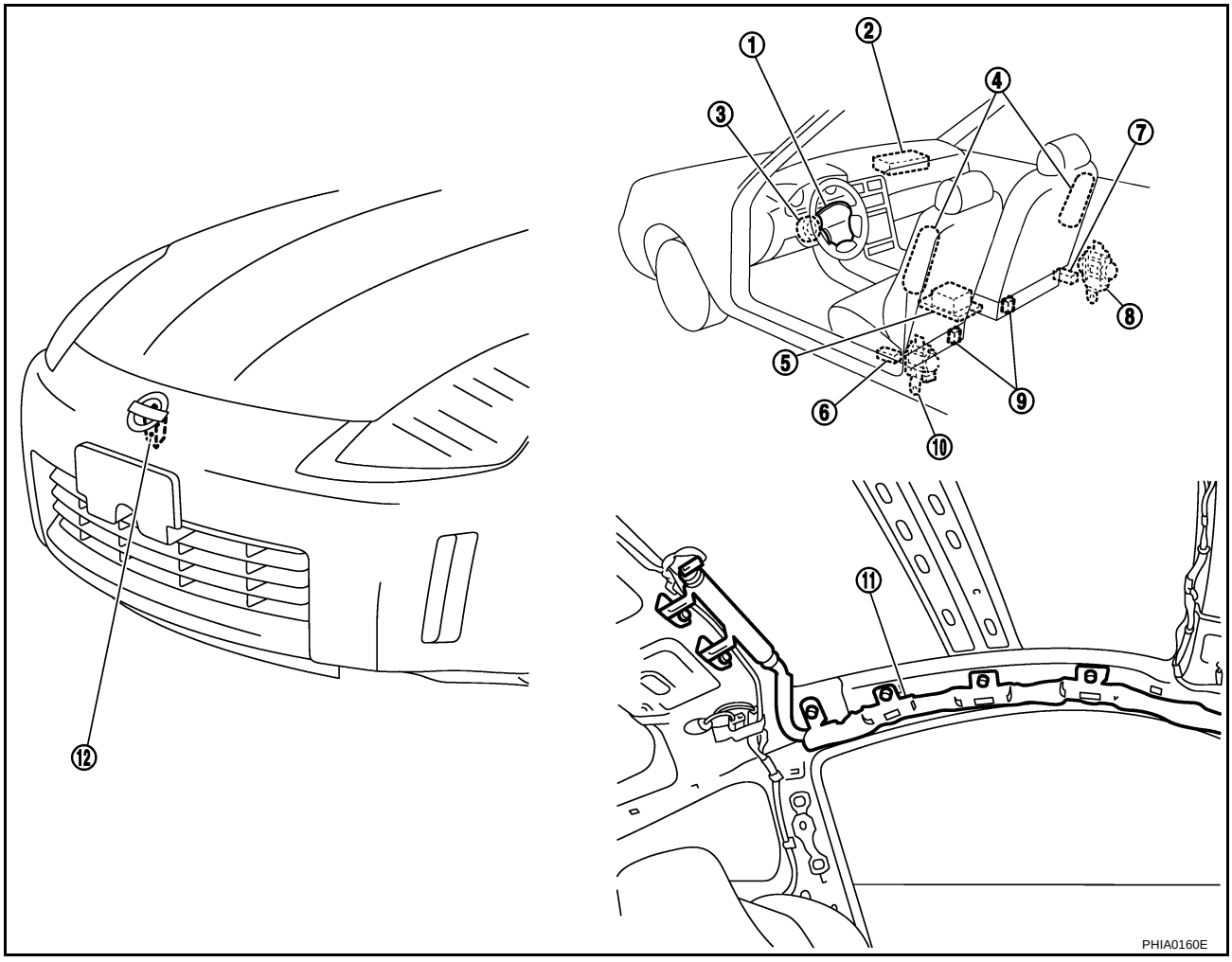
*4: SRS-34, "DIAGNOSTIC PROCEDURE 6".

*5 SRS-28, "DIAGNOSTIC PROCEDURE 3".

*6 SRS-34, "DIAGNOSTIC PROCEDURE 6".

Component Parts Location

AHS0001U

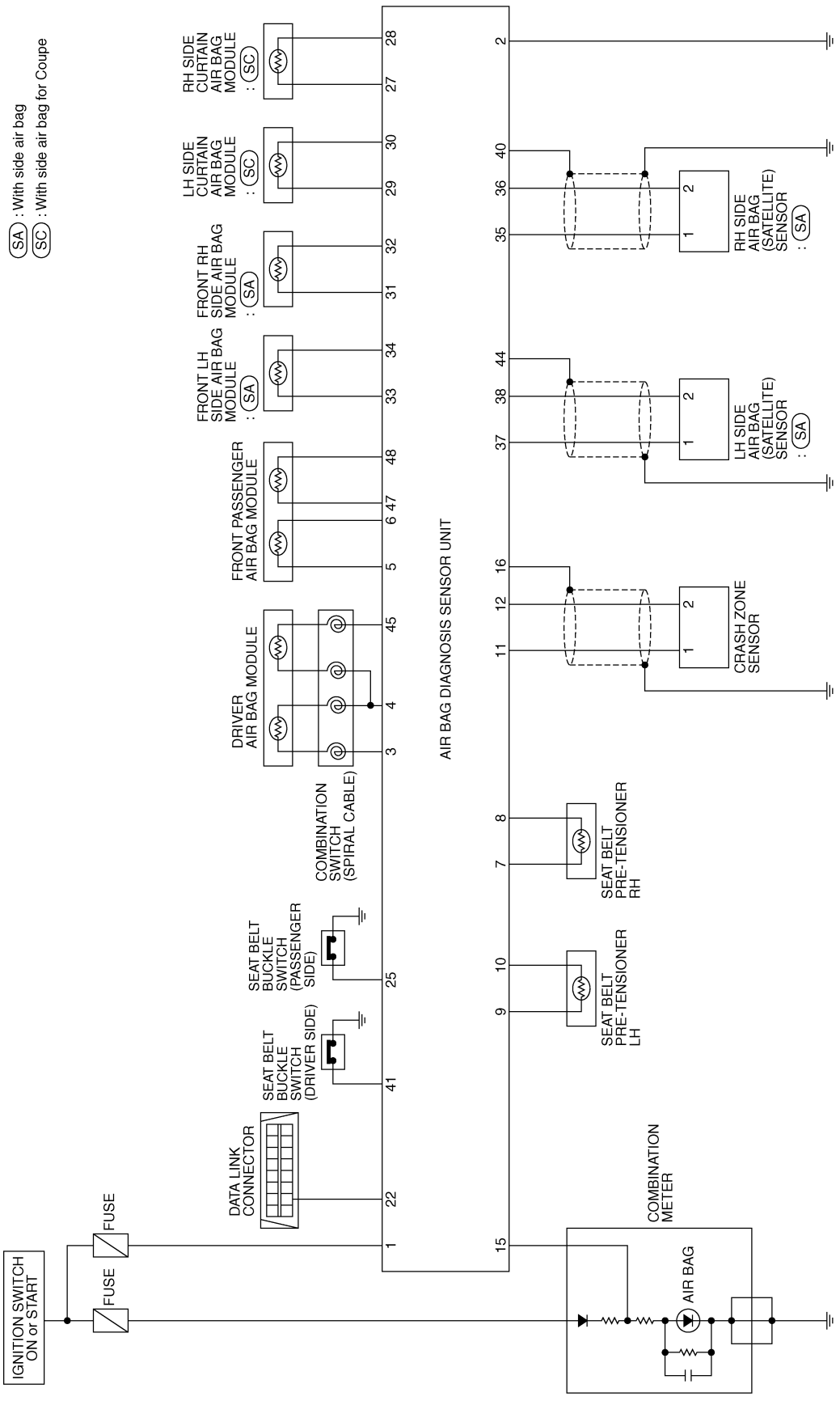


1. Driver air bag module
2. Front passenger air bag module
3. Spiral cable
4. Front side air bag module
5. Diagnosis sensor unit
6. Side air bag (Satellite) sensor LH
7. Side air bag (Satellite) sensor RH
8. Seat belt pre-tensioner RH
9. Seat belt buckle switches
10. Seat belt pre-tensioner LH
11. Side curtain air bag module*
12. Crash zone sensor

*: For Coupe

Schematic

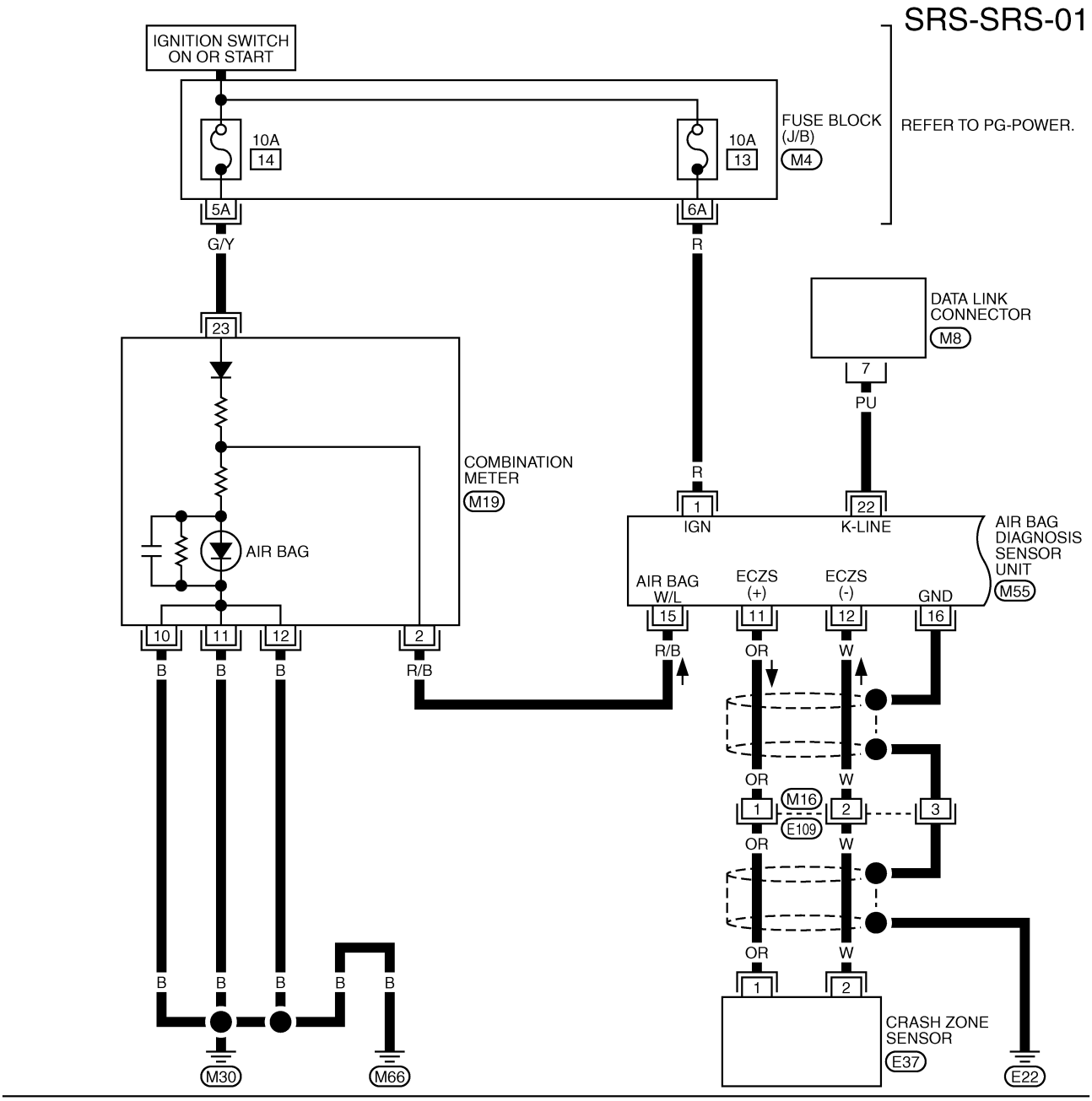
AHS0001V

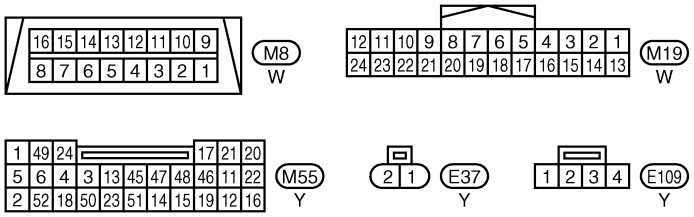


THWT0079E

Wiring Diagram — SRS —/For Coupe

AHS0001W



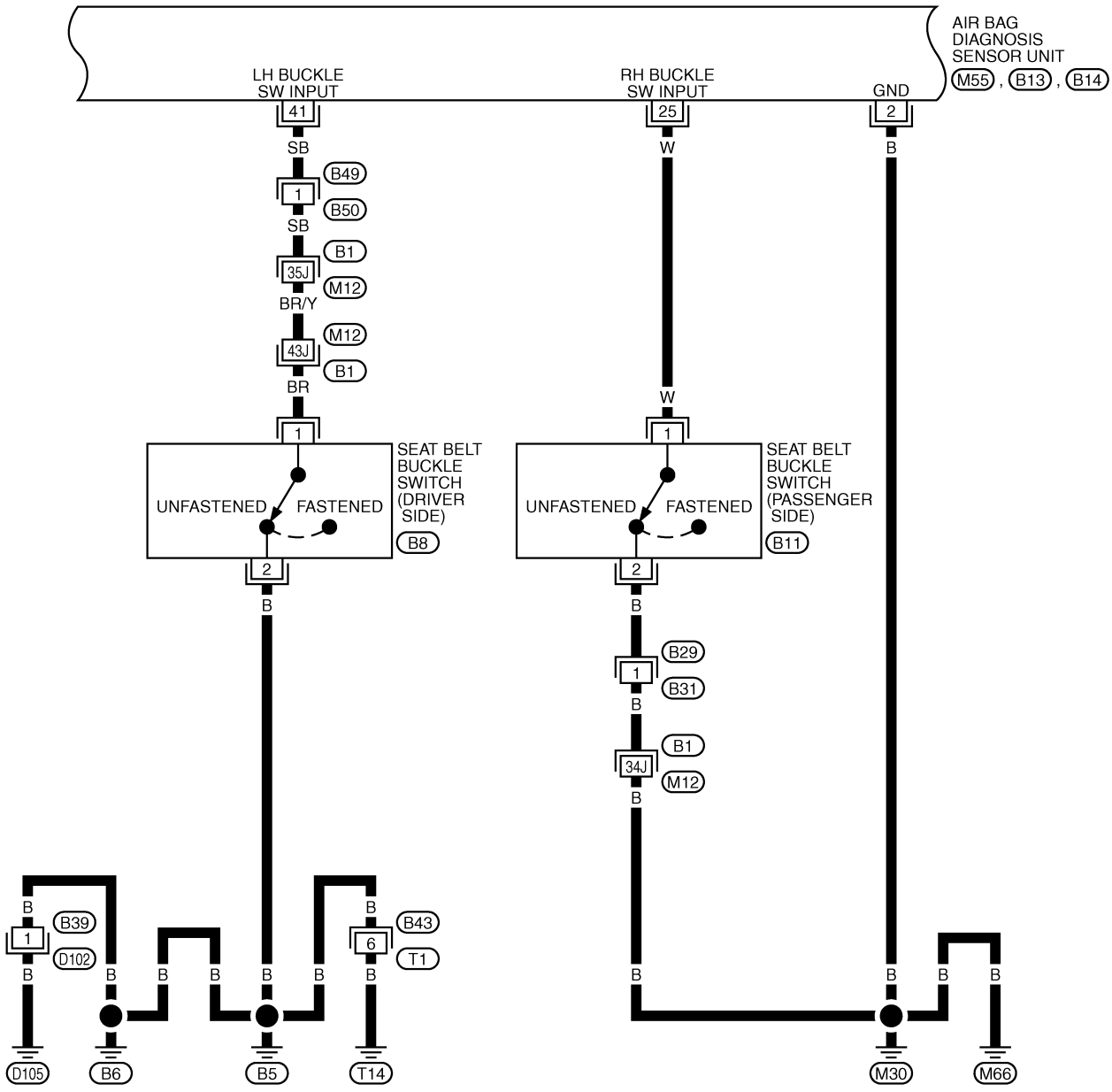


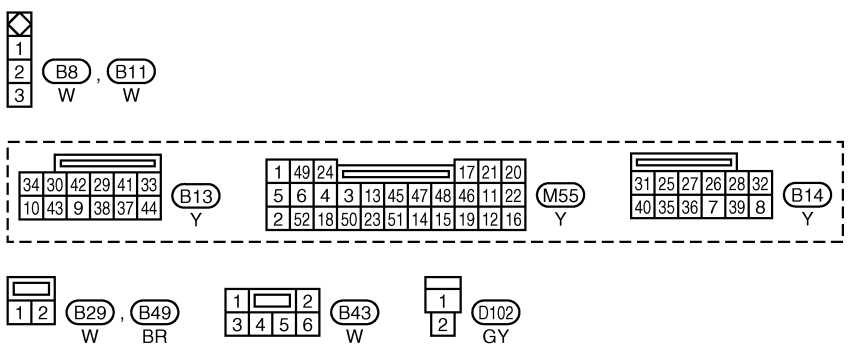
REFER TO THE FOLLOWING.

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

THWT0080E

SRS-SRS-02

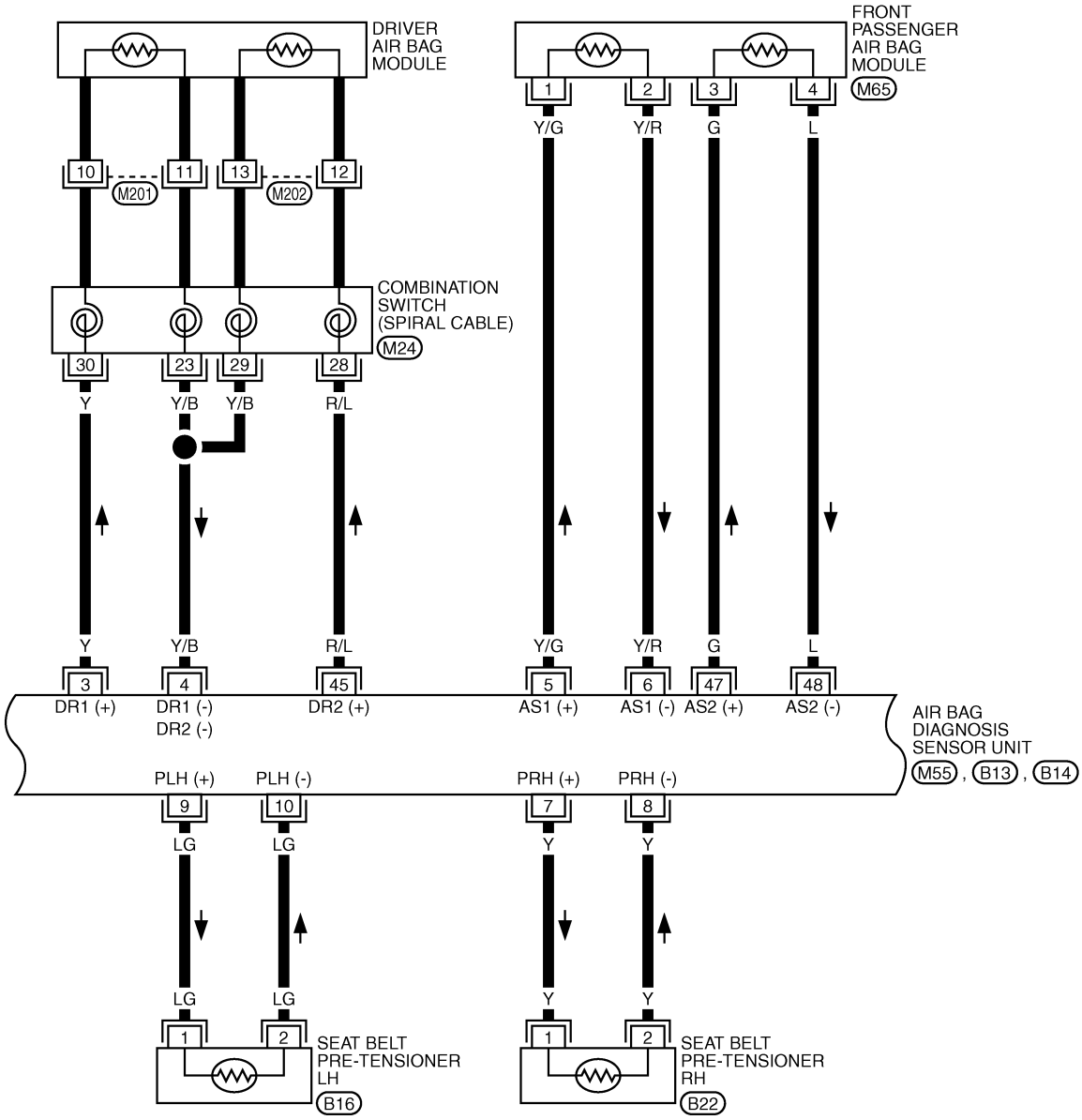


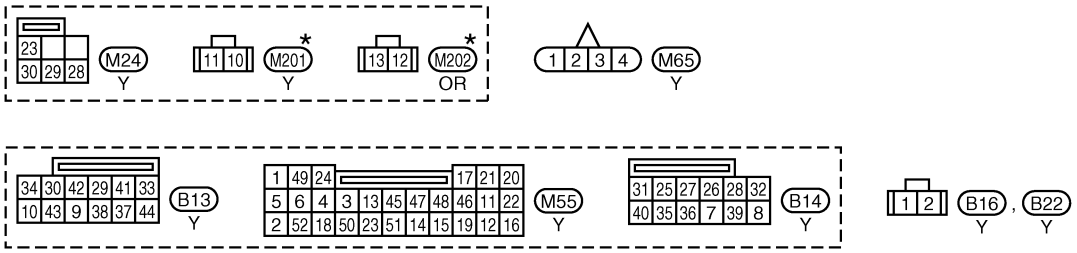


REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

THWT0081E

SRS-SRS-03

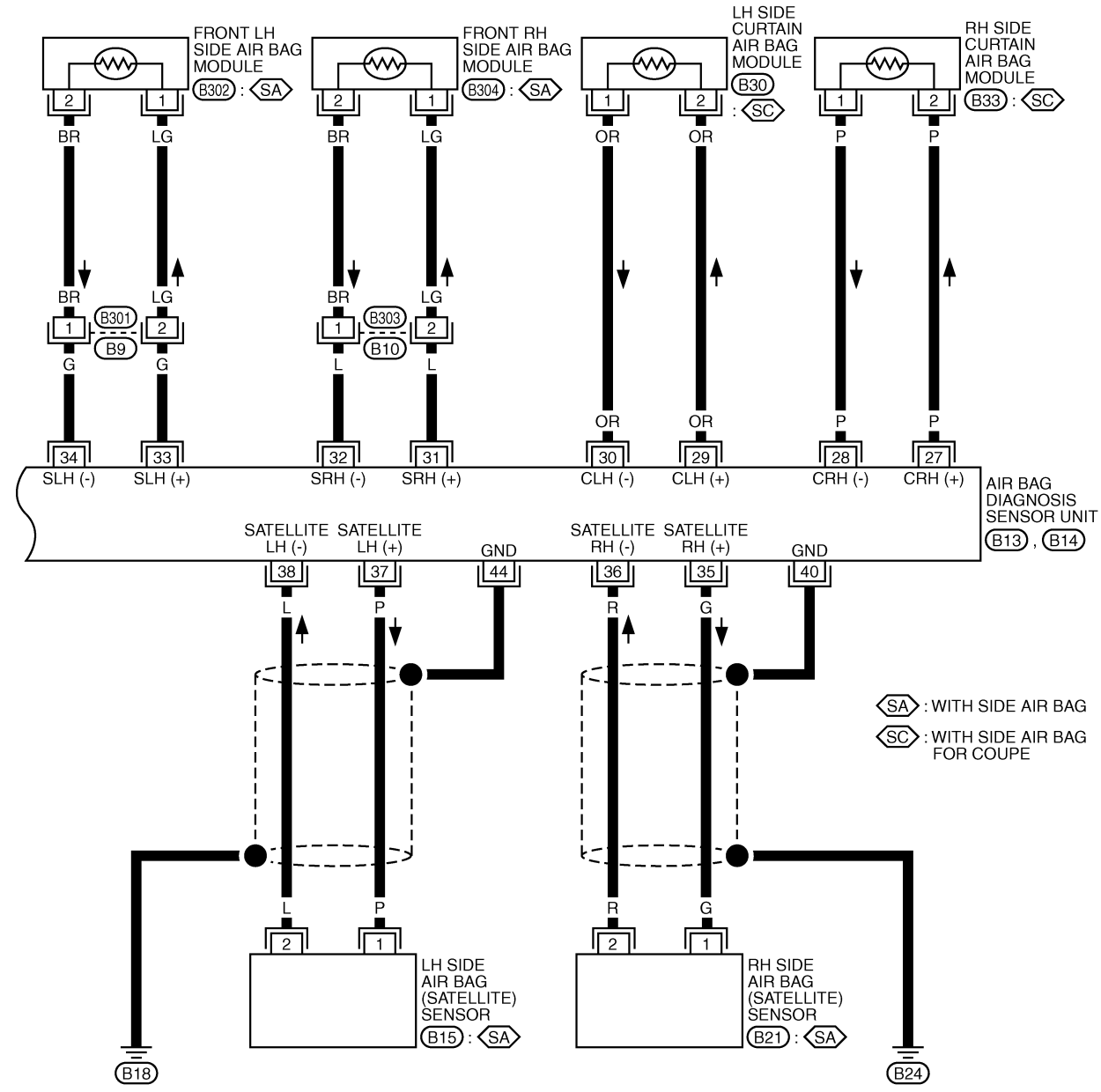


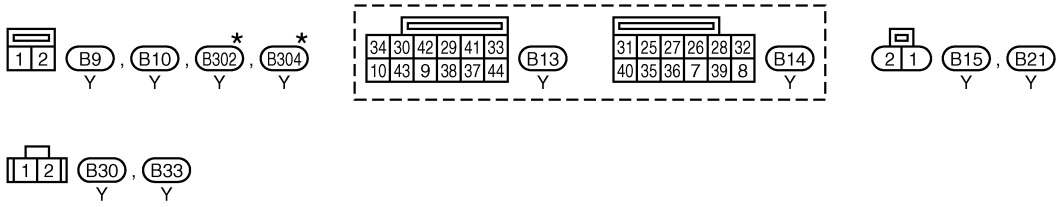


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

THWT0082E

SRS-SRS-04



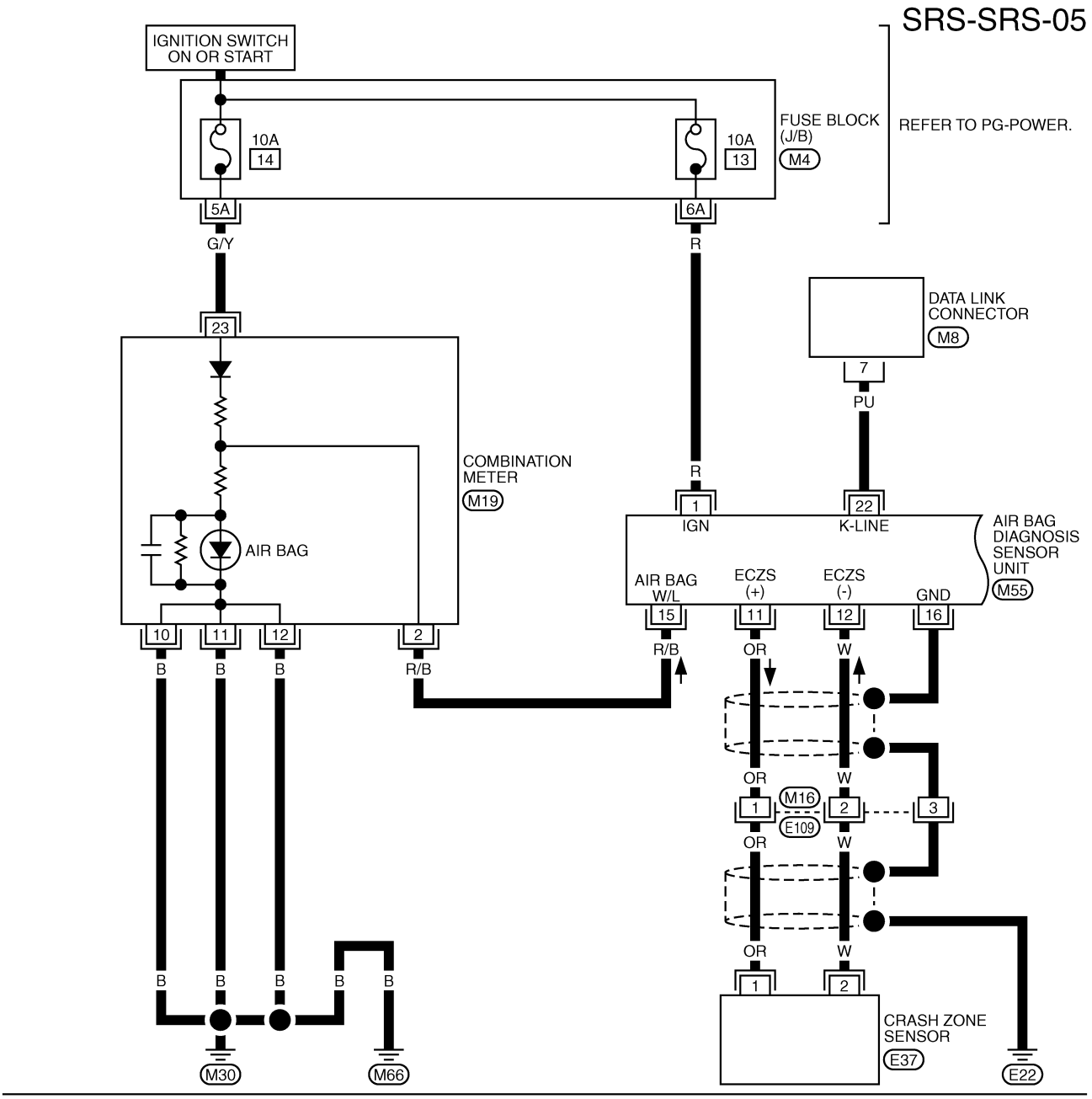


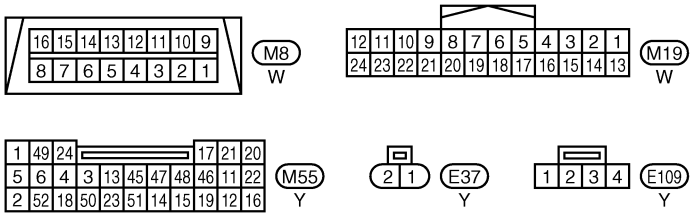
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

THWT0083E

Wiring Diagram — SRS —/For Roadster

AHS000JO



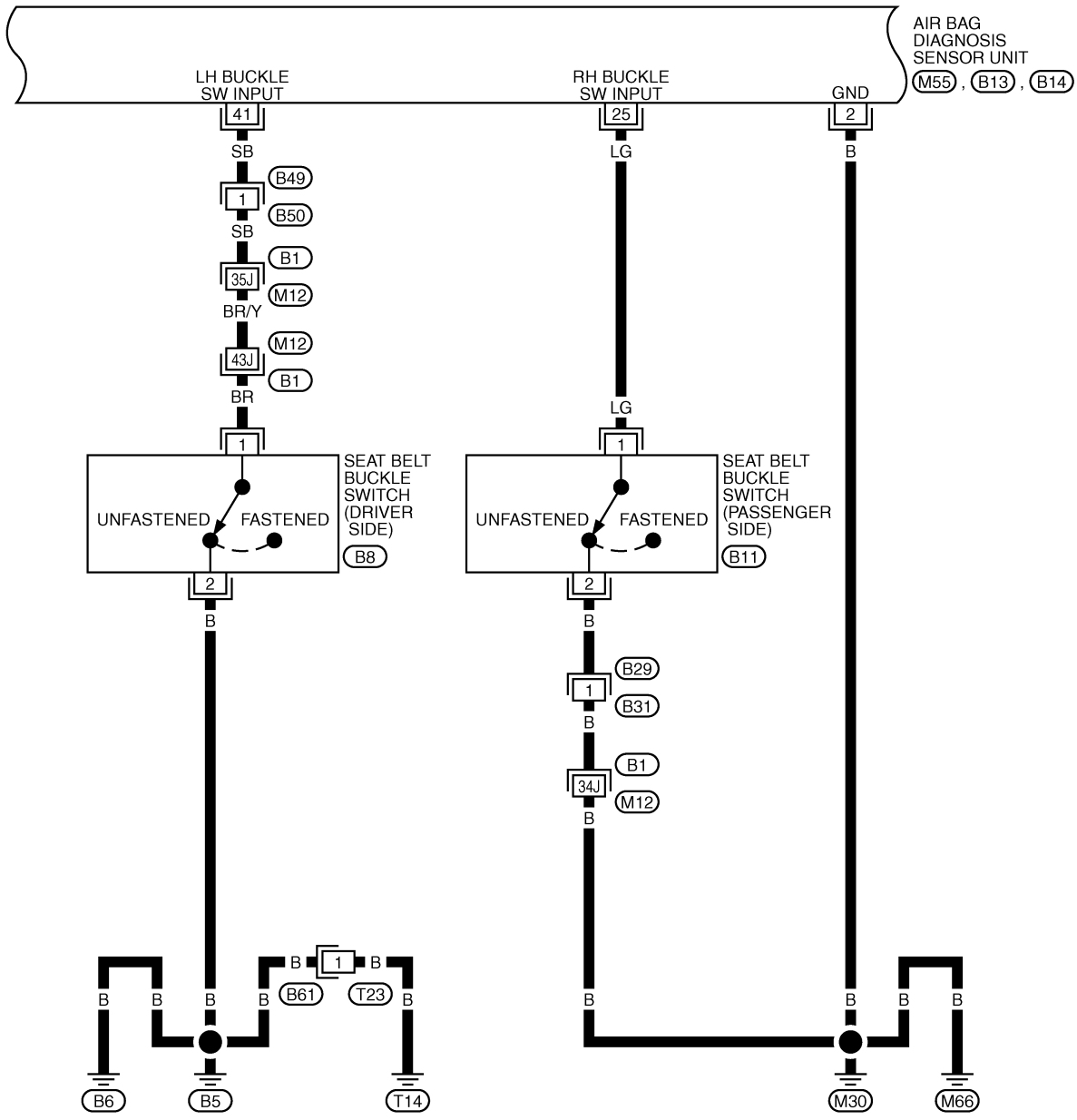


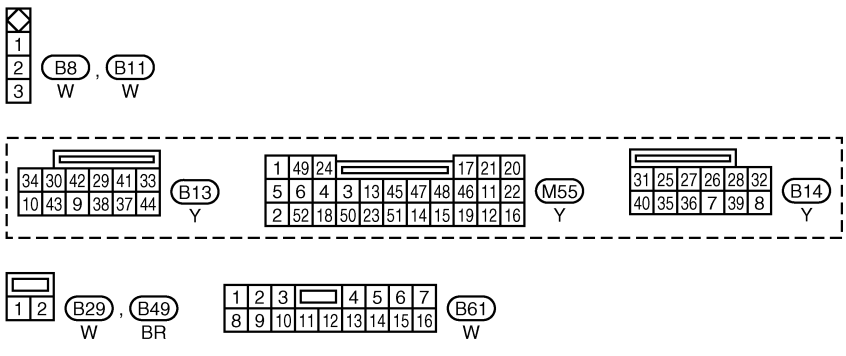
REFER TO THE FOLLOWING.

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

THWT0084E

SRS-SRS-06

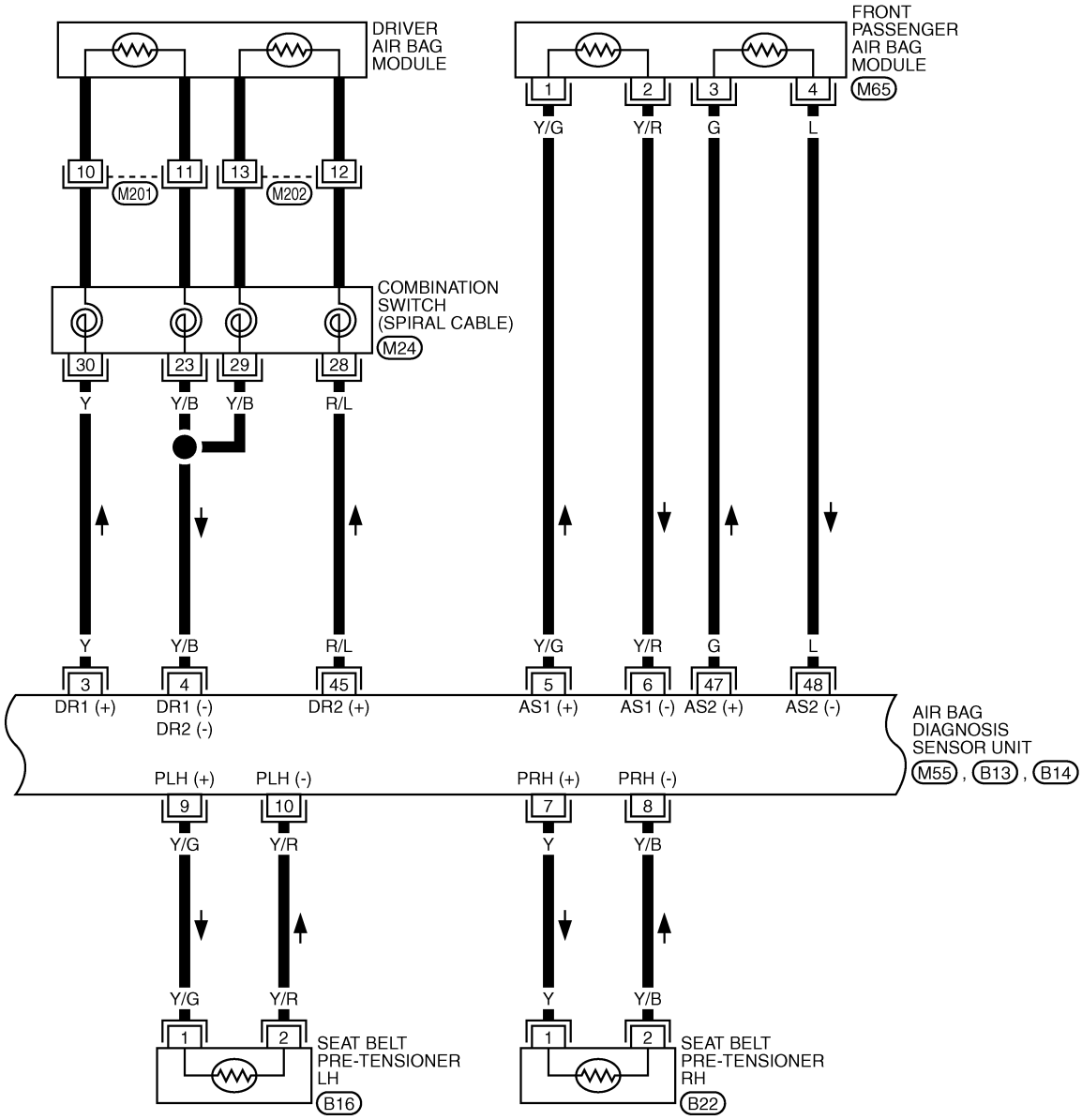


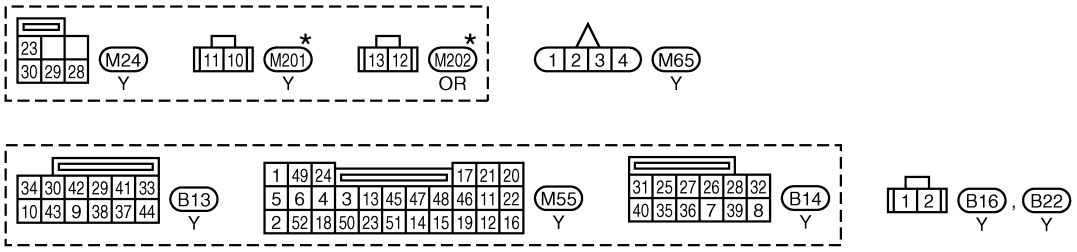


REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

THWT0085E

SRS-SRS-07

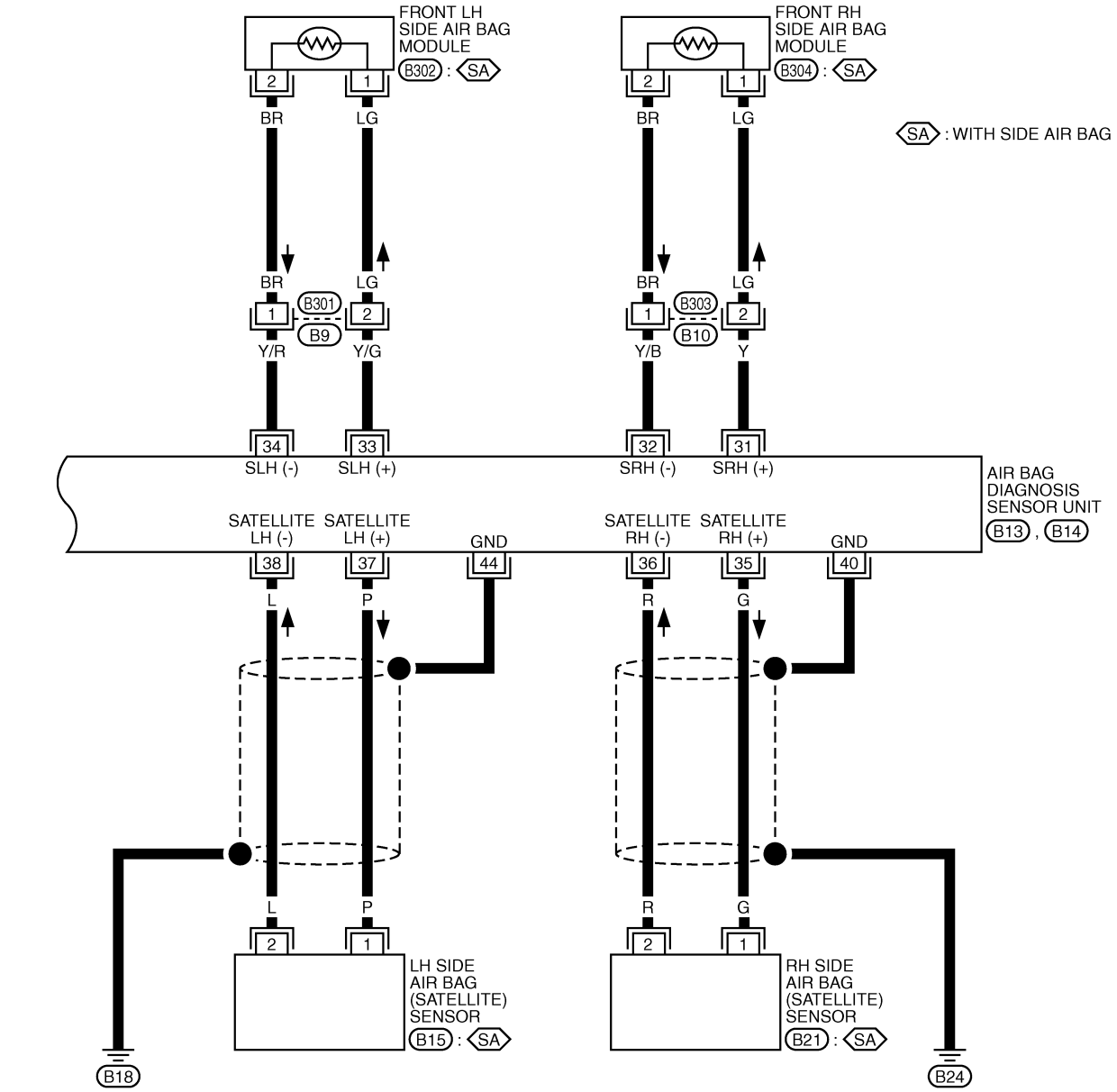


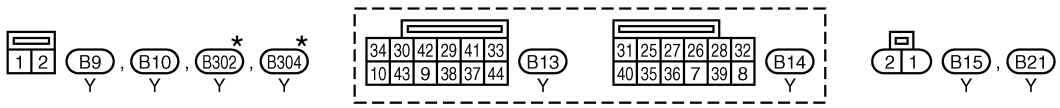


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

THWT0086E

SRS-SRS-08





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

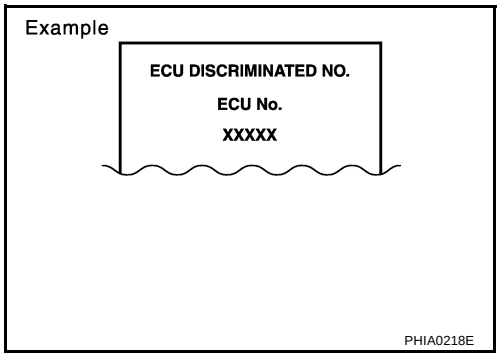
THWT0087E

CONSULT-II Function

AHS0001X

DIAGNOSIS MODE FOR CONSULT-II

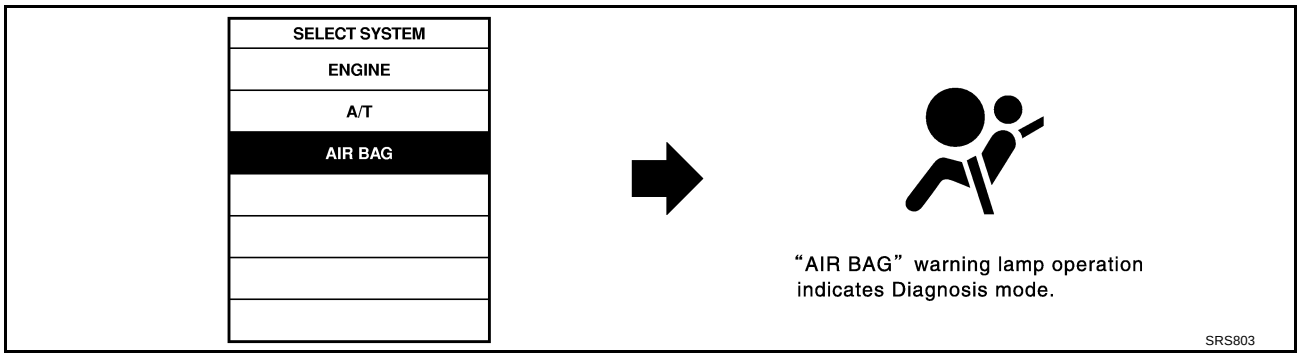
- “SELF-DIAG [CURRENT]”
  A current self-diagnostic results (also indicated by the number of warning lamp flashes in the Diagnosis mode) is displayed on the CONSULT-II screen in real time. This refers to a malfunctioning part requiring repairs.
- “SELF-DIAG [PAST]”
  Self-diagnostic results previously stored in the memory are displayed on the CONSULT-II screen. The stored results are not erased until memory erasing is performed.
- “TROUBLE DIAG RECORD”
  With TROUBLE DIAG RECORD, diagnostic results previously erased by a reset operation can be displayed on the CONSULT-II screen.
- “ECU DISCRIMINATED NO.”
  The diagnosis sensor unit for each vehicle model is assigned with its own, individual classification number. This number will be displayed on the CONSULT-II screen, as shown. When replacing the diagnosis sensor unit, refer to the part number for the compatibility. After installation, replacement with a correct unit can be checked by confirming this classification number on the CONSULT-II screen.
  After repair, make sure the discriminated number of diagnosis sensor unit installed to vehicle are same. Refer to SRS-53, "ECU DISCRIMINATED NO." .



HOW TO CHANGE SELF-DIAGNOSIS MODE WITH CONSULT-II

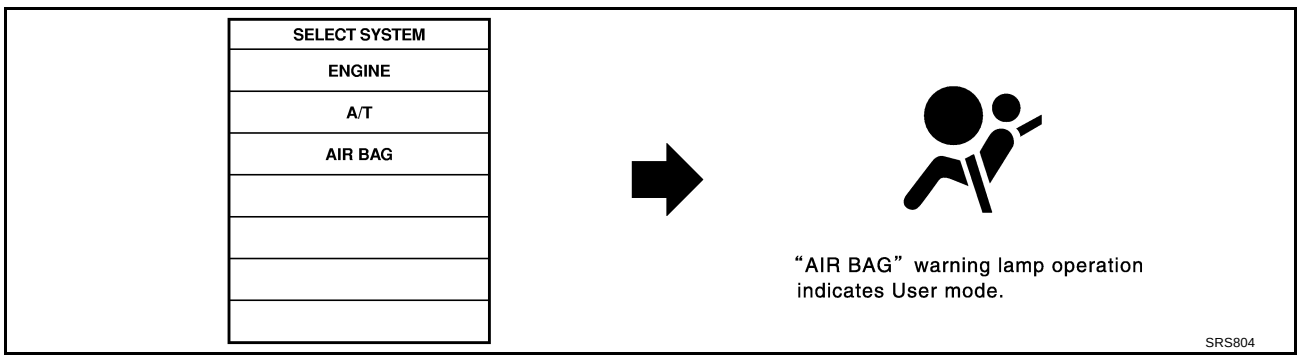
From User Mode to Diagnosis Mode

After selecting “AIR BAG” on the “SELECT SYSTEM” screen, User mode automatically changes to Diagnosis mode.



From Diagnosis Mode to User Mode

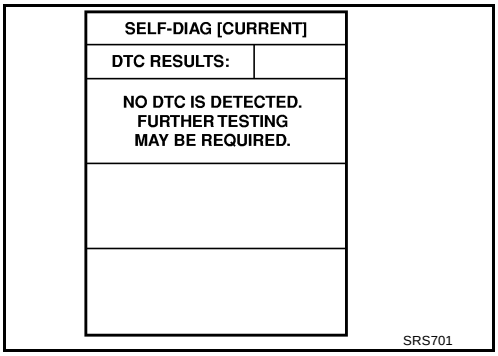
To return to User mode from Diagnosis mode, touch “BACK” key of CONSULT-II until “SELECT SYSTEM” appears, then diagnosis mode automatically changes to User mode.



HOW TO ERASE SELF-DIAGNOSTIC RESULTS

- "SELF-DIAG [CURRENT]"
  A current self-diagnostic result is displayed on the CONSULT-II screen in real time.
  After the malfunction is repaired completely, no malfunction is detected on "SELF-DIAG [CURRENT]".
- "SELF-DIAG [PAST]"
  Return to the "SELF-DIAG [CURRENT]" CONSULT-II screen by touching "BACK" key of CONSULT-II and select "SELF-DIAG [CURRENT]" in SELECT DIAG MODE. Touch "ERASE" in "SELF-DIAG [CURRENT]" mode.

  NOTE:
  If the memory of the malfunction in "SELF-DIAG [PAST]" is not erased, the User mode shows the system malfunction by the operation of the warning lamp even if the malfunction is repaired completely.
- "TROUBLE DIAG RECORD"
  The memory of "TROUBLE DIAG RECORD" cannot be erased.

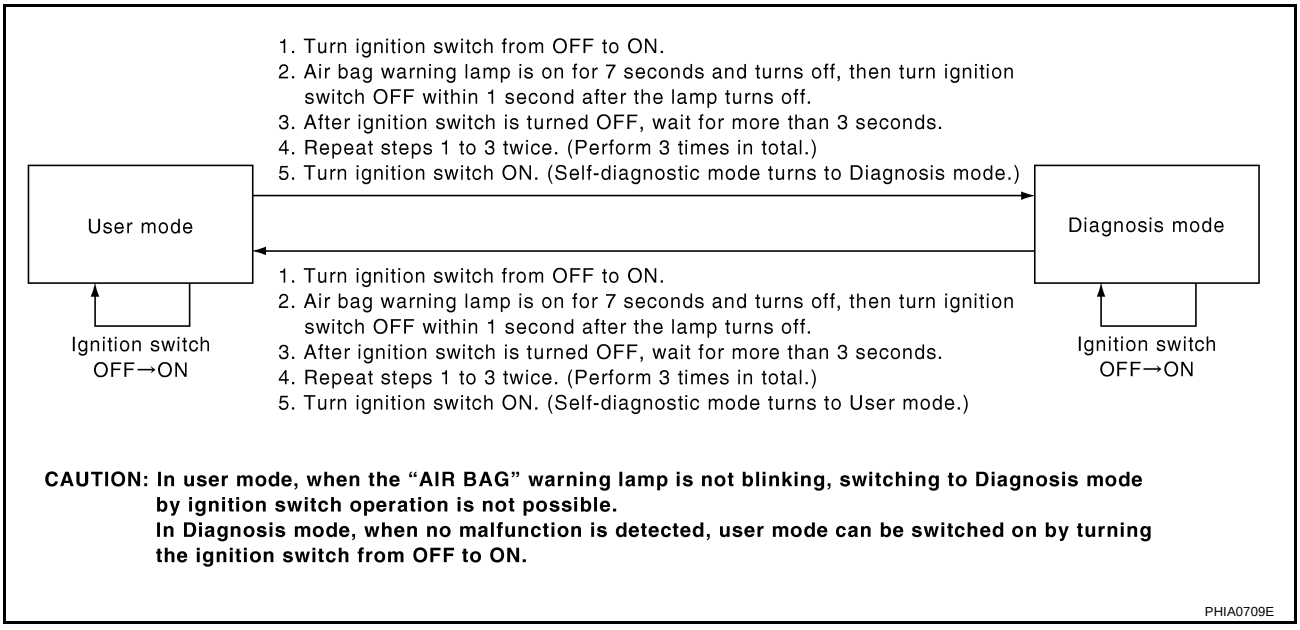


Self-Diagnosis Function (Without CONSULT-II)

AHS0001Y

- The reading of these results is accomplished "User mode" and "Diagnosis mode".
- After a malfunction is repaired, turn ignition switch ON. Diagnosis mode returns to the User mode. At that time, the self-diagnostic result is cleared.

HOW TO CHANGE SELF-DIAGNOSTIC MODE WITHOUT CONSULT-II



HOW TO ERASE SELF-DIAGNOSTIC RESULTS

After a malfunction is repaired, turn the ignition switch OFF for at least one second, then back ON. Diagnosis mode returns to the User mode. At that time, the self-diagnostic results are cleared.

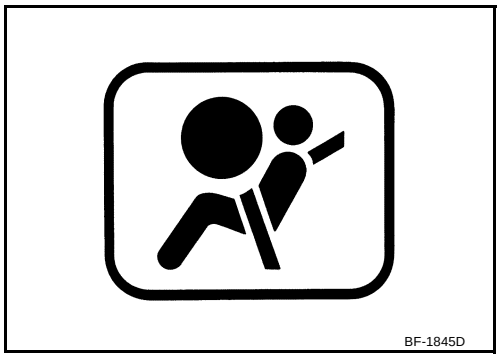
SRS Operation Check

AHS0001Z

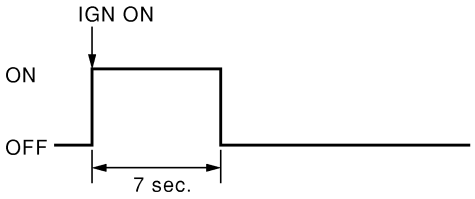
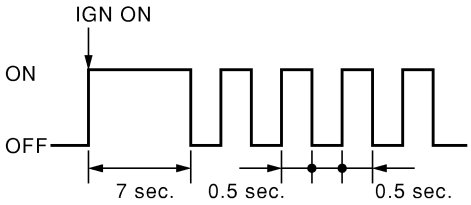
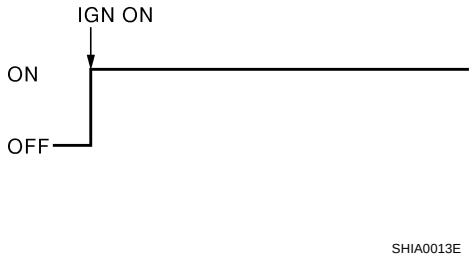
DIAGNOSTIC PROCEDURE 1

Checking Air Bag Operation by Using “AIR BAG” Warning Lamp — User Mode

1. Turn ignition switch from OFF to ON, and make sure that the air bag warning lamp blinks.
2. Compare the SRS air bag warning lamp blinking pattern with the examples.



Warning lamp examples

“AIR BAG” warning lamp operation-User mode-	SRS condition	Reference item
 SHIA0011E	● No malfunction is detected. ● No further action is necessary.	—
 SHIA0012E	● The system is malfunctioning and needs to be repaired as indicated.	Go to SRS-24, "DIAGNOSTIC PROCEDURE 2" or SRS-34, "DIAGNOSTIC PROCEDURE 6" .
 SHIA0013E	● Air bag is deployed. ● Seat belt pre-tensioner is deployed.	Go to SRS-61, "COLLISION DIAGNOSIS" .
	● Diagnosis sensor unit is malfunctioning. ● Air bag power supply circuit is malfunctioning. ● SRS air bag warning lamp circuit is malfunctioning.	Go to SRS-39, "Trouble Diagnosis: “AIR BAG” Warning Lamp Does Not Turn Off" .
SHIA0014E	● Diagnosis sensor unit is malfunctioning. ● Air bag warning lamp circuit is malfunctioning.	Go to SRS-40, "Trouble Diagnosis: “AIR BAG” Warning Lamp Does Not Turn On" .

Trouble Diagnosis with CONSULT-II

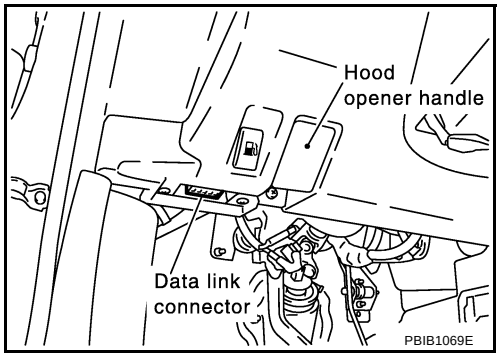
AHS0009A

DIAGNOSTIC PROCEDURE 2

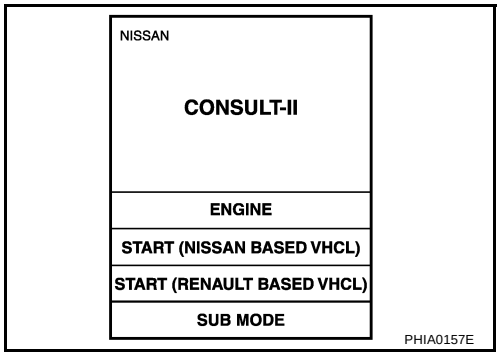
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

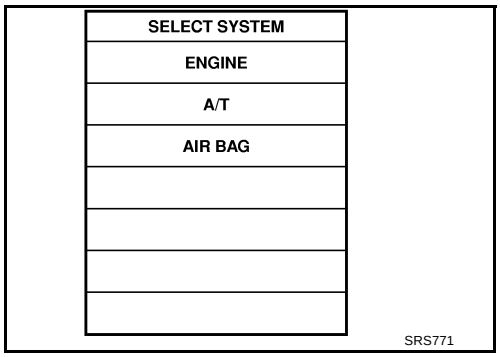
1. Turn ignition switch OFF.
2. Connect CONSULT-II and CONSULT-II CONVERTER to the data link connector.



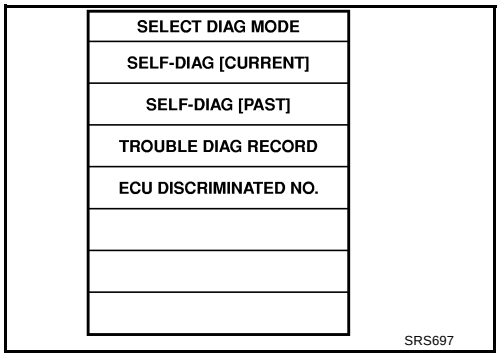
3. Turn ignition switch ON.
4. Touch “START (NISSAN BASED VHCL)”.



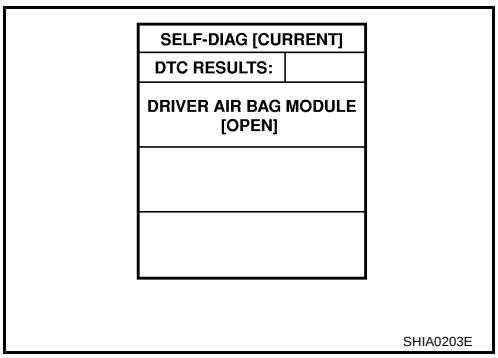
5. Touch “AIR BAG”.
   If “AIR BAG” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



6. Touch “SELF-DIAG [CURRENT]”.

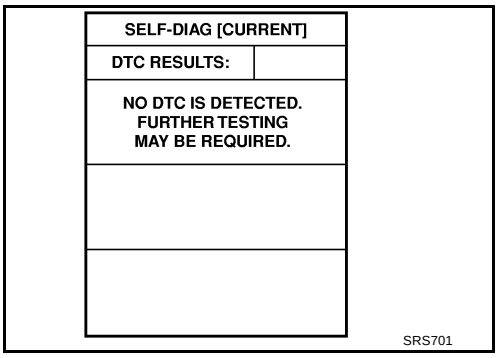


7. Diagnostic code is displayed on “SELF-DIAG [CURRENT]”.



If no malfunction is detected on “SELF-DIAG [CURRENT]” even though malfunction is detected in “SRS Operation Check”, check the battery voltage. If the battery voltage is less than 9 V, charge or replace the battery. SRS-28, "DIAGNOSTIC PROCEDURE 3" . If the battery voltage is OK, go to SRS-30, "DIAGNOSTIC PROCEDURE 4 (CONTINUED FROM DIAGNOSTIC PROCEDURE 2)" diagnose the following cases:

- Self-diagnostic result “SELF-DIAG [PAST]” (previously stored in the memory) might not be erased after repair.
- The SRS system malfunctions intermittently.



CONSULT-II Diagnostic Code Chart (“SELF-DIAG [CURRENT]”)

Diagnostic item	Explanation		Repair order “Recheck SRS at each replacement”
NO DTC IS DETECTED.	When malfunction is indicated by the “AIR BAG” warning lamp in User mode.	● Low battery voltage (Less than 9V)	● Go to SRS-28, "DIAGNOSTIC PROCEDURE 3" after charging the battery.
		● Self-diagnostic results “SELF-DIAG [PAST]” (previously stored in the memory) might not be erased after repair. ● Intermittent malfunction has been detected in the past.	● Go to SRS-30, "DIAGNOSTIC PROCEDURE 4 (CONTINUED FROM DIAGNOSTIC PROCEDURE 2)" . ● Go to SRS-30, "DIAGNOSTIC PROCEDURE 5" .
	● No malfunction is detected.		—
DRIVER AIRBAG MODULE [OPEN]	● Driver air bag module circuit is open (including the spiral cable).		1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace driver air bag module. (Before disposal, it must be deployed.) 4. Replace the spiral cable. 5. Replace the diagnosis sensor unit. 6. Replace the related harness.
DRIVER AIRBAG MODULE [VB-SHORT]	● Driver air bag module circuit is shorted to a power supply circuit (including the spiral cable).		
DRIVER AIRBAG MODULE [GND-SHORT]	● Driver air bag module circuit is shorted to ground (including the spiral cable).		
DRIVER AIRBAG MODULE [SHORT]	● Driver air bag module circuit is shorted between lines.		
ASSIST A/B MODULE [VB-SHORT]	● Front passenger air bag module circuit is shorted to a power supply circuit.		1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace front passenger air bag module. (Before disposal, it must be deployed.) 4. Replace the diagnosis sensor unit. 5. Replace the related harness.
ASSIST A/B MODULE [OPEN]	● Front passenger air bag module circuit is open.		
ASSIST A/B MODULE [GND-SHORT]	● Front passenger air bag module circuit is shorted to ground.		
ASSIST A/B MODULE [SHORT]	● Front passenger air bag module circuit is shorted between lines.		

Diagnostic item	Explanation	Repair order “Recheck SRS at each replacement”
CRASH ZONE SEN [UNIT FAIL] CRASH ZONE SEN [COMM FAIL] CRASH ZONE SEN [UNMATCH]	● Crash zone sensor	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the crash zone sensor. 4. Replace the diagnosis sensor unit. 5. Replace the related harness.
SIDE MODULE LH [OPEN]	● Front LH side air bag module circuit is open.	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace front LH setback assembly (front LH side air bag module). (Before disposal, it must be deployed.) 4. Replace the diagnosis sensor unit. 5. Replace the related harness.
SIDE MODULE LH [VB-SHORT]	● Front LH side air bag module circuit is shorted to a power supply circuit.	
SIDE MODULE LH [GND-SHORT]	● Front LH side air bag module circuit is shorted to ground.	
SIDE MODULE LH [SHORT]	● Front LH side air bag module circuit is shorted between lines.	
SIDE MODULE RH [OPEN]	● Front RH side air bag module circuit is open.	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace front RH setback assembly (front RH side air bag module). (Before disposal, it must be deployed.) 4. Replace the diagnosis sensor unit. 5. Replace the related harness.
SIDE MODULE RH [VB-SHORT]	● Front RH side air bag module circuit is shorted to some power supply circuit.	
SIDE MODULE RH [GND-SHORT]	● Front RH side air bag module circuit is shorted to ground.	
SIDE MODULE RH [SHORT]	● Front RH side air bag module circuit is shorted between lines.	
SATELLITE SENS LH [UNIT FAIL] SATELLITE SENS LH [COMM FAIL] SATELLITE SENS LH [UNMATCH]	● LH side air bag (Satellite) sensor	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the LH side air bag (Satellite) sensor. 4. Replace the diagnosis sensor unit. 5. Replace the related harness.
SATELLITE SENS RH [UNIT FAIL] SATELLITE SENS RH [COMM FAIL] SATELLITE SENS RH [UNMATCH]	● RH side air bag (Satellite) sensor	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the RH side air bag (Satellite) sensor. 4. Replace the diagnosis sensor unit. 5. Replace the related harness.
PRE-TEN FRONT LH [OPEN]	● Front LH pre-tensioner circuit is open.	1. Visually check the wiring harness connections. 2. Replace the harness if it has visible damage. 3. Replace front LH seat belt. (Before disposal, it must be activated.) 4. Replace the diagnosis sensor unit. 5. Replace the related harness.
PRE-TEN FRONT LH [VB-SHORT]	● Front LH pre-tensioner circuit is shorted to a power supply circuit.	
PRE-TEN FRONT LH [GND-SHORT]	● Front LH pre-tensioner circuit is shorted to ground.	
PRE-TEN FRONT LH [SHORT]	● Front LH pre-tensioner circuit is shorted between lines.	

Diagnostic item	Explanation	Repair order “Recheck SRS at each replacement”
PRE-TEN FRONT RH [OPEN]	● Front RH pre-tensioner circuit is shorted to a power supply circuit.	1. Visually check the wiring harness connections. 2. Replace the harness if it has visible damage. 3. Replace front RH seat belt. (Before disposal, it must be activated.) 4. Replace the diagnosis sensor unit. 5. Replace the related harness.
PRE-TEN FRONT RH [VB-SHORT]	● Front RH pre-tensioner is shorted to a power supply circuit.	
PRE-TEN FRONT RH [GND-SHORT]	● Front RH pre-tensioner circuit is shorted to ground.	
PRE-TEN FRONT RH [SHORT]	● Front RH pre-tensioner circuit is shorted between lines.	
CURTAIN MODULE LH* [OPEN]	● LH side curtain air bag module circuit is open.	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace LH side curtain air bag module. (Before disposal, it must be deployed.) 4. Replace the diagnosis sensor unit. 5. Replace the related harness.
CURTAIN MODULE LH* [VB-SHORT]	● LH side curtain air bag module circuit is shorted to some power supply circuits.	
CURTAIN MODULE LH* [GND-SHORT]	● LH side curtain air bag module circuit is shorted to ground.	
CURTAIN MODULE LH* [SHORT]	● LH side curtain air bag module circuit is shorted between lines.	
CURTAIN MODULE RH* [OPEN]	● RH side curtain air bag module circuit is open.	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace RH side curtain air bag module. (Before disposal, it must be deployed.) 4. Replace the diagnosis sensor unit. 5. Replace the related harness.
CURTAIN MODULE RH* [VB-SHORT]	● RH side curtain air bag module circuit is shorted to a power supply circuit.	
CURTAIN MODULE RH* [GND-SHORT]	● RH side curtain air bag module circuit is shorted to ground.	
CURTAIN MODULE RH* [SHORT]	● RH side curtain air bag module circuit is shorted between lines.	
CONTROL UNIT	● Diagnosis sensor unit is malfunctioning.	1. Visually check the wiring harness connection. 2. Replace the diagnosis sensor unit.

*: For coupe

NOTE:

- Follow the procedures in numerical order when repairing malfunctioning parts. Confirm whether malfunction is eliminated using air bag warning lamp or CONSULT-II each time repair is finished. If malfunction is still observed, proceed to the next step. When malfunction is eliminated, further repair work is not required.

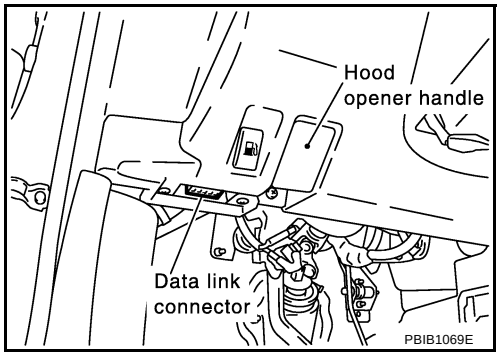
DIAGNOSTIC PROCEDURE 3

Final checking after repairing SRS by using CONSULT-II — Diagnosis mode

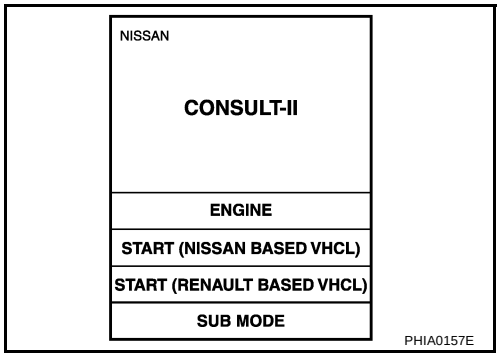
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

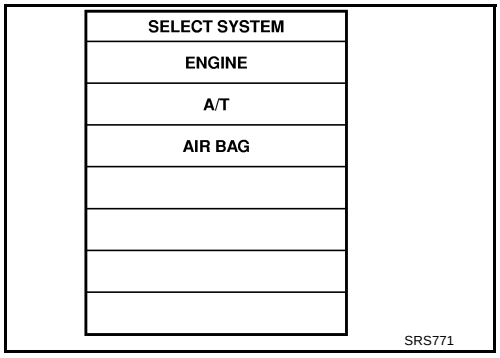
1. After repairing SRS, connect both battery cables.
2. Connect CONSULT-II and CONSULT-II CONVERTER to data link connector.



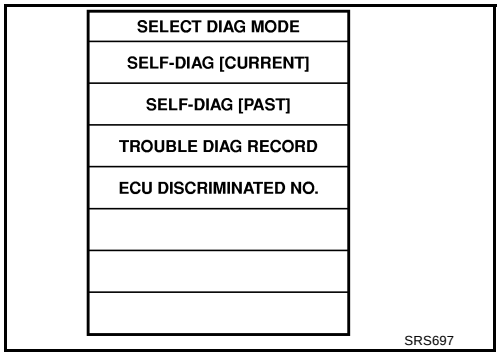
3. Turn ignition switch ON.
4. Touch “START (NISSAN BASED VHCL)”.



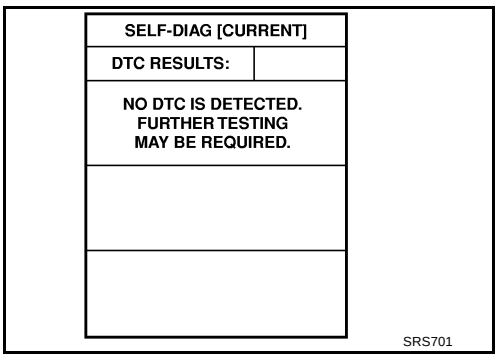
5. Touch “AIR BAG”.
   If “AIR BAG” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



6. Touch “SELF-DIAG [CURRENT]”.



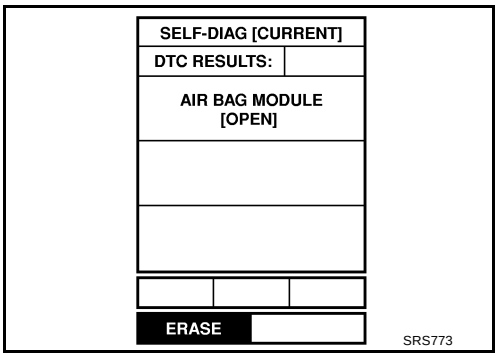
7. If no malfunction is detected on “SELF-DIAG [CURRENT]”, repair of SRS is completed. Go to step 8.
If any malfunction is detected on “SELF-DIAG [CURRENT]”, the malfunctioning part is not repaired completely or another malfunctioning part is detected. Go to SRS-24, "DIAGNOSTIC PROCEDURE 2" , and repair malfunctioning part completely.



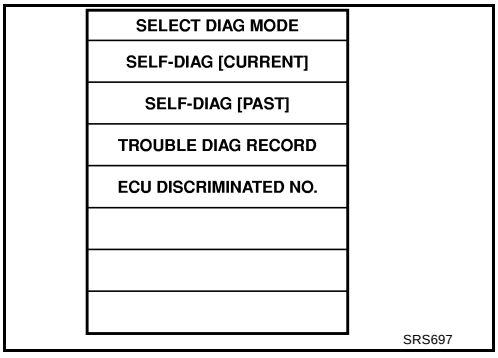
8. Touch “ERASE”.

NOTE:

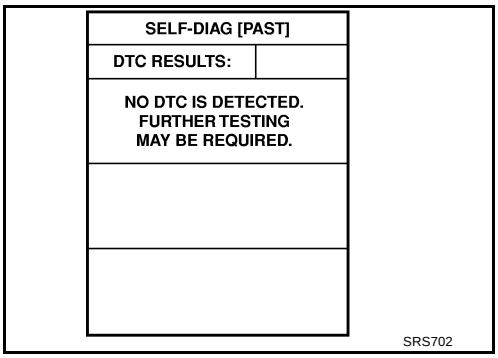
- Touch “ERASE” to clear the memory of the malfunction (“SELF-DIAG [PAST]”).
- If the memory of the malfunction in “SELF-DIAG [PAST]” is not erased, the User mode shows the system malfunction by the operation of the warning lamp even if the malfunction is repaired completely.



9. Touch “BACK” key of CONSULT-II to “SELECT DIAG MODE” screen. Touch “SELF-DIAG [PAST]”.



10. Make sure that no malfunction is detected on “SELF-DIAG [PAST]”.
11. Touch “BACK” key of CONSULT-II until “SELECT SYSTEM” appears in order to return to User mode from Diagnosis mode.
12. Turn ignition switch OFF then turn off and disconnect CONSULT-II. Go to SRS-22, "Checking Air Bag Operation by Using “AIR BAG” Warning Lamp — User Mode" .



DIAGNOSTIC PROCEDURE 4 (CONTINUED FROM DIAGNOSTIC PROCEDURE 2)

Inspecting SRS malfunctioning record

1. CONSIDER POSSIBILITY OF NOT ERASING SELF-DIAGNOSTIC RESULT AFTER REPAIRING

Is it the first time for maintenance of SRS?

YES or NO

YES >> Go to SRS-24, "DIAGNOSTIC PROCEDURE 2" .

NO >> Self-diagnostic result “SELF-DIAG [PAST]” (previously stored in the memory) might not be erased after repair. Go to SRS-28, "DIAGNOSTIC PROCEDURE 3" .

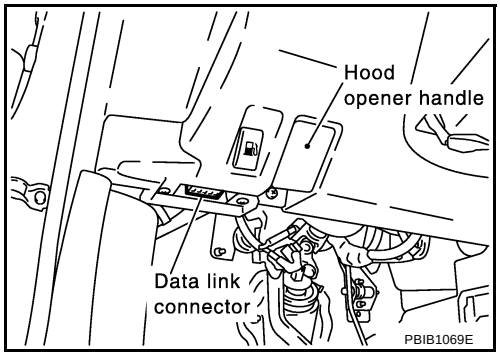
DIAGNOSTIC PROCEDURE 5

Inspecting SRS intermittent malfunction by using CONSULT-II — Diagnosis mode

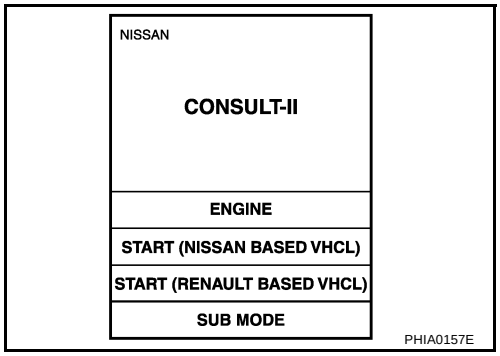
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunction might be detected in self-diagnosis depending on control unit which carry out CAN communication.

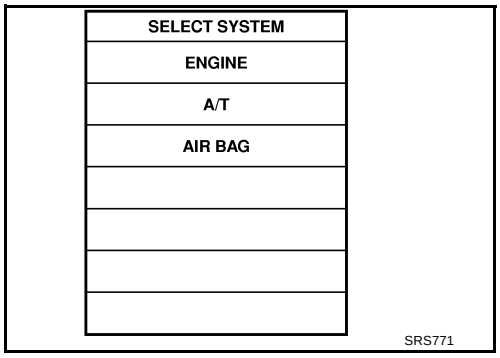
1. Turn ignition switch OFF.
2. Connect CONSULT-II and CONSULT-II CONVERTER to data link connector.



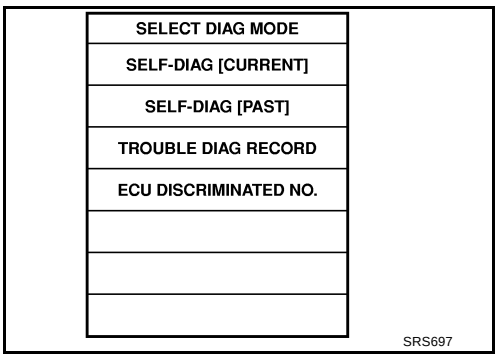
3. Turn ignition switch ON.
4. Touch “START (NISSAN BASED VHCL)”.



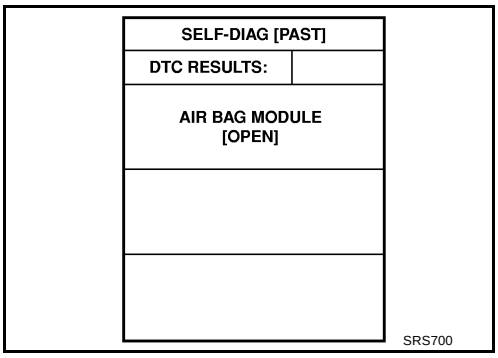
5. Touch “AIR BAG”.
   If “AIR BAG” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



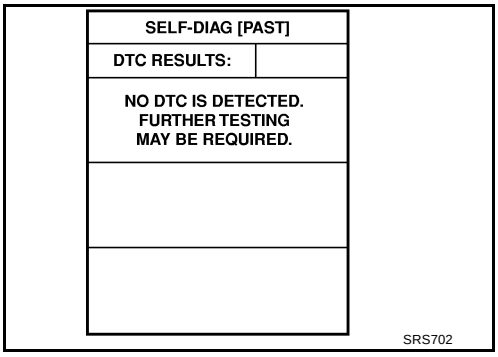
6. Touch “SELF-DIAG [PAST]”.



7. If diagnostic codes are displayed on “SELF-DIAG [PAST]”, go to step 10.

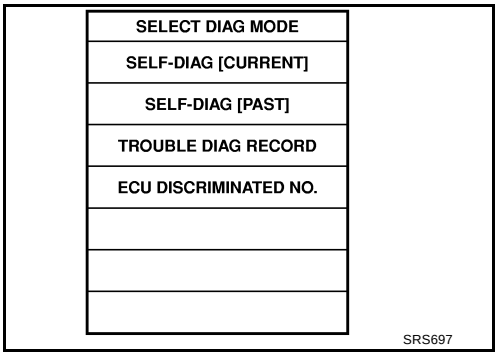


If no malfunction is detected on “SELF-DIAG [PAST]”, touch “BACK” and go back to “SELECT DIAG MODE”.

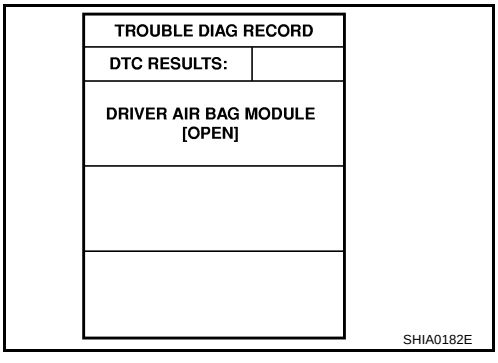


8. Touch “TROUBLE DIAG RECORD”.

NOTE:
With “TROUBLE DIAG RECORD”, diagnosis results previously erased by a reset operation can be displayed.



9. Diagnostic code is displayed on “TROUBLE DIAG RECORD”.
10. Touch “PRINT”.
11. Compare diagnostic codes to SRS-32, "CONSULT-II Diagnostic Code Chart (“SELF-DIAG [PAST]” or “TROUBLE DIAG RECORD”)" .
12. Touch “BACK” key of CONSULT-II until “SELECT SYSTEM” appears.
13. Turn ignition switch OFF, then turn off and disconnect CONSULT-II, and both battery cables.



14. Repair the system as outlined by the “Repair order” in “Intermittent Malfunction Diagnostic Code Chart”, that corresponds to the self-diagnostic result. For replacement procedure of component parts, refer to the Removal and Installation procedure for the appropriate component.
15. Go to SRS-28, "DIAGNOSTIC PROCEDURE 3" , for final checking.

CONSULT-II Diagnostic Code Chart (“SELF-DIAG [PAST]” or “TROUBLE DIAG RECORD”)

Diagnostic item	Explanation		Repair order “Recheck SRS at each replacement”
NO DTC IS DETECTED.	When malfunction is indicated by the “AIR BAG” warning lamp in User mode.	● Low battery voltage (Less than 9V)	● Go to SRS-28, "DIAGNOSTIC PROCEDURE 3" .
	● No malfunction is detected.		● Go to SRS-28, "DIAGNOSTIC PROCEDURE 3" .
DRIVER AIRBAG MODULE [OPEN]	● Driver air bag module circuit is open (including the spiral cable).		1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. If the harness check result is OK, replace driver air bag module, diagnosis sensor unit and spiral cable. (Before disposal, it must be deployed.)
DRIVER AIRBAG MODULE [VB-SHORT]	● Driver air bag module circuit is shorted to a power supply circuit (including the spiral cable).		
DRIVER AIRBAG MODULE [GND-SHORT]	● Driver air bag module circuit is shorted to ground (including the spiral cable).		
DRIVER AIRBAG MODULE [SHORT]	● Driver air bag module circuit is shorted between lines.		
ASSIST A/B MODULE [OPEN]	● Front passenger air bag module circuit is open.		1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. If the harness check result is OK, replace the diagnosis sensor unit and front passenger air bag module. (Before disposal, it must be deployed.)
ASSIST A/B MODULE [VB-SHORT]	● Front passenger air bag module circuit is shorted to a power supply circuit.		
ASSIST A/B MODULE [GND-SHORT]	● Front passenger air bag module circuit is shorted to ground.		
ASSIST A/B MODULE [SHORT]	● Front passenger air bag module circuit is shorted between lines.		
CRASH ZONE SEN [UNIT FAIL] CRASH ZONE SEN [COMM FAIL] CRASH ZONE SEN [UNMATCH]	● Crash zone sensor		1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. If the harness check result is OK, replace crash zone sensor and diagnosis sensor unit.
SIDE MODULE LH [OPEN]	● Front LH side air bag module circuit is open.		1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. If the harness check result is OK, replace the diagnosis sensor unit and LH side air bag module. (Before disposal, it must be deployed.)
SIDE MODULE LH [VB-SHORT]	● Front LH side air bag module circuit is shorted to a power supply circuit.		
SIDE MODULE LH [GND-SHORT]	● Front LH side air bag module circuit is shorted to ground.		
SIDE MODULE LH [SHORT]	● Front LH side air bag module circuit is shorted between lines.		

Diagnostic item	Explanation	Repair order “Recheck SRS at each replacement”
SIDE MODULE RH [OPEN]	● Front RH side air bag module circuit is open.	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. If the harness check result is OK, replace the diagnosis sensor unit and RH side air bag module (Before disposal, it must be deployed.)
SIDE MODULE RH [VB-SHORT]	● Front RH side air bag module circuit is shorted to a power supply circuit.	
SIDE MODULE RH [GND-SHORT]	● Front RH side air bag module circuit is shorted to ground.	
SIDE MODULE RH [SHORT]	● Front RH side air bag module circuit is shorted between lines.	
SATELLITE SENS LH [UNIT FAIL] SATELLITE SENS LH [COMM FAIL] SATELLITE SENS LH [UNMATCH]	● LH side air bag (Satellite) sensor	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. If the harness check result is OK, replace the diagnosis sensor unit and LH side air bag (Satellite) sensor.
SATELLITE SENS RH [UNIT FAIL] SATELLITE SENS RH [COMM FAIL] SATELLITE SENS RH [UNMATCH]	● RH side air bag (Satellite) sensor	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. If the harness check result is OK, replace the diagnosis sensor unit and RH side air bag (Satellite) sensor.
PRE-TEN FRONT LH [OPEN]	● Front LH pre-tensioner circuit is open.	1. Visually check the wiring harness connections. 2. Replace the harness if it has visible damage. 3. If the harness check result is OK, replace the diagnosis sensor unit and front LH seat belt (Before disposal, it must be activated.)
PRE-TEN FRONT LH [VB-SHORT]	● Front LH pre-tensioner circuit is shorted to a power supply circuit.	
PRE-TEN FRONT LH [GND-SHORT]	● Front LH pre-tensioner circuit is shorted to ground.	
PRE-TEN FRONT LH [SHORT]	● Front LH pre-tensioner circuit is shorted between lines.	
PRE-TEN FRONT RH [OPEN]	● Front RH pre-tensioner circuit is open.	1. Visually check the wiring harness connections. 2. Replace the harness if it has visible damage. 3. If the harness check result is OK, replace the diagnosis sensor unit and front RH seat belt (Before disposal, it must be activated.)
PRE-TEN FRONT RH [VB-SHORT]	● Front RH pre-tensioner is shorted to a power supply circuit.	
PRE-TEN FRONT RH [GND-SHORT]	● Front RH pre-tensioner is shorted to ground.	
PRE-TEN FRONT RH [SHORT]	● Front RH pre-tensioner circuit is shorted between lines.	
CURTAIN MODULE LH* [OPEN]	● LH side curtain air bag module circuit is open.	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. If the harness check result is OK, replace the diagnosis sensor unit and LH side curtain air bag module. (Before disposal, it must be deployed.)
CURTAIN MODULE LH* [VB-SHORT]	● LH side curtain air bag module circuit is shorted to a power supply circuits.	
CURTAIN MODULE LH* [GND-SHORT]	● LH side curtain air bag module circuit is shorted to ground.	

Diagnostic item	Explanation	Repair order “Recheck SRS at each replacement”
CURTAIN MODULE RH* [OPEN]	● RH side curtain air bag module circuit is open.	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. If the harness check result is OK, replace the diagnosis sensor unit and RH side curtain air bag module. (Before disposal, it must be deployed.)
CURTAIN MODULE RH* [VB-SHORT]	● RH side curtain air bag module circuit is shorted to a power supply circuit.	
CURTAIN MODULE RH* [GND-SHORT]	● The RH side curtain air bag module circuit is shorted to ground.	
CURTAIN MODULE RH* [SHORT]	● RH side curtain air bag module circuit is shorted between lines.	
CONTROL UNIT	● Diagnosis sensor unit is malfunctioning.	1. Visually check the wiring harness connection. 2. Replace the diagnosis sensor unit.

*: For coupe

Trouble Diagnosis without CONSULT-II

AHS0009B

DIAGNOSTIC PROCEDURE 6

Inspecting SRS Malfunctioning Parts by Using “AIR BAG” Warning Lamp — Diagnosis Mode

NOTE:

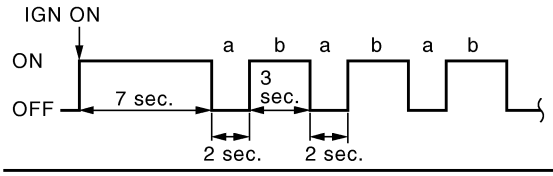
SRS will not enter Diagnosis mode if no malfunction is detected in User mode.

1. Turn ignition switch ON.
2. After “AIR BAG” warning lamp lights for 7 seconds, turn ignition switch OFF within 1 second.
3. Wait more than 3 seconds.
4. Repeat the steps 1 to 3 two times.
5. Turn ignition switch ON.

SRS is now in Diagnosis mode.
“AIR BAG” warning lamp operates in Diagnosis mode as follows:

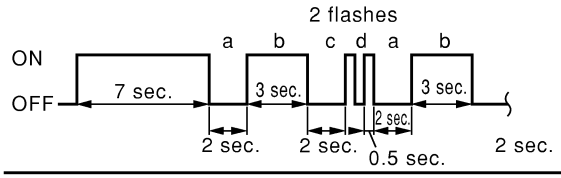
WARNING LAMP FLASH CODE CHART

<Diagnosis results (previously stored in the memory) might not be erased after repair or intermittent malfunctions have been detected in the past.>

Flash pattern	Repair order
a through b are repeated. 	1. Erase memory. (Once key switch is turned from OFF to ON, TROUBLE DIAG RECORD will be erased.)

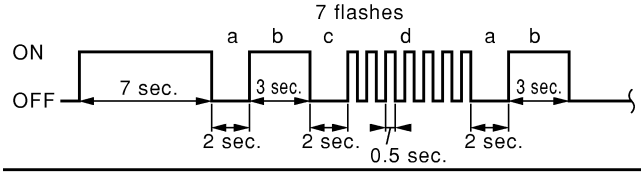
PHIA0532E

<Driver air bag module>

Flash pattern	Repair order
a through d are repeated. d: Two flashes indicates malfunctioning driver air bag module circuit. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the spiral cable. 4. Replace driver air bag module. (Before disposal, it must be deployed.) 5. Replace the diagnosis sensor unit. 6. Replace the related harness.

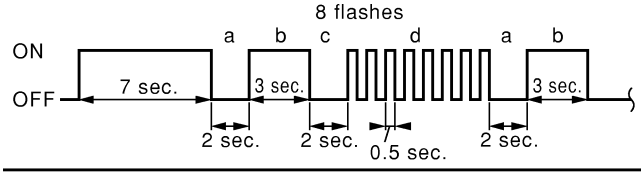
PHIA0185E

<Diagnosis sensor unit>

Flash pattern	Repair order
a through d are repeated. d: Seven flashes indicate malfunctioning diagnosis sensor unit circuit. 	1. Visually check the wiring harness connections. 2. Replace the harness if it has visible damage. 3. Replace the diagnosis sensor unit. 4. Replace the related harness.

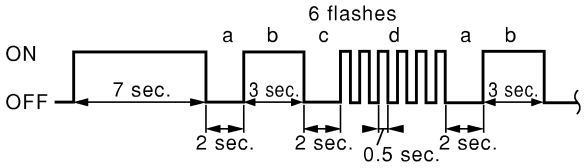
SHIA0028E

<Front passenger air bag module>

Flash pattern	Repair order
a through d are repeated. d: Eight flashes indicate malfunctioning front passenger air bag module circuit. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace front passenger air bag module. (Before disposal, it must be deployed.) 4. Replace the diagnosis sensor unit. 5. Replace the related harness.

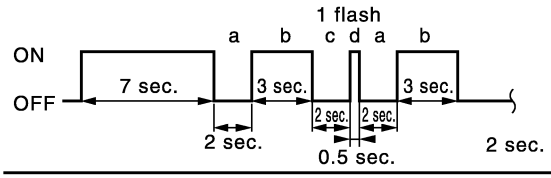
SHIA0029E

<Crash zone sensor>

Flash pattern	Repair order
a through d are repeated. d: Six flashes indicate malfunctioning crash zone sensor circuit. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the crash zone sensor. 4. Replace the diagnosis sensor unit. 5. Replace the related harness.

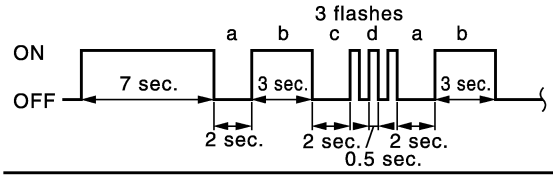
SHIA0083E

<Front RH seat belt pre-tensioner>

Flash pattern	Repair order
a through d are repeated. d: One flash indicates malfunctioning front RH seat belt pre-tensioner circuit. 	1. Visually check the wiring harness connections. 2. Replace the harness if it has visible damage. 3. Replace front RH seat belt pre-tensioner. (Before disposal, it must be activated.) 4. Replace the diagnosis sensor unit. 5. Replace the related harness.

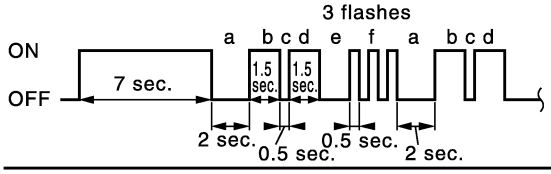
SHIA0030E

<Front LH seat belt pre-tensioner>

Flash pattern	Repair order
a through d are repeated. d: Three flashes indicate malfunctioning front LH seat belt pre-tensioner circuit. 	1. Visually check the wiring harness connections. 2. Replace the harness if it has visible damage. 3. Replace front LH seat belt pre-tensioner. (Before disposal, it must be activated.) 4. Replace the diagnosis sensor unit. 5. Replace the related harness.

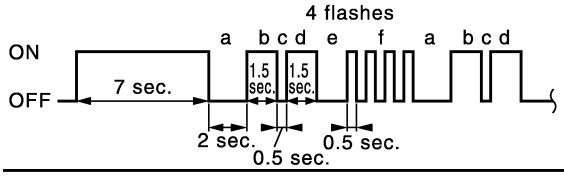
SHIA0031E

<RH side air bag (Satellite) sensor>

Flash pattern	Repair order
a through f are repeated. f: Three flashes indicate malfunctioning RH side air bag (Satellite) sensor circuit. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the RH side air bag (Satellite) sensor. 4. Replace the diagnosis sensor unit. 5. Replace the related harness.

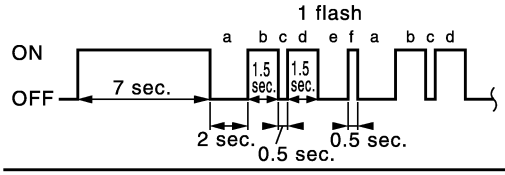
SHIA0032E

<LH side air bag (Satellite) sensor>

Flash pattern	Repair order
a through f are repeated. f: Four flashes indicate malfunctioning LH side air bag (Satellite) sensor. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the LH side air bag (Satellite) sensor. 4. Replace the diagnosis sensor unit. 5. Replace the related harness.

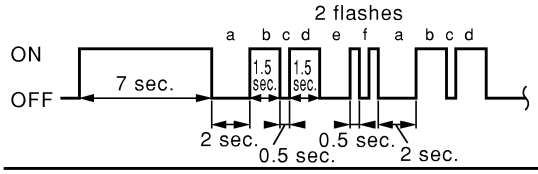
SHIA0033E

<Front RH side air bag module>

Flash pattern	Repair order
a through f are repeated. f: One flash indicate malfunctioning front RH side air bag module circuit. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace front RH side air bag module. (Before disposal, it must be deployed.) 4. Replace the diagnosis sensor unit. 5. Replace the related harness.

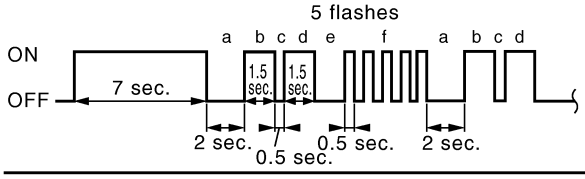
SHIA0034E

<Front LH side air bag module>

Flash pattern	Repair order
a through f are repeated. f: Two flashes indicate malfunctioning front LH side air bag module circuit. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace front LH side air bag module. (Before disposal, it must be deployed.) 4. Replace the diagnosis sensor unit. 5. Replace the related harness.

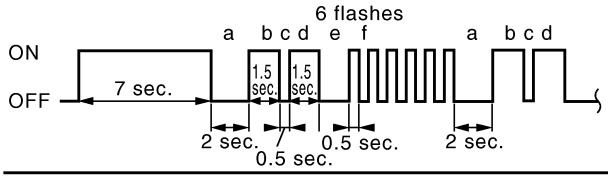
SHIA0035E

<RH side curtain air bag module (Coupe)>

Flash pattern	Repair order
a through f are repeated. f: Five flashes indicate malfunctioning RH side curtain air bag module circuit. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace RH side curtain air bag module. (Before disposal, it must be deployed.) 4. Replace the diagnosis sensor unit. 5. Replace the related harness.

PHIA0461E

<LH side curtain air bag module (Coupe)>

Flash pattern	Repair order
a through f are repeated. f: Six flashes indicate malfunctioning LH side curtain air bag module circuit.  PHIA0462E	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace LH side curtain air bag module. (Before disposal, it must be deployed.) 4. Replace the diagnosis sensor unit. 5. Replace the related harness.

Trouble Diagnosis: “AIR BAG” Warning Lamp Does Not Turn Off

AHS0009C

DIAGNOSTIC PROCEDURE 7

1. CHECK THE DEPLOYMENT OF AIR BAG MODULE

Is air bag module deployed?

YES or NO

YES >> Refer to SRS-61, "COLLISION DIAGNOSIS" .
NO >> GO TO 2.

2. CHECK THE AIR BAG FUSE

Check 10A fuse [No.13, located in fuse block (J/B)].
Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. CHECK AIR BAG FUSE AGAIN

Replace “AIR BAG” fuse and turn ignition switch ON.

Does the “AIR BAG” fuse blow again?

YES >> Repair main harness.
NO >> **INSPECTION END**

4. CHECK DIAGNOSIS SENSOR UNIT

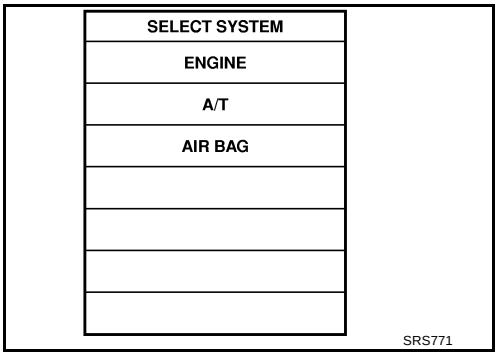
With CONSULT-II

Connect CONSULT-II and touch “START”.

- Is “AIR BAG” displayed on CONSULT-II?

YES or NO

YES >> GO TO 5.
NO >> Visually check the wiring harness connection of diagnosis sensor unit. If the harness connection check result is OK, replace diagnosis sensor unit.



5. CHECK HARNESS CONNECTION

Is harness connection between warning lamp and diagnosis sensor unit OK?

OK or NG

OK >> Replace diagnosis sensor unit.
NG >> Connect “AIR BAG” warning lamp and diagnosis sensor unit connector properly. If “AIR BAG” warning lamp still does not go off, replace harness.

Trouble Diagnosis: “AIR BAG” Warning Lamp Does Not Turn On

AHS0009D

DIAGNOSTIC PROCEDURE 8

1. CHECK “METER” FUSE

Check 10A fuse [No.14, located in fuse block (J/B)].
Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. CHECK “METER” FUSE AGAIN

Replace 10A fuse [No.14, located in fuse block (J/B)] and turn ignition switch ON.

Does the meter fuse blow again?

YES >> Repair the related harness.
NO >> **INSPECTION END**

3. CHECK HARNESS CONNECTION BETWEEN DIAGNOSIS SENSOR UNIT AND COMBINATION METER

Disconnect diagnosis sensor unit connector and turn ignition switch ON.

- Does “AIR BAG” warning lamp turn on?

YES or NO

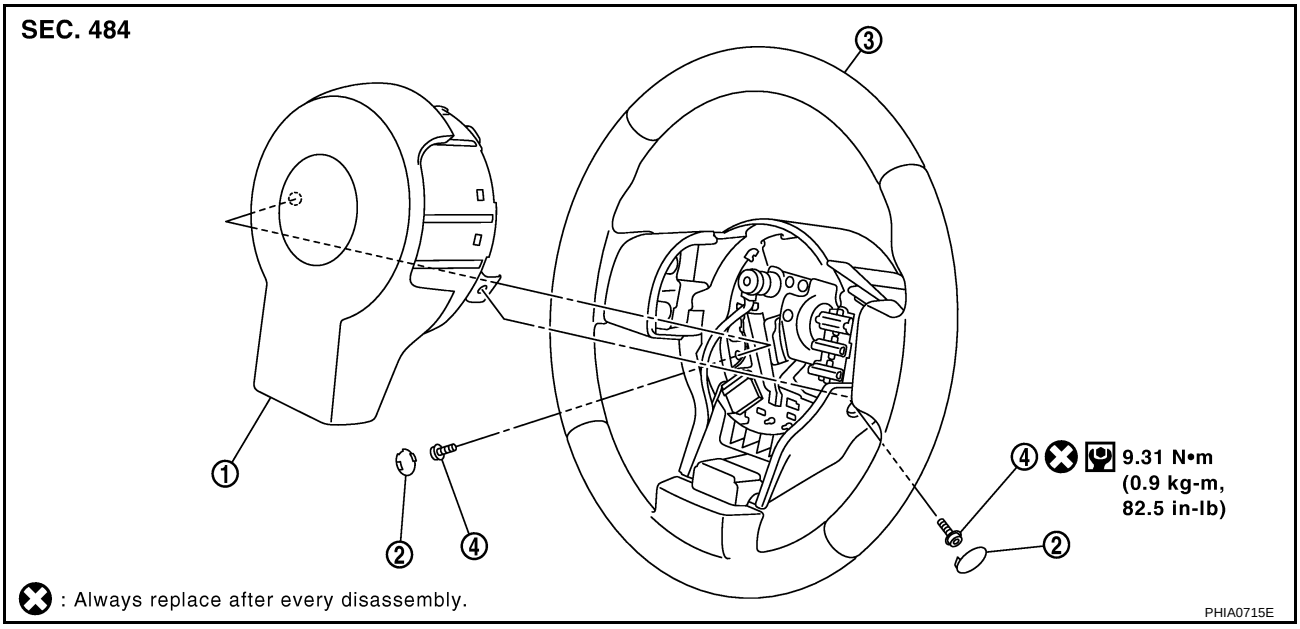
YES >> Replace diagnosis sensor unit.
NO >> Replace combination meter assembly.

DRIVER AIR BAG MODULE

PFP:K8510

Removal and Installation

AHS00024



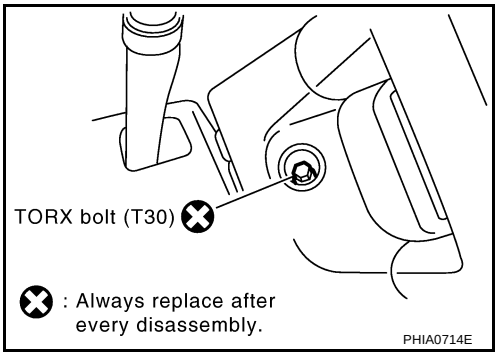
1. Driver air bag module
2. Side lid (RH/LH)
3. Steering wheel
4. TORX bolt (T30)

REMOVAL

CAUTION:

- **Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **Always work from the side of driver air bag module.**

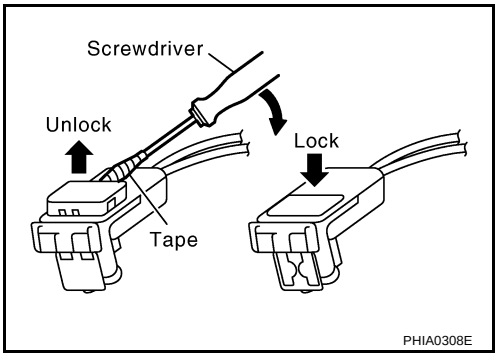
1. Remove the side lids (RH/LH).
2. Using Tamper resistant TORX bit (T30), remove the TORX bolts (T30) at right and left.



3. Disconnect the steering wheel switch sub-harness connector.
4. Disconnect the air bag harness connector, and remove the driver air bag module.

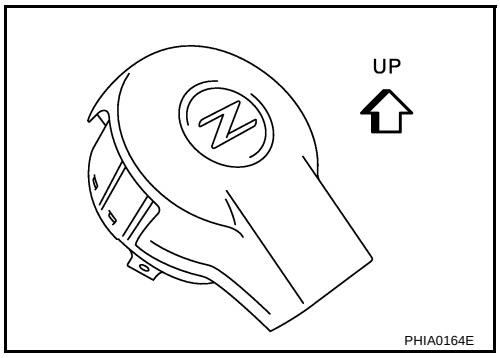
CAUTION:

- **For installing / removing driver air bag module connector, insert thin screwdriver wrapped in tape into notch, lift lock and remove connector.**
- **Install connector with lock raised, and push lock into connector.**

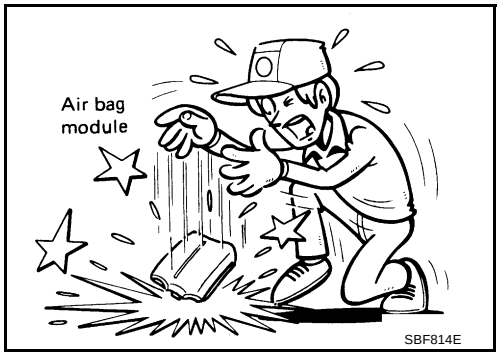


CAUTION:

- **Always work from the side of driver air bag module.**
- **Always place driver air bag module with pad side facing upward.**
- **Do not insert any foreign objects (screwdriver, etc.) into driver air bag module.**
- **Do not disassemble driver air bag module.**
- **Do not use old bolts after removal; replace with new bolts.**
- **Do not expose the driver air bag module to temperatures exceeding 90°C (194°F).**



- **Replace driver air bag module if it has been dropped or sustained an impact.**
- **Do not allow oil, grease or water to come in contact with the front passenger air bag module.**



INSTALLATION

Install in the reverse order of removal.

CAUTION:

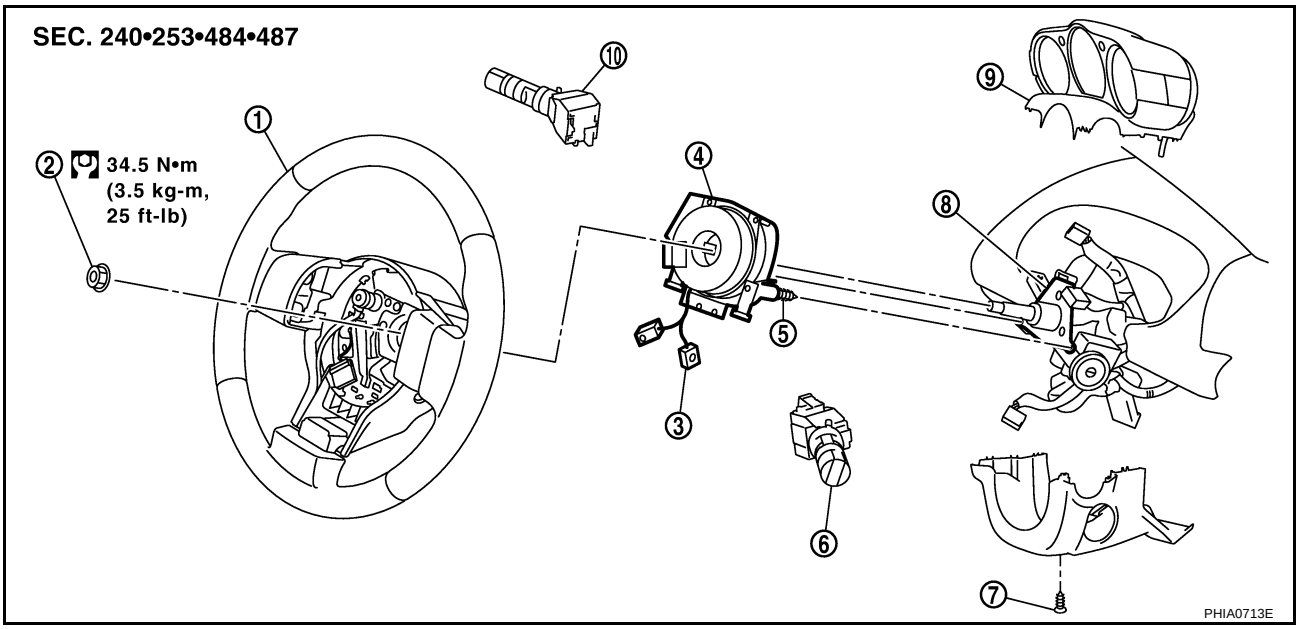
- **For installing the air bag module, tighten the TORX bolts (T30).**
- **After the work is completed, perform self-diagnosis to make sure that no malfunction is detected. Refer to SRS-22, "SRS Operation Check" .**

SPIRAL CABLE

PFP:25554

Removal and Installation

AHS00025



1. Steering wheel
2. Nut
3. Driver air bag module connector
4. Spiral cable
5. Scerw (Do not remove)
6. Wiper and washer switch
7. Screw
8. Steering column assembly
9. Combination meter
10. Lighting and turn signal switch

REMOVAL

CAUTION:

Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.

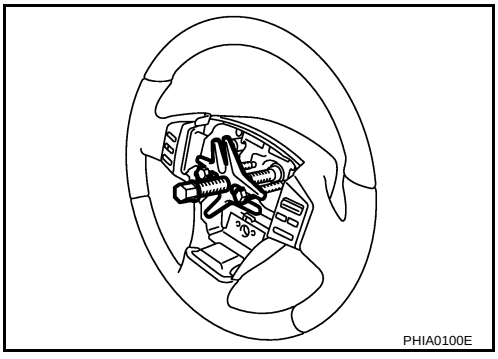
1. Remove driver air bag module. Refer to SRS-41, "Removal and Installation" .
2. Set the steering wheel in the neutral position.
3. Remove steering wheel nut.
4. Remove combination meter assembly. Refer to DI-28, "Removal and Installation for Combination Meter" .
5. Disconnect the spiral cable connector.

   CAUTION:

   Do not tap or bump the steering wheel.
6. Remove steering wheel with steering wheel puller.

   CAUTION:

   Be careful not to over-tighten puller on steering wheel.



7. Loosen the spiral cable fixing screws, remove the spiral cable.

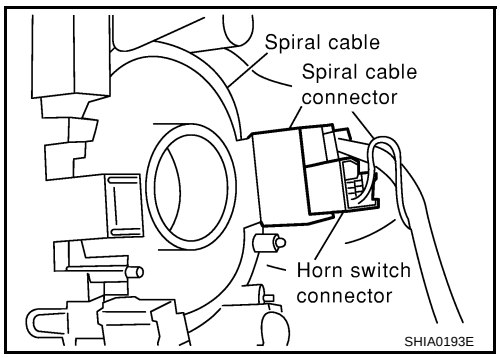
   CAUTION:

   - **Do not disassemble spiral cable.**
   - **Do not apply lubricant to the spiral cable.**

8. Remove the horn switch connector and then spiral cable connector.

CAUTION:

Also, with the steering linkage disconnected the cable may snap by turning the steering wheel beyond the limited number of turns.

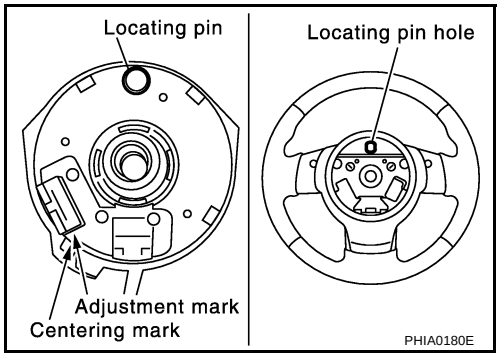


INSTALLATION

Install in the reverse order of removal.

CAUTION:

- **The spiral cable may snap due to steering operation if the cable is installed in an improper position.**
- **Also, with the steering linkage disconnected the cable may snap by turning the steering wheel beyond the limited number of turns. The spiral cable can be turned counterclockwise about 2.5 turns from the right end position.**
- **After the work is completed, perform self-diagnosis to make sure that no malfunction is detected. Refer to SRS-22, "SRS Operation Check" .**



FRONT PASSENGER AIR BAG MODULE

PFP:K8515

Removal and Installation

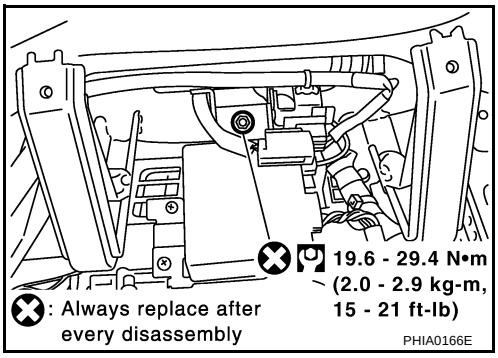
AHS00026

REMOVAL

CAUTION:

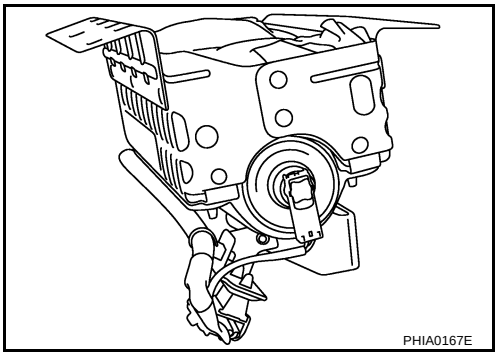
- **Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **Always work from the side of or under front passenger air bag module.**

1. Remove instrument passenger panel lower. Refer to IP-13, "(M) Instrument Passenger Panel Lower" .
2. Remove cluster lid C. Refer to IP-14, "(R) Cluster Lid C" .
3. Disconnect passenger air bag connector.
4. Remove special bolt, then remove front passenger air bag module.

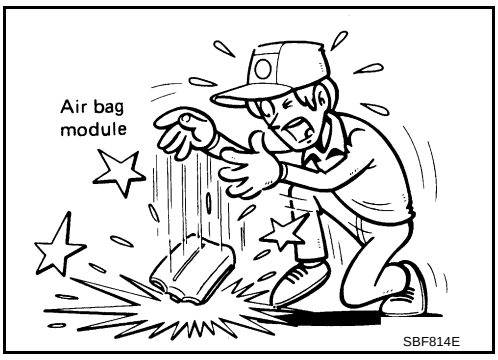


CAUTION:

- **Always place front passenger air bag module with caution label side facing upward.**
- **Do not insert any foreign objects (screwdriver, etc.) into front passenger air bag module.**
- **Do not disassemble front passenger air bag module.**
- **Do not use old bolts after removal; replace with new bolts.**



- **Replace front passenger air bag module if it has been dropped or sustained an impact.**
- **Do not expose the front passenger air bag module to temperatures exceeding 90°C (194°F).**
- **Do not allow oil, grease or water to come in contact with the front passenger air bag module.**
- **After front passenger air bag module inflates, the instrument panel assembly should be replaced.**



INSTALLATION

Install in the reverse order of removal.

CAUTION:

- **Always work from the side of or under front passenger air bag module.**
- **After the work is completed, perform self-diagnosis to make sure that no malfunction is detected. Refer to SRS-22, "SRS Operation Check" .**

FRONT SIDE AIR BAG MODULE

PFP:K8EH0

Removal and Installation

AHS000L1

CAUTION:

Removal of front side air bag module should only be done to allow deployment of front side air bag module prior to disposal of seatback assembly.

Only complete seatback assemblies can be replaced. Refer to SE-71, "REMOVAL OF SEATBACK ASSEMBLY" .

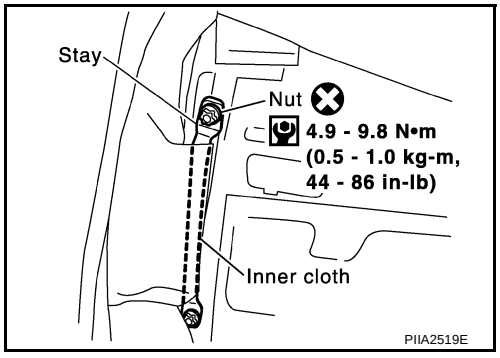
CAUTION:

- **Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **Always work from the rear of the front side air bag module.**
- **Do not use old nuts. Replace with new nuts.**

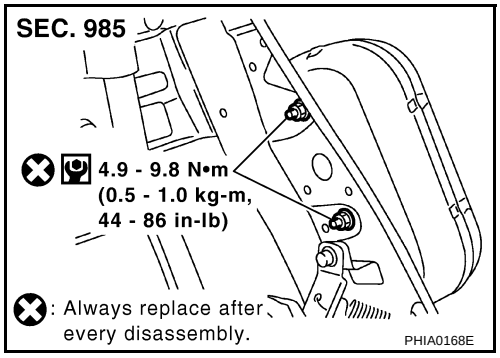
REMOVAL

For Manual or Power Seat/Coupe or Roadster

1. Remove the driver and/or passenger seat. Refer to SE-70, "REMOVAL" .
2. Remove the seatback trim and pad. Refer to SE-71, "SEATBACK TRIM AND PAD (MANUAL SEAT AND POWER SEAT)" .
3. Remove air bag module harness clips.
4. Remove the stay securing the inner cloth.



5. Remove the front side air bag module.

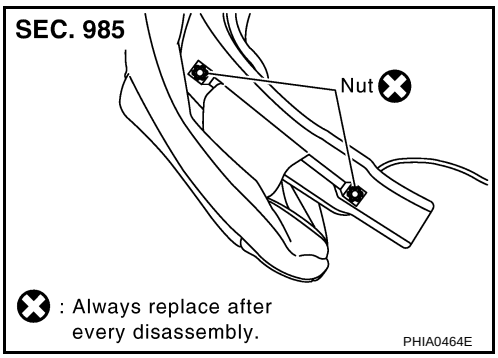


For Net Seat/Roadster

1. Remove the driver and/or passenger seat. Refer to SE-70, "REMOVAL" .
2. Remove the seatback upper. Refer to SE-72, "SEATBACK TRIM AND PAD (NET SEAT FOR ROADSTER)" .
3. Pull the seatback upper trim off. Refer to SE-72, "SEATBACK TRIM AND PAD (NET SEAT FOR ROADSTER)" .

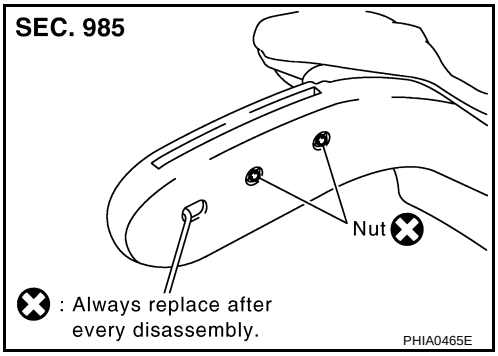
4. Remove the stay securing the inner cloth.

Special nut : 7.35 N·m (0.75 kg-m, 65 in-lb)



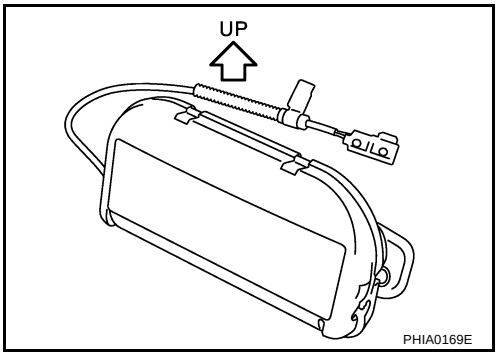
5. Remove the front side air bag module.

Special nut : 7.35 N·m (0.75 kg-m, 65 in-lb)

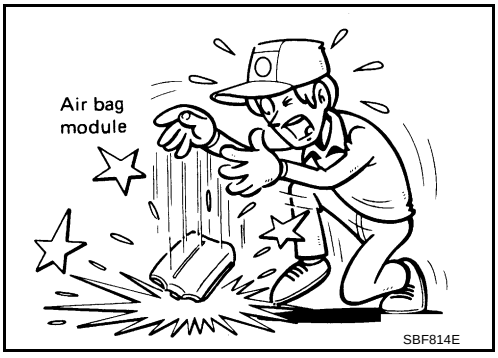


CAUTION:

- **Always place the front side air bag module standing with the stud bolt side facing down.**
- **Do not insert any foreign objects (screwdrivers) into front side air bag module.**
- **Do not disassemble front side air bag module.**



- **Replace front seatback assembly (side air bag module) if it has been dropped or sustained an impact.**
- **Do not expose front seatback assembly (side air bag module) to temperatures exceeding 90°C (194°F).**
- **Do not allow oil, grease or water to come in contact with the front side air bag module.**
- **After front side air bag module inflates, front seatback assembly must be replaced.**



INSTALLATION

Install in the reverse order of removal.

CAUTION:

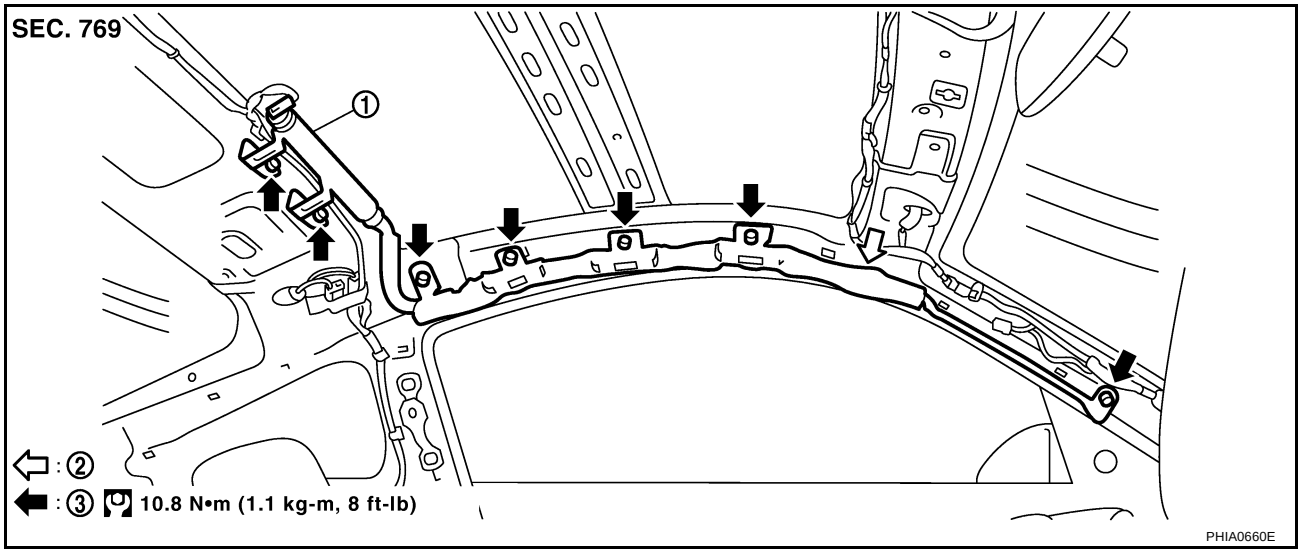
- **Always work from the side of or under front side air bag module.**
- **After the work is completed, perform self-diagnosis to make sure that no malfunction is detected. Refer to SRS-22, "SRS Operation Check" .**

SIDE CURTAIN AIR BAG MODULE (FOR COUPE)

PFP:985P0

Removal and Installation

AHS00028



1. Side curtain air bag module
2. Clip
3. Bolt

REMOVAL

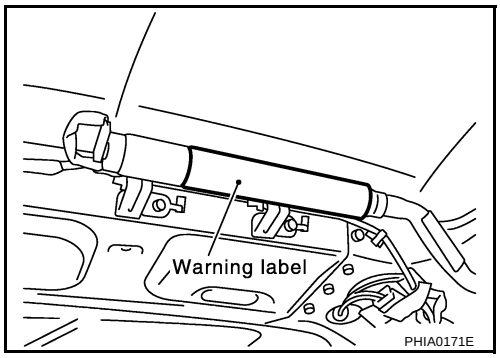
CAUTION:

- **Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **Always work from the side of the side curtain air bag module.**

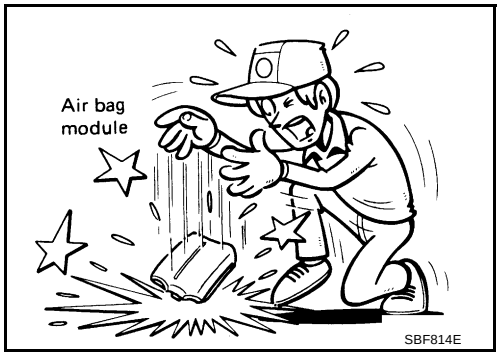
1. Remove headlining. Refer to EI-44, "Removal and Installation (for Coupe Models)" .
2. Disconnect side curtain air bag connector.
3. Remove side curtain air bag module fixing bolts and clip.
4. Remove the side curtain air bag module.

CAUTION:

- **Always place the side curtain air bag module with the warning label facing upward.**
- **Do not disassemble side curtain air bag module.**
- **Do not insert any foreign objects (screwdriver, etc.) into air bag module connector.**



- **Replace side curtain air bag module if it has been dropped or sustained an impact.**
- **Do not expose the air bag module to temperatures exceeding 90°C (194°F).**
- **Do not allow oil, grease or water to come in contact with the side curtain air bag module.**



INSTALLATION

Install in the reverse order of removal.

CAUTION:

- **Always work from the side of the side curtain air bag module.**
- **After replacement of side curtain air bag module, perform self-diagnosis to make sure that no malfunction is detected. Refer to SRS-22, "SRS Operation Check" .**

CRASH ZONE SENSOR

PFP:98531

Removal and Installation

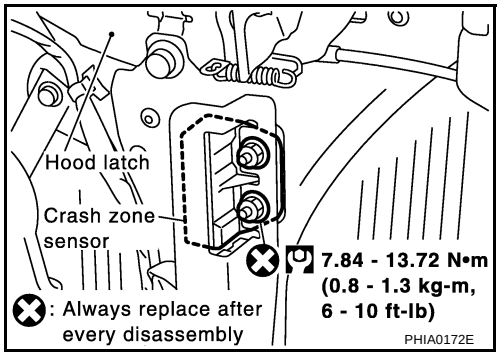
AHS00029

REMOVAL

CAUTION:

Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.

1. Remove crash zone sensor connector.
2. Remove crash zone sensor fixing nuts.



CAUTION:

- **Replace crash zone sensor if it has been dropped or sustained an impact.**
- **Do not disassemble crash zone sensor.**

INSTALLATION

Install in the reverse order of removal.

CAUTION:

- **Check crash zone sensor for proper installation.**
- **After the work is complete, perform self-diagnosis to make sure that no malfunction is detected. Refer to SRS-22, "SRS Operation Check" .**

SIDE AIR BAG (SATELLITE) SENSOR

PFP:98830

Removal and Installation

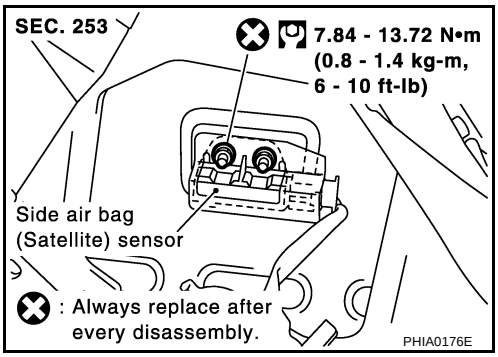
AHS0002A

REMOVAL

CAUTION:

Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.

1. Remove seat belt pre-tensioner. Refer to SB-4, "Removal and Installation of Seat Belt (Coupe)" or SB-6, "Removal and Installation of Seat Belt (Roadster)" .
2. Remove side air bag (Satellite) sensor fixing nuts.
3. Remove the side air bag (Satellite) sensor connector.



CAUTION:

- **Do not use old nuts; replace with new ones.**
- **Check side air bag (Satellite) sensor to ensure it is free of deformities, dents, cracks or rust. If it shows any visible signs of damage, replace it with new one.**
- **Do not attempt to disassemble side air bag (Satellite) sensor.**
- **Replace side air bag (Satellite) sensor if it has been dropped or sustained an impact.**

INSTALLATION

Install in the reverse order of removal.

CAUTION:

- **Check side air bag (Satellite) sensor for proper installation.**
- **After replacement of side air bag (Satellite) sensor, perform self-diagnosis to make sure that no malfunction is detected. Refer to SRS-22, "SRS Operation Check" .**

FRONT SEAT BELT PRE-TENSIONER

PFP:86884

Removal and Installation

AHS0002B

For removal and installation procedures, refer to SB-4, "Removal and Installation of Seat Belt (Coupe)" or SB-6, "Removal and Installation of Seat Belt (Roadster)" .

DIAGNOSIS SENSOR UNIT

PFP:28556

Removal and Installation

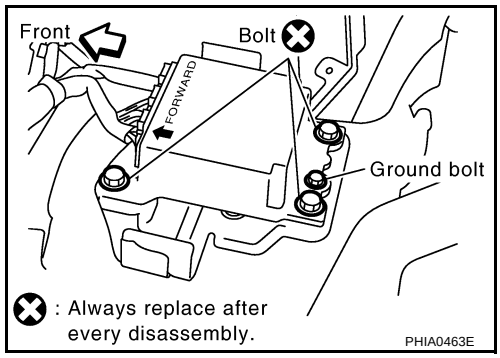
AHS0002C

REMOVAL

CAUTION:

Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.

1. Disconnect each harness connector for the air bag module and seat belt pre-tensioner.
2. Remove center console. Refer to IP-11, "Removal and Installation" .
3. Disconnect diagnosis sensor unit connector.
4. Remove fixing bolts from the diagnosis sensor unit.



Hexagon head bolt : 24.5 N·m (2.5 kg-m, 18 ft-lb)

Special bolt : 19.6 N·m (2.0 kg-m, 14 ft-lb)

Ground bolt : 6.9 N·m (0.7 kg-m, 61 in-lb)

CAUTION:

- **Do not use old bolts. Replace with new ones.**
- **Check diagnosis sensor unit bracket to ensure it is free of deformities, dents, cracks or rust. If it shows any visible signs of damage, replace with new one.**
- **Replace diagnosis sensor unit if it has been dropped or sustained an impact.**

INSTALLATION

Install in the reverse order of removal.

CAUTION:

- **Check the diagnosis sensor unit for proper installation.**
- **After replacement of diagnosis sensor unit, perform self-diagnosis to make sure that no malfunction is detected. Refer to SRS-22, "SRS Operation Check" .**

ECU DISCRIMINATED NO.

After replacing the diagnosis sensor unit, make sure that the diagnosis sensor unit identification is correct for the vehicle as equipped.

Model	Specification	ECU DISCRIMINATED No.
Coupe	Models with driver and passenger air bags and seat belt pre-tensioner	FA51
	Models with driver and passenger air bags, seat belt pre-tensioner, side air bags and curtain air bags	FA53
Roadster	Models with driver and passenger air bags and seat belt pre-tensioner	FA86
	Models with driver and passenger air bags, seat belt pre-tensioner and side air bags	FA52

DISPOSAL OF AIR BAG MODULE AND SEAT BELT PRE-TENSIONER

PFP:00014

Caution for Air Bag Module and Seat Belt Pre-tensioner

AHS0002D

- Before disposing of air bag module and seat belt pre-tensioner, or vehicles equipped with such systems, deploy the systems. If such systems have already been deployed due to an accident, dispose of them as indicated in SRS-54, "DISPOSAL OF AIR BAG MODULE AND SEAT BELT PRE-TENSIONER" .
- When deploying the air bag module and seat belt pre-tensioner, always use the Special Service Tool; Deployment tool [KV99106400 (J38381)].
- When deploying the air bag module and seat belt pre-tensioner, stand at least 5 m (16 ft) away from the deployment component.
- When deploying air bag module and seat belt pre-tensioner, a fairly loud noise is made, followed by smoke being released. The smoke is not poisonous, however, be careful not to inhale smoke since it irritates the throat and can cause choking.
- Always activate one air bag module at a time.
- Due to heat, leave air bag module unattended for more than 30 minutes after deployment. Also leave seat belt pre-tensioner unattended for more than 10 minutes after deployment.
- Be sure to wear gloves when handling a deployed air bag module and seat belt pre-tensioner.
- Do not apply water to the deployed air bag module and seat belt pre-tensioner.
- Wash your hands clean after finishing work.
- Place the vehicle outdoors with an open space of at least 6 m (20 ft) on all sides when deploying air bag module and seat belt pre-tensioner while mounted in vehicle.
- Use a voltmeter to make sure the vehicle battery is fully charged.
- Do not dispose of the air bag module and seat belt pre-tensioner undeployed.

CHECKING DEPLOYMENT TOOL

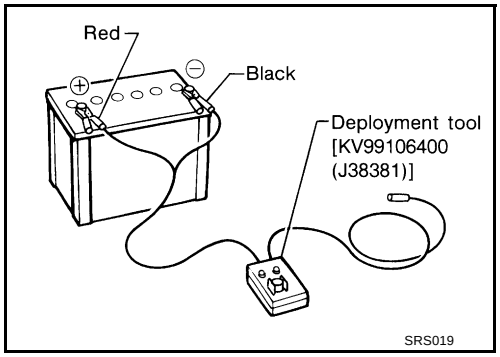
Connecting to Battery

CAUTION:

The battery must show voltage of 9.6 V or more.

Remove the battery from the vehicle and place it on dry wood blocks approximately 5 m (16 ft) away from the vehicle.

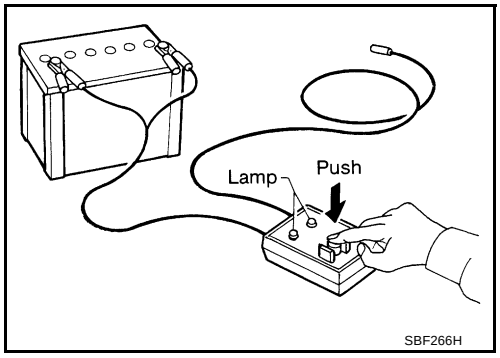
- Wait 3 minutes after the vehicle battery is disconnected before proceeding.
- Connect red clip of deployment tool to battery positive terminal and black clip to negative terminal.



Make sure the polarity is correct. The right side lamp in the tool, marked “deployment tool power”, should glow with a green light. If the right side lamp glows red, reverse the connections to the battery.

Deployment Tool Check

Press the deployment tool switch to the ON position. The left side lamp in the tool, marked “air bag connector voltage” should illuminate. If it does not illuminate, replace the tool.



Air Bag Deployment Tool Lamp Illumination Chart (Battery Connected)

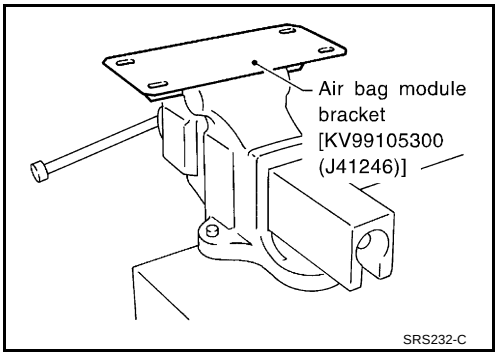
Switch operation	Left side lamp, green* “AIR BAG CONNECTOR VOLTAGE”	Right side lamp, green* “DEPLOYMENT TOOL POWER”
OFF	OFF	ON
ON	ON	ON

*: If this lamp glows red, the tool is connected to the battery incorrectly. Reverse the connections and make sure the lamp glows green.

DEPLOYMENT PROCEDURES FOR AIR BAG MODULE (OUTSIDE OF VEHICLE)

Unless the vehicle is being scrapped, deploying the air bag in the vehicle is not recommended. This may cause damage to the vehicle interior.

Anchor air bag module bracket [SST: KV99105300 (J41246)] in a vise secured to a firm foundation during deployment.

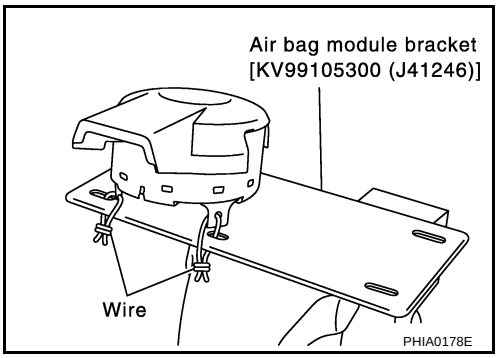


Deployment of Driver Air Bag Module (Outside of Vehicle)

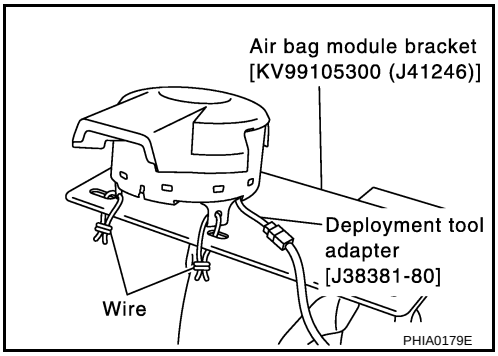
1. Using wire, secure air bag module to air bag module bracket [SST: KV99105300 (J41246)] at two places.

   CAUTION:
   Use wire of at least 1 mm (0.04 in) diameter.

2. Firmly secure air bag module bracket [SST: KV99105300 (J41246)] with air bag module attached, in a vise.

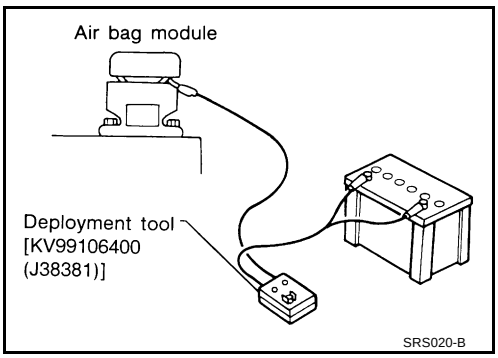


3. Connect deployment tool adapter (SST: J38381-80) to air bag module connector and deployment tool connector [SST: KV99106400 (J38381)].



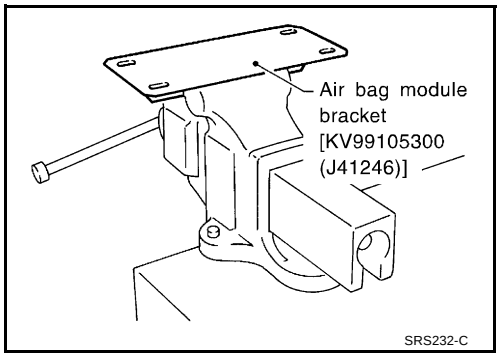
4. Connect red clip of deployment tool to battery positive terminal and black clip to negative terminal.
5. The lamp on the right side of the tool, marked “deployment tool power”, should glow green, not red.
6. Press the button on the deployment tool. The left side lamp on the tool, marked “air bag connector voltage”, will illuminate and the air bag module will deploy.

CAUTION:
When deploying the driver air bag module, stand at least 5 m (16 ft) away from the air bag module.



Deployment of Front Passenger Air Bag Module (Outside of Vehicle)

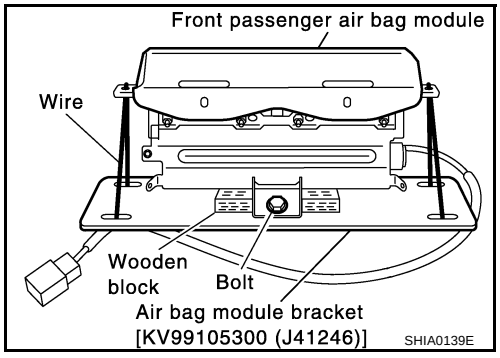
1. Firmly secure air bag module bracket [SST: KV99105300 (J41246)] in a vise.



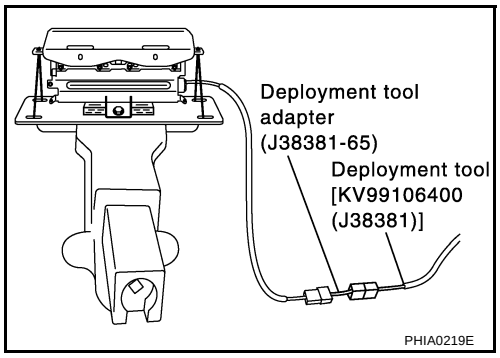
2. Match the hole in air bag module bracket (held in vise) and front passenger air bag module and fix them with one bolt [M8 × 25 - 30 mm (0.98 - 1.18 in)].

CAUTION:

If a gap exists between front passenger air bag module and air bag module bracket, use a piece of wooden block inserted in the gap to stabilize the air bag module.



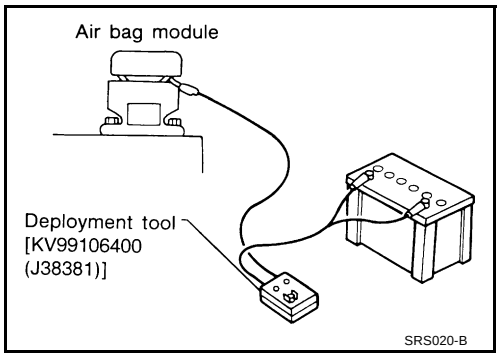
3. Connect deployment tool [SST: KV99106400 (J38381)] and deployment tool adapter (SST: J38381-65) to front passenger air bag module connector.
4. Connect red clip of deployment tool to battery positive terminal and black clip to negative terminal.
5. The lamp on the right side of the tool, marked “deployment tool power”, should glow green, not red.



6. Press the button on the deployment tool. The left side lamp on the tool, marked “air bag connector voltage”, will illuminate and the air bag module will deploy.

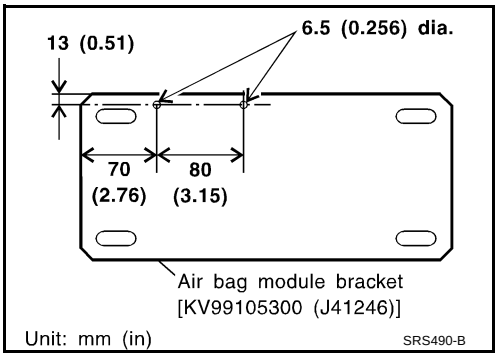
CAUTION:

- **When deploying the front passenger air bag module, do not stand on the deploying side.**
- **Stand at least 5 m (16 ft) away from the air bag module.**



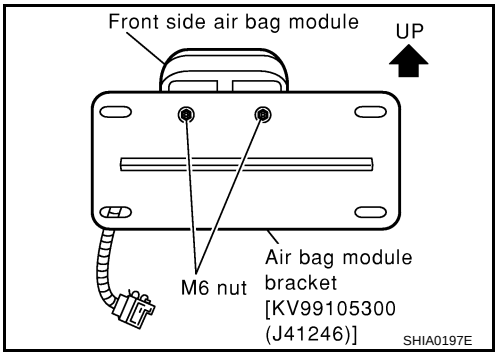
Deployment of Front Side Air Bag Module (Outside of Vehicle)

1. Make 6.5 mm (0.256 in) diameter holes in air bag module bracket [SST: KV99105300 (J41246)] at the position shown in figure.

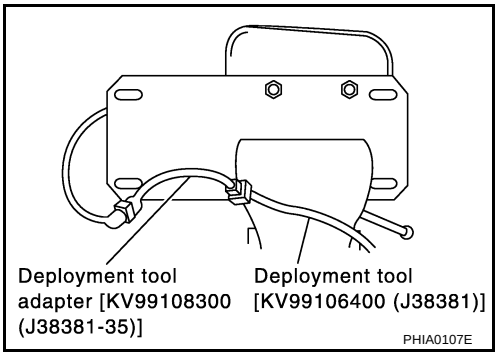


2. Firmly secure air bag module bracket [SST: KV99105300 (J41246)] in a vise.
3. Insert the stud bolts of side air bag module into the two holes in air bag module bracket (held in vise) and fix them with two M6 nuts.

CAUTION:
Side air bag module should be secured to air bag module bracket [SST: KV99105300 (J41246)] in a vise with stud bolt side facing down.

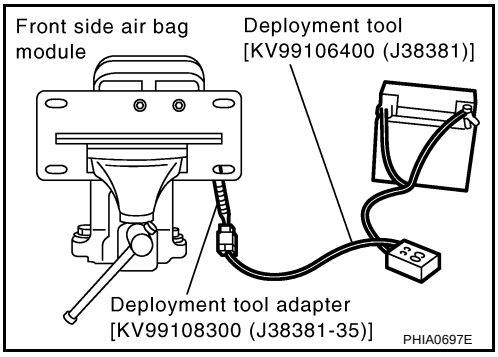


4. Connect deployment tool adapter [SST: KV99108300 (J38381-35)] and deployment tool [SST: KV99106400 (J38381)] on side air bag module.



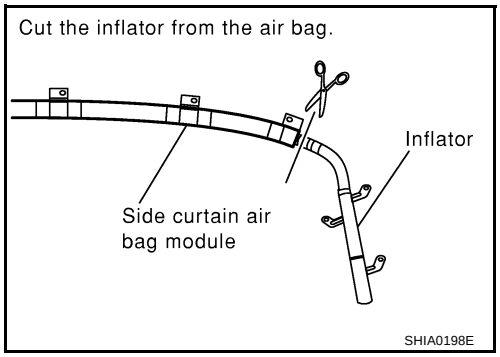
5. Connect red clip of deployment tool to battery positive terminal and black clip to negative terminal.
6. The lamp on the right side of the tool, marked “deployment tool power”, should glow green, not red.
7. Press the button on the deployment tool. The left side lamp on the tool, marked “air bag connector voltage”, will illuminate and the air bag module will deploy.

CAUTION:
When deploying the front side air bag module, stand at least 5 m (16 ft) away from the air bag module.

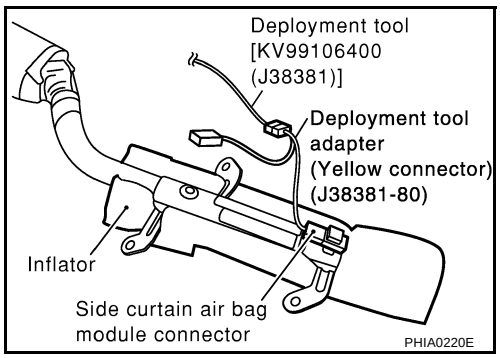


Deployment of Side Curtain Air Bag Module (Outside of Vehicle)/For Coupe

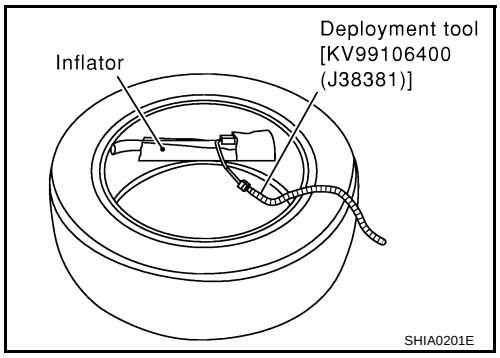
1. Cut the inflator from side curtain air bag module.



2. Connect deployment tool [SST: KV99106400 (J38381)] and deployment tool adapter yellow connector (SST: J38381-80)to the inflator.



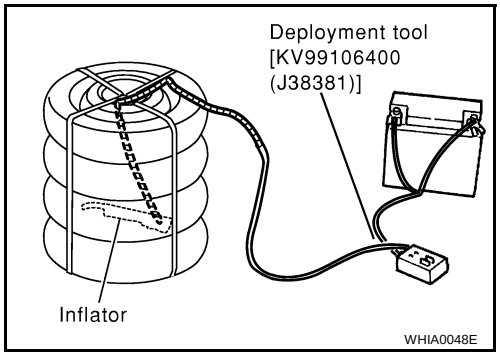
3. Put the inflator connected with the deployment tool [SST: KV99106400 (J38381)] into a tire without a wheel.



4. Put the tire with the inflator onto another tire without wheel. Add an additional tire without a wheel and then a tire mounted on a wheel on top.

   CAUTION:
   Tie all tires together with a strap in order keep them standing.

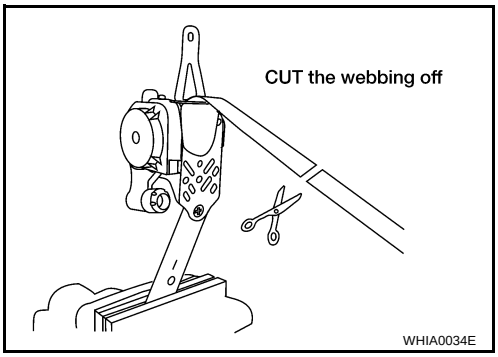
5. Connect red clip of deployment tool to battery positive terminal and black clip to negative terminal.
6. The lamp on the right side of the tool, marked “deployment tool power”, should glow green, not red.
7. Press the button on the deployment tool. The left side lamp on the tool, marked “air bag connector voltage”, will illuminate and the air bag module will deploy.



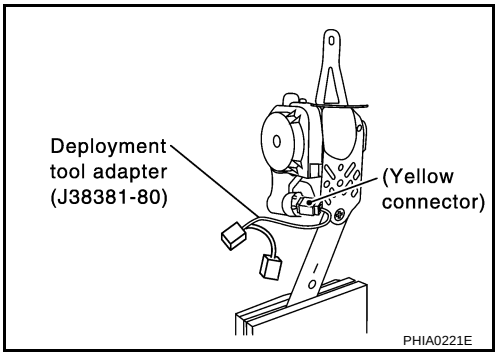
   CAUTION:
   When deploying the side curtain air bag module, stand at least 5 m (16 ft) away from the side curtain air bag module.

DEPLOYMENT PROCEDURES FOR SEAT BELT PRE-TENSIONER (OUTSIDE OF VEHICLE)

1. Firmly grip pre-tensioner in a vise and cut off the webbing.

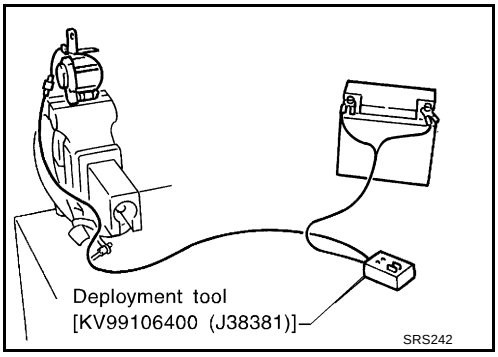


2. Connect deployment tool [SST: KV99106400 (J38381)] and deployment tool adapter (SST: J38381-80) yellow connector to front seat belt pre-tensioner.



3. Connect red clip of deployment tool to battery positive terminal and black clip to negative terminal.
4. The lamp on the right side of the tool, marked “deployment tool power”, should glow green, not red.
5. Press the button on the deployment tool. The left side lamp on the tool, marked “seat belt pre-tensioner connector voltage”, will illuminate and the seat belt pre-tensioner will deploy.

CAUTION:
When deploying the front seat belt pre-tensioner, stand at least 5 m (16 ft) away from the seat belt pre-tensioner.



DISPOSAL OF AIR BAG MODULE AND SEAT BELT PRE-TENSIONER

DEPLOYMENT OF AIR BAG MODULE AND SEAT BELT PRE-TENSIONER WHILE MOUNTED IN VEHICLE

When disposing of a vehicle, deploy air bag module and seat belt pre-tensioners while they are mounted in vehicle.

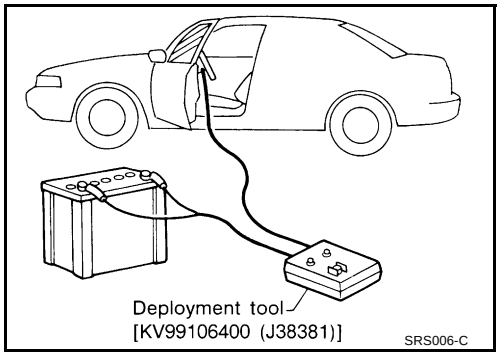
CAUTION:

When deploying air bag module or seat belt pre-tensioner, ensure vehicle is empty.

1. Disconnect both the vehicle battery cables and wait 3 minutes.
2. Disconnect air bag module and seat belt pre-tensioner connector.
3. Connect deployment tool [SST: KV99106400 (J38381)] to air bag module.
   For front passenger air bag module, attach deployment tool adapter [SST: J38381-65] to the tool connector. For side air bag module, attach deployment tool adapter [SST: KV99108300 (J38381-35)]. For curtain air bag module and seat belt pre-tensioner, attach deployment tool adapter (SST: J38381-80).
4. Connect red clip of deployment tool to battery positive terminal and black clip to negative terminal.
5. The lamp on the right side of the tool, marked “deployment tool power”, should glow green, not red.
6. Press the button on the deployment tool. The left side lamp on the tool, marked “air bag connector voltage”, will illuminate and the air bag module or seat belt pre-tensioner will deploy.

   CAUTION:

   Activate only one air bag module or seat belt pre-tensioner at a time.

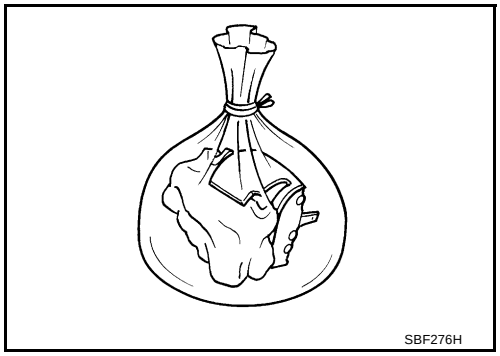


DISPOSING OF AIR BAG MODULE AND SEAT BELT PRE-TENSIONER

Deployed air bag module and seat belt pre-tensioner are very hot. Before disposing of air bag module and seat belt pre-tensioner, wait at least 30 minutes, and 10 minutes, respectively. Seal them in a plastic bag before disposal.

CAUTION:

- **Do not apply water to a deployed air bag module or seat belt pre-tensioner.**
- **Be sure to wear gloves when handling a deployed air bag module or seat belt pre-tensioner.**
- **No poisonous gas is produced upon air bag module deployment. However, be careful not to inhale gas since it irritates the throat and can cause choking.**
- **Do not disassemble air bag module or seat belt pre-tensioner.**
- **Air bag module and seat belt pre-tensioner cannot be reused.**
- **Wash hands clean after finishing work.**



COLLISION DIAGNOSIS

PFP:00015

For Frontal Collision

AHS0002E

To repair the SRS, perform the following steps.

When SRS (except the front side air bag and side curtain air bag modules) is activated in a collision:

1. Replace the diagnosis sensor unit.
2. Remove the air bag modules (except the front side air bag modules and side curtain air bag modules), crash zone sensor assembly, bracket and seat belt pre-tensioner assemblies.
3. Check the SRS components using the table below:

– Replace any SRS components showing visible signs of damage (dents, cracks and deformation).

4. Install new air bag modules (except the front side air bag modules and side curtain air bag modules) crash zone sensor assembly, bracket and seat belt pre-tensioner assemblies.
5. Perform self-diagnosis using CONSULT-II or “AIR BAG” warning lamp. Refer to SRS-22, "SRS Operation Check" for details. Ensure entire SRS operates properly.

When SRS is not activated in a collision:

1. Check the SRS components using the table below:

– Replace any SRS components showing visible signs of damage (dents, cracks and deformation).

2. Perform self-diagnosis using CONSULT-II or “AIR BAG” warning lamp. Refer to SRS-22, "SRS Operation Check" for details. Ensure entire SRS operates properly.

When only one front air bag module is activated in a collision:

1. Replace the following components:

– Diagnosis sensor unit

– Crash zone sensor

– Activated front air bag and seat belt pre-tensioner.

2. Check the other SRS components using the table below. (Refer to “SRS is NOT activated”.)

– Replace any SRS components showing visible signs of damage (dents, cracks and deformation).

3. Perform self-diagnosis using CONSULT-II or “AIR BAG” warning lamp. Refer to SRS-22, "SRS Operation Check" for details. Ensure entire SRS operates properly.

Only one front air bag may inflate a crash, depending on the crash severity and whether the front occupants are belted or unbelted. This does not indicate improper performance of the system. Perform self-diagnosis to make sure the entire SRS operates properly.

SRS INSPECTION (FOR FRONTAL COLLISION)

Part	SRS is activated	SRS is NOT activated
Air bag module (driver and front passenger air bag module)	REPLACE Install with new bolts.	1. Remove air bag module. Check harness cover and connectors for damage, terminals for deformities, and harness for binding. 2. – Install driver air bag module into the steering wheel to check fit and alignment with the wheel. – Install passenger air bag module into the instrument panel to check fit with the instrument panel. 3. No damage found, reinstall with new bolts. 4. If damaged—REPLACE air bag modules with new special bolts. Air bag must be deployed before disposal.
Crash zone sensor	REPLACE the crash zone sensor and bracket with new nuts.	1. Remove the crash zone sensor. Check harness connectors for damage, terminals for deformities, and harness for binding. 2. Check for visible signs of damage (dents, cracks, deformation) of the crash zone sensor and bracket. 3. Install the crash zone sensor to check fit. 4. No damage found, reinstall with new bolts. 5. If damaged—REPLACE the crash zone sensor and bracket with new nuts.

Part	SRS is activated	SRS is NOT activated
Seat belt pre-tensioner assemblies	REPLACE Install seat belt pre-tensioner with new bolts.	1. Remove seat belt pre-tensioners. Check harness cover and connectors for damage, terminals for deformities, and harness for binding. 2. Check belts for damage and anchors for loose mounting. 3. Check retractor for smooth operation. 4. Check seat belt adjuster for damage. 5. If no damage is found, reinstall seat belt pre-tensioner assembly with new bolts. 6. If damaged—REPLACE seat belt pre-tensioners with new bolts. Seat belt pre-tensioners must be deployed before disposal.
Diagnosis sensor unit	REPLACE Install with new bolts.	1. Check case for dents, cracks or deformities. 2. Check connectors for damage, and terminals for deformities. 3. If no damage is found, reinstall with new bolts and ground bolt. 4. If damaged—REPLACE diagnosis sensor unit with new bolts and ground bolt.
Steering wheel	1. Visually check steering wheel for deformities. 2. Check harness (built into steering wheel) and connectors for damage, and terminals for deformities. 3. Install air bag module to check fit or alignment with steering wheel. 4. Check steering wheel for excessive free play. 5. If no damage is found, reinstall with nut. 6. If damaged—REPLACE.	
Spiral cable	1. Visually check spiral cable and combination switch for damage. 2. Check connectors and protective tape for damage. 3. Check steering wheel for noise, binding or heavy operation. 4. If no damage is found, reinstall with screws. 5. If damaged—REPLACE.	
Harness and connectors	1. Check connectors for poor connection, damage, and terminals for deformities. 2. Check harness for binding, chafing, cuts, or deformities. 3. If no damage is found, reinstall the harness and connectors. 4. If damaged—REPLACE damaged section of harness. Do not repair, splice or modify any SRS harness.	
Instrument panel	1. Visually check instrument panel for damage. 2. If no damage is found, reinstall the instrument panel. 3. If damaged—REPLACE the instrument panel with bolts.	

For Side Collision

AHS0002F

WHEN THE SIDE AIR BAG IS ACTIVATED IN THE SIDE COLLISION:

1. Replace the following components:
- All parts of front seatback (including front seatback frame) with front side air bag module (on the side on which front side air bag is activated)
- Curtain air bag module (on the side on which side curtain air bag is activated)
- Diagnosis sensor unit
- Satellite sensor (on the side on which side air bag and side curtain air bag is activated)
2. Check the SRS components and the related parts using the following table.
- Replace any SRS components and the related parts showing visible signs of damage (dents, cracks, deformation).
3. Perform self-diagnosis using CONSULT-II or “AIR BAG” warning lamp. Refer to SRS-22, "SRS Operation Check" . Ensure entire SRS operates properly.

WHEN SRS IS NOT ACTIVATED IN THE SIDE COLLISION:

1. Check the SRS components and the related parts using the following table.

– Replace any SRS components and the related parts showing visible signs of damage (dents, cracks, deformation).

2. Perform self-diagnosis using CONSULT-II or “AIR BAG” warning lamp. Refer to SRS-22, "SRS Operation Check" . Ensure entire SRS operates properly.

SRS INSPECTION (FOR SIDE COLLISION)

Part	Front side air bag and side curtain air bag is activated	Front side air bag and side curtain air bag is NOT activated
(LH or RH) side curtain air bag module*	Replace the side curtain air bag module. (Repair the center pillar inner, etc. before installing new one if damaged.)	1. Check for visible signs of damage (dents, tears, deformation) of the center pillar on the collision side. 2. If damaged— Remove the side curtain air bag module. 3. Check for visible signs of damaged (tears etc.) of the side curtain air bag module. 4. Check harness and connectors for damage, and terminals for deformities. 5. If no damage is found, reinstall the side curtain air bag module with new bolts. 6. If damaged—REPLACE the side curtain air bag module with new bolts. Air bag must be deployed before disposal.
Front (LH or RH) side air bag module	REPLACE all parts of seatback with deployed front side air bag module.	1. Check for visible signs of damage (dents, tears, deformation) of the seat back on the collision side. 2. Check harness and connectors for damage, and terminals for deformities. 3. If damaged—REPLACE the front seatback assembly. Air bag must be deployed before disposal.
(LH or RH) side air bag (Satellite) sensor	REPLACE the side air bag (Satellite) sensor on the collision side with new nuts. (Repair the center pillar inner, etc. before installing new one if damaged.)	1. Remove the side air bag (Satellite) sensor on the collision side. Check harness connectors for damage, terminals for deformities, and harness for binding. 2. Check for visible signs of damage (dents, cracks, deformation) of the side air bag (Satellite) sensor. 3. Install the side air bag (Satellite) sensor to check fit. 4. If no damage is found, reinstall the side sir bag (Satellite) sensor with new nuts. 5. If damaged—REPLACE the side air bag (Satellite) sensor with new nuts.
Diagnosis sensor unit	REPLACE the diagnosis sensor unit with the new bolts.	1. Check case and bracket for dents, cracks or deformities. 2. Check connectors for damage, and terminals for deformities. 3. If no damage is found, reinstall the diagnosis sensor unit with new bolts and ground bolt. 4. If damaged—REPLACE the diagnosis sensor unit with new bolts and ground bolt.
Seat belt pre-tensioner assembly	1. Check if the seat belt can be extended smoothly. If the seat belt cannot be extended smoothly, – Check for deformities of the center pillar inner. – If the center pillar inner has no damage, REPLACE the seat belt pre-tensioner assembly. 2. Remove the seat belt pre-tensioner assembly on the collision side. Check harness cover and connectors for damage, terminals for deformities, and harness for binding. 3. Check for visible signs of damage (dents, cracks, deformation) of the seat belt pre-tensioner assembly. 4. Check seat belt adjuster for damage. 5. If no damage is found, reinstall the seat belt pre-tensioner assembly. 6. If damaged—REPLACE the seat belt pre-tensioner assembly with new bolts. The seat belt pre-tensioner assembly must be deployed before disposal.	

Part	Front side air bag and side curtain air bag is activated	Front side air bag and side curtain air bag is NOT activated
Seat with front side air bag	REPLACE all parts of front seatback (including front seatback frame)	1. Visually check the seat on the collision side. 2. Remove the seat on the collision side and check the following for damage and deformities. – Harness, connectors and terminals – Frame and recliner (for front and rear seat), and also adjuster and slides (for front seat) 3. If no damage is found, reinstall the seat. 4. If damaged—REPLACE the damaged seat parts using new bolts.
Center inner pillar	1. Check the center inner pillar on the collision side for damage (dents, cracks, deformation). 2. If damaged—REPAIR the center inner pillar.	
Trim/headlining*	1. Check for visible signs of damage (dents, cracks, deformation) of the interior trim on the collision side. 2. If damaged—REPLACE the damaged trim parts.	

*: For coupe

SECTION BL

BODY, LOCK & SECURITY SYSTEM

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

AIS000BP

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

AIS003N6

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Work

AIS000BQ

- After removing and installing the opening/closing parts, be sure to carry out fitting adjustments to check their operation.
- Check the lubrication level, damage, and wear of each part. If necessary, grease or replace it.

Wiring Diagnosis and Trouble Diagnosis

AIS000BR

When you read wiring diagrams, refer to the following:

- GI-15, "How to Read Wiring Diagrams".
- PG-4, "POWER SUPPLY ROUTING CIRCUIT".

When you perform trouble diagnosis, refer to the following:

- GI-11, "HOW TO FOLLOW TEST GROUPS IN TROUBLE DIAGNOSES".
- GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident".
  Check for any Service bulletins before servicing the vehicle.

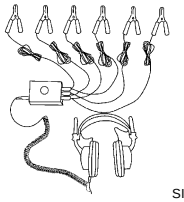
PREPARATION

PFP:00002

Special Service Tools

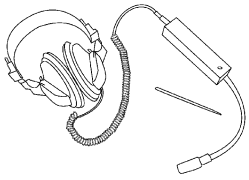
AIS000BS

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
(J-39570) Chassis ear  SIIA0993E	Locating the noise
(J-43980) NISSAN Squeak and Rattle Kit SIIA0994E	Repairing the cause of noise

Commercial Service Tools

AIS000BT

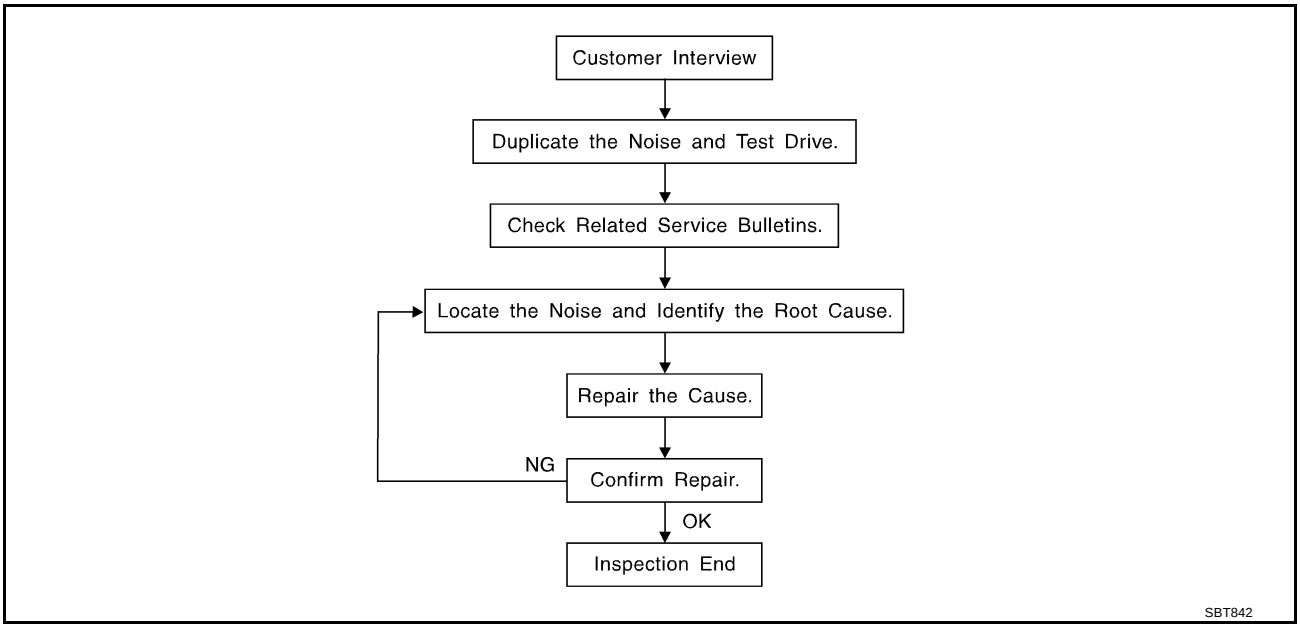
Tool name	Description
Engine ear  SIIA0995E	Locating the noise

SQUEAK AND RATTLE TROUBLE DIAGNOSIS

PFP:00000

Work Flow

AIS000BU



CUSTOMER INTERVIEW

Interview the customer if possible, to determine the conditions that exist when the noise occurs.Use the Diagnostic Worksheet during the interview to document the facts and conditions when the noise occurs and any customer's comments; refer to BL-11, "Diagnostic Worksheet" . This information is necessary to duplicate the conditions that exist when the noise occurs.

- The customer may not be able to provide a detailed description or the location of the noise. Attempt to obtain all the facts and conditions that exist when the noise occurs (or does not occur).
- If there is more than one noise in the vehicle, be sure to diagnose and repair the noise that the customer is concerned about. This can be accomplished by test driving the vehicle with the customer.
- After identifying the type of noise, isolate the noise in terms of its characteristics. The noise characteristics are provided so the customer, service adviser and technician are all speaking the same language when defining the noise.
- Squeak —(Like tennis shoes on a clean floor)
  Squeak characteristics include the light contact/fast movement/brought on by road conditions/hard surfaces=higher pitch noise/softer surfaces=lower pitch noises/edge to surface=chirping
- Creak—(Like walking on an old wooden floor)
  Creak characteristics include firm contact/slow movement/twisting with a rotational movement/pitch dependent on materials/often brought on by activity.
- Rattle—(Like shaking a baby rattle)
  Rattle characteristics include the fast repeated contact/vibration or similar movement/loose parts/missing clip or fastener/incorrect clearance.
- Knock —(Like a knock on a door)
  Knock characteristics include hollow sounding/sometimes repeating/often brought on by driver action.
- Tick—(Like a clock second hand)
  Tick characteristics include gentle contacting of light materials/loose components/can be caused by driver action or road conditions.
- Thump—(Heavy, muffled knock noise)
  Thump characteristics include softer knock/dead sound often brought on by activity.
- Buzz—(Like a bumble bee)
  Buzz characteristics include high frequency rattle/firm contact.
- Often the degree of acceptable noise level will vary depending upon the person. A noise that you may judge as acceptable may be very irritating to the customer.
- Weather conditions, especially humidity and temperature, may have a great effect on noise level.

DUPLICATE THE NOISE AND TEST DRIVE

If possible, drive the vehicle with the customer until the noise is duplicated. Note any additional information on the Diagnostic Worksheet regarding the conditions or location of the noise. This information can be used to duplicate the same conditions when you confirm the repair.
If the noise can be duplicated easily during the test drive, to help identify the source of the noise, try to duplicate the noise with the vehicle stopped by doing one or all of the following:

1) Close a door.
2) Tap or push/pull around the area where the noise appears to be coming from.
3) Rev the engine.
4) Use a floor jack to recreate vehicle “twist”.
5) At idle, apply engine load (electrical load, half-clutch on M/T model, drive position on A/T model).
6) Raise the vehicle on a hoist and hit a tire with a rubber hammer.

- Drive the vehicle and attempt to duplicate the conditions the customer states exist when the noise occurs.
- If it is difficult to duplicate the noise, drive the vehicle slowly on an undulating or rough road to stress the vehicle body.

CHECK RELATED SERVICE BULLETINS

After verifying the customer concern or symptom, check ASIST for Technical Service Bulletins (TSBs) related to that concern or symptom.
If a TSB relates to the symptom, follow the procedure to repair the noise.

LOCATE THE NOISE AND IDENTIFY THE ROOT CAUSE

1. Narrow down the noise to a general area. To help pinpoint the source of the noise, use a listening tool (Chassis Ear: J-39570, Engine Ear and mechanics stethoscope).
2. Narrow down the noise to a more specific area and identify the cause of the noise by:

- removing the components in the area that you suspect the noise is coming from.
  Do not use too much force when removing clips and fasteners, otherwise clips and fastener can be broken or lost during the repair, resulting in the creation of new noise.
- tapping or pushing/pulling the component that you suspect is causing the noise.
  Do not tap or push/pull the component with excessive force, otherwise the noise will be eliminated only temporarily.
- feeling for a vibration with your hand by touching the component(s) that you suspect is (are) causing the noise.
- placing a piece of paper between components that you suspect are causing the noise.
- looking for loose components and contact marks.
  Refer to BL-9, "Generic Squeak and Rattle Troubleshooting" .

REPAIR THE CAUSE

- If the cause is a loose component, tighten the component securely.
- If the cause is insufficient clearance between components:
  - separate components by repositioning or loosening and retightening the component, if possible.
  - insulate components with a suitable insulator such as urethane pads, foam blocks, felt cloth tape or urethane tape. A Nissan Squeak and Rattle Kit (J-43980) is available through your authorized Nissan Parts Department.

CAUTION:
Do not use excessive force as many components are constructed of plastic and may be damaged.
Always check with the Parts Department for the latest parts information.
The following materials are contained in the Nissan Squeak and Rattle Kit (J-43980). Each item can be ordered separately as needed.
URETHANE PADS [1.5 mm (0.059 in) thick]
Insulates connectors, harness, etc.
76268-9E005: 100 × 135 mm (3.94 × 5.31 in)/76884-71L01: 60 × 85 mm (2.36 × 3.35 in)/76884-71L02: 15 × 25 mm (0.59 × 0.98 in)
INSULATOR (Foam blocks)
Insulates components from contact.Can be used to fill space behind a panel.
73982-9E000: 45 mm (1.77 in) thick, 50 × 50 mm (1.97 × 1.97 in)/73982-50Y00: 10 mm (0.39 in) thick, 50 × 50 mm (1.97 × 1.97 in)

INSULATOR (Light foam block)
80845-71L00: 30 mm (1.18 in) thick, 30 × 50 mm (1.18×1.97 in)
FELT CLOTHTAPE
Used to insulate where movement does not occur. Ideal for instrument panel applications.
68370-4B000: 15 × 25 mm (0.59 × 0.98 in) pad/68239-13E00: 5 mm (0.20 in) wide tape roll The following materials, not found in the kit, can also be used to repair squeaks and rattles.
UHMW(TEFLON) TAPE
Insulates where slight movement is present. Ideal for instrument panel applications.
SILICONE GREASE
Used in place of UHMW tape that will be visible or not fit.
Note: Will only last a few months.
SILICONE SPRAY
Use when grease cannot be applied.
DUCT TAPE
Use to eliminate movement.

CONFIRM THE REPAIR

Confirm that the cause of a noise is repaired by test driving the vehicle. Operate the vehicle under the same conditions as when the noise originally occurred. Refer to the notes on the Diagnostic Worksheet.

Generic Squeak and Rattle Troubleshooting

AIS000BV

Refer to Table of Contents for specific component removal and installation information.

INSTRUMENT PANEL

Most incidents are caused by contact and movement between:

1. The cluster lid A and instrument panel
2. Acrylic lens and combination meter housing
3. Instrument panel to front pillar garnish
4. Instrument panel to windshield
5. Instrument panel mounting pins
6. Wiring harnesses behind the combination meter
7. A/C defroster duct and duct joint

These incidents can usually be located by tapping or moving the components to duplicate the noise or by pressing on the components while driving to stop the noise. Most of these incidents can be repaired by applying felt cloth tape or silicon spray (in hard to reach areas). Urethane pads can be used to insulate wiring harness.

CAUTION:
Do not use silicone spray to isolate a squeak or rattle. If you saturate the area with silicone, you will not be able to recheck the repair.

CENTER CONSOLE

Components to pay attention to include:

1. Shifter assembly cover to finisher
2. A/C control unit and cluster lid C
3. Wiring harnesses behind audio and A/C control unit

The instrument panel repair and isolation procedures also apply to the center console.

DOORS

Pay attention to the:

1. Finisher and inner panel making a slapping noise
2. Inside handle escutcheon to door finisher
3. Wiring harnesses tapping
4. Door striker out of alignment causing a popping noise on starts and stops

Tapping or moving the components or pressing on them while driving to duplicate the conditions can isolate many of these incidents. You can usually insulate the areas with felt cloth tape or insulator foam blocks from the Nissan Squeak and Rattle Kit (J-43980) to repair the noise.

TRUNK

Trunk noises are often caused by a loose jack or loose items put into the trunk by the owner.
In addition look for:

1. Trunk lid dumpers out of adjustment
2. Trunk lid striker out of adjustment
3. The trunk lid torsion bars knocking together
4. A loose license plate or bracket

Most of these incidents can be repaired by adjusting, securing or insulating the item(s) or component(s) causing the noise.

SUNROOF/HEADLINING

Noises in the sunroof/headlining area can often be traced to one of the following:

1. Sunroof lid, rail, linkage or seals making a rattle or light knocking noise
2. Sunvisor shaft shaking in the holder
3. Front or rear windshield touching headlining and squeaking

Again, pressing on the components to stop the noise while duplicating the conditions can isolate most of these incidents. Repairs usually consist of insulating with felt cloth tape.

SEATS

When isolating seat noise it's important to note the position the seat is in and the load placed on the seat when the noise is present. These conditions should be duplicated when verifying and isolating the cause of the noise.
Cause of seat noise include:

1. Headrest rods and holder
2. A squeak between the seat pad cushion and frame
3. The rear seatback lock and bracket

These noises can be isolated by moving or pressing on the suspected components while duplicating the conditions under which the noise occurs. Most of these incidents can be repaired by repositioning the component or applying urethane tape to the contact area.

UNDERHOOD

Some interior noise may be caused by components under the hood or on the engine wall. The noise is then transmitted into the passenger compartment.
Causes of transmitted underhood noise include:

1. Any component mounted to the engine wall
2. Components that pass through the engine wall
3. Engine wall mounts and connectors
4. Loose radiator mounting pins
5. Hood bumpers out of adjustment
6. Hood striker out of adjustment

These noises can be difficult to isolate since they cannot be reached from the interior of the vehicle. The best method is to secure, move or insulate one component at a time and test drive the vehicle. Also, engine RPM or load can be changed to isolate the noise. Repairs can usually be made by moving, adjusting, securing, or insulating the component causing the noise.

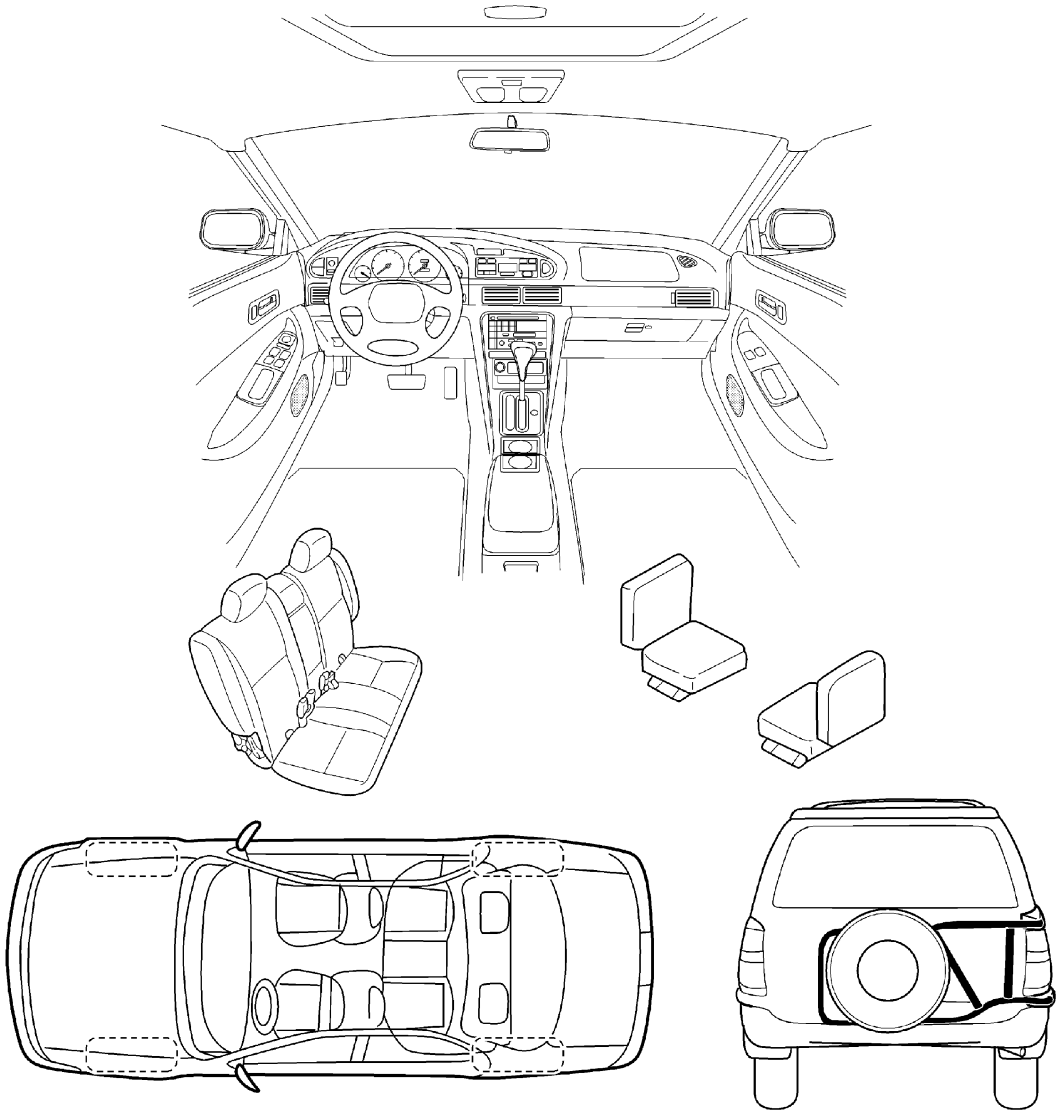
Diagnostic Worksheet

AIS000BW

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET

Dear Nissan Customer:
We are concerned about your satisfaction with your Nissan vehicle. Repairing a squeak or rattle sometimes can be very difficult. To help us fix your Nissan right the first time, please take a moment to note the area of the vehicle where the squeak or rattle occurs and under what conditions. You may be asked to take a test drive with a service advisor or technician to ensure we confirm the noise you are hearing.

I. WHERE DOES THE NOISE COME FROM? (circle the area of the vehicle)
The illustrations are for reference only, and may not reflect the actual configuration of your vehicle.



Continue to the back of the worksheet and briefly describe the location of the noise or rattle. In addition, please indicate the conditions which are present when the noise occurs.

PIIB0723E

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET- page 2

Briefly describe the location where the noise occurs:

_____

_____

II. WHEN DOES IT OCCUR? (check the boxes that apply)

- ❑ anytime
- ❑ 1st time in the morning
- ❑ only when it is cold outside
- ❑ only when it is hot outside
- ❑ after sitting out in the sun
- ❑ when it is raining or wet
- ❑ dry or dusty conditions
- ❑ other: _____

III. WHEN DRIVING:

- ❑ through driveways
- ❑ over rough roads
- ❑ over speed bumps
- ❑ only at about ____ mph
- ❑ on acceleration
- ❑ coming to a stop
- ❑ on turns : left, right or either (circle)
- ❑ with passengers or cargo
- ❑ other: _____
- ❑ after driving ____ miles or ____ minutes

IV. WHAT TYPE OF NOISE?

- ❑ squeak (like tennis shoes on a clean floor)
- ❑ creak (like walking on an old wooden floor)
- ❑ rattle (like shaking a baby rattle)
- ❑ knock (like a knock on a door)
- ❑ tick (like a clock second hand)
- ❑ thump (heavy, muffled knock noise)
- ❑ buzz (like a bumble bee)

TO BE COMPLETED BY DEALERSHIP PERSONNEL
Test Drive Notes:

_____

_____

	YES	NO	Initials of person performing
Vehicle test driven with customer	❑	❑	_____
- Noise verified on test drive	❑	❑	
- Noise source located and repaired	❑	❑	_____
- Follow up test drive performed to confirm repair	❑	❑	_____

VIN: _____ Customer Name: _____

W.O. #: _____ Date: _____

This form must be attached to Work Order

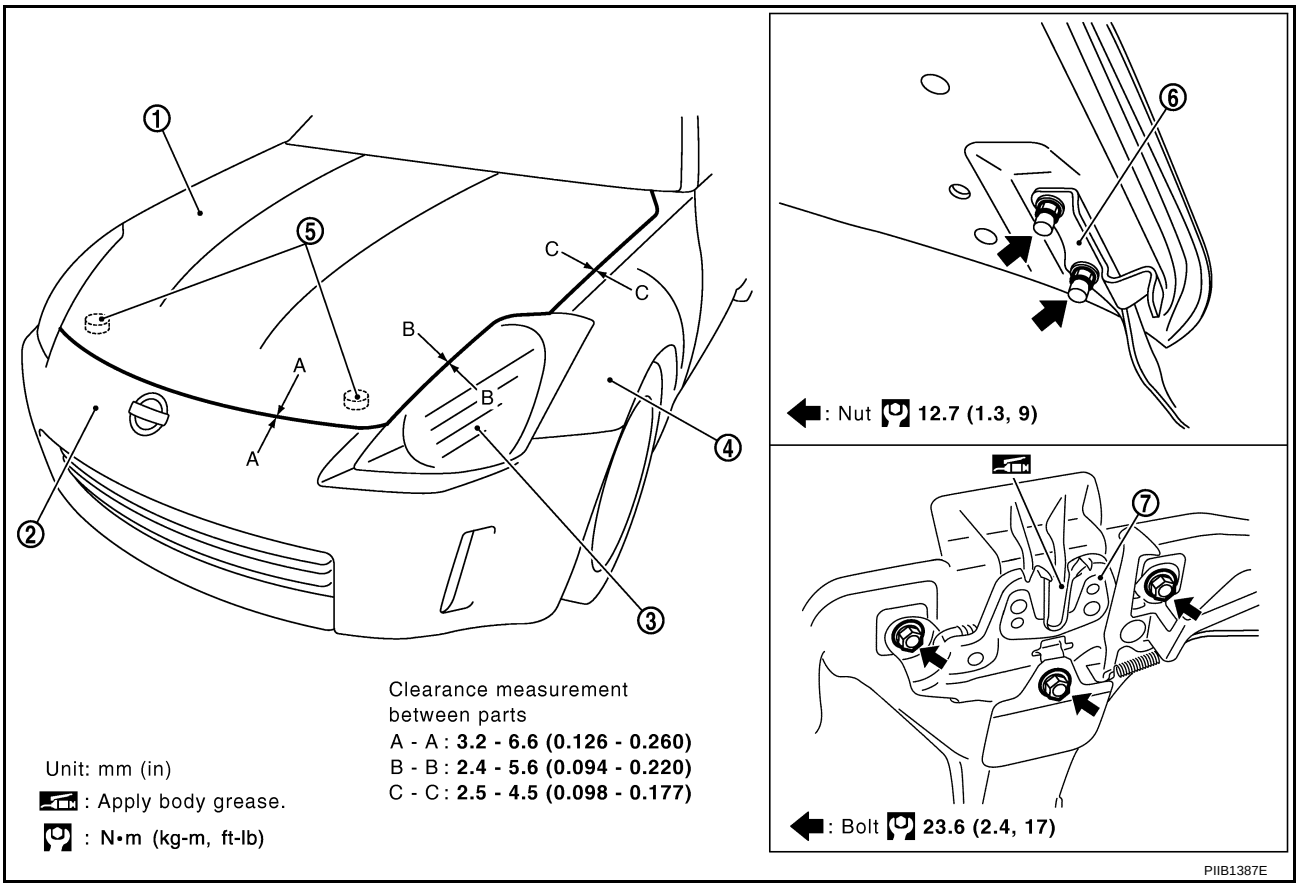
SBT844

HOOD

PFP:F5100

Fitting Adjustment

AIS000BX



1. Hood assembly
2. Front bumper
3. Head lamp
4. Front fender
5. Bumper rubber
6. Hood hinge
7. Hood lock assembly

LONGITUDINAL AND LATERAL CLEARANCE ADJUSTMENT

1. Remove hood lock assembly, loosen the hood hinge nuts and close the hood.
2. Adjust the lateral and longitudinal clearance, and open the hood to tighten the hood hinge mounting bolts to the specified torque.
3. Install the hood lock temporarily, and align the hood striker and hood lock so that the centers of hood striker and hood lock become vertical viewed from the front, by moving the hood lock laterally.
4. Tighten hood lock assembly mounting bolts to the specified torque.

CAUTION:

Adjust right/left clearance between hood and each part to the following specification.

Hood and head lamp (B–B) : Less than 2.0 mm (0.08 in)

Hood and fender (C–C) : Less than 1.0 mm (0.04 in)

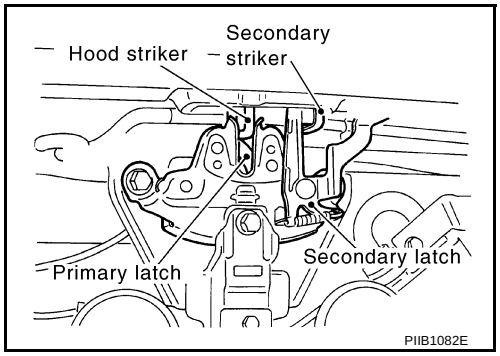
FRONT END HEIGHT ADJUSTMENT

1. Remove the hood lock and adjust the height by rotating the bumper rubber until the hood becomes 1 to1.5 mm (0.04 to 0.059 in) lower than the fender.
2. Temporarily tighten the hood lock assembly, and position it by engaging it with the hood striker. Check the hood lock and hood striker for looseness, and tighten the hood lock assembly mounting bolts to the specified torque.

SURFACE HEIGHT ADJUSTMENT

1. Remove hood lock assembly, and adjust the surface height difference of hood and fender according to the fitting standard dimension, by rotating RH and LH bumper rubbers.
2. Install hood lock temporarily, and move hood lock laterally until the centers of striker and lock become vertical when viewed from the front.
3. Make sure that the hood lock secondary latch is properly engaged with the secondary striker with hood's own weight.
4. Make sure that the hood lock primary latch is securely engaged with the hood striker with hood's own weight by dropping hood from approx. 200 mm (7.87 in) height.

   CAUTION:
   Do not drop hood from a height of 300 mm (11.81 in) or more.
5. Move hood lockup and down until striker smoothly engages the lock when the hood is closed.
6. When pulling the hood opener lever gently, make sure that front end of the hood rises by approximately 20 mm (0.79 in) and that hood striker and hood lock primary latch is disengaged. Also make sure that hood opener returns to the original position.
7. After adjustment, tighten lock bolts to the specified torque.

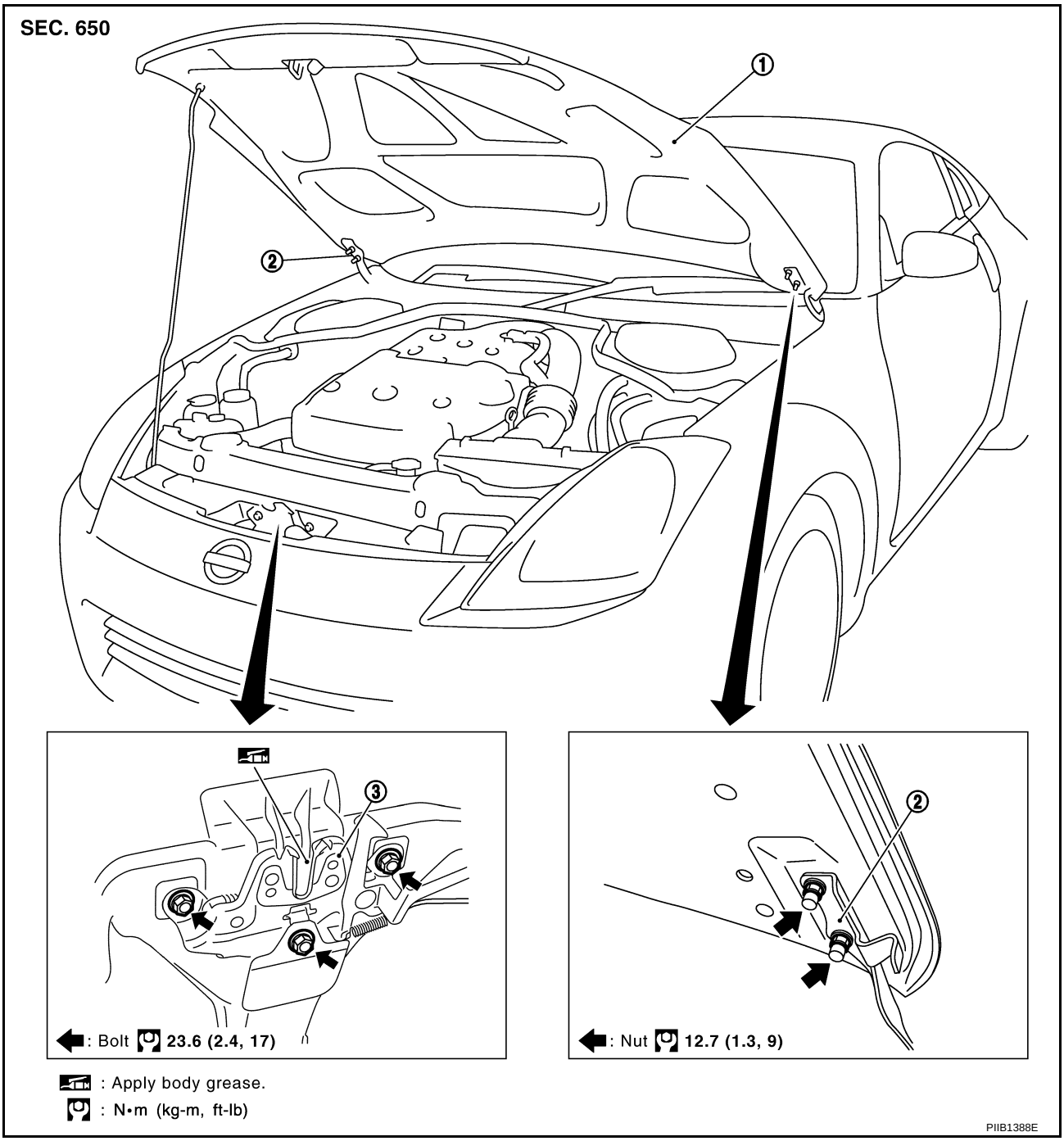


CAUTION:
Adjust evenness between hood and fender to the following specification.

Hood and fender (C–C) : 0 ± 1.0 mm (0 ± 0.04 in)

Removal and Installation of Hood Assembly

AIS000BY



1. Hood assembly
2. Hood hinge
3. Hood lock assembly

REMOVAL

Remove the hinge mounting nuts on the hood to remove the hood assembly.

CAUTION:

Operate with two workers, because of its heavy weight.

INSTALLATION

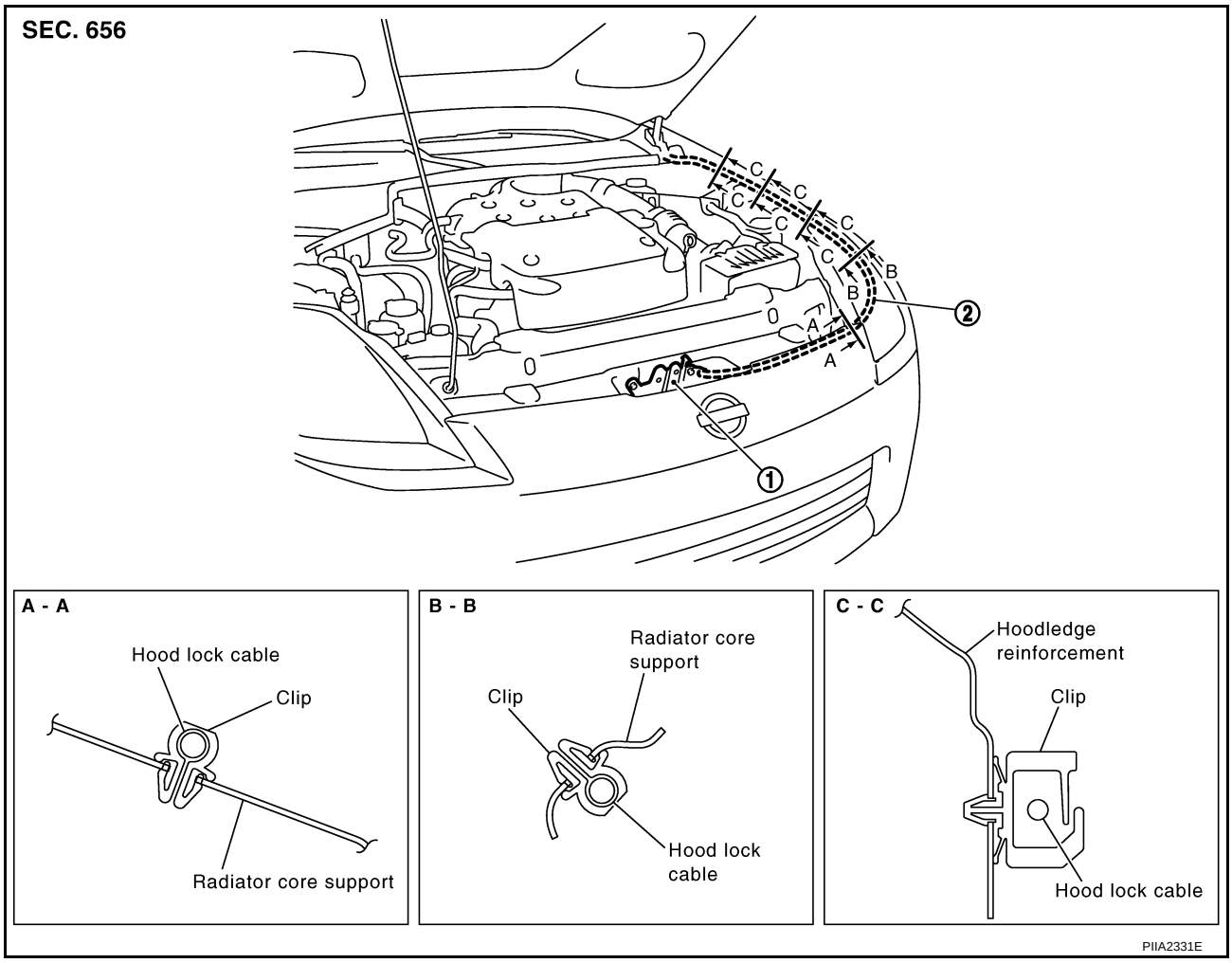
Install in the reverse order of removal.

CAUTION:

- **Before installing hood hinge, apply anticorrosive agent onto the mounting surface of the vehicle body.**
- **After installing, perform hood fitting adjustment. Refer to BL-13, "Fitting Adjustment" .**

Removal and Installation of Hood Lock Control

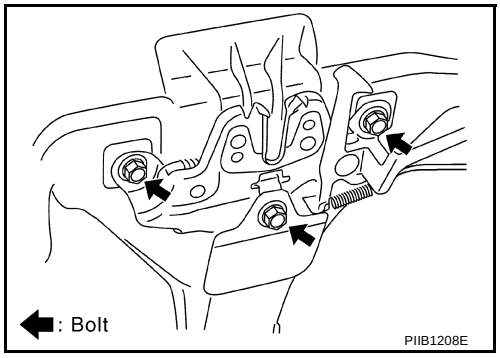
AIS000BZ



1. Hood lock assembly
2. Hood lock cable

REMOVAL

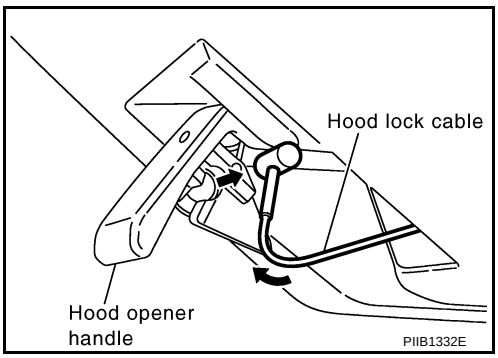
1. Remove the fender protector (LH). Refer to EI-21, "FENDER PROTECTOR" .
2. Remove the hood lock assembly.



3. Remove the dash side finisher. Refer to IP-10, "Component Parts Drawing" .
4. Remove hood lock cable and unclip it from portion of radiator core support.

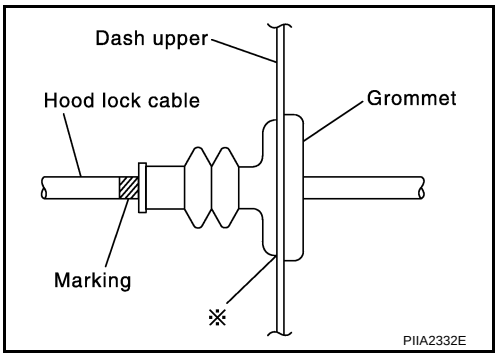
5. While pulling the hood lock cable, remove hood lock cable connected to hood opener handle.
6. Remove grommet on dash board, and pull hood lock cable toward passenger compartment.

CAUTION:
While pulling, be careful not to damage (peeling) the outside of the hood lock cable.

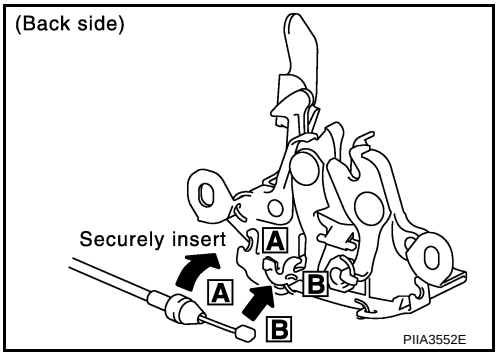


INSTALLATION

1. Pull the hood lock cable through the panel hole to the engine compartment. Be careful not to bend the cable too much, keeping the radius 100 mm (3.94 in) or more.
2. Check that the cable is not offset from the positioning grommet, and push the grommet into the panel hole securely.
3. Apply the sealant to the grommet (at * mark) properly.
4. Install while pulling hood lock cable.



5. Install the hood lock cable securely to the hood lock.
6. Install hood lock assembly.
7. After installing, check the hood lock adjustment and hood opener operation.

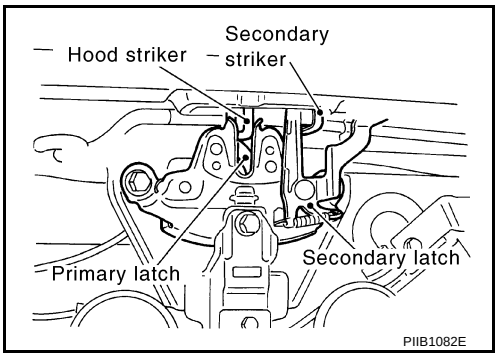


Hood Lock Control Inspection

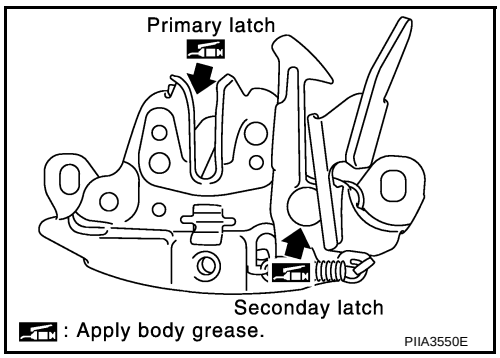
AIS000C0

CAUTION:
If the hood lock cable is bent or deformed, replace it.

1. Check that the secondary latch is properly engaged with the secondary striker with hood's own weight by dropping it from approx. 200 mm (7.87 in) height.
2. While operating the hood opener, carefully check that the front end of the hood is raised by approx. 20 mm (0.79 in). Also check that the hood opener returns to the original position.



3. Check the hood lock lubrication condition. If necessary, apply “body grease” to the points shown in the figure.

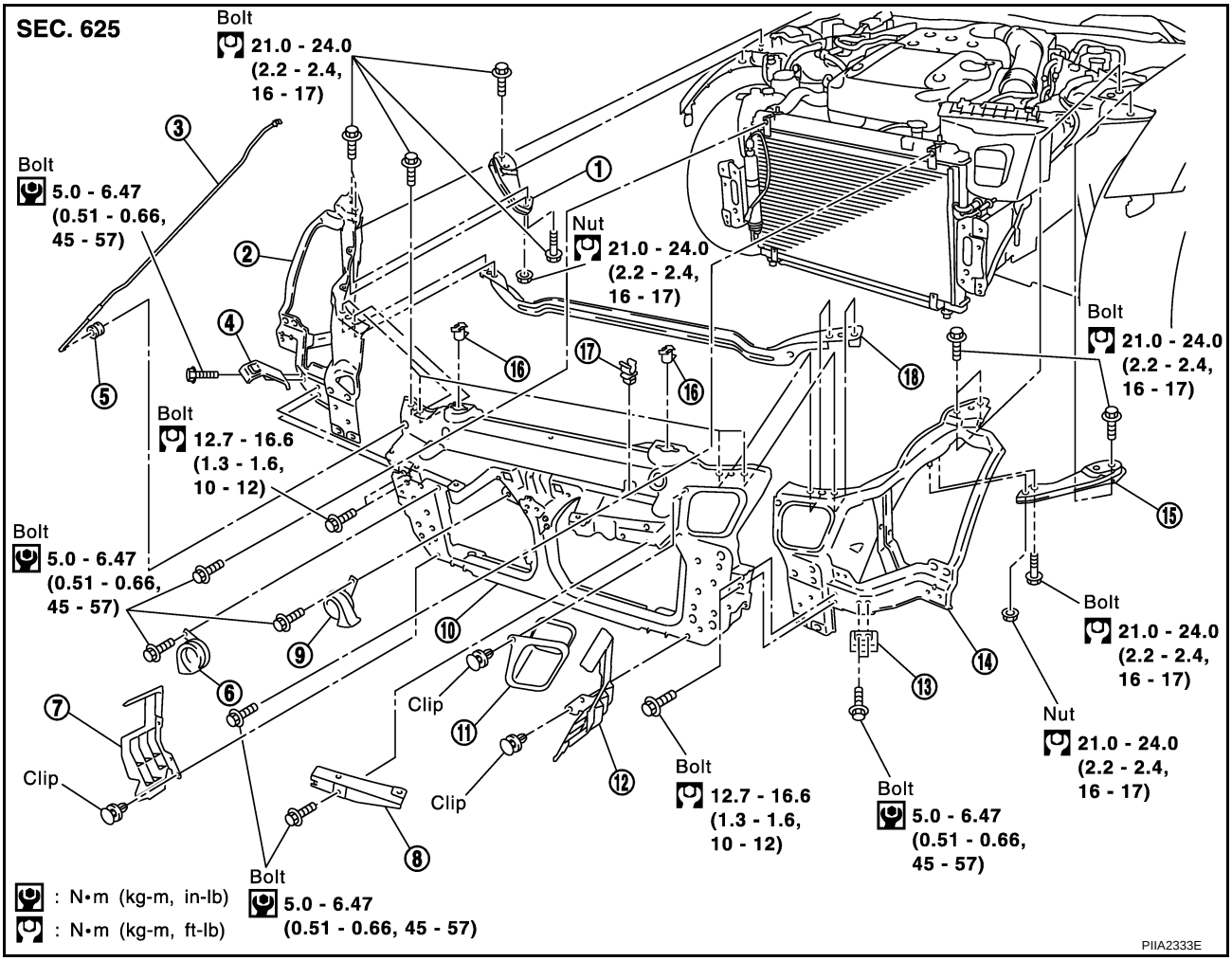


RADIATOR CORE SUPPORT

PFP:62500

Removal and Installation

AIS000C1

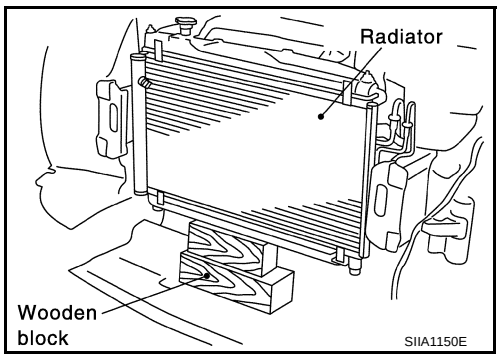


1.	Radiator core support side stay (RH)	2.	Radiator core support side (RH)	3.	Hood stay
4.	Bumper retainer (RH)	5.	Grommet	6.	Horn (High)
7.	Air guide (RH)	8.	Bumper fascia stay radiator core support center	9.	Horn (Low)
10.	Radiator core support center	11.	Air duct	12.	Air guide (LH)
13.	Bumper retainer (LH)	14.	Radiator core support side (LH)	15.	Radiator core support side stay (LH)
16.	Radiator upper bracket	17.	Hood rod clamp	18.	Radiator core support bar

REMOVAL

1. Remove hood assembly. Refer to BL-15, "Removal and Installation of Hood Assembly" .
2. Remove front bumper. Refer to EI-14, "Removal and Installation" .
3. Remove head lamp (LH/RH). Refer to LT-36, "Removal and Installation" .
4. Remove hood lock assembly, and then hood lock cable. Refer to BL-16, "Removal and Installation of Hood Lock Control" .
5. Remove washer tank. Refer to WW-36, "Removal and Installation for Washer Tank" .
6. Remove crash zone sensor. Refer to SRS-50, "Removal and Installation" .
7. Remove washer tank inlet clip. Refer to WW-36, "Removal and Installation for Washer Tank" .
8. Remove the oil cooler. Refer to PS-34, "HYDRAULIC LINE" .
9. Remove ambient sensor. Refer to ATC-110, "Removal and Installation"
10. Remove horn connectors.
11. Remove mounting harness clip on radiator core support center and side to separate the harness.

12. Remove radiator upper bracket, and radiator core support side and radiator core support hood ledge stay bolts. Remove radiator core support center and side together. Remove bolts with power tool.



CAUTION:

Put a wooden block under the radiator assembly to prevent the radiator assembly from falling.

13. Remove radiator core support center and side together.
14. After removing radiator core support center and side together, the following parts are separated.
    - Remove the hood stay, grommet and hood rod clamp
    - Horn (High/Low)
    - Air duct
    - Air guide (LH/RH)
    - Bumper fascia stay radiator core support center
    - Bumper retainer (LH/RH)
    - Radiator core support side and radiator core support side bar
    - Radiator core support side hood ledge stay (LH/RH)

INSTALLATION

Install in the reverse order of removal.

CAUTION:

After installing, check the hood lock adjustment and hood opener operation. Refer to BL-13, "Fitting Adjustment" .

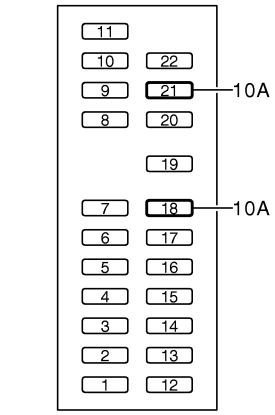
POWER DOOR LOCK SYSTEM

PFP:24814

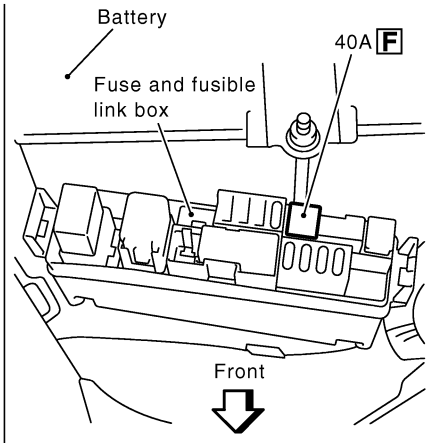
Component Parts and Harness Connector Location

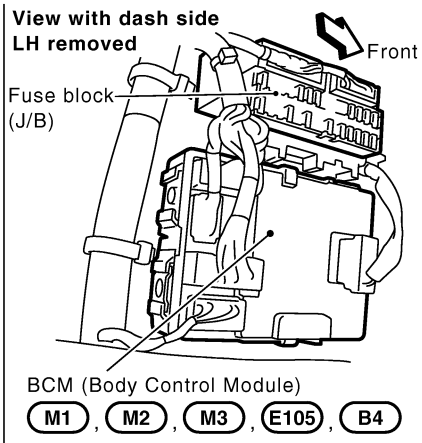
AIS004CZ

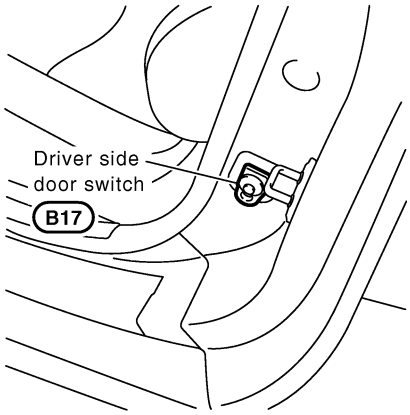
FOR COUPE

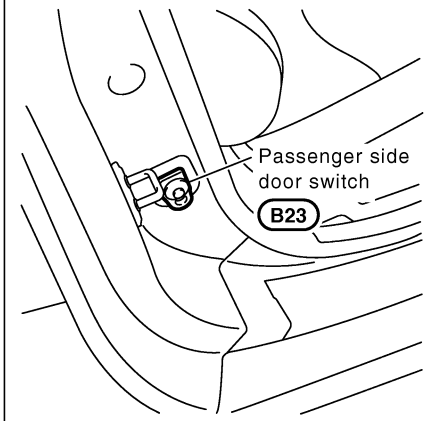


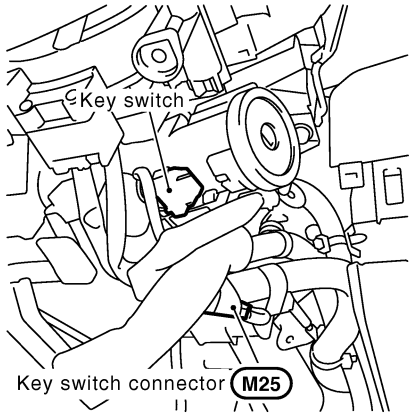
Fuse block (J/B) fuse layout

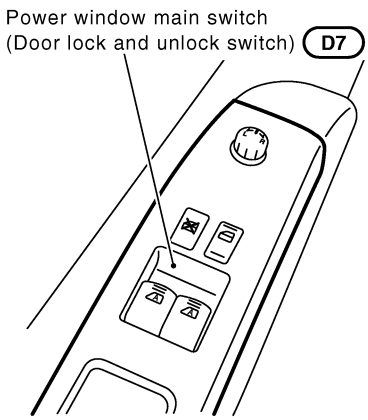


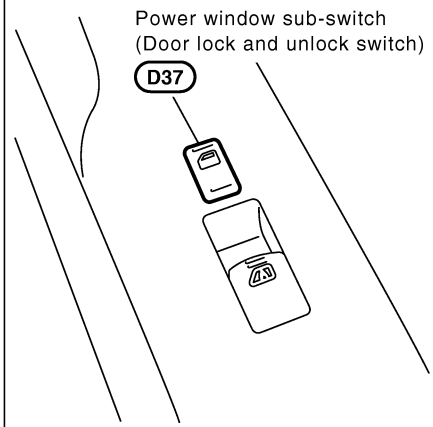


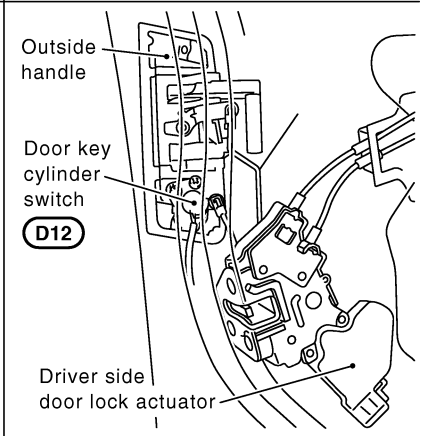


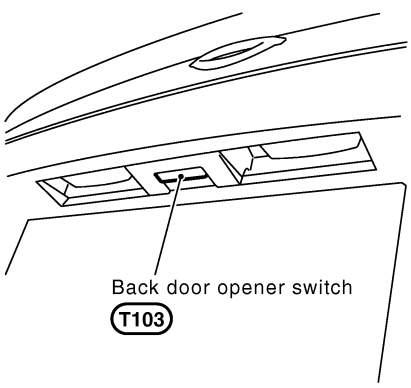


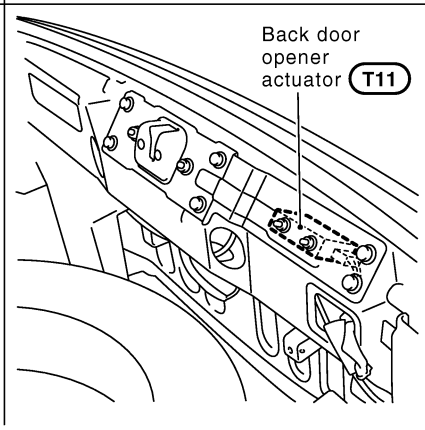


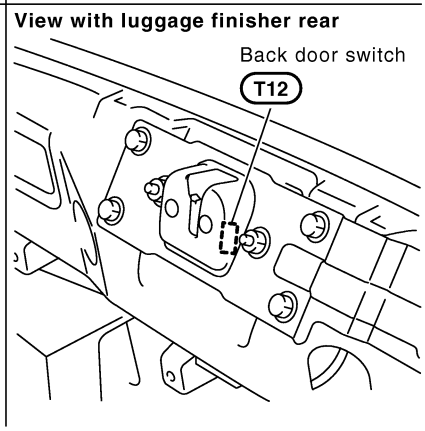












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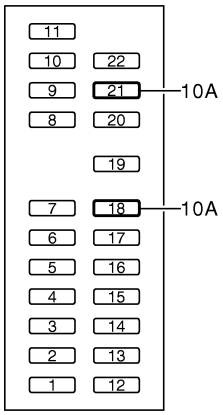
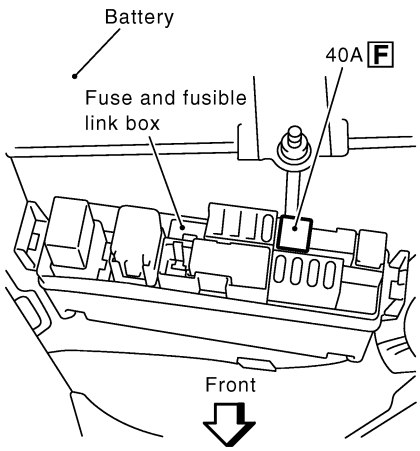
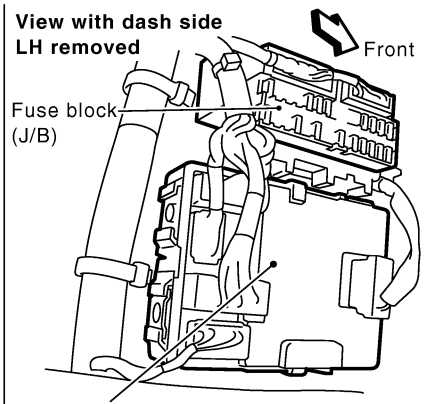
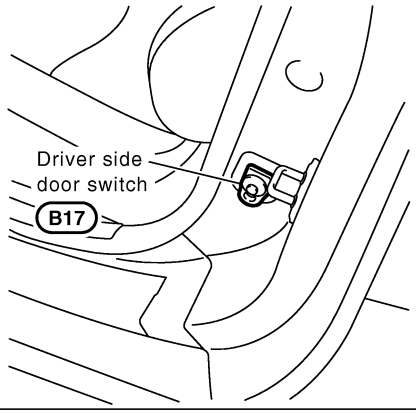
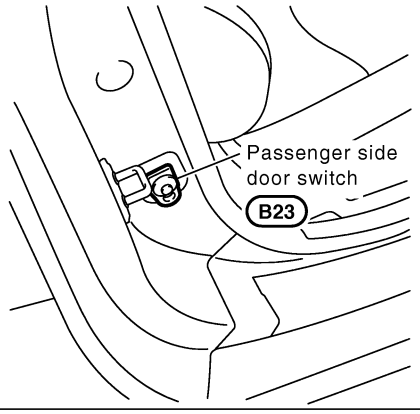


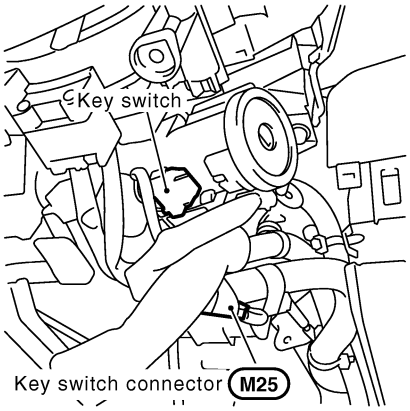
Fuse block (J/B) fuse layout

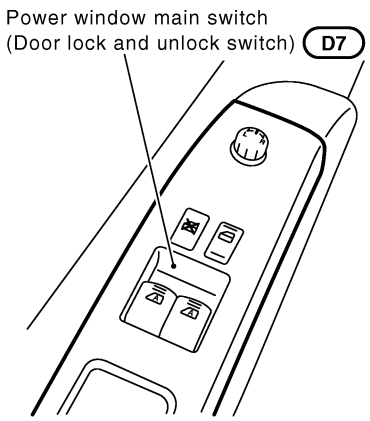


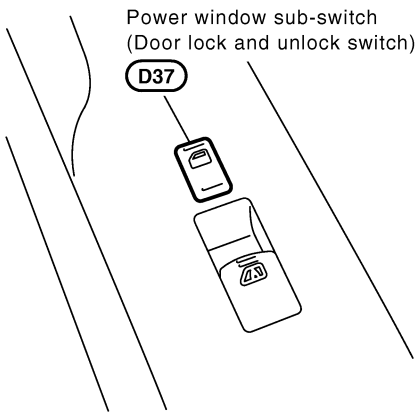


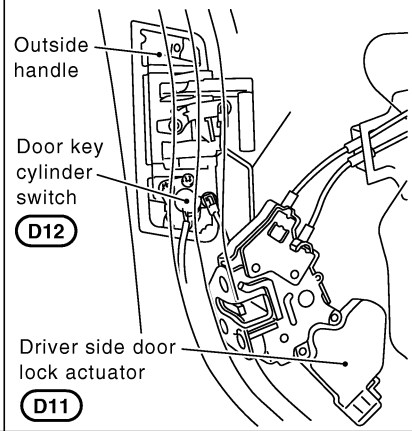


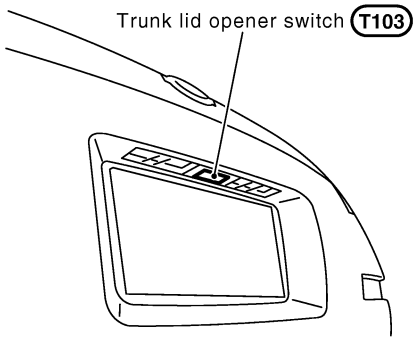


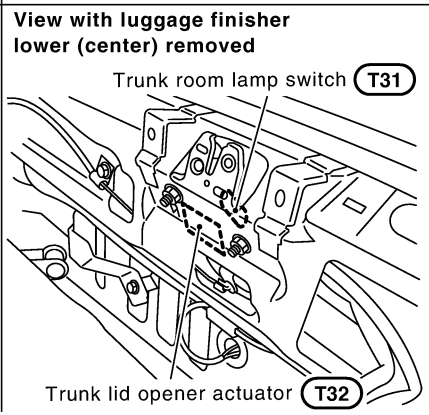


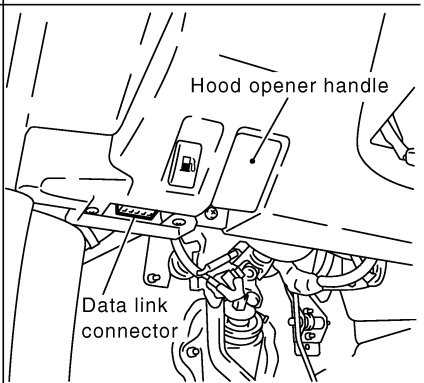












PIIB1276E

System Description

AIS004D0

Power is supplied at all times

- through 40A fusible link (letter **F** , located in the fuse and fusible link box)
- to BCM terminal 55,
- through 10A fuse [No.18, located in the fuse block (J/B)]
- to BCM terminal 42,
- through 10A fuse [No.21, located in the fuse block (J/B)]
- to key switch terminal 2.

When ignition key inserted, power is supplied

- through key switch terminal 1
- to BCM terminal 37.

Ground is supplied to terminal 52 of BCM through body grounds M30 and M66.

When the door is locked or unlocked with power window main switch (door lock and unlock switch), ground is supplied

- to power window main switch (door lock and unlock switch) terminal 15
- through body grounds M30 and M66.

Power window main switch (door lock and unlock switch) operation signal is supplied

- through power window main switch (door lock and unlock switch) terminal 12
- to BCM terminal 22.

When the door is locked or unlocked with power window sub-switch (door lock and unlock switch), ground is supplied

- to power window sub-switch (door lock and unlock switch) terminal 11
- through body grounds M30 and M66.

Power window sub-switch (door lock and unlock switch) operation signal is supplied

- through power window sub-switch (door lock and unlock switch) terminal 16
- to BCM terminal 22.

When the door is locked with door key cylinder switch, ground is supplied

- to power window main switch (door lock and unlock switch) terminal 6
- through door key cylinder switch terminals 3 and 2 and
- through body grounds M30 and M66.

Door key cylinder switch operation signal is supplied

- through power window main switch (door lock and unlock switch) terminal 12
- to BCM terminal 22.

When the door is unlocked with door key cylinder switch, ground is supplied

- to power window main switch (door lock and unlock switch) terminal 7
- through door key cylinder switch terminals 1 and 2 and
- through body grounds M30 and M66.

Door key cylinder switch operation signal is supplied

- through power window main switch (door lock and unlock switch) terminal 12
- to BCM terminal 22.

BCM is connected to power window main switch (door lock and unlock switch) and power window sub-switch (door lock and unlock switch) as serial link.

POWER WINDOW SERIAL LINK

Power window main switch, power window sub-switch and BCM transmit and receive the signal by power window serial link.
The under mentioned signal is transmitted from power window main switch to BCM.

- Door lock and unlock switch signal.

The under mentioned signal is transmitted from power window sub-switch to BCM.

- Door lock and unlock switch signal.

OUTLINE

Functions available by operating the door lock and unlock switches on driver's door and passenger's door

- With the locking operation of door lock and unlock switch, door lock actuators of driver's and passenger's doors are locked.
- With the unlocking operation of door lock and unlock switch, door lock actuators of driver's and passenger's doors are unlocked.

Functions available by operating the key cylinder switch

- With the locking operation of door key cylinder, door lock actuators of all doors are locked.
- When door key cylinder is unlocked, door lock actuator (driver side) is unlocked.
- When door key cylinder is unlocked for the second time within 5 seconds after the first unlock operation, door lock actuators on driver's and passenger's doors are unlocked.

Unlock mode can be changed by using CONSULT-II “WORK SUPPORT” mode in “DOOR LOCK-UNLOCK SET”.
Refer to BL-36, "WORK SUPPORT" .

Key reminder door system

When door lock and unlock switch is operated to lock doors with ignition key put in key cylinder and driver's and passenger's door open, driver and passenger door lock actuators are locked and then unlocked.

Back door opener operation/For coupe

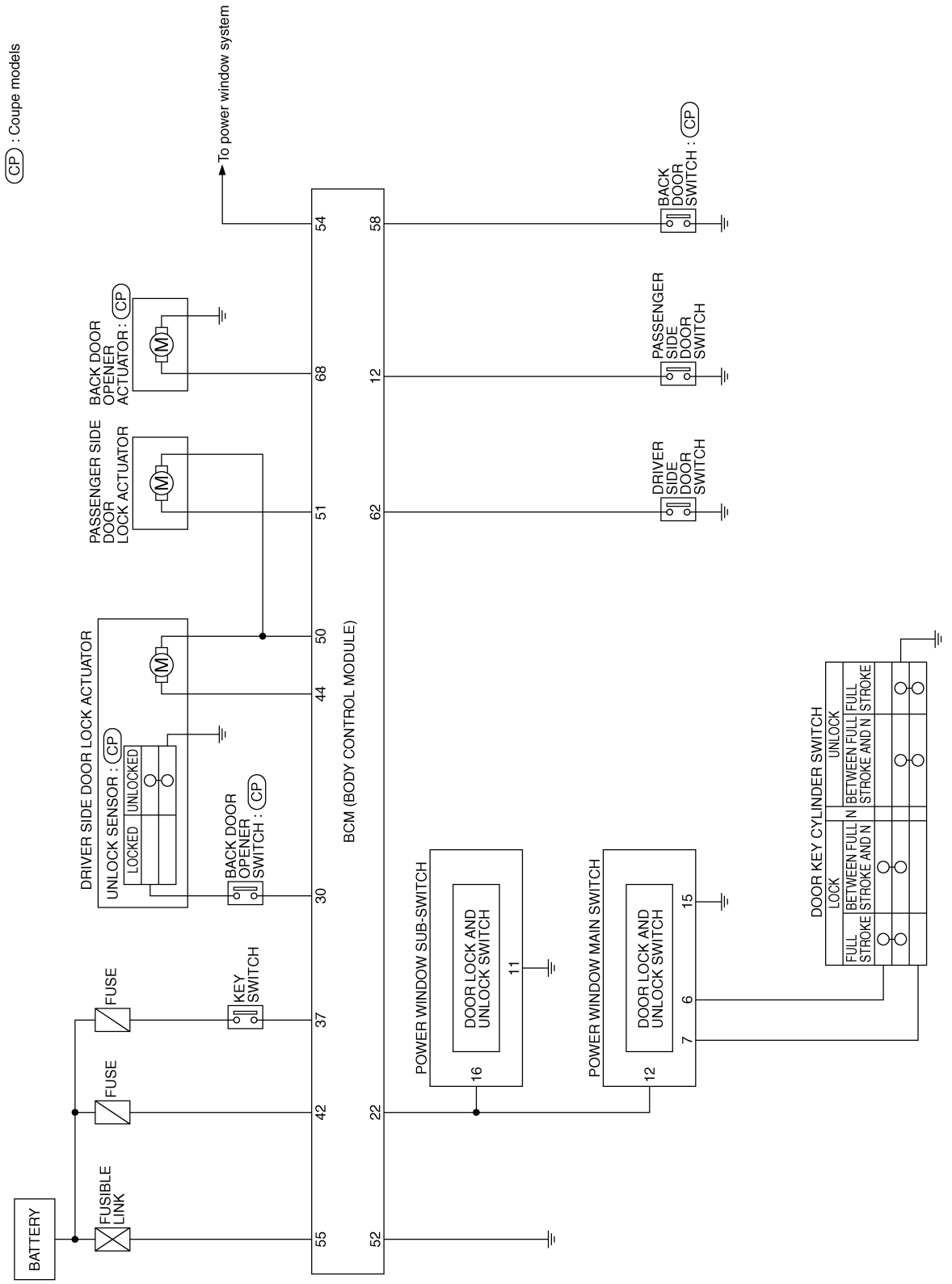
When back door opener switch is ON with driver's door unlocked,
ground is supplied

- to BCM terminal 68
- through back door opener actuator terminals 1 and 2 and
- through body grounds B5, B6, D105 and T14

Then back door opener actuator opens back door.

Schematic

AIS004D1

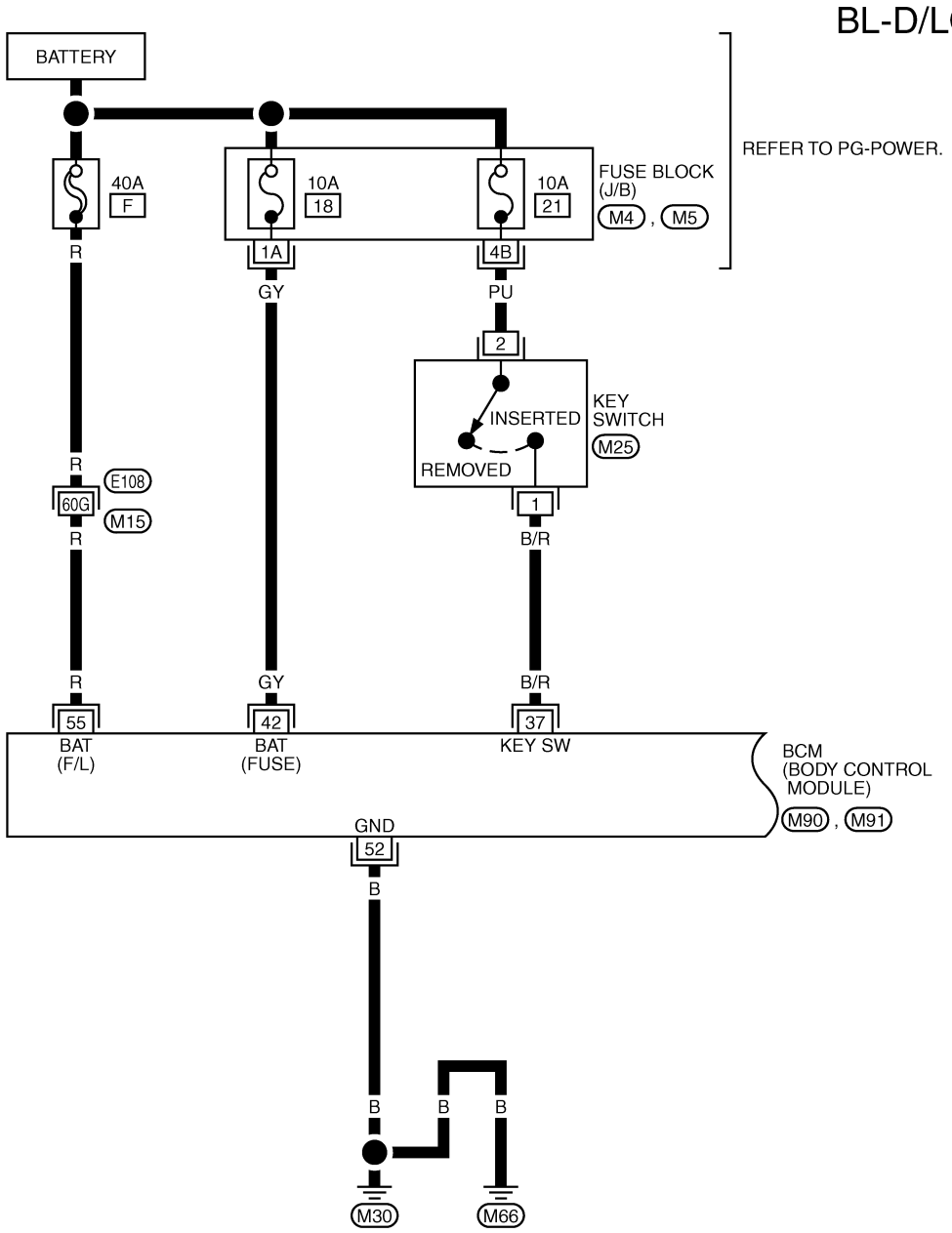


TIWT0785E

Wiring Diagram —D/LOCK— /For Coupe

AIS004D2

FIG. 1



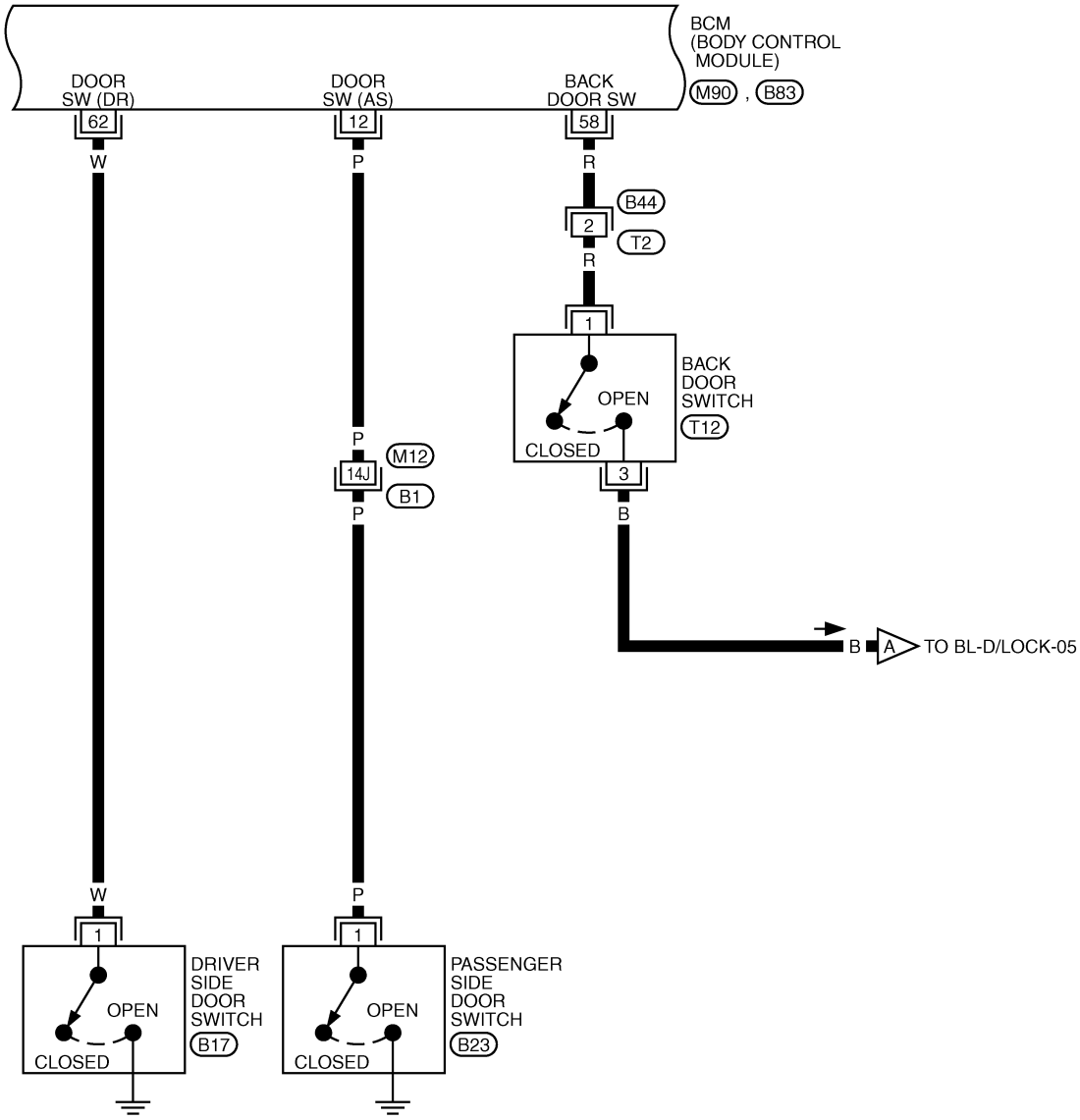
1 2 M25
BR

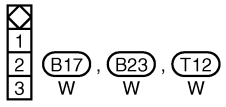
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)
M90 , M91 -ELECTRICAL UNITS

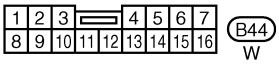
TIWT0786E

FIG. 2

BL-D/LOCK-02





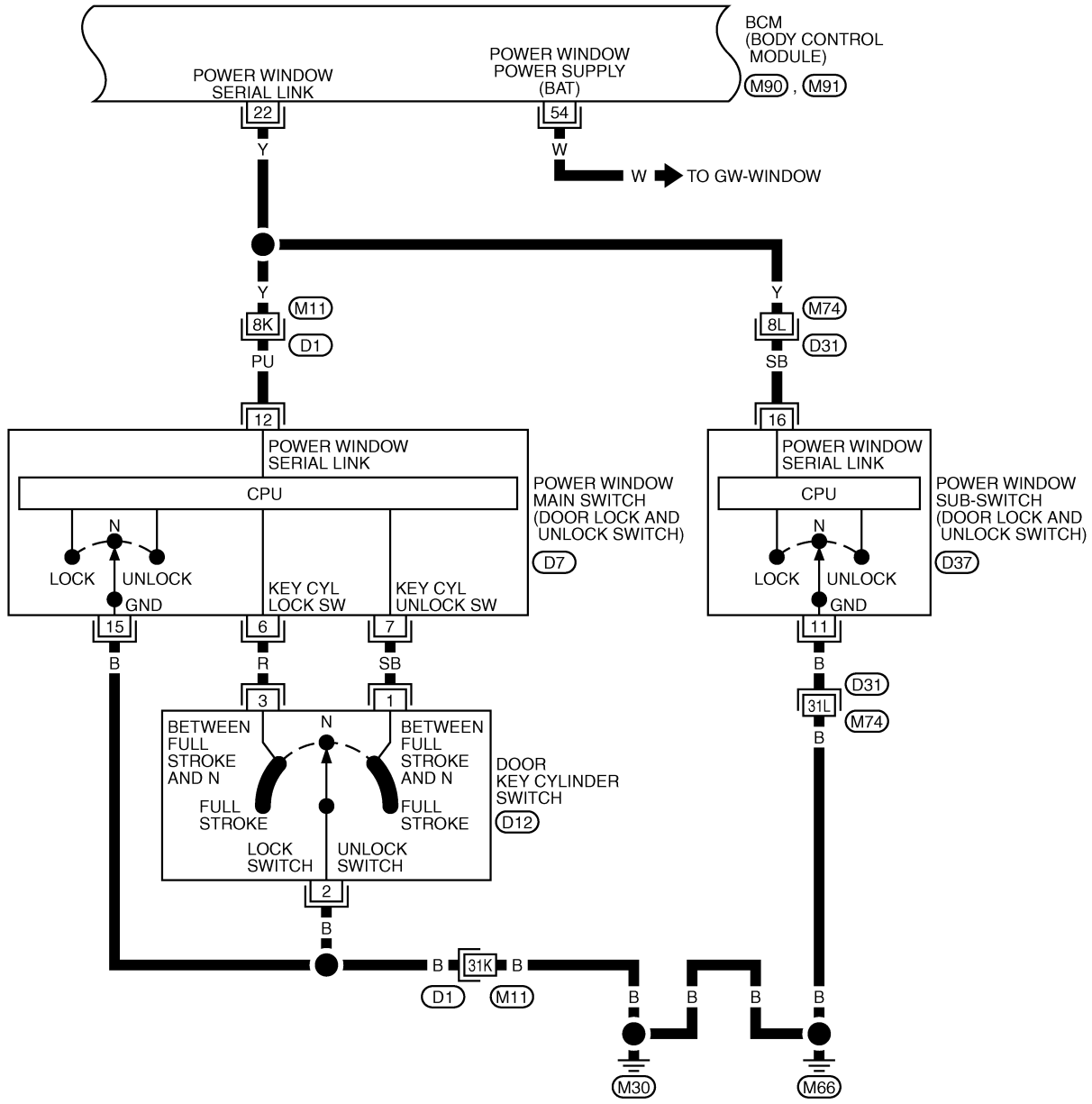


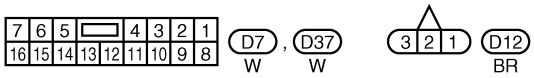
REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)
M90 , B83 -ELECTRICAL UNITS

TIWT0787E

FIG. 3

BL-D/LOCK-03



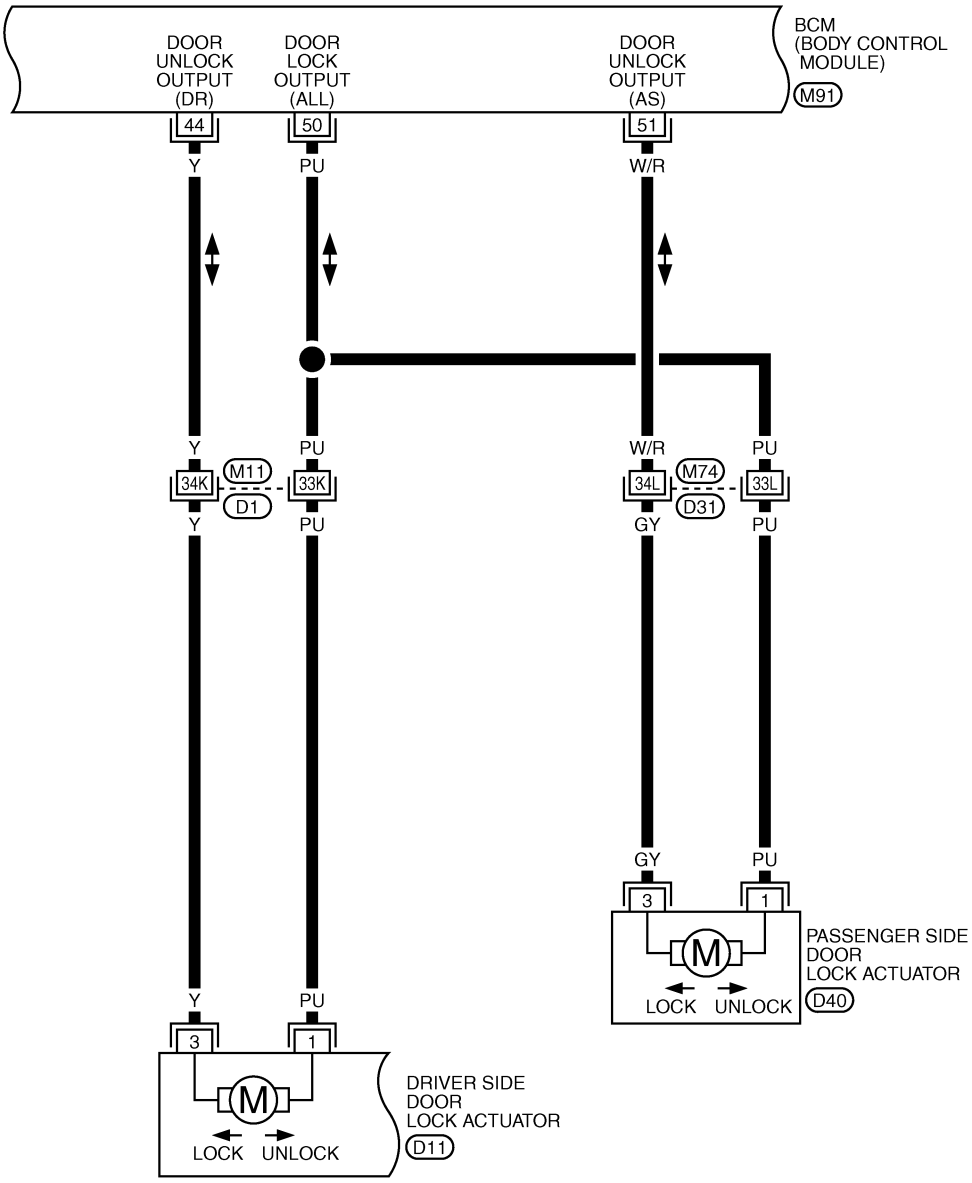


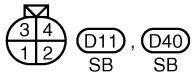
REFER TO THE FOLLOWING.
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)
M90 , M91 -ELECTRICAL UNITS

TIWT0788E

FIG. 4

BL-D/LOCK-04



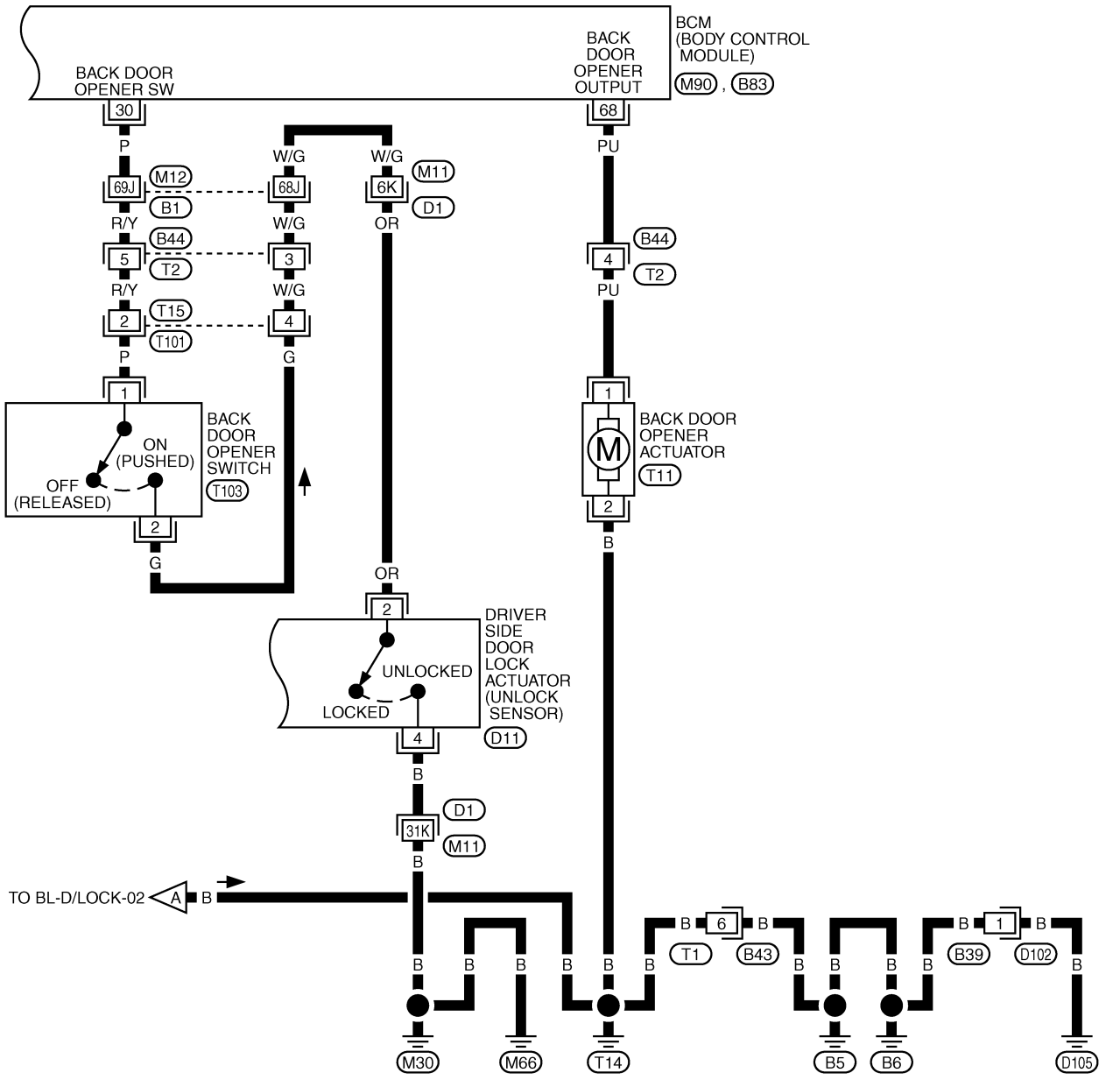


REFER TO THE FOLLOWING.
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)
M91 -ELECTRICAL UNITS

TIWT0789E

FIG. 5

BL-D/LOCK-05

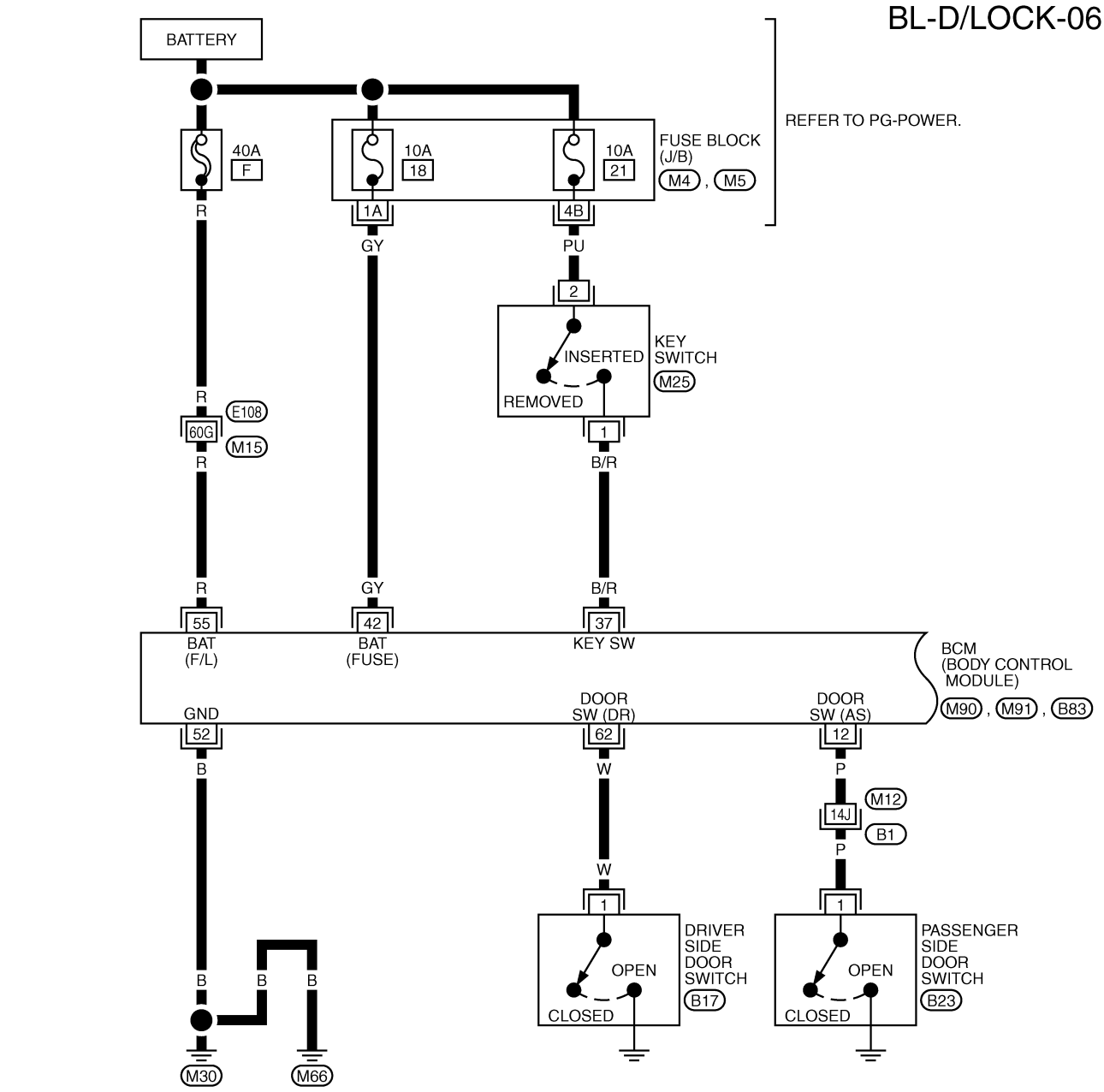


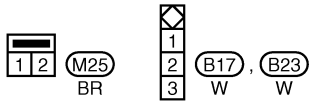
TIWT0790E

Wiring Diagram —D/LOCK— /For Roadster

AIS004DI

FIG. 1



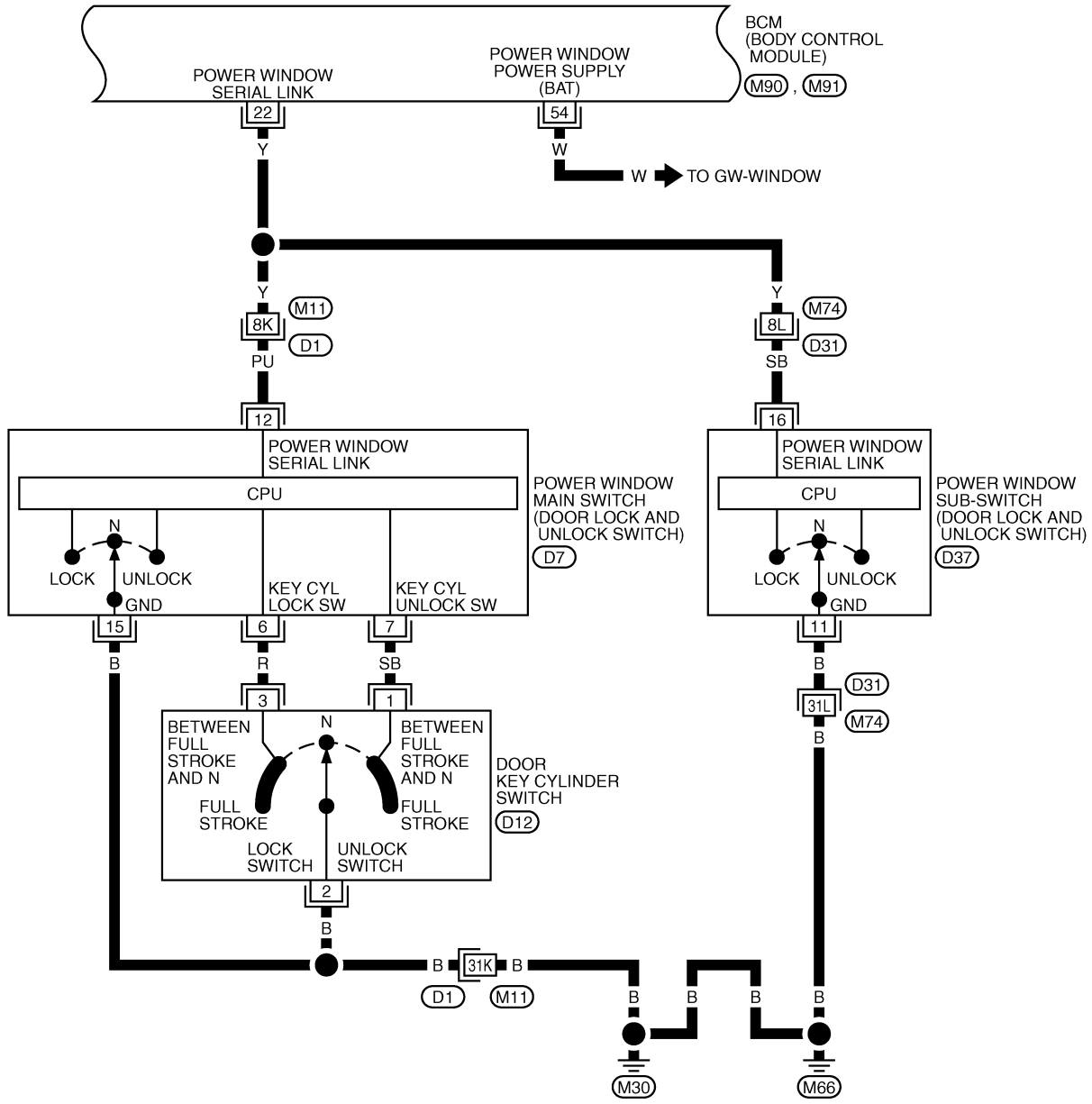


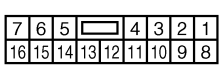
REFER TO THE FOLLOWING.
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)
M90 , M91 , B83 -ELECTRICAL UNITS

TIWT0791E

FIG. 2

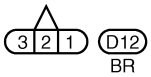
BL-D/LOCK-07





D7 , D37

W W



D12

BR

REFER TO THE FOLLOWING.

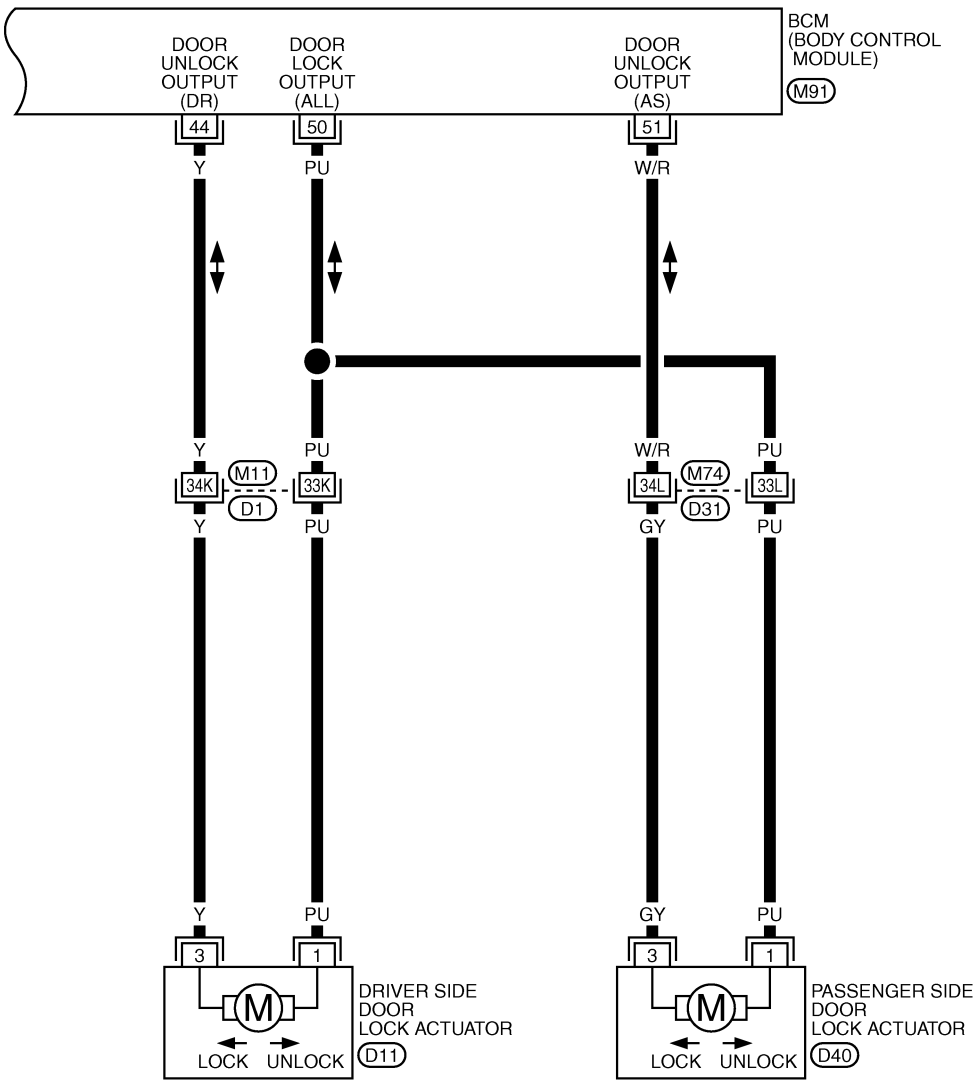
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

M90 , M91 -ELECTRICAL UNITS

TIWT0792E

FIG. 3

BL-D/LOCK-08



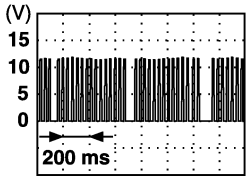
3 4
1 2
D11 SB , D40 SB

REFER TO THE FOLLOWING.
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)
M91 -ELECTRICAL UNITS

TIWT0793E

Terminals and Reference Value for BCM

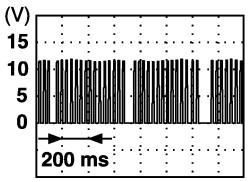
AIS004D3

Terminal	Wire color	Item	Condition	Voltage (V) (Approx.)
12	P	Passenger side door switch	ON (Open) → OFF (Closed)	0 → 5
22	Y	Power window switch serial link	—	 PIIA2344J
30	P	Back door opener switch	Press the back door opener switch when driver side door is unlocked	5 → 0
37	B/R	Ignition key switch (insert)	ON (Key inserted) → OFF (Key removed from IGN key cylinder)	Battery voltage → 0
42	W	Power source (Fuse)	—	Battery voltage
44	Y	Driver side door lock actuator (unlock)	Door lock / unlock switch (Free → Unlock)	0 → Battery voltage → 0
50	PU	All door lock actuator (lock)	Door lock / unlock switch (Free → Lock)	0 → Battery voltage → 0
51	W/R	Passenger side door lock actuator (unlock)	Door lock / unlock switch (Free → Unlock)	0 → Battery voltage → 0
52	B	Ground	—	0
55	R	Power source (Fusible link)	—	Battery voltage
57	R/W	Back door switch	ON (Open) → OFF (Closed)	0 → Battery voltage *
62	W	Driver side door switch	ON (Open) → OFF (Closed)	0 → 5
68	PU	Back door opener output	Press the back door opener switch when driver side door is unlocked	0 → Battery voltage

*When interior lamp battery saver control is in OFF: Approx. 5V

Terminal and Reference Value for Power Window Main Switch

AIS004D4

Terminal	Wire color	Item	Condition	Voltage (V) (Approx.)
6	R	Key cylinder switch lock signal	Key position (Neutral → Locked)	5 → 0
7	SB	Key cylinder switch unlock signal	Key position (Neutral → Unlocked)	5 → 0
12	PU	Power window switch serial link	—	 PIIA2344J
15	B	Ground	—	0

Work Flow

AIS004D5

1. Check the symptom and customer's requests.
2. Understand the outline of system. Refer to BL-23, "System Description" .
3. Does power window system operate normally? If Yes GO TO 5, If No Refer to GW-18, "POWER WINDOW SYSTEM"
4. According to the trouble diagnosis chart, repair or replace the cause of the malfunction. Refer to BL-37, "Trouble Diagnoses Symptom Chart" .
5. Does power door lock system operate normally? If Yes, GO TO 6, If No, GO TO 4.
6. INSPECTION END.

CONSULT-II Function

AIS004D7

Power door lock system check with data monitor and active test can be executed by combining data reception and command transmission via communication line from BCM.

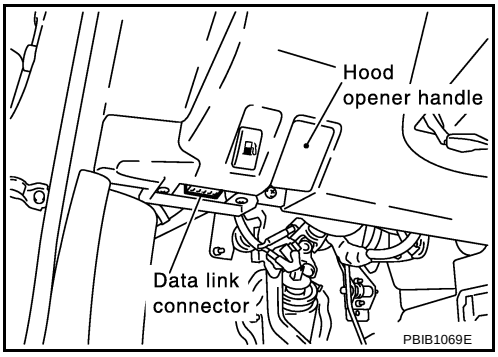
BCM diagnosis part	Inspection item, self-diagnosis mode	Content
Door lock	Work support	Changes the setting for each function.
	Data monitor	Displays BCM input data on real-time basis.
	Active test	Sends drive signals to door lock actuator to perform operation check.

CONSULT-II BASIC OPERATION PROCEDURE

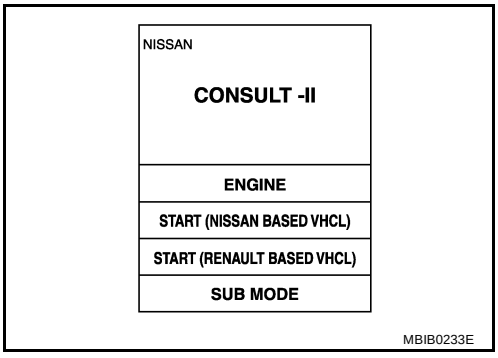
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis, depending on control unit which carry out CAN communication.

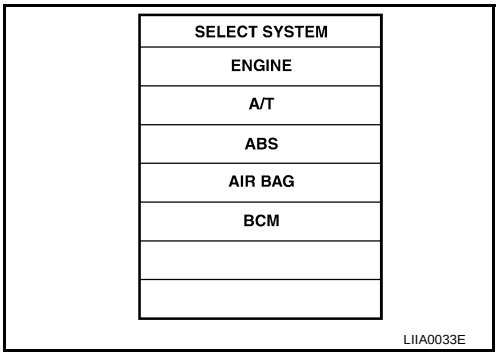
1. Turn ignition switch “OFF”.
2. Connect “CONSULT-II” and CONSULT-II CONVERTER to data link connector.



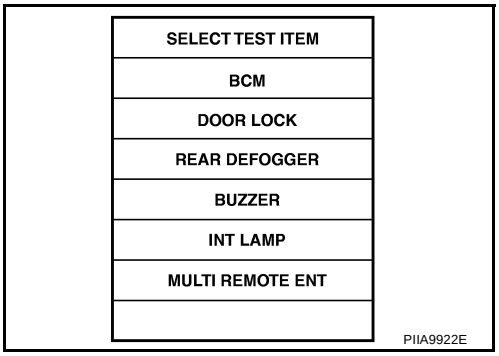
3. Turn ignition switch “ON”.
4. Touch “START(NISSAN BASED VHCL)”.



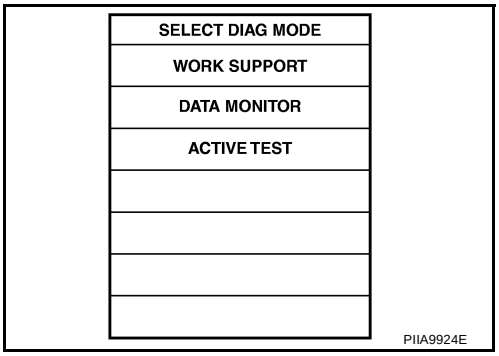
5. Touch “BCM”.
If “BCM” is not indicated, go to GI-39 .



6. Touch “DOOR LOCK”.



7. Select diagnosis mode.
“WORK SUPPORT”, “DATA MONITOR” and “ACTIVE TEST” are available.



WORK SUPPORT

Work item	Description
DOOR LOCK-UNLOCK SET	Select unlock mode can be changed in this mode. Selects ON-OFF of select unlock mode.
ANTI-LOCK OUT SET	Key reminder door mode can be changed in this mode. Selects ON-OFF of key reminder door mode.

DATA MONITOR

Monitor item “operation”		Content
KEY ON SW	“ON/OFF”	Indicates [ON/OFF] condition of key switch.
LOCK SW DR/AS	“ON/OFF”	Indicates [ON/OFF] condition of lock signal from lock/unlock switch of driver and passenger side.
UNLK SW DR/AS	“ON/OFF”	Indicates [ON/OFF] condition of unlock signal from lock/unlock switch of driver and passenger side.
KEY CYL LK-SW	“ON/OFF”	Indicates [ON/OFF] condition of lock signal from key cylinder.
KEY CYL UN-SW	“ON/OFF”	Indicates [ON/OFF] condition of unlock signal from key cylinder.
LK BUTTON/SIG	“ON/OFF”	Indicates [ON/OFF] condition of lock signal from key fob.
UN BUTTON/SIG	“ON/OFF”	Indicates [ON/OFF] condition of unlock signal from key fob.
IGN ON SW	“ON/OFF”	Indicates [ON/OFF] condition of ignition switch.
DOOR SW-DR	“ON/OFF”	Indicates [ON/OFF] condition of driver side door switch.
DOOR SW-AS	“ON/OFF”	Indicates [ON/OFF] condition of passenger side door switch.

Monitor item “operation”		Content
BACK DOOR SW*1	“ON/OFF”	Indicates [ON/OFF] condition of back door switch.
TRNK OPN MNTR*2	“ON/OFF”	Indicates [ON/OFF] condition of trunk lid opener switch.

*1: For Coupe
*2: For Roadster

ACTIVE TEST

Test item	Content
ALL D/LK MTR	This test is able to check all door lock actuators lock operation. These actuators lock when “ON” on CONSULT-II screen is touched.
DR D/UN MTR	This test is able to check driver side door lock actuator unlock operation. This actuator unlock when “ON” on CONSULT-II screen is touched.
NON DR D/UN	This test is able to check door lock actuators (except driver side door lock actuator) unlock operation. These actuator unlock when “ON” on CONSULT-II screen is touched.

Trouble Diagnoses Symptom Chart

AIS004D8

Symptom	Diagnoses service procedure	Reference to page
Key reminder door system does not operate properly.	1. Power supply and ground circuit check of BCM.	BL-38
	2. Key switch (Insert) check.	BL-41
	3. Door switch check.	BL-39
	4. Replace BCM.	BCS-17
Power door lock does not operate by door lock and unlock switch on power window main switch or power window sub-switch.	1. Power supply and ground circuit check of BCM.	BL-38
	2. Door lock and unlock switch check.	BL-43
	3. Driver side door lock actuator check.	BL-46
	4. Passenger side door lock actuator check.	BL-47
	5. Replace BCM	BCS-17
Driver side door lock actuator does not operate.	1. Power supply and ground circuit check of BCM.	BL-38
	2. Driver side door lock actuator check.	BL-46
Passenger side door lock actuator does not operate.	1. Power supply and ground circuit check of BCM.	BL-38
	2. Passenger side door lock actuator check.	BL-47
Power door lock does not operate by door key cylinder operation, but operates by door lock and unlock switch.	1. Power supply and ground circuit check of BCM.	BL-38
	2. Door key cylinder switch check.	BL-48
	3. Replace power window main switch.	—
Back door opener does not operate.	1. Power supply and ground circuit check of BCM.	BL-38
	2. Back door opener switch check.	BL-50
	3. Back door opener actuator check.	BL-51

Power Supply and Ground Circuit Check of BCM

AIS004D6

FUSE CHECK

1. FUSE INSPECTION

1. Turn ignition switch OFF.
2. Check the following.

- 40A fusible link (letter **F** , located in the fuse and fusible link box)
- 10A fuse [No.18, located in the fuse block (J/B)]

NOTE:
Refer to BL-21, "Component Parts and Harness Connector Location" .

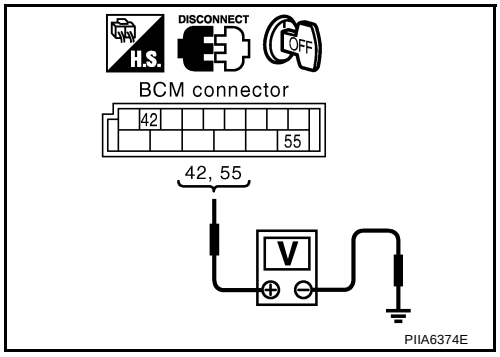
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Disconnect BCM connector.
2. Check voltage between BCM harness connector M91 terminal 42, 55 and ground.

42 (GY) - Ground : Battery voltage
55 (R) – Ground : Battery voltage



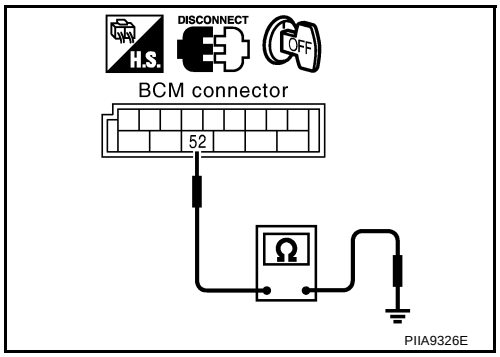
OK or NG

OK >> GO TO 3.
NG >> Check BCM power supply circuit for open or short.

3. CHECK GROUND CIRCUIT

Check continuity between BCM harness connector M91 terminal 52 and ground.

52 (B) – Ground Continuity should exist.



OK or NG

OK >> Power supply and ground circuit is OK.
NG >> Check BCM ground circuit for open or short.

Door Switch Check

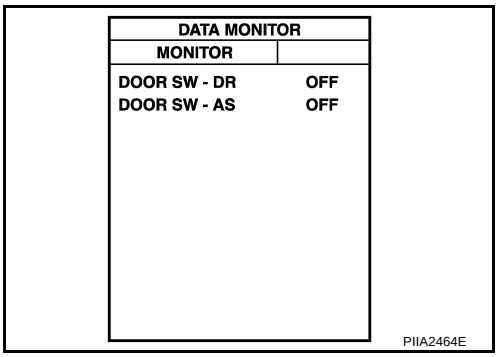
AIS004D9

1. CHECK DOOR SWITCH INPUT SIGNAL

With CONSULT-II

Check door switches (“DOOR SW-AS” and “DOOR SW-DR”) in “DATA MONITOR” mode with CONSULT-II.

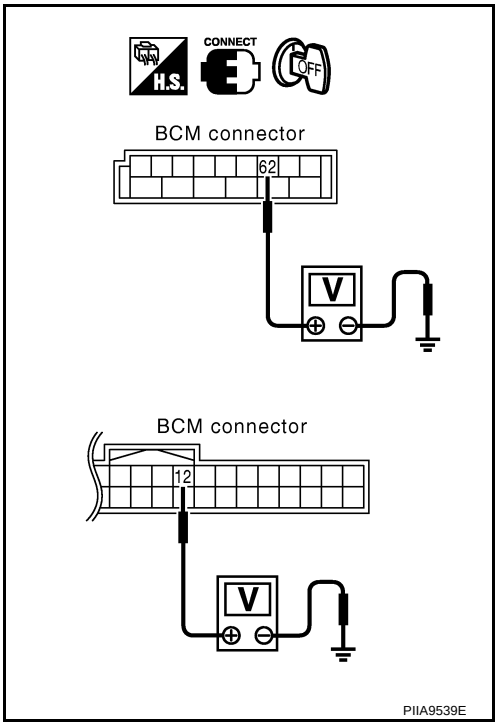
Monitor item	Condition	
DOOR SW-DR	OPEN	: ON
	CLOSE	: OFF
DOOR SW-AS	OPEN	: ON
	CLOSE	: OFF



Without CONSULT-II

Check voltage between BCM connector and ground.

Item	Terminals			Condition of door switch	Voltage (V) (Approx.)
	Connector	(+) Terminal (Wire color)	(–)		
Driver side door switch	B83	62 (W)	Ground	Open	0
				Close	5
Passenger side door switch	M90	12 (P)		Open	0
				Close	5



OK or NG

OK >> Door switch is OK.
NG >> GO TO 2.

2. CHECK DOOR SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect door switch and BCM connector.
3. Check continuity between door switch harness connector B17, B23, terminals 1 and BCM harness connector B83 terminals 62 (driver side) or M90 terminal 12 (passenger side).

Driver side door

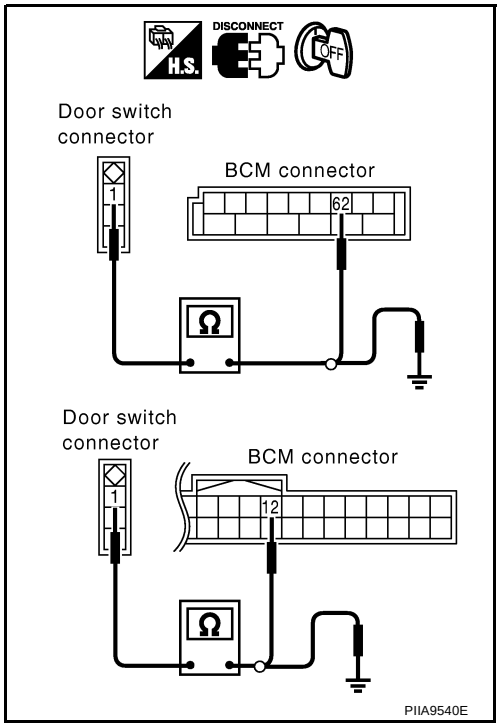
1 (W) – 62 (W) : Continuity should exist.

Passenger door

1 (P) – 12 (P) : Continuity should exist.

4. Check continuity between door switch harness connector B17, B23, terminals 1 and ground.

1 (W or P) – Ground : Continuity should not exist.



OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

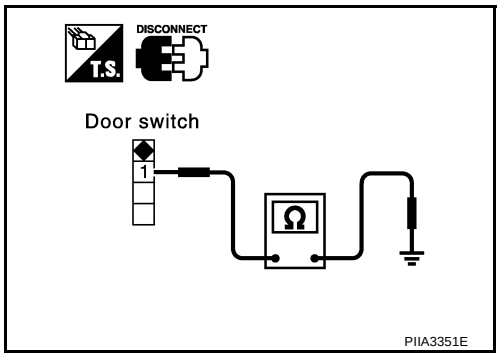
3. CHECK DOOR SWITCH

Check continuity between door switch harness connector B17 (driver side) or B23 (passenger side) terminal 1 and ground.

Terminal (Wire color)		Door switch	Continuity
1 (W or P)	Ground	Pushed	No
		Released	Yes

OK or NG

OK >> Further inspection is necessary. Refer to symptom chart.
NG >> Replace malfunction door switch.



Key Switch (insert) Check

AIS004DA

1. CHECK KEY SWITCH INPUT SIGNAL

With CONSULT-II

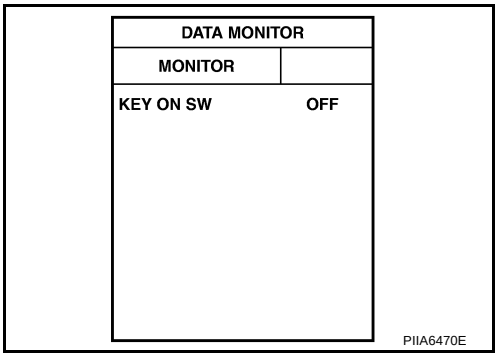
Check ignition key cylinder switch “KEY ON SW” in “DATE MONITOR” mode with CONSULT-II

- When key is inserted in ignition key cylinder

  KEY ON SW :ON

- When key is removed in ignition key cylinder

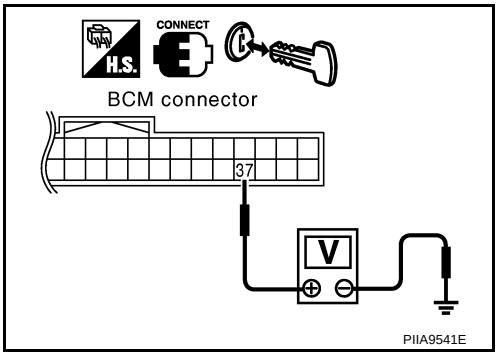
  KEY ON SW :OFF



Without CONSULT-II

Check voltage between BCM connector and ground.

Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(-)		
M90	37 (B/R)	Ground	Key is inserted	Battery voltage
			Key is removed	0



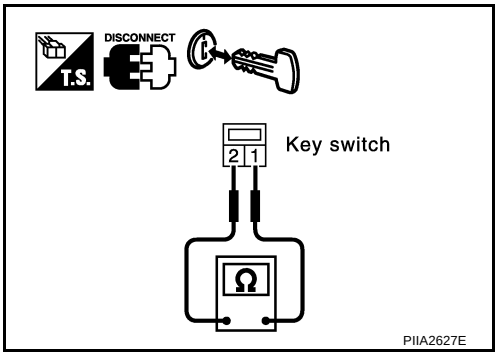
OK or NG

OK >> Key switch is OK.
NG >> GO TO 2.

2. CHECK KEY SWITCH (INSERT)

1. Turn ignition switch OFF.
2. Disconnect key switch connector.
3. Check continuity between key switch terminals 1 and 2.

Connector	Terminals		Condition	Continuity
M25	1	2	Key is inserted in ignition key cylinder	Yes
			Key is removed from ignition key cylinder	No



OK or NG

OK >> GO TO 3.
NG >> Replace key switch.

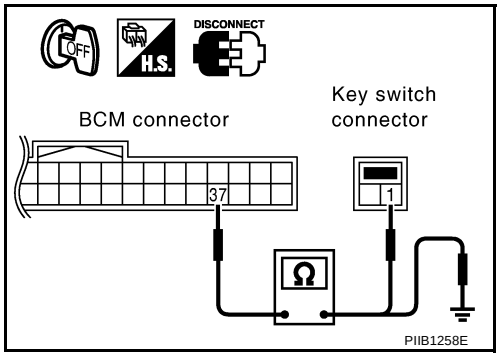
3. CHECK KEY SWITCH CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M90 terminal 37 and key switch harness connector M25 terminal 4.

37 (B/R) - 1 (B/R) : Continuity should exist.

3. Check continuity between BCM harness connector M90 terminal 37 and ground.

37 (B/R) - Ground : Continuity should not exist.



OK or NG

OK >> Check the following.
- 10A fuse [No.21, located in the fuse block (J/B)]
- Harness for open or short between key switch and fuse

NG >> Repair harness or connector.

Door Lock and Unlock Switch Check

AIS004DB

1. CHECK POWER WINDOW OPERATION

Does power window system operate normally?

YES or NO?

YES >> GO TO 2

NO >> Refer to GW-31, "Trouble Diagnoses Symptom Chart" .

2. CHECK DOOR LOCK AND UNLOCK SWITCH OUTPUT SIGNAL

With CONSULT-II

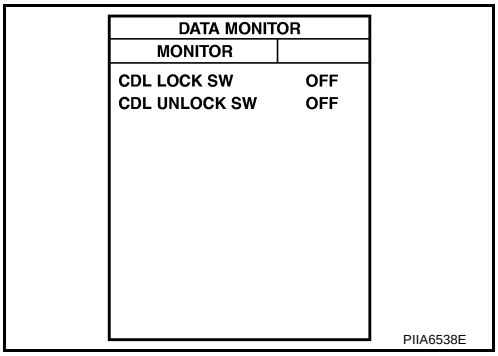
Check door lock and unlock switch (“LOCK SW DR/AS”, “UNLK SW DR/AS”) in DATA MONITOR mode with CONSULT-II. Refer to BL-36, "DATA MONITOR" .

- When door lock and unlock switch is turned to LOCK

  CDL LOCK SW :ON

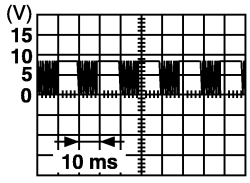
- When door lock and unlock switch is turned to UNLOCK

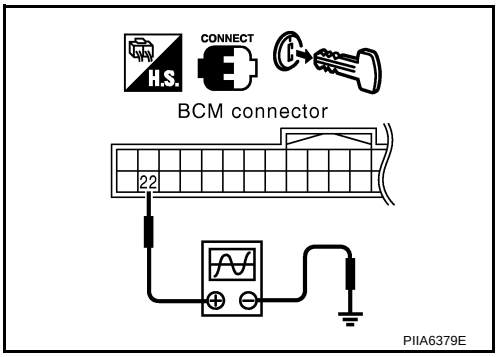
  CDL UNLOCK SW :ON



Without CONSULT-II

1. Remove key from ignition switch, and close the doors of driver side and passenger side.
2. Check the signal between BCM connector and ground with oscilloscope when door lock and unlock switch (driver side and passenger side) is turned “LOCK” or “UNLOCK”.
3. Make sure signals which are shown in the figure below can be detected during 10 second just after door lock and unlock switch (driver side or passenger side) is turned “LOCK” or “UNLOCK”.

Connector	Terminal (Wire color)		Signal (Reference value)
	(+)	(–)	
M90	22 (Y)	Ground	



OK or NG

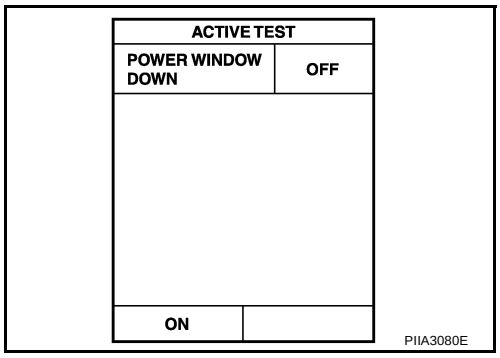
OK >> GO TO 3.

NG >> GO TO 4.

3. CHECK BCM OUTPUT SIGNAL

Check power window serial link (“POWER WINDOW DOWN”) in “ACTIVE TEST” mode with CONSULT-II. Refer to BL-77, "Active Test" .

When “ACTIVE TEST” is executed, the window of driver side and passenger side are go down.



OK or NG

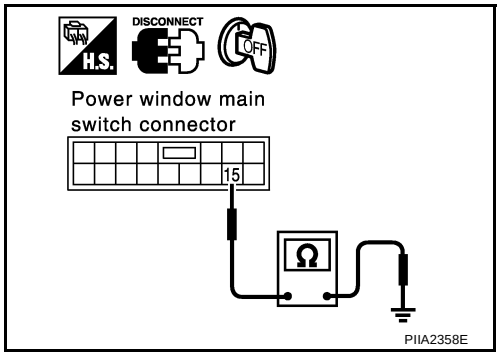
OK >> Further inspection is necessary. Refer to symptom chart.

NG >> Replace BCM.

4. CHECK DOOR LOCK AND UNLOCK SWITCH GROUND CIRCUIT

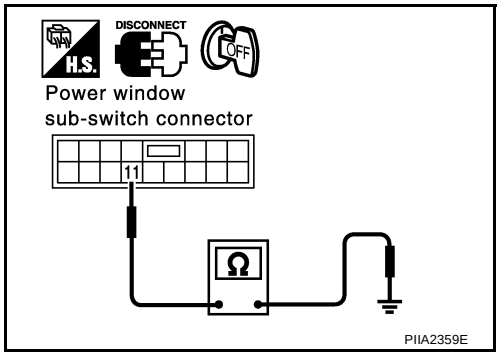
1. Turn ignition switch OFF.
2. Disconnect power window main switch (door lock and unlock switch) and power window sub-switch (door lock and unlock switch) connector.
3. Check continuity between power window main switch (door lock and unlock switch) harness connector D7 terminal 15 and ground.

15 (B) – Ground : Continuity should exist.



4. Check continuity between power window sub-switch (door lock and unlock switch) harness connector D37 terminal 11 and ground.

11 (B) – Ground : Continuity should exist.



OK or NG

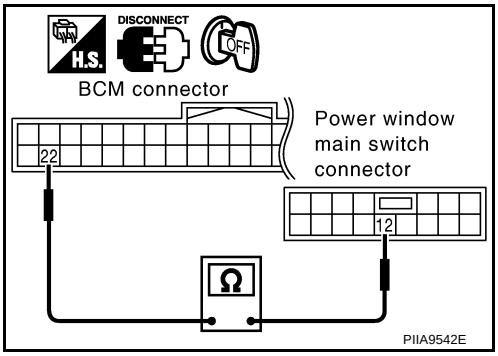
OK >> GO TO 5.

NG >> Repair or replace harness.

5. CHECK POWER WINDOW SERIAL LINK CIRCUIT

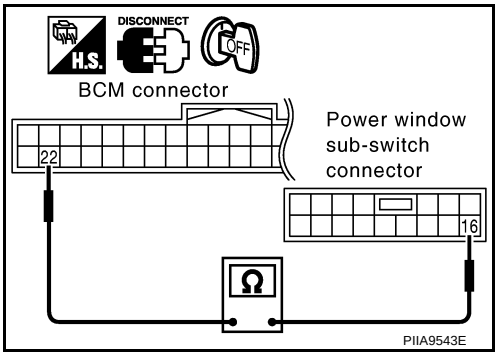
1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M90 terminal 22 and power window main switch (door lock and unlock switch) harness connector D7 terminal 12.

22 (Y) – 12 (PU) **: Continuity should exist.**



3. Check continuity between BCM harness connector M90 terminal 22 and power window sub-switch (door lock and unlock switch) harness connector D37 terminal 16.

22 (Y) – 16 (SB) **: Continuity should exist.**



OK or NG

OK >> Replace power window main switch.
NG >> Repair or replace harness.

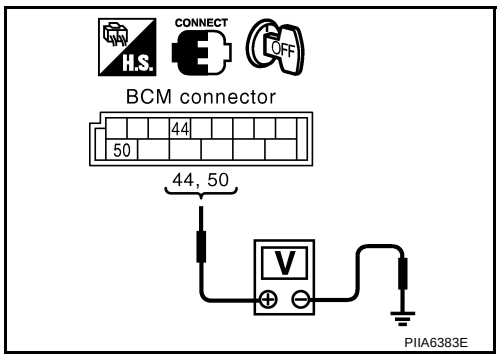
Driver Side Door Lock Actuator Check

AIS004DC

1. CHECK DOOR LOCK ACTUATOR SIGNAL

1. Turn ignition switch OFF.
2. Check voltage between BCM connector and ground.

Connector	Terminal (Wire color) (+)	Terminal (Wire color) (–)	Condition	Voltage (V) (Approx.)
M91	44 (Y)	Ground	Driver door lock/unlock switch is turned to UNLOCK.	0 → Battery voltage → 0
	50 (PU)		Driver door lock/unlock switch is turned to LOCK.	0 → Battery voltage → 0



OK or NG

OK >> GO TO 2.
NG >> Replace BCM.

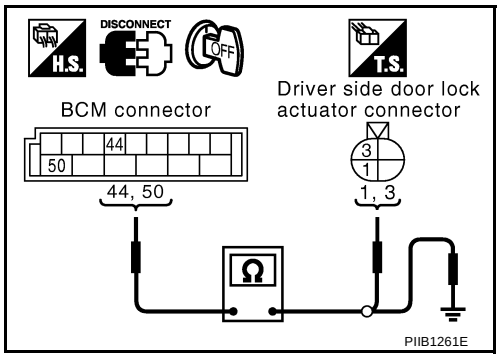
2. CHECK DOOR LOCK ACTUATOR CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M91 terminals 44, 50 and driver side door lock actuator harness connector D11 terminals 1, 3.

44 (Y) – 3 (Y) : Continuity should exist.
50 (PU) – 1 (PU) : Continuity should exist.

3. Check continuity between BCM harness connector M91 terminals 44, 50 and ground.

44 (Y) – Ground : Continuity should not exist.
50 (PU) – Ground : Continuity should not exist.



OK or NG

OK >> Replace driver side door lock actuator.
NG >> Repair or replace harness between BCM and driver side door lock actuator.

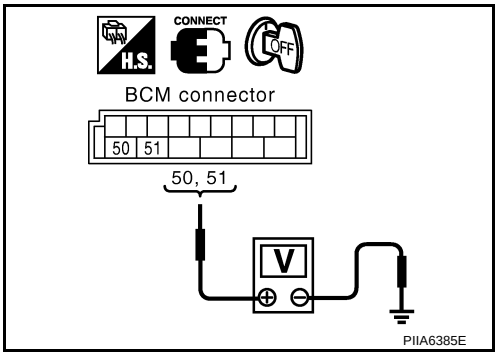
Passenger Side Door Lock Actuator Check

AIS004DD

1. CHECK DOOR LOCK ACTUATOR SIGNAL

1. Turn ignition switch OFF.
2. Check voltage between passenger side door lock actuator connector and ground.

Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(–)		
M91	50 (PU)	Ground	Door lock/unlock switch is turned to LOCK.	0 → Battery voltage → 0
	51 (GY)		Door lock/unlock switch is turned to UNLOCK.	0 → Battery voltage → 0



OK or NG

OK >> GO TO 2.
NG >> Replace BCM.

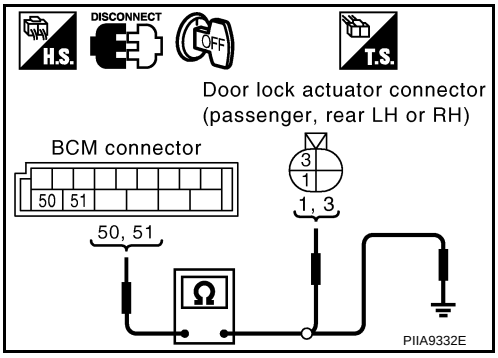
2. CHECK DOOR LOCK ACTUATOR CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M91 terminals 50, 51 and passenger side door lock actuator harness connector D40 terminals 1, 3.

50 (PU) – 1 (PU) : Continuity should exist.
51 (W/R) – 3 (GY) : Continuity should exist.

3. Check continuity between BCM harness connector M91 terminals 50, 51 and ground.

50 (PU) – Ground : Continuity should not exist.
51 (W/R) – Ground : Continuity should not exist.



OK or NG

OK >> Replace passenger side door lock actuator.
NG >> Repair or replace harness between BCM and passenger side door lock actuator.

Door Key Cylinder Switch Check

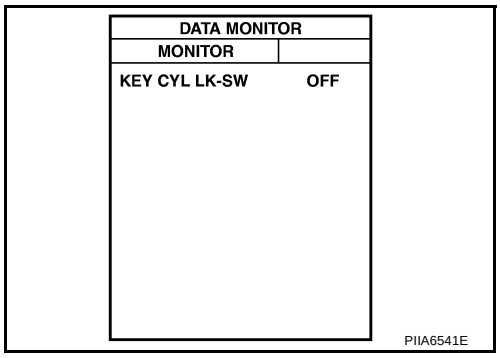
AIS004DE

1. CHECK DOOR KEY CYLINDER SWITCH INPUT SIGNAL

With CONSULT-II

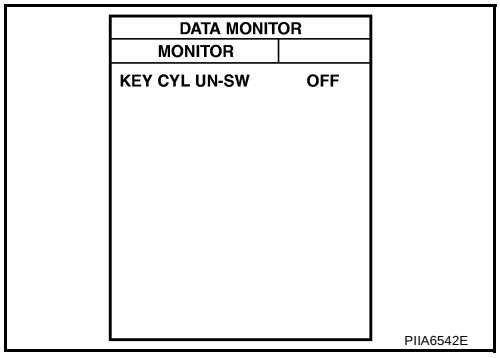
- Check door key cylinder switch (“KEY CYL LK SW”) in “DATA MONITOR” mode with CONSULT-II.

  “KEY CYL LK-SW” should be “ON” when key inserted in door key cylinder is turned to lock.



- Check door key cylinder switch (“KEY CYL UN-SW”) in “DATA MONITOR” mode with CONSULT-II.

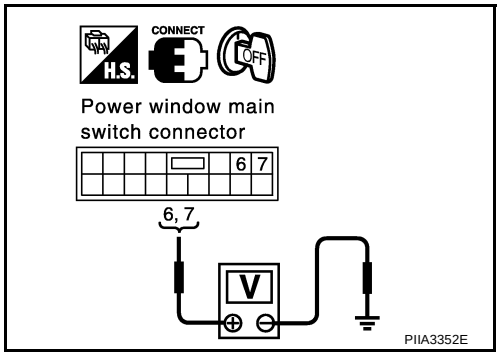
  “KEY CYL UN-SW” should be “ON” when key inserted in door key cylinder is turned to unlock.



Without CONSULT-II

Check voltage between power window main switch (door lock and unlock switch) connector and ground.

Connector	Terminals (+)	Terminals (–)	Key position	Voltage (V) (Approx.)
D7	6 (R)	Ground	Neutral/Unlock	5
			Lock	0
	7 (SB)		Neutral/Lock	5
			Unlock	0



OK or NG

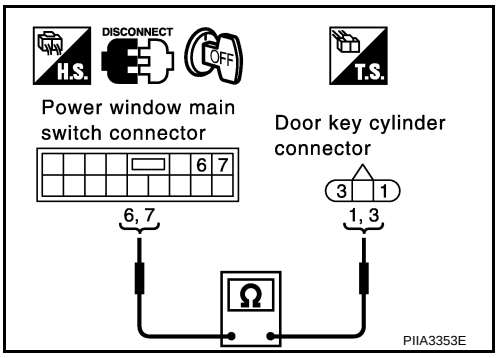
OK >> Further inspection is necessary. Refer to symptom chart.

NG >> GO TO 2.

2. CHECK DOOR KEY CYLINDER SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power window main switch (door lock and unlock switch) and door key cylinder switch connector.
3. Check continuity between power window main switch (door lock and unlock switch) harness connector D7 terminals 6, 7 and door key cylinder switch harness connector D12 terminals 1, 3.

6 (R) – 3 (R) **: Continuity should exist.**
7 (SB) – 1 (SB) **: Continuity should exist.**



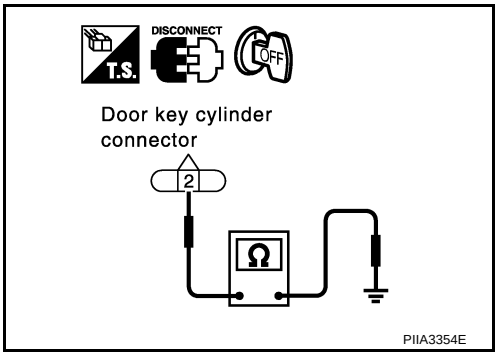
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness between power window main switch and door key cylinder switch.

3. CHECK DOOR KEY CYLINDER SWITCH GROUND CIRCUIT

Check continuity between door key cylinder switch harness connector D12 terminal 2 and ground.

2 (B) – Ground **: Continuity should exist.**



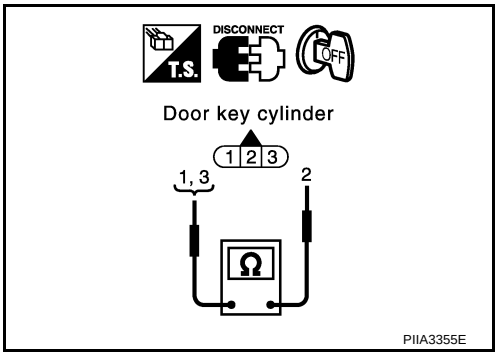
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK DOOR KEY CYLINDER SWITCH

Check continuity between door key cylinder switch terminals 1, 3 and 2.

Connector	Terminals		Key position	Continuity
D12	1	2	Neutral/Lock	No
			Unlock	Yes
	3		Neutral/Unlock	No
			Lock	Yes



OK or NG

OK >> Further inspection is necessary. Refer to symptom chart.
NG >> Replace door key cylinder switch.

Back Door Opener Switch Check

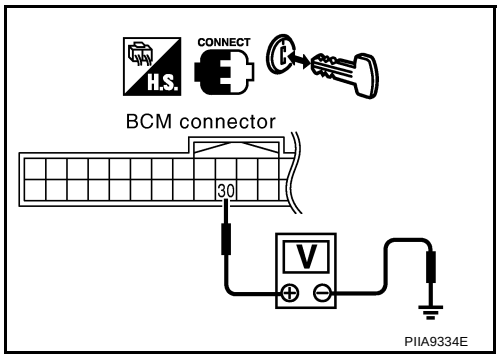
AIS004DF

1. CHECK BACK DOOR OPENER SIGNAL

Check voltage between BCM connector and ground.
Press back door opener switch when driver side door is unlocked.

Connector	Terminals (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(–)		
M90	30 (P)	Ground	Back door opener switch ON	0
			Back door opener switch OFF	Battery voltage*

*: When interior lamp battery saver control is in OFF position. →Approx.5V



OK or NG

OK >> GO TO 2.
NG >> Replace BCM.

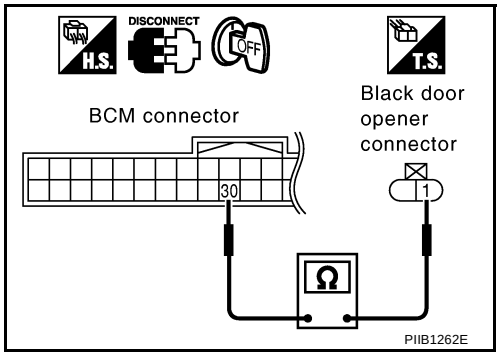
2. CHECK BACK DOOR OPENER SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM and back door opener switch connector.
3. Check continuity between BCM harness connector M90 terminal 30 and back door opener switch harness connector T103 terminal 1.

30 (P) – 1 (P) : Continuity should exist.

OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness between BCM and back door opener switch.



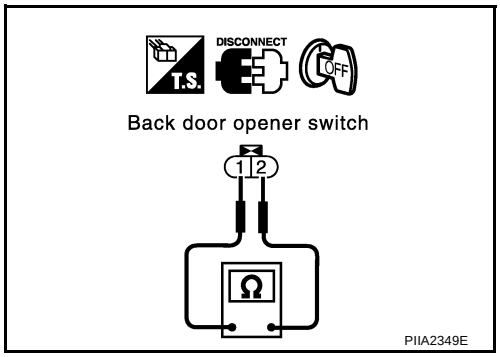
3. CHECK BACK DOOR OPENER SWITCH

Check continuity between back door opener switch terminals 1 and 2.

Connector	Terminals		Condition	Continuity
T103	1	2	Back door opener switch: ON	Yes
			Back door opener switch: OFF	No

OK or NG

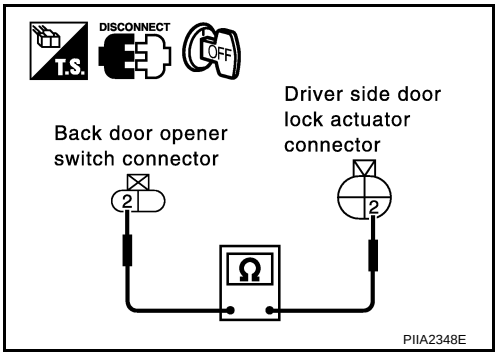
OK >> GO TO 4.
NG >> Replace back door opener switch.



4. CHECK DOOR LOCK ACTUATOR CIRCUIT

1. Disconnect driver side door lock actuator connector.
2. Check continuity between back door opener switch harness connector T103 terminal 2 and driver side door lock actuator harness connector D11 terminal 2.

2 (G) – 2 (OR) : Continuity should exist.



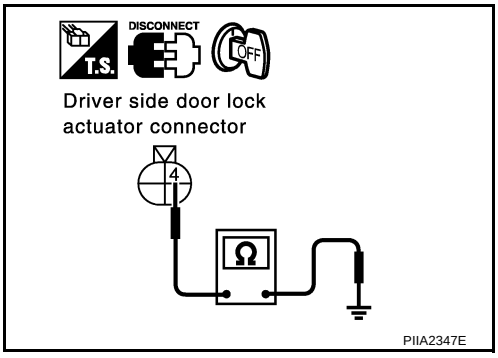
OK or NG

OK >> GO TO 5.
NG >> Repair or replace harness between back door opener switch and driver side door lock actuator.

5. CHECK DOOR LOCK ACTUATOR GROUND CIRCUIT

Check continuity between driver side door lock actuator harness connector D11 terminal 4 and ground.

4 (B) – Ground : Continuity should exist.



OK or NG

OK >> Replace driver side door lock actuator.
NG >> Repair or replace harness.

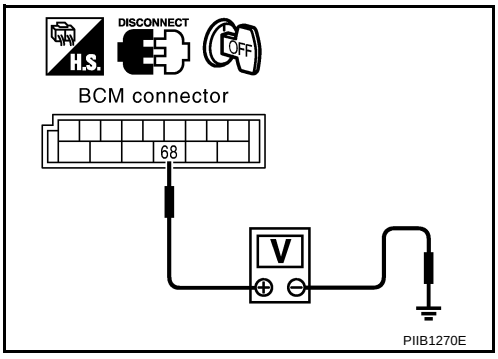
Back Door Opener Actuator Check

AIS004DG

1. CHECK BACK DOOR OPENER ACTUATOR SIGNAL

Check voltage between BCM connector and ground.
Press the back door opener switch when driver side door is unlocked.

Connector	Terminals (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(–)		
B83	68 (PU)	Ground	Back door opener switch ON	Battery voltage
			Back door opener switch OFF	0



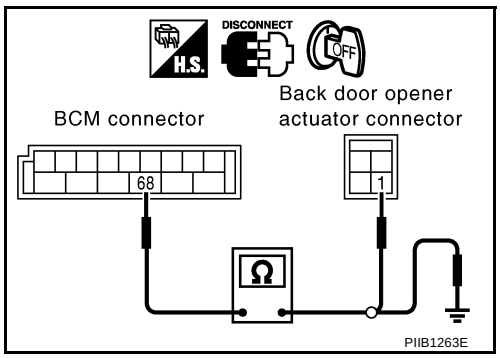
OK or NG

OK >> GO TO 2.
NG >> Replace BCM.

2. CHECK BACK DOOR OPENER ACTUATOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM and back door opener actuator connector.
3. Check continuity between BCM harness connector B83 terminal 68 and back door opener actuator harness connector T11 terminal 1.

68 (PU) – 1 (PU) : Continuity should exist.



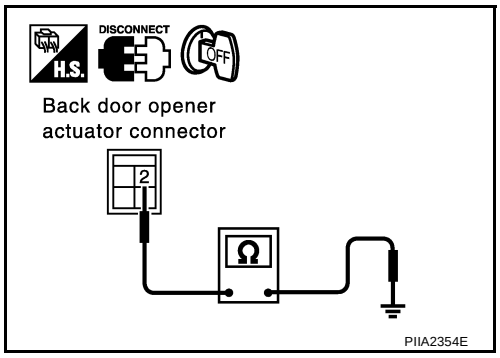
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness between BCM and back door opener actuator.

3. CHECK BACK DOOR OPENER ACTUATOR GROUND CIRCUIT

Check continuity between back door opener actuator harness connector T11 terminal 2 and ground.

2 (B) – Ground : Continuity should exist.



OK or NG

OK >> Replace back door opener actuator.
NG >> Repair or replace.

FUEL FILLER LID OPENER

PFP:78820

System Description/For RoadSter

AIS00405

Power is supplied at all times

- through 40A fusible link (letter **F** , located in the fuse and fusible link box)
- to BCM terminal 55,
- through 10A fuse [No.18, located in the fuse block (J/B)]
- to BCM terminal 42.

When ignition switch ACC or ON position, power is supplied

- through 10A fuse [No. 6, located in the fuse block (J/B)]
- to BCM terminal 11.

Ground is supplied

- to BCM terminal 52
- through body grounds M30 and M66.

FUEL LID OPEN OPERATION

When fuel lid opener switch is ON (pushed), ground is supplied

- to BCM terminal 58
- through fuel lid opener switch terminals 1 and 2, and
- through body grounds M30 and M66.

And power is supplied

- to BCM terminal 70
- through fuel lid opener actuator terminals 1 and 2, and
- through body grounds B5, B6, and T14.

Then fuel lid opener actuator opens fuel lid.

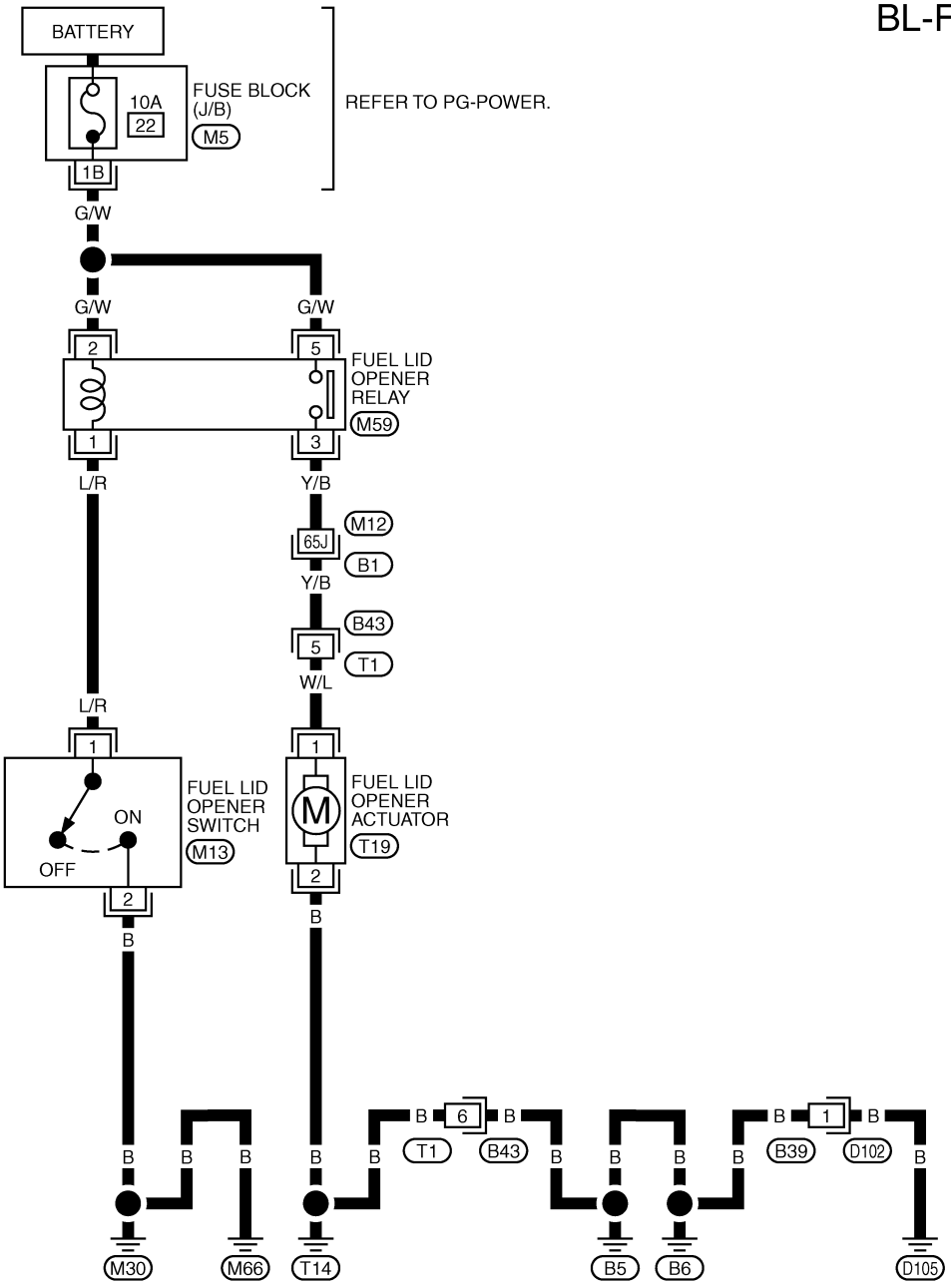
FUEL LID OPENER CANCEL OPERATION

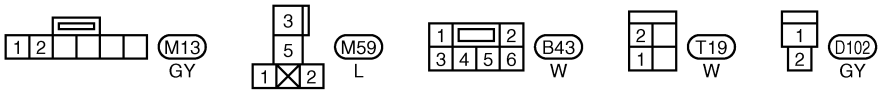
Fuel lid cannot open when vehicle condition is in arm or alarm phase.

Wiring Diagram —F/LID— /For Coupe

AIS001O9

BL-F/LID-01





REFER TO THE FOLLOWING.

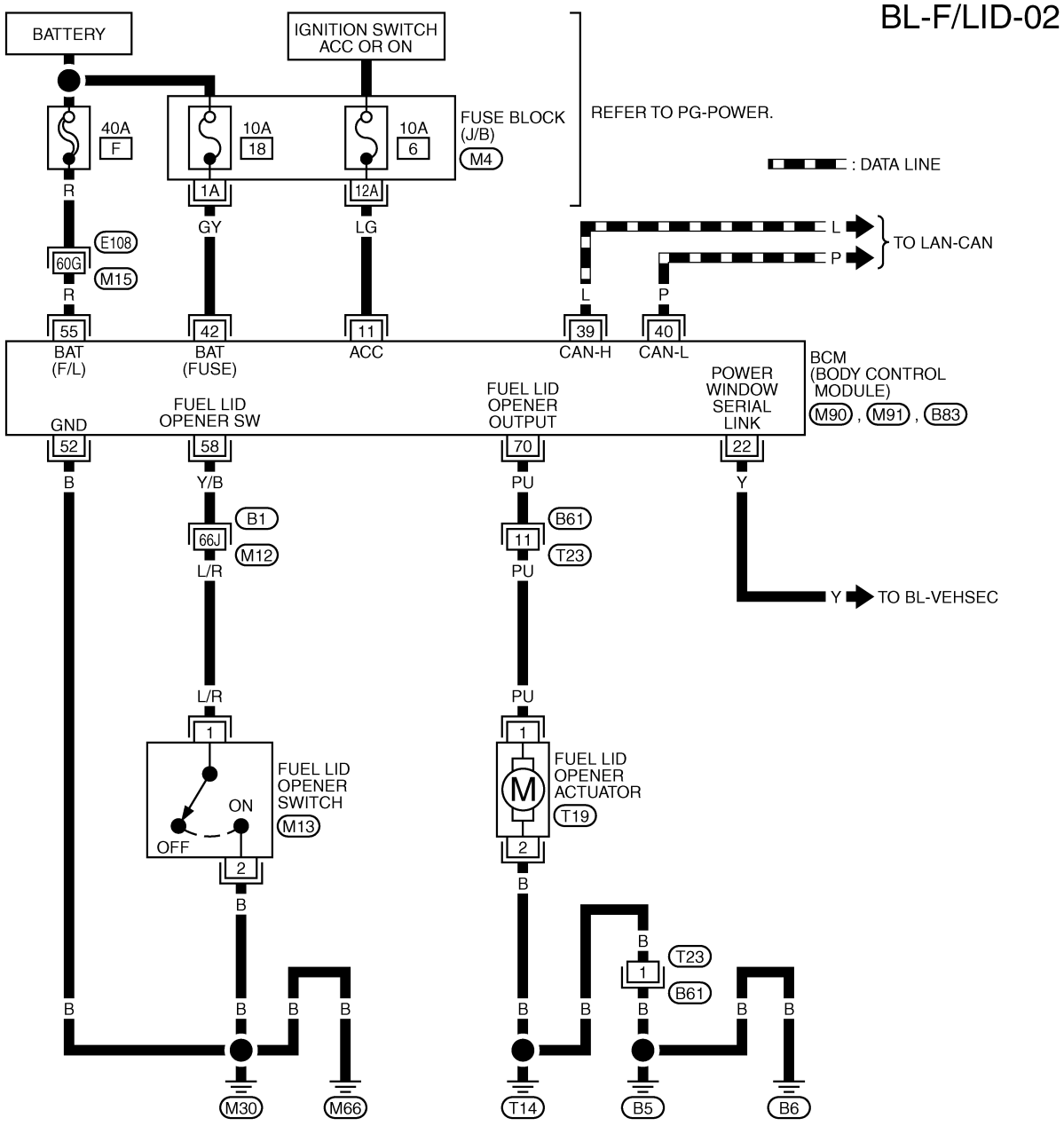
B1 -SUPER MULTIPLE JUNCTION (SMJ)

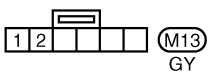
M5 -FUSE BLOCK-JUNCTION BOX (J/B)

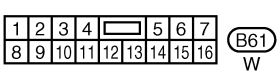
TIWT0633E

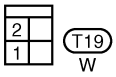
Wiring Diagram —F/LID— / For Roadster

AIS004DH









REFER TO THE FOLLOWING.
E108, B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M90, M91, B83 -ELECTRICAL UNIT

TIWT0795E

CONSULT-II Function/For Roadster

AIS00406

Fuel filler lid opener check with data monitor and active test can be executed by combining data reception and command transmission via communication line from BCM.

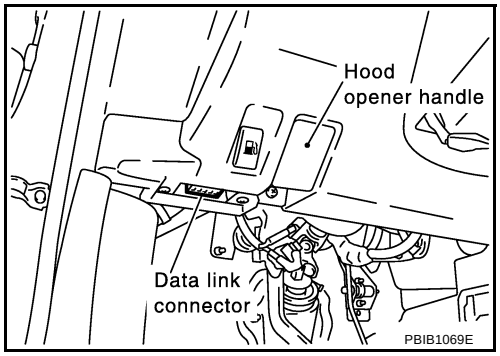
BCM diagnosis part	Inspection item, self-diagnosis mode	Content
Fuel lid	Data monitor	Displays BCM input data on real-time basis.
	Active test	Sends drive signals to fuel lid opener actuator to perform operation check.

CONSULT-II BASIC OPERATION PROCEDURE

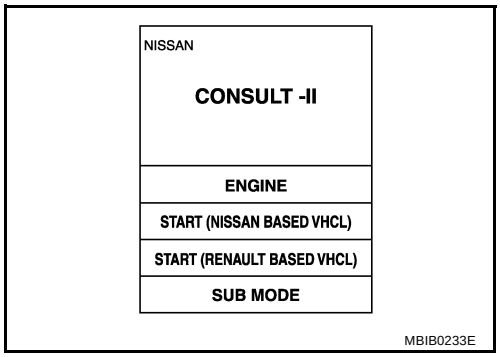
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

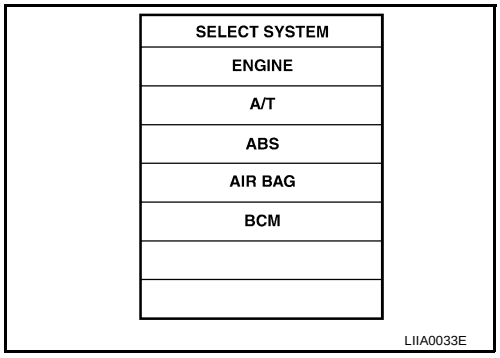
1. Turn ignition switch “OFF”.
2. Connect “CONSULT-II” and CONSULT-II CONVERTER to data link connector.



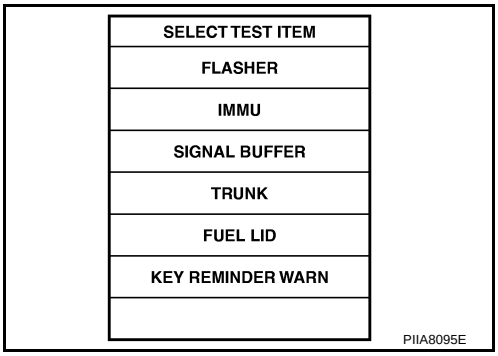
3. Turn ignition switch “ON”.
4. Touch “START(NISSAN BASED VHCL)”.



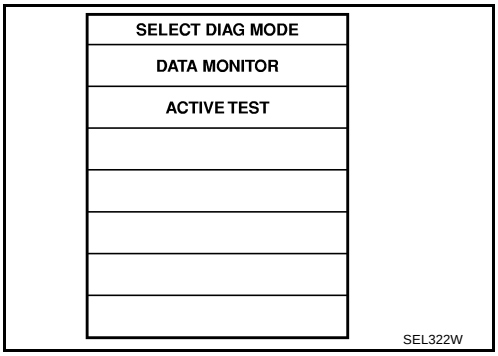
5. Touch “BCM”.
   If “BCM” is not indicated, go to GI-39 , “CONSULT-II Date Link Connector (DLC) Circuit”



6. Touch “FUEL LID”.



7. Select diagnosis mode.
“DATA MONITOR” and “ACTIVE TEST”



DATA MONITOR

Monitor item “operation”	Content
F/LID OPN SW	Indicates [ON/OFF] condition of fuel lid opener switch.

ACTIVE TEST

Test item	Content
FUEL LID OPEN	This test is able to check fuel lid opener actuator unlock operation. This actuator unlocks when “ON” on CONSULT-II screen is touched.

Terminals and Reference Value for BCM/For Roadster

AIS00407

Terminal	Wire color	Item	Condition	Voltage [V] (Approx.)
11	LG	Ignition switch (ACC)	Ignition switch (ACC or ON)	Battery voltage
42	GY	Power source (Fuse)	—	Battery voltage
52	B	Ground	—	0
55	R	Power source (Fusible link)	—	Battery voltage
58	Y/B	Fuel lid opener switch	Fuel lid opener switch is ON	0
			Fuel lid opener switch is OFF	Battery voltage
70	PU	Fuel lid opener release output signal	Fuel lid opener switch is ON	0
			Fuel lid opener switch is OFF	Battery voltage (For 0.5s)

Trouble Diagnosis/For Roadster

AIS00408

FUEL LID DOSE NOT OPEN WITH FUEL LID OPENER SWITCH

1. VEHICLE CONDITION

Check vehicle security system.

Arm phase or alarm phase?

Yes or No

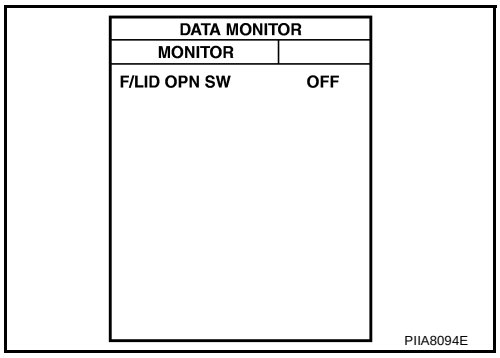
Yes >> Cancel arm phase or alarm phase condition.
No >> GO TO 2.

2. CHECK FUEL LID OPEN INPUT SIGNAL

With CONSULT-II

Check door switches (“F/LID OPN SW”) in “DATA MONITOR” mode with CONSULT-II.

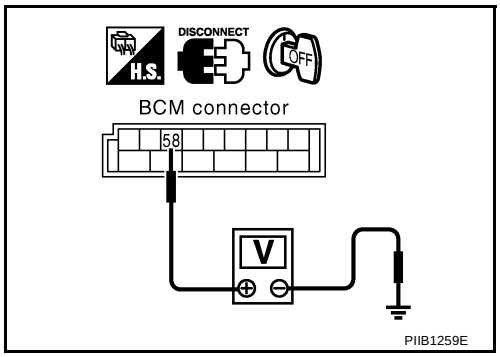
Monitor item	Condition	
F/LID OPN SW	OPEN	: ON
	CLOSE	: OFF



Without CONSULT-II

1. Turn ignition switch OFF.
2. Check voltage between BCM and ground.

Connector	Terminal (Wire color)		Condition	Voltage [V] (Approx.)
	(+)	(–)		
B83	58 (Y/B)	Ground	Fuel lid opener switch ON	0
			Fuel lid opener switch OFF	Battery voltage



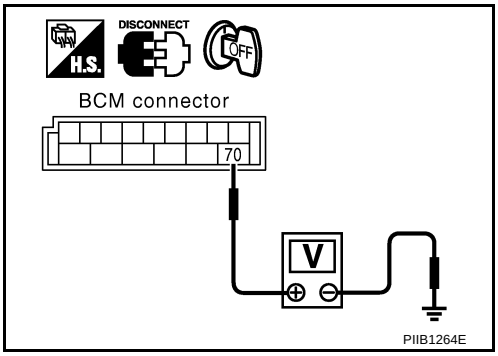
OK or NG

OK >> GO TO 3.
NG >> GO TO 6.

3. CHECK FUEL LID OPEN OUTPUT SIGNAL

Check voltage between BCM connector and ground.

Connector	Terminal (Wire color)		Condition	Voltage [V] (Approx.)
	(+)	(–)		
B83	70 (PU)	Ground	Fuel lid opener switch ON	Battery voltage (for 0.5s)
			Fuel lid opener switch OFF	0



OK or NG

OK >> GO TO 4.
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

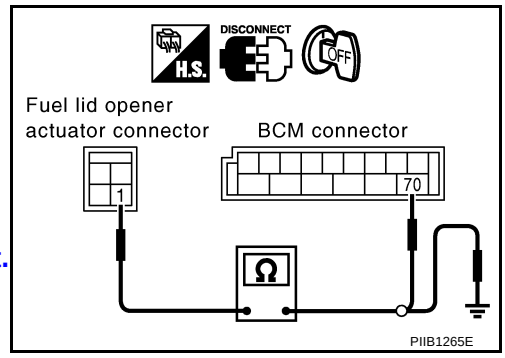
4. CHECK FUEL LID OPENER ACTUATOR CIRCUIT

1. Disconnect BCM connector and fuel lid opener actuator connector.
2. Check continuity between BCM harness connector B83 terminal 70 and fuel lid opener actuator harness connector T19 terminal 1.

70 (PU) - 1 (PU) : Continuity should exist.

3. Check continuity between fuel lid opener actuator harness connector T19 terminal 1 and ground.

1 (PU) - ground : Continuity should not exist.



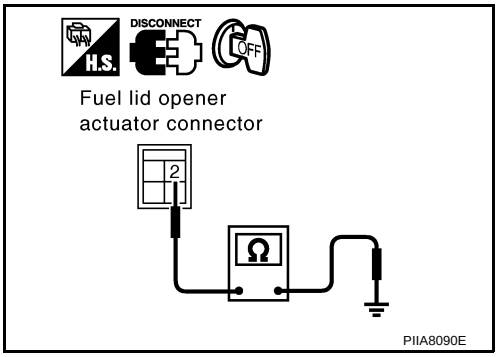
OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK FUEL LID OPENER ACTUATOR GROUND CIRCUIT

Check continuity between fuel lid opener actuator harness connector T19 terminal 2 and ground.

2 (B) - ground : Continuity should exist.



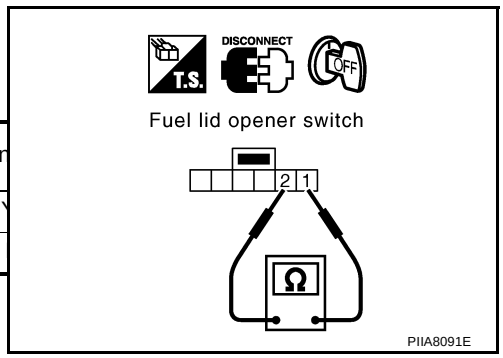
OK or NG

OK >> Replace fuel lid opener actuator.
NG >> Repair harness or connector.

6. CHECK FUEL LID OPENER SWITCH

1. Disconnect fuel lid opener switch
2. Check continuity between fuel lid opener switch harness connector M13 terminals 1 and 2.

Connector	Terminals		Fuel lid opener switch condition	Con
M13	1	2	ON (Pushed)	
			OFF (Released)	



OK or NG

OK >> GO TO 7.
NG >> Replace fuel lid opener switch.

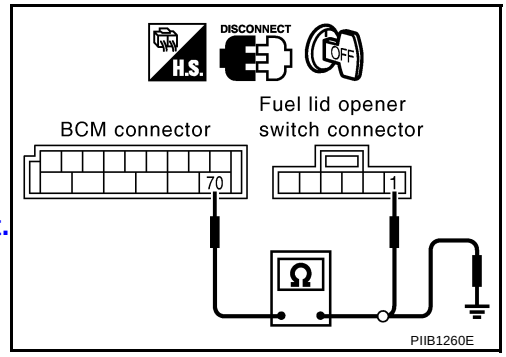
7. CHECK FUEL LID OPENER SWITCH CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector B83 terminal 58 and fuel lid opener switch harness connector M13 terminal 1.

58 (Y/B) - 1 (L/R) : Continuity should exist.

3. Check continuity between BCM harness connector B83 terminal 58 (Y/B) and ground.

58 (Y/B) - ground : Continuity should not exist.



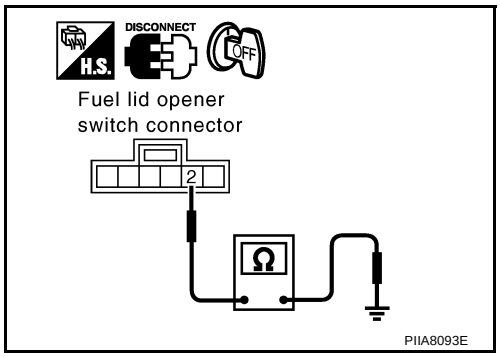
OK or NG

OK >> GO TO 8.
NG >> Repair harness or connector.

8. CHECK FUEL LID OPENERE SWITCH GROUND CIRCUIT

Check continuity between fuel lid opener switch harness connector M13 terminal 2 and ground.

2 (B) - ground : Continuity should exist.



OK or NG

OK >> Replace fuel lid opener switch.
NG >> Repair harness or connector.

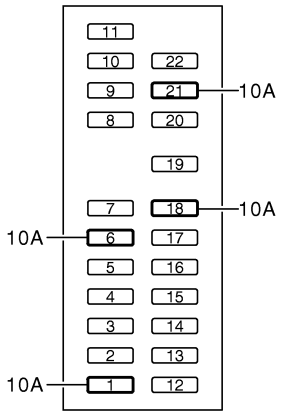
REMOTE KEYLESS ENTRY SYSTEM

PFP:28596

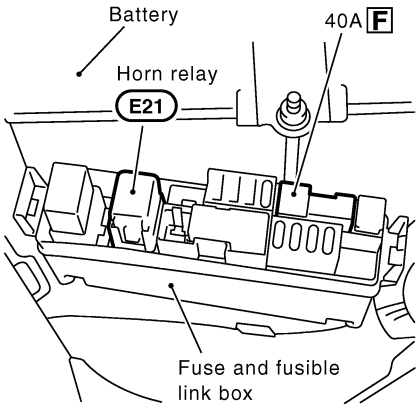
Component Parts and Harness Connector Location

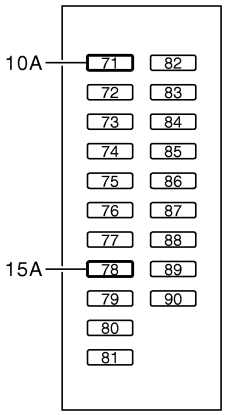
AIS000CK

FOR COUPE



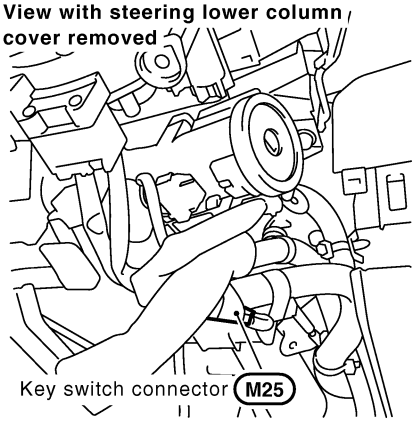
Fuse block (J/B) fuse layout



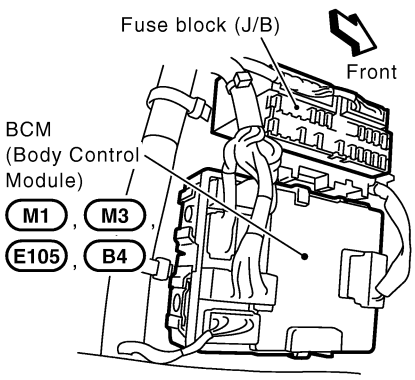


IPDM E/R fuse layout

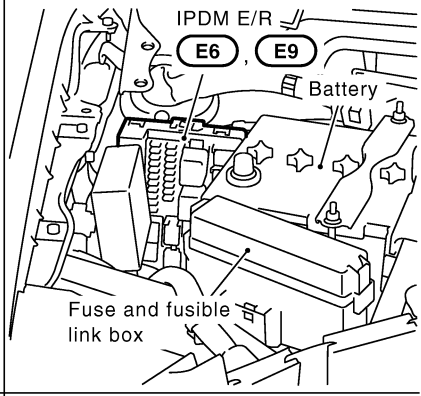
View with steering lower column cover removed

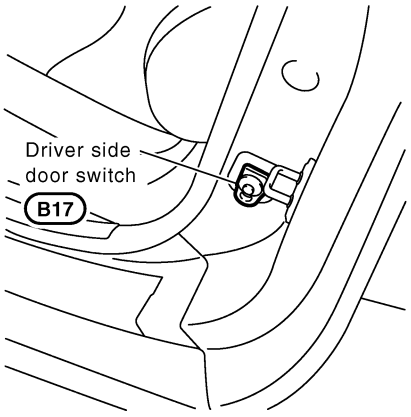


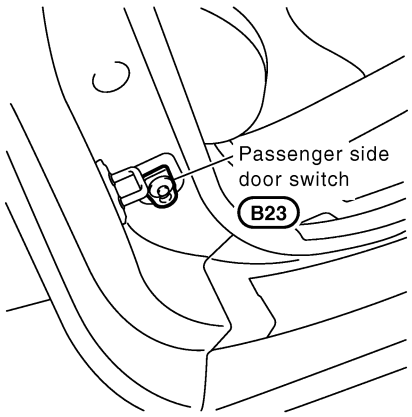
View with dash side LH removed



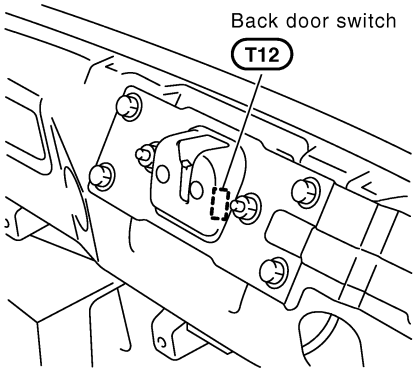
View with cowl top removed

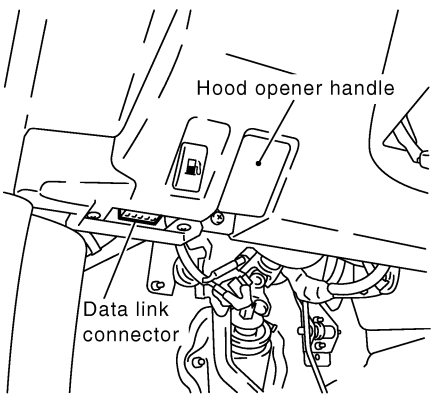




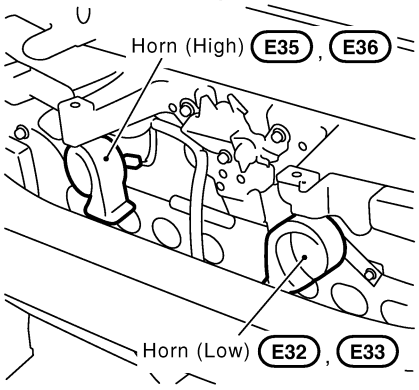


View with luggage finisher rear

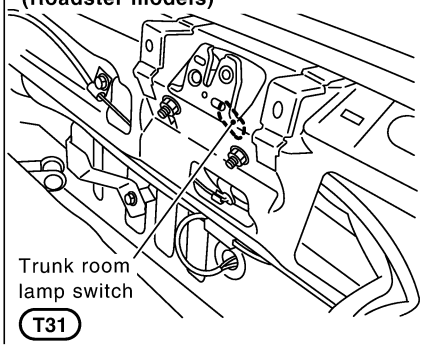




View with front bumper removed

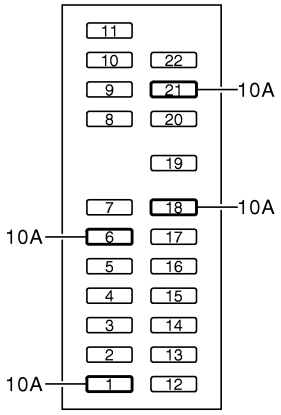


View with luggage finisher lower (center) removed (Roadster models)

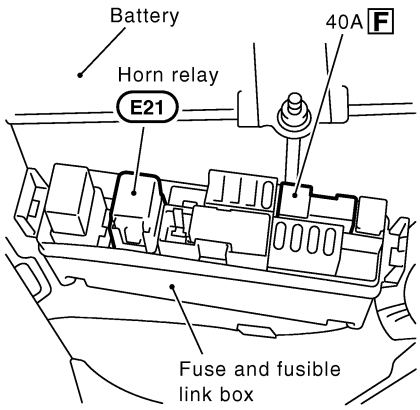


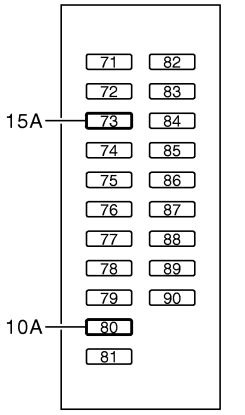
PIIB1277E

FOR ROADSTER



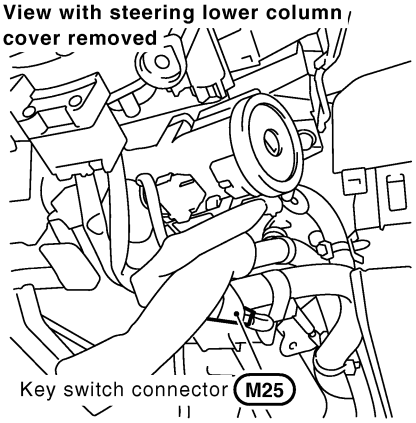
Fuse block (J/B) fuse layout



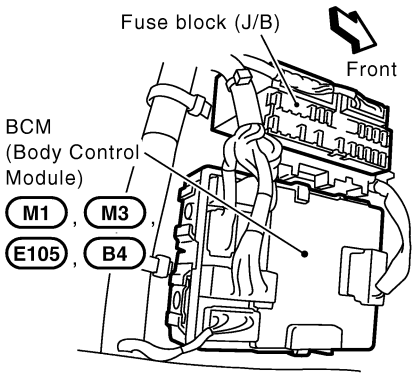


IPDM E/R fuse layout

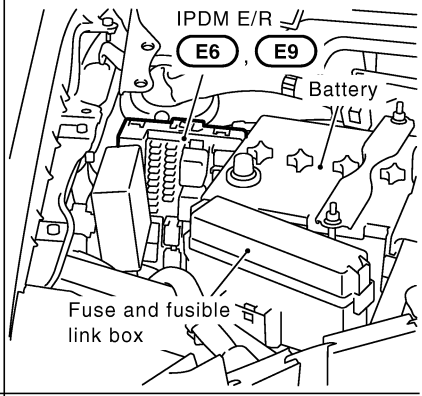
View with steering lower column cover removed

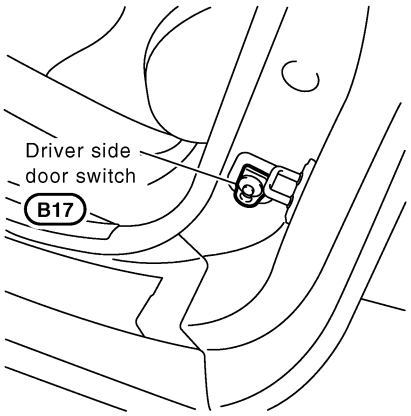


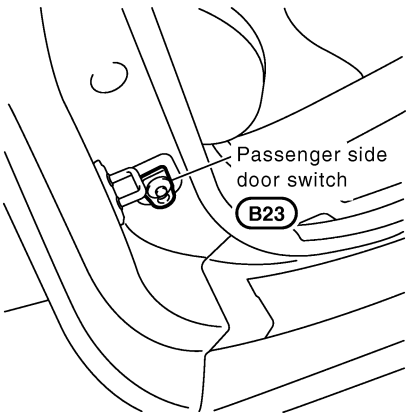
View with dash side LH removed



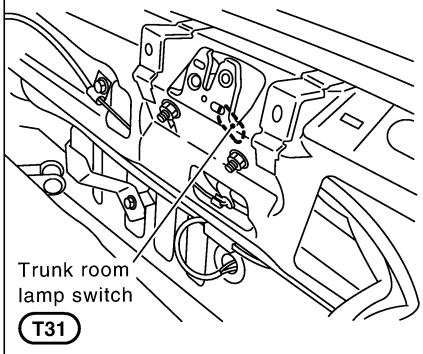
View with cowl top removed

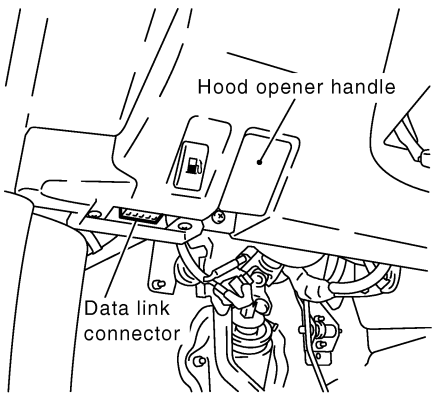




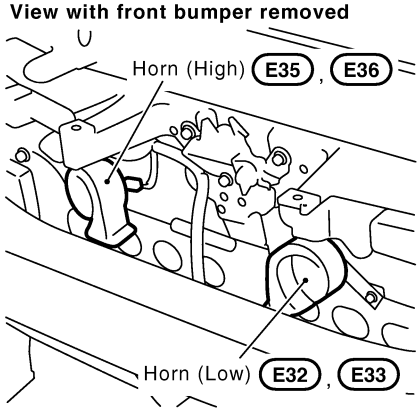


View with luggage finisher lower (center) removed





View with front bumper removed



PIIB1278E

System Description

AIS000CL

INPUTS

Power is supplied at all times

- through 40A fusible link (letter **F** , located in the fuse and fusible link box)
- to BCM terminal 55,
- through 10A fuse [No.18, located in the fuse block (J/B)]
- to BCM terminal 42,
- through 10A fuse [No. 21, located in the fuse block (J/B)]
- to key switch terminal 2.

When the ignition switch is ON or START position, power is supplied

- through 10A fuse [No.1, located in the fuse block (J/B)]
- to BCM terminal 38.

When the ignition switch is ACC or ON position, power is supplied

- through 10A fuse [No. 6, located in the fuse block (J/B)]
- to BCM terminal 11.

Ground is supplied

- to BCM terminal 52
- through body grounds M30 and M66.

When the driver side door switch is ON (door is OPEN), ground is supplied

- to BCM terminal 62
- through driver side door switch terminal 1 and
- through driver door switch case ground.

When the passenger side door switch is ON (door is OPEN), ground is supplied

- to BCM terminal 12
- through passenger side door switch terminal 1 and
- through passenger side door switch case ground.

When the back door switch (For coupe models) is ON (door is OPEN), ground is supplied

- to BCM terminal 57
- through the back door switch terminals 1 and 3 and
- through body grounds B5, B6, D105 and T14.

When the trunk room lamp switch (For roadster models) is ON (trunk is OPEN), ground is supplied

- to BCM terminal 18
- through the trunk room lamp switch terminals 1 and 2 and
- through body grounds B5,B6 and T14.

When the key switch is ON (key is inserted in ignition key cylinder), power is supplied

- through key switch terminal 1
- to BCM terminal 37.

Key fob signal is sent to BCM (the antenna of the system is combined with BCM).
The remote keyless entry system controls operation of the

- power door lock
- hazard and horn reminder
- auto door lock
- interior lamp and step lamp
- panic alarm
- back door opener (For coupe)
- trunk lid opener (For roadster)
- keyless power window down (open)

OPERATION PROCEDURE

Power Door Lock Operation

BCM receives a LOCK signal from key fob. BCM locks all doors receiving of LOCK signal from key fob.
When an UNLOCK signal is sent from key fob once, driver's door will be unlocked.
Then, if an UNLOCK signal is sent from key fob again within 5 seconds, all other doors will be unlocked.

Hazard Reminder

When the doors are locked or unlocked by key fob, power is supplied to hazard warning lamp and it flashes as follows

- LOCK operation: C mode (flash twice) or S mode (flash twice)
- UNLOCK operation: C mode (flash once) or S mode (does not flash)

Horn Reminder

BCM output to IPDM E/R for horn reminder signal as DATA LINE (CAN H line and CAN L line).
The horn reminder has C mode (horn chirp mode) and S mode (non-horn chirp mode).

Operating function of hazard and horn reminder

	C mode		S mode	
Remote controller operation	Lock	Unlock	Lock	Unlock
Hazard warning lamp flash	Twice	Once	Twice	—
Horn sound	Once	—	—	—

Hazard and horn reminder does not operate if any door switch is ON (any door is OPEN).

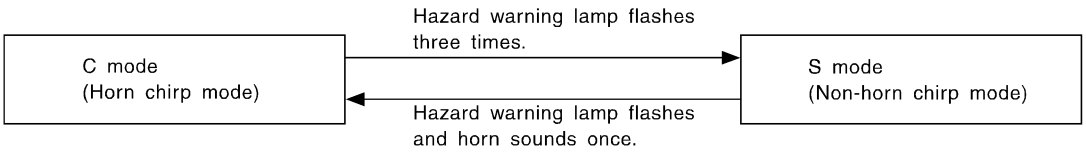
How to change hazard and horn reminder mode

With CONSULT-II

Hazard and horn reminder can be changed using “WORK SUPPORT” mode in “MULTI ANSWER BACK SET”.
Refer to BL-76, "Work Support" .

Without CONSULT-II

When LOCK and UNLOCK signals are sent from the key fob for more than 2 seconds at the same time, the hazard and horn reminder mode is changed and hazard warning lamp flashes and horn sounds as follows:



SEL153WA

Auto Door Lock Operation

Auto lock function signal is sent for operation when any of the following signals are not sent within 1 minute after the unlock signal is sent from the key fob:

- when door switch is turned ON for open.
- when the key switch is turned ON.
- when the lock signal is sent from the key fob.

Auto door lock mode can be changed using “WORK SUPPORT” mode in “AUTO LOCK SET”.
Refer to BL-76, "Work Support" .

Interior Lamp and Step Lamp Operation

When the following conditions come:

- condition of interior lamp switch is DOOR position;
- door switch OFF (when all the doors are closed);

Remote keyless entry system turns on interior lamp (for 30 seconds) with input of UNLOCK signal from key fob.
For detailed description, refer to LT-212, "MAP LAMP TIMER OPERATION" .

Panic Alarm Operation

When key switch is OFF (when ignition key is not inserted in key cylinder), BCM turns on and off horn and headlamp intermittently with input of PANIC ALARM signal from key fob.
The alarm automatically turns off after 25 seconds or when BCM receives any signal from key fob.
For detailed description, refer to BL-132, "PANIC ALARM OPERATION" .

Back Door Operation/For Coupe

When a BACK DOOR OPEN signal is sent with key OFF (ignition key removed from key cylinder) from key fob, power is supplied through BCM terminal 19.
When power and ground are supplied, back door opener actuator opens back door.

Trunk Opener Operation/For Roadster

When a TRUNK OPEN signal is sent with key OFF (ignition key removed from key cylinder) from key fob, power is supplied through BCM terminal 19.
When power and ground are supplied, trunk lid opener actuator opens trunk.

Keyless Power Window Down (open) Operation

When key fob unlock switch is turned ON with ignition switch OFF, and key fob unlock switch is detected to be on continuously for 3 seconds, the driver's door and passenger's door power windows are simultaneously opened.
Power window is operated to open and the operation continues as long as the key fob unlock switch is pressed.

CAN Communication System Description

AIS001O4

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

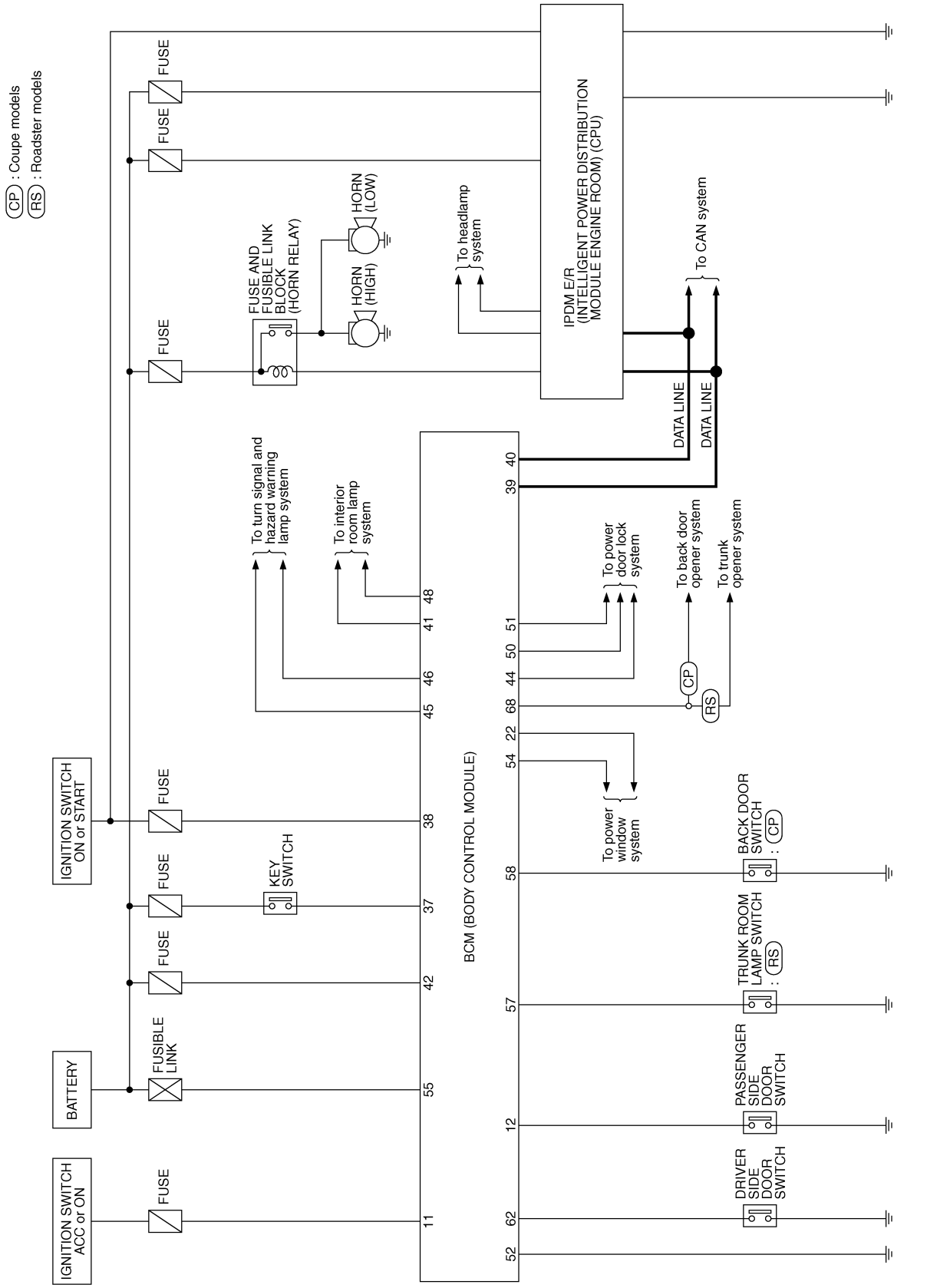
CAN Communication Unit

AIS00411

Refer to LAN-5, "CAN COMMUNICATION" .

Schematic

AIS000CN

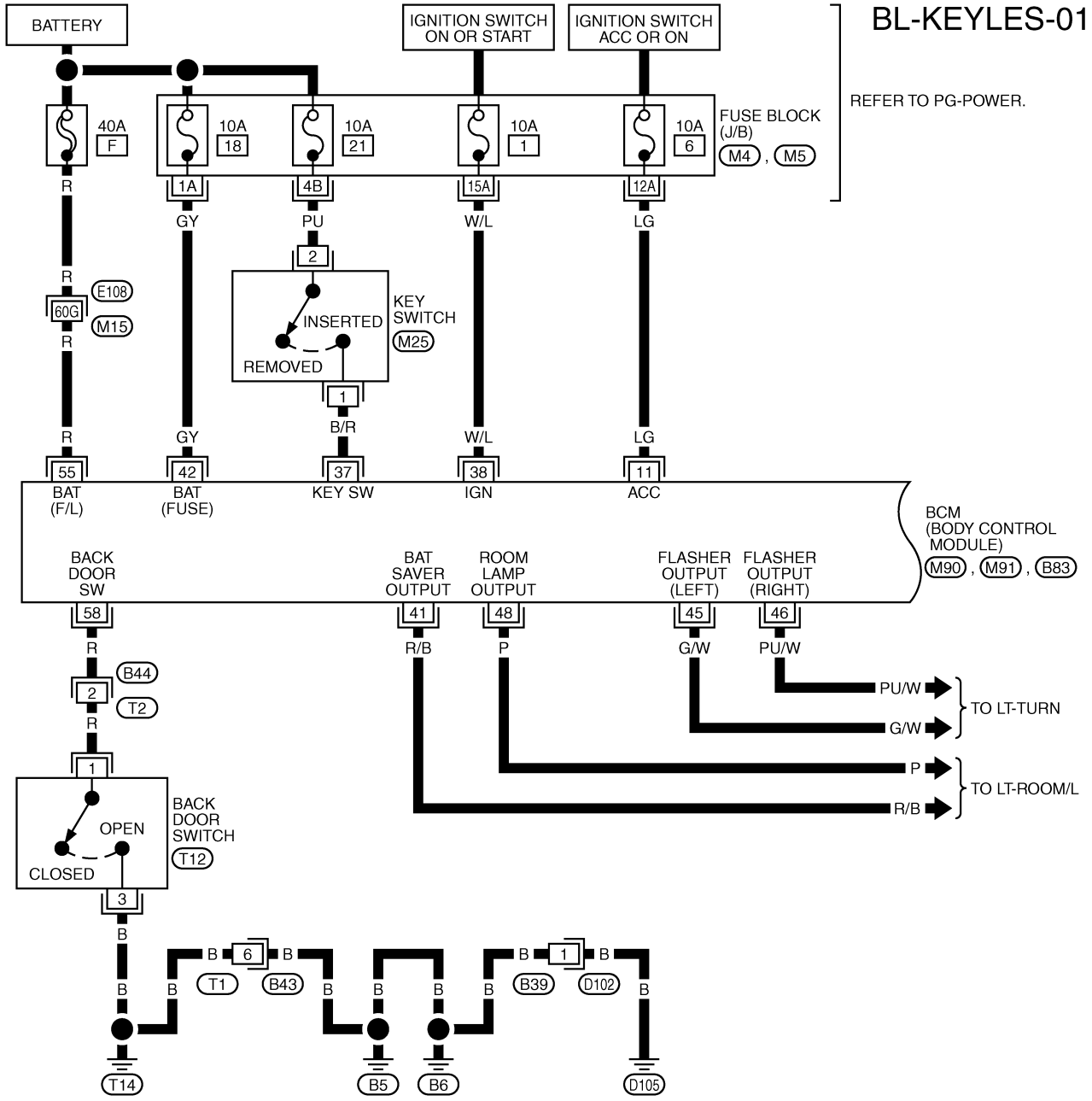


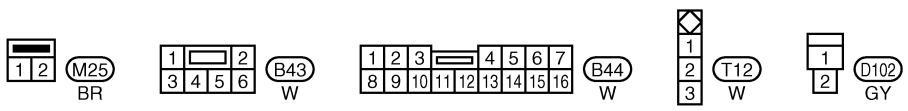
TIWT0796E

Wiring Diagram — KEYLES— /For Coupe

AIS000CO

FIG. 1

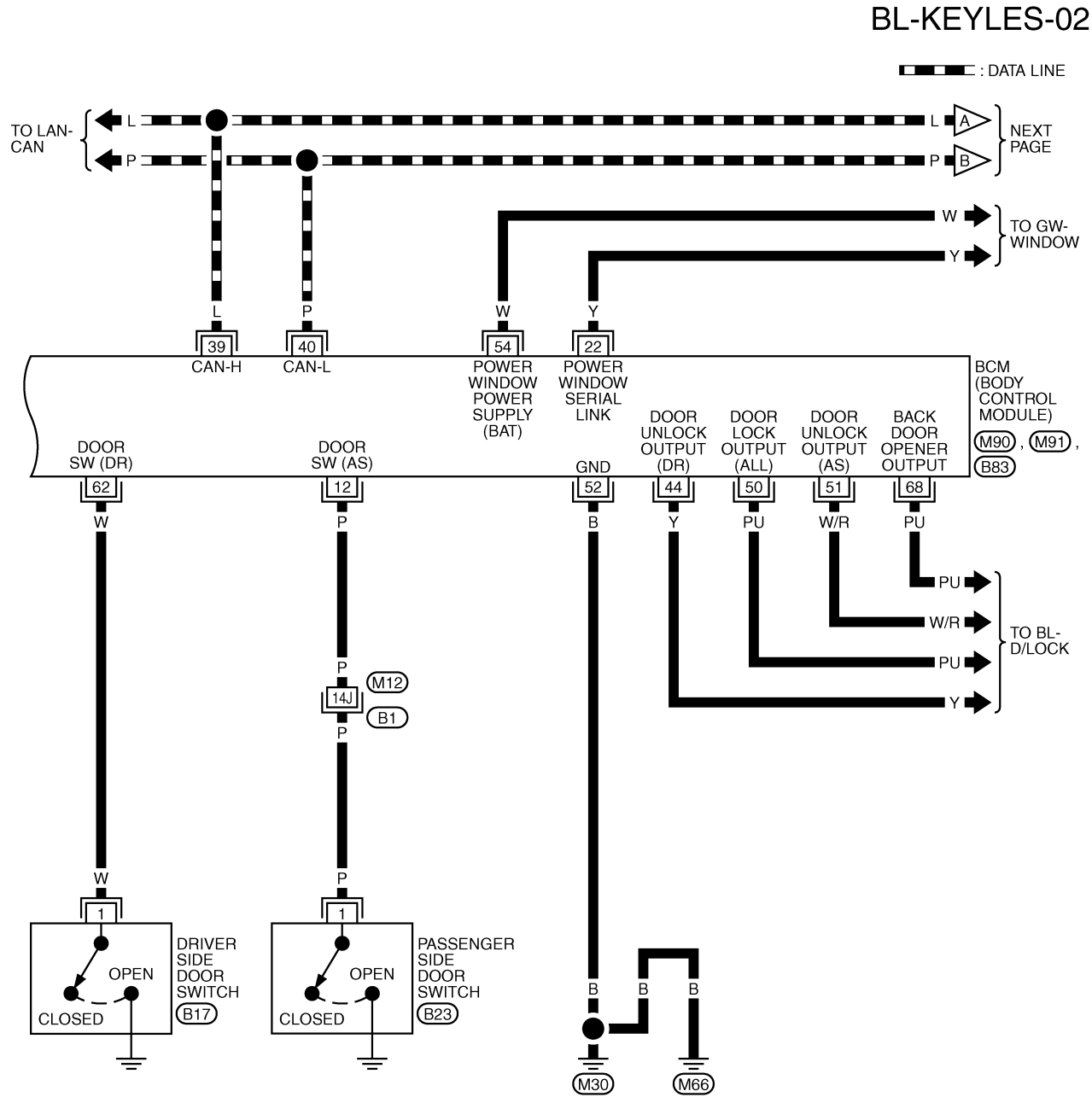




REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)
M90 , M91 , B83 -ELECTRICAL UNITS

TIWT0797E

FIG. 2

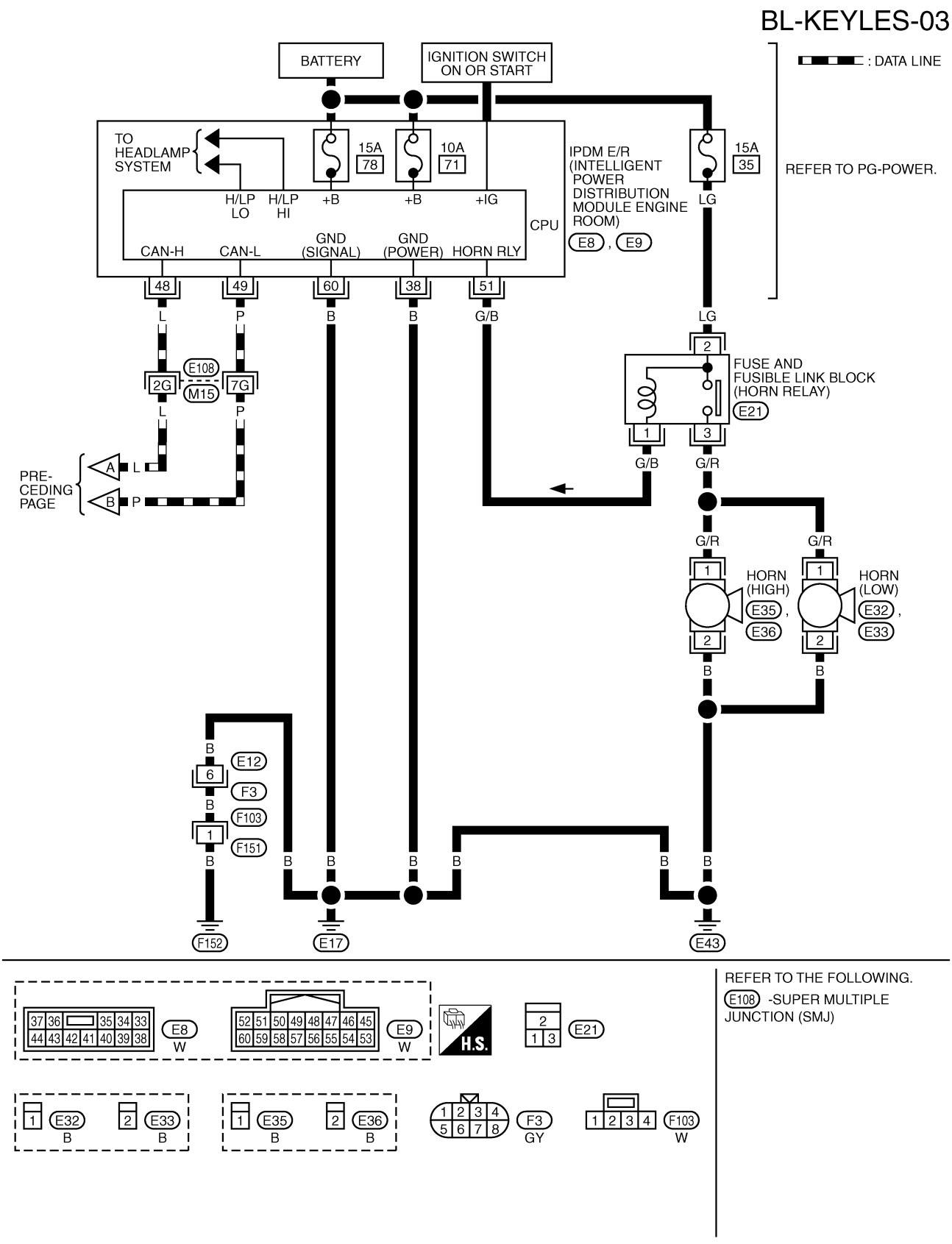


1
2 B17 , B23
3 W W

REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)
M90 , M91 , B83 -ELECTRICAL UNITS

TIWT0798E

FIG. 3



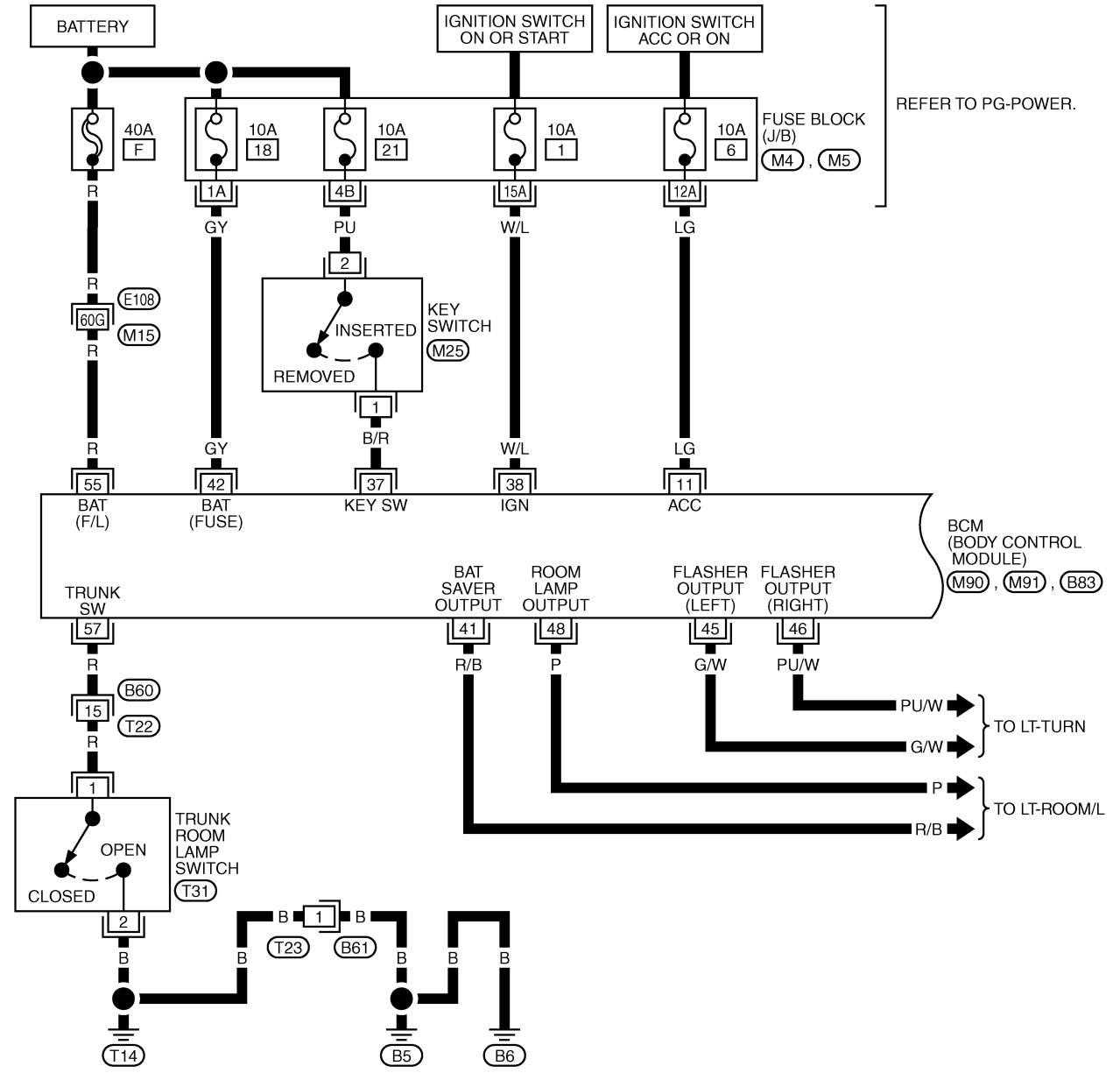
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

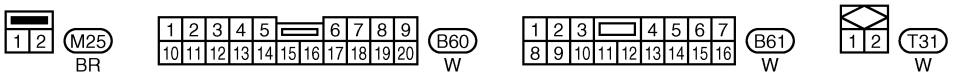
TIWT0776E

Wiring Diagram — KEYLES— /For Roadster

AIS004DJ

BL-KEYLES-04

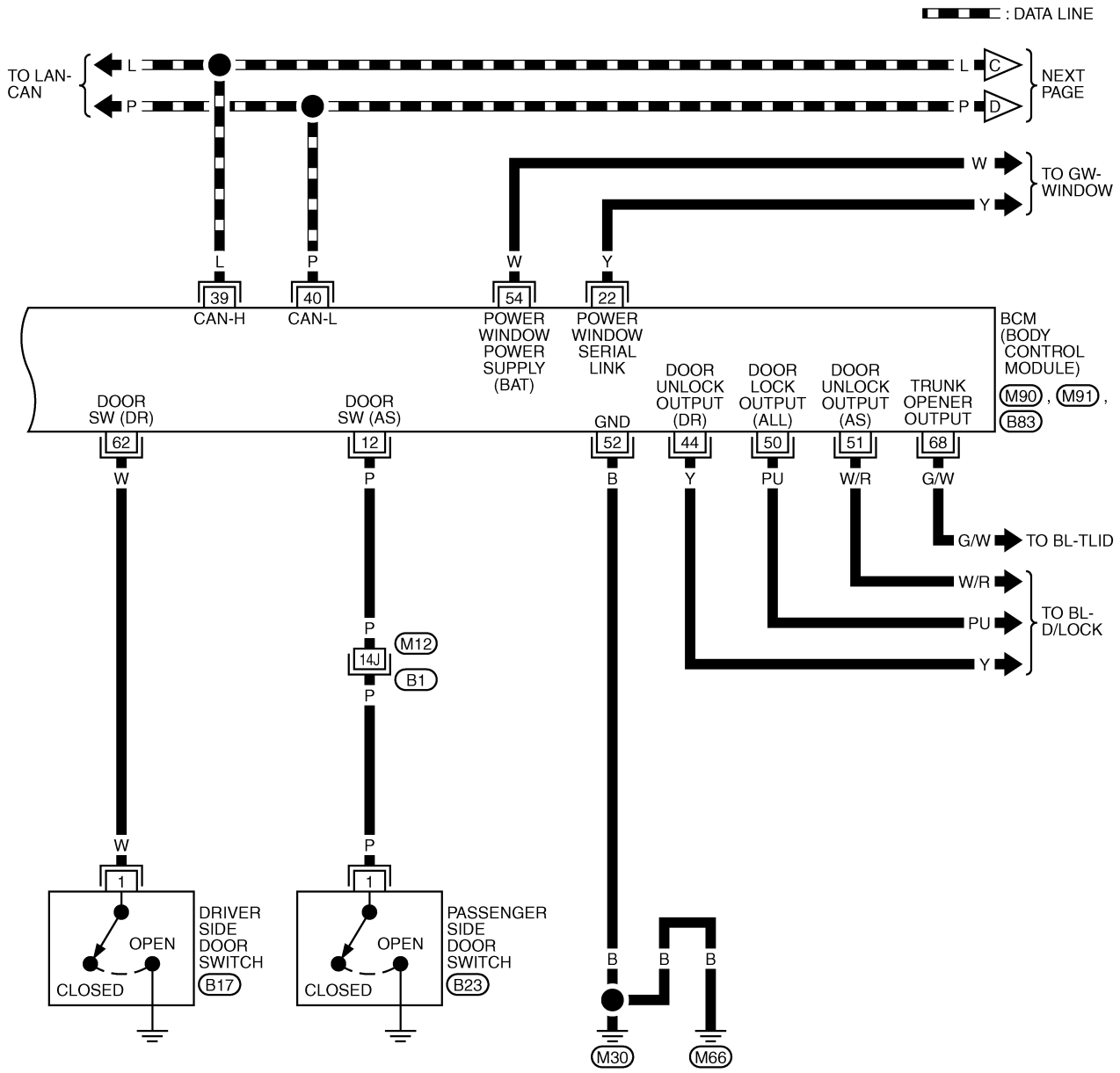




REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)
M90 , M91 , B83 -ELECTRICAL UNITS

TIWT0800E

BL-KEYLES-05

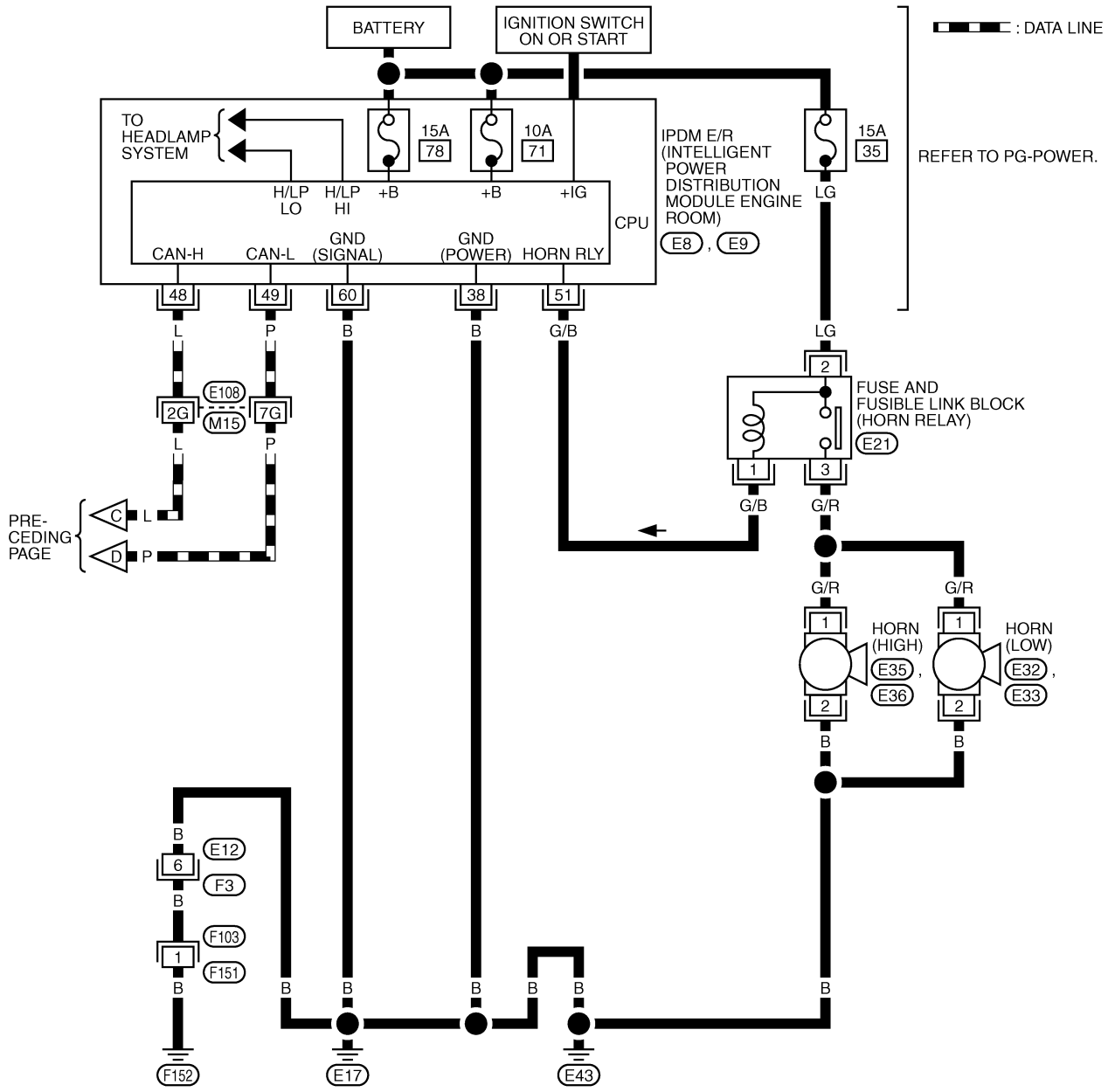


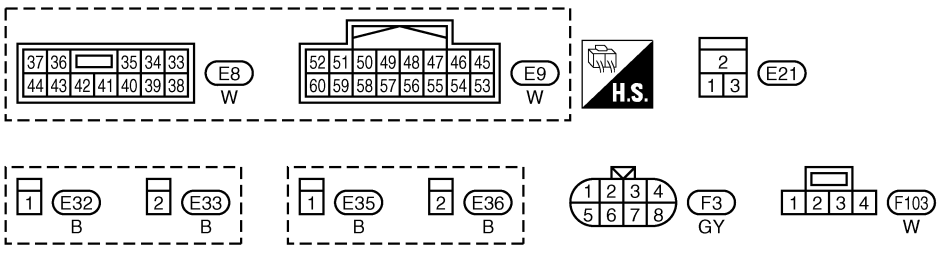
1
2
3
B17, B23
W W

REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)
M90, M91, B83
-ELECTRICAL UNITS

TIWT0801E

BL-KEYLES-06





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TIWT0744E

Terminals and Reference Value for BCM

AIS000CP

Terminal	Wire color	Item	Condition	Voltage (V) (Approx.)
11	LG	Ignition switch (ACC)	Ignition switch (ACC or ON position)	Battery voltage
12	P	Passenger side door switch	ON (Open) → OFF (Closed)	0 → 5
37	B/R	Key switch (Insert)	ON (Key inserted) → OFF (Key removed from IGN key cylinder)	Battery voltage → 0
38	W/L	Ignition switch (ON)	Ignition switch (ON or START position)	Battery voltage
39	L	CAN – H	—	—
40	P	CAN – L	—	—
42	GY	Power source (Fuse)	—	Battery voltage
52	B	Ground	—	0
55	R	Power source (Fusible link)	—	Battery voltage
57	R/W	Back door switch Trunk room lamp switch*2	ON (Open) → OFF (Closed)	0 → Battery voltage*1
62	W	Driver side door switch	ON (Open) → OFF (Closed)	0 → 5

*1: When interior lamp battery saver control is in OFF: Approx 5V.
*2: For roadster.

Terminals and Reference Value for IPDM E/R

AIS001MF

Terminal	Wire color	Item	Condition	Voltage (V) (Approx.)
38	B	Ground	—	0
48	L	CAN – H	—	0
49	P	CAN – L	—	0
51	G/B	Horn relay	When door lock is operated using key fob* (ON → OFF)	Battery voltage → 0
60	B	Ground	—	0

*: In the state that horn reminder operates.

CONSULT-II Function

AIS000CQ

- The following functions are executed by combining data received and command transmitted via the communication line from the BCM.

BCM diagnosis position	Inspection items and diagnosis mode		Description
BCM C/U*	Self-diagnosis results		Carries out the self-diagnosis.
	Data monitor	CAN diagnosis support monitor	Displays CAN communication system diagnosis, displays transmission status, and communication status of each unit communicated with BCM.
		Selection from menu	Displays the input data to BCM on real-time basis.
MULTI REMOTE ENT	Data monitor		Displays the input remote keyless entry system data to BCM on real–time basis.
	Active test		Sends a drive signal to check the operation.
	Work support		Changes the setting for each function.

*:Refer to BCS-16, "CAN Communication Inspection Using CONSULT-II (Self-Diagnosis)" .

CONSULT-II Inspection Procedure for BCM

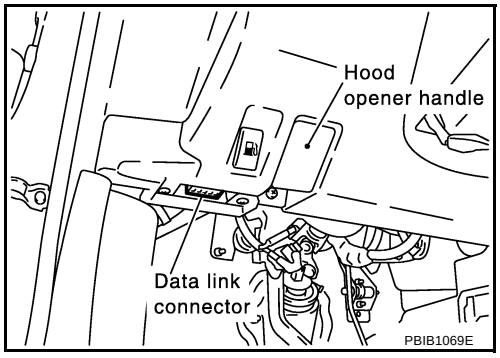
AIS000CR

CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

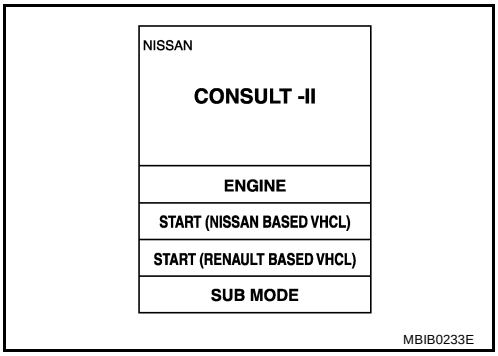
“MULTI REMOTE ENT”

1. Turn ignition switch “OFF”.
2. Connect “CONSULT-II” and “CONSULT-II CONVERTER” to the data link connector.

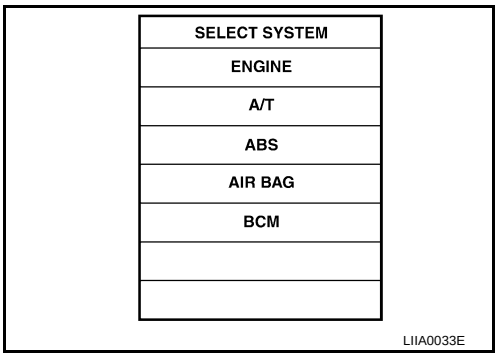


3. Turn ignition switch “ON”.

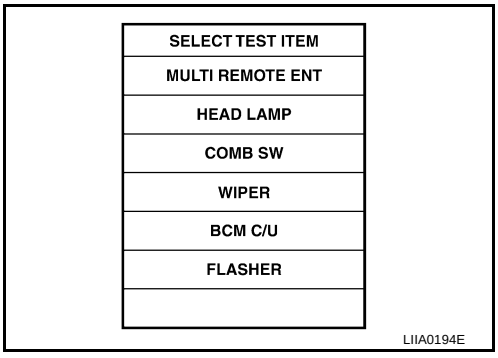
4. Touch “START(NISSAN BASED VHCL)”.



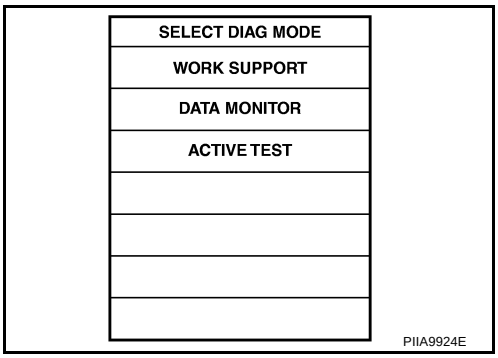
5. Touch “BCM”.
If “BCM” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



6. Touch “MULTI REMOTE ENT”.



7. Select diagnosis mode.
“WORK SUPPORT”, “DATA MONITOR”, “ACTIVE TEST” are available.



CONSULT-II Application Items for BCM

AIS000CS

"MULTI REMOTE CONTENT"

Work Support

Test Item	Description
REMO CONT ID CONFIR	It can be checked whether key fob ID code is registered or not in this mode.
REMO CONT ID REGIST	Key fob ID code can be registered.
REMO CONT ID ERASUR	Key fob ID code can be erased.
MULTI ANSWER BACK SET	Hazard and horn reminder mode can be changed in this mode. The reminder mode will be changed when "MODE SET" on CONSULT-II screen is touched.
AUTO LOCK SET	Auto locking function mode can be changed in this mode. The function mode will be changed when "MODE SET" on CONSULT-II screen is touched.
PANIC ALRM SET	Panic alarm operation mode can be changed in this mode. The operation mode will be changed when "MODE SET" on CONSULT-II screen is touched.
TRUNK OPEN SET	Back door opener operation mode can be changed in this mode. The operation mode will be changed when "MODE SET" on CONSULT-II screen is touched.
	Trunk lid opener operation mode can be changed in this mode. The operation mode will be changed when "MODE SET" on CONSULT-II screen is touched.
PW DOWN SET	Keyless power window down (open) operation mode can be changed in this mode. The operation mode will be changed when"MODE SET" on CONSULT-II screen is touched.

Hazard and horn reminder mode

	ON (C mode)		OFF (S mode)		MODE 3		MODE 4		MODE 5		MODE 6	
Key fob operation	Lock	Unlock	Lock	Unlock	Lock	Unlock	Lock	Unlock	Lock	Unlock	Lock	Unlock
Hazard warning lamp flash	Twice	Once	Twice	—	—	—	Twice	Once	Twice	—	—	Once
Horn sound	Once	—	—	—	—	—	—	—	Once	—	Once	—

Auto door lock operation mode

	MODE 1	MODE 2	MODE 3
Auto locking function	1 minutes	Nothing	5 minutes

Panic alarm operation mode

	MODE 1	MODE 2	MODE 3
Key fob operation	0.5 seconds	Nothing	1.5 seconds

Back door open operation mode

	MODE 1	MODE 2	MODE 3
Key fob operation	0.5 seconds	Nothing	1.5 seconds

Trunk lid open operation mode (Roadster models)

	MODE 1	MODE 2	MODE 3
Key fob operation	0.5 seconds	Nothing	1.5 seconds

Power window down (open) operation mode

	MODE 1	MODE 2	MODE 3
Key fob operation	3 seconds	Nothing	5 seconds

Data Monitor

Monitored Item	Description
IGN ON SW	Indicates [ON/OFF] condition of ignition switch in ON position.
ACC ON SW	Indicates [ON/OFF] condition of ignition switch in ACC position.

Monitored Item	Description
KEY ON SW	Indicates [ON/OFF] condition of key switch.
DOOR SW-DR	Indicates [ON/OFF] condition of driver side door switch.
DOOR SW-AS	Indicates [ON/OFF] condition of passenger side door switch.
BACK DOOR SW	Indicates [ON/OFF] condition of back door switch (For Coupe).
LOCK SW DR/AS	Indicates [ON/OFF] condition of lock signal from lock/unlock switch.
UNLK SW DR/AS	Indicates [ON/OFF] condition of unlock signal from lock/unlock switch.
KEY CYL LK SW	Indicates [ON/OFF] condition of lock signal from door key cylinder switch.
LK BUTTON/SIG	Indicates [ON/OFF] condition of lock signal from key fob.
UN BUTTON/SIG	Indicates [ON/OFF] condition of unlock signal from key fob.
PANIC BTN	Indicates [ON/OFF] condition of panic signal from key fob.
TRUNK OPNR SW	Indicates [ON/OFF] condition of trunk room lamp switch (For Roadster).
TRUNK BTN/SIG	Indicates [ON/OFF] condition of back door open signal from key fob.
	Indicates [ON/OFF] condition of trunk open signal from key fob. (For Roadster)
TRUNK OPN MNTR	Indicates [ON/OFF] condition of trunk lid opener switch. (For Roadster)
UN BUTTON ON	Indicates [ON/OFF] condition of unlock signal from key fob.
LK/UN BTN ON	Indicates [ON/OFF] condition of lock/unlock signal at the same time from key fob.
DOOR SW-RR	This is displayed even when it is not equipped.

Active Test

Test Item	Description
INT LAMP	This test is able to check interior lamp operation. The interior lamp is turned on when “ON” on CONSULT-II screen is touched.
IGN ILLUM	This is displayed even when it is not equipped.
TRUNK/BACK DOOR	This test is able to check back door (For Coupe) or trunk lid (For Roadster) opener actuator operation. The back door (For Coupe) or trunk (For Roadster) is unlocked when “ON” on CONSULT-II screen is touched.
HORN	This test is able to check panic alarm and horn reminder operations. The horn activate for 0.02 seconds after “ON” on CONSULT-II screen is touched.
HEAD LAMP(HI)	This test is able to check headlamps panic alarm operation. The headlamp illuminates for 0.5 seconds after “ON” on CONSULT-II screen is touched.
POWER WINDOW DOWN	This test is able to check power window open operation. The front power windows activate for 10 seconds after “ON” or CONSULT-II screen is touched.
FLASHER RIGHT	This test is able to check hazard reminder operation. The right hazard lamp turns on when “ON” on CONSULT-II screen is touched.
FLASHER LEFT	This test is able to check hazard reminder operation. The left hazard lamp turns on when “ON” on CONSULT-II screen is touched.
FLASHER RIGHT (CAN)	This test is able to check hazard reminder operation. The right hazard indicator lamp turns on when “ON” on CONSULT-II screen is touched.
FLASHER LEFT (CAN)	This test is able to check hazard reminder operation. The left hazard indicator lamp turns on when “ON” on CONSULT-II screen is touched.

CONSULT-II Inspection Procedure for IPDM E/R

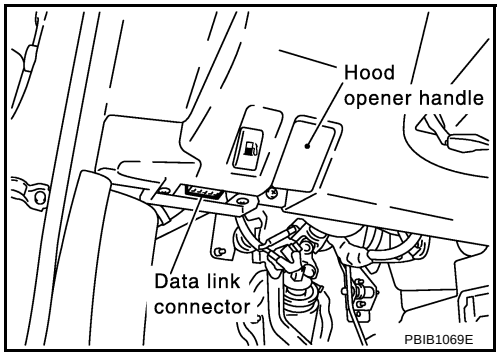
AIS004U6

CAUTION:

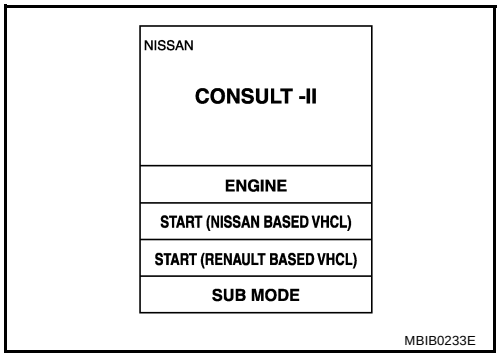
If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

“IPDM E/R”

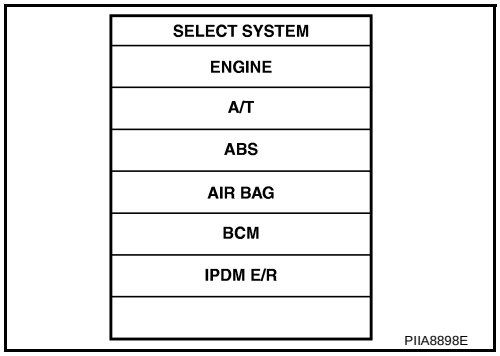
1. Turn ignition switch “OFF”.
2. Connect “CONSULT-II” and “CONSULT-II CONVERTER” to the data link connector.



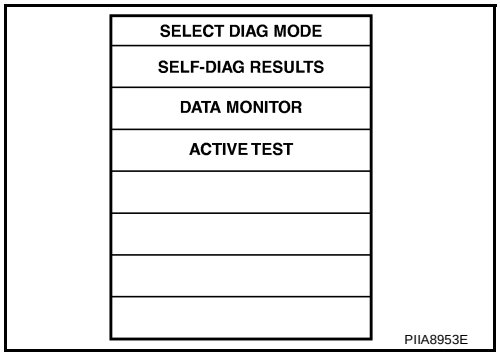
3. Turn ignition switch “ON”.
4. Touch “START(NISSAN BASED VHCL)”.



5. Touch “IPDM E/R”.
   If “IPDM E/R” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



6. Select diagnosis mode.
   “SELF-DIAG RESULTS”, “DATA MONITOR” and “ACTIVE TEST” are available.



CONSULT-II Application Items for IPDM E/R

AIS004U7

DATA MONITOR

Monitored Item	Description
HORN CHIRP	Indicates [ON/OFF] condition of horn function by IPDM E/R.

ACTIVE TEST

Test Item	Description
HORN	This test is able to check horn operation. Horn activates when “ON” on CONSULT-II screen is touched.

Work Flow

AIS000CT

1. Check the trouble symptom and customer's requests.
2. Understand outline of system. Refer to BL-63, "System Description" .
3. Confirm that power door lock system operates normally. Refer to BL-21, "POWER DOOR LOCK SYSTEM" .
4. Refer to trouble diagnosis chart by symptom, repair or replace any malfunctioning parts. Refer to BL-79, "Trouble Diagnosis Chart by Symptom" .
5. Inspection end.

Trouble Diagnosis Chart by Symptom

AIS000CV

NOTE:

- Always check the “Work Flow” before troubleshooting. Refer to BL-79, "Work Flow" .
- Always check key fob battery before replacing key fob.
- The panic alarm operation, back door or trunk lid (Roadster models) opener operation and keyless power window down operation of remote keyless entry system do not activate with the ignition key inserted in the ignition key cylinder.

Symptom	Diagnoses/service procedure	Reference page
All functions of remote keyless entry system do not operate.	1. Key fob battery and function check	BL-81
	2. Replace key fob. Refer to ID Code Entry Procedure. **NOTE:** If the result of key fob function check with CONSULT-II is OK, key fob is not malfunctioning.	BL-93
	3. Replace BCM	BCS-17
The new ID of key fob cannot be entered without CONSULT-II.	1. Key fob battery and function check	BL-81
	2. Key switch check	BL-89
	3. Door switch check	BL-83
	4. ACC switch check	BL-82
	5. Door lock and unlock switch check	BL-43
	6. Replace key fob. Refer to ID Code Entry Procedure. **NOTE:** If the result of key fob function check with CONSULT-II is OK, key fob is not malfunctioning.	BL-93
	7. Replace BCM	BCS-17
Door lock or unlock does not work.	1. Door lock operation check.	BL-23
	2. Key fob battery and function check.	BL-81
	3. Replace key fob. Refer to ID Code Entry Procedure. **NOTE:** If the result of key fob function check with CONSULT-II is OK, key fob is not malfunctioning.	BL-93
	4. Replace BCM	BCS-17

Symptom	Diagnoses/service procedure	Reference page
Back door does not open when back door opener button is continuously pressed.	1. Back door opener operation check.	BL-23
	2. Back door open operation mode check.	BL-76
	3. Key fob battery and function check	BL-81
	4. Key switch check	BL-89
	5. Replace BCM	BCS-17
Trunk does not open when trunk opener button is continuously pressed. (Roadster models)	1. Trunk opener operation check.	BL-119
	2. Trunk open operation mode check.	BL-76
	3. Key fob battery and function check	BL-81
	4. Key switch check	BL-89
	5. Replace BCM	BCS-17
Hazard reminder does not activate properly when pressing lock or unlock button of key fob.	1. Hazard reminder mode check* *: Hazard reminder can be activated or deactivated. First check the hazard reminder setting.	BL-76
	2. Check hazard warning lamp function with hazard switch.	LT-144
	3. Door switch check	BL-83
	4. Replace BCM	BCS-17
Horn reminder does not activate properly when pressing lock button of key fob.	1. Horn reminder mode check* *: Horn reminder can be activated or deactivated. First check the horn chirp setting.	BL-76
	2. Check horn chirp function with horn switch.	BL-92
	3. Door switch check	BL-83
	4. IPDM E/R operation check	BL-91
	5. Replace BCM	BCS-17
Interior lamp and step lamp operation do not activate properly.	1. Interior lamp and step lamp operation check	BL-92
	2. Door switch check	BL-83
	3. Replace BCM	BCS-17
Panic alarm (horn and headlamp) does not activate when panic alarm button is continuously pressed.	1. Panic alarm mode check* *: Panic alarm can be activated or deactivated. First check the Panic alarm setting.	BL-76
	2. Key fob battery and function check	BL-81
	3. Headlamp alarm check	BL-92
	4. Check horn chirp function with horn switch.	BL-92
	5. IPDM E/R operation check	BL-91
	6. Key switch check	BL-89
	7. Replace key fob. Refer to ID Code Entry Procedure. **NOTE:** If the result of key fob function check with CONSULT-II is OK, key fob is not malfunctioning.	BL-93
	8. Replace BCM	BCS-17
Auto door lock operation does not activate properly. (All other remote keyless entry system function is OK.)	1.Auto door lock operation mode check* *: Auto door lock operation can be activated or deactivated. First check the auto door lock operation setting.	BL-76
	2. Replace BCM	BCS-17
Keyless power window down (open) operation does not activate properly. (All other remote keyless entry system function is OK.)	1. Power window down operation mode check* *: Power window down operation can be activated or deactivated. First check the power window down setting.	BL-76
	2. Check power window function	GW-19
	3. Replace BCM	BCS-17

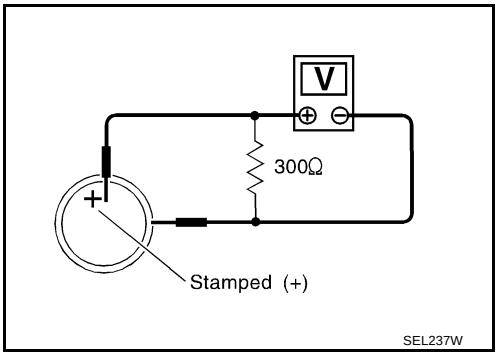
Key Fob Battery and Function Check

AIS000CW

1. CHECK KEY FOB BATTERY

1. Remove key fob battery. Refer to BL-96, "Key Fob Battery Replacement" .
2. Measure voltage between battery positive and negative terminals.

Voltage : 2.5 - 3.0V



NOTE:
Key fob does not function if battery is not set correctly.

OK or NG

OK >> GO TO 2
NG >> Replace battery.

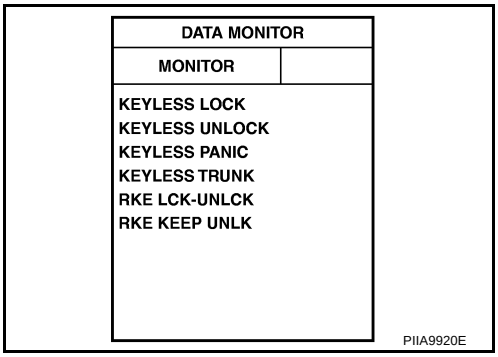
2. CHECK KEY FOB FUNCTION

With CONSULT-II

Check key fob function in “DATA MONITOR” mode with CONSULT-II.

When pushing each button of key fob, the corresponding monitor item should be turned as follows.

Condition	Monitor item	
Pushing LOCK	KEYLESS LOCK	: ON
Pushing UNLOCK	KEYLESS UNLOCK	: ON
Keep pushing UNLOCK	RKE KEEP UNLK *: "RKE KEEP UNLK" turns to ON 3 seconds after UNLOCK button keeps pushing.	: ON*
Pushing TRUNK	KEYLESS TRUNK	: ON
Pushing PANIC	KEYLESS PANIC	: ON
Pushing LOCK and UNLOCK at the same time	RKE LCK - UNLCK	: ON



OK or NG

OK >> Key fob is OK.
NG >> Replace key fob.

ACC Switch Check

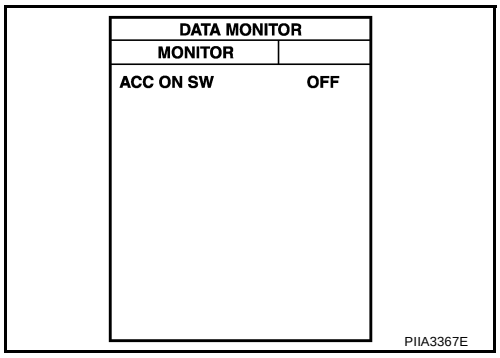
AIS001OV

1. CHECK ACC SWITCH

With CONSULT-II

Check ACC switch (“ACC ON SW”) in “DATA MONITOR” mode with CONSULT-II.

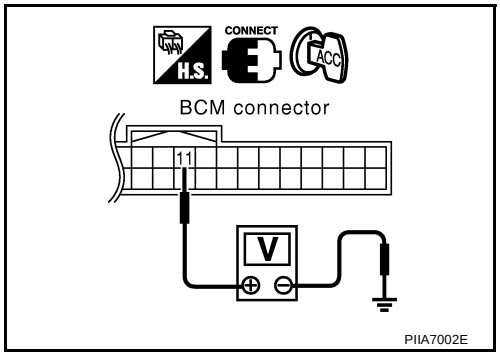
Monitor item	Condition	
ACC ON SW	Ignition switch position is ACC or ON	: ON
	Ignition switch position is OFF	: OFF



Without CONSULT-II

Check voltage between BCM connector and ground.

Item	Con-nector	Terminals (Wire color)		Condition	Voltage [V] (Approx.)
		(+)	(–)		
Ignition switch	M90	11 (LG)	Ground	ACC or ON	Battery voltage
				OFF	0



OK or NG

OK >> ACC switch is OK.

NG >> Check the following.

- 10A fuse [No. 6, located in fuse block (J/B)]
- Harness for open or short between BCM and fuse

Door Switch Check

AIS000CX

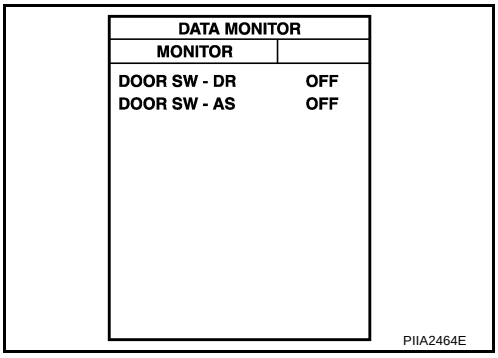
DRIVER SIDE DOOR SWITCH AND PASSENGER SIDE DOOR SWITCH CHECK

1. CHECK DOOR SWITCH INPUT SIGNAL

With CONSULT-II

Check door switches (“DOOR SW-DR” and “DOOR SW-AS”) in “DATA MONITOR” mode with CONSULT-II.

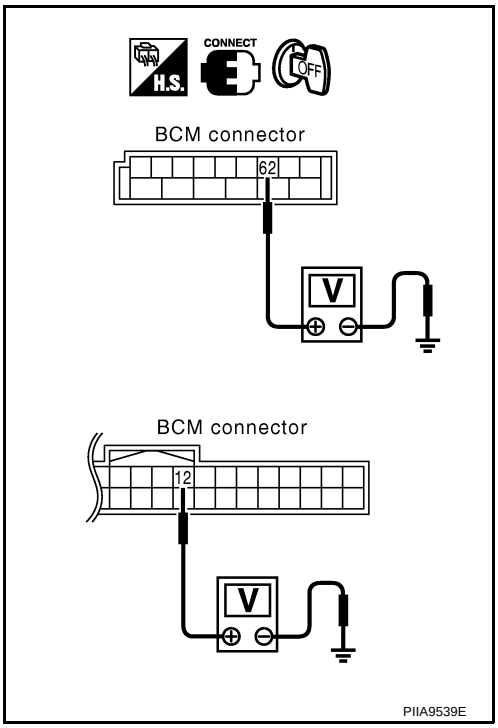
Monitor item	Condition	
DOOR SW-DR	OPEN	: ON
	CLOSE	: OFF
DOOR SW-AS	OPEN	: ON
	CLOSE	: OFF



Without CONSULT-II

Check voltage between BCM connector and ground.

Item	Con-nector	Terminals (Wire color)		Condition	Voltage [V] (Approx.)
		(+)	(–)		
Driver side door switch	B83	62 (W)	Ground	Open	0
				Close	5
Passenger side door switch	M90	12 (P)		Open	0
				Close	5



OK or NG

OK >> Door switch is OK.

NG >> GO TO 2.

2. CHECK DOOR SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect door switch and BCM connector.
3. Check continuity between door switch harness connector B17, B23 terminal 1 and BCM harness connector B83 terminal 62 (driver side) or M90 terminal 12 (passenger side).

Driver side door

1 (W) - 62 (W) : Continuity should exist.

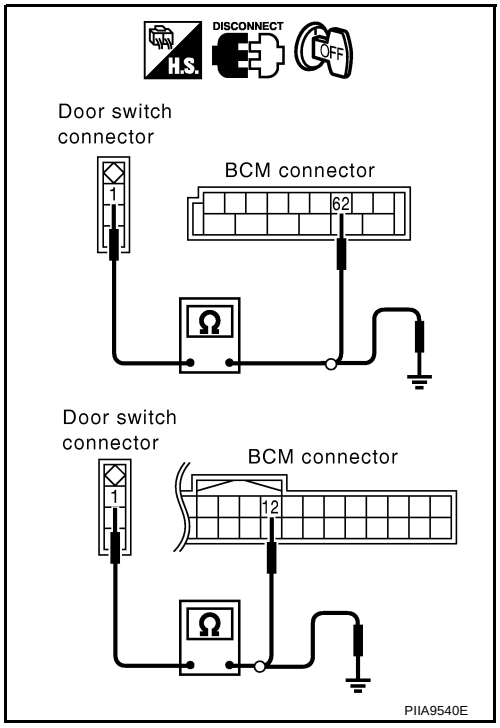
Passenger side door

1 (P) - 12 (P) : Continuity should exist.

4. Check continuity between door switch harness connector B17, B23 terminal 1and ground.

Each door switch

1 (W or P) - Ground : Continuity should not exist.



OK or NG

OK >> GO TO 3.
NG >> Repair or replace door switch harness.

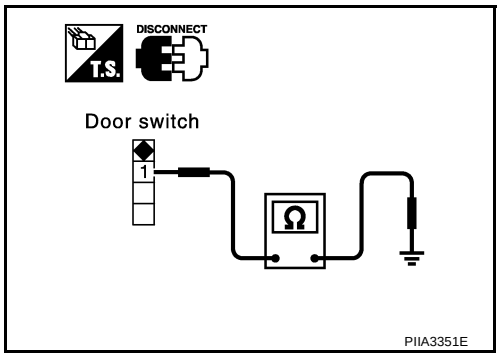
3. CHECK DOOR SWITCH

Check continuity between door switch B17 (driver side) or B410 (passenger side) terminal 1 and ground part of door switch.

Terminal		Condition of door switch	Continuity
1	Ground part of door switch	Pushed	No
		Released	Yes

OK or NG

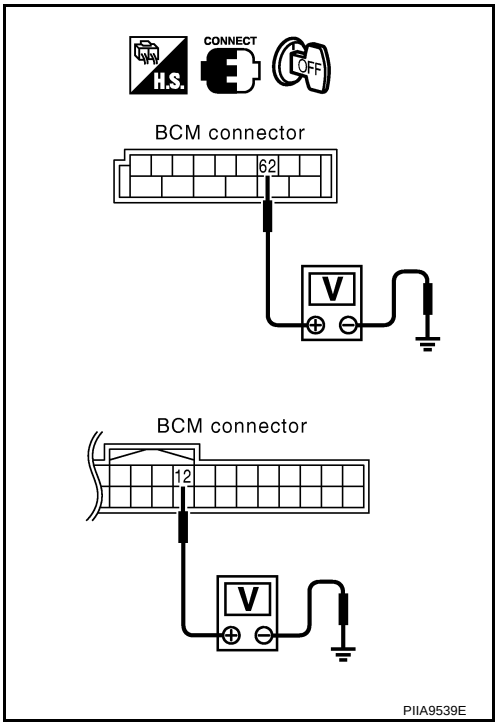
OK >> GO TO 4.
NG >> Replace door switch.



4. CHECK DOOR SWITCH INPUT SIGNAL

1. Connect BCM connector.
2. Check voltage between BCM harness connectors B4 (driver side), M1 (passenger side) terminals 62, 12 and ground.

62 (Y) – Ground	**: Approx. 5V**
12 (P) – Ground	**: Approx. 5V**



OK or NG

OK >> Check harness connection.
NG >> Replace BCM.

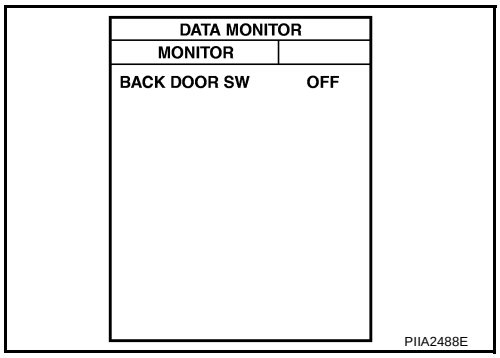
BACK DOOR SWITCH CHECK/FOR COUPE

1. CHECK BACK DOOR SWITCH INPUT SIGNAL

With CONSULT-II

Check back door switch (“BACK DOOR SW”) in “DATA MONITOR” mode with CONSULT-II.

Monitor item	Condition	
BACK DOOR SW	OPEN	: ON
	CLOSE	: OFF

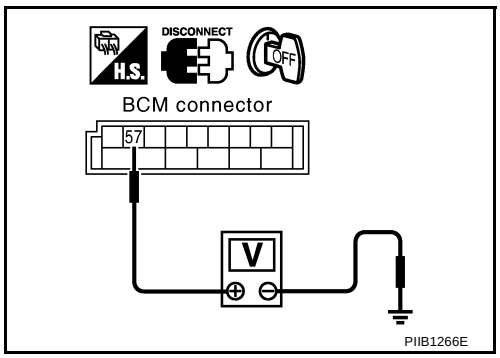


Without CONSULT-II

1. Turn ignition switch OFF.
2. Check voltage between BCM connector and ground.

Connector	Terminals (Wire color)		Condition of back door switch	Voltage [V] (Approx.)
	(+)	(–)		
B83	57 (R/W)	Ground	Open	0
			Close	Battery voltage*

* : When interior lamp battery saver control is in OFF. → Approx. 5V



OK or NG

OK >> Back door switch circuit is OK.
NG >> GO TO 2.

2. CHECK DOOR SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect back door switch and BCM connector.
3. Check continuity between BCM harness connector B83 terminal 57 and back door switch harness connector T12 terminal 1.

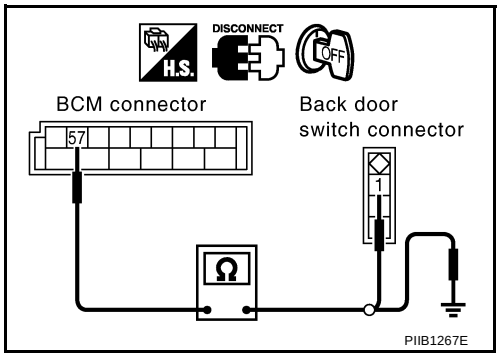
57 (R) - 1 (R) : Continuity should exist.

4. Check continuity between BCM harness connector B83 terminal 57 and ground.

57 (R) - Ground : Continuity should not exist.

OK or NG

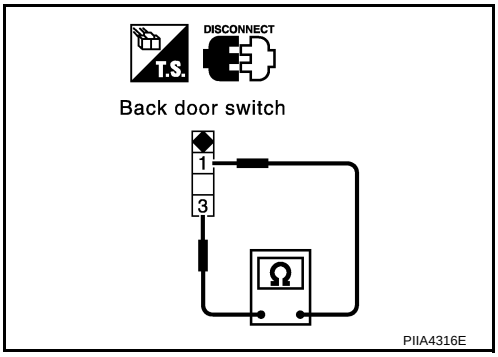
OK >> GO TO 3.
NG >> Repair or replace back door switch harness.



3. CHECK BACK DOOR SWITCH

Check continuity between back door switch terminals 1 and 3.

Connector	Terminal		Condition of back door switch	Continuity
T12	1	3	Open position	Yes
			Closed position	No



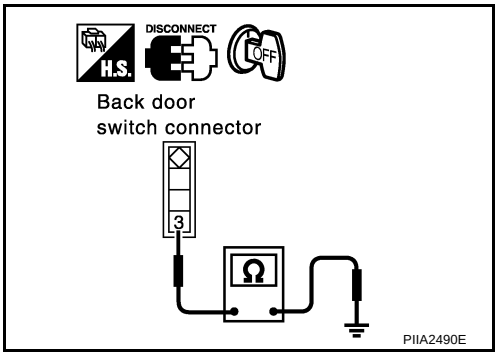
OK or NG

OK >> GO TO 4.
NG >> Replace back door switch.

4. CHECK BACK DOOR SWITCH GROUND CIRCUIT

Check continuity between door switch harness connector T12 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.



OK or NG

OK >> Check harness connection.
NG >> Repair or replace back door switch harness.

Trunk Room Lamp Switch Check/For Roadster

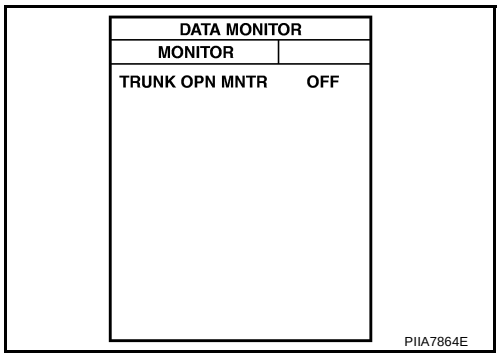
AIS003XV

1. CHECK TRUNK ROOM LAMP SWITCH INPUT SIGNAL

With CONSULT-II

Check trunk lid opener switch (“TRUNK OPN MNTR”) in “DATA MONITOR” mode with CONSULT-II.

Monitor item	Condition	
TRNK OPN MNTR	OPEN	: ON
	CLOSE	: OFF

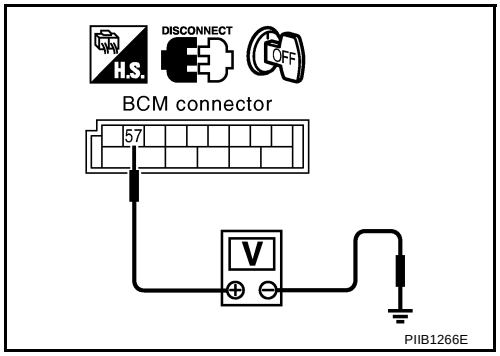


Without CONSULT-II

Check voltage between BCM connector and ground.

Connector	Terminals (Wire color)		Condition of trunk room lamp switch	Voltage [V] (Approx.)
	(+)	(–)		
B83	57 (R)	Ground	Open	0
			Close	Battery voltage*

*: When interior lamp battery saver control is in OFF. → Approx. 5V.



OK or NG

OK >> Trunk room lamp switch is OK.
NG >> GO TO 2.

2. CHECK TRUNK ROOM LAMP SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect back door switch and BCM connector.
3. Check continuity between BCM harness connector B83 terminal 57 and trunk room lamp switch harness connector T31 terminal 1.

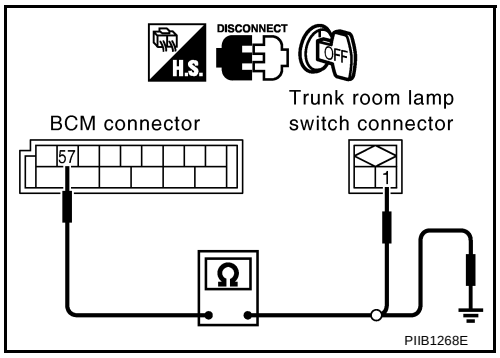
   57 (R) - 1 (R) : Continuity should exist.

4. Check continuity between BCM harness connector B83 terminal 57 and ground.

   57 (R) - Ground : Continuity should not exist.

OK or NG

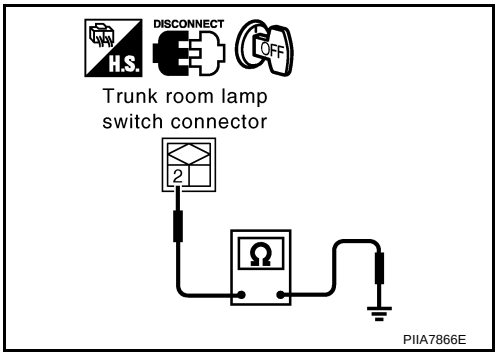
OK >> GO TO 3.
NG >> Repair or replace trunk room lamp switch harness.



3. CHECK TRUNK ROOM LAMP SWITCH GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect trunk room lamp switch connector.
3. Check continuity between trunk room lamp connector T31 terminal 2 and ground.

2 (B) - Ground : Continuity should exist.



OK or NG

OK >> Check trunk room lamp switch.
NG >> Repair or replace trunk room lamp switch harness.

Key Switch Check

AIS000CZ

1. CHECK KEY SWITCH INPUT SIGNAL

With CONSULT-II

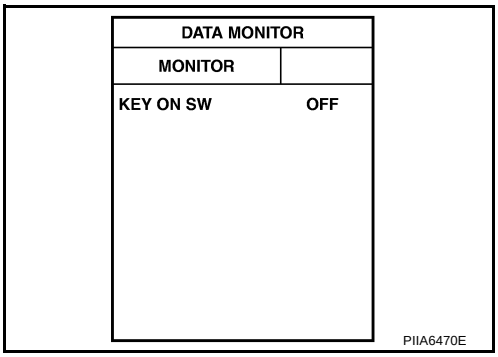
Check key switch “KEY ON SW” in “DATE MONITOR” mode with CONSULT-II

- When key is inserted in ignition key cylinder

  KEY ON SW :ON

- When key is removed in ignition key cylinder

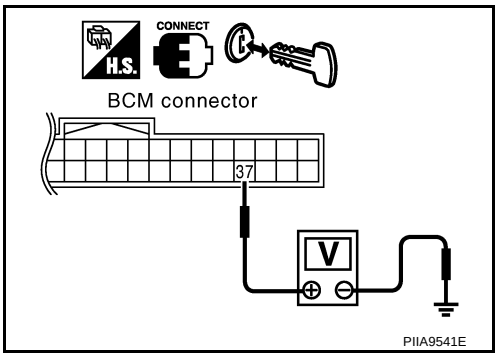
  KEY ON SW :OFF



Without CONSULT-II

Check voltage between BCM connector and ground.

Connector	Terminal (Wire color)		Condition of key switch	Voltage (V) (Approx.)
	(+)	(–)		
M90	37 (B/R)	Ground	Inserted	Battery voltage
			Removed	0



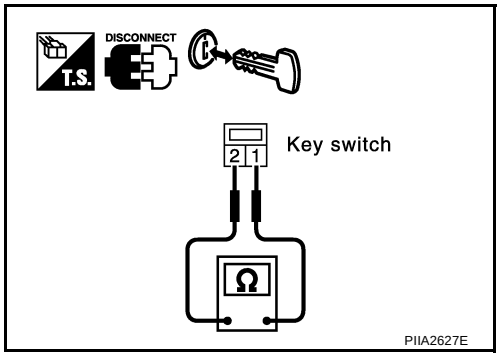
OK or NG

OK >> Key switch is OK.
NG >> GO TO 2.

2. CHECK KEY SWITCH

Check continuity key switch terminals 1 and 2.

Connector	Terminals		Condition of key switch	Continuity
M25	1	2	Inserted	Yes
			Removed	No



OK or NG

OK >> GO TO 3.
NG >> Replace key switch.

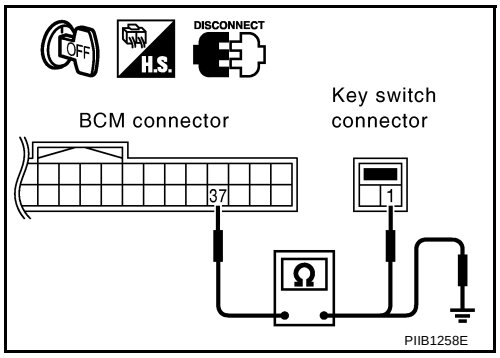
3. CHECK KEY SWITCH CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M90 terminal 37 and key switch harness connector M25 terminal 1.

37 (B/R) - 1 (B/R) : Continuity should exist.

3. Check continuity between BCM harness connector M90 terminal 37 and ground.

37 (B/R) - Ground : Continuity should not exist.



OK or NG

OK >> Check the following.
- 10A fuse [No.21, located in the fuse block (J/B)]
- Harness for open or short between key switch and fuse

NG >> Repair or replace harness.

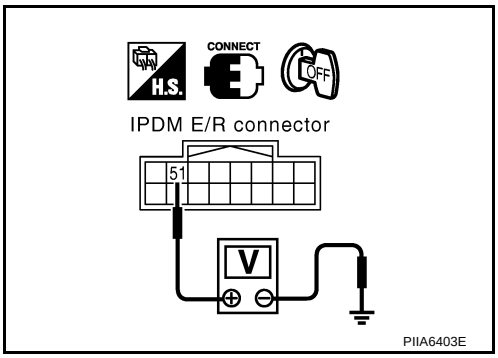
IPDM E/R Operation Check

AIS001NY

1. CHECK IPDM E/R INPUT SIGNAL

Check voltage between IPDM E/R connector E9 terminal 51 and ground.

51 (G/B) – Ground : Battery voltage



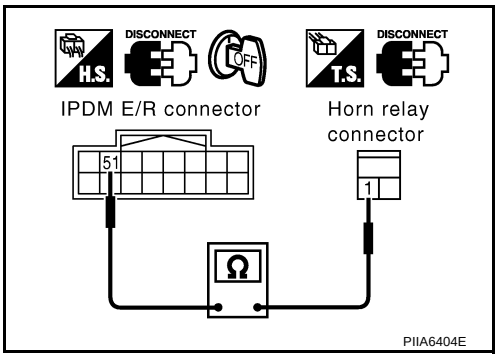
OK or NG

OK >> Replace IPDM E/R.
NG >> GO TO 2.

2. CHECK IPDM E/R CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R and horn relay connector.
3. Check continuity between IPDM E/R harness connector E9 terminal 51 and horn relay harness connector E21 terminal 1.

1 (G/B) - 51(G/B) : Continuity should exist.



OK or NG

OK >> Check harness connection.
NG >> Repair or replace harness.

Horn Function Check

AIS000D2

First perform the “SELF-DIAG RESULTS” in “BCM” with CONSULT-II, then perform the trouble diagnosis of malfunction system indicated “SELF-DIAG RESULTS” of “BCM”. Refer to BCS-16, "CAN Communication Inspection Using CONSULT-II (Self-Diagnosis)" .

1. CHECK HORN OPERATION

Check if horn sounds with horn switch.

Does horn operate?

Yes >> Horn circuit is OK.
No >> Check horn circuit. Refer to WW-55, "Wiring Diagram — HORN —" .

Headlamp Alarm Check

AIS001OW

First perform the “SELF-DIAG RESULTS” in “BCM” with CONSULT-II, then perform the trouble diagnosis of malfunction system indicated “SELF-DIAG RESULTS” of “BCM”. Refer to BCS-16, "CAN Communication Inspection Using CONSULT-II (Self-Diagnosis)" .

1. CHECK HEADLAMP OPERATION

Does headlamp come on when turning lighting switch “ON”.

YES or NO

Yes >> Headlamp alarm circuit is OK.
No >> Check headlamp system. Refer to LT-7, "HEADLAMP (FOR USA) - XENON TYPE -" , LT-38, "HEADLAMP (FOR USA) - CONVENTIONAL TYPE -" , LT-68, "HEADLAMP (FOR CANADA) - XENON TYPE -" , LT-105, "HEADLAMP (FOR CANADA) - CONVENTIONAL TYPE -" .

Interior Lamp and Step Lamp Operation Check

AIS000D3

1. CHECK ILLUMINATION OPERATION

When interior lamp switch is in “DOOR” position, open the door (driver side or passenger side).

Interior lamp and step lamp should illuminate.

OK or NG

OK >> Interior lamp and step lamp circuit is OK.
NG >> Check illumination circuit. Refer to LT-215, "Wiring Diagram — ROOM/L —" .

ID Code Entry Procedure

AIS000D4

KEY FOB ID SETUP WITH CONSULT-II

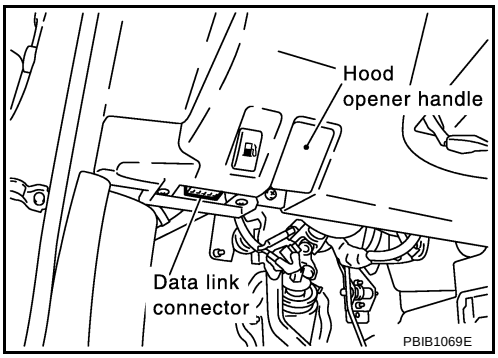
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

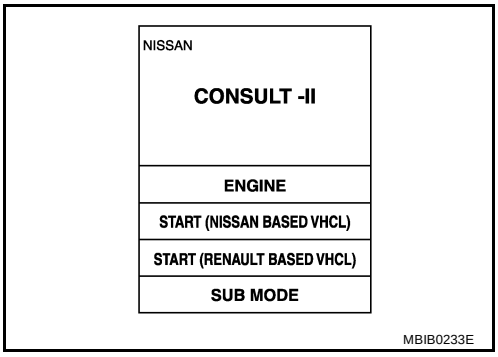
NOTE:

If a key fob is lost, the ID code of the lost key fob must be erased to prevent unauthorized use. When the ID code of a lost key fob is not known, all controller ID codes should be erased. After all ID codes are erased, the ID codes of all remaining and/or new key fobs must be re-registered.

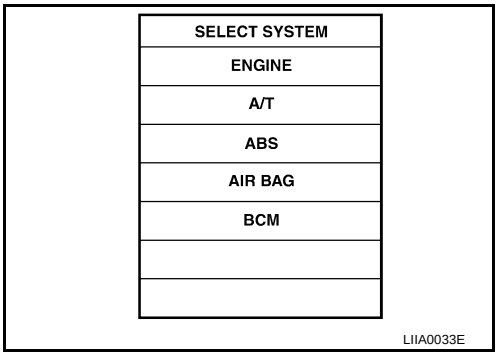
1. Turn ignition switch “OFF”.
2. Connect “CONSULT-II” and “CONSULT-II CONVERTER” to the data link connector.



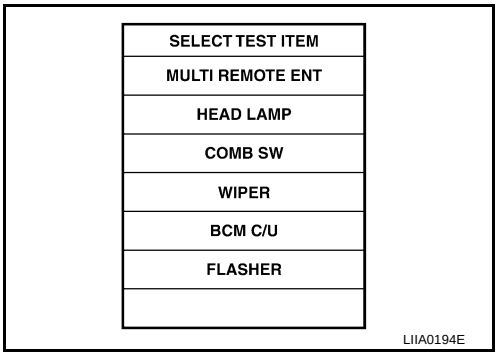
3. Turn ignition switch ON.
4. Touch “START (NISSAN BASED VHCL)”.



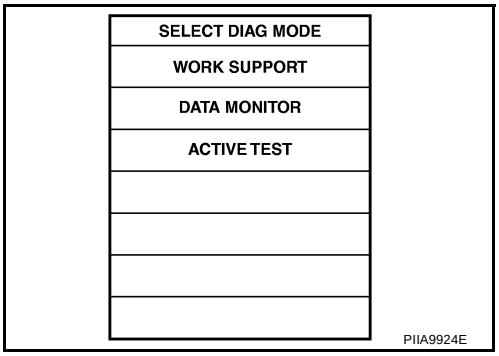
5. Touch “BCM”.
   If “BCM” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



6. Touch “MULTI REMOTE ENT”.

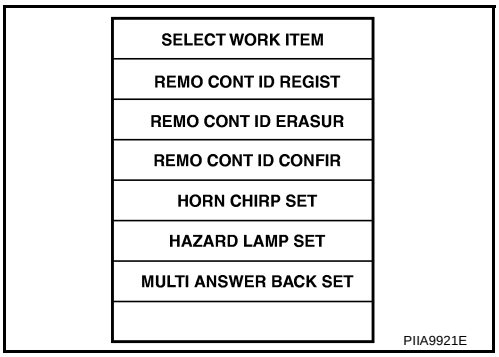


7. Touch “WORK SUPPORT”.

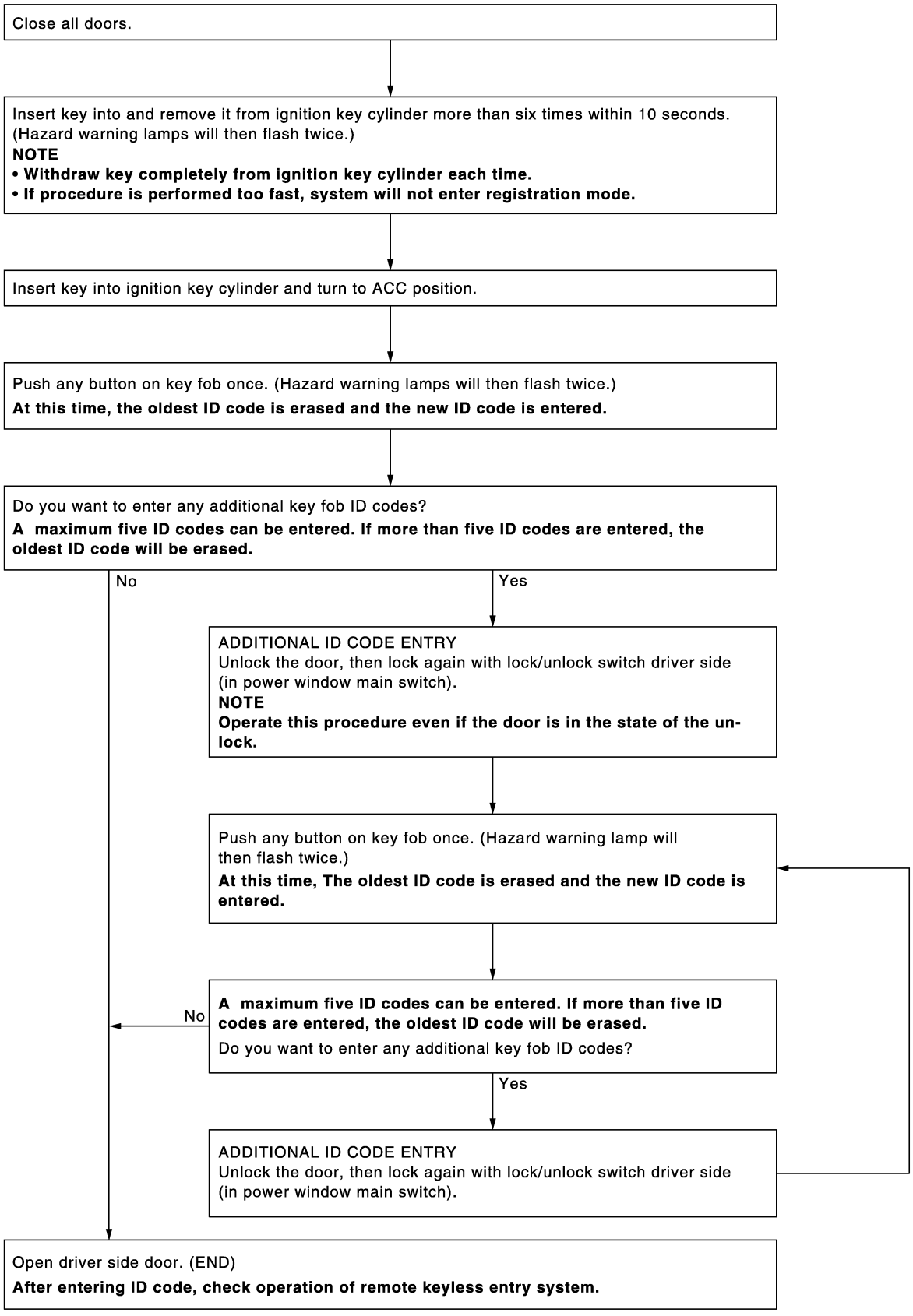


8. The items shown on the figure can be set up.
   - “REMO CONT ID REGIST”
     Use this mode to register a key fob ID code.

     NOTE:
     Register the ID code when key fob or BCM is replaced, or when additional key fob is required.
   - “REMO CONT ID ERASUR”
     Use this mode to erase a key fob ID code.
   - “REMO CONT ID CONFIR”
     Use this mode to confirm if a key fob ID code is registered or not.



KEY FOB ID SETUP WITHOUT CONSULT-II



PIIA2839E

NOTE:

- If a key fob is lost, the ID code of the lost key fob must be erased to prevent unauthorized use. A specific ID code can be erased with CONSULT-II. However, when the ID code of a lost key fob is not known, all controller ID codes should be erased. After all ID codes are erased, the ID codes of all remaining and/or new key fobs must be re-registered.
  To erase all ID codes in memory, register one ID code (key fob) five times. After all ID codes are erased, the ID codes of all remaining and/or new key fobs must be re-registered.
- When registering an additional key fob, the existing ID codes in memory may or may not be erased. If five ID codes are stored in memory, when an additional code is registered, only the oldest code is erased. If less than five ID codes are stored in memory, when an additional ID code is registered, the new ID code is added and no ID codes are erased.
- If you need to activate more than two additional new key fobs, repeat the procedure “Additional ID code entry” for each new key fob.
- Entry of maximum five ID codes is allowed. When more than five ID codes are entered, the oldest ID code will be erased.
- Even if same ID code that is already in the memory is input, the same ID code can be entered. The code is counted as an additional code.

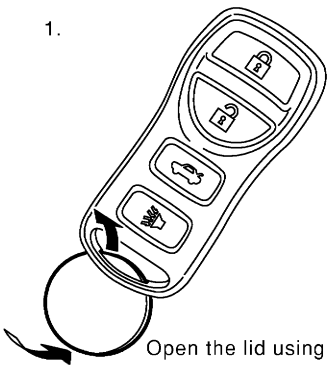
Key Fob Battery Replacement

AIS000D5

NOTE:

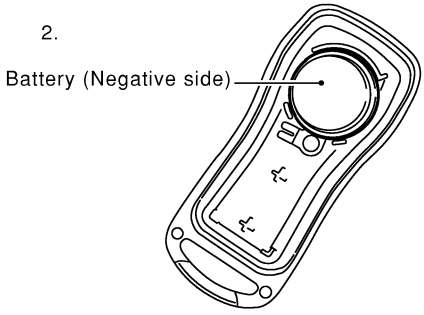
• Be careful not to touch the circuit board or battery terminal.
• The keyfob is water-resistant. However, if it does get wet, immediately wipe it dry.

1.



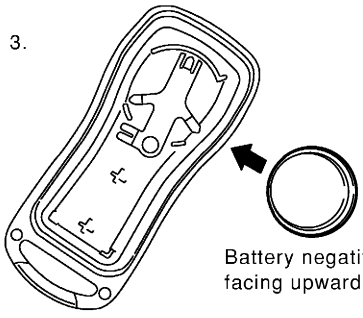
Open the lid using a coin.

2.



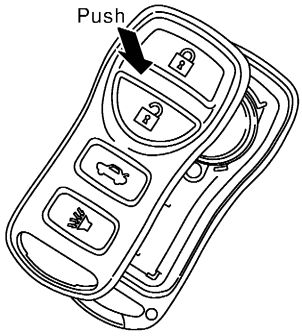
Remove the battery.

3.



Insert the new battery.

4.



Close the lid securely.
Push the keyfob button two or three times to check its operation.

SEL411Y

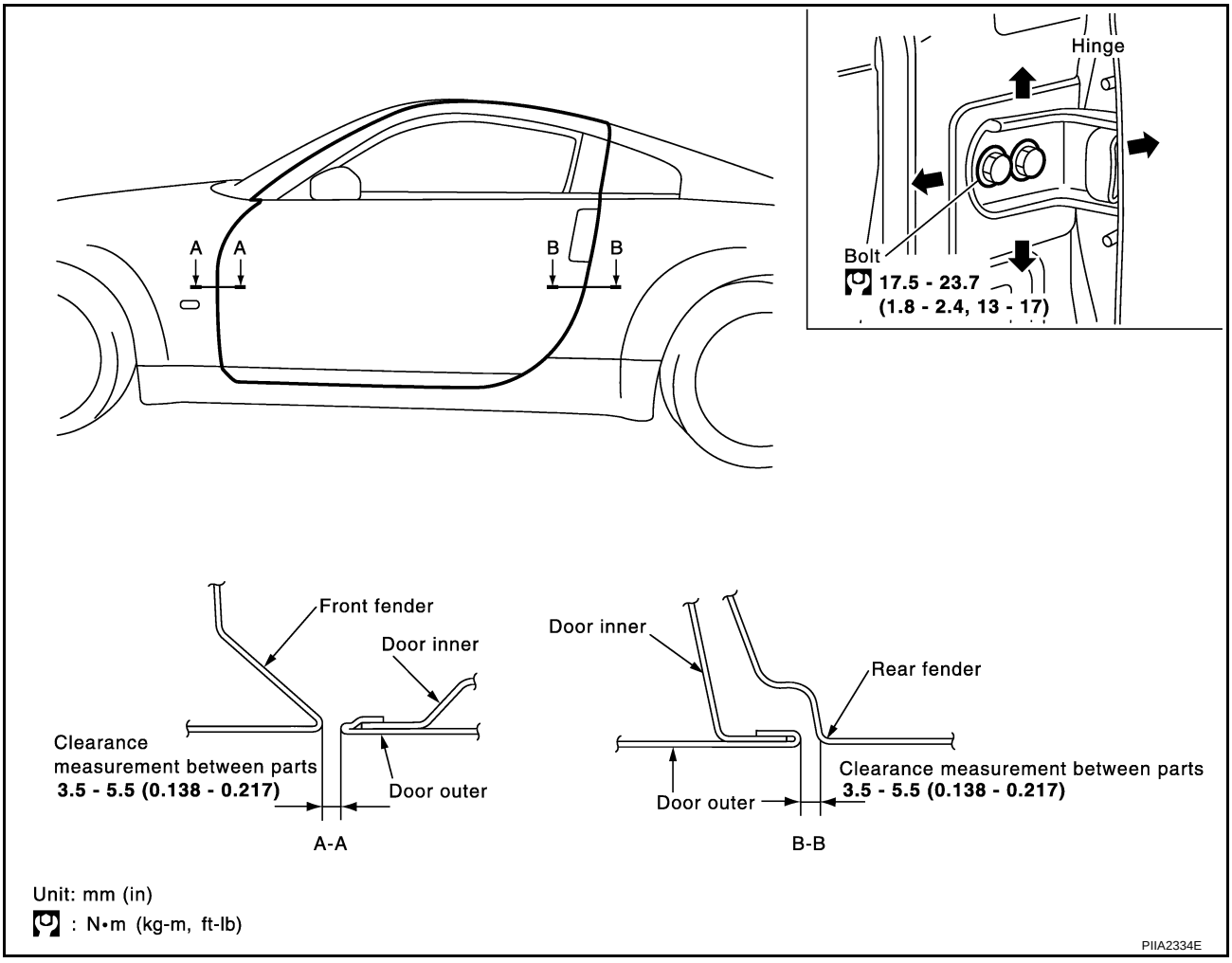
DOOR

PFP:80100

Fitting Adjustment

AIS000D6

COUPE



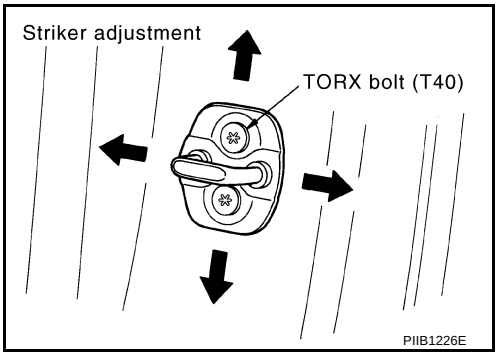
DOOR

Longitudinal clearance and surface height adjustment at front end

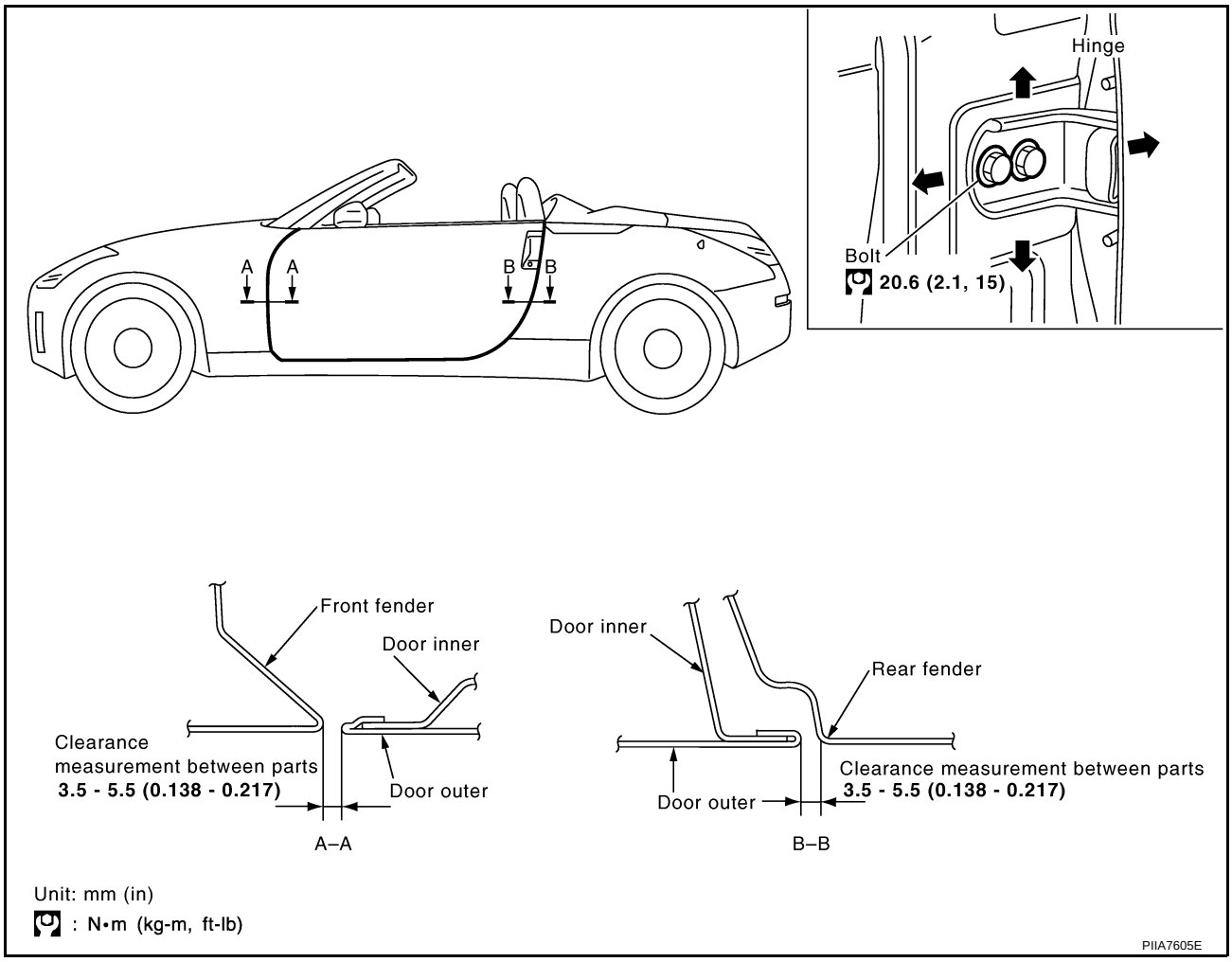
1. Remove the fender protector. Refer to EI-21, "FENDER PROTECTOR" .
2. Loosen the hinge mounting bolts. Raise the door at rear end to adjust.

STRIKER ADJUSTMENT

1. Adjust the striker so that it becomes parallel with the lock insertion direction.



ROADSTER



DOOR

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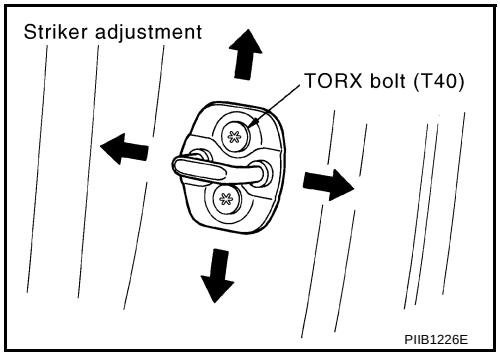
2. Loosen the hinge mounting bolts. Raise the door at rear end to adjust.

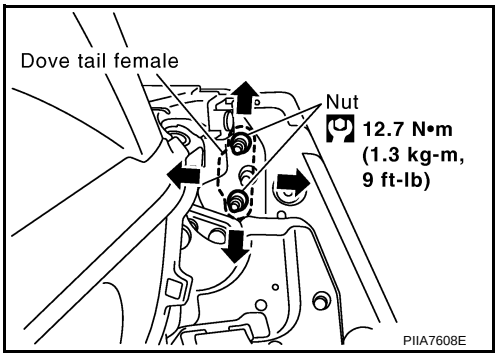
STRIKER ADJUSTMENT

1. Adjust the striker so that it becomes parallel with the lock insertion direction.



DOVE TAIL FEMALE ADJUSTMENT (ROADSTER)

1. Adjust the dove tail female so that it becomes parallel with the lock insertion direction.



Removal and Installation

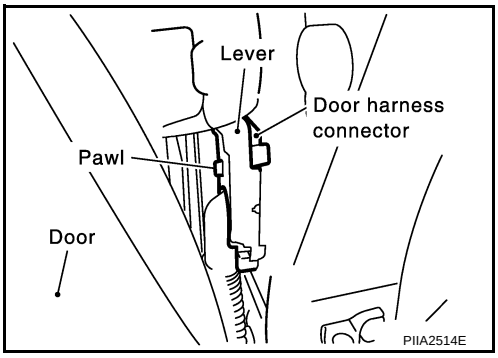
AIS000D7

CAUTION:

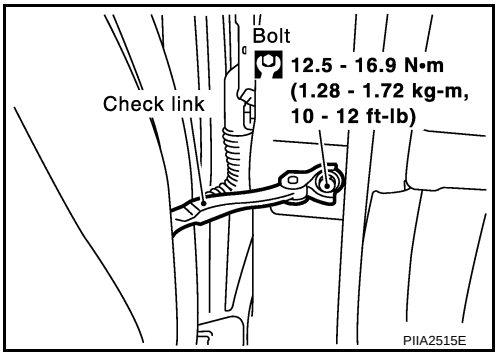
- **When removing and installing the door assembly, support the door with a jack and cloth to protect the door and body.**
- **When removing and installing door assembly, be sure to perform the fitting adjustment Refer to BL-97, "Fitting Adjustment" .**
- **Operate with two workers, because of its heavy weight.**
- **Check the hinge rotating part for poor lubrication. If necessary, apply “body grease”.**
- **After installing, check operation.**
- **Apply sealant and coat with the same body color paint to door hinge installation part and mounting nuts.**

REMOVAL

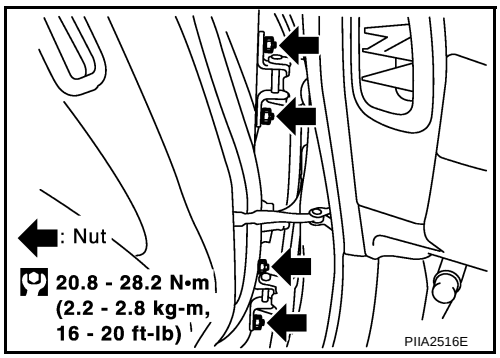
1. Pull the lever and remove the door harness connector while removing tabs of door harness connector.



2. Remove the mounting bolts of the check link on the vehicle.



3. Remove the door-side hinge mounting nuts, and remove the door assembly.



INSTALLATION

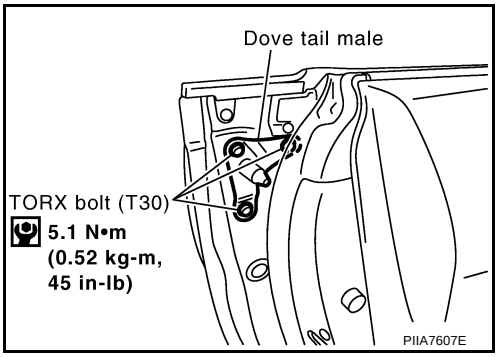
Install in the reverse order of removal.

Removal and Installation of Dove Tail Male & Female (Roadster)

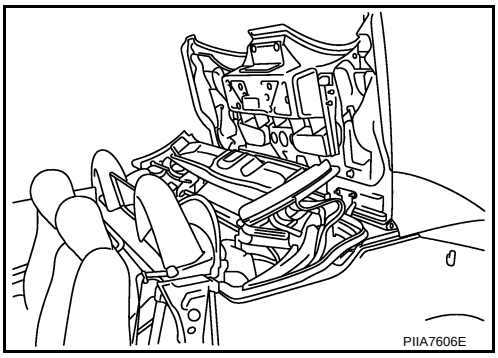
AIS003X8

REMOVAL

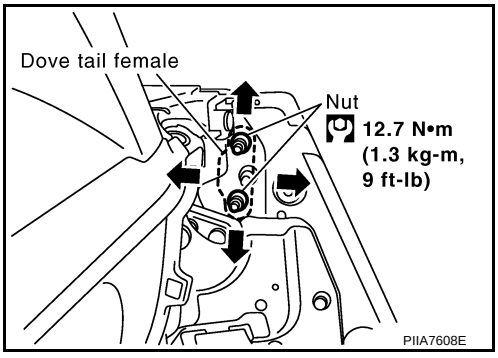
1. Remove the TORX bolts (T30) of dove tail male.



2. Soft top assembly locate like a figure.
3. Remove the body side welt. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
4. Remove the body side weatherstrip. Refer to EI-32, "Removal and Installation (for Roadster Models)" .
5. Remove the rear side finisher and kicking plate inner. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
6. Remove the shoulder anchor. Refer to SB-6, "Removal and Installation of Seat Belt (Roadster)" .
7. Remove the rear side trim. Refer to EI-37, "Removal and Installation (for Roadster Models)" .



8. Remove the dove tail female mounting nuts. Remove the dove tail female.

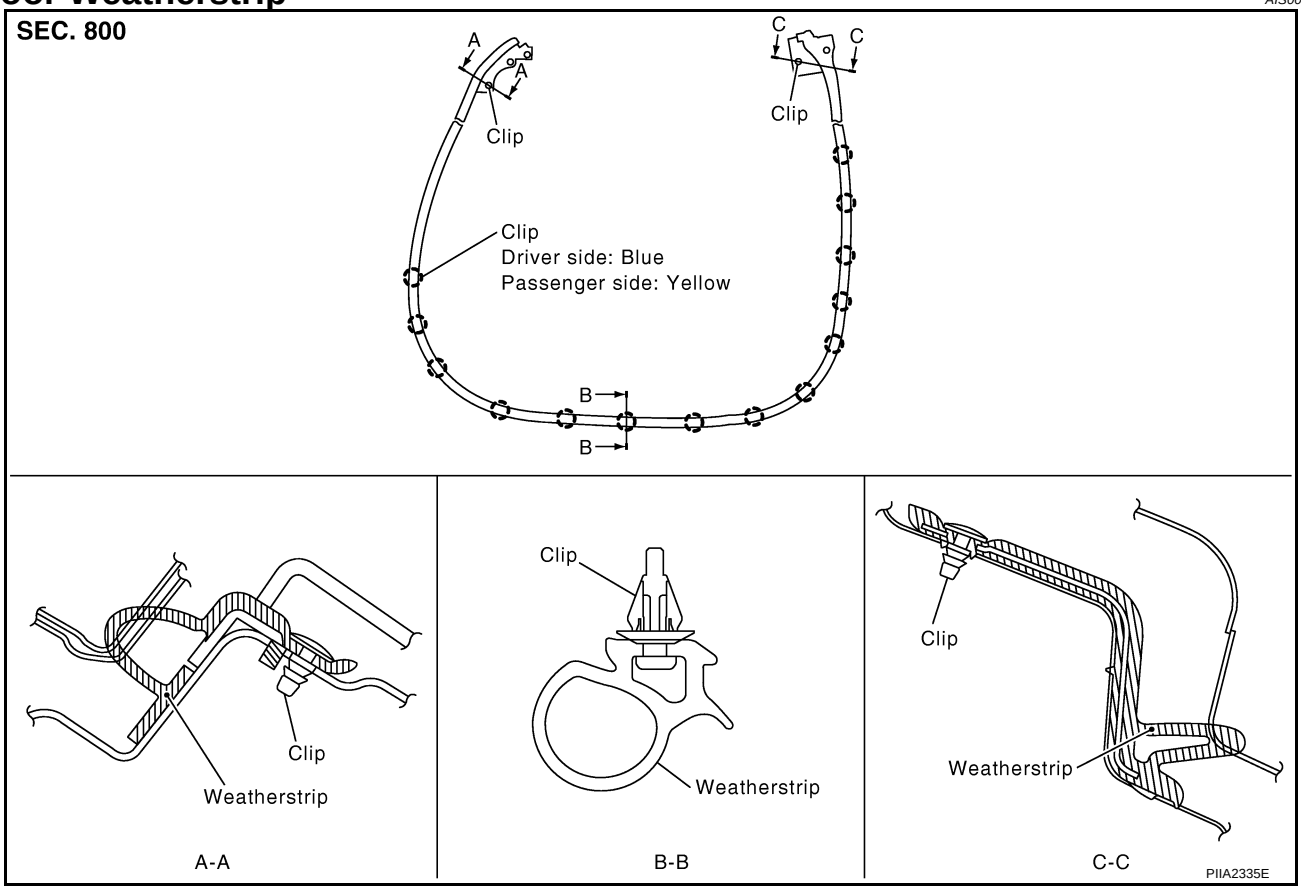


INSTALLATION

Install in the reverse order of removal.

Door Weatherstrip

AIS0057M



REMOVAL

Remove the weatherstrip clips and remove weatherstrip.

INSTALLATION

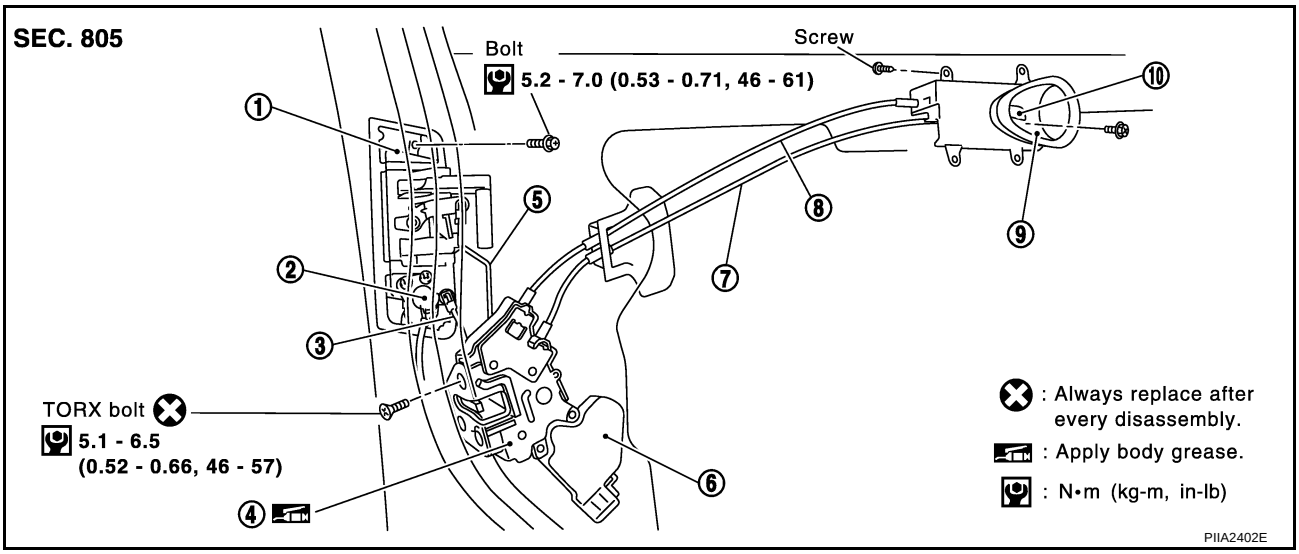
Install in the reverse order of removal.

DOOR LOCK

PFP:80502

Component Structure

AIS000D9



1. Outside handle
2. Key cylinder (driver side only)
3. Key lock rod (driver side only)
4. Door lock assembly
5. Outside handle rod
6. Door lock actuator
7. Lock knob cable
8. Inside handle cable
9. Inside handle
10. Lock knob

Inspection and Adjustment

AIS000DA

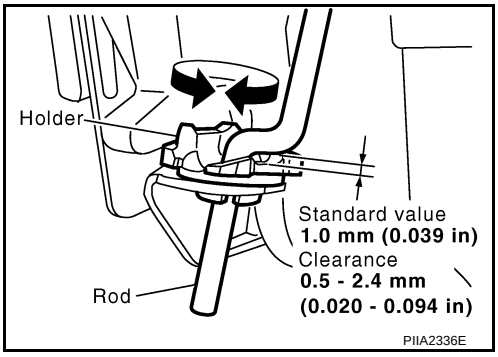
1. Remove the door finisher. Refer to EI-33, "Removal and Installation" .
2. Remove the door window and door module assembly. Refer to GW-51, "Removal and Installation" .

EXTERIOR HANDLE ROD ADJUSTMENT

Rotate the bushing to adjust so that the clearance between the bushing and rod becomes as shown in the figure.

CAUTION:

Be careful not to make the clearance 0 mm (0 in) or the rod will be pressed continuously.

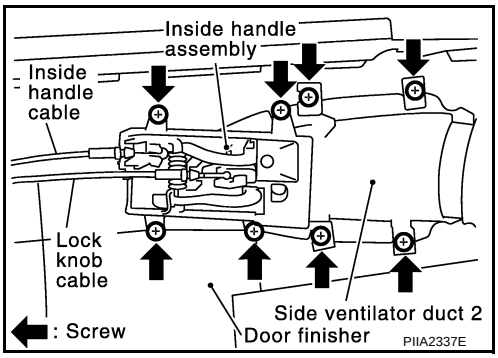


Removal and Installation

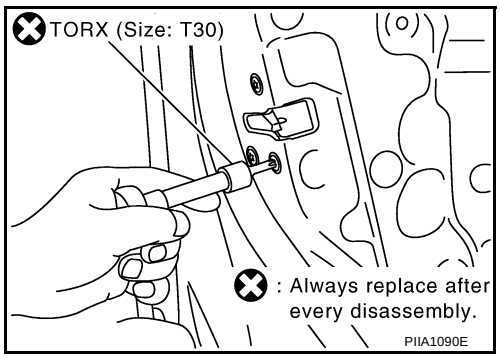
AIS000DB

REMOVAL

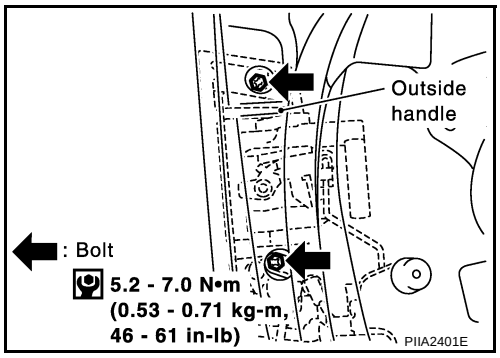
1. Remove the door finisher. Refer to EI-33, "Removal and Installation" .
2. Remove the door window and door module assembly. Refer to GW-51, "Removal and Installation" .
3. Disconnect the inside handle cable and locking knob cable from the back side of the door finisher.



4. Reach to separate the key cylinder (driver side only) rod and outside handle rod connection (on the handle).
5. Disconnect the door lock actuator connector.
6. Remove the mounting screws (TORX T30), remove the door lock assembly.



7. Remove the outside handle mounting bolts, remove the outside handle.



INSTALLATION

Install in the reverse order of removal.

CAUTION:

- **To install each rod, be sure to rotate the rod holder until a click is felt.**
- **After installing, check operation.**
- **After installing, perform fitting adjustment. Refer to BL-97, "Fitting Adjustment" .**

Disassembly and Assembly

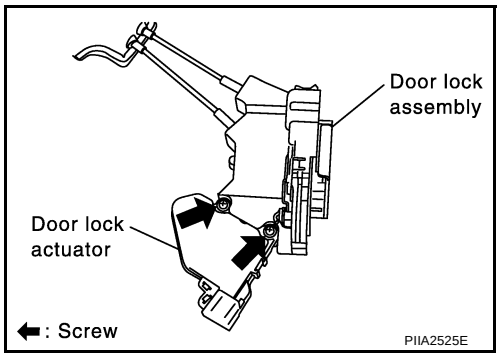
AIS000DC

DISASSEMBLY

CAUTION:

Be sure to remove or install the actuator with the door lock assembly removed.

1. Remove the mounting screws, and remove the actuator from the door lock assembly.
2. Pull the actuator straight downward to separate it from the door lock assembly.



ASSEMBLY

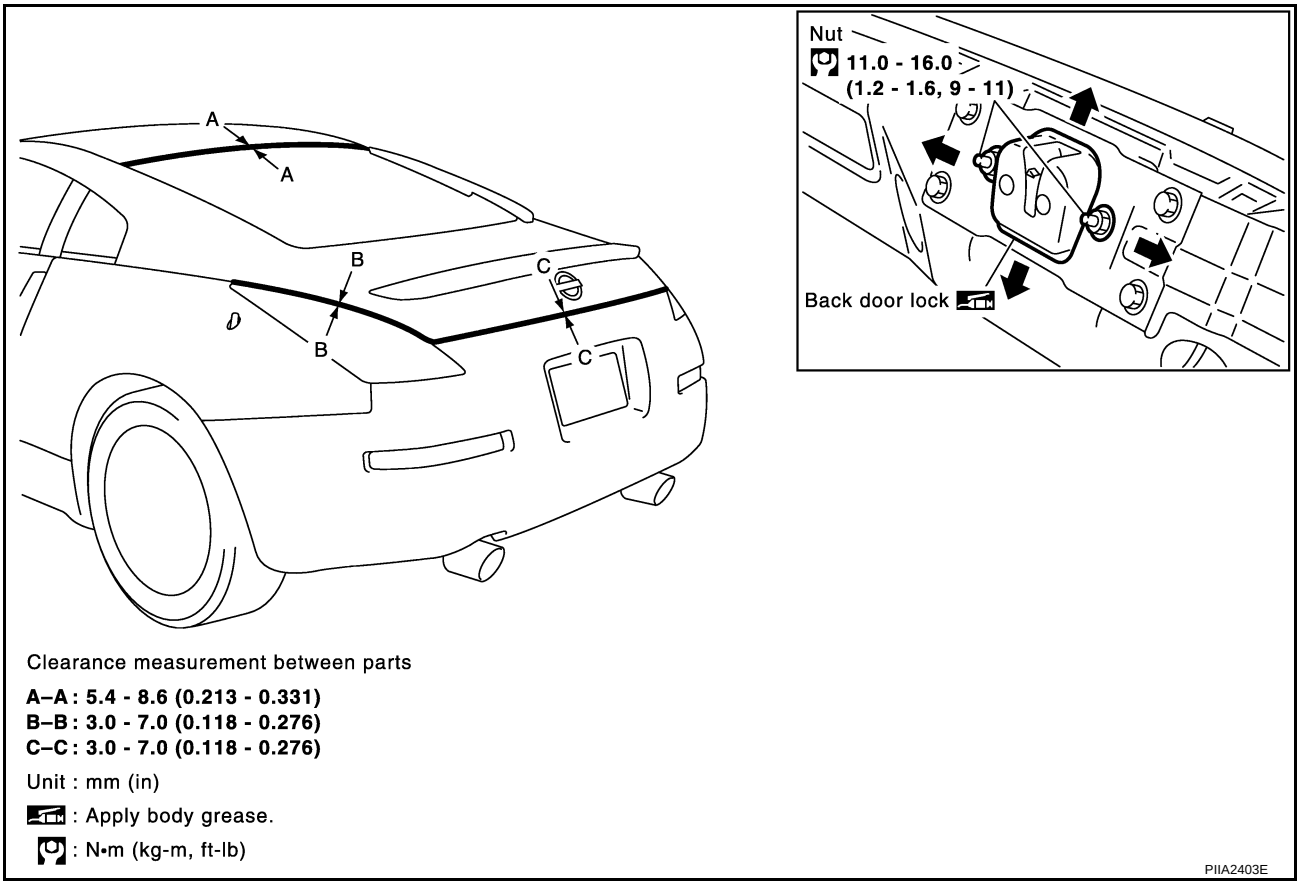
1. Align the actuator pivot with the cutout on the knob lever of the door lock assembly, then assemble the actuator.
2. Move the knob lever and the actuator pivot toward the lock-on direction, and check that it engages securely.

BACK DOOR

PFP:90100

Fitting Adjustment

AIS0013P



Clearance measurement between parts

A–A : 5.4 - 8.6 (0.213 - 0.331)
B–B : 3.0 - 7.0 (0.118 - 0.276)
C–C : 3.0 - 7.0 (0.118 - 0.276)

Unit : mm (in)

: Apply body grease.

: N•m (kg-m, ft-lb)

PIIA2403E

VERTICAL/LATERAL CLEARANCE ADJUSTMENT

1. Remove back door weatherstrip. Refer to BL-108, "Removal and Installation of Back Door Weatherstrip" .
2. Remove the luggage finisher lower (center). Refer to EI-40, "LUGGAGE FLOOR TRIM" .
3. Loosen the back door lock mounting bolts. Raise the back door lock to the top position, and temporarily tighten the back door lock mounting bolt at the position.
4. Close the back door lightly and adjust the surface height, then open the back door to finally tighten the back door lock mounting bolts to the specified torque.

Back Door Assembly

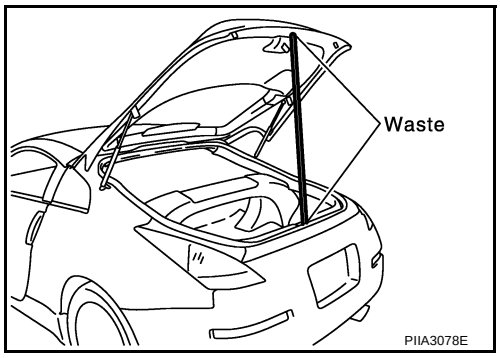
AIS0013Q

REMOVAL

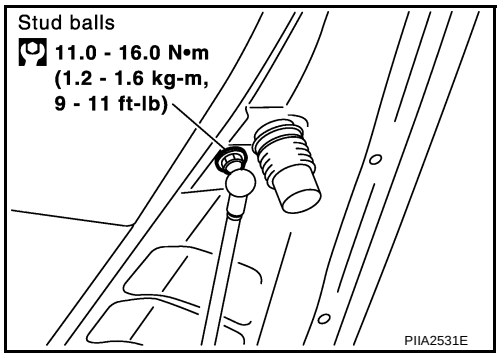
1. Remove the headlining. Refer to EI-44, "Removal and Installation (for Coupe Models)" .
2. Disconnect each harness connector, which is out to body from back door.
3. Support the back door striker with a proper material to prevent it from falling.

   WARNING:

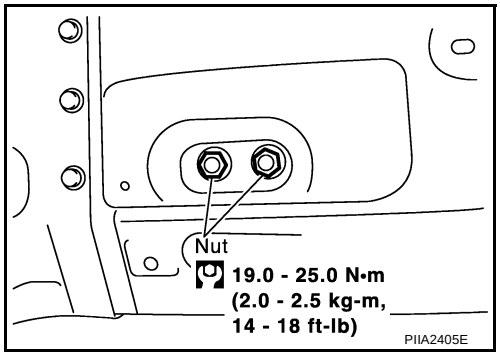
   Body injury may occur if no supporting rod is holding the back door open when removing the damper stay.



4. Remove stud balls on back door.



5. Remove hinge mount nuts of the body and remove back door assembly.



INSTALLATION

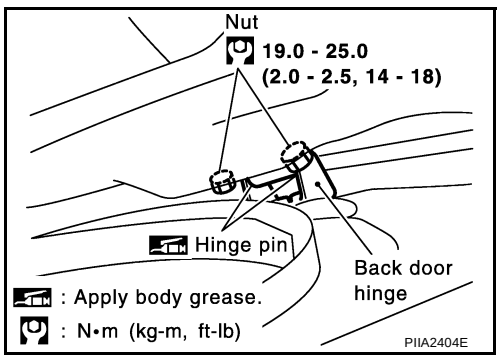
Install in the reverse order of removal.

CAUTION:

- **After installing, check operation.**
- **After installing, perform fitting adjustment.**

INSPECTION

1. Check hinges for the following items
   - Malfunction noise or door closing and opening effort
   - Component wear or damage
2. Apply body grease to the rotating part of the hinge.

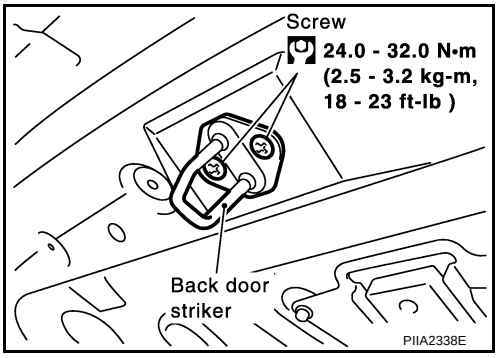


Removal and Installation of Back Door Striker

AIS0013R

REMOVAL

1. Remove back door finisher lower. Refer to EI-47, "BACK DOOR FINISHER" .
2. Remove mounting screws, and remove striker from the vehicle.



INSTALLATION

Install in the reverse order of removal.

CAUTION:

After installing, perform fitting adjustment.

Removal and Installation of Back Door Stay

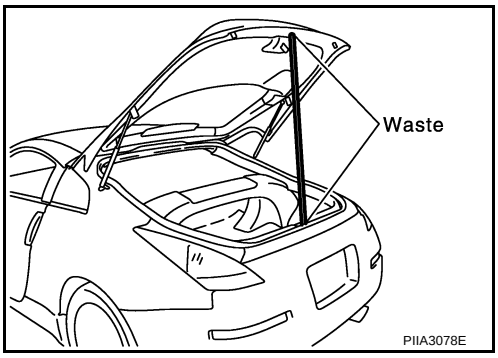
AIS0013S

REMOVAL

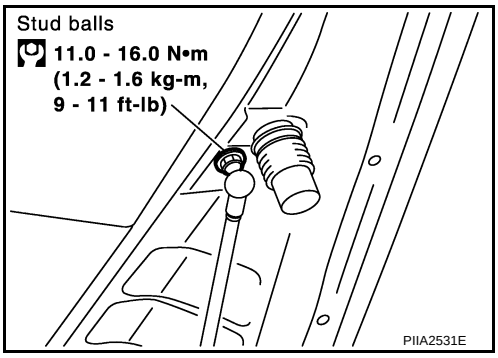
1. Support the back door striker with a proper material to prevent it from falling.

   WARNING:

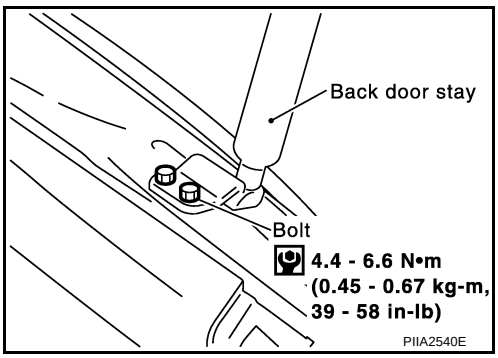
   Body injury may occur if no supporting rod is holding the back door open when removing the damper stay.



2. Remove stud balls on back door.



3. Remove back door stay assembly (gas stay) bracket adjusting nuts and remove back door stay assembly.



INSTALLATION

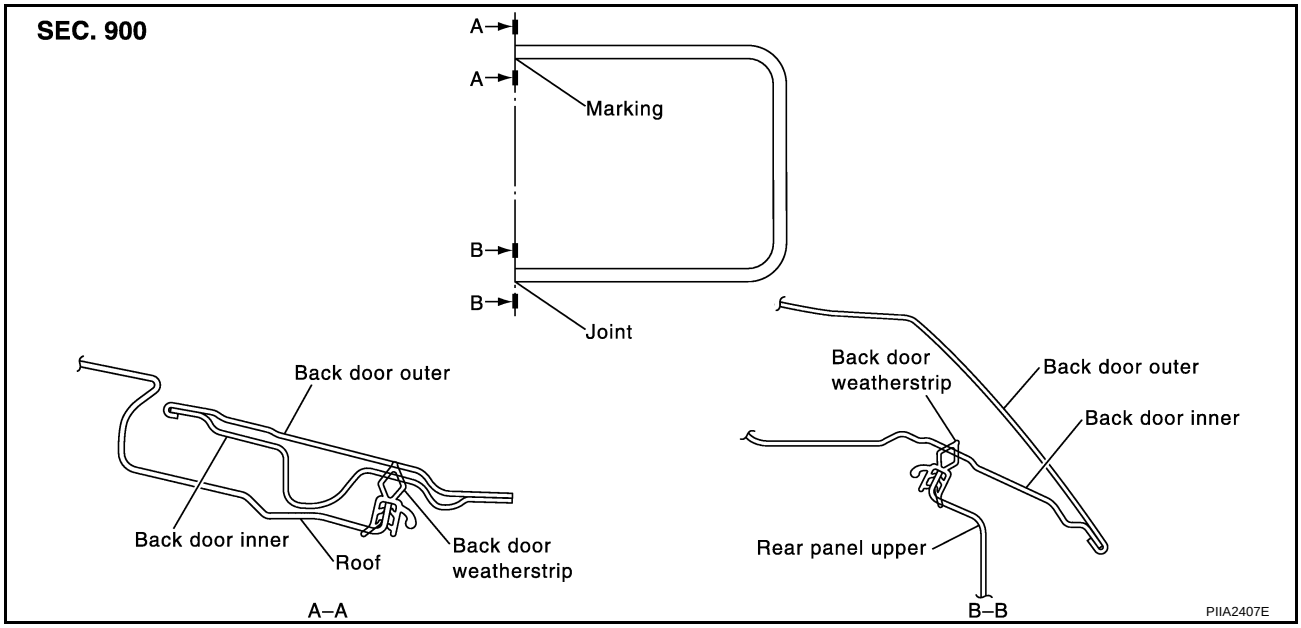
Install in the reverse order of removal.

CAUTION:

After installing, check operation.

Removal and Installation of Back Door Weatherstrip

AIS0013T



REMOVAL

Pull up and remove engagement with body from weatherstrip joint.

CAUTION:

After removal, do not pull strongly on the weatherstrip.

INSTALLATION

Install in the reverse order of removal.

1. Working from the upper section, align weatherstrip mark with vehicle center position mark and install weatherstrip onto the vehicle.
2. For the lower section, align the weatherstrip seam with center of the striker.
3. After installation, pull the weatherstrip gently to ensure that there is no loose section.

   NOTE:
   Make sure the weatherstrip is fit tightly at each corner and back door rear plate.

BACK DOOR LOCK

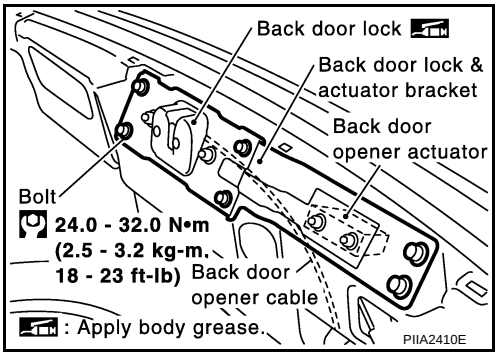
PFP:90504

Removal and Installation of Back Door Lock & Back Door Opener Actuator

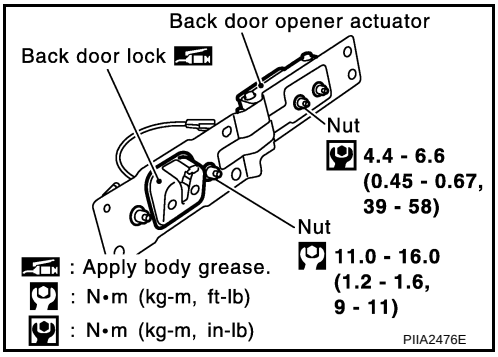
AIS0013U

REMOVAL

1. Remove back door weatherstrip. Refer to BL-108, "Removal and Installation of Back Door Weatherstrip" .
2. Remove luggage finisher lower (center). Refer to EI-40, "LUGGAGE FLOOR TRIM" .
3. Disconnect the connector and the clip of the back door opener.
4. Remove the mounting bolts.



5. Disconnect the connector of the back door opener actuator and back door opener cable, remove the bracket.
6. Remove the mounting nuts, remove back door lock and back door opener actuator.



INSTALLATION

Install in the reverse order of removal.

CAUTION:

- **After installing, check operation.**
- **After installing, perform fitting adjustment. Refer to BL-105, "Fitting Adjustment" .**

INSPECTION

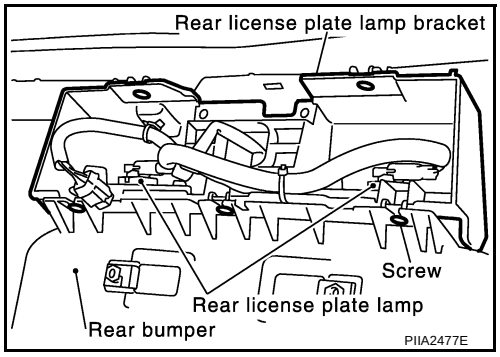
1. Check back door lock for the following items.
   - Malfunction noise or door closing and opening effort
   - Component wear or damage
2. Apply body grease to the rotating part of the back door lock.

Removal and Installation of Back Door Opener Switch (External)

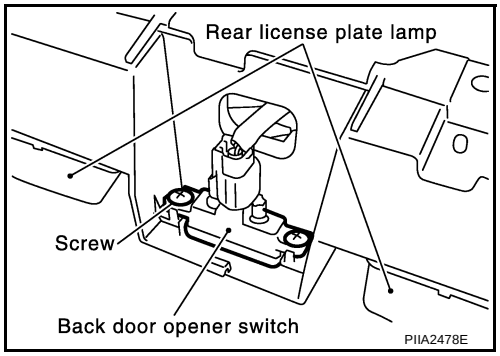
AIS0013V

REMOVAL

1. Remove rear bumper fascia assembly. Refer to EI-17, "Removal and Installation" .
2. Remove the mounting screws of the license plate bracket.



3. Remove the mounting screws and connector of the back door opener switch.

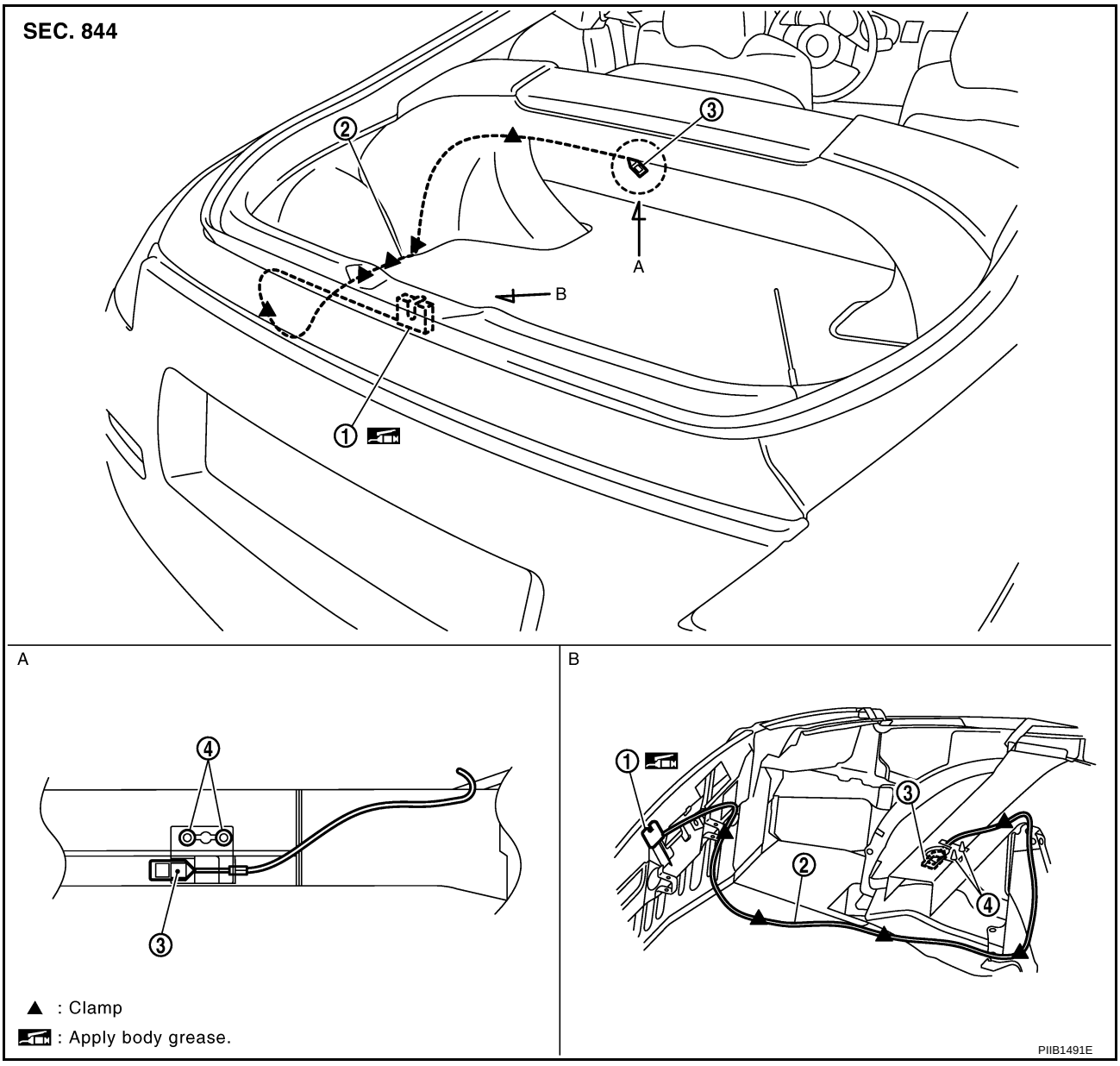


INSTALLATION

1. Install in the reverse order of removal.
2. After installing, check the operation.

Removal and Installation of Back Door Emergency Opener Cable

AIS005WC



1. Back door lock assembly
2. Back door emergency opener cable
3. hook
4. Clip

REMOVAL

1. Remove back door weather strip. Refer to BL-108, "Removal and Installation of Back Door Weatherstrip" .
2. Remove luggage finisher lower (center), luggage side finisher lower (LH), luggage side finisher upper (LH), trunk side box, luggage floor carpet, strut cover rear, strut cover lower (center), and strut cover lower (LH). Refer to EI-39, "Removal and Installation (for Coupe Models)" .
3. Disconnect back door emergency opener cable from back door lock.
4. Disconnect back door emergency opener cable from back door emergency opener cable clamp, and then remove back door emergency opener cable.

INSTALLATION

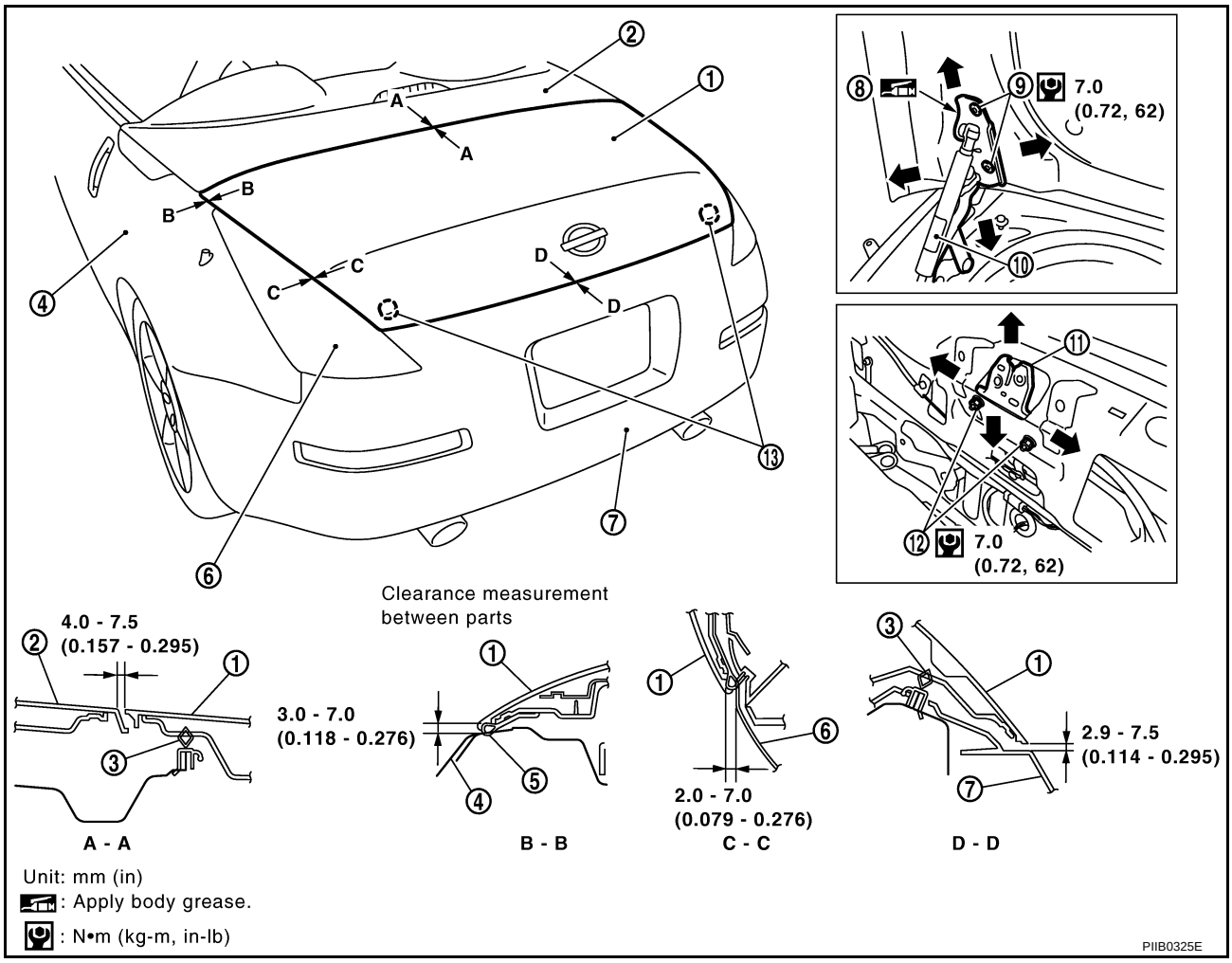
1. Install in the reverse order of removal.
2. After installing, check the operation.

TRUNK LID

PFP:H4300

Fitting Adjustment

AIS003X2



1. Trunk lid assembly
2. Storage lid
3. Trunk lid weatherstrip
4. Rear fender
5. Trunk lid moulding
6. Rear combination lamp
7. Rear bumper fascia
8. Trunk lid hinge
9. TORX bolt (T30)
10. Trunk lid stay
11. Trunk lid lock assembly
12. Nut
13. Bumper rubber

LONGITUDINAL AND LATERAL CLEARANCE ADJUSTMENT

1. Remove trunk rear finisher. Refer to EI-48, "TRUNK ROOM TRIM & TRUNK LID FINISHER" .
2. Loosen trunk lid hinge mounting bolts, and remove trunk lid lock. And then, close trunk lid.
3. Tighten trunk lid hinge mounting bolts to the specified torque after adjusting lateral clearance and clearance to storage lid and rear bumper fascia.
4. Position trunk lid lock and engage trunk lid striker. Check trunk lid striker and trunk lid lock for looseness.
5. Tighten trunk lid mounting bolts to the specified torque.

SURFACE HEIGHT ADJUSTMENT

1. Remove trunk rear finisher. Refer to EI-48, "TRUNK ROOM TRIM & TRUNK LID FINISHER" .
2. Remove trunk lid lock. Rotate bumper rubber to adjust height between trunk lid and bumper fascia.
3. Position trunk lid lock and engage trunk lid striker. Check trunk lid striker and trunk lid lock for looseness. Tighten trunk lid mounting bolts to the specified torque.
4. Adjust lateral clearance and surface height between trunk lid and other parts so that they are within the following dimensional difference.

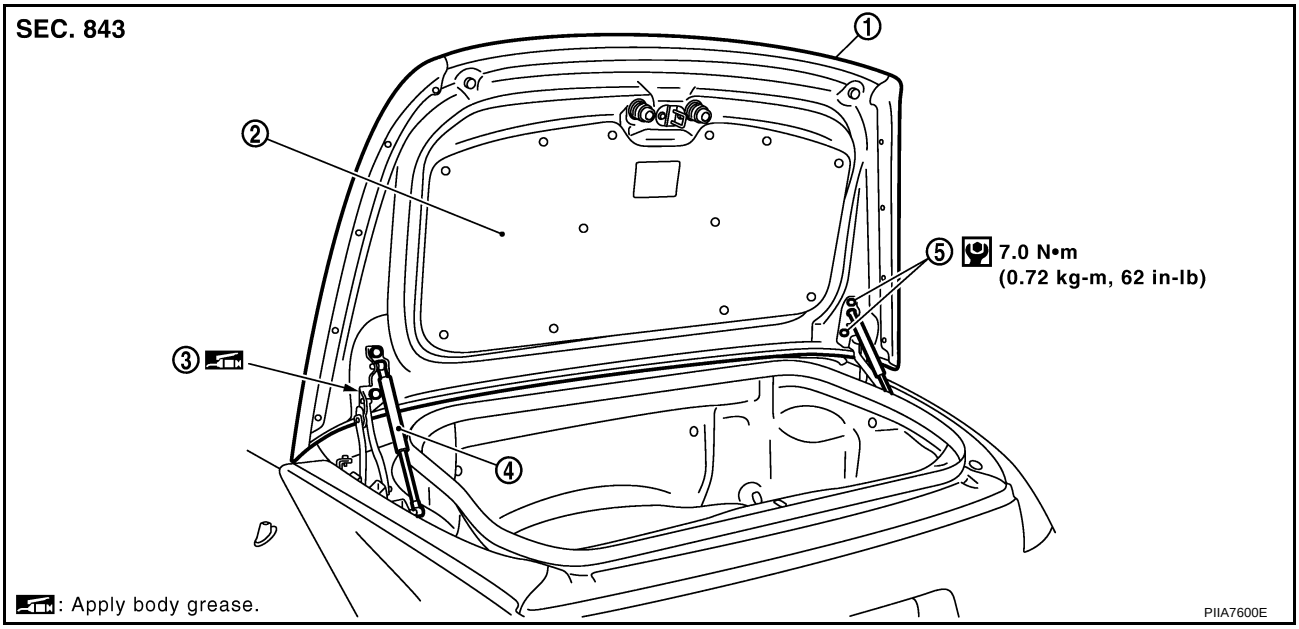
CAUTION:

Adjust evenness between trunk lid and each part to the following specification.

Trunk lid and storage lid (A–A) : 0 ± 1.0 mm (0 ± 0.04 in)
Trunk lid and rear bumper fascia (D–D) : 0.85 ± 2.1 mm (0.0335 ± 0.083 in)

Removal and Installation of Trunk Lid Assembly

AIS003X3

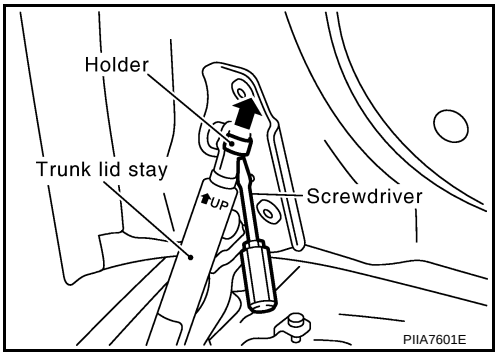


1. Trunk lid assembly
2. Trunk lid insulator
3. Trunk lid hinge
4. Trunk lid stay
5. TORX bolt (T30)

CAUTION:
Operate with two workers, because of its heavy weight.

REMOVAL

1. Screwdriver into the gap and remove holder.
2. Remove trunk lid stay (gas stay).
3. Remove the trunk lid hinge bolts, trunk lid assembly side and remove the trunk lid assembly.



INSTALLATION

Note the following, and install in the reverse order of removal.
Install holder to trunk lid stay, and then push it into trunk lid hinge (stud ball) when installing trunk lid stay.

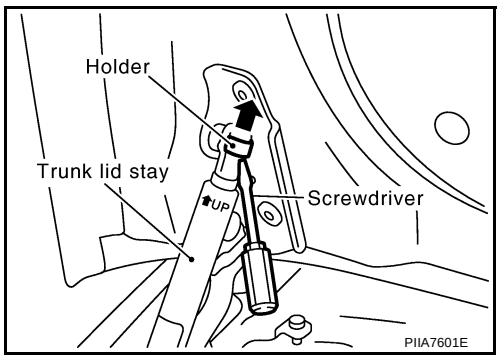
CAUTION:
- **Check trunk lid open/close operation after installation**
- **Apply sealant and coat with the same body color paint to trunk lid hinge installation part and mounting bolts.**

Removal and Installation of Trunk Lid Stay

AIS003X4

REMOVAL

1. Screwdriver into the gap and remove holder.
2. Remove trunk lid stay.



INSTALLATION

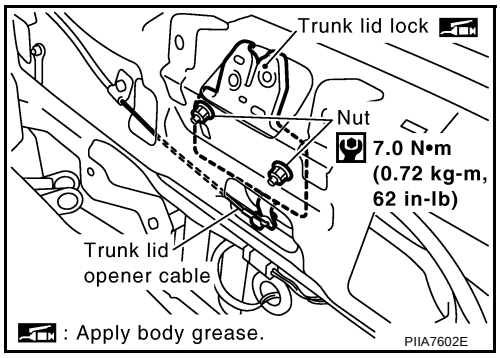
1. Note the following, and install in the reverse order of removal.
   Install holder to trunk lid stay, and then push it into trunk lid hinge (stud ball) when installing trunk lid stay.
2. After installation, check the operation.

Removal and Installation of Trunk Lid Lock Assembly

AIS003X5

REMOVAL

1. Remove the trunk lid weatherstrip. Refer to BL-118, "Removal and Installation of Trunk Lid Weatherstrip" .
2. Remove trunk lid release lever. Refer to EI-48, "Removal and Installation (for Roadstar Models)" .
3. Remove the trunk lid finisher. Refer to EI-48, "TRUNK ROOM TRIM & TRUNK LID FINISHER" .
4. Disconnect the release lever cable and trunk lid opener cable from the clip.
5. After removing the harness connector, remove the mounting bolts, and remove the trunk lid lock.



INSTALLATION

1. Install in the reverse order of removal.

CAUTION:

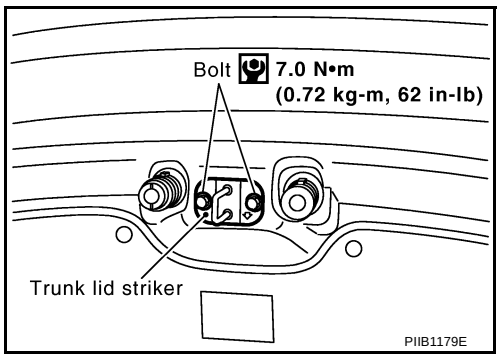
- **After installing, close the trunk lid height. Perform the lock and surface height adjustment. Refer to BL-112, "Fitting Adjustment" .**
- **After installing, check the operation.**

Removal and Installation of Trunk Lid Striker

AIS003X6

REMOVAL

Remove the mounting bolts, then remove the striker from the trunk lock support.



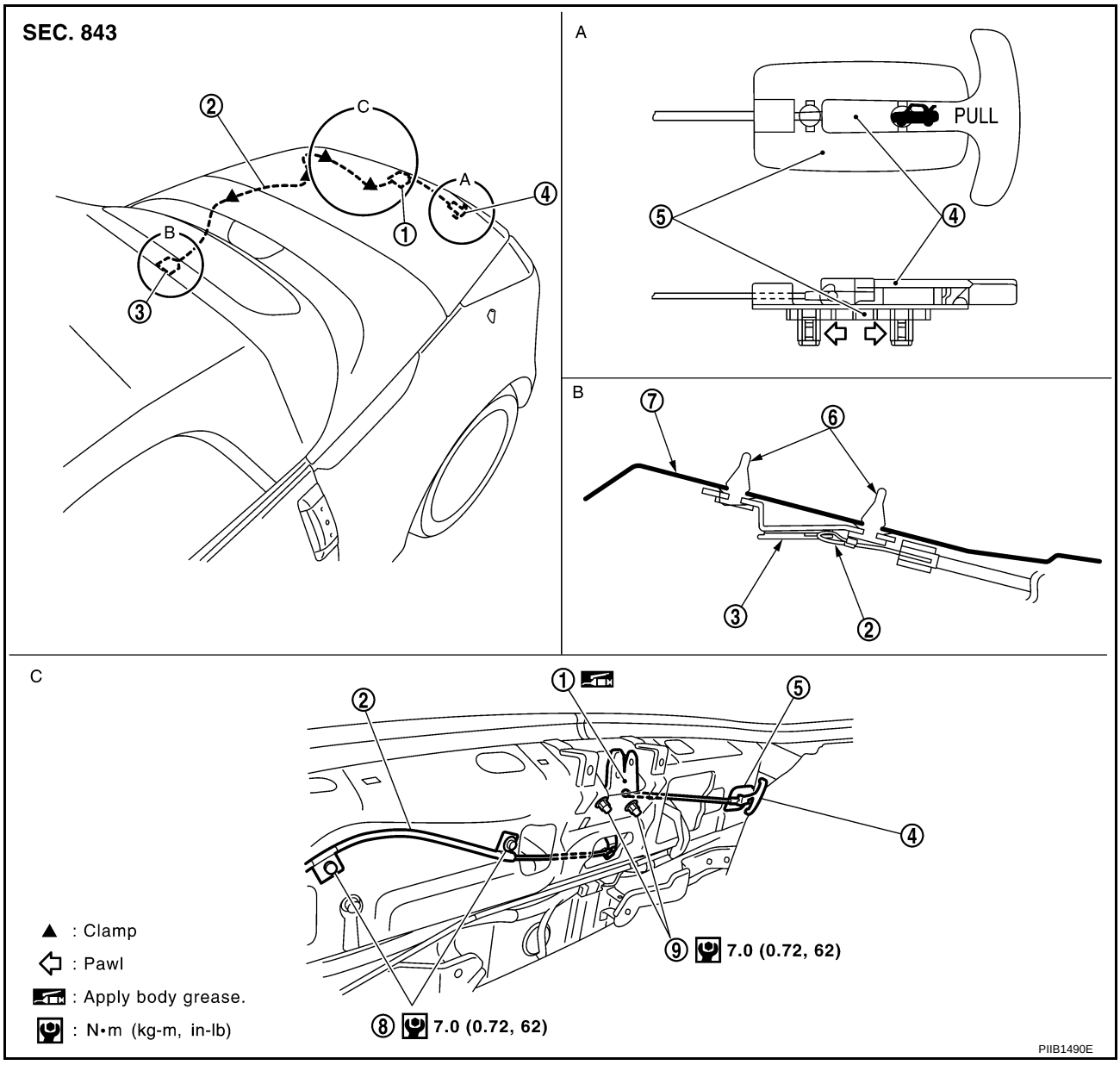
INSTALLATION

1. Install in the reverse order of removal.

2. After installing, close the trunk lid height. Perform the lock and surface height adjustment. Refer to BL-112, "Fitting Adjustment" .
3. After installation, check the operation.

Removal and Installation of Trunk lid Emergency Opener Cable

AIS005WD



1. Trunk rid lock assembly	2. Trunk rid emergency opener cable	3. Trunk rid emergency opener cable hook
4. Trunk rid emergency opener lever (secondary)	5. Trunk rid emergency opener lever holder	6. Clip
7. Panel	8. Bolt	9. Nut

REMOVAL

1. Remove trunk lid weatherstrip. Refer to BL-118, "Removal and Installation of Trunk Lid Weatherstrip" .
2. Remove trunk floor carpet, spare tire cover, trunk rear finisher, trunk front finisher,and trunk side box. Refer to EI-48, "TRUNK ROOM TRIM & TRUNK LID FINISHER"
3. Remove floor box lid. Refer to EI-41, "Removal and Installation (for Roadster Models)" .
4. Disconnect trunk lid emergency opener cable from trunk lid lock.
5. Disconnect each clamp of trunk lid emergency opener cable.

INSTALLATION

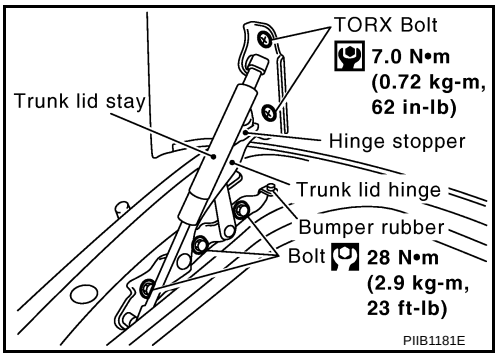
Install in the reverse order of removal.

Removal and Installation of Trunk Lid Hinge

AIS00562

REMOVAL

1. Remove trunk lid stay. Refer to BL-114, "Removal and Installation of Trunk Lid Stay" .
2. Remove trunk lid assembly. Refer to BL-113, "Removal and Installation of Trunk Lid Assembly" .
3. Remove trunk lid hinge mounting bolts, and then remove trunk lid hinge.



INSTALLATION

1. Position trunk lid hinge to body side. Temporarily tighten front side bolt and rear side bolt in this order, and then tighten them to the specified torque.
2. Install trunk lid to trunk lid hinge.
3. Install trunk lid stay.

CAUTION:

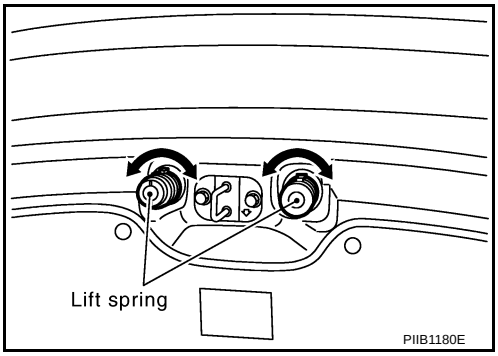
- **Before installing trunk lid hinge, apply anticorrosive agent onto the mounting surface of the vehicle body.**
- **After installation, perform trunk lid fitting adjustment. Refer to BL-112, "Fitting Adjustment" .**
- **Check trunk lid open/close operation after installation**
- **Apply sealant and the same body color paint to trunk lid hinge and mounting bolts to cover broken seal area.**

Removal and Installation of Lift Spring

AIS00563

REMOVAL

Rotate lift spring bottom clockwise/counterclockwise by approximately 90 deg, and then remove lift spring.

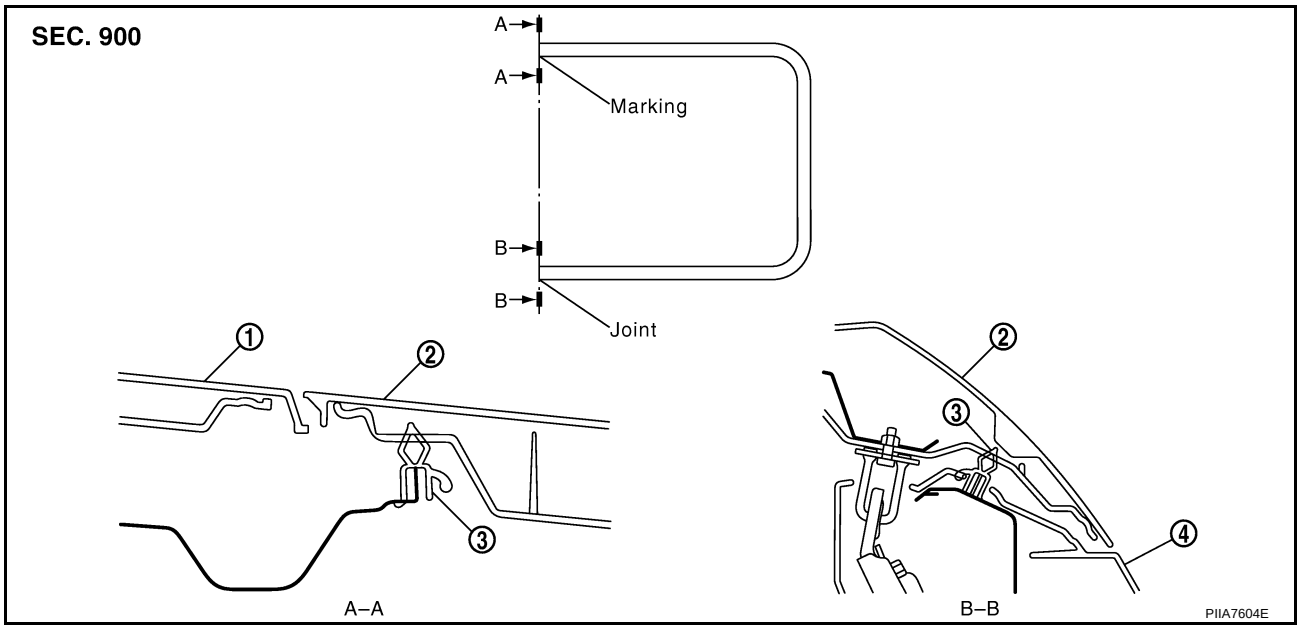


INSTALLATION

Install in the reverse order of removal.

Removal and Installation of Trunk Lid Weatherstrip

AIS003X7



1. Storage lid
2. Trunk lid assembly
3. Trunk lid weatherstrip
4. Rear bumper fascia

REMOVAL

Pull up and remove engagement with body from weatherstrip joint.

CAUTION:

After removal, do not pull strongly on the weatherstrip.

INSTALLATION

Install in the reverse order of removal.

1. Install the weatherstrip from the front with the vehicle center mark aligned to the weatherstrip mark.
2. At rear side, align the weatherstrip seam to the center of the striker.
3. After installing, pull the weatherstrip lightly to check for looseness.

   CAUTION:

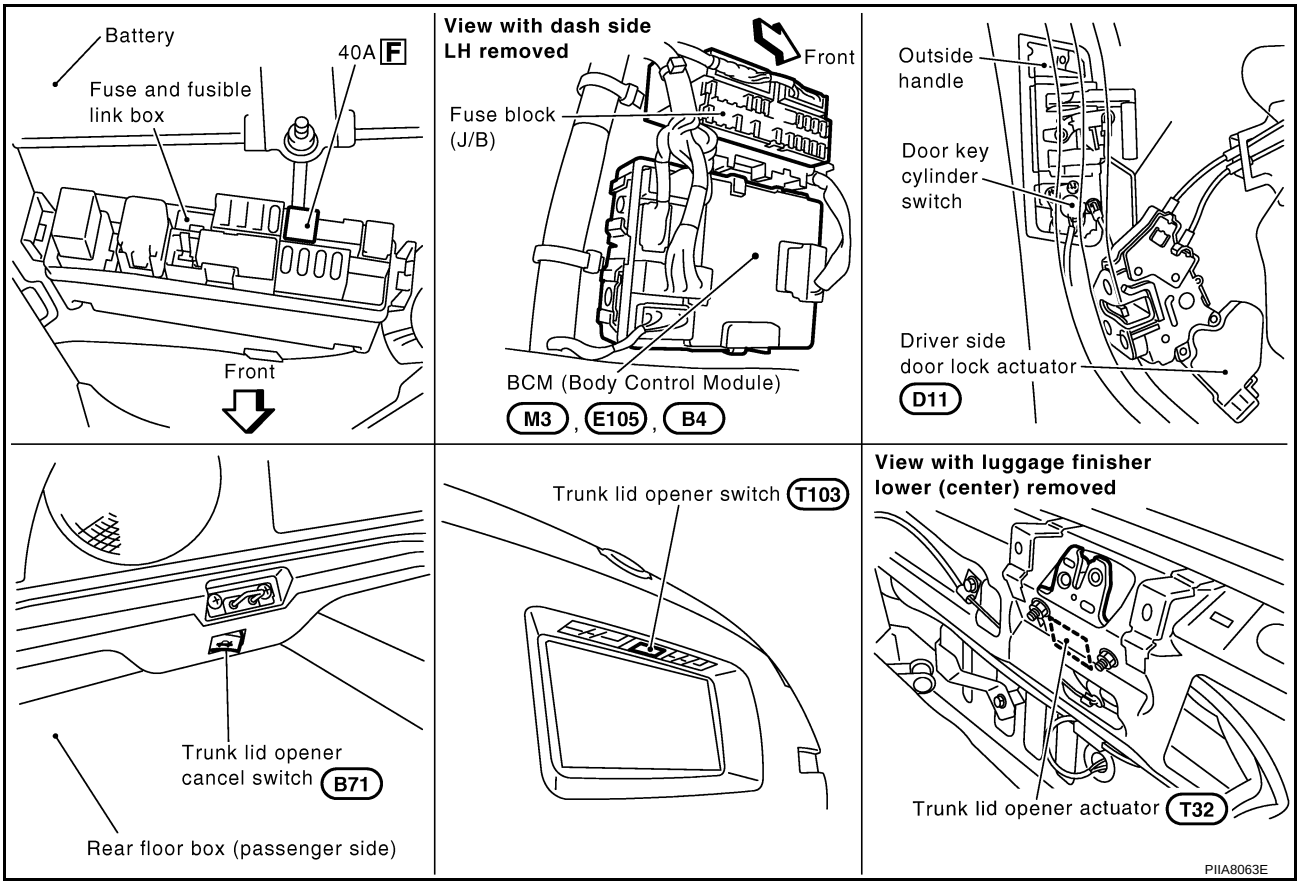
   The weatherstrip should fit tightly onto the corners and trunk lid rear plate.

TRUNK LID OPENER

PFP:84640

Component Parts and Harness Connector Location

AIS00409



System Description

AIS003XI

Power is supplied at all times

- through 40A fusible link (letter **F** , located in the fuse and fusible link box)
- to BCM terminal 55
- through 10A fuse [No.18, located in the fuse block (J/B)]
- to BCM terminal 42.

Ground is supplied

- to BCM terminal 52
- through body grounds M30 and M66.

When trunk lid opener switch is ON (pushed) with trunk lid opener cancel switch is ON and driver's door unlocked ground is supplied

- to BCM terminal 30
- through trunk lid opener cancel switch terminals 1 and 2,
- through trunk lid opener switch terminals 1 and 2,
- through driver side door lock actuator (unlock sensor) terminals 2 and 4, and
- through body grounds M30 and M66.

And power is supplied

- to BCM terminal 68
- through trunk lid opener actuator terminals 1 and 2
- through body grounds B5, B6 and T14.

Then trunk lid opener actuator opens trunk.

TRUNK LID OPENER CANCEL OPERATION

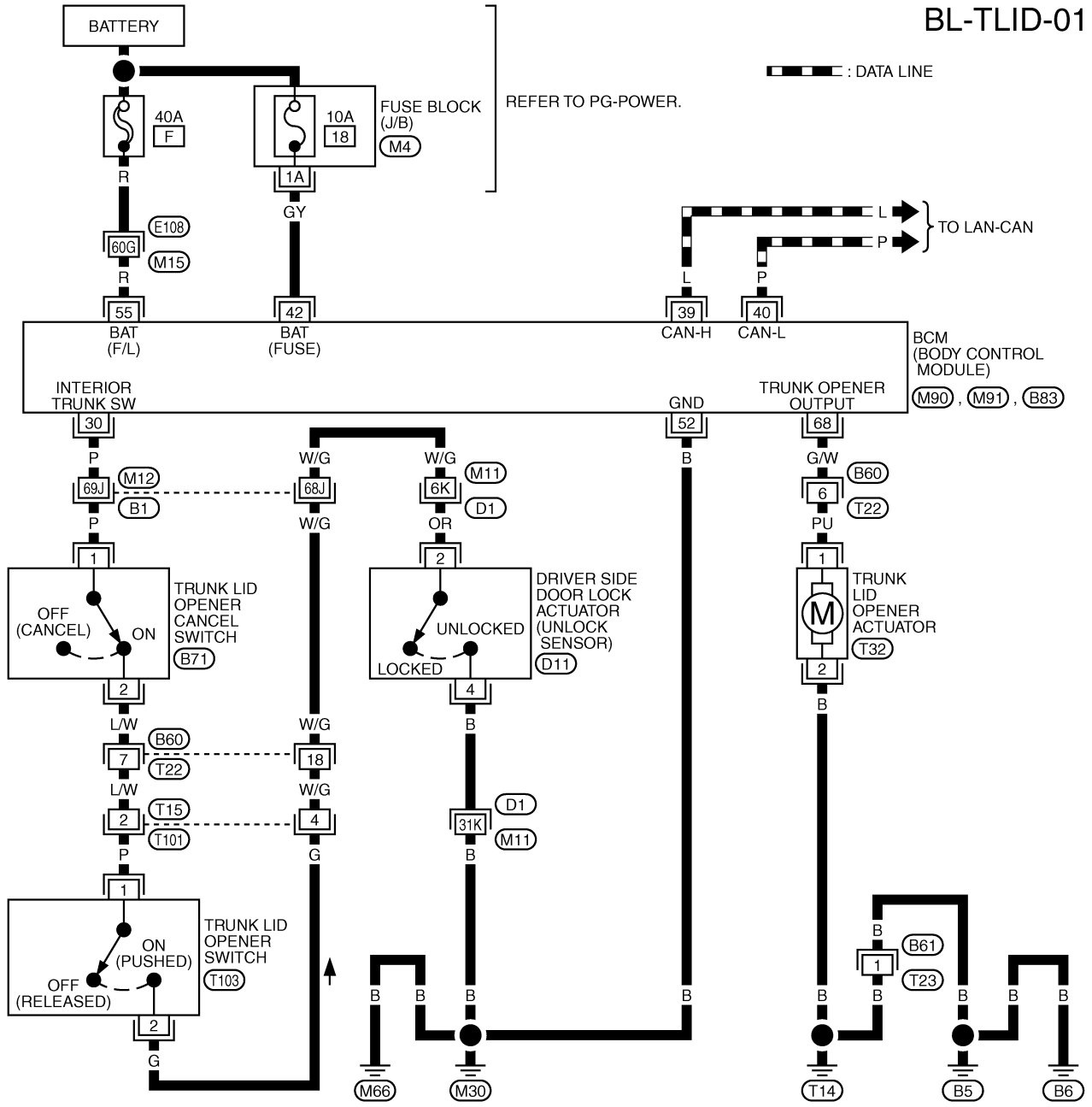
When trunk lid opener cancel switch is OFF (CANCEL), it cannot open trunk with trunk lid opener switch.

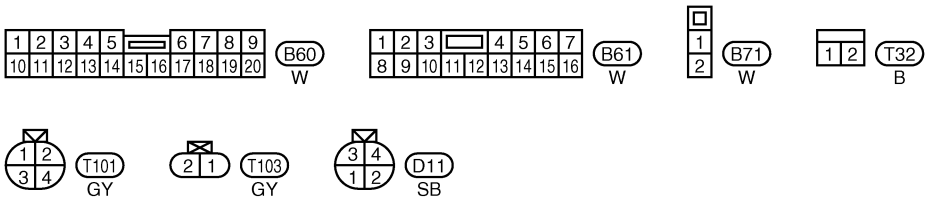
TRUNK OPENER OPERATION WITH KEY FOB

Open the trunk with key fob. Refer to BL-65, "Trunk Opener Operation/For Roadster" .

Wiring Diagram—T/LID—

AIS003XJ





REFER TO THE FOLLOWING.
E108 , B1 , D1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M90 , M91 , B83 -ELECTRICAL UNITS

TIWT0794E

Terminals and Reference Value for BCM

AIS003Y4

Terminal	Wire color	Item	Condition		Voltage (V) (Approx.)
30	P	Trunk lid opener switch	Trunk lid opener cancel switch is ON	Trunk lid opener switch is ON	0
				Trunk lid opener switch is OFF	5
			Driver side door is locked	Trunk lid opener cancel switch is OFF	5
42	GY	Ignition switch (ON)	Ignition switch ON or START position		Battery voltage
52	B	Ground	—		0
55	R	Power source (Fusible link)	—		Battery voltage
68	G/W	Trunk lid opener release output signal	Closed (OFF) → Opened (ON)		0 → Battery voltage

CONSULT-II Function

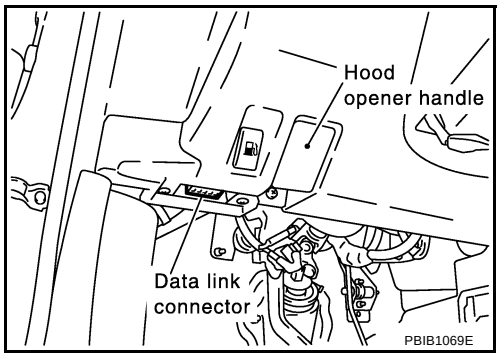
AIS0040A

CONSULT-II BASIC OPERATION PROCEDURE

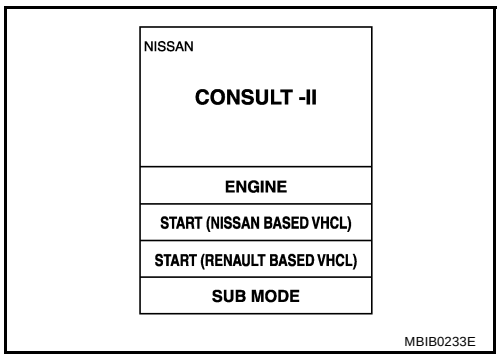
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

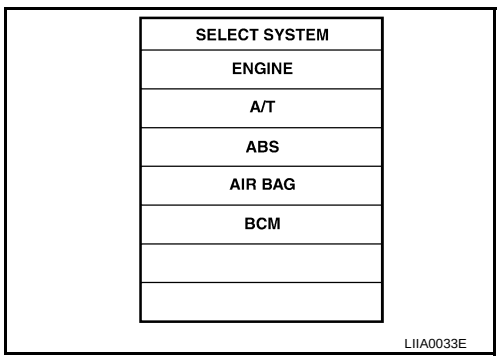
1. Turn ignition switch “OFF”.
2. Connect “CONSULT-II” and CONSULT-II CONVERTER to data link connector.



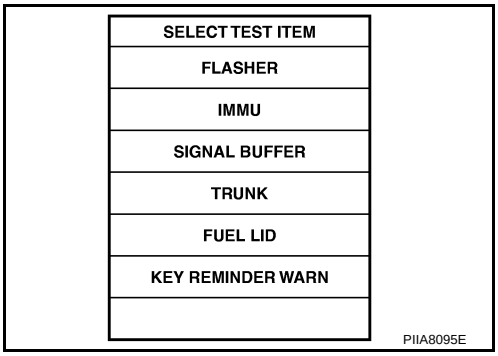
3. Turn ignition switch “ON”.
4. Touch “START(NISSAN BASED VHCL)”.



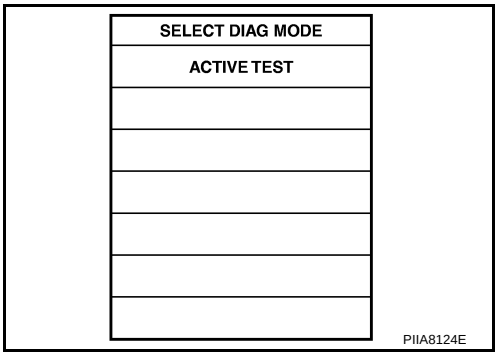
5. Touch “BCM”.
   If “BCM” is not indicated, go to GI-39 , “CONSULT-II Date Link Connector (DLC) Circuit”



6. Touch “TRUNK”.



7. Select diagnosis mode.
“ACTIVE TEST”



ACTIVE TEST

Test item	Content
TRUNK/BACK DOOR	This test is able to check trunk lid opener actuator unlock operation. This actuator unlocks when “ON” on CONSULT-II screen is touched.

Trouble Diagnosis

AIS003Y5

TRUNK DOSE NOT OPEN WITH TRUNK LID OPENER SWITCH

1. CHECK TRUNK LID OPENER CANCEL SWITCH

Check trunk lid opener cancel switch position.

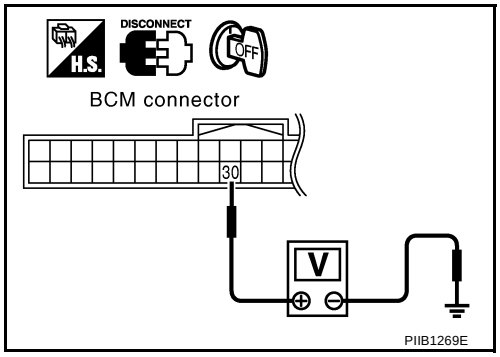
Does trunk lid opener cancel switch turn OFF?

Yes or No

Yes >> Turn on trunk lid opener cancel switch.
No >> GO TO 2.

2. CHECK TRUNK LID OPEN INPUT SIGNAL

1. Remove Key from ignition key cylinder.
2. Turn on trunk lid opener cancel switch.
3. Unlock driver side door.
4. Check voltage between BCM and ground.



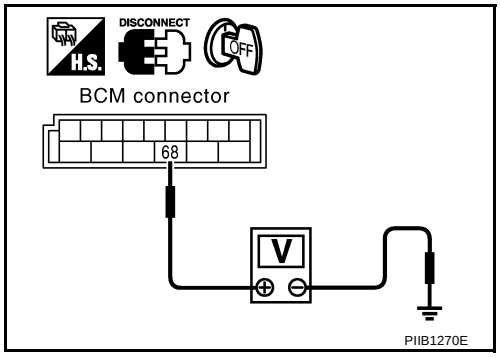
Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(–)		
M90	30 (P)	Ground	Trunk lid opener switch ON	0
			Trunk lid opener switch OFF	5

OK or NG

OK >> GO TO 3.
NG >> GO TO 6.

3. CHECK TRUNK LID OPEN OUTPUT SIGNAL

Check voltage between BCM and ground.



Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(–)		
B83	68 (G/W)	Ground	Trunk lid opener switch ON	Battery voltage
			Trunk lid opener switch OFF	0

OK or NG

OK >> GO TO 4.
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

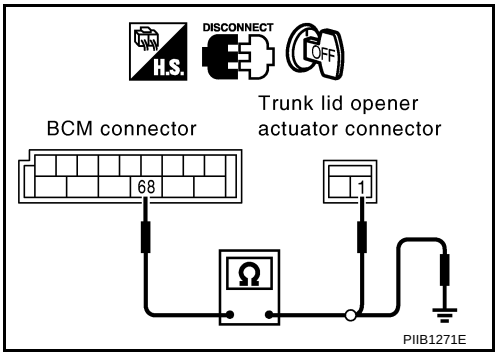
4. CHECK TRUNK LID OPENER ACTUATOR CIRCUIT

1. Disconnect BCM connector and trunk lid opener actuator connector.
2. Check continuity between BCM harness connector B83 terminal 68 and trunk lid opener actuator harness connector T32 terminal 1.

68 (G/W) - 1 (PU) : Continuity should exist.

3. Check continuity between BCM harness connector B83 terminal 68 and ground.

68 (G/W) - ground : Continuity should not exist.



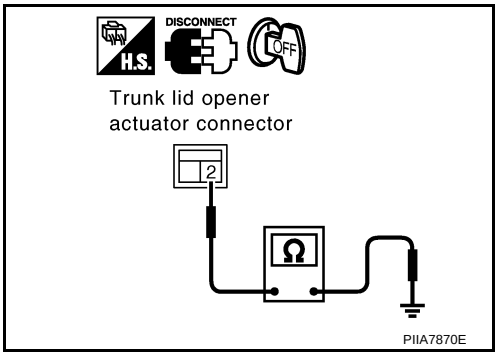
OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK TRUNK LID OPENER ACTUATOR GROUND CIRCUIT

Check continuity between trunk lid opener actuator harness connector T32 terminal 2 and ground.

2 (B) - ground : Continuity should exist.



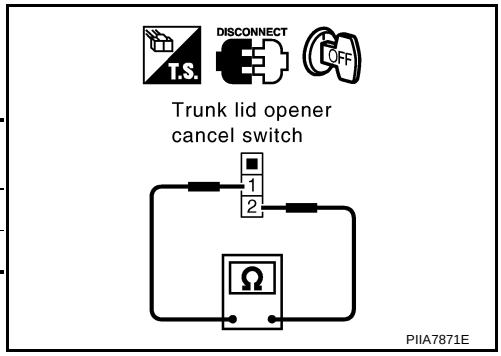
OK or NG

OK >> Replace trunk lid opener actuator.
NG >> Repair harness or connector.

6. CHECK TRUNK LID OPENER CANCEL SWITCH

1. Disconnect trunk lid opener cancel switch.
2. Check continuity between trunk lid opener cancel switch harness connector B71 terminals 1 and 2.

Terminals		Trunk lid opener cancel switch condition	Continuity
1	2	ON	Yes
		OFF	No



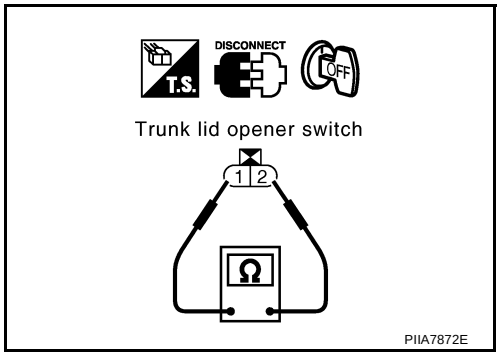
OK or NG

OK >> GO TO 7.
NG >> Replace trunk lid opener cancel switch.

7. CHECK TRUNK LID OPENER SWITCH

1. Disconnect trunk lid opener switch
2. Check continuity between trunk lid opener switch harness connector T103 terminals 1 and 2.

Terminals		Trunk lid opener switch condition	Continuity
1	2	ON (Pushed)	Yes
		OFF (Released)	No



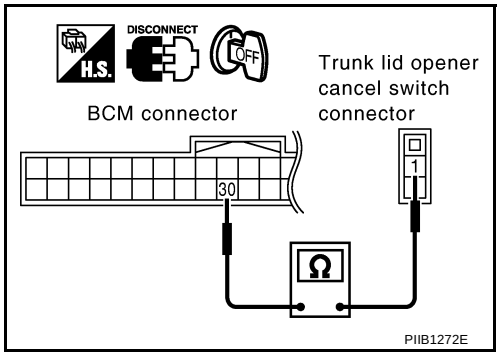
OK or NG

OK >> GO TO 8.
NG >> Replace trunk lid opener switch.

8. CHECK TRUNK LID OPENER CANCEL SWITCH CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M90 terminal 30 and trunk lid opener cancel switch harness connector B71 terminal 1.

30 (P) - 1 (GY) : Continuity should exist.



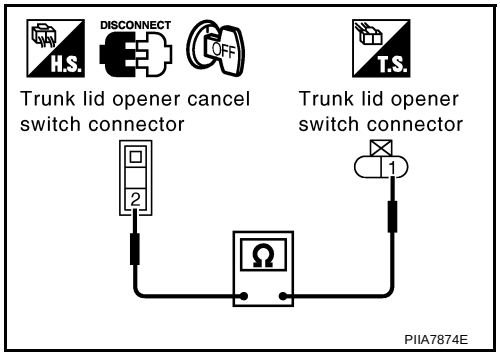
OK or NG

OK >> GO TO 9.
NG >> Repair harness or connector.

9. CHECK TRUNK LID OPENER SWITCH CIRCUIT

Check continuity between trunk lid opener cancel switch harness connector B71 terminal 2 and trunk lid opener switch harness connector T103 terminal 1.

2 (L/W) - 1 (P) : Continuity should exist.



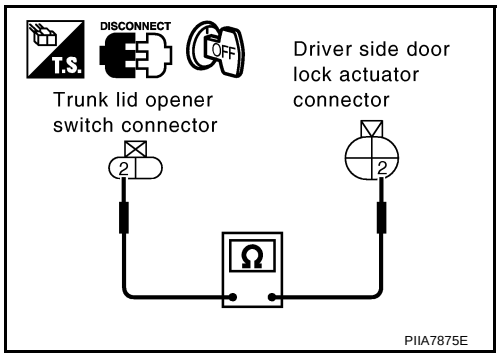
OK or NG

OK >> GO TO 10.
NG >> Repair harness or connector.

10. CHECK DRIVER SIDE DOOR LOCK ACTUATOR CIRCUIT

1. Disconnect driver side door lock actuator connector.
2. Check continuity between trunk lid opener switch harness connector T103 terminal 2 and driver side door lock actuator switch harness connector D11 terminal 2.

2 (G) - 2 (OR) : Continuity should exist.



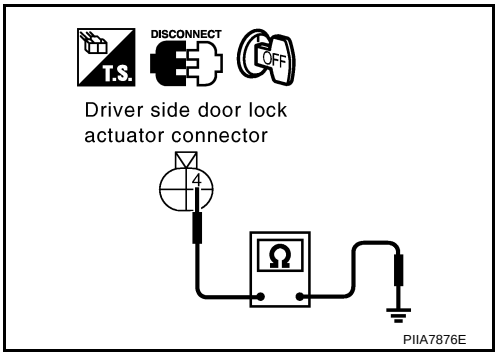
OK or NG

OK >> GO TO 11.
NG >> Repair harness or connector.

11. CHECK DRIVER SIDE DOOR LOCK ACTUATOR GROUND CIRCUIT

Check continuity between driver side door lock actuator switch harness connector D11 terminal 4 and ground.

4 (B) - ground : Continuity should exist.



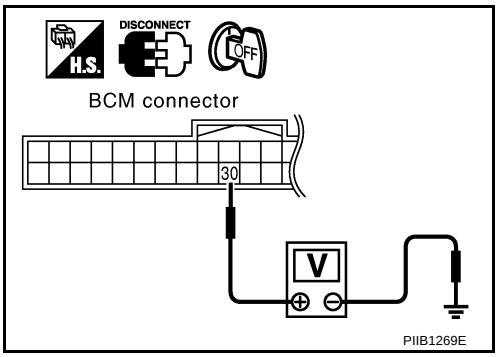
OK or NG

OK >> Replace driver side door lock actuator.
NG >> Repair harness or connector.

TRUNK DOSE NOT CLOSE

1. CHECK TRUNK LID OPEN INPUT SIGNAL

1. Remove Key from ignition key cylinder.
2. Turn on trunk lid opener cancel switch.
3. Unlock driver side door.
4. Check voltage between BCM and ground.



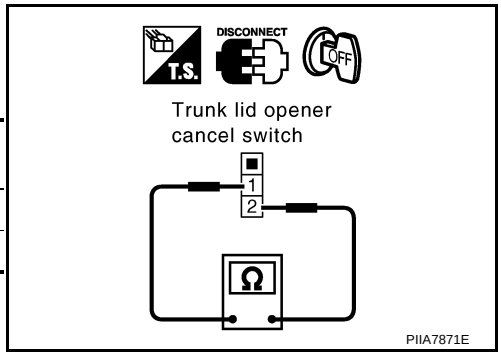
Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(–)		
M90	30 (P)	Ground	Trunk lid opener switch ON	0
			Trunk lid opener switch OFF	5

OK or NG

OK >> GO TO 2.
NG >> Replace BCM.

2. CHECK TRUNK LID OPENER CANCEL SWITCH

1. Disconnect trunk lid opener cancel switch.
2. Check continuity between trunk lid opener cancel switch harness connector B71 terminals 1 and 2.



Terminals		Trunk lid opener cancel switch condition	Continuity
1	2	ON	Yes
		OFF	No

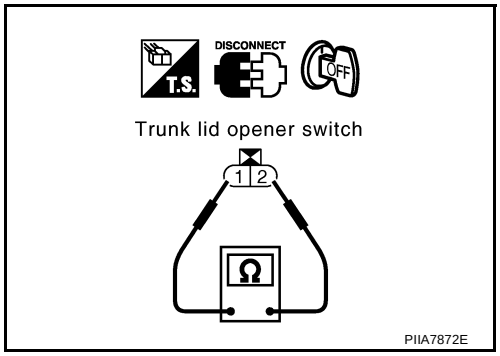
OK or NG

OK >> GO TO 3.
NG >> Replace trunk lid opener cancel switch.

3. CHECK TRUNK LID OPENER SWITCH

1. Disconnect trunk lid opener switch
2. Check continuity between trunk lid opener switch harness connector T103 terminals 1 and 2.

Terminals		Trunk lid opener switch condition	Continuity
1	2	ON (Pushed)	Yes
		OFF (Released)	No



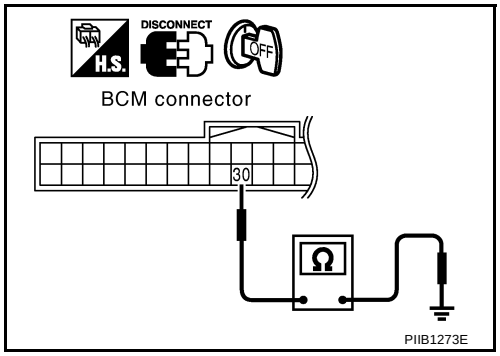
OK or NG

OK >> GO TO 4.
NG >> Replace trunk lid opener switch.

4. CHECK TRUNK LID OPENER CANCEL SWITCH CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M90 terminal 30 and ground.

30 (P) - ground : Continuity should not exist.



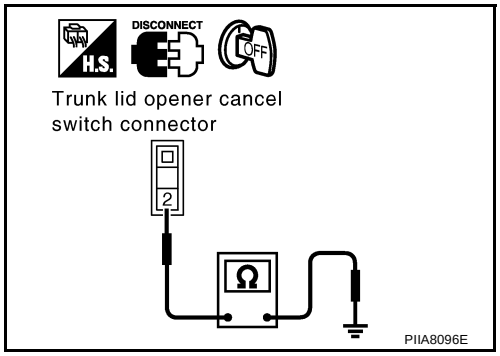
OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK TRUNK LID OPENER SWITCH CIRCUIT

Check continuity between trunk lid opener cancel switch harness connector B71 terminal 2 and ground.

2 (L/W) - ground : Continuity should not exist.



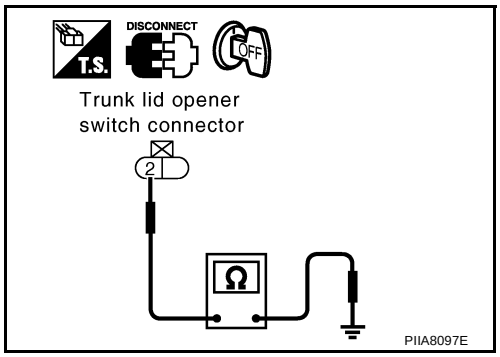
OK or NG

OK >> GO TO 6.
NG >> Repair harness or connector.

6. CHECK DRIVER SIDE DOOR LOCK ACTUATOR CIRCUIT

1. Disconnect driver side door lock actuator connector.
2. Check continuity between trunk lid opener switch harness connector T103 terminal 2 and ground.

2 (G) - ground : Continuity should not exist.



OK or NG

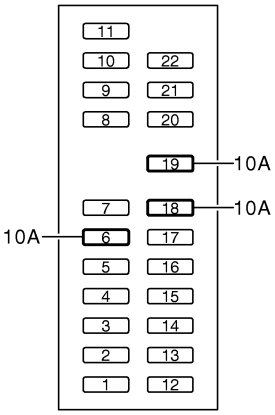
OK >> Replace BCM.
NG >> Repair harness or connector.

VEHICLE SECURITY (THEFT WARNING) SYSTEM

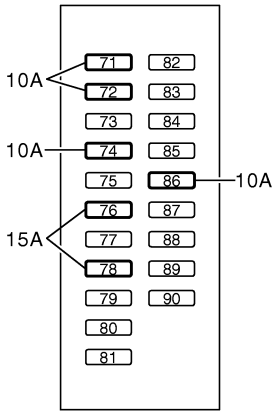
PFP:28491

Component Parts and Harness Connector Location

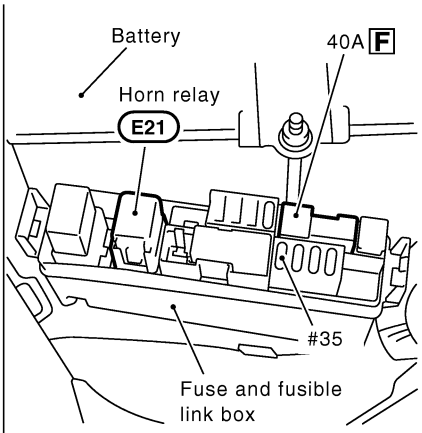
AIS0014P



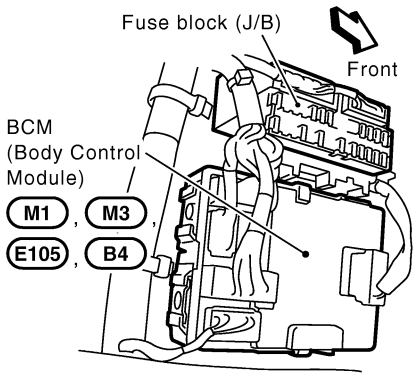
Fuse block (J/B) fuse layout



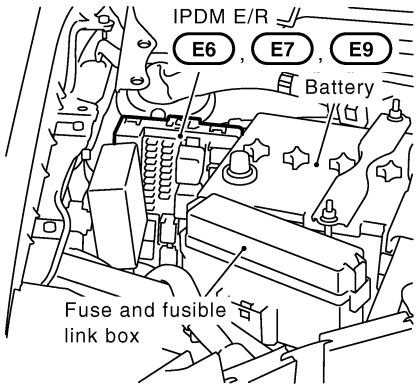
IPDM E/R fuse layout

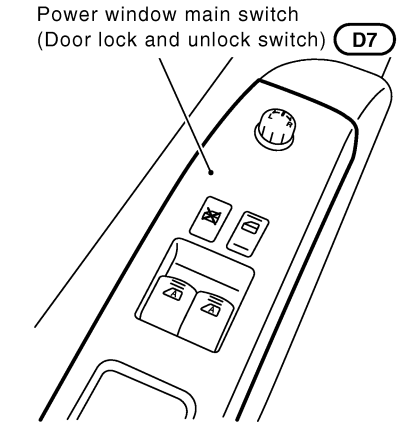


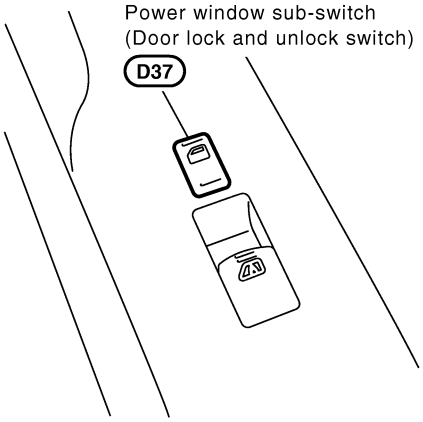
View with dash side LH removed



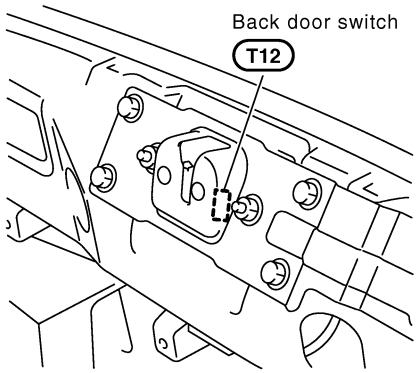
View with cowl top removed

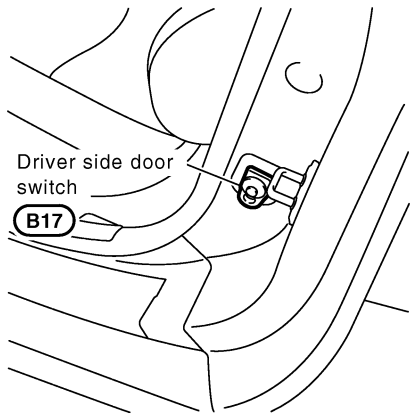


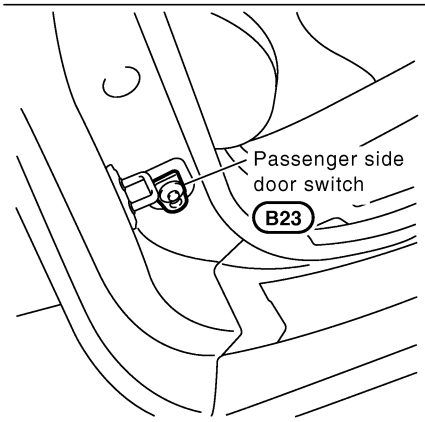




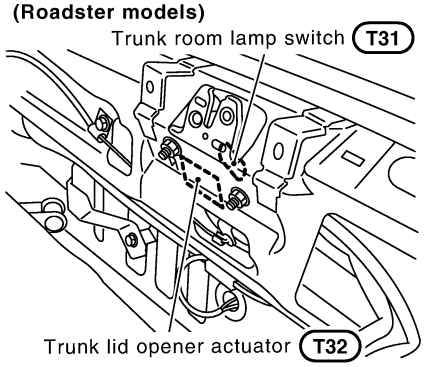
View with luggage finisher rear



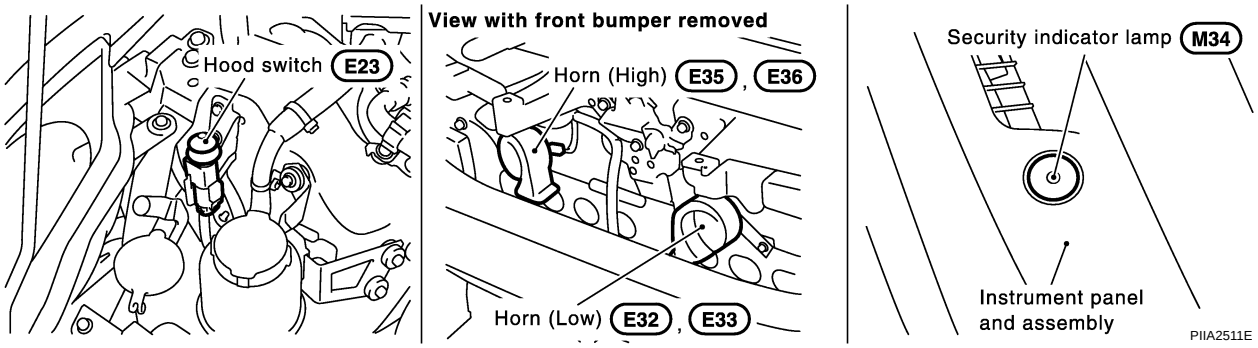




View with luggage finisher lower (center) removed (Roadster models)



PIIB1280E

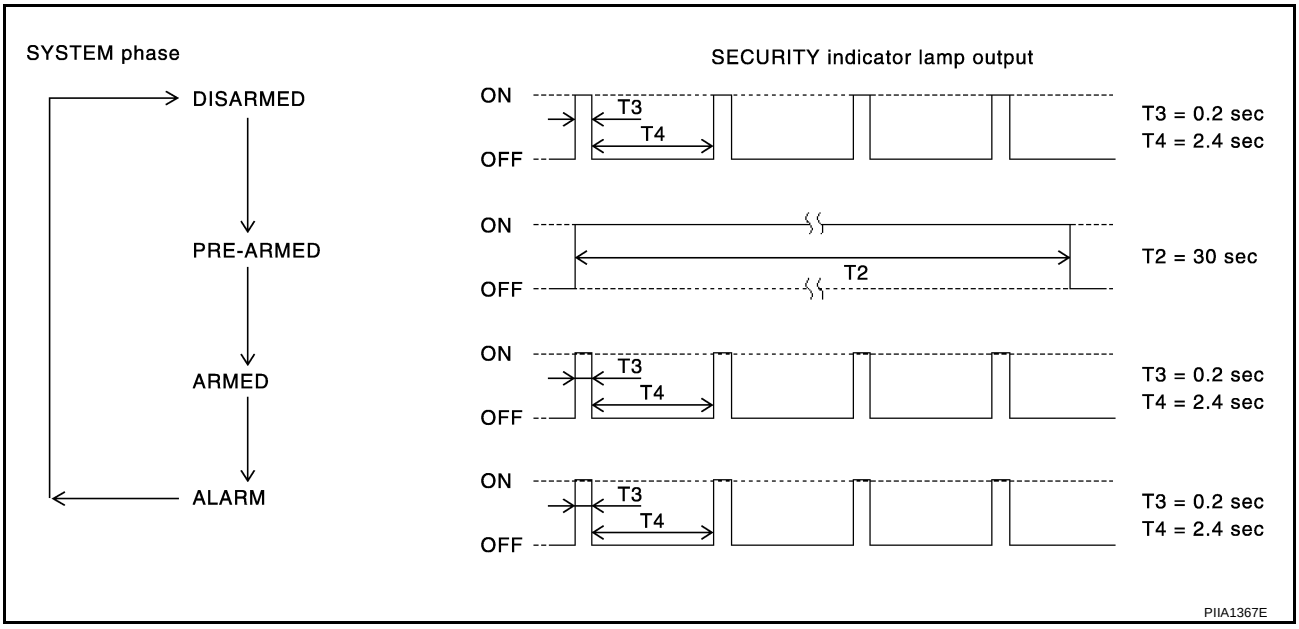


System Description

AIS0014Q

DESCRIPTION

Operation Flow



Setting the vehicle security system

Initial condition

- Ignition switch is in OFF position.

Disarmed phase

- When hood, doors, back door (for Coupe) or trunk (for Roadster) is open, the vehicle security system is set in the disarmed phase on the assumption that the owner is inside or near the vehicle.
- When the vehicle security system is in the disarmed phase, the security indicator lamp blinks every 2.4 seconds.

Pre-armed phase and armed phase

When the following operation 1 or 2 is performed, the vehicle security system turns into the “pre-armed” phase. (The security indicator lamp illuminates.)

1. BCM receives LOCK signal from door key cylinder switch or key fob after hood, all doors and back door (for Coupe) or trunk (for Roadster) are closed.
2. Hood, all doors and back door (for Coupe) or trunk (for Roadster) are closed after doors are locked by key or door lock and unlock switch.
   The security indicator lamp illuminates for 30 seconds. Then, the system automatically shifts into the “armed” phase.

Canceling the set vehicle security system

When one of the following operations is performed, the armed phase is canceled.

1. Unlock the doors with the key or the key fob.
2. Open the back door (for Coupe) or trunk (for Roadster) with the key fob.

3. Turn ignition switch to “ON” or “ACC” position.

Canceling the alarm operation of the vehicle security system

When one of the following operations is performed, the alarm operation is canceled.

- Unlock the door with the key or key fob.
- Open the trunk (for Roadster) with the key fob.

Activating the alarm operation of the vehicle security system

Make sure the system is in the armed phase. (The security indicator lamp blinks every 2.4 seconds.)
When the following operation 1 or 2 is performed, the system sounds the horns and flashes the headlamps for about 50 seconds.

1. Hood, any door or trunk (for Roadster) is opened during armed phase.
2. Disconnecting and connecting the battery connector before canceling armed phase.

POWER SUPPLY AND GROUND

Power is supplied at all times

- through 10A fuse [No.19, located in the fuse block (J/B)]
- to security indicator lamp terminal 1.

Power is supplied at all times

- through 40A fusible link (letter **F** , located in the fuse and fusible link box)
- to BCM terminal 55,
- through 10A fuse [No.18, located in the fuse block (J/B)]
- to BCM terminal 42.

With the ignition switch in the ACC or ON position, power is supplied

- through 10A fuse [No. 6, located in the fuse block (J/B)]
- to BCM terminal 11.

Ground is supplied.

- to BCM terminal 52
- through body grounds M30 and M66.

INITIAL CONDITION TO ACTIVATE THE SYSTEM

The operation of the vehicle security system is controlled by the doors, hood and trunk (for Roadster).
To activate the vehicle security system, BCM must receive signals indicating the doors, hood and trunk (for Roadster) are closed and the doors are locked by key or key fob.
When a door is open, BCM terminals 12, 5 receives a ground signal from each door switch.
When driver side door is unlocked by power window main switch (door lock and unlock switch), BCM terminal 22 receives a signal from terminal 12 of power window main switch.
When passenger side door is unlocked by power window sub-switch (door lock and unlock switch), BCM terminal 22 receives a signal from terminal 16 of power window sub-switch.
When the hood is open, IPDM E/R receives a ground signal

- to IPDM E/R terminal 56
- through hood switch terminals 1 and 2, and
- through body grounds E17, E43 and F152.

The IPDM E/R then sends a signal to the BCM via CAN communication line.
When the back door (for Coupe) or trunk (for Roadster) is open, BCM terminal 57 receives a ground signal

- from terminal 1 of the back door switch (for Coupe) or trunk room lamp switch (for Roadster)
- through body grounds B5, B6,T14 or D105 (for Coupe).

VEHICLE SECURITY SYSTEM ALARM OPERATION

The vehicle security system is triggered by

- opening a driver or passenger side door
- opening the back door (for Coupe)
- opening the trunk (for Roadster)
- opening the hood
- detection of battery disconnect and connect.

The vehicle security system will be triggered once the system is in armed phase,
when BCM receives a ground signal at terminals 12, 62 (door switch), 57 (back door switch or trunk room lamp switch), or IPDM E/R receives a ground signal at terminal 56 (hood switch).
Power is supplied at all times

- to horn relay terminal 2
- through 15A fuse (No. 35, located in the fuse and fusible link box).

When the vehicle security system is triggered, ground is supplied intermittently to both headlamp relay and horn relay.
When both headlamp relay (with built-in IPDM E/R) and horn relay are energized and then power is supplied to headlamps (high beam and low beam) and horns (HIGH and LOW).
The headlamps flash and the horn sounds intermittently.
The alarm automatically turns off after 50 seconds, but will reactivate if the vehicle is tampered with again.

VEHICLE SECURITY SYSTEM DEACTIVATION

To deactivate the vehicle security system, a door must be unlocked or back door (for Coupe) or trunk (for Roadster) must be opened with the key or key fob.
When the key is used to unlock a door, BCM terminal 22 receives signal

- from terminal 12 of the power window main switch (door lock and unlock switch).

When the BCM receives either above signal or unlock signal from key fob, the vehicle security system is deactivated. (Disarmed phase)

PANIC ALARM OPERATION

Remote keyless entry system may or may not operate vehicle security system (horn and headlamps) as required.
When the remote keyless entry system is triggered, ground is supplied intermittently to both headlamp relay and horn relay.
When both headlamp relay (with built-in IPDM E/R) and horn relay are energized and then power is supplied to headlamps (high beam and low beam) and horns (HIGH and LOW).
The headlamp flashes and the horn sounds intermittently.
The alarm automatically turns off after 25 seconds or when BCM receives any signal from key fob.

CAN Communication System Description

AIS0014R

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

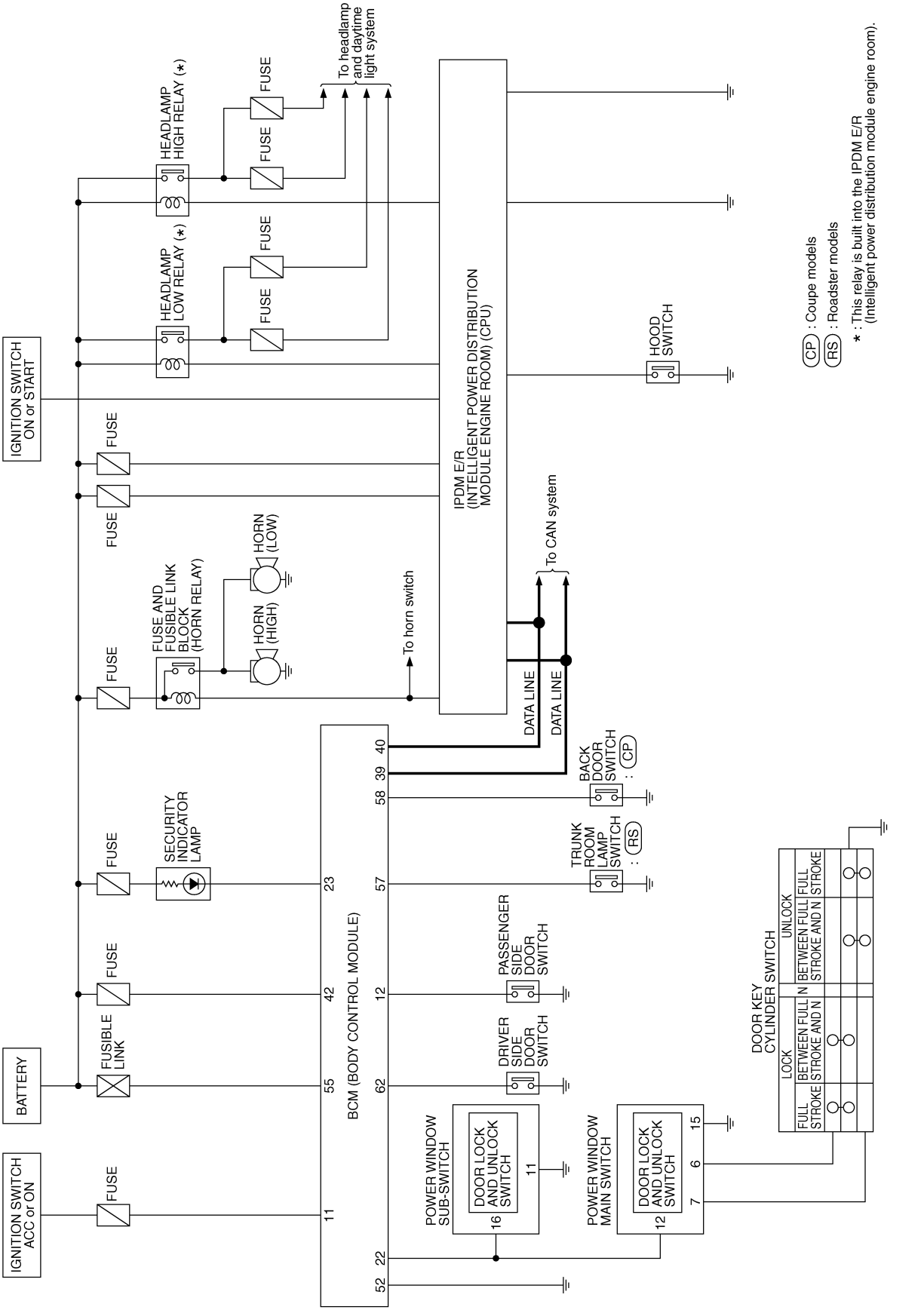
CAN Communication Unit

AIS00410

Refer to LAN-5, "CAN COMMUNICATION" .

Schematic

AIS0014S



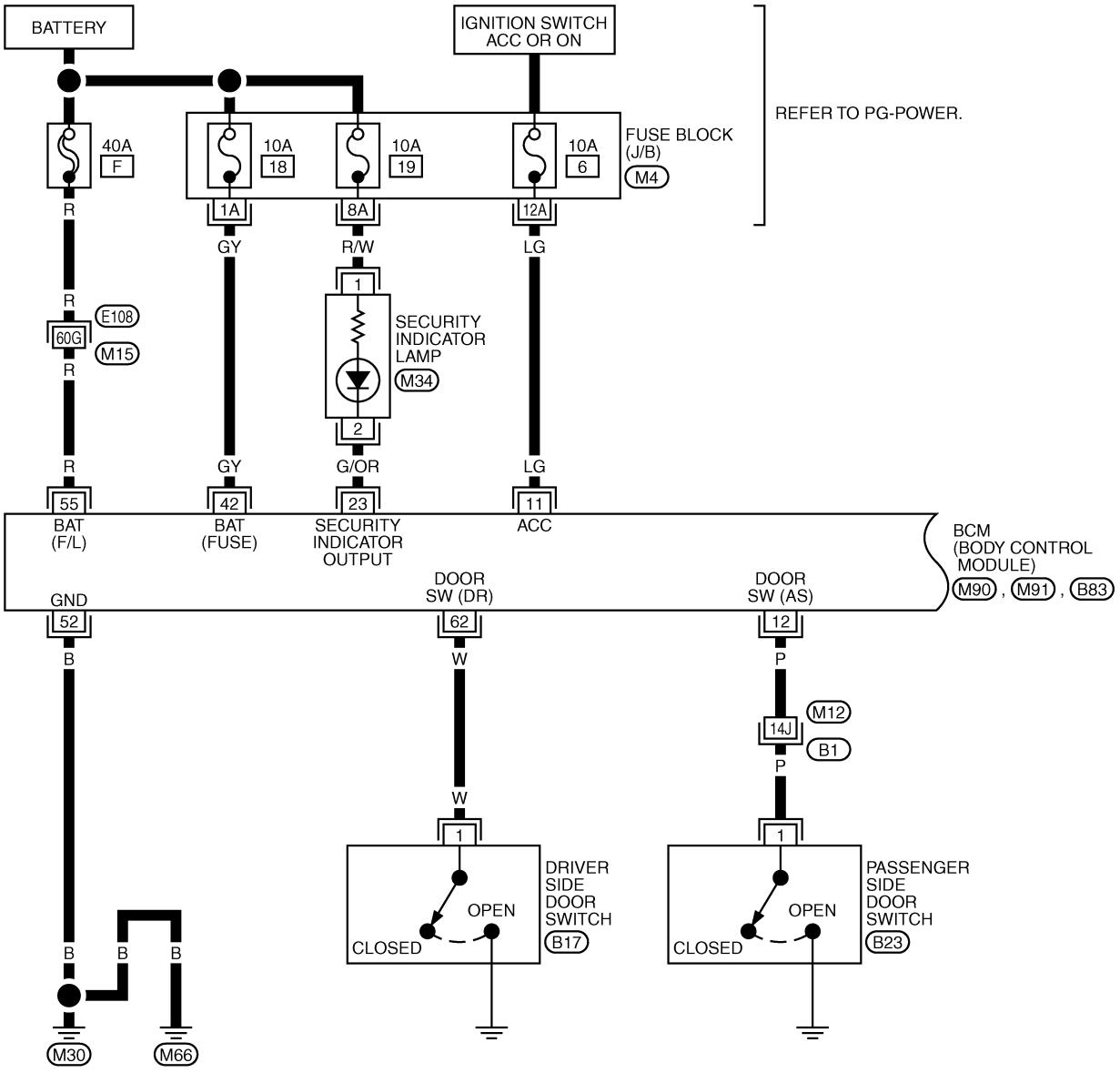
TIWT0803E

Wiring Diagram —VEHSEC—

AIS0014T

FIG. 1

BL-VEHSEC-01



M34 W

B17, B23 W W

REFER TO THE FOLLOWING.

E108, B1 -SUPER MULTIPLE JUNCTION (SMJ)

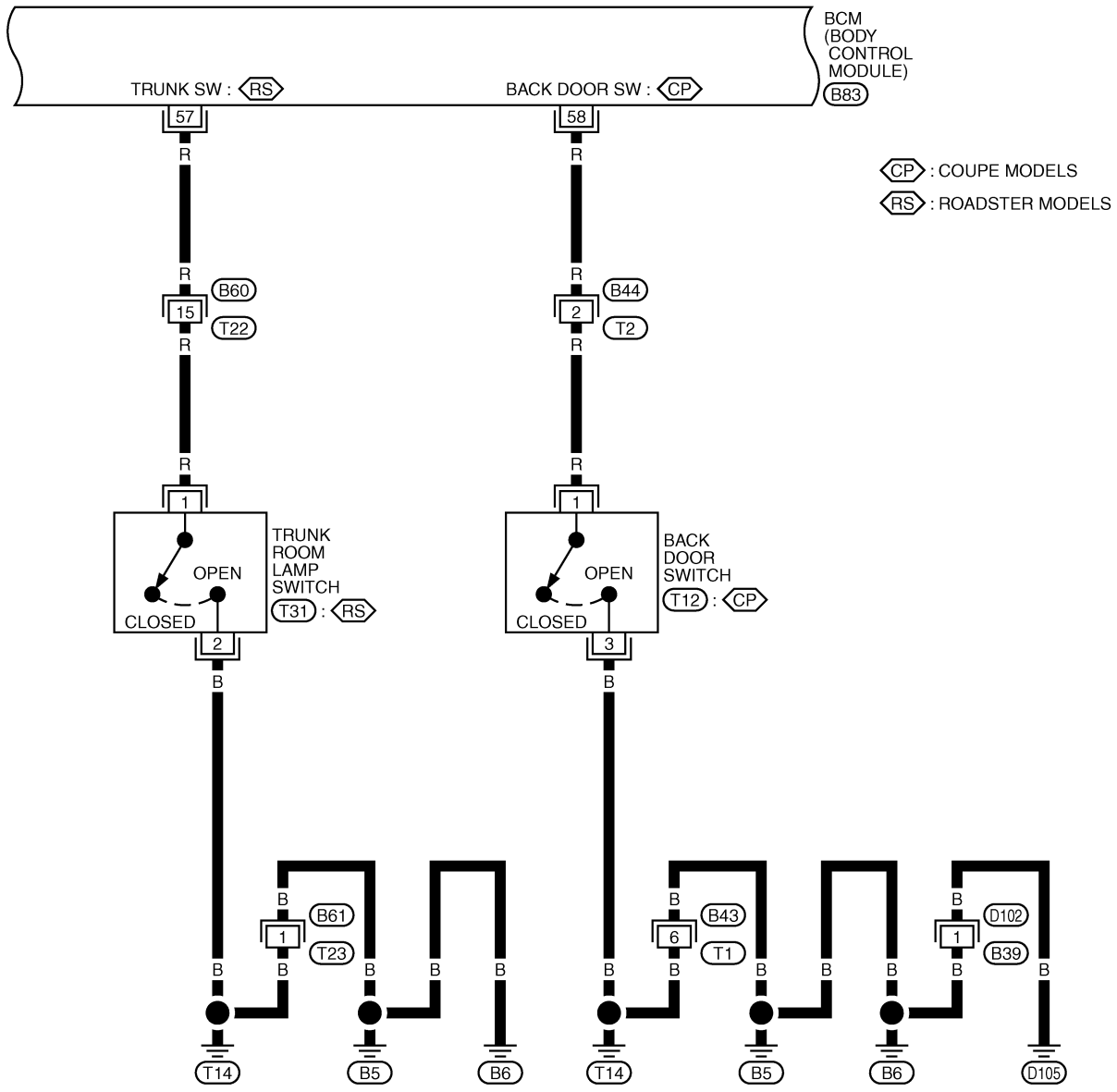
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

M90, M91, B83 -ELECTRICAL UNITS

TIWT0804E

FIG. 2

BL-VEHSEC-02

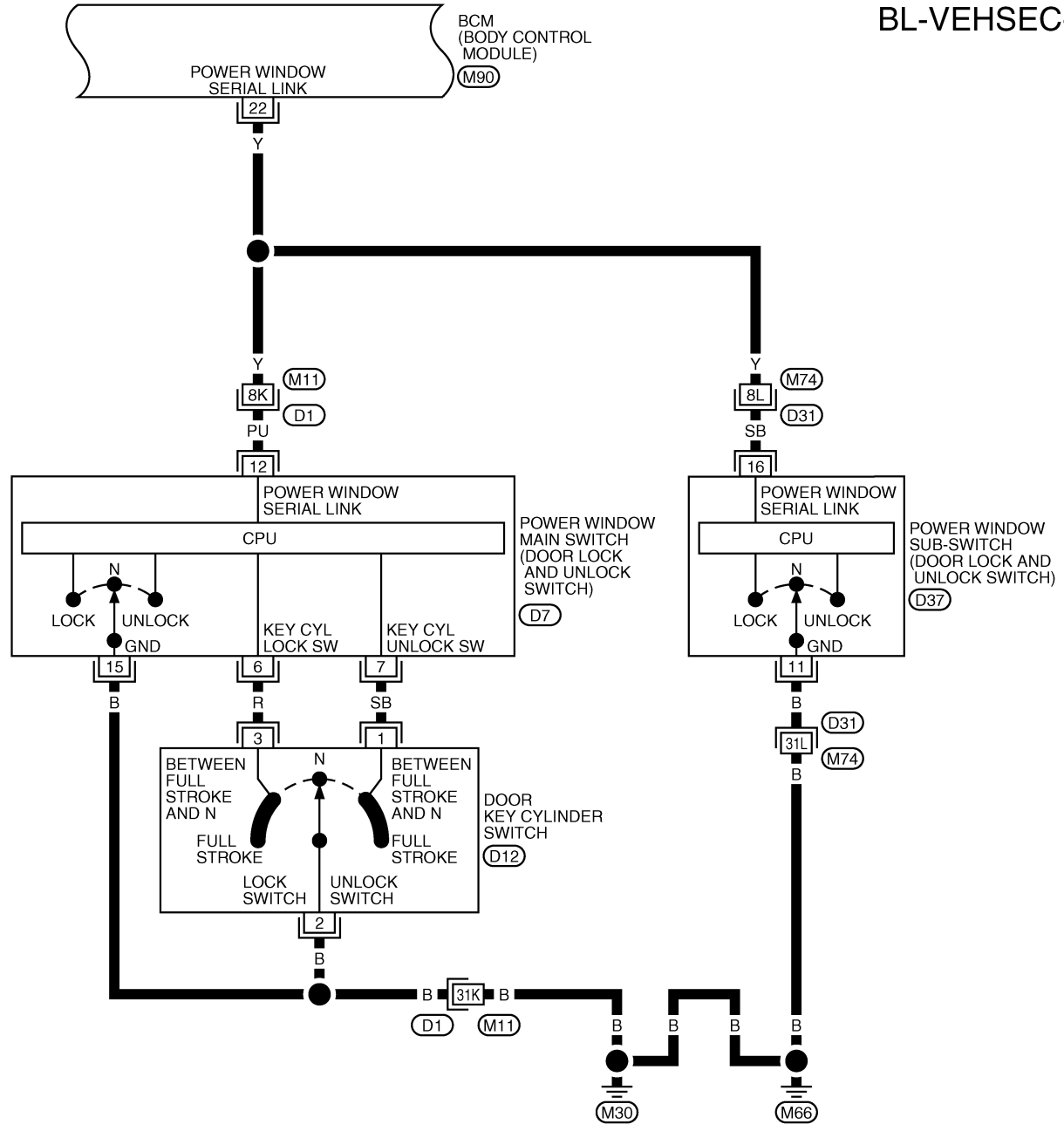


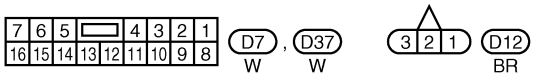
REFER TO THE FOLLOWING.
B83 -ELECTRICAL UNITS

TIWT0805E

FIG. 3

BL-VEHSEC-03



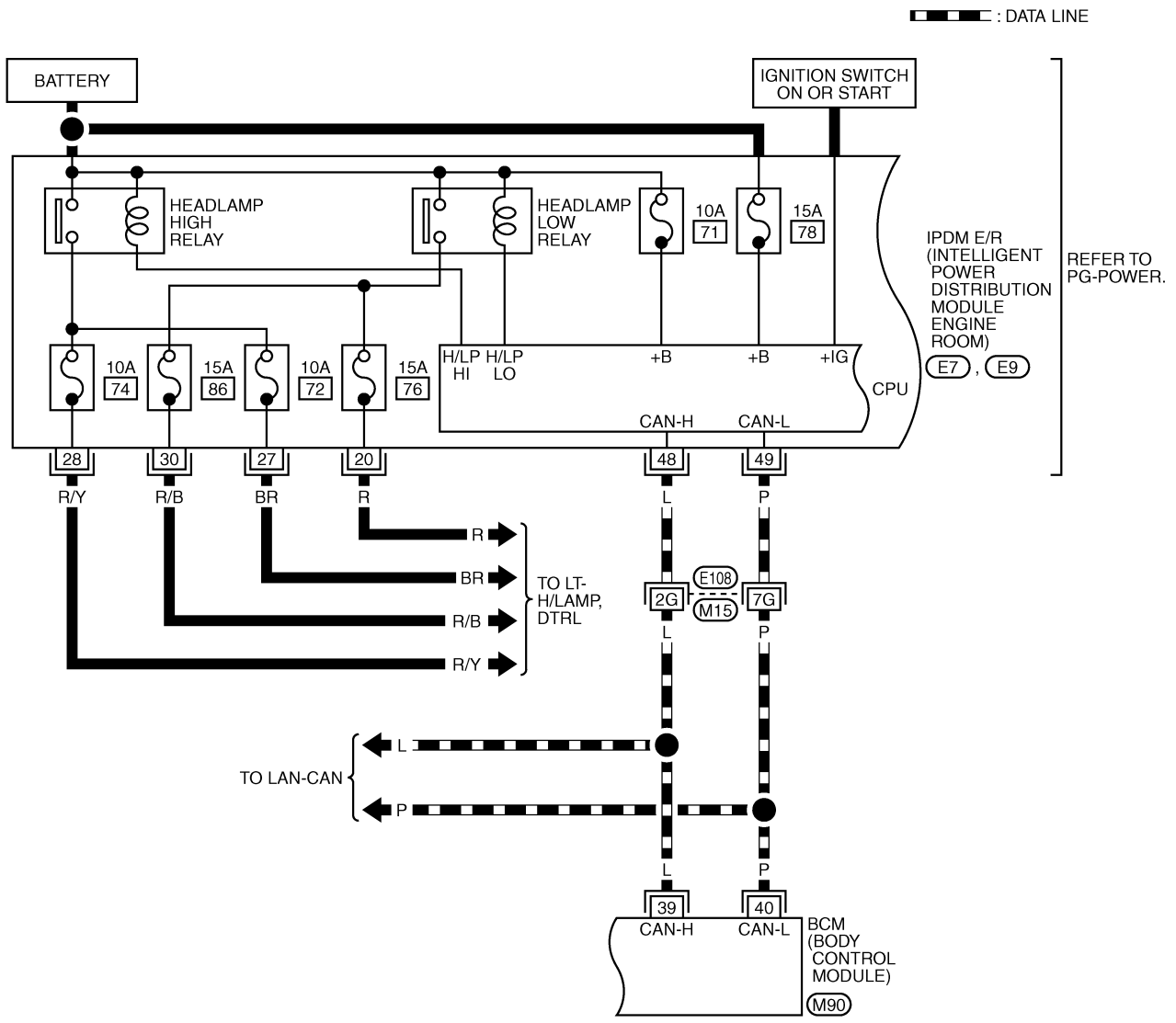


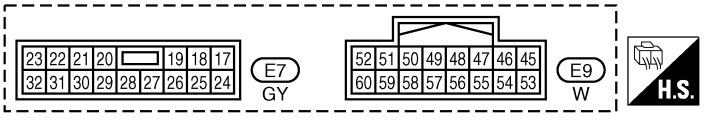
REFER TO THE FOLLOWING.
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)
M90 -ELECTRICAL UNITS

TIWT0806E

FIG. 4

BL-VEHSEC-04

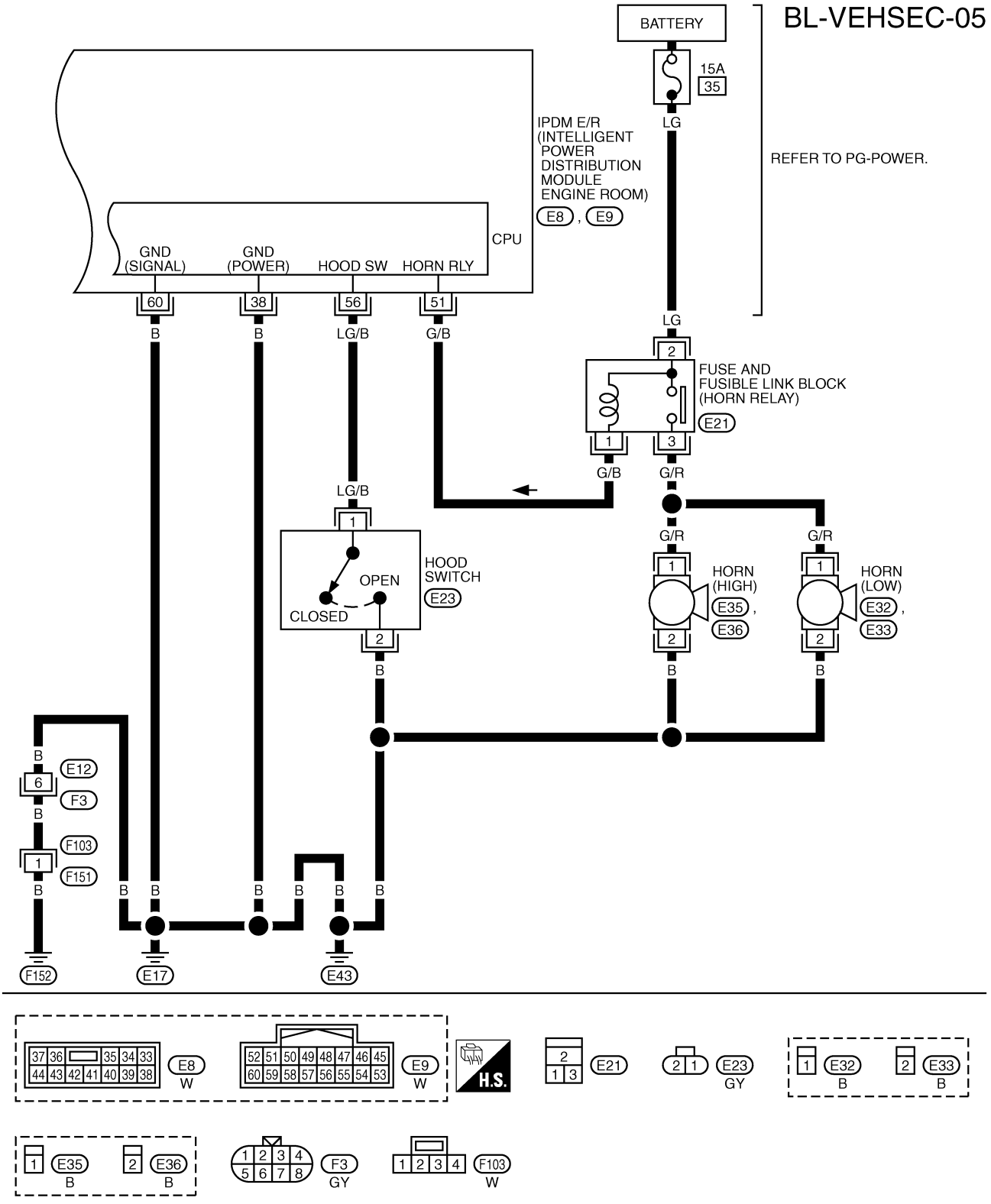




REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M90 -ELECTRICAL UNITS

TIWT0807E

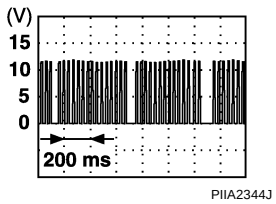
FIG. 5



TIWT0749E

Terminals and Reference Value for BCM

AIS0014U

Terminal	Wire color	Item	Condition	Voltage [V] (Approx.)
11	LG	Ignition switch (ACC)	Ignition switch (ACC or ON)	Battery voltage
12	P	Passenger side door switch	ON (Open) → OFF (Closed)	0 → 5
22	Y	Power window switch (Serial link)	Driver side door and passenger side door are closed. (Each door switch is OFF)	 PIIA2344J
23	G/OR	Security indicator lamp	Goes off → Illuminates (Every 2.4 seconds)	Battery voltage → 0
39	L	CAN-H	—	—
40	P	CAN-L	—	—
42	GY	Ignition switch (ON)	Ignition switch (ON or START)	Battery voltage
52	B	Ground	—	0
55	R	Power source (Fusible link)	—	Battery voltage
57	R	Back door switch (For Coupe) Trunk room lamp switch (For Roadster)	ON (Open) → OFF (Closed)	0 → Battery voltage*1
62	W	Driver side door switch	ON (Open) → OFF (Closed)	0 → 5

*1: When interior lamp battery saver control is in OFF: Approx.5V.

Terminals and Reference Value for IPDM E/R

AIS0014V

Terminal	Wire color	Item	Condition	Voltage [V] (Approx.)
38	B	Ground	—	0
48	L	CAN-H	—	—
49	P	CAN-L	—	—
51	G/B	Horn relay	ON → OFF	0 → Battery voltage
56	LG/B	Hood switch	ON (Open) → OFF (closed)	0 → Battery voltage
60	B	Ground	—	0

CONSULT-II Function of BCM

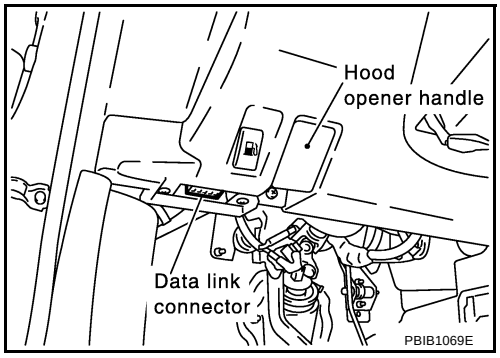
AIS0014W

CONSULT-II BASIC OPERATION PROCEDURE

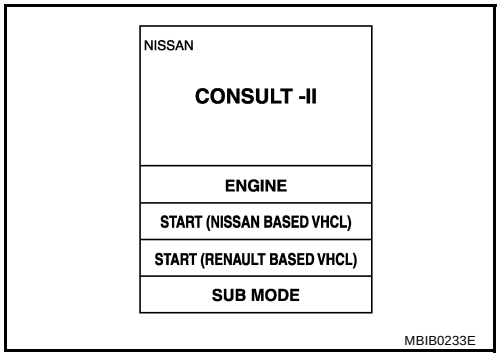
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

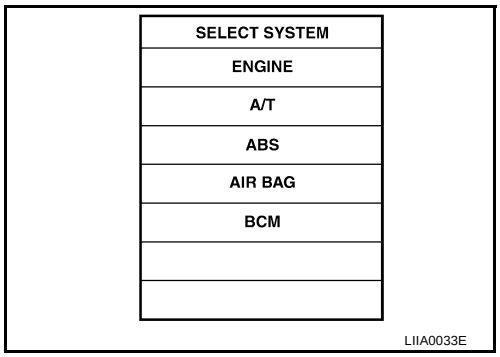
1. Turn ignition switch “OFF”.
2. Connect CONSULT-II and CONSULT-II CONVERTER to data link connector.



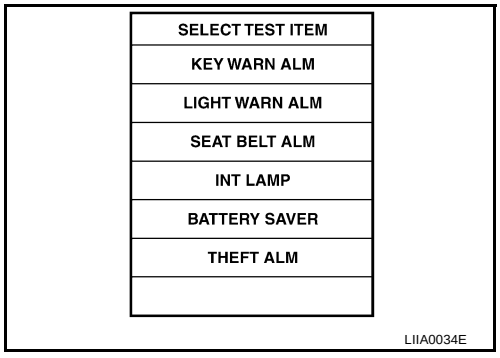
3. Turn ignition switch “ON”.
4. Touch “START(NISSAN BASED VHCL)”.



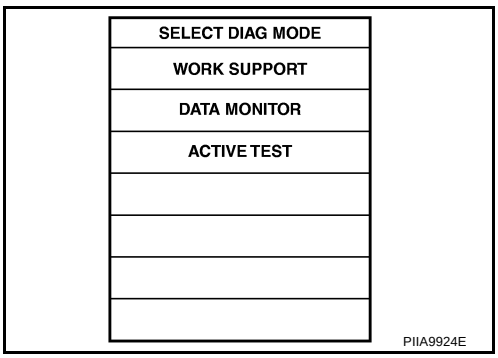
5. Touch “BCM”.
   If “BCM” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



6. Touch “THEFT ALM”.



7. Select diagnosis mode.
“WORK SUPPORT”, “DATE MONITOR”, “ACTIVE TEST” are available.



CONSULT-II APPLICATION ITEM

Work Support

Test Item	Description
SECURITY ALARM SET	This mode is able to confirm and change security alarm ON-OFF setting.
THEFT ALM TRG	The switch which triggered vehicle security alarm is recorded. This mode is able to confirm and erase the record of vehicle security alarm. The trigger data can be erased by touching “CLEAR” on CONSULT-II screen.

Data Monitor

Monitored Item	Description
IGN ON SW	Indicates [ON/OFF] condition of ignition switch.
ACC ON SW	Indicates [ON/OFF] condition of ignition switch in ACC position.
KEY CYL LK SW	Indicates [ON/OFF] condition of lock signal from key cylinder switch.
KEY CYL UN SW	Indicates [ON/OFF] condition of unlock signal from key cylinder switch.
DOOR SW-DR	Indicates [ON/OFF] condition of driver side door switch.
DOOR SW-AS	Indicates [ON/OFF] condition of passenger side door switch.
BACK DOOR SW	Indicates [ON/OFF] condition of back door switch.
TRUNK OPNR SW	Indicates [ON/OFF] condition of trunk room lamp switch. (Roadster models)
TRUNK OPN MNTR	This is displayed even when it is not equipped. Indicates [ON/OFF] condition of trunk lid opener switch. (Roadster models)
TRUNK KEY SW	This is displayed even when it is not equipped.
DOOR SW-RR	This is displayed even when it is not equipped.
HOOD SW	Indicates [ON/OFF] condition of hood switch.
LOCK SW DR/AS	Indicates [ON/OFF] condition of lock signal from driver and passenger side door lock/unlock switch.
UNLK SW DR/AS	Indicates [ON/OFF] condition of unlock signal from driver and passenger side door lock/unlock switch.
LK BUTTON/SIG	Indicates [ON/OFF] condition of lock signal from key fob.
UN BUTTON/SIG	Indicates [ON/OFF] condition of unlock signal from key fob.
TRUNK BTN/SIG	Indicate [ON/OFF] condition of back door open signal from key fob (for Coupe). Indicates [ON/OFF] condition of trunk open signal from key fob (for Roadster).

Active Test

Test Item	Description
THEFT IND	This test is able to check security indicator lamp operation. The lamp will be turned on when “ON” on CONSULT-II screen is touched.
HORN	This test is able to check vehicle security horn (horn alarm) operation. The horns will be activated for 0.5 seconds after “ON” on CONSULT-II screen is touched.
HEAD LAMP	This test is able to check vehicle security lamp (headlamp alarm) operation. The headlamps will be activated for 0.5 seconds after “ON” on CONSULT-II screen is touched.

CONSULT-II Function of IPDM E/R

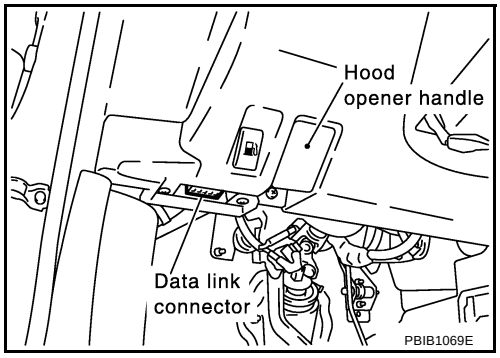
AIS004U5

BASIC OPERATION PROCEDURE

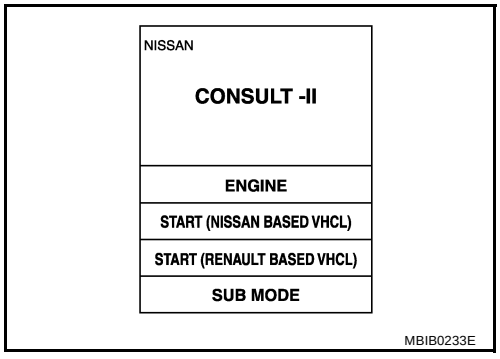
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

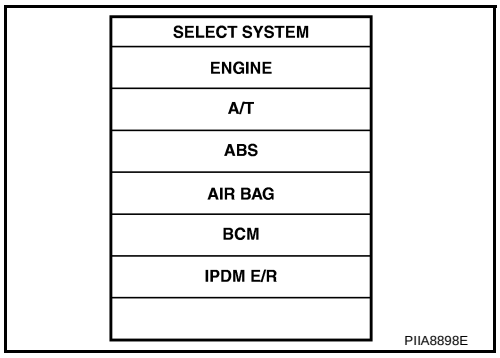
1. Turn ignition switch “OFF”.
2. Connect CONSULT-II and CONSULT-II CONVERTER to data link connector.



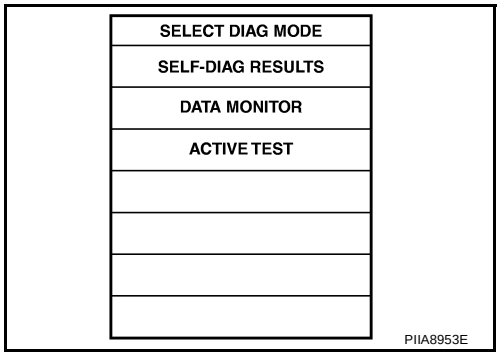
3. Turn ignition switch “ON”.
4. Touch “START(NISSAN BASED VHCL)”.



5. Touch “IPDM”.
   If “IPDM” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



6. Select diagnosis mode.
   “DATE MONITOR” and “ACTIVE TEST” are available.



CONSULT-II APPLICATION ITEM

Data Monitor

Monitored Item	Description
HL LO REQ	Indicates [ON/OFF] condition of headlamp low beam.
HL HI REQ	Indicates [ON/OFF] condition of headlamp high beam.
HOOD SW	Indicates [ON/OFF] condition of hood switch.
THFT HRN REQ	Indicates [ON/OFF] condition of horn relay.

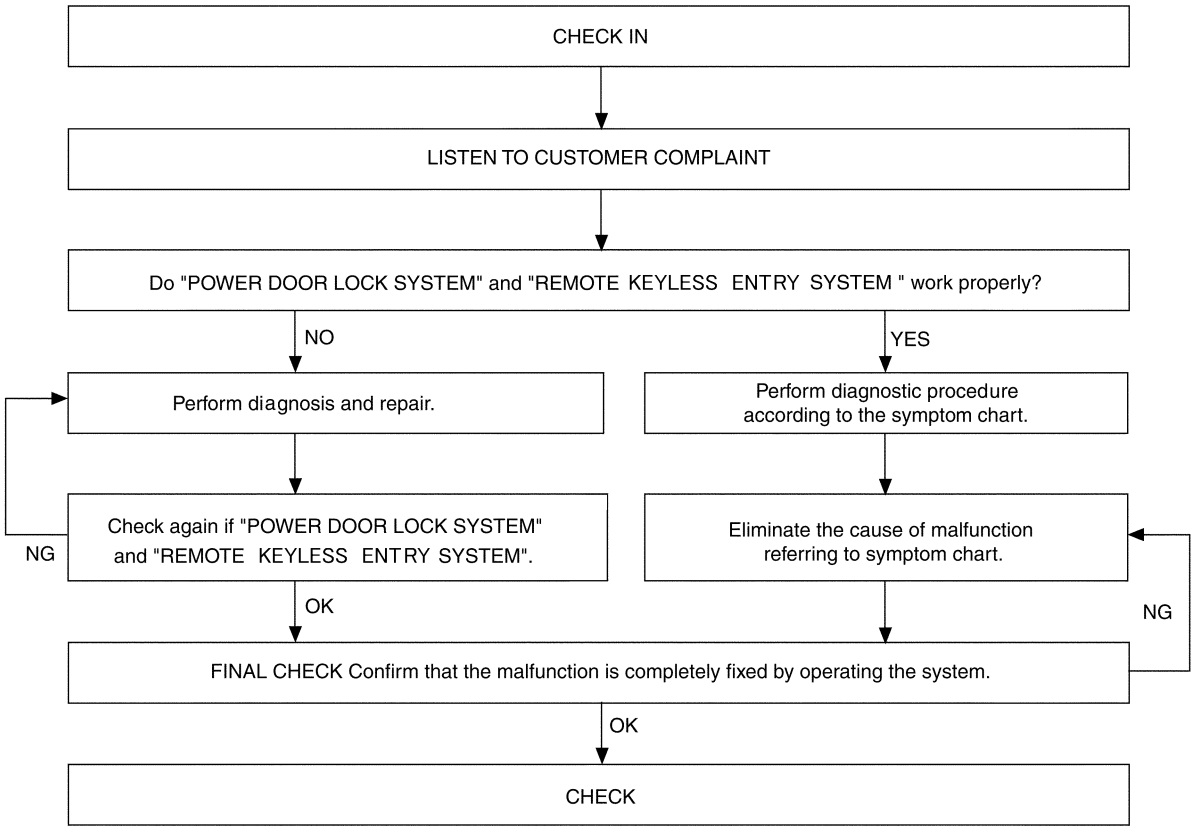
Active Test

Test Item	Description
LAMPS	This test is able to check theft warning lamp (headlamp alarm) operation. The headlamps will be activated for 0.5 seconds after “ON” on CONSULT-II screen is touched.
HORN	This test is able to check theft warning horn (horn alarm) operation. The horns will be activated for 0.5 seconds after “ON” on CONSULT-II screen is touched.

Trouble Diagnosis

AIS0014X

WORK FLOW



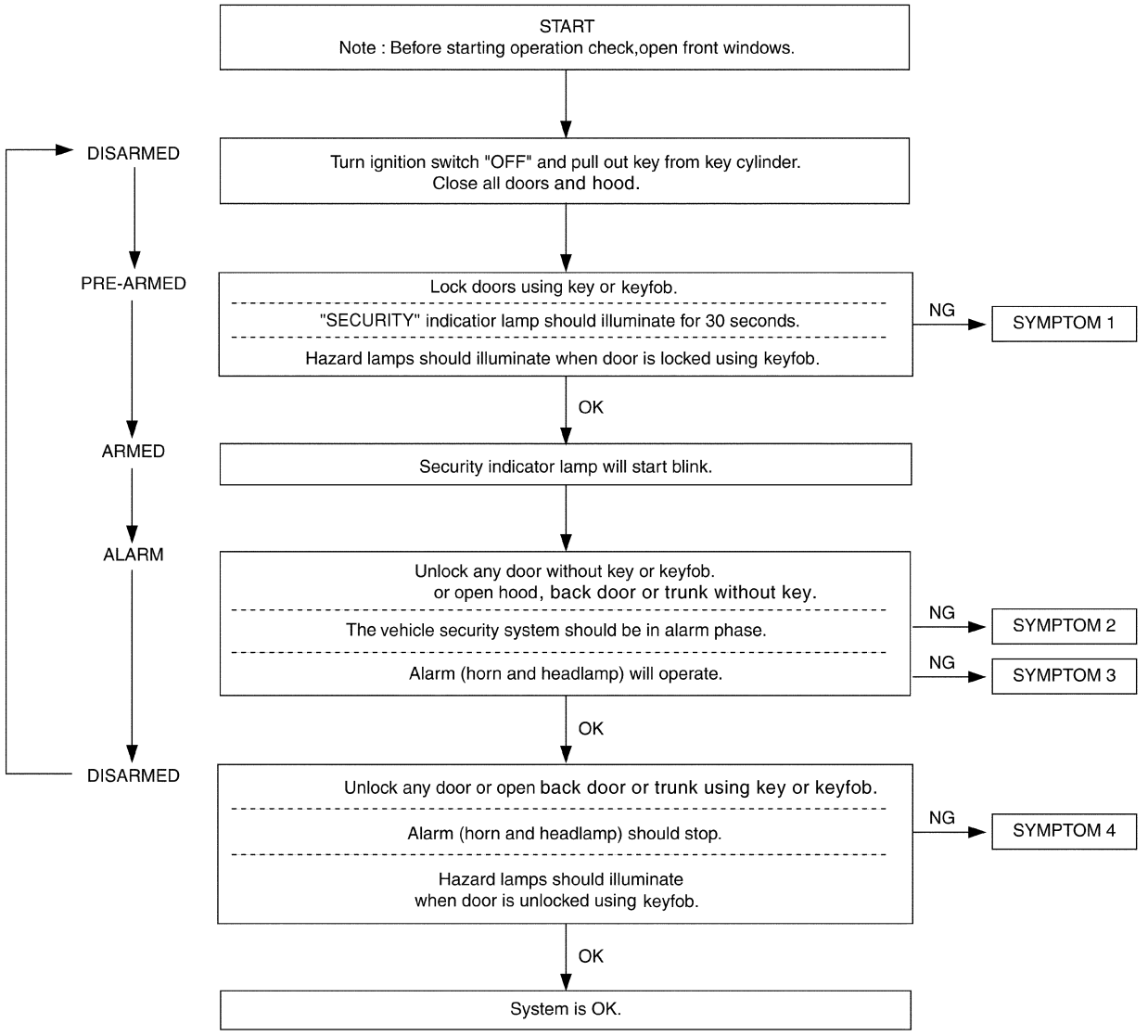
LIIA0123E

- “POWER DOOR LOCK SYSTEM” Diagnosis; refer to BL-35, "Work Flow" .
- “REMOTE KEYLESS ENTRY” Diagnosis; refer to BL-79, "Work Flow" .

Preliminary Check

AIS0014Y

The system operation is canceled by turning ignition switch to “ACC” at any step between START and ARMED in the following flow chart.



PIIA8954E

After performing preliminary check, go to symptom chart. Refer to BL-145, "Symptom Chart" .

Symptom Chart

AIS0014Z

PROCEDURE / SYMPTOM			Diagnostic procedure	Reference page
1	Vehicle security system cannot be set by …..	Door switch	Diagnostic Procedure 1 (Door, hood, back door switch or trunk room lamp switch check)	BL-146
		Lock/unlock switch	Diagnostic Procedure 6 (Door lock/unlock switch check)	BL-157
		Door outside key	Diagnostic Procedure 3 (Door key cylinder switch check)	BL-155
		Key fob	Check remote keyless entry system function.	BL-63
		BCM	If the above systems are “OK”, replace BCM.	BCS-17
	Security indicator does not turn “ON”.		Diagnostic Procedure 2 (Security indicator lamp check)	BL-154
			If the above systems are “OK”, replace BCM.	BCS-17
2	*1 Vehicle security system does not alarm when ….	Any door is opened.	Diagnostic Procedure 1 (Door, hood and trunk room lamp switch check)	BL-146
			If the above systems are “OK”, replace BCM.	BCS-17
3	Vehicle security alarm does not activate.	Horn alarm	Diagnostic Procedure 4 (Vehicle security horn alarm check)	BL-156
			If the above systems are “OK”, replace BCM.	BCS-17
		Headlamp alarm	Diagnostic Procedure 5 (Vehicle security headlamp alarm check)	BL-156
			If the above systems are “OK”, replace BCM.	BCS-17
4	Vehicle security system cannot be canceled by ….	Door outside key	Diagnostic Procedure 3 (Door key cylinder switch check)	BL-155
		Key fob	Check remote keyless entry system function.	BL-63
			If the above systems are “OK”, replace BCM.	BCS-17

*1: Make sure the system is in the armed phase.

Diagnostic Procedure 1

AIS00150

1 – 1 DOOR SWITCH CHECK

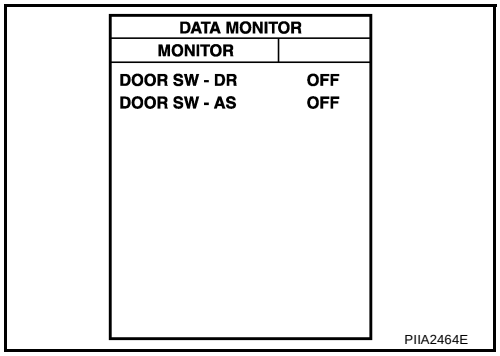
Driver side door switch and passenger side door switch check

1. CHECK DOOR SWITCH INPUT SIGNAL

With CONSULT-II

Check door switches (“DOOR SW-DR” and “DOOR SW-AS”) in “DATA MONITOR” mode with CONSULT-II.

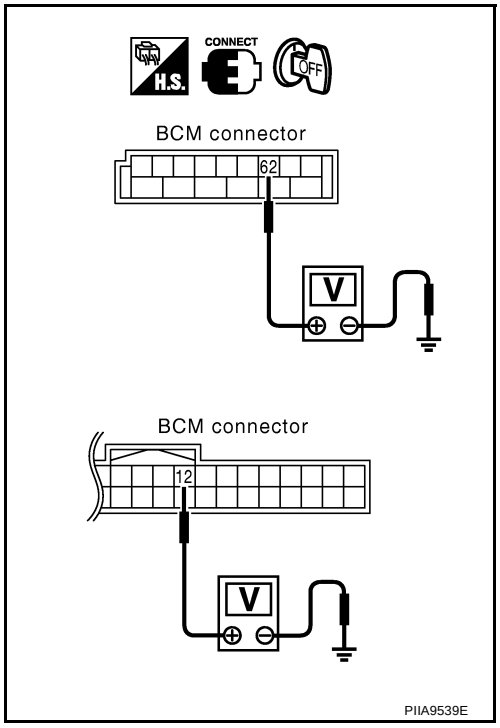
Monitor item	Condition	
DOOR SW-DR	OPEN	: ON
	CLOSE	: OFF
DOOR SW-AS	OPEN	: ON
	CLOSE	: OFF



Without CONSULT-II

Check voltage between BCM connector and ground.

Item	Con-nector	Terminal (Wire color)		Condi-tion of door switch	Voltage [V] (Approx.)
		(+)	(–)		
Driver side door switch	B83	62 (W)	Ground	Open	0
				Close	5
Passenger side door switch	M90	12 (P)		Open	0
				Close	5



OK or NG

OK >> Door switch is OK, and go to the following

- BL-149, "1 – 2 BACK DOOR SWITCH CHECK/FOR COUPE"
- BL-151, "1 – 3 TRUNK ROOM LAMP SWITCH CHECK/FOR ROADSTER"

NG >> GO TO 2.

2. CHECK DOOR SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect door switch and BCM connector.
3. Check continuity between door switch harness connector B17, B23 terminal 1 and BCM harness connector B83 terminal 62 (driver side) or B83 terminal 12 (passenger side).

Driver side door

1 (W) - 62 (W) : Continuity should exist.

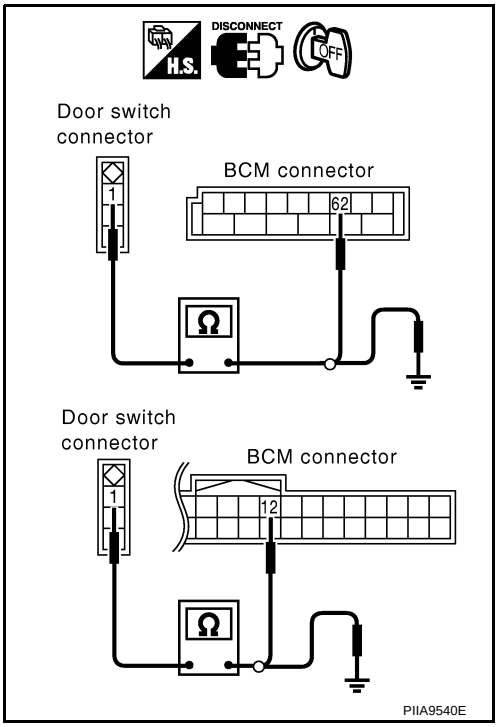
Passenger side door

1 (P) - 12 (P) : Continuity should exist.

4. Check continuity between door switch harness connector B17, B23 terminal 1 (P, W) and ground.

Each door switch

1 (W or P) - Ground : Continuity should not exist.



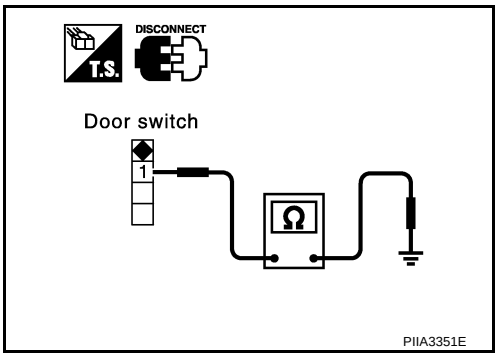
OK or NG

OK >> GO TO 3.
NG >> Repair or replace door switch harness.

3. CHECK DOOR SWITCH

Check continuity between door switch B17 (driver side) or B410 (passenger side) terminal 1 and ground part of door switch.

Terminal		Condition of door switch	Continuity
1	Ground part of door switch	Pushed	No
		Released	Yes



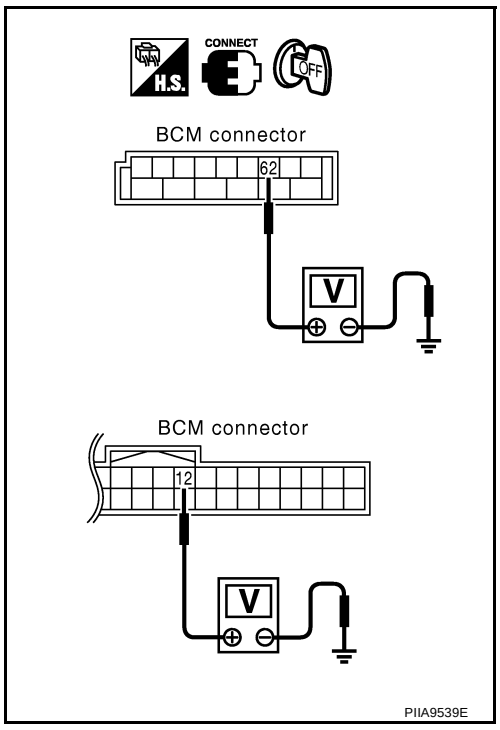
OK or NG

OK >> GO TO 4.
NG >> Replace door switch.

4. CHECK DOOR SWITCH INPUT SIGNAL

1. Connect BCM connector.
2. Check voltage between BCM harness connectors B4 (driver side), M1 (passenger side) terminals 62, 12 and ground.

62 (W) – Ground : Approx. 5V
12 (P) – Ground : Approx. 5V



OK or NG

OK >> Check harness connection.
NG >> Replace BCM.

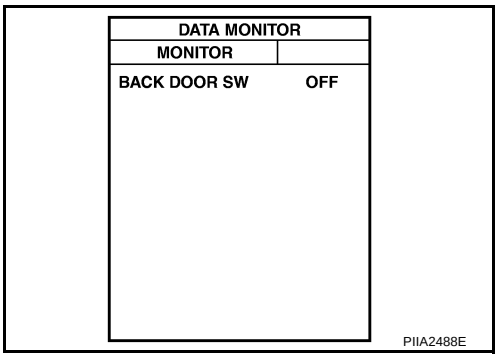
1 – 2 BACK DOOR SWITCH CHECK/FOR COUPE

1. CHECK BACK DOOR SWITCH INPUT SIGNAL

With CONSULT-II

Check back door switch (“BACK DOOR SW”) in “DATA MONITOR” mode with CONSULT-II.

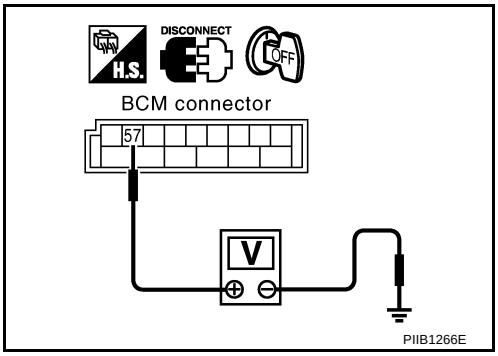
Monitor item	Condition	
BACK DOOR SW	OPEN	: ON
	CLOSE	: OFF



Without CONSULT-II

Check voltage between BCM connector and ground.

Connector	Terminal (Wire color)		Condition of back door switch	Voltage [V] (Approx.)
	(+)	(–)		
M91	58 (R)	Ground	Open	0
			Close	Buttery voltage



OK or NG

OK >> Back door switch is OK, and go to BL-152, "1 – 4 HOOD SWITCH CHECK" .

NG >> GO TO 2.

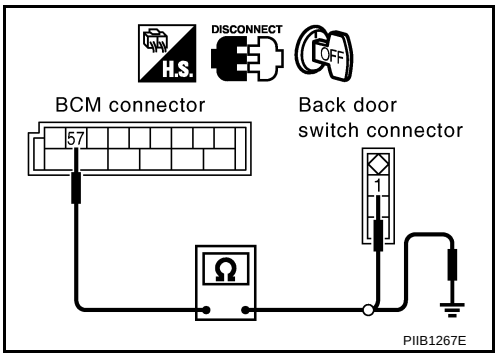
2. CHECK BACK DOOR SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM and back door switch connectors.
3. Check continuity between BCM harness connector B83 terminal 58 and back door switch harness connector T12 terminal 1.

58 (R) - 1 (R) : Continuity should exist.

4. Check continuity between BCM harness connector B83 terminal 58 and ground.

58 (R) - Ground : Continuity should not exist.



OK or NG

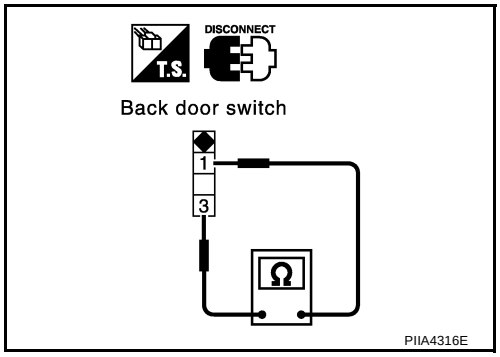
OK >> GO TO 3.

NG >> Repair or replace back door switch harness.

3. CHECK BACK DOOR SWITCH

Check continuity between door switch terminals 1 and 3.

Terminal		Condition of back door switch	Continuity
1	3	Open position	Yes
		Closed position	No



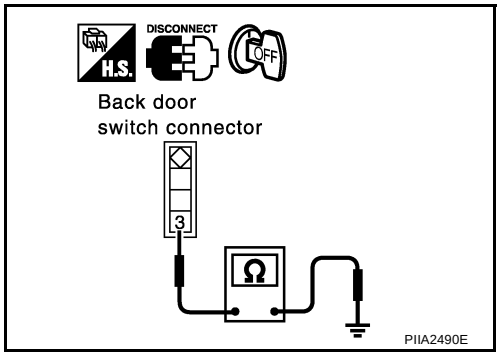
OK or NG

OK >> GO TO 4.
NG >> Replace back door switch.

4. CHECK BACK DOOR SWITCH GROUND CIRCUIT

Check continuity between back door switch harness connector T12 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.



OK or NG

OK >> Back door switch circuit is OK.
NG >> Repair or replace harness.

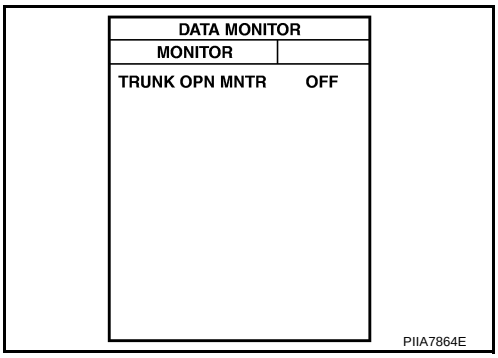
1 – 3 TRUNK ROOM LAMP SWITCH CHECK/FOR ROADSTER

1. CHECK TRUNK ROOM LAMP SWITCH INPUT SIGNAL

With CONSULT-II

Check trunk lid opener switch (“TRUNK OPN MNTR”) in “DATA MONITOR” mode with CONSULT-II.

Monitor item	Condition	
TRNK OPN MNTR	OPEN	: ON
	CLOSE	: OFF

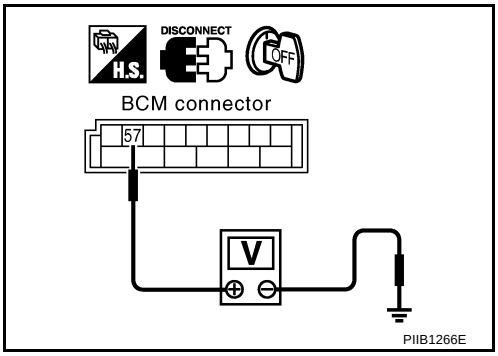


Without CONSULT-II

Check voltage between BCM connector and ground.

Connector	Terminal (Wire color)		Condition of trunk room lamp switch	Voltage [V] (Approx.)
	(+)	(–)		
B83	57 (R)	Ground	Open	0
			Close	Battery voltage*

*: When interior lamp battery saver control is in OFF. → Approx 5V.



OK or NG

OK >> Trunk room lamp switch is OK, and go to BL-152, "1 – 4 HOOD SWITCH CHECK" .

NG >> GO TO 2.

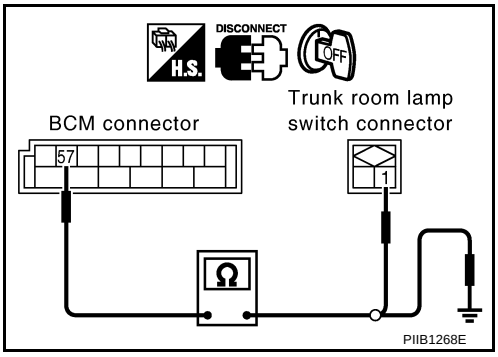
2. CHECK TRUNK ROOM LAMP SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect trunk room lamp switch and BCM connector.
3. Check continuity between trunk room lamp switch harness connector T31 terminal 1 and BCM harness connector B83 terminal 57.

   1 (R) - 57 (R) : Continuity should exist.

4. Check continuity between trunk room lamp switch harness connector T31 terminal 1 and ground.

   1 (R) - Ground : Continuity should not exist.



OK or NG

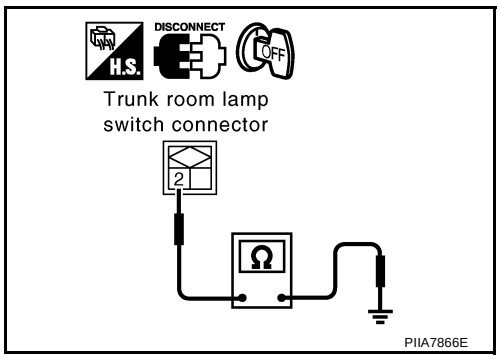
OK >> GO TO 3.

NG >> Replace trunk room lamp switch harness.

3. CHECK TRUNK ROOM LAMP SWITCH GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between trunk room lamp switch harness connector T31 terminal 2 and ground.

2 (B) - Ground : Continuity should exist.



OK or NG

OK >> Check trunk room lamp switch.
NG >> Repair or replace trunk room lamp switch harness.

1 – 4 HOOD SWITCH CHECK

First perform the "SELF-DIAG RESULTS" in "BCM" with CONSULT-II, then perform the trouble diagnosis of malfunction system indicated "SELF-DIAG RESULTS" of "BCM". Refer to BCS-16, "CAN Communication Inspection Using CONSULT-II (Self-Diagnosis)" .

1. CHECK HOOD SWITCH

Check hood switch and hood fitting condition.

OK or NG

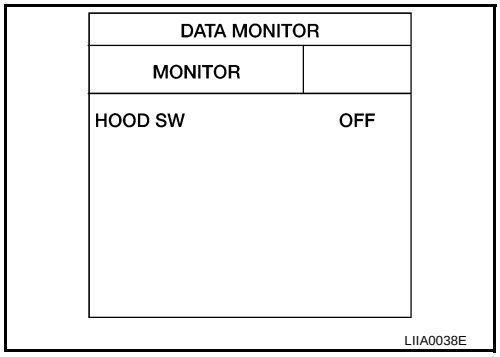
OK >> GO TO 2.
NG >> Adjust installation of hood switch.

2. CHECK HOOD SWITCH INPUT SIGNAL

With CONSULT-II

Check "HOOD SW" in "DATA MONITOR" mode in "IPDM E/R".

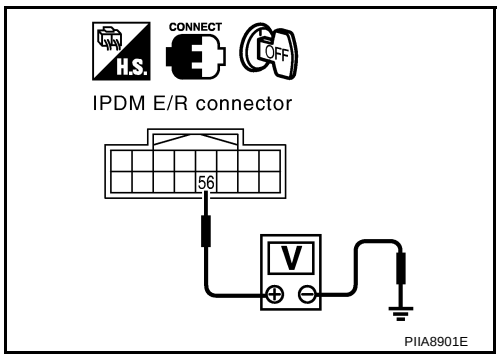
Monitor item	Condition	
HOOD SW	Hood open	: ON
	Hood closed	: OFF



Without CONSULT-II

Check voltage between IPDM E/R connector and ground.

Connector	Terminals (Wire color)		Condition of hood switch	Voltage (V) (Approx.)
	(+)	(–)		
E9	56 (LG/B)	Ground	Pushed	Battery voltage
			Released	0



OK or NG

OK >> Hood switch is OK.
NG >> GO TO 3.

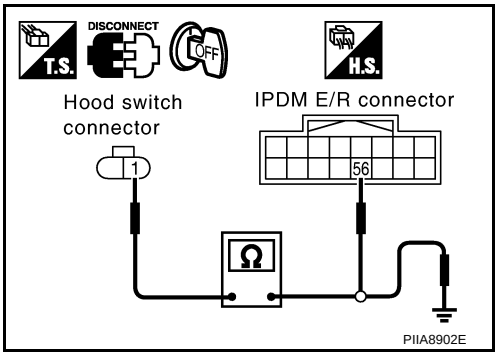
3. CHECK HOOD SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R and hood switch connector.
3. Check continuity between hood switch harness connector E23 terminal 1 and IPDM E/R harness connector E9 terminal 56.

1 (LG/B) - 56 (LG/B) : Continuity should exist.

4. Check continuity between hood switch harness connector E23 terminal 1 and ground.

1 (LG/B) - Ground : Continuity should not exist.



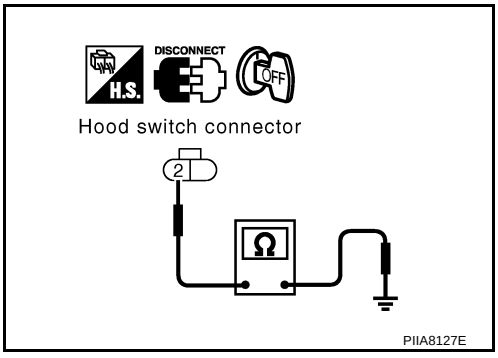
OK or NG

OK >> GO TO 4.
NG >> Repair or replace hood switch harness.

4. CHECK HOOD SWITCH GROUND CIRCUIT

Check continuity between hood switch connector E23 terminal 2 and ground.

2 (B) - Ground : Continuity should exist.



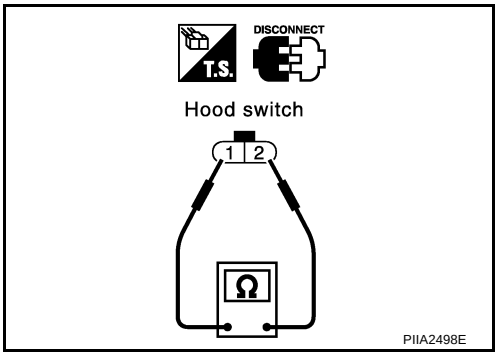
OK or NG

OK >> GO TO 5.
NG >> Repair or replace hood switch harness.

5. CHECK HOOD SWITCH

Check continuity between hood switch terminals 1 and 2.

Connector	Terminals		Condition	Continuity
E23	1	2	Pressed	No
			Released	Yes



OK or NG

OK >> Replace IPDM E/R.
NG >> Replace hood switch.

Diagnostic Procedure 2

AIS00151

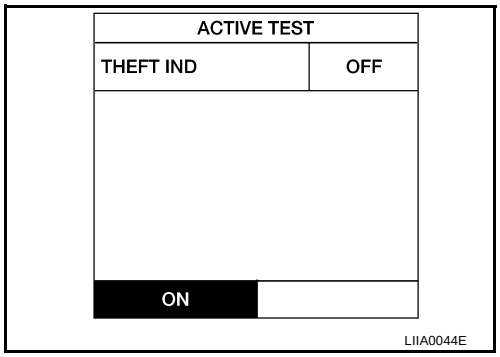
SECURITY INDICATOR LAMP CHECK

1. SECURITY INDICATOR LAMP ACTIVE TEST

With CONSULT-II

Check “THEFT IND” in “ACTIVE TEST” mode with CONSULT-II.

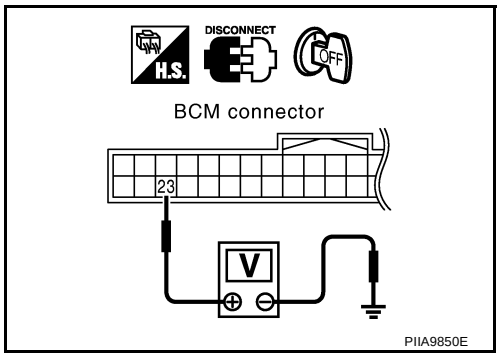
Perform operation shown on display.
Indicator lamp should illuminate.



Without CONSULT-II

1. Disconnect BCM connector.
2. Check voltage between BCM connector M90 terminal 23 and ground.

23 (G/OR) - Ground : Battery voltage



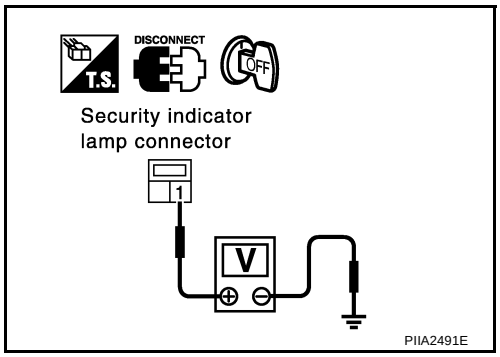
OK or NG

OK >> Security indicator lamp is OK.
NG >> GO TO 2.

2. CHECK POWER SUPPLY CIRCUIT FOR SECURITY INDICATOR LAMP

1. Disconnect security indicator lamp connector.
2. Check voltage between security indicator lamp connector M34 terminal 1 and ground.

1 (R/W) - Ground : Battery voltage



OK or NG

OK >> GO TO 3.
NG >> Check the following.

- 10A fuse [No. 19, located in fuse block (J/B)]
- Harness for open or short between security indicator lamp and fuse

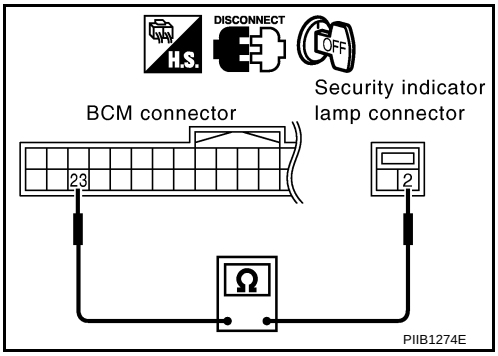
3. CHECK SECURITY INDICATOR LAMP CIRCUIT

1. Check continuity between BCM harness connector M90 terminal 23 and security indicator lamp harness connector M34 terminal 2.

23 (G/OR) - 2 (G/OR) : Continuity should exist.

2. Check continuity between BCM harness connector M90 terminal 23 and ground.

23 (G/OR) - Ground : Continuity should not exist.



OK or NG

OK >> Check indicator lamp condition.
NG >> Repair harness or connector.

Diagnostic Procedure 3

AIS00152

DOOR KEY CYLINDER SWITCH CHECK

1. CHECK DOOR KEY CYLINDER SWITCH DRIVER SIDE OPERATION

Do doors lock/unlock when using the key?

YES or NO

YES >> Door key cylinder switch operation is OK.
NO >> Check door key cylinder switch circuit. Refer to BL-48, "Door Key Cylinder Switch Check" .

Diagnostic Procedure 4

AIS00153

VEHICLE SECURITY HORN ALARM CHECK

First perform the “SELF-DIAG RESULTS” of “BCM” with CONSULT-II, then perform the trouble diagnosis of malfunction system indicated in “SELF-DIAG RESULTS” of “BCM”. Refer to BCS-16, "CAN Communication Inspection Using CONSULT-II (Self-Diagnosis)" .

1. CHECK HORN OPERATION

Check if horn sounds with horn switch.

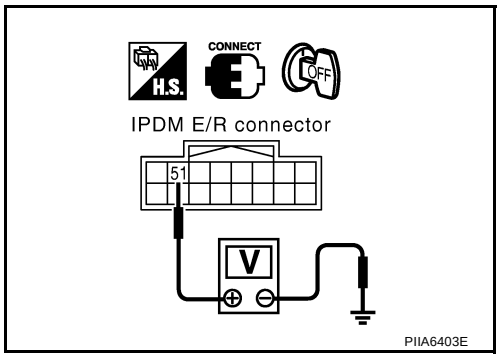
Does horn operate?

YES >> GO TO 2.
NO >> Check horn circuit. Refer to WW-55, "HORN" .

2. CHECK IPDM E/R INPUT SIGNAL

Check voltage between IPDM E/R connector E9 terminal 51 and ground.

51 (G/B) – Ground : Battery voltage.



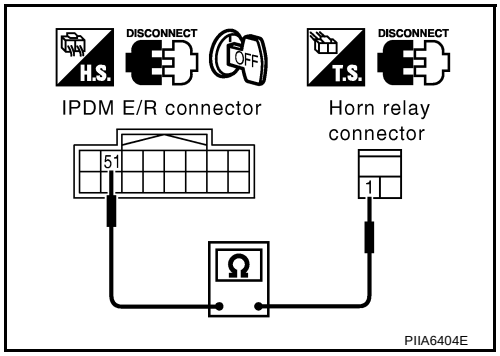
OK or NG

OK >> Replace IPDM E/R.
NG >> GO TO 3.

3. CHECK HORN RERAY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R and horn relay connector.
3. Check continuity between IPDM E/R harness connector E9 terminal 51 and horn relay harness connector E21 terminal 1.

1 (G/B) - 51(G/B) : Continuity should exist.



OK or NG

OK >> Horn circuit is OK.
NG >> Repair or replace harness.

Diagnostic Procedure 5

AIS00154

VEHICLE SECURITY HEADLAMP ALARM CHECK

1. CHECK HEAD LAMP OPERATION

Does headlamp come on when turning lighting switch “ON”?

YES or NO

YES >> Headlamp alarm circuit is OK.
NO >> Check headlamp system. Refer to LT-7, "HEADLAMP (FOR USA) - XENON TYPE -" , LT-38, "HEADLAMP (FOR USA) - CONVENTIONAL TYPE -" , LT-68, "HEADLAMP (FOR CANADA) - XENON TYPE -" , LT-105, "HEADLAMP (FOR CANADA) - CONVENTIONAL TYPE -" .

Diagnostic Procedure 6

AIS00155

DOOR LOCK AND UNLOCK SWITCH CHECK

1. CHECK DOOR LOCK AND UNLOCK SWITCH INPUT SIGNAL

Do doors lock/unlock when using power window main switch (door lock and unlock switch) or power window sub-switch (door lock and unlock switch)?

YES or NO?

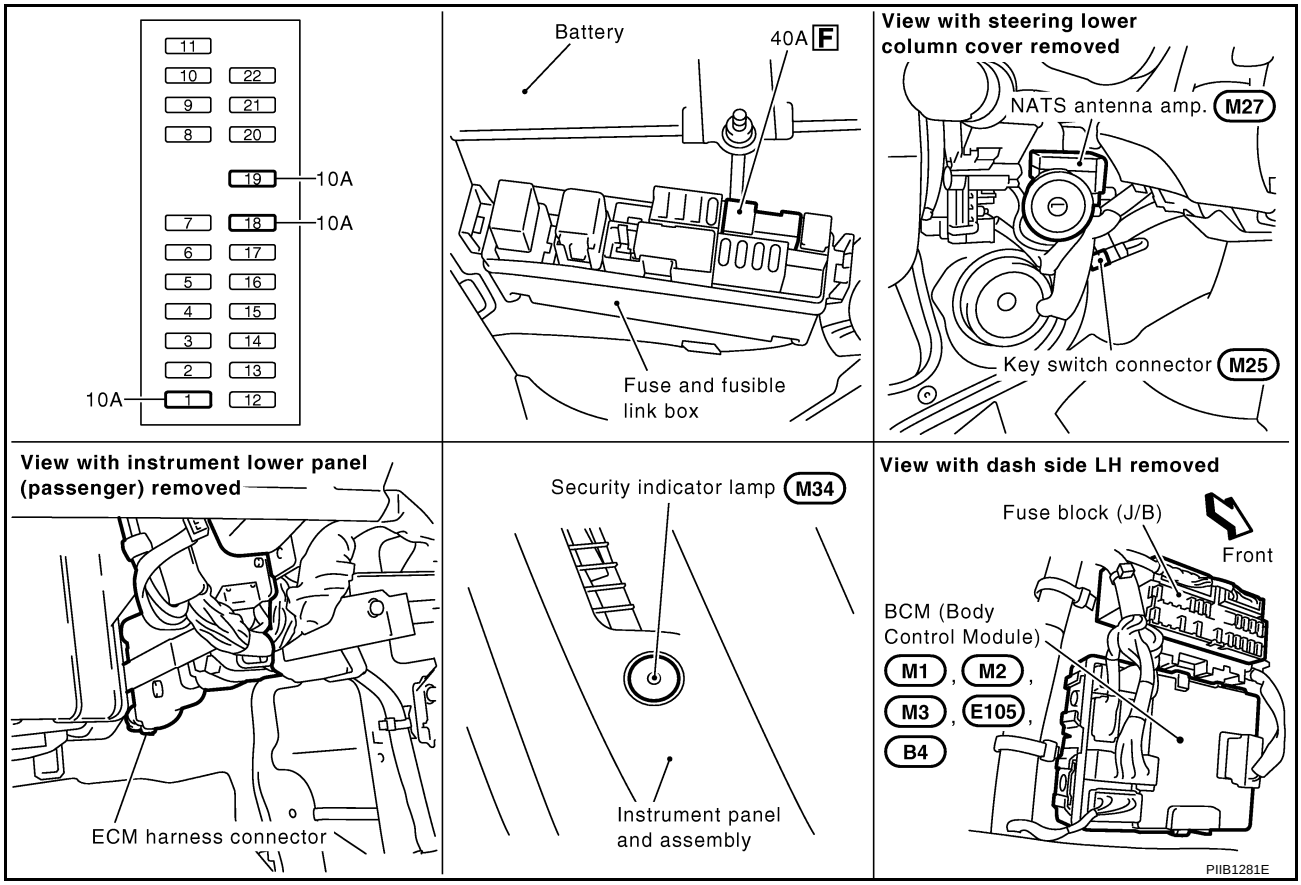
YES >> Door lock and unlock switch is OK.
NO >> Refer to BL-43, "Door Lock and Unlock Switch Check" .

NVIS (NISSAN VEHICLE IMMOBILIZER SYSTEM-NATS)

PFP:25386

Component Parts and Harness Connector Location

AIS00143



NOTE:

If customer reports a “No start” condition, request ALL KEYS to be brought to an NISSAN dealer in case of a NVIS (NATS) malfunction.

System Description

AIS00144

NVIS (Nissan Vehicle Immobilizer System-NATS) has the following immobilizer functions:

- Since only NVIS (NATS) ignition keys, whose ID Nos. have been registered into the ECM and BCM (NATS control unit), allow the engine to run, a vehicle operation without a key registered in NVIS (NATS) is prevented by NVIS (NATS).
  That is to say, NVIS (NATS) will immobilize the engine if someone tries to start it without the registered key of NVIS (NATS).
- All of the originally supplied ignition key IDs (except for card plate key) have been registered in NVIS (NATS).
  If requested by the vehicle owner, a maximum of five key IDs can be registered into the NVIS (NATS) components.
- The security indicator blinks when the ignition switch is in “OFF” or “ACC” position. Therefore, NVIS (NATS) warns outsiders that the vehicle is equipped with the anti-theft system.
- When NVIS (NATS) detects trouble, the security indicator lamp lights up while ignition key is in the “ON” position.
- NVIS (NATS) trouble diagnoses, system initialization and additional registration of other NVIS (NATS) ignition key IDs must be carried out using CONSULT-II hardware and CONSULT-II NVIS (NATS) software.
  When NVIS (NATS) initialization has been completed, the ID of the inserted ignition key is automatically registered in NVIS (NATS). Then, if necessary, additional registration of other NVIS (NATS) ignition key IDs can be carried out.
  Regarding the procedures of NVIS (NATS) initialization and NVIS (NATS) ignition key ID registration, refer to CONSULT-II Operation Manual NATS-IVIS/NVIS.
- **When servicing a malfunction of the NVIS (NATS) (indicated by lighting up of Security Indicator Lamp) or registering another NVIS (NATS) ignition key ID No., it may be necessary to re-register original key identification. Therefore, be sure to receive ALL KEYS from vehicle owner.**

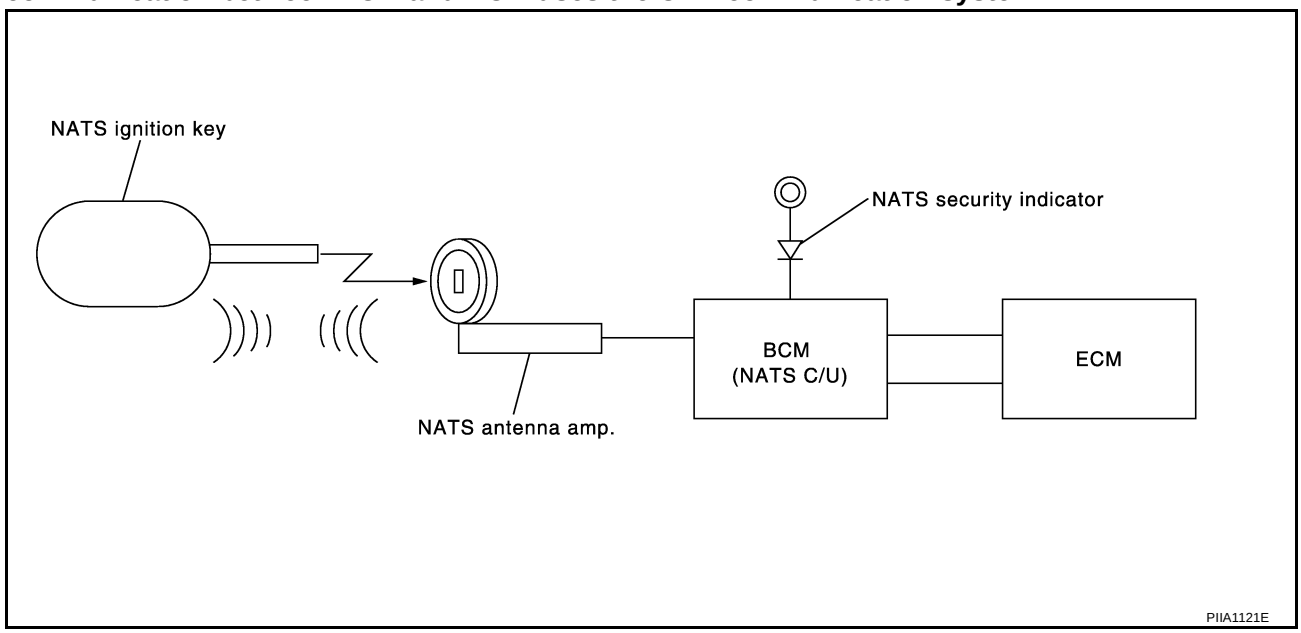
System Composition

AIS00145

The immobilizer function of the NVIS (NATS) consists of the following:

- NATS ignition key
- NATS antenna amp. located in the ignition key cylinder
- BCM (NATS control unit)
- Engine control module (ECM)
- Security indicator

NOTE:
The communication between ECM and BCM uses the CAN communication system.



ECM Re-communicating Function

AIS00146

Performing following procedure can automatically perform re-communication of ECM and BCM, but only when the ECM has been replaced with a new one (*1).
*1: New one means a virgin ECM which has never been energized on-board.
(In this step, initialization procedure by CONSULT-II is not necessary)

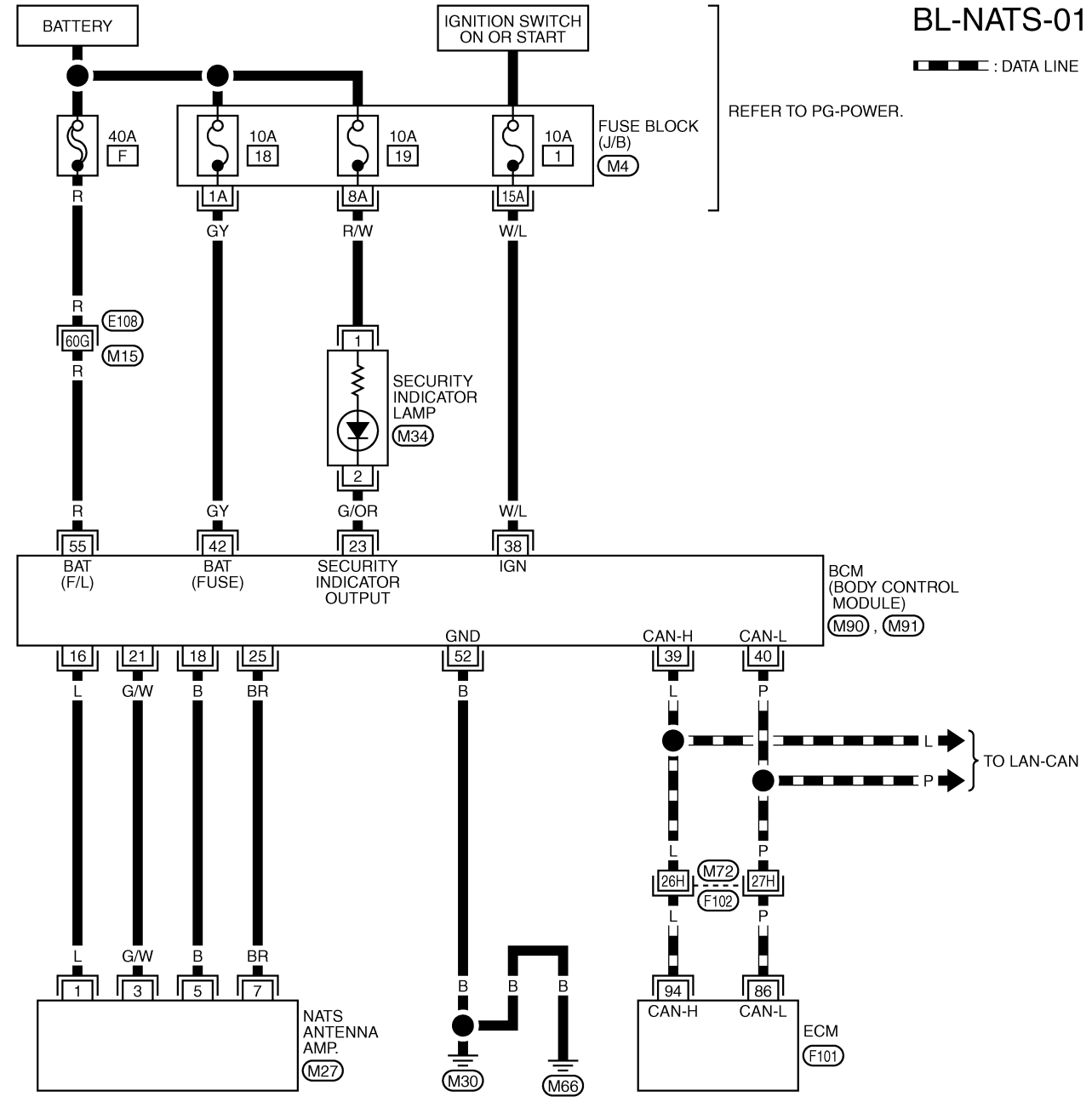
NOTE:

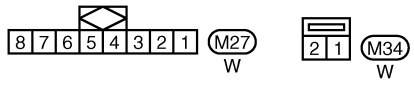
- **When registering new Key IDs or replacing the ECM other than brand new, refer to CONSULT-II Operation Manual NATS-IVIS/NVIS.**
- **If multiple keys are attached to the key holder, separate them before work.**
- **Distinguish keys with unregistered key ID from those with registered ID.**

1. Install ECM.
2. Using a registered key (*2), turn ignition switch to “ON”.
   *2: To perform this step, use the key (except for card plate key) that has been used before performing ECM replacement.
3. Maintain ignition switch in “ON” position for at least 5 seconds.
4. Turn ignition switch to “OFF”.
5. Start engine.
   If engine can be started, procedure is completed.
   If engine cannot be started, refer to CONSULT-II Operation Manual NATS-IVIS/NVIS and initialize control unit.

Wiring Diagram — NATS —

AIS00147





REFER TO THE FOLLOWING.
E108, F102 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M90, M91, F101 -ELECTRICAL UNITS

TIWT0809E

Terminals and Reference Value for BCM

AIS00148

Terminal	Wire color	Item	Condition	Voltage (V) (Approx.)
16	L	NATS antenna amp.	Ignition switch: OFF → ON	0 → 5 (for 3 seconds)
18	B	NATS antenna amp.	—	0
21	G/W	NATS antenna amp.	Ignition switch (OFF → ON)	Just after turning ignition switch “ON”: Pointer of tester should move.
23	G/OR	Security indicator lamp	Goes OFF → illuminates (Every 2.4 seconds)	Battery voltage → 0
25	BR	NATS antenna amp.	Ignition switch (OFF → ON)	Just after turning ignition switch “ON”: Pointer of tester should move.
38	W/L	Ignition switch (ON)	Ignition switch (ON or START)	Battery voltage
39	L	CAN-H	—	—
40	P	CAN-L	—	—
42	GY	Power source (Fuse)	—	Battery voltage
52	B	Ground	—	0
55	R	Power source (Fusible link)	—	Battery voltage

CONSULT-II

AIS00149

CONSULT-II INSPECTION PROCEDURE

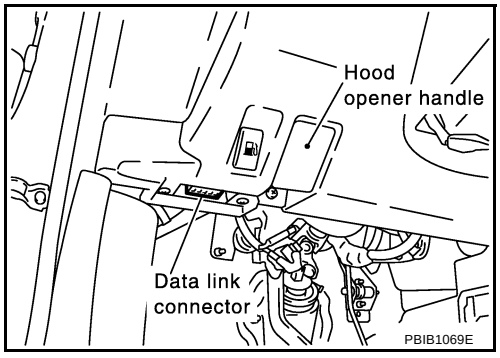
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

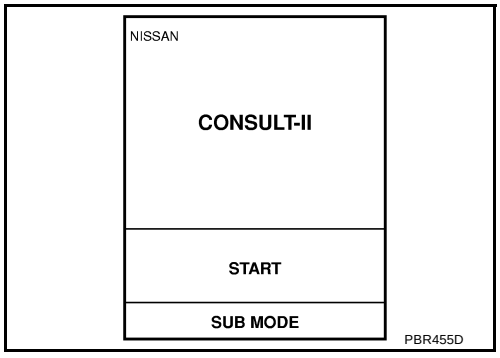
1. Turn ignition switch OFF.
2. Insert NVIS (NATS) program card into CONSULT-II.

   Program card : NATS (AEN02C)

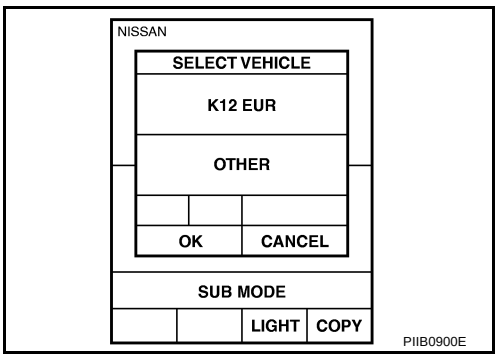
3. Connect CONSULT-II and CONSULT-II CONVERTER to data link connector.



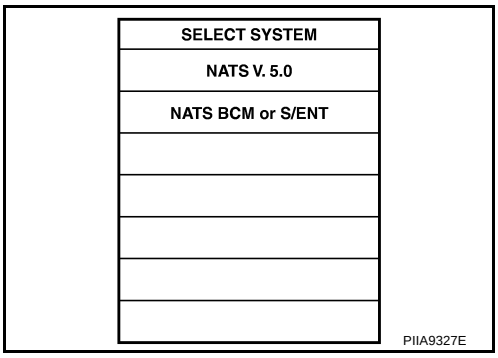
4. Turn ignition switch ON.
5. Touch “START”.



6. Touch “OTHER”.

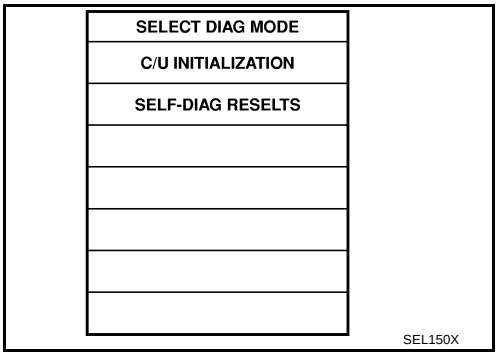


7. Select “NATS V.5.0”.
If “NATS V5.0” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



8. Perform each diagnostic test mode according to each service procedure.

For further information, see the CONSULT-II Operation Manual NATS-IVIS/NVIS.



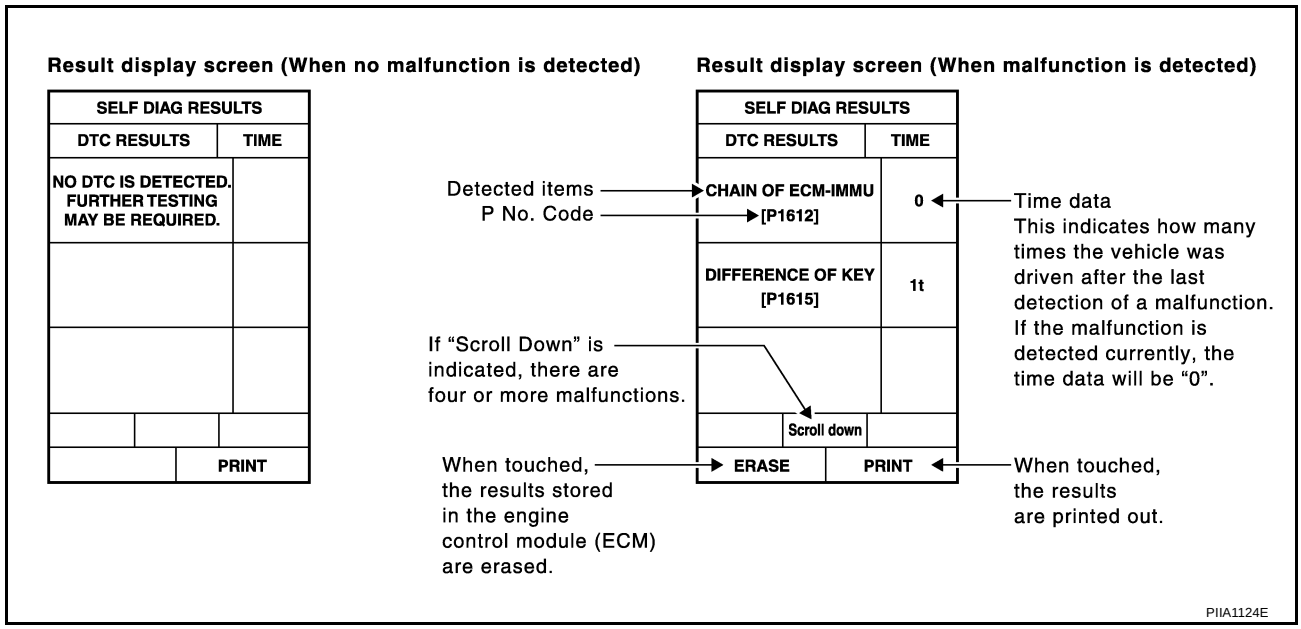
CONSULT-II DIAGNOSTIC TEST MODE FUNCTION

CONSULT-II DIAGNOSTIC TEST MODE	Description
C/U INITIALIZATION	When replacing any of the following components, C/U initialization and re-registration of all NATS ignition keys are necessary. [(NATS ignition key/ BCM (NATS control unit)/ ECM]
SELF-DIAG RESULTS	Detected items (screen terms) are as shown in the chart. Refer to BL-164, "NVIS (NATS) SELF-DIAGNOSTIC RESULTS ITEM CHART" .

NOTE:

- When any initialization is performed, all ID previously registered will be erased and all NATS ignition keys must be registered again.
- The engine cannot be started with an unregistered key. In this case, the system will show “DIFFERENCE OF KEY” or “LOCK MODE” as a self-diagnostic result on the CONSULT-II screen.
- In rare case, “CHAIN OF ECM-IMMU” might be stored as a self-diagnostic result during key registration procedure, even if the system is not malfunctioning.

HOW TO READ SELF-DIAGNOSTIC RESULTS

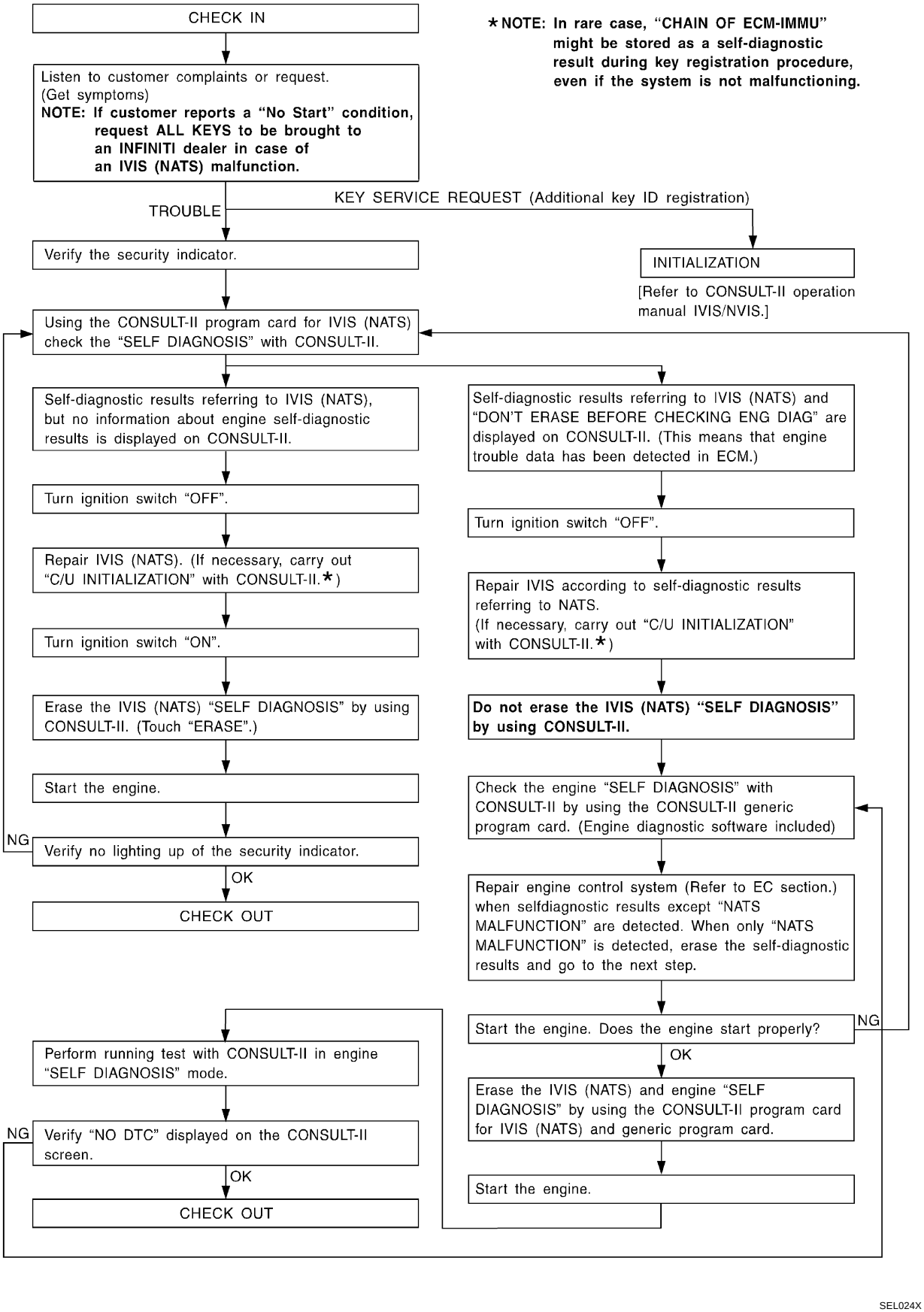


NVIS (NATS) SELF-DIAGNOSTIC RESULTS ITEM CHART

Detected items [NVIS (NATS) program card screen terms]	P No. Code (Self-diagnostic result of “ENGINE”)	Malfunction is detected when.....	Reference page
CHAIN OF ECM-IMMU [P1612]	NATS MALFUNCTION P1612	Communication impossible between ECM and BCM (NATS control unit) In rare case, “CHAIN OF ECM-IMMU” might be stored during key registration procedure, even if the system is not malfunctioning.	Refer to BL-168, "Diagnostic Procedure 1" .
DIFFERENCE OF KEY [P1615]	NATS MALFUNCTION P1615	BCM (NATS control unit) can receive the key ID signal but the result of ID verification between key ID and BCM (NATS control unit) is NG.	Refer to BL-169, "Diagnostic Procedure 2" .
CHAIN OF IMMU-KEY [P1614]	NATS MALFUNCTION P1614	BCM (NATS control unit) cannot receive the key ID signal.	Refer to BL-170, "Diagnostic Procedure 3" .
ID DISCORD, IMM-ECM [P1611]	NATS MALFUNCTION P1611	The result of ID verification between BCM (NATS control unit) and ECM is NG. System initialization is required.	Refer to BL-172, "Diagnostic Procedure 4" .
LOCK MODE [P1610]	NATS MALFUNCTION P1610	When the starting operation is carried out five or more times consecutively under the following conditions, NVIS (NATS) will shift the mode to one which prevents the engine from being started. ● Unregistered ignition key is used. ● BCM (NATS control unit) or ECM’s malfunctioning.	Refer to BL-175, "Diagnostic Procedure 6" .
DON'T ERASE BEFORE CHECKING ENG DIAG	—	All engine trouble codes except NVIS (NATS) trouble code has been detected in ECM.	Refer to BL-165, "Work Flow" .

Work Flow

AIS0014A



SEL024X

Trouble Diagnoses

AIS0014B

SYMPTOM MATRIX CHART 1

Self-diagnosis related item

SYMPTOM	Displayed “SELF-DIAG RESULTS” on CONSULT-II screen.	DIAGNOSTIC PROCEDURE (Reference page)	SYSTEM (Malfunctioning part or mode)	REFERENCE PART NO. OF ILLUSTRATION ON SYSTEM DIAGRAM
● Security indicator lighting up* ● Engine cannot be started	CHAIN OF ECM-IMMU [P1612]	PROCEDURE 1 (BL-168)	In rare case, “CHAIN OF ECM-IMMU” might be stored during key registration procedure, even if the system is not malfunctioning.	—
			Open circuit in battery voltage line of BCM (NATS control unit) circuit	C1
			Open circuit in ignition line of BCM (NATS control unit) circuit	C2
			Open circuit in ground line of BCM (NATS control unit) circuit	C3
			Open or short circuit between BCM (NATS control unit) and ECM communication line	C4
			ECM	B
			BCM (NATS control unit)	A
	DIFFERENCE OF KEY [P1615]	PROCEDURE 2 (BL-169)	Unregistered key	D
			BCM (NATS control unit)	A
	CHAIN OF IMMU-KEY [P1614]	PROCEDURE 3 (BL-170)	Malfunction of key ID chip	E5
			Communication line between ANT/ AMP and BCM (NATS control unit): Open circuit or short circuit of battery voltage line or ground line	E1
				E2
			Open circuit in power source line of ANT/ AMP circuit	E3
			Open circuit in ground line of ANT/ AMP circuit	E4
			NATS antenna amp.	E6
			BCM (NATS control unit)	A
	ID DISCORD, IMM-ECM [P1611]	PROCEDURE 4 (BL-172)	System initialization has not yet been completed.	F
			ECM	B

SYMPTOM	Displayed “SELF-DIAG RESULTS” on CONSULT-II screen.	DIAGNOSTIC PROCEDURE (Reference page)	SYSTEM (Malfunctioning part or mode)	REFERENCE PART NO. OF ILLUSTRATION ON SYSTEM DIAGRAM
● Security indicator lighting up* ● Engine cannot be started	LOCK MODE [P1610]	PROCEDURE 6 (BL-175)	LOCK MODE	When the starting operation is carried out five or more times consecutively under the following conditions, NVIS (NATS) will shift the mode to one which prevents the engine from being started. ● Unregistered ignition key is used. ● BCM (NATS control unit) or ECM’s malfunctioning.
Security indicator lighting up*	DON’T ERASE BEFORE CHECKING ENG DIAG	WORK FLOW (BL-165)	Engine trouble data and NVIS (NATS) trouble data have been detected in ECM	—

*: When NVIS (NATS) detects trouble, the security indicator lights up while ignition key is in the “ON” position.

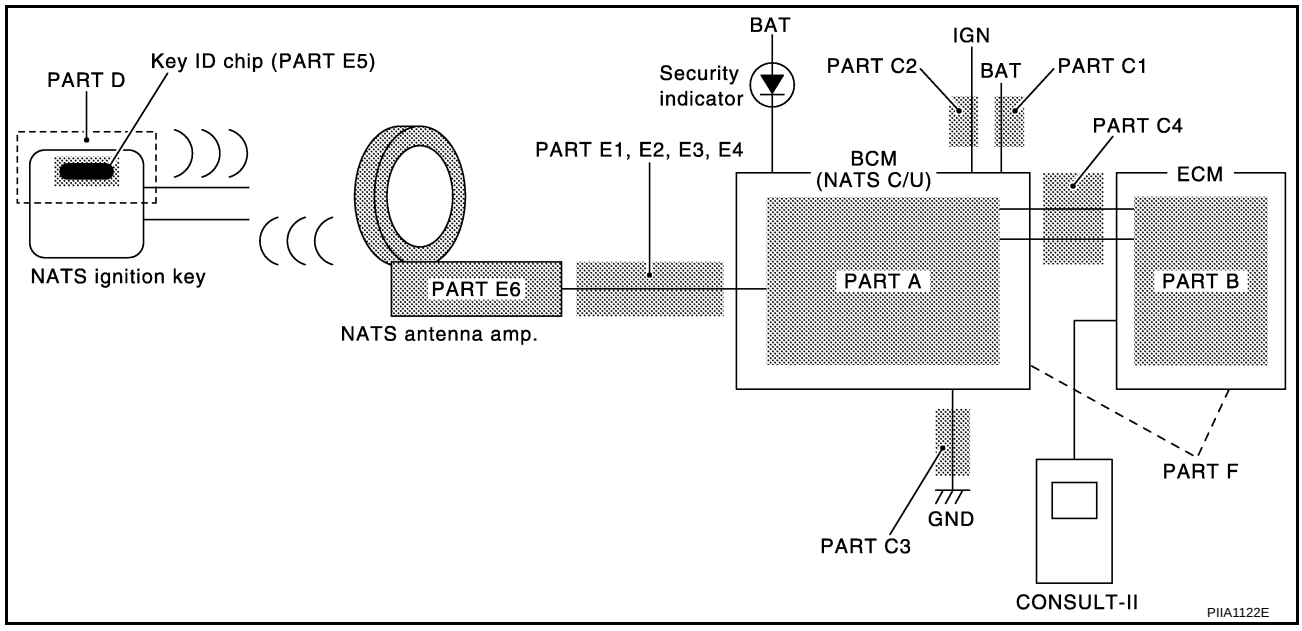
SYMPTOM MATRIX CHART 2

Non self-diagnosis related item

SYMPTOM	DIAGNOSTIC PROCEDURE (Reference page)	SYSTEM (Malfunctioning part or mode)	REFERENCE PART NO. OF ILLUSTRATION ON SYSTEM DIAGRAM
Security indicator does not light up*.	PROCEDURE 5 (BL-173)	Security indictor.	—
		Open circuit between Fuse and BCM (NATS control unit)	—
		BCM (NATS control unit)	A

*: CONSULT-II self-diagnostic results display screen “no malfunction is detected”.

DIAGNOSTIC SYSTEM DIAGRAM



Diagnostic Procedure 1

AIS0014C

Self-diagnostic results:
“CHAIN OF ECM-IMMU” displayed on CONSULT-II screen
First perform the “SELF-DIAG RESULTS” in “BCM” with CONSULT-II, then perform the trouble diagnosis of malfunction system indicated “SELF-DIAG RESULTS” of “BCM”. Refer to BCS-16, "CAN Communication Inspection Using CONSULT-II (Self-Diagnosis)" .

1. CONFIRM SELF-DIAGNOSTIC RESULTS

Confirm SELF-DIAGNOSTIC RESULTS “CHAIN OF ECM-IMMU” displayed on CONSULT-II screen.

NOTE:
In rare case, “CHAIN OF ECM-IMMU” might be stored during key registration procedure, even if the system is not malfunctioning.

Is CONSULT-II screen displayed as above?

Yes >> GO TO 2.
No >> GO TO BL-166, "SYMPTOM MATRIX CHART 1" .

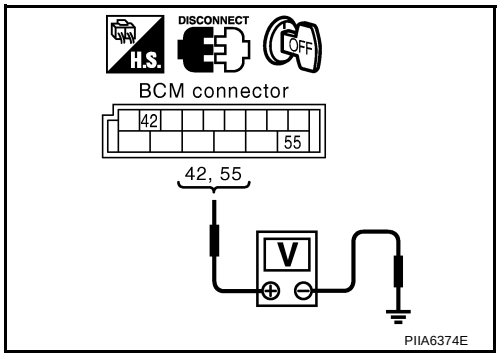
SELF DIAGNOSIS	
DTC RESULTS	TIME
CHAIN OF ECM-IMMU [P1612]	0

PIIA1260E

2. CHECK POWER SUPPLY CIRCUIT FOR BCM (NATS CONTROL UNIT)

1. Disconnect BCM (NATS control unit) connector.
2. Check voltage between BCM (NATS control unit) harness connector M91 terminal 42, 55 and ground with CONSULT-II or tester.

42 (GY) - Ground : Battery voltage
55 (R) - Ground : Battery voltage



PIIA6374E

OK or NG

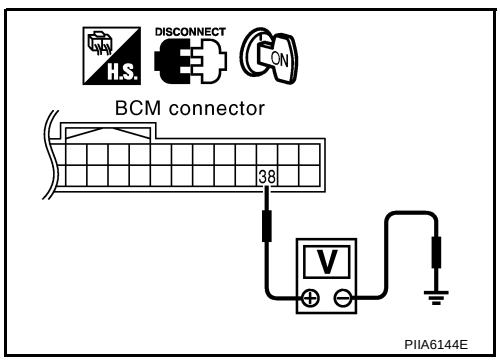
OK >> GO TO 3.
NG >> Check the following.

- 40A fusible link (letter **F** , located in fuse and fusible link box)
- 10A fuse [No.18, located in the fuse block (J/B)]
- Harness for open or short between fusible link and BCM (NATS control unit). **Ref. Part No. C1**
- Harness for open or short between fuse and BCM (NATS control unit). **Ref. Part No. C1**

3. CHECK IGN SW. ON SIGNAL

1. Turn ignition switch ON.
2. Check voltage between BCM (NATS control unit) harness connector M90 terminal 38 and ground with CONSULT-II or tester.

38 (W/L) - Ground : Battery voltage



PIIA6144E

OK or NG

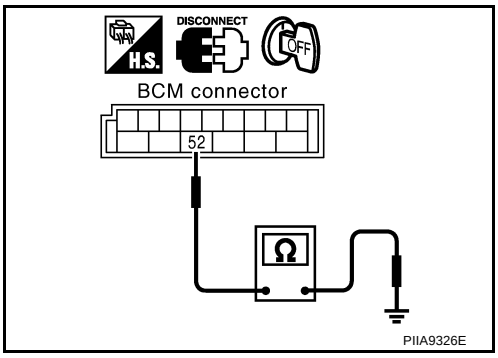
OK >> GO TO 4.
NG >> Check the following.

- 10A fuse [No. 1, located in the fuse block (J/B)]
- Harness for open or short between fuse and BCM (NATS control unit). **Ref. part No. C2**

4. CHECK GROUND CIRCUIT FOR BCM (NATS CONTROL UNIT)

1. Turn ignition OFF.
2. Check continuity between BCM (NATS control unit) harness connector M91 terminal 52 and ground.

52 (B) - Ground : Continuity should exist.



OK or NG

OK >> GO TO 5.
NG >> Repair harness. **Ref. part No. C3**

5. REPLACE BCM (NATS CONTROL UNIT)

1. Replace BCM (NATS control unit) **Ref. part No. A**
2. Perform initialization with CONSULT-II.
   For initialization, refer to “CONSULT-II Operation Manual NATS-IVIS/NVIS”.

Does the engine start?

Yes >> BCM (NATS control unit) is malfunctioning.
- Replace BCM (NATS control unit). **Ref. part No. A**
- Perform initialization with CONSULT-II.
- For initialization, refer to “CONSULT-II Operation Manual NATS-IVIS/NVIS”.

No >> ECM is malfunctioning.
- Replace ECM. **Ref. part No. B**
- Perform initialization or re-communicating function.
- For initialization, refer to “CONSULT-II Operation Manual NATS-IVIS/NVIS”.
- For re-communicating function, refer to BL-160, "ECM Re-communicating Function" .

Diagnostic Procedure 2

AIS0014D

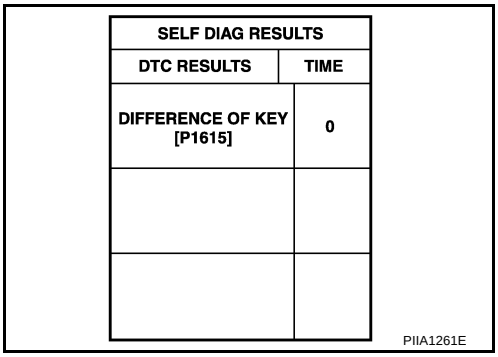
Self-diagnostic results:
“DIFFERENCE OF KEY” displayed on CONSULT-II screen

1. CONFIRM SELF-DIAGNOSTIC RESULTS

Confirm SELF-DIAGNOSTIC RESULTS “DIFFERENCE OF KEY” displayed on CONSULT-II screen.

Is CONSULT-II screen displayed as above?

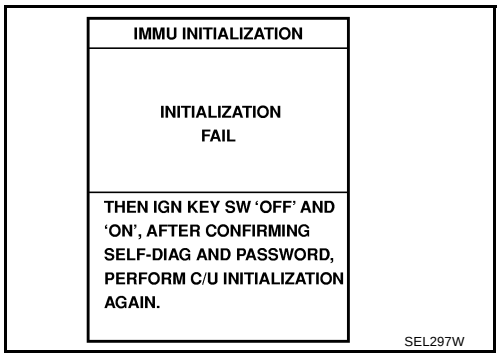
Yes >> GO TO 2.
No >> GO TO BL-166, "SYMPTOM MATRIX CHART 1" .



2. PERFORM INITIALIZATION WITH CONSULT-II

Perform initialization with CONSULT-II. Re-register all NATS ignition key IDs.
For initialization and registration of NATS ignition key IDs, refer to “CONSULT-II Operation Manual NATS-IVIS/NVIS”.

NOTE:
If the initialization is not completed or malfunctions, CONSULT-II shows message on the screen.



Can the system be initialized and can the engine be started with re-registered NATS ignition key?

Yes >> Ignition key ID was unregistered. **Ref. part No. D**
No >> BCM (NATS control unit) is malfunctioning.

- Replace BCM (NATS control unit). **Ref. part No. A**
- Perform initialization with CONSULT-II.
- For initialization, refer to “CONSULT-II Operation Manual NATS-IVIS/NVIS”.

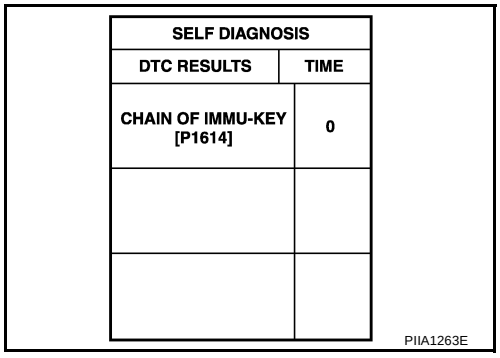
Diagnostic Procedure 3

AIS0014E

Self-diagnostic results:
“CHAIN OF IMMU-KEY” displayed on CONSULT-II screen

1. CONFIRM SELF-DIAGNOSTIC RESULTS

Confirm SELF-DIAGNOSTIC RESULTS “CHAIN OF IMMU-KEY” displayed on CONSULT-II screen.



Is CONSULT-II screen displayed as shown in figure?

Yes >> GO TO 2.
No >> GO TO BL-166, "SYMPTOM MATRIX CHART 1" .

2. CHECK NATS ANTENNA AMP. INSTALLATION

Check NATS antenna amp. installation. Refer to BL-176, "How to Replace NATS Antenna Amp." .

OK or NG

OK >> GO TO 3.
NG >> Reinstall NATS antenna amp. correctly.

3. CHECK NVIS (NATS) IGNITION KEY ID CHIP

Start engine with another registered NATS ignition key.

Does the engine start?

Yes >> Ignition key ID chip is malfunctioning.

- Replace the ignition key. **Ref. part No, E5**
- Perform initialization with CONSULT-II.
  For initialization, refer to “CONSULT-II Operation Manual NATS-IVIS/NVIS”.

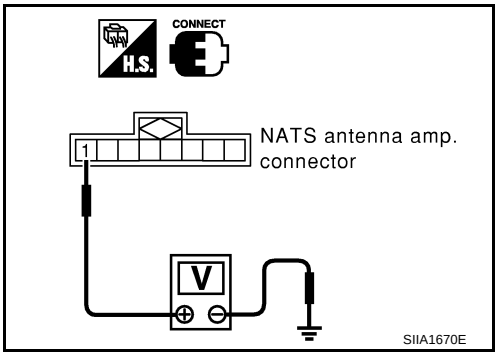
No >> GO TO 4.

4. CHECK POWER SUPPLY FOR NATS ANTENNA AMP.

1. Turn ignition switch “ON”.
2. Check voltage between NATS antenna amp. harness connector M27 terminal 1 and ground with CONSULT-II or tester.

Just after turning ignition switch “ON”

Voltage: Approx. 5V (For 3 seconds)



OK or NG

OK >> GO TO 5.

NG >> ● Check harness for open or short between NATS antenna amp. and BCM (NATS control unit).

NOTE:

If harness is OK, replace BCM (NATS control unit), perform initialization with CONSULT-II. For initialization, refer to “CONSULT-II Operation Manual NATS-IVIS/NVIS”.

5. CHECK NATS ANTENNA AMP. SIGNAL LINE- 1

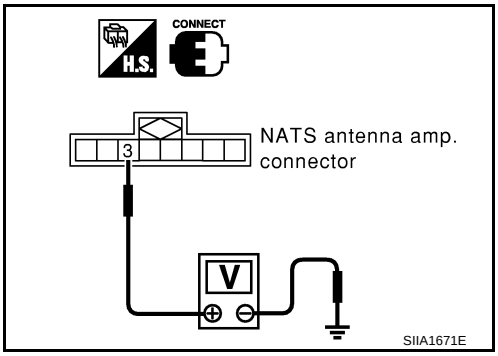
Check voltage between NATS antenna amp. harness connector M27 terminal 3 and ground with analogue tester.

Before turning ignition switch “ON”

Voltage: 0V

Just after turning ignition switch “ON”

: Pointer of tester should move.



OK or NG

OK >> GO TO 6.

NG >> ● Check harness for open or short between NATS antenna amp. and BCM (NATS control unit).

NOTE:

If harness is OK, replace BCM (NATS control unit), perform initialization with CONSULT-II. For initialization, refer to “CONSULT-II Operation Manual NATS-IVIS/NVIS”.

6. CHECK NATS ANTENNA AMP. SIGNAL LINE- 2

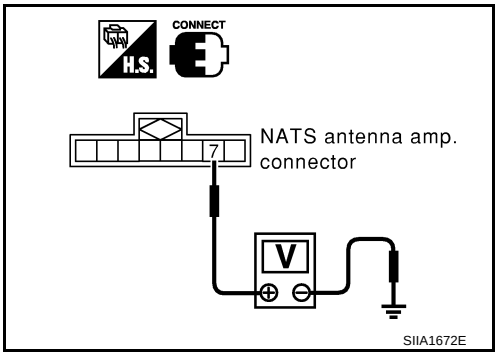
Check voltage between NATS antenna amp. harness connector M27 terminal 7 and ground with analogue tester.

Before turning ignition switch “ON”

Voltage: 0V

Just after turning ignition switch “ON”

: Pointer of tester should move.



OK or NG

OK >> GO TO 7.

NG >> ● Check harness for open or short between NATS antenna amp. and BCM (NATS control unit).

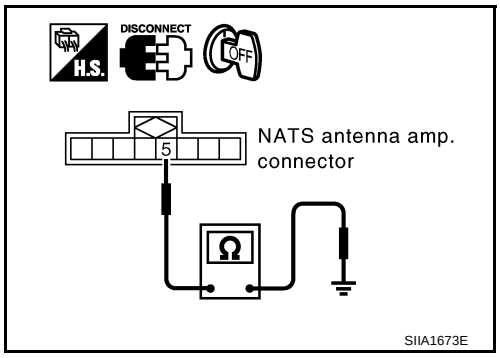
NOTE:

If harness is OK, replace BCM (NATS control unit), perform initialization with CONSULT-II. For initialization, refer to “CONSULT-II Operation Manual NATS-IVIS/NVIS”.

7. CHECK NATS ANTENNA AMP. GROUND LINE CIRCUIT

1. Turn ignition switch “OFF”.
2. Check continuity between NATS antenna amp. connector harness M27 terminal 5 and ground.

5 (B) – Ground : Continuity should exist.



OK or NG

OK >> NATS antenna amp. is malfunctioning. **Ref. part No. E6**

NG >> Replace NATS antenna amp.

- Check harness for open or short between NATS antenna amp. and BCM (NATS control unit).

NOTE:
If harness is OK, replace BCM (NATS control unit), perform initialization with CONSULT-II. For initialization, refer to “CONSULT-II Operation Manual NATS-IVIS/NVIS”.

Diagnostic Procedure 4

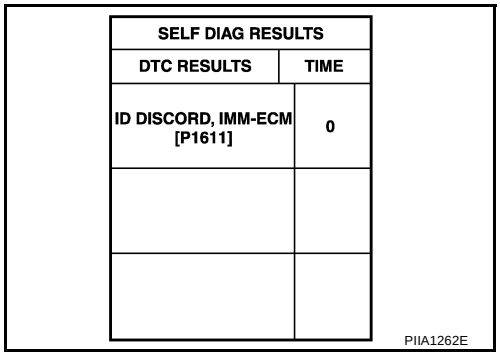
AIS0014F

Self-diagnostic results:
“ID DISCORD, IMM-ECM” displayed on CONSULT-II screen

1. CONFIRM SELF-DIAGNOSTIC RESULTS

Confirm SELF-DIAGNOSTIC RESULTS “ID DISCORD, IMM-ECM” displayed on CONSULT-II screen.

NOTE:
“ID DISCORD IMM-ECM”:
Registered ID of BCM (NATS control unit) is in discord with that of ECM.



Is CONSULT-II screen displayed as above?

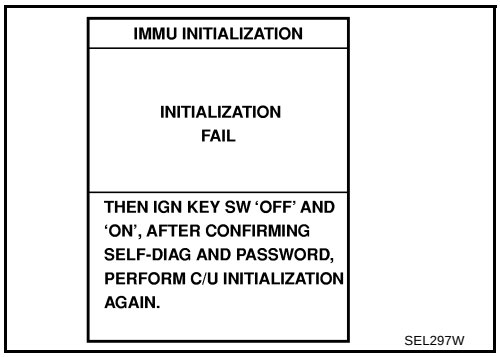
Yes >> GO TO 2.

No >> GO TO BL-166, "SYMPTOM MATRIX CHART 1" .

2. PERFORM INITIALIZATION WITH CONSULT-II

Perform initialization with CONSULT-II. Re-register all NATS ignition key IDs.
For initialization, refer to “CONSULT-II Operation Manual NATS-IVIS/NVIS”.

NOTE:
If the initialization is not completed or malfunctions, CONSULT-II shows message on the screen.



Can the system be initialized?

Yes >> Start engine. (END)

- (System initialization had not been completed. **Ref. part No. F**)

No >> ECM is malfunctioning.

- Replace ECM. **Ref. part No. B**
- Perform initialization with CONSULT-II.
  For initialization, refer to “CONSULT-II Operation Manual NATS-IVIS/NVIS”.

Diagnostic Procedure 5

AIS0014G

“SECURITY INDICATOR LAMP DOES NOT LIGHT UP”

1. CHECK FUSE

- Check 10A fuse [No.19, located in the fuse block (J/B)]

  NOTE:
  Refer to BL-158, "Component Parts and Harness Connector Location" .

OK or NG

OK >> GO TO 2.
NG >> Replace fuse.

2. CHECK SECURITY INDICATOR LAMP

1. Install 10A fuse.
2. Start engine and turn ignition switch OFF.
3. Check the security indicator lamp lights up.

Security indicator lamp should light up.

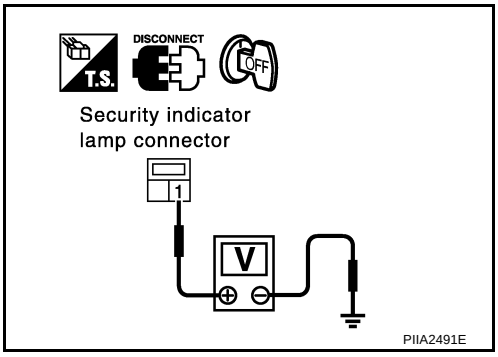
OK or NG

OK >> Inspection END.
NG >> GO TO 3.

3. CHECK SECURITY INDICATOR LAMP POWER SUPPLY CIRCUIT

1. Disconnect security indicator lamp connector.
2. Check voltage between security indicator lamp harness connector M34 terminal 1 (R/W) and ground.

1 (R/W) – Ground : Battery voltage should exist.



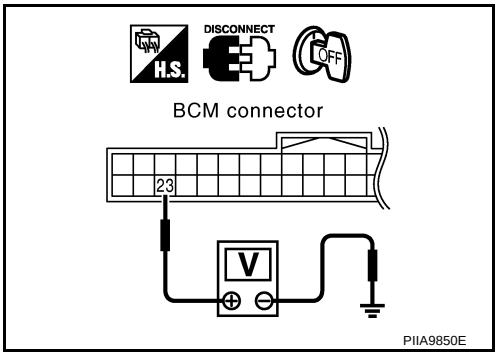
OK or NG

OK >> GO TO 4.
NG >> Check harness for open or short between fuse and security indicator lamp.

4. CHECK BCM (NATS CONTROL UNIT) FUNCTION

1. Connect security indicator lamp connector.
2. Disconnect BCM (NATS control unit) connector.
3. Check voltage between BCM (NATS control unit) harness connector M90 terminal 23 (G/OR) and ground.

23 (G/OR) – Ground : Battery voltage



OK or NG

OK >> BCM (NATS control unit) is malfunctioning.
- Replace BCM (NATS control unit).
  Ref. part No. A
- Perform initialization with CONSULT-II.
- For initialization, refer to “CONSULT-II Operation Manual NATS-IVIS/NVIS”.

NG >> GO TO 5.

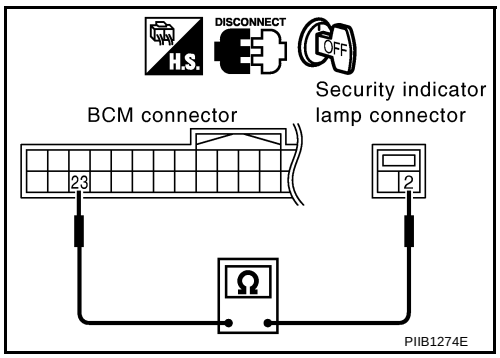
5. CHECK SECURITY INDICATOR LAMP CIRCUIT

1. Check continuity between BCM harness connector M90 terminal 23 and security indicator lamp harness connector M34 terminal 2.

23 (G/OR) - 2 (G/OR) : Continuity should exist.

2. Check continuity between BCM harness connector M90 terminal 23 and ground.

23 (G/OR) - Ground : Continuity should not exist.



OK or NG

OK >> Check indicator lamp condition.
NG >> Repair harness or connector.

Diagnostic Procedure 6

AIS0014H

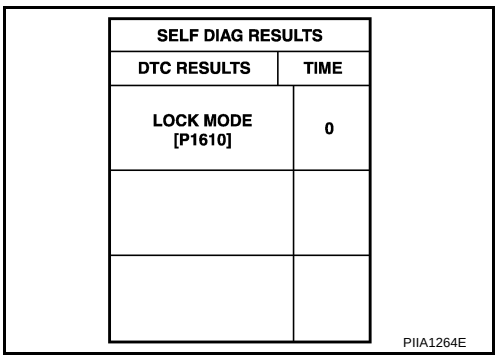
Self-diagnostic results:
“LOCK MODE” displayed on CONSULT-II screen

1. CONFIRM SELF-DIAGNOSTIC RESULTS

Confirm SELF-DIAGNOSTIC RESULTS “LOCK MODE” is displayed on CONSULT-II screen.

Is CONSULT-II screen displayed as above?

Yes >> GO TO 2.
No >> GO TO BL-166, "SYMPTOM MATRIX CHART 1" .



2. ESCAPE FROM LOCK MODE

1. Turn ignition switch OFF.
2. Turn ignition switch ON with registered key. (Do not start engine.) Wait 5 seconds.
3. Return the key to OFF position. Wait 5 seconds.
4. Repeat steps 2 and 3 twice (total of three cycles).
5. Start the engine.

Does engine start?

Yes >> System is OK (Now system is escaped from “LOCK MODE”).
No >> GO TO 3.

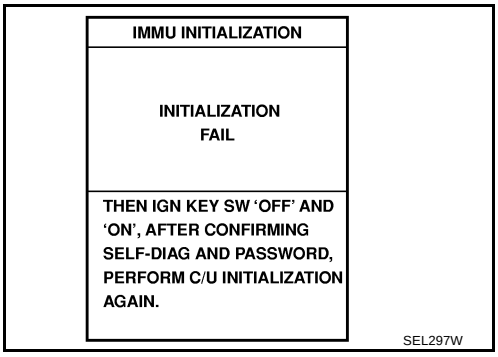
3. PERFORM INITIALIZATION WITH CONSULT-II

Perform initialization with CONSULT-II.
For initialization, refer to “CONSULT-II Operation Manual NATS-IVIS/NVIS”.

NOTE:
If the initialization is not completed or malfunctions, CONSULT-II shows the message on the screen.

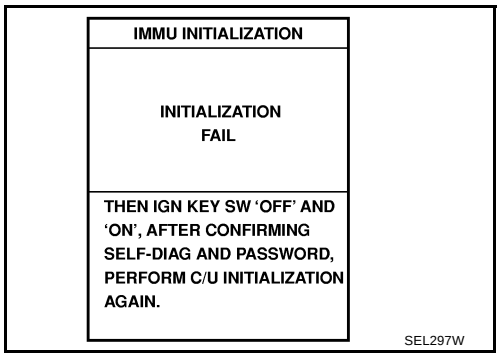
Can the system be initialized?

Yes >> System is OK.
No >> GO TO 4.



4. PERFORM INITIALIZATION WITH CONSULT-II AGAIN

1. Replace BCM (NATS control unit).
2. Perform initialization with CONSULT-II.
   For initialization, refer to “CONSULT-II Operation Manual NATS-IVIS/NVIS”.



NOTE:
If the initialization is not completed or malfunctions, CONSULT-II shows the message on the screen.

Can the system be initialized?

Yes >> System is OK. (BCM (NATS control unit) is malfunctioning. **Ref. part No. A**)

No >> ECM is malfunctioning.

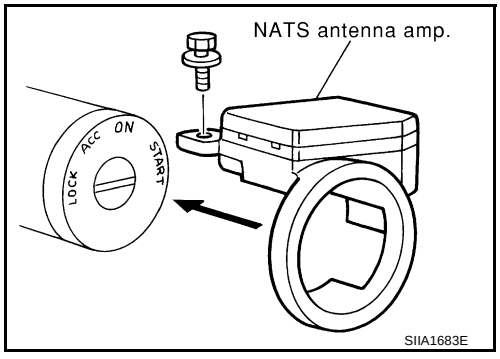
- Replace ECM. **Ref. part No. B**
- Perform initialization with CONSULT-II.
  For initialization, refer to “CONSULT-II Operation Manual NATS-IVIS/NVIS”.

How to Replace NATS Antenna Amp.

AIS0014I

NOTE:

- **If NATS antenna amp. is not installed correctly, NVIS (NATS) system will not operate properly and SELF-DIAG RESULTS on CONSULT-II screen will show “LOCK MODE” or “CHAIN OF IMMU-KEY”.**
- **Initialization is not necessary only when NATS antenna amp. is replaced with a new one.**



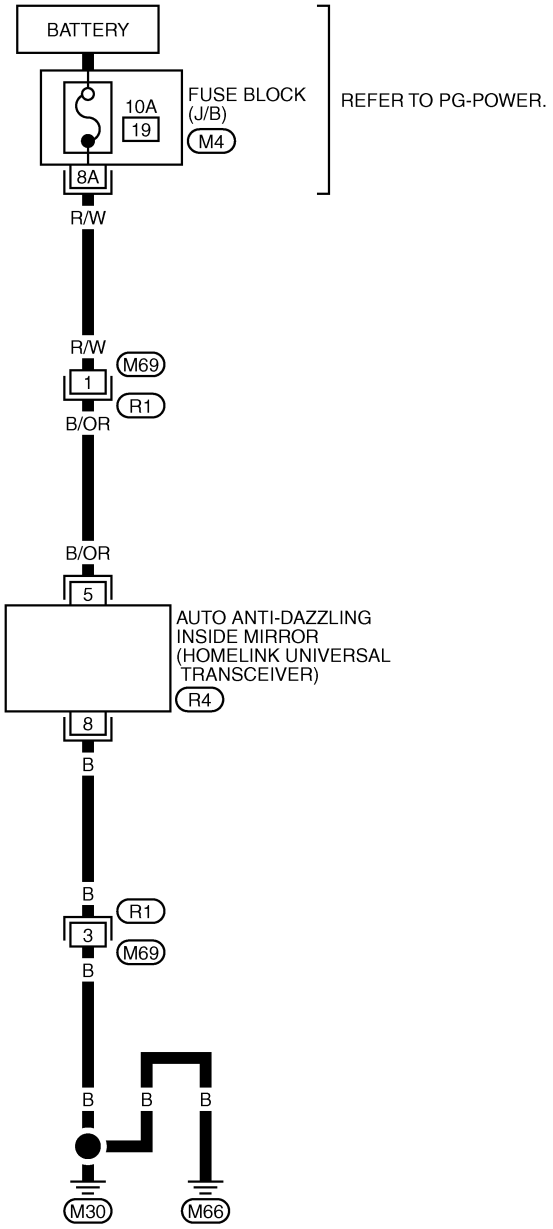
INTEGRATED HOMELINK TRANSMITTER

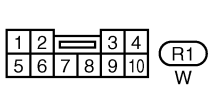
PFP:96401

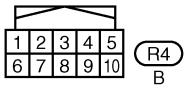
Wiring Diagram —TRNSCV—

AIS000EK

BL-TRNSCV-01







REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TIWT0497E

Trouble Diagnoses

AIS000EL

DIAGNOSTIC PROCEDURE

SYMPTOM: Transmitter does not activate receiver.

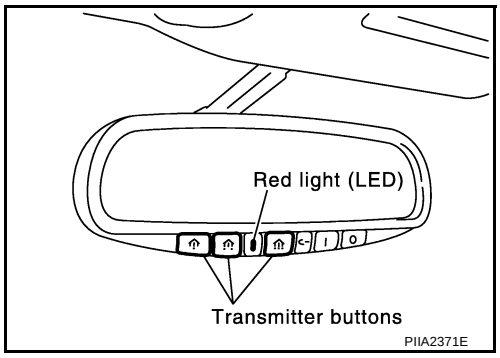
Before conducting the procedure given below, make sure that system receiver (garage door opener, etc.) operates with original, hand-held transmitter. If NG, receiver or hand-held transmitter is malfunctioning, not vehicle related.

1. ILLUMINATION CHECK

1. Turn ignition switch “OFF”.
2. Does red light (LED) of transmitter illuminate when any transmitter button is pressed?

YES or NO

YES >> GO TO 2.
NO >> GO TO 3.



2. TRANSMITTER CHECK

Check transmitter with Tool*.
*:For details, refer to Technical Service Bulletin.

OK or NG

OK >> Receiver or hand-held transmitter malfunction, not vehicle related.
NG >> Replace inside mirror assembly.

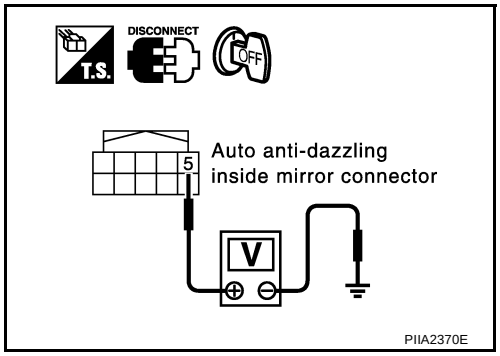
3. CHECK POWER SUPPLY

1. Disconnect transmitter connector.
2. Turn ignition switch “OFF”.
3. Check voltage between auto anti-dazzling inside mirror (integrated homelink transmitter) connector R4 terminal 5 (B/OR) and ground.

5 (B/OR) – Ground : Battery voltage

OK or NG

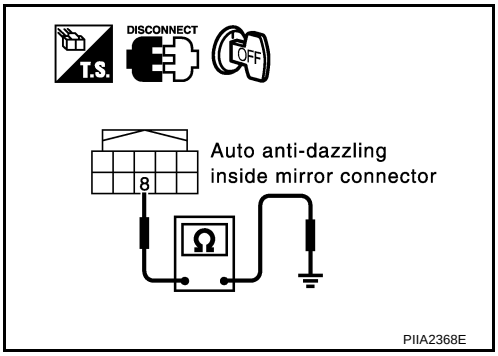
OK >> GO TO 4.
NG >>
- Check 10A fuse. [No. 19 located in the fuse block (J/B)]
- Harness for open or short between fuse and anti-dazzling inside mirror (integrated homelink transmitter).



4. GROUND CIRCUIT CHECK

Check continuity between anti-dazzling inside mirror (integrated homelink transmitter) connector R4 terminal 8 (B) and ground.

8 (B) – Ground : Continuity should exist.



OK or NG

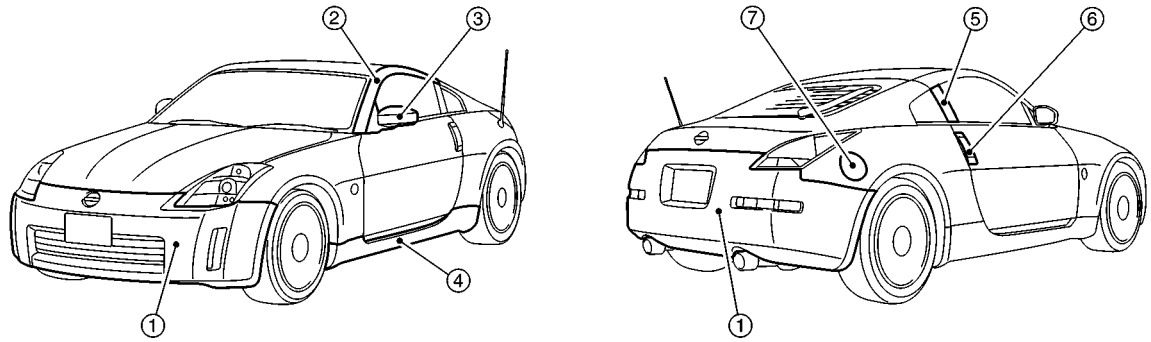
OK >> Replace inside mirror assembly.
NG >> Harness for open or short between anti-dazzling inside mirror (integrated homelink transmitter) body ground.

BODY REPAIR

PFP:60100

Body Exterior Paint Color (Coupe)

AIS0043R



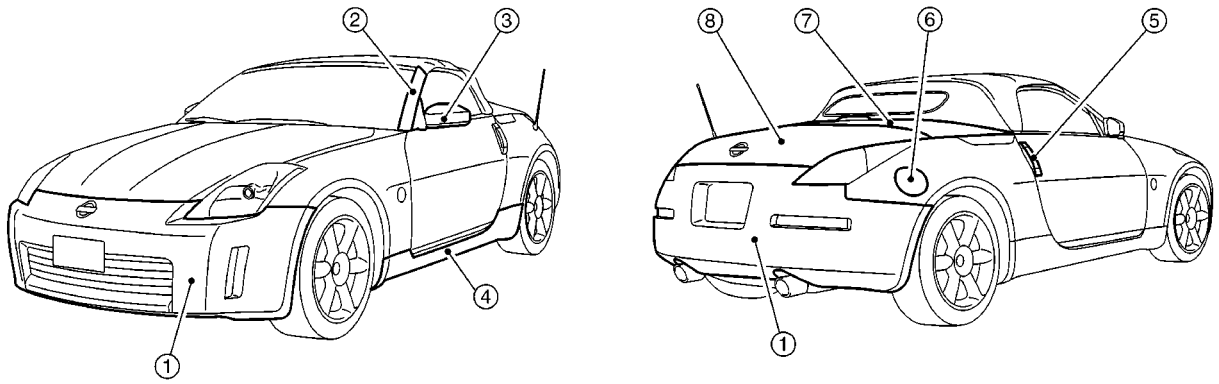
SIIA1975E

Component				Color code	BA17	BAX6	BAX8	BB17	BKH3	BKY0	BQX1	BWV2	BK25
				Description	Orange	Red	Red	Blue	Black	Silver	White	Silver	Silver
				Paint type	2P	2S	2P	CPM	2S	M	3P	M	M
				Hard clear coat	-	X	X	X	X	-	-	-	-
1	Bumper fascia		Body color		BA17	BAX6	BAX8	BB17	BKH3	BKY0	BQX1	BWV2	BK25
2	Front pillar finisher		Body color		BA17	BAX6	BAX8	BB17	BKH3	BKY0	BQX1	BWV2	BK25
3	Door outside mirror	Case	Body color		BA17	BAX6	BAX8	BB17	BKH3	BKY0	BQX1	BWV2	BK25
		Base	Body color		BA17	BAX6	BAX8	BB17	BKH3	BKY0	BQX1	BWV2	BK25
4	Center mud-guard		Body color		BA17	BAX6	BAX8	BB17	BKH3	BKY0	BQX1	BWV2	BK25
5	Door sash		Black		GROSS 88	GROSS 88	GROSS 88	GROSS 88	GROSS 88	GROSS 88	GROSS 88	GROSS 88	GROSS 88
6	Door outside handle and escutcheon		Velour chromium-plate		Cr2p	Cr2p	Cr2p	Cr2p	Cr2p	Cr2p	Cr2p	Cr2p	Cr2p
7	Fuel filler lid		Body color		BA17	BAX6	BAX8	BB17	BKH3	BKY0	BQX1	BWV2	BK25

2S: Solid + Clear, M: Metallic, 2P: 2-Coat pearl, 3P: 3-Coat pearl, CPM: Clear pearl metallic

Body Exterior Paint Color (Roadster)

AIS0044F



SIIA2295E

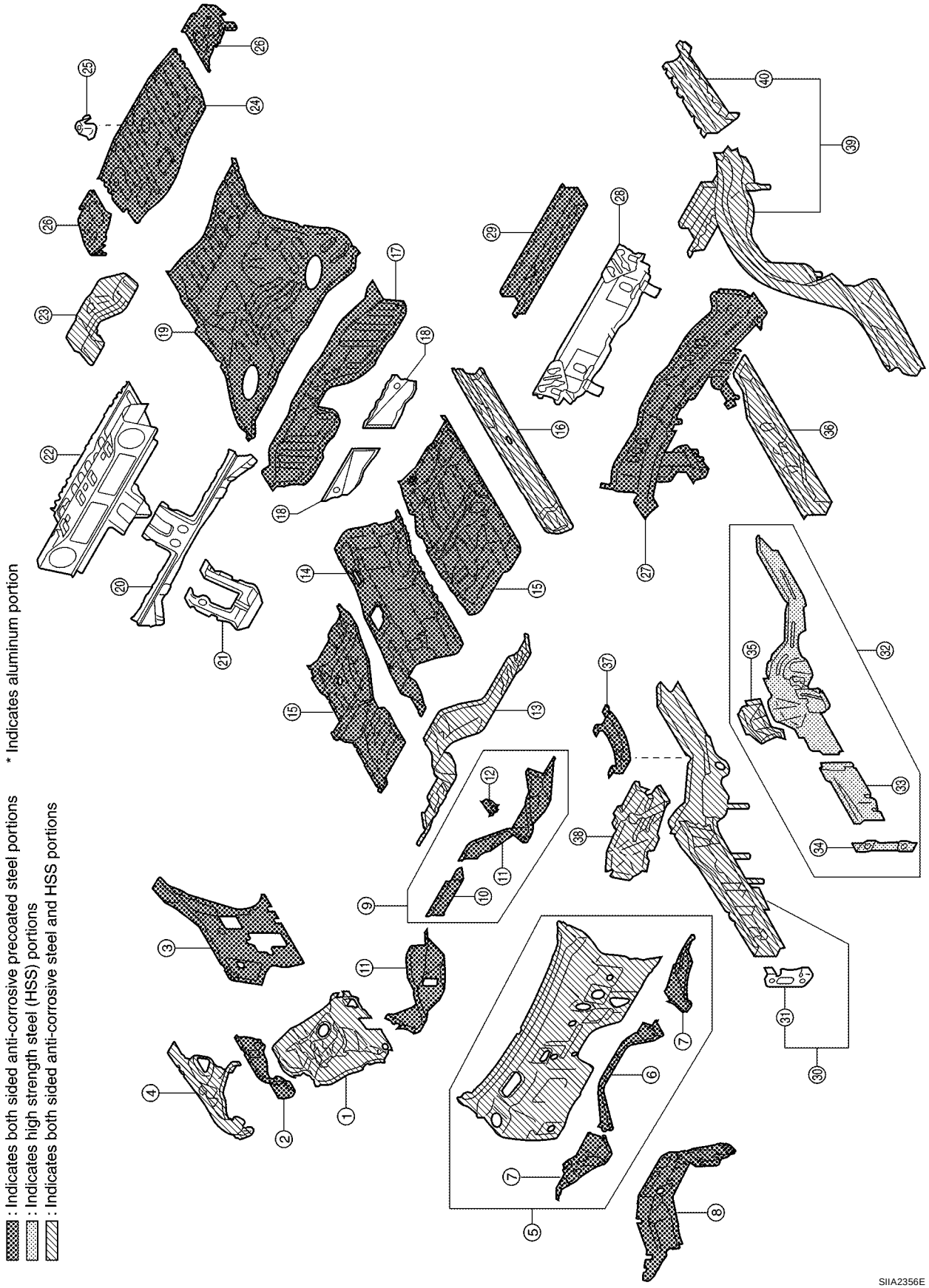
Component			Color code	BA17	BAX6	BB17	BKH3	BKY0	BQX1	BWV2
			Description	Orange	Red	Blue	Black	Silver	White	Silver
			Paint type	2P	2S	CPM	2S	M	3P	M
			Hard clear coat	-	X	X	X	-	-	-
1	Bumper fascia		Body color	BA17	BAX6	BB17	BKH3	BKY0	BQX1	BWV2
2	Front pillar finisher		Body color	BA17	BAX6	BB17	BKH3	BKY0	BQX1	BWV2
3	Door outside mirror	Case	Body color	BA17	BAX6	BB17	BKH3	BKY0	BQX1	BWV2
		Base	Body color	BA17	BAX6	BB17	BKH3	BKY0	BQX1	BWV2
4	Center mudguard		Body color	BA17	BAX6	BB17	BKH3	BKY0	BQX1	BWV2
5	Door outside handle and escutcheon		Velour chromium-plate	Cr2p	Cr2p	Cr2p	Cr2p	Cr2p	Cr2p	Cr2p
6	Fuel filler lid		Body color	BA17	BAX6	BB17	BKH3	BKY0	BQX1	BWV2
7	Storage lid		Body color	BA17	BAX6	BB17	BKH3	BKY0	BQX1	BWV2
8	Trunk lid		Body color	BA17	BAX6	BB17	BKH3	BKY0	BQX1	BWV2

2S: Solid + Clear, M: Metallic, 2P: 2-Coat pearl, 3P: 3-Coat pearl, CPM: Clear pearl metallic

Body Component Parts (Coupe)

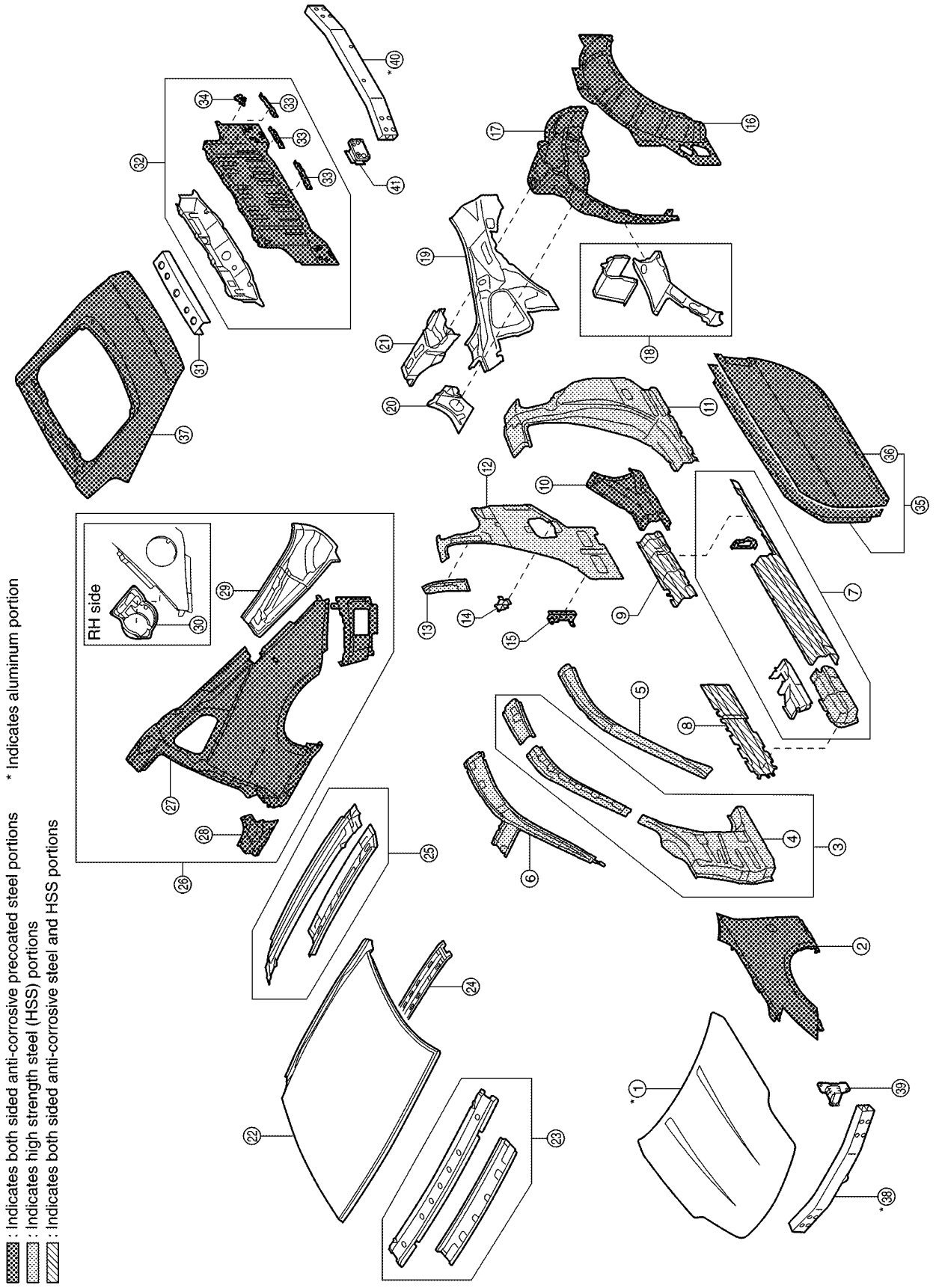
AIS0044G

UNDERBODY COMPONENT PARTS



1. Front strut housing (RH&LH)
2. Upper front hoodledge (RH&LH)
3. Upper rear hoodledge (RH&LH)
4. Hoodledge reinforcement (RH&LH)
5. Upper dash assembly
6. Lower dash crossmember center reinforcement
7. Lower dash crossmember reinforcement
8. Cowl top
9. Lower dash crossmember assembly
10. Front crossmember center
11. Lower dash crossmember
12. Steering column mounting reinforcement
13. Lower dash
14. Front floor center
15. Front floor
16. Inner sill (RH&LH)
17. Rear seat crossmember reinforcement assembly
18. Rear floor gusset
19. Rear floor front
20. Rear step upper panel assembly
21. Rear step lower panel assembly
22. Inside step panel
23. Rear floor seat belt anchor reinforcement
24. Rear floor rear
25. Spare tire clamp bracket
26. Rear floor side
27. Rear seat crossmember
28. 2ND rear crossmember
29. Rear center crossmember assembly
30. Front side member assembly (RH&LH)
31. Inner front towing hook bracket (RH&LH)
32. Front side member closing plate assembly (RH&LH)
33. Front side member front closing plate (RH&LH)
34. Outer front towing hook bracket (RH&LH)
35. Front side member center closing plate (RH&LH)
36. Front side member rear extension (RH&LH)
37. Front side member rear reinforcement (RH&LH)
38. Front side member outrigger assembly (RH&LH)
39. Rear side member assembly (RH&LH)
40. Rear side member extension (RH&LH)

BODY COMPONENT PARTS



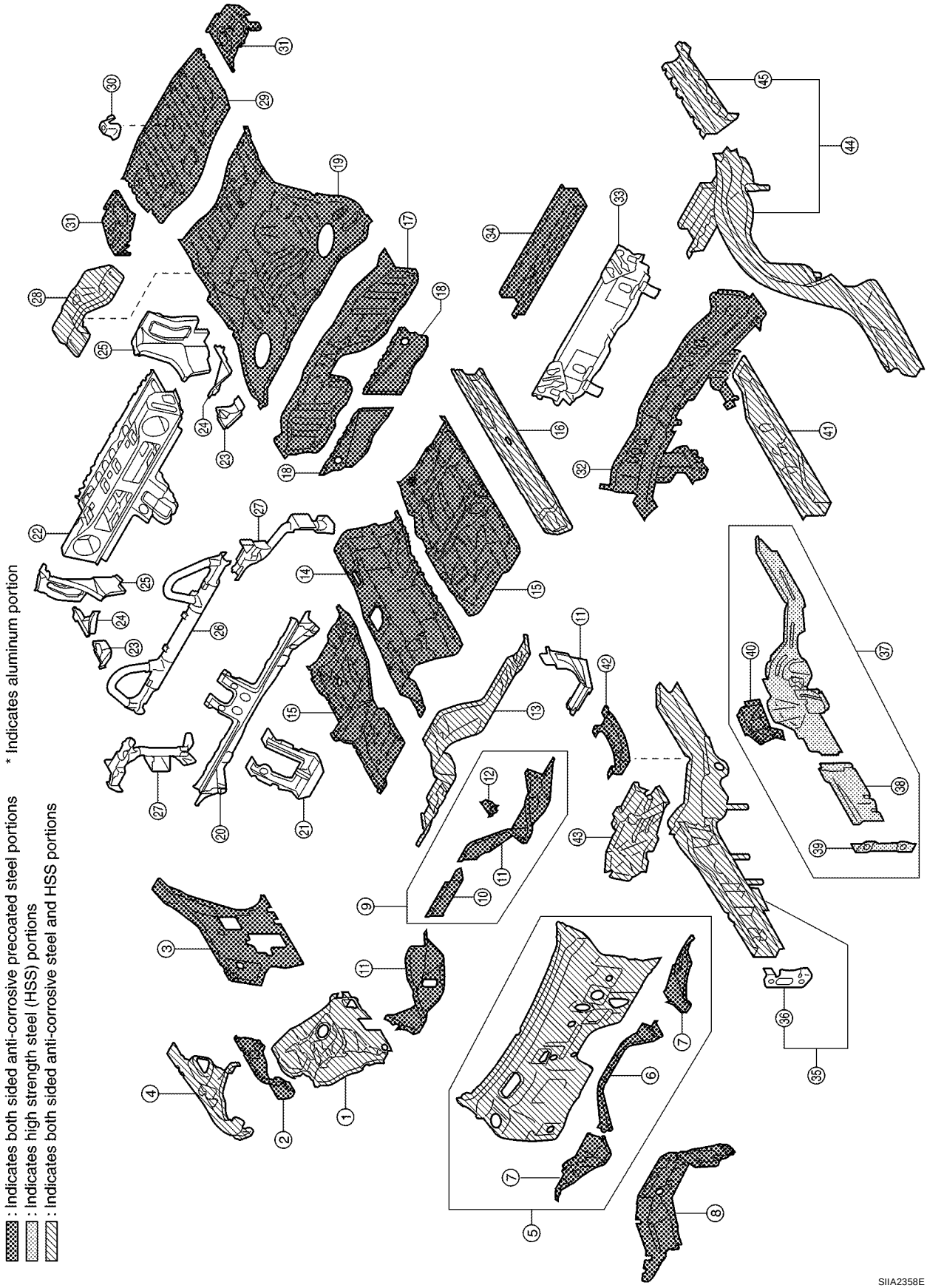
1. Hood
2. Front fender (RH&LH)

3. Front pillar reinforcement assembly (RH&LH)
4. Front pillar hinge brace (RH&LH)
5. Outer front pillar (RH&LH)
6. Inner side roof rail (RH&LH)
7. Outer sill reinforcement assembly (RH&LH)
8. Lower front pillar reinforcement (RH&LH)
9. Lower center pillar bulkhead assembly (RH&LH)
10. Outer rear wheel house extension (RH&LH)
11. Outer lock pillar reinforcement (RH&LH)
12. Inner lock pillar assembly (RH&LH)
13. Inner lock pillar reinforcement (RH&LH)
14. Seat belt anchor assembly (RH&LH)
15. Outer sill brace (RH&LH)
16. Outer rear wheel house (RH&LH)
17. Inner rear wheel house (RH&LH)
18. Inner rear pillar joint (RH&LH)
19. Inner rear pillar (RH&LH)
20. Seat back support (RH&LH)
21. Side parcel shelf (RH&LH)
22. Roof
23. Front roof rail assembly
24. Roof bow No.1
25. Rear roof rail assembly
26. Rear fender assembly (RH&LH)
27. Rear fender (RH&LH)
28. Outer sill extension (RH&LH)
29. Rear fender corner (RH&LH)
30. Fuel filler lid base
31. Parcel shelf
32. Rear panel assembly
33. Rear bumper fascia bracket
34. Rear bumper fascia center bracket (RH&LH)
35. Front door assembly (RH&LH)
36. Outer front door panel (RH&LH)
37. Back door
38. Front bumper reinforcement
39. Front bumper stay (RH&LH)
40. Rear bumper reinforcement
41. Rear bumper stay (RH&LH)

Body Component Parts (Roadster)

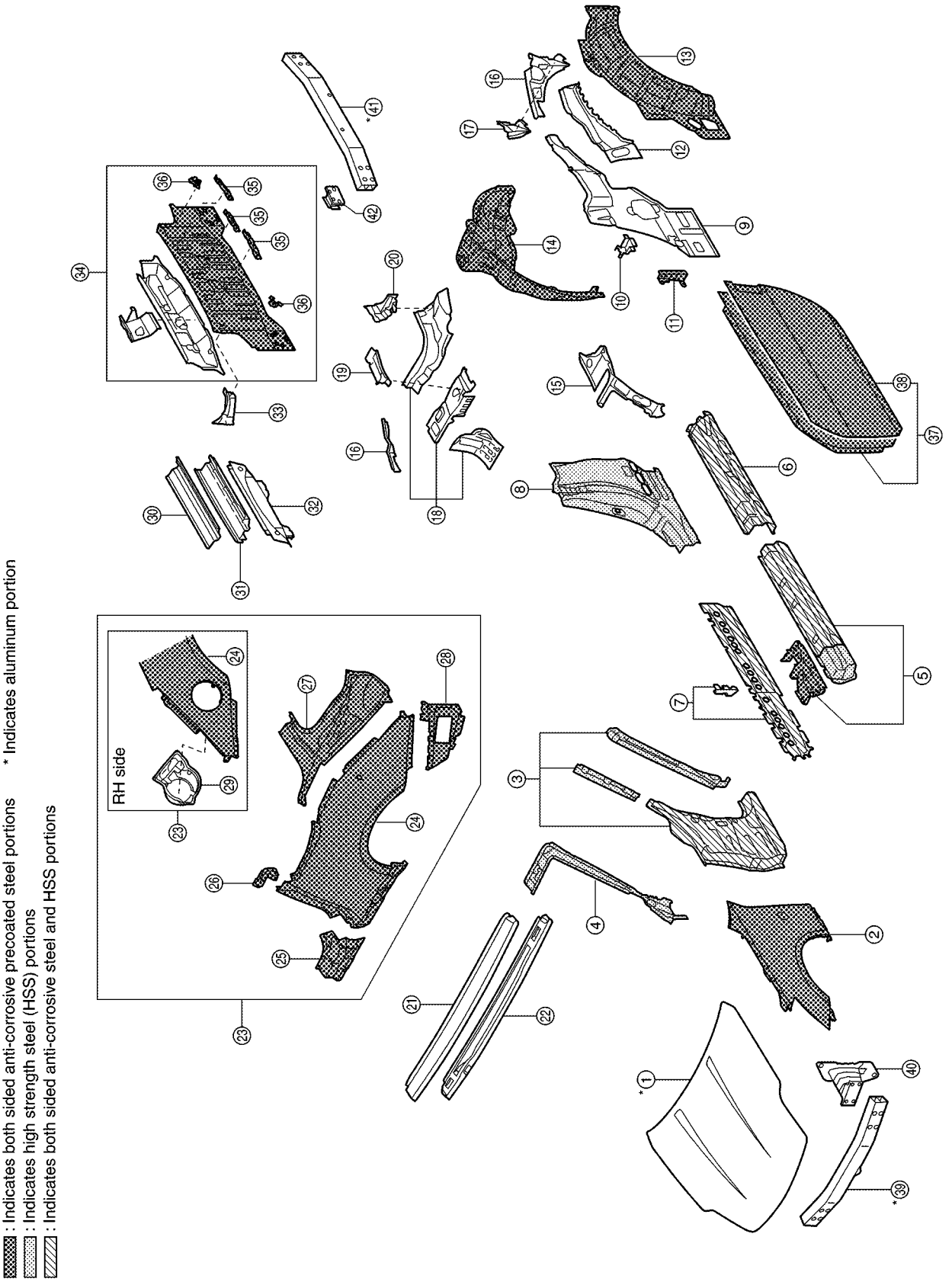
AIS0044H

UNDERBODY COMPONENT PARTS



1. Front strut housing (RH&LH)
2. Upper front hoodledge (RH&LH)
3. Upper rear hoodledge (RH&LH)
4. Hoodledge reinforcement (RH&LH)
5. Upper dash assembly
6. Lower dash crossmember center reinforcement
7. Lower dash crossmember reinforcement
8. Cowl top
9. Lower dash crossmember assembly
10. Front crossmember center
11. Lower dash crossmember
12. Steering column mounting reinforcement
13. Lower dash
14. Front floor center
15. Front floor
16. Inner sill (RH&LH)
17. Rear seat crossmember reinforcement assembly
18. Rear floor gusset
19. Rear floor front
20. Rear step upper panel assembly
21. Rear step lower panel assembly
22. Inside step panel
23. Guard frame gusset
24. Rear side member connector
25. Inner rear wheelhouse connector
26. Guard frame assembly
27. Inside guard frame post
28. Rear floor seat belt anchor reinforcement
29. Rear floor rear
30. Spare tire clamp bracket
31. Rear floor side
32. Rear seat crossmember
33. 2ND rear crossmember
34. Rear center crossmember assembly
35. Front side member assembly (RH&LH)
36. Inner front towing hook bracket (RH&LH)
37. Front side member closing plate assembly (RH&LH)
38. Front side member front closing plate (RH&LH)
39. Outer front towing hook bracket (RH&LH)
40. Front side member center closing plate (RH&LH)
41. Front side member rear extension (RH&LH)
42. Front side member rear reinforcement (RH&LH)
43. Front side member outrigger assembly (RH&LH)
44. Rear side member assembly (RH&LH)
45. Rear side member extension (RH&LH)

BODY COMPONENT PARTS



1. Hood
2. Front fender (RH&LH)
3. Outer front pillar assembly (RH&LH)
4. Inner side roof rail (RH&LH)
5. Outer front sill reinforcement assembly (RH&LH)
6. Outer rear sill reinforcement assembly (RH&LH)
7. Lower front pillar reinforcement assembly (RH&LH)
8. Outer lock pillar reinforcement (RH&LH)
9. Inner rear pillar (RH&LH)
10. Seat belt anchor assembly (RH&LH)
11. Outer sill brace (RH&LH)
12. Rear side waist reinforcement (RH&LH)
13. Outer rear wheel house (RH&LH)
14. Inner rear wheel house (RH&LH)
15. Rear pillar joint (RH&LH)
16. Inner lower rear pillar
17. Lower rear pillar rear
18. Side parcel shelf assembly (RH&LH)
19. Side parcel shelf (RH&LH)
20. Rear pillar gusset (RH&LH)
21. Outer front roof rail
22. Inner front roof rail
23. Rear fender assembly
24. Rear fender
25. Outer sill extension (RH&LH)
26. Rear fender extension A (RH&LH)
27. Rear fender extension B (RH&LH)
28. Rear fender extension C (RH&LH)
29. Fuel filler lid base
30. Rear waist
31. Parcel shelf
32. Seat back support
33. Rear panel bracket reinforcement (RH&LH)
34. Rear panel assembly
35. Center rear bumper fascia bracket
36. Rear bumper fascia bracket
37. Front door assembly (RH&LH)
38. Outer front door panel (RH&LH)
39. Front bumper reinforcement
40. Front bumper stay (RH&LH)
41. Rear bumper reinforcement
42. Rear bumper stay (RH&LH)

Corrosion Protection

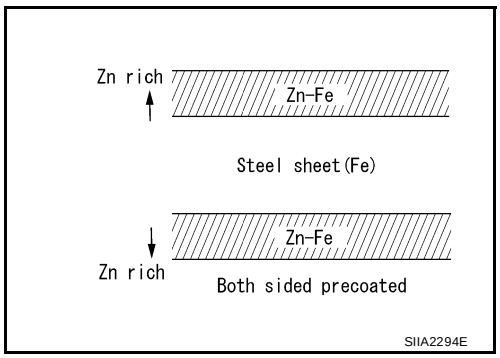
AIS0044I

DESCRIPTION

To provide improved corrosion prevention, the following anti-corrosive measures have been implemented in NISSAN production plants. When repairing or replacing body panels, it is necessary to use the same anti-corrosive measures.

Anti-corrosive precoated steel (Galvannealed steel)

To improve repairability and corrosion resistance, a new type of anti-corrosive precoated steel sheet has been adopted replacing conventional zinc-coated steel sheet.
Galvannealed steel is electroplated and heated to form Zinc-iron alloy, which provides excellent and long term corrosion resistance with cationic electrodeposition primer.



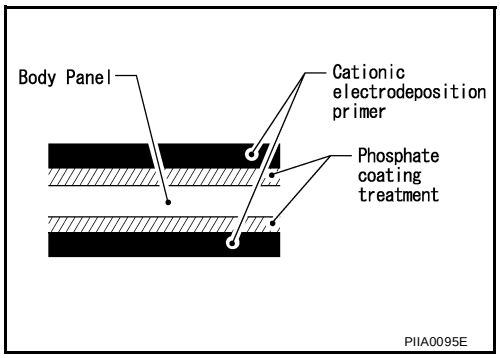
Nissan Genuine Service Parts are fabricated from galvannealed steel. Therefore, it is recommended that GENUINE NISSAN PARTS or equivalent be used for panel replacement to maintain the anti-corrosive performance built into the vehicle at the factory.

Phosphate coating treatment and cationic electrodeposition primer

A phosphate coating treatment and a cationic electrodeposition primer, which provide excellent corrosion protection, are employed on all body components.

CAUTION:

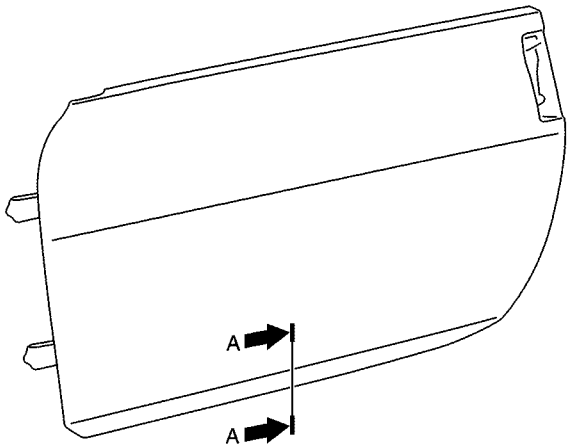
Confine paint removal during welding operations to an absolute minimum.



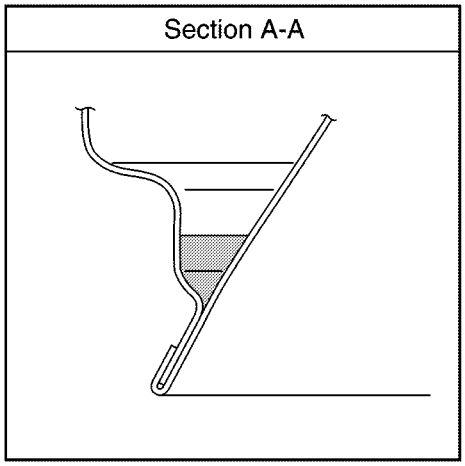
Nissan Genuine Service Parts are also treated in the same manner. Therefore, it is recommended that GENUINE NISSAN PARTS or equivalent be used for panel replacement to maintain anti-corrosive performance built into the vehicle at the factory.

ANTI-CORROSIVE WAX

To improve corrosion resistance, anti-corrosive wax is applied inside the body sill and inside other closed sections. Accordingly, when replacing these parts, be sure to apply anti-corrosive wax to the appropriate areas of the new parts. Select an excellent anti-corrosive wax which will penetrate after application and has a long shelf life.



: Indicates anti-corrosive wax coated portions.



SIIA1979E

UNDERCOATING

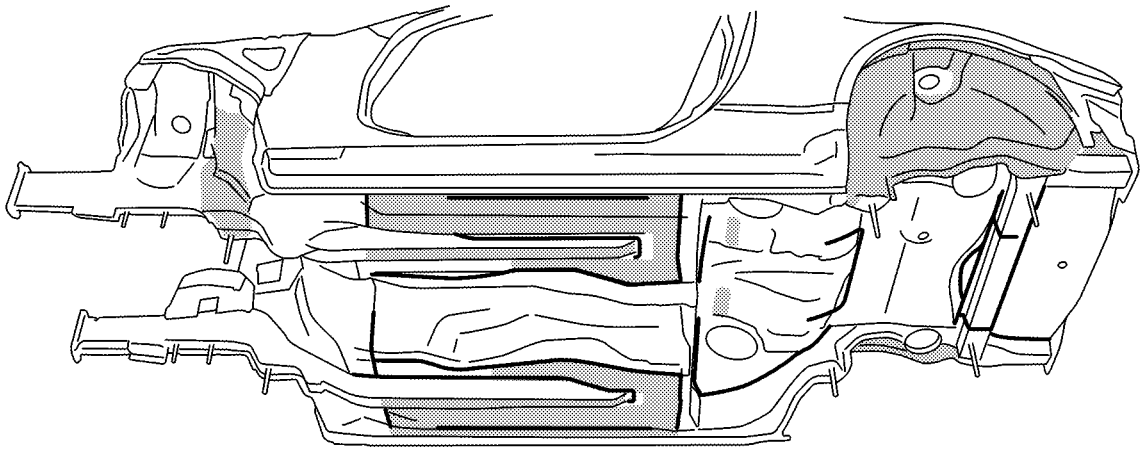
The underside of the floor and wheelhouse are undercoated to prevent rust, vibration, noise and stone chipping. Therefore, when such a panel is replaced or repaired, apply undercoating to that part. Use an undercoating which is rust preventive, soundproof, vibration-proof, shock-resistant, adhesive, and durable.

Precautions in undercoating

1. Do not apply undercoating to any place unless specified (such as the areas above the muffler and three way catalyst which are subjected to heat).
2. Do not undercoat the exhaust pipe or other parts which become hot.
3. Do not undercoat rotating parts.
4. Apply bitumen wax after applying undercoating.
5. After putting seal on the vehicle, put undercoating on it.

: Indicates undercoated portions.

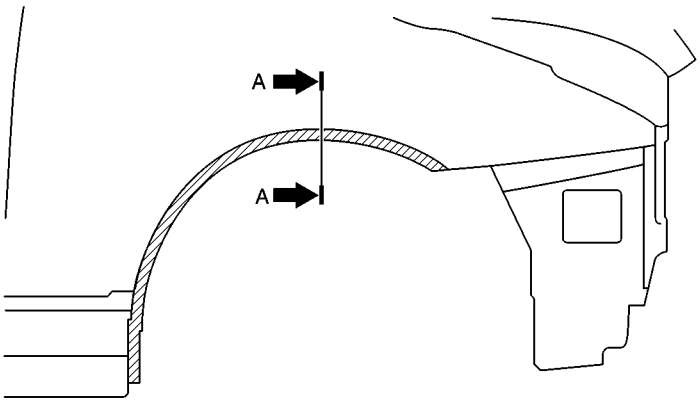
: Indicates sealed portions.



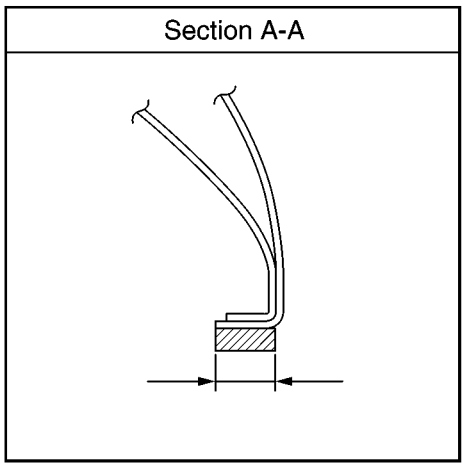
SIIA2298E

STONE GUARD COAT

To prevent damage caused by stones, the lower outer body panel (fender, door, etc.) have an additional layer of Stone Guard Coating over the ED primer coating. When replacing or repairing these panels, apply Stone Guard coating to the same portions as before. Use a coating which is rust preventive, durable, shock-resistant and has a long shelf life.



: Indicates stone guard coated portions.



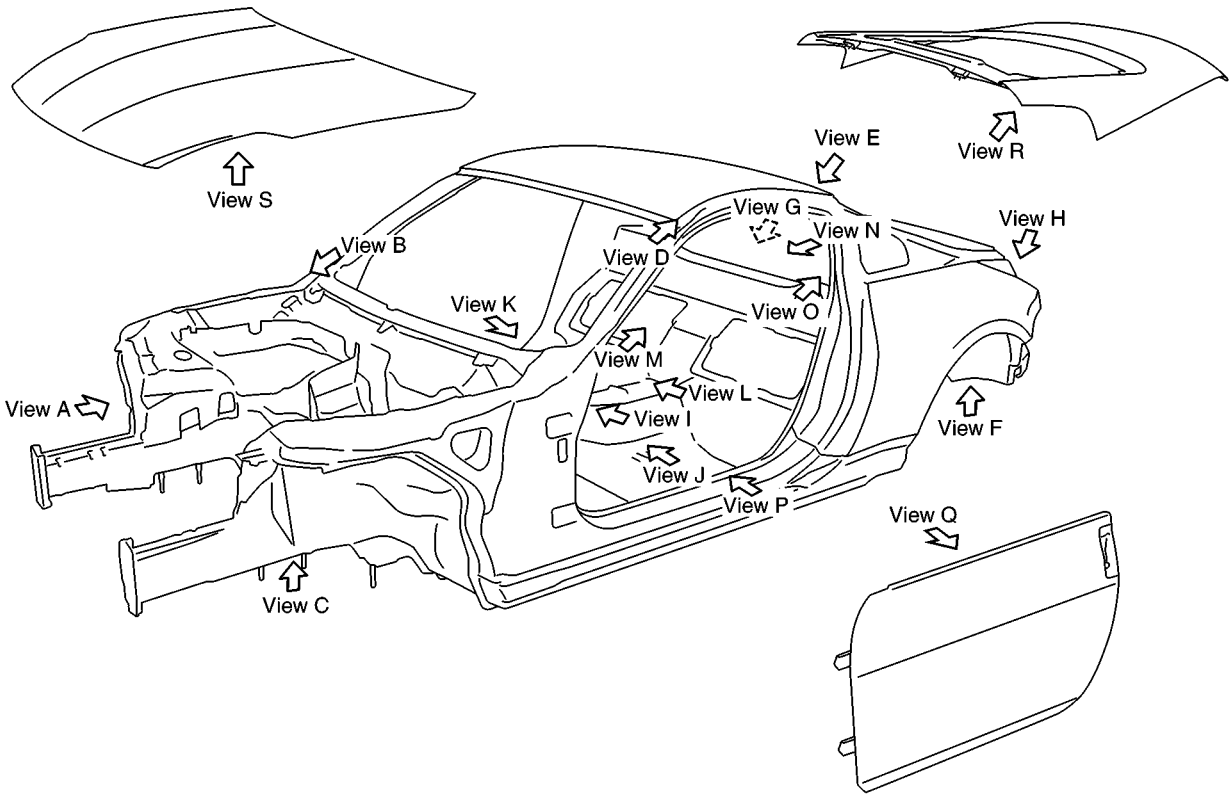
SIIA2299E

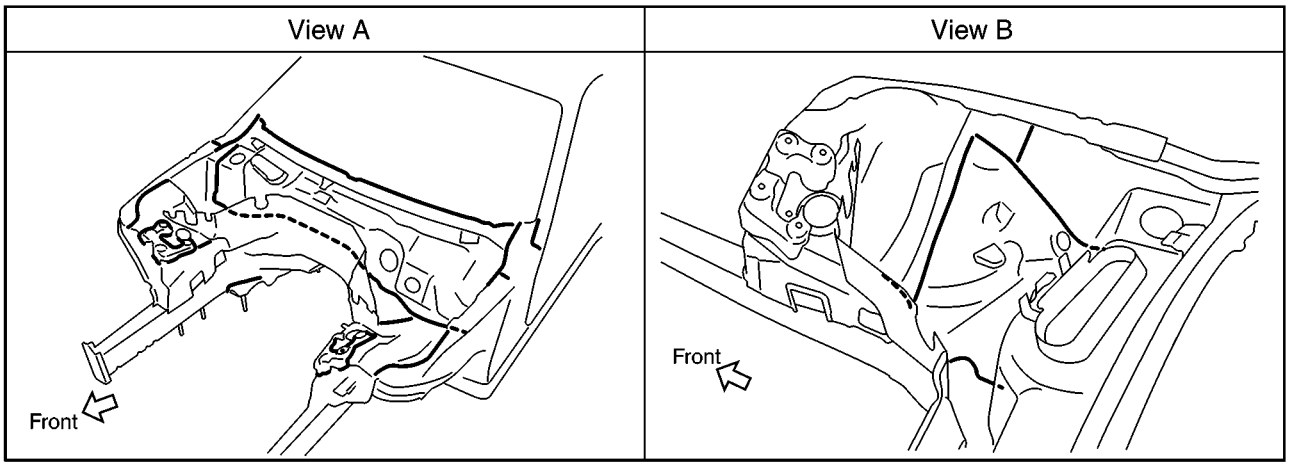
Body Sealing (Coupe)

AIS0044J

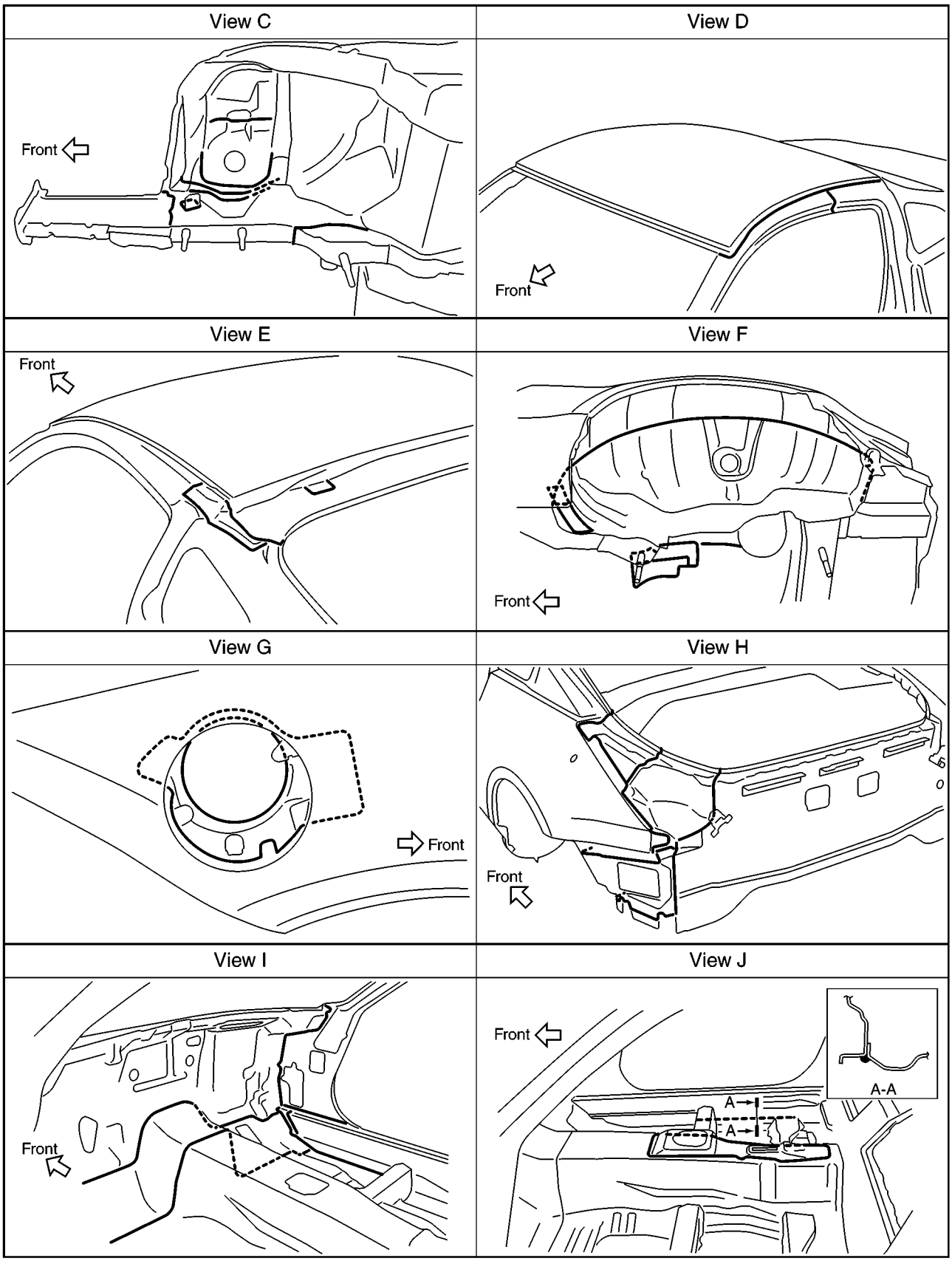
DESCRIPTION

The following figure shows the areas which are sealed at the factory. Sealant which has been applied to these areas should be smooth and free from cuts or gaps. Care should be taken not to apply an excess amount of sealant and not to allow other unaffected parts to come into contact with the sealant.





SIIA1976E


View C
Front
View D
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View E
Front
View F
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View G
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View H
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View I
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View J
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A-A
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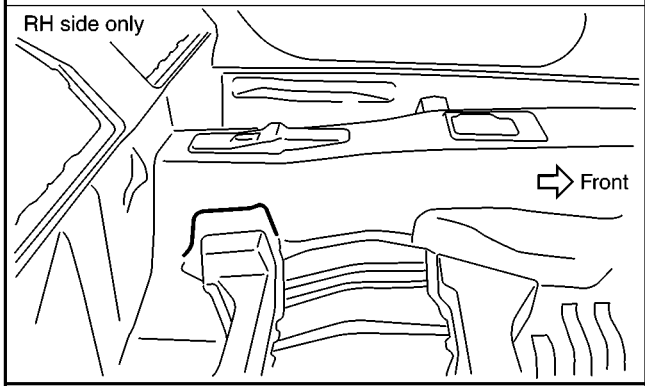
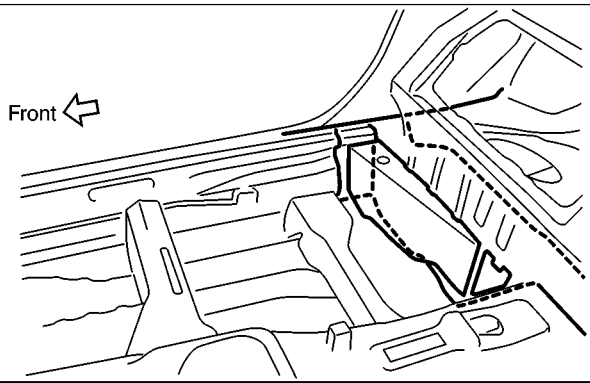
A

SIIA1977E

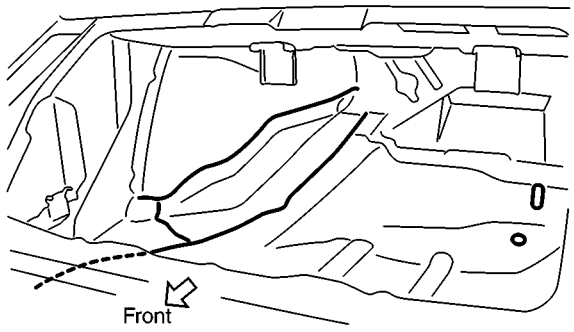
View K



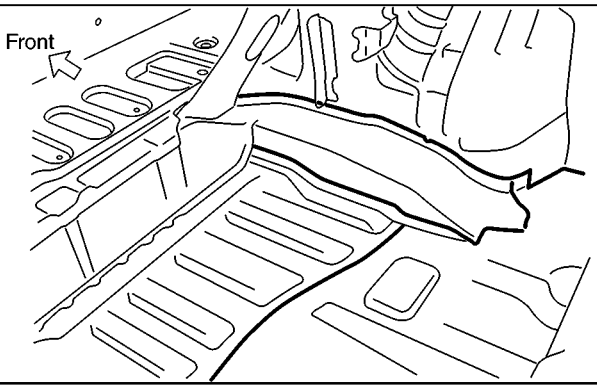
View L



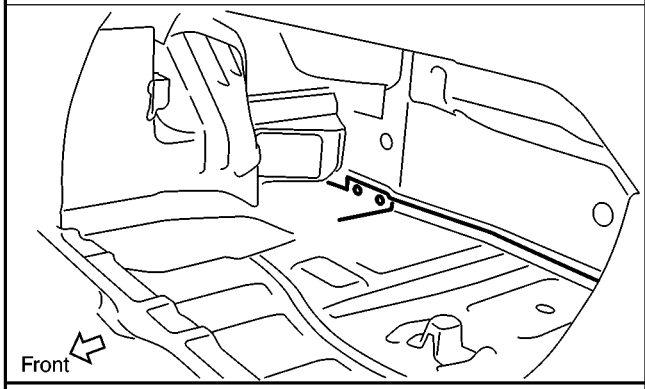
View M



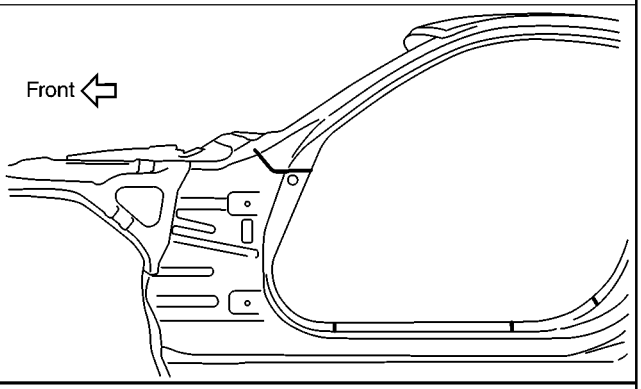
View N



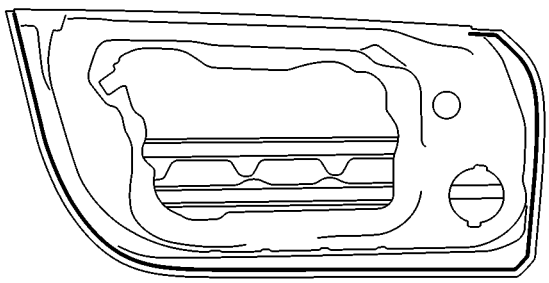
View O



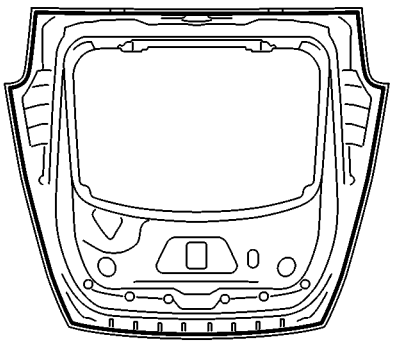
View P



View Q

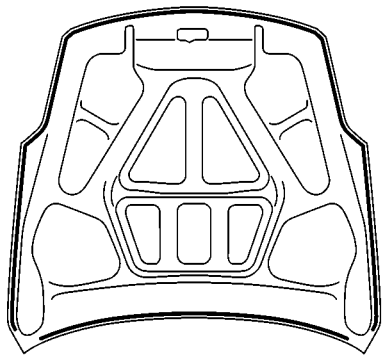


View R



SIIA1978E

View S



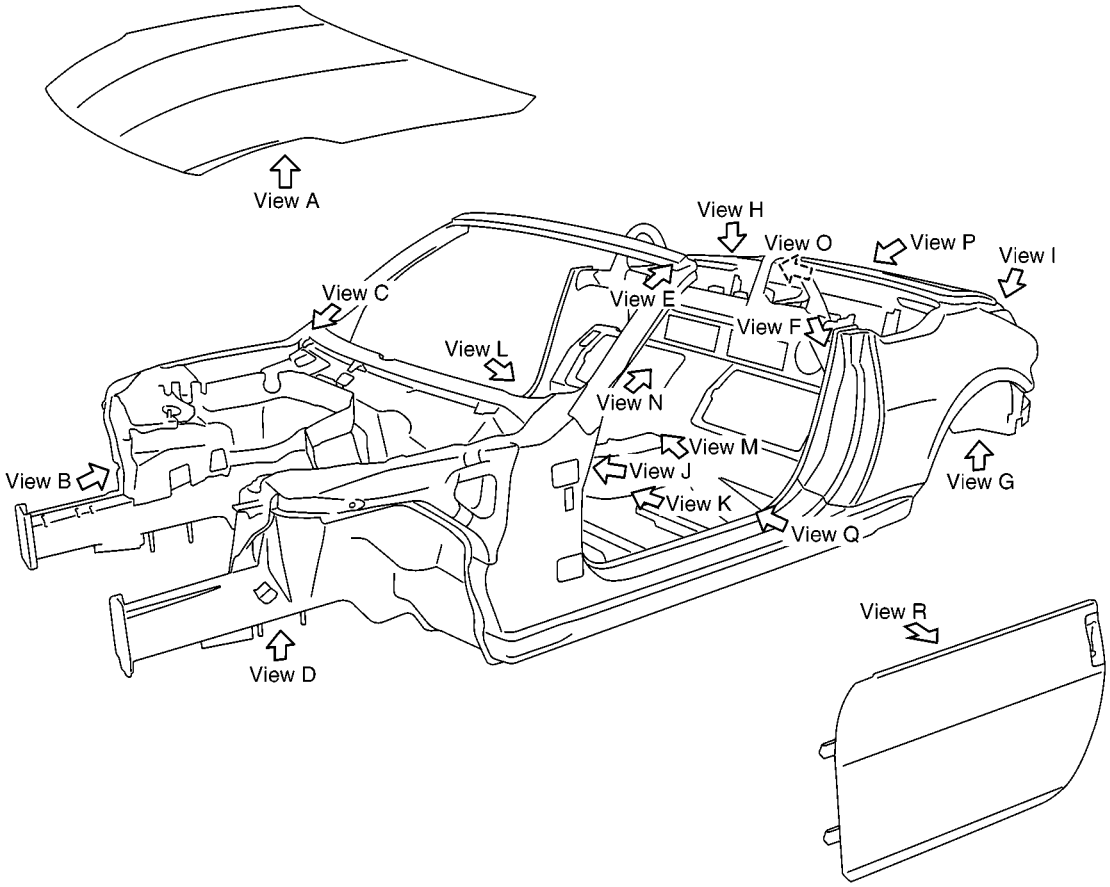
SIIA2335E

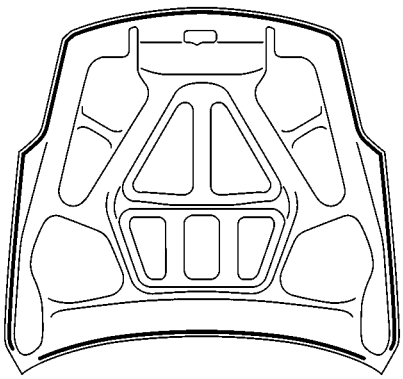
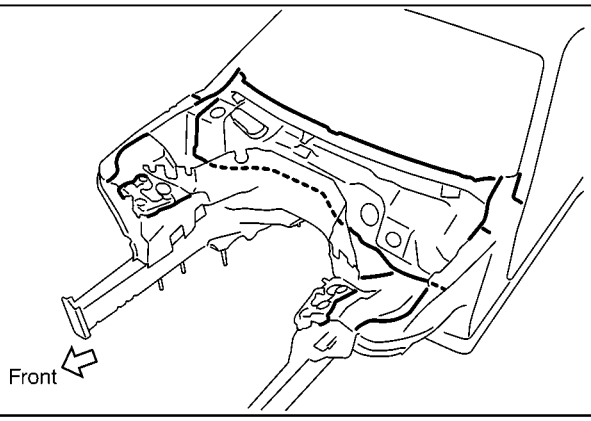
Body Sealing (Roadster)

AIS0044K

DESCRIPTION

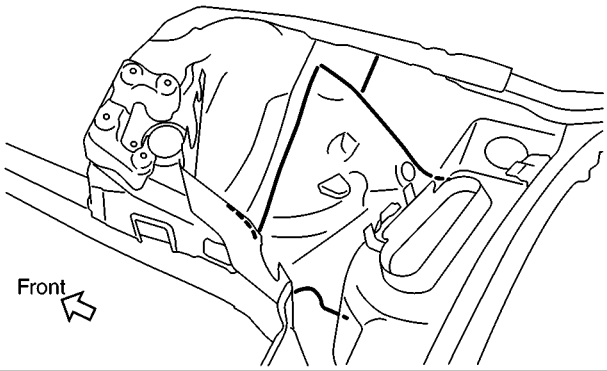
The following figure shows the areas which are sealed at the factory. Sealant which has been applied to these areas should be smooth and free from cuts or gaps. Care should be taken not to apply an excess amount of sealant and not to allow other unaffected parts to come into contact with the sealant.



View A	View B
	

SIIA2300E

View C



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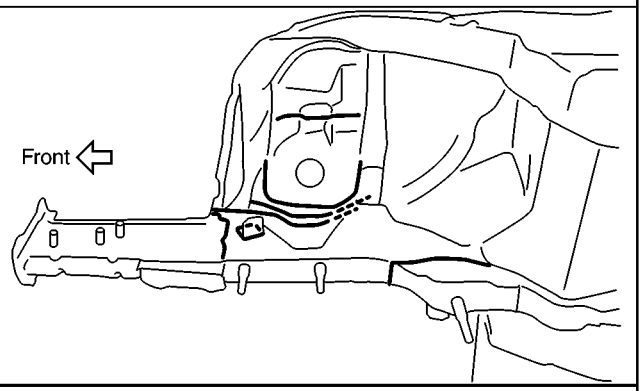

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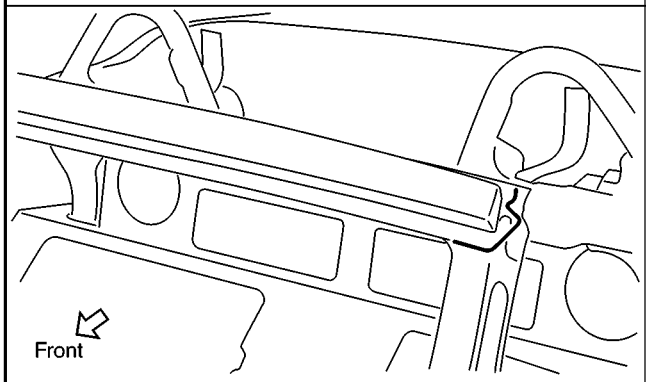

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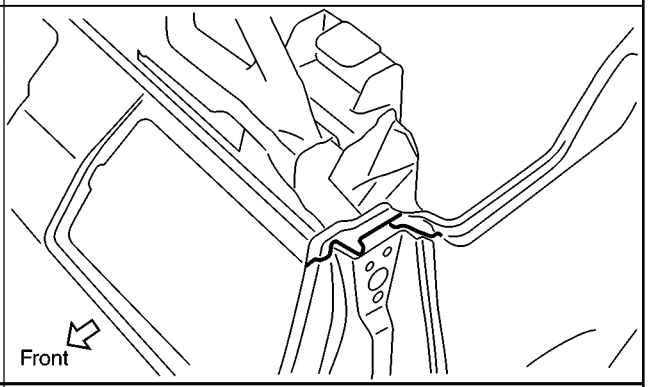

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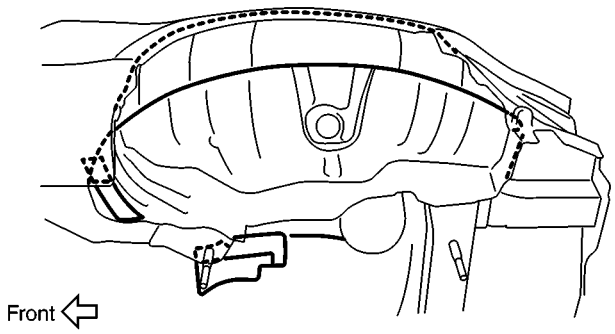

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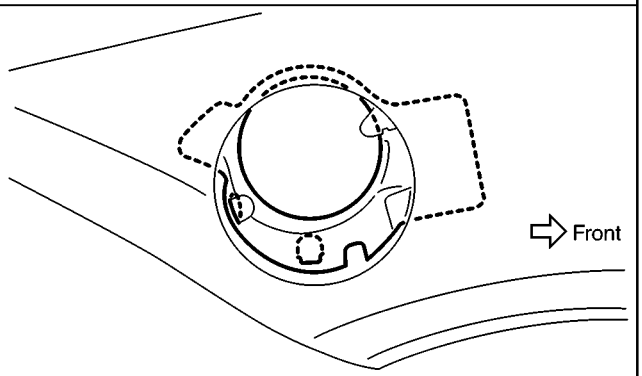

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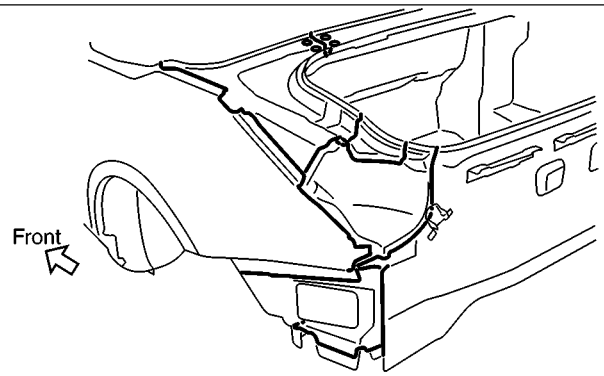

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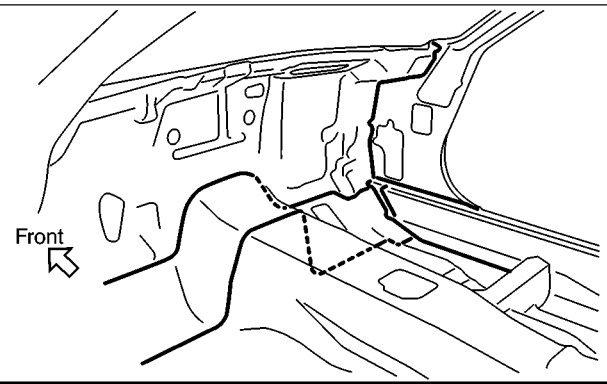

SIIA2301E

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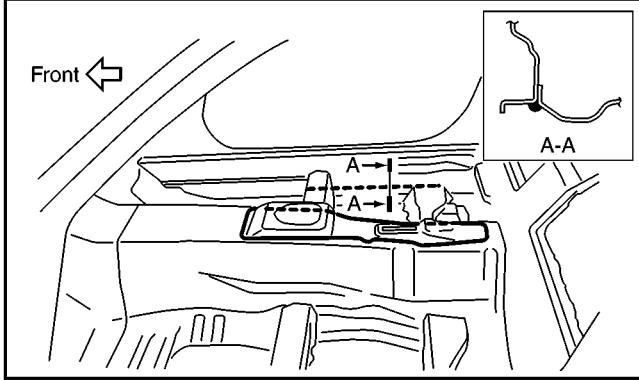

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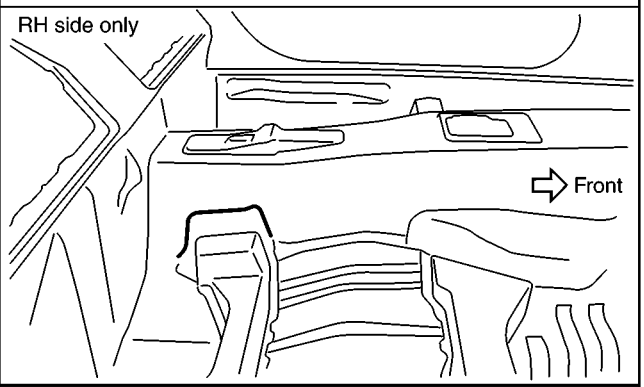

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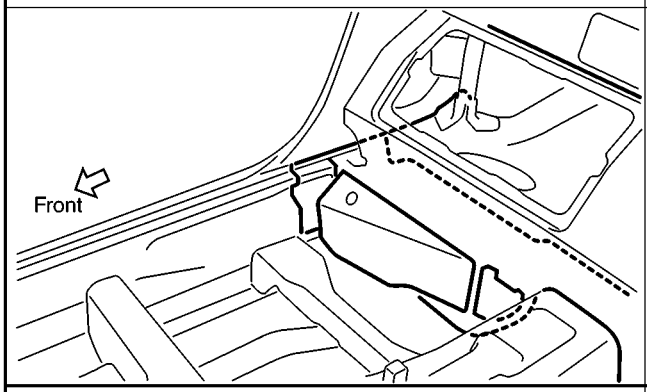

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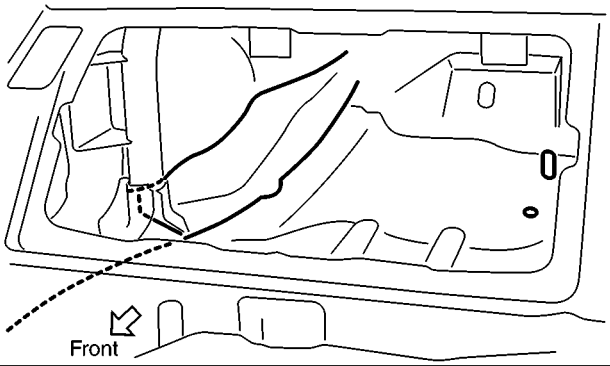
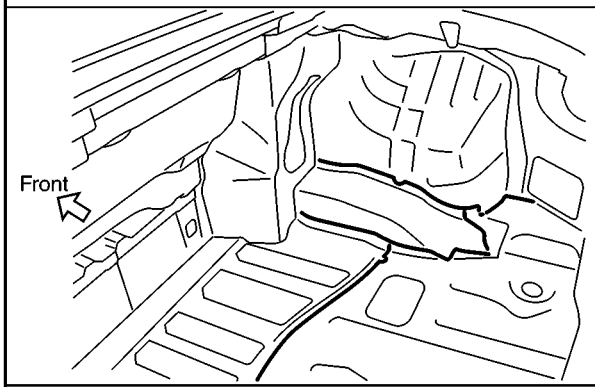
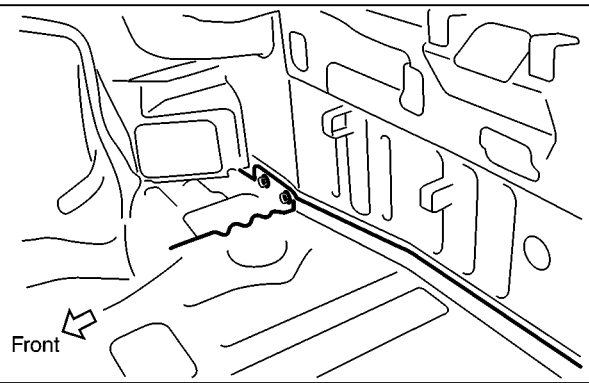


View O



View P



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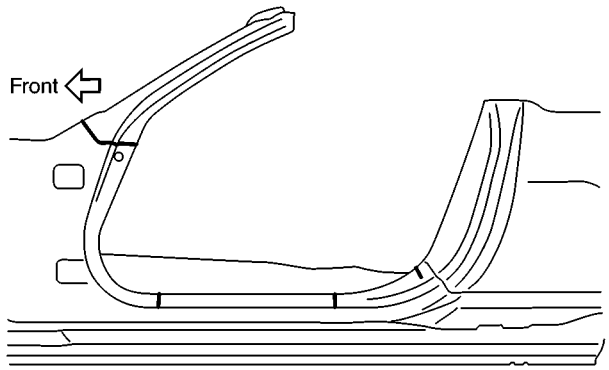

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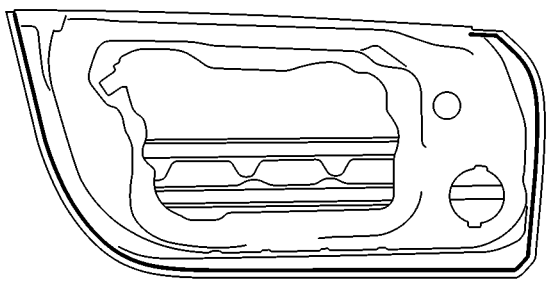
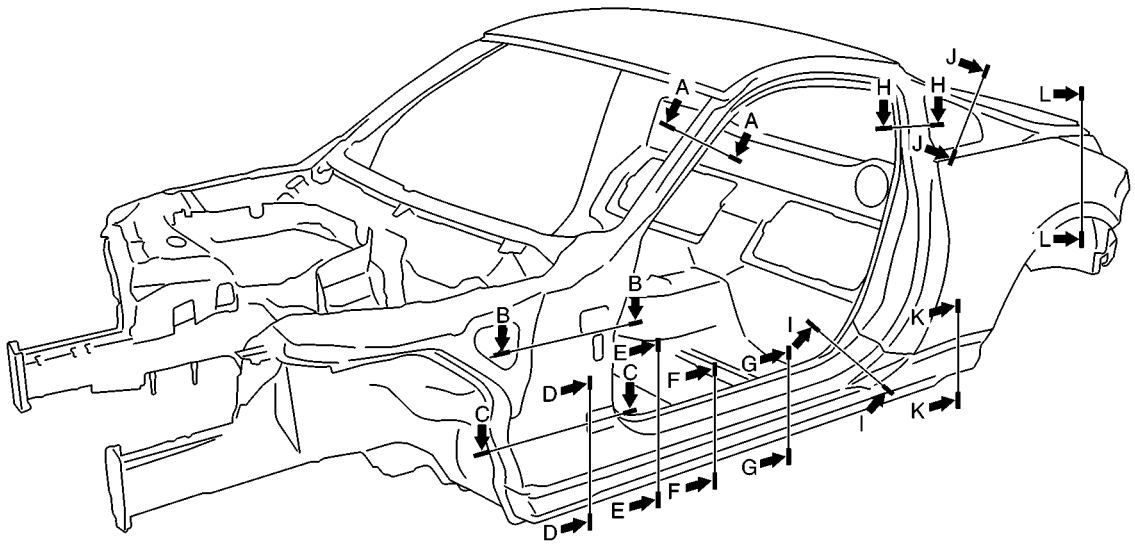


SIIA2302E

Body Construction (Coupe)

BODY CONSTRUCTION

AIS0044L



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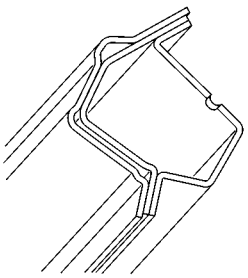	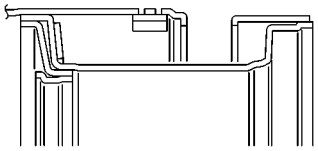	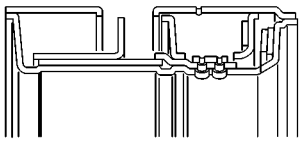	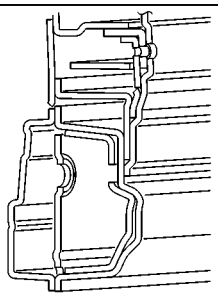
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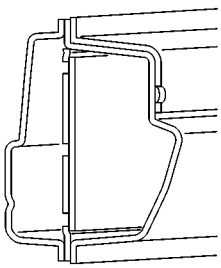	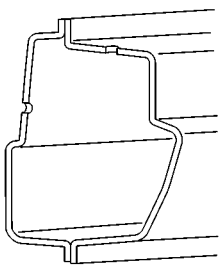	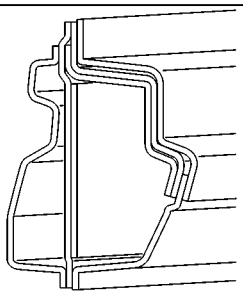	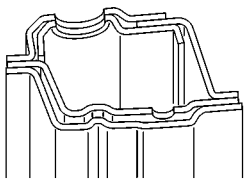
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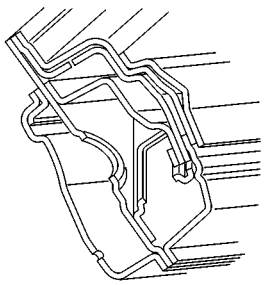
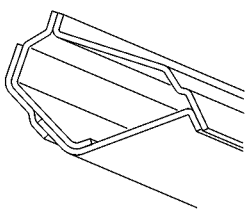
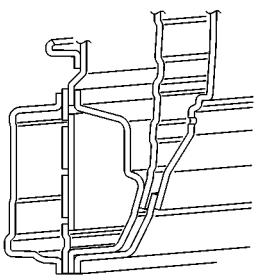
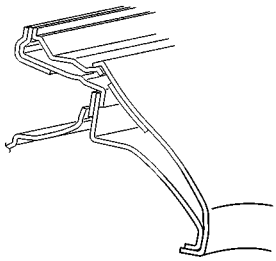
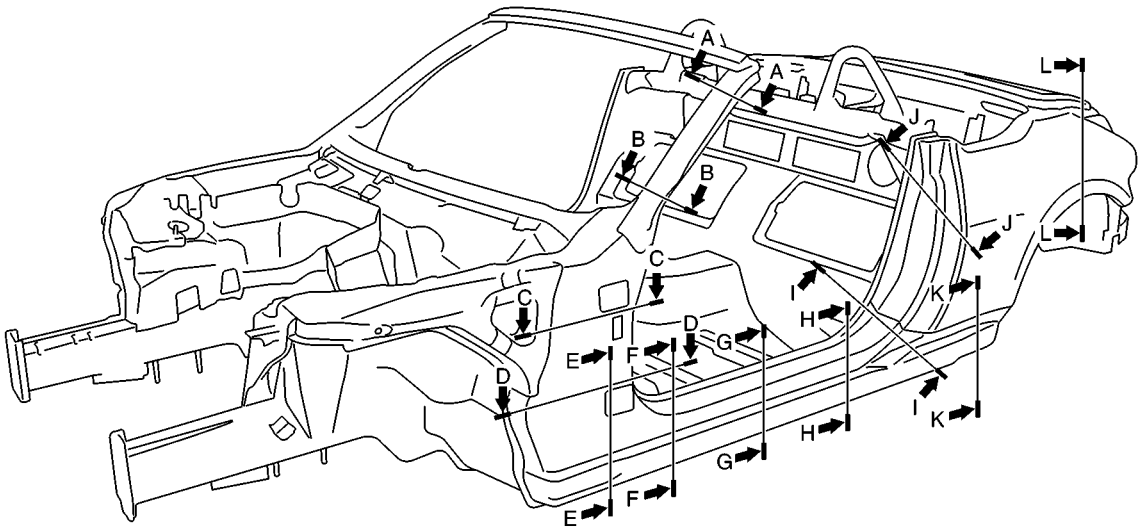
			

SIIA2362E

Body Construction (Roadster)

AIS0044M

BODY CONSTRUCTION



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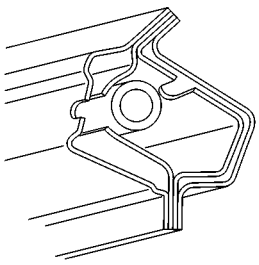	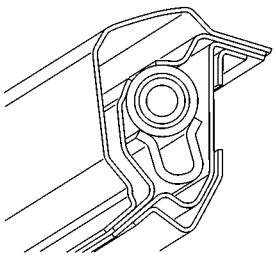	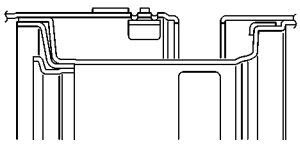	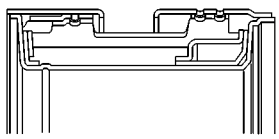
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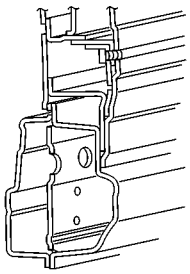	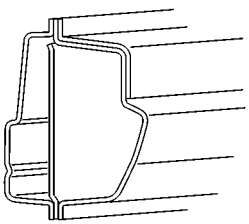	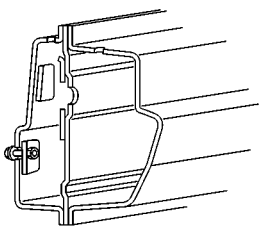	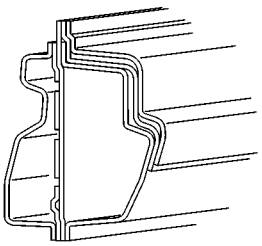
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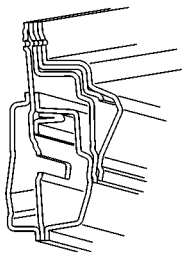
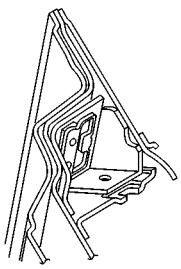
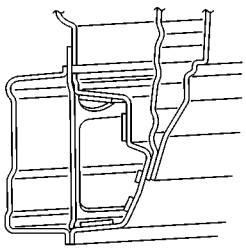
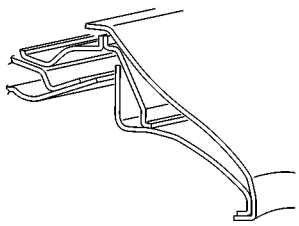
			

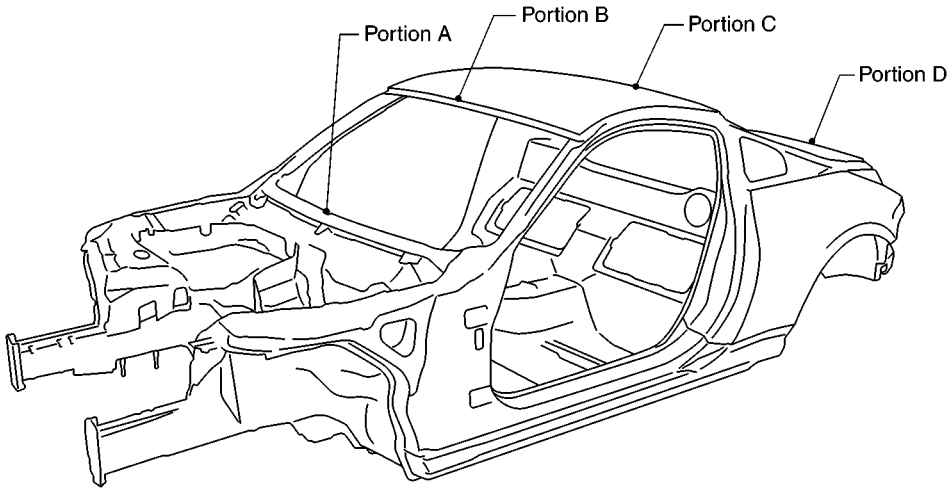
SIIA2303E

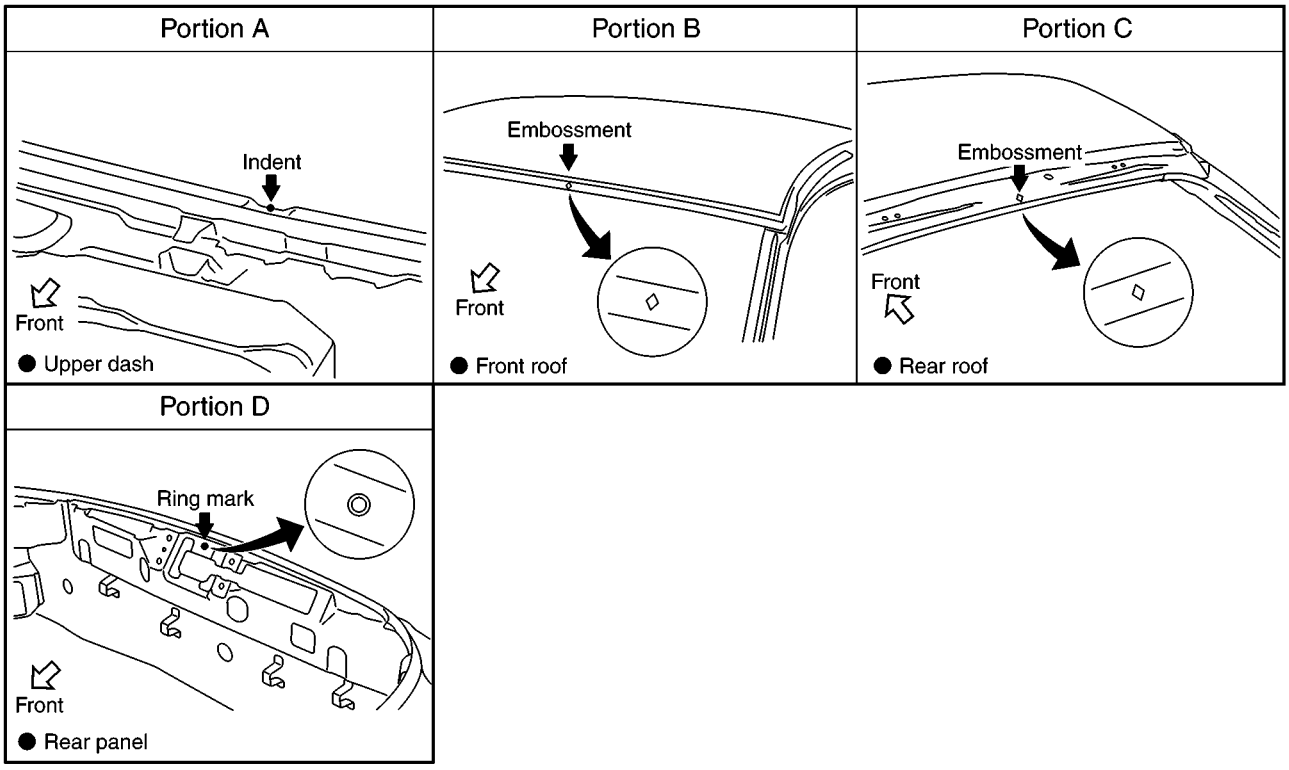
Body Alignment (Coupe)

AIS0044N

BODY CENTER MARKS (COUPE)

A mark has been placed on each part of the body to indicate the vehicle center. When repairing parts damaged by an accident which might affect the vehicle frame (members, pillars, etc.), more accurate and effective repair will be possible by using these marks together with body alignment specifications.

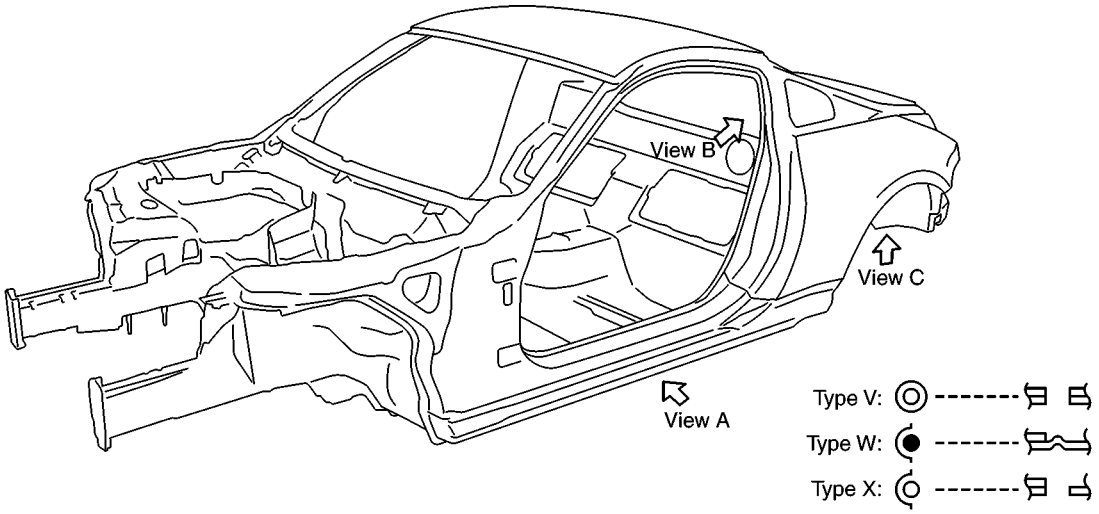


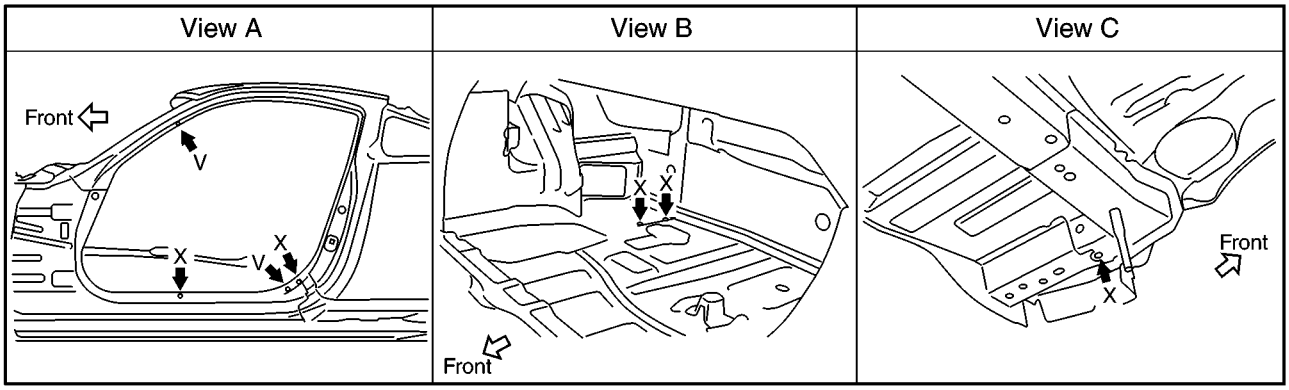


SIIA1974E

PANEL PARTS MATCHING MARKS (COUPE)

A mark has been placed on each body panel to indicate the parts matching positions. When repairing parts damaged by an accident which might affect the vehicle structure (members, pillars, etc.), more accurate and effective repair will be possible by using these marks together with body alignment specifications.

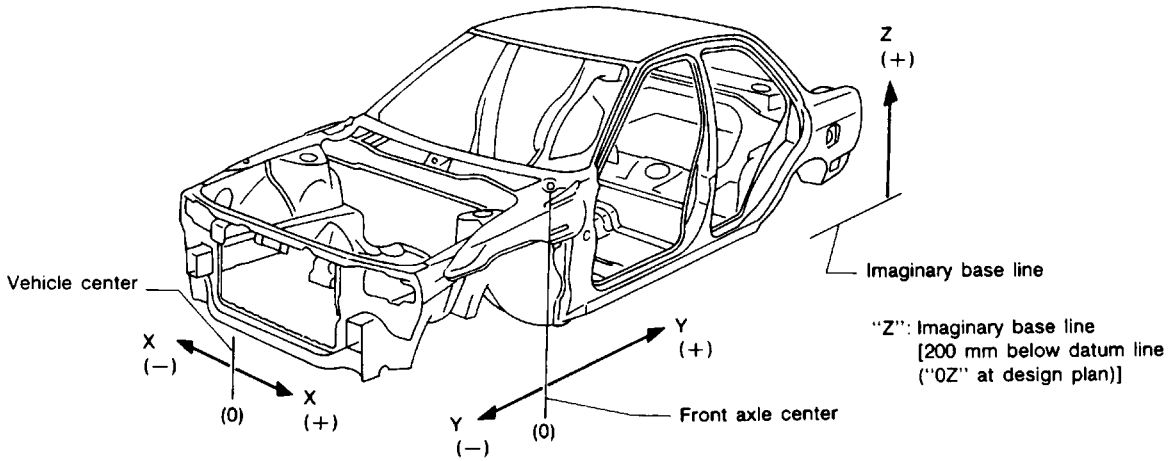




SIIA1981E

DESCRIPTION

- All dimensions indicated in the figures are actual.
- When using a tracking gauge, adjust both pointers to equal length. Then check the pointers and gauge itself to make sure there is no free play.
- When a measuring tape is used, check to be sure there is no elongation, twisting or bending.
- Measurements should be taken at the center of the mounting holes.
- An asterisk (*) following the value at the measuring point indicates that the measuring point on the other side is symmetrically the same value.
- The coordinates of the measurement points are the distances measured from the standard line of ″X″, ″Y″ and ″Z″.

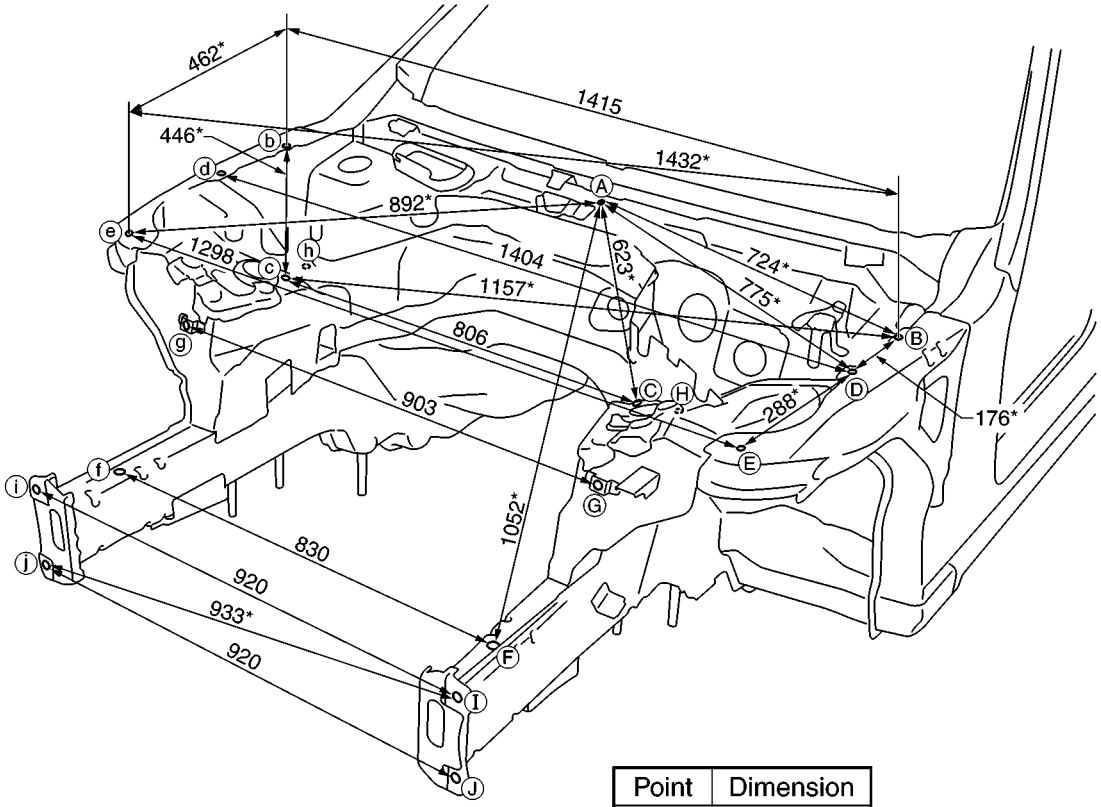


ENGINE COMPARTMENT

Measurement

Figures marked with a (*) indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.

Unit : mm

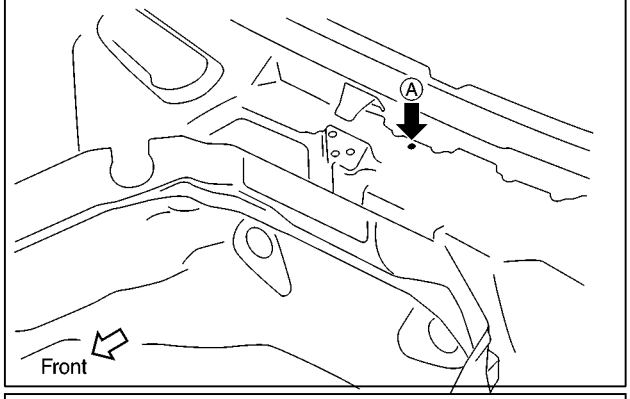


Point	Dimension
Ⓒ~ⓖ	883*
Ⓗ~ⓗ	903

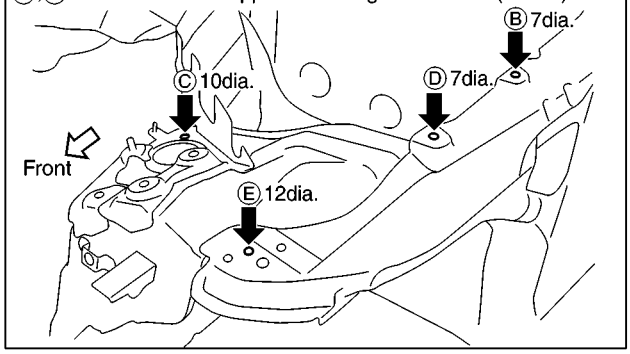
SIIA2306E

Measurement points

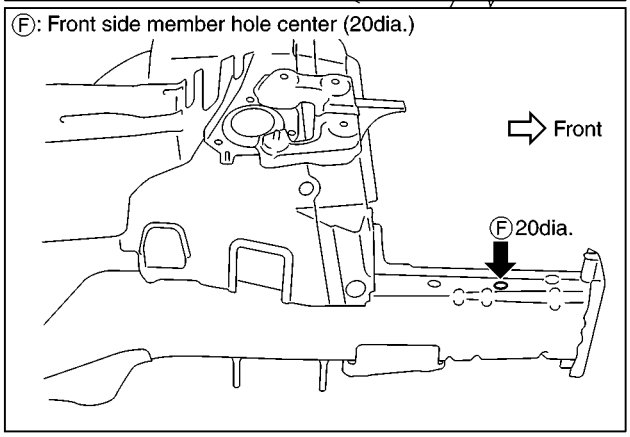
Ⓐ : Upper dash positioning mark center of center positioning mark



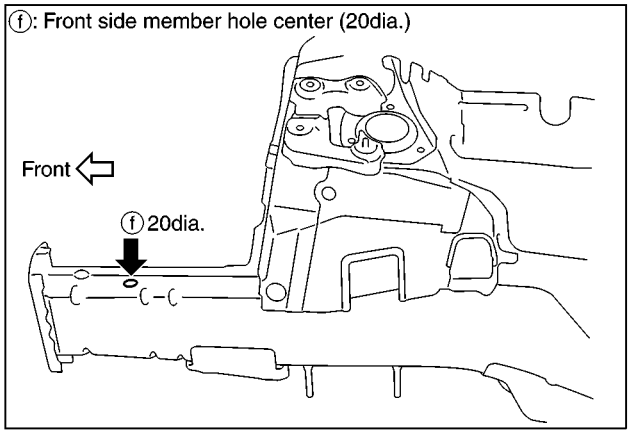
Ⓑ,ⓑ,Ⓓ,ⓓ : Front fender installing hole center (7dia.)
Ⓒ,ⓒ : Front strut installing hole center (10dia.)
Ⓔ,ⓔ : Radiator core support installing hole center (12dia.)



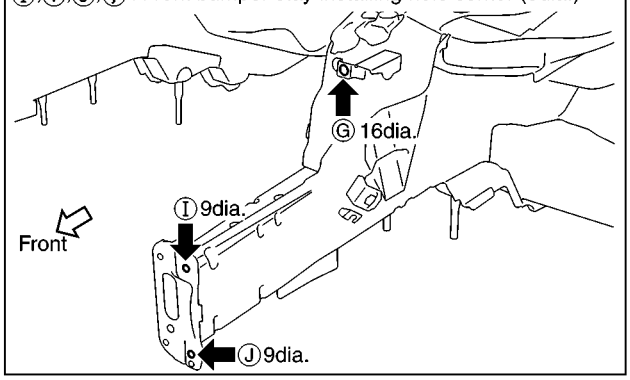
Ⓕ: Front side member hole center (20dia.)



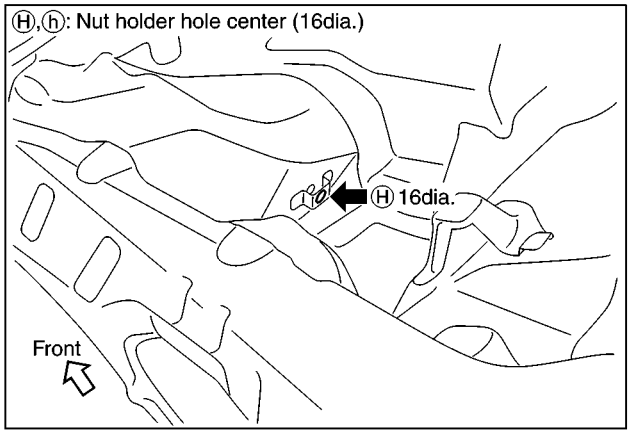
ⓕ: Front side member hole center (20dia.)



Ⓖ,ⓖ : Nut holder hole center (16dia.)
Ⓘ,ⓘ,Ⓙ,ⓙ : Front bumper stay installing hole center (9dia.)



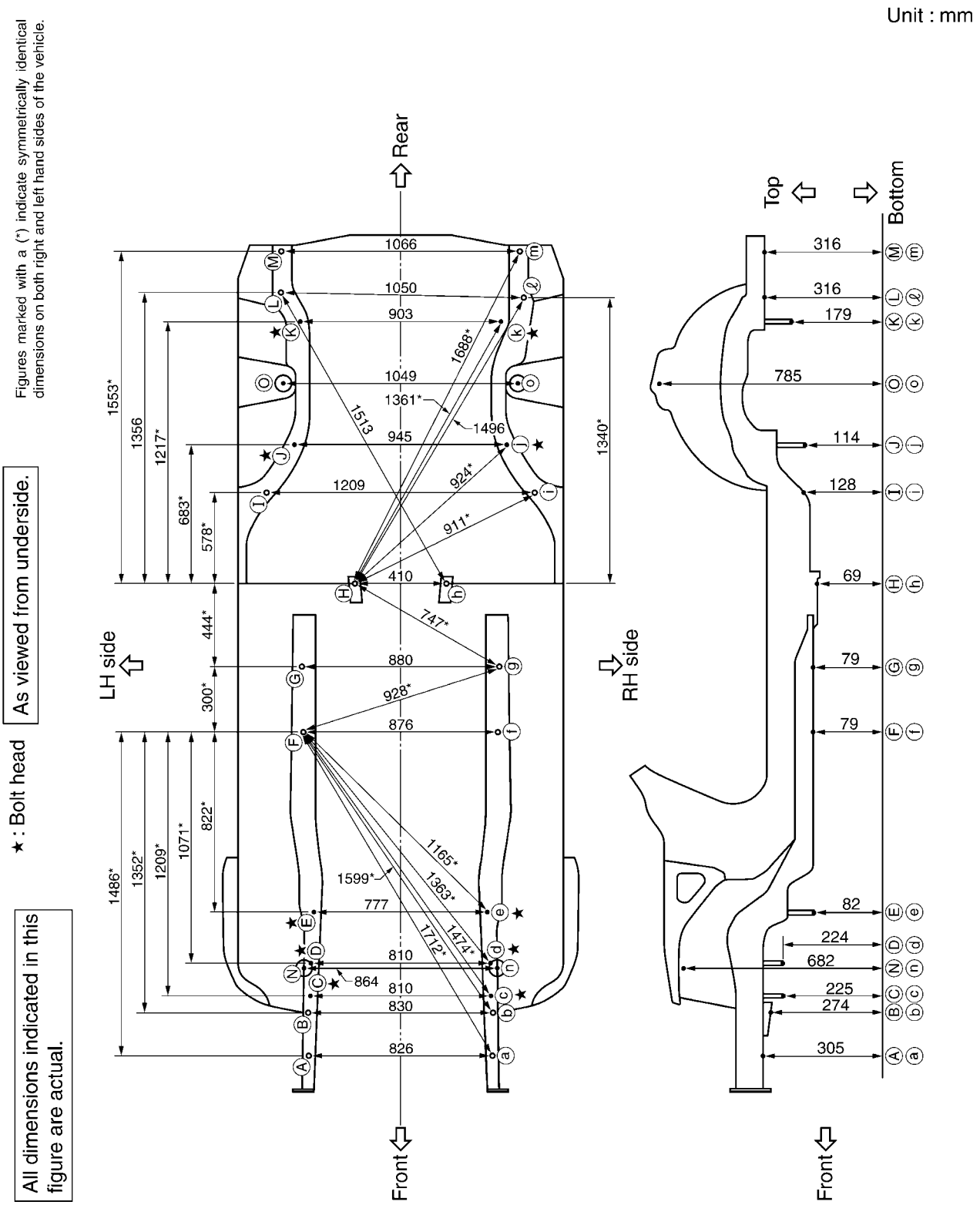
Ⓗ,ⓗ: Nut holder hole center (16dia.)



SIIA2307E

UNDERBODY
Measurement

Unit : mm

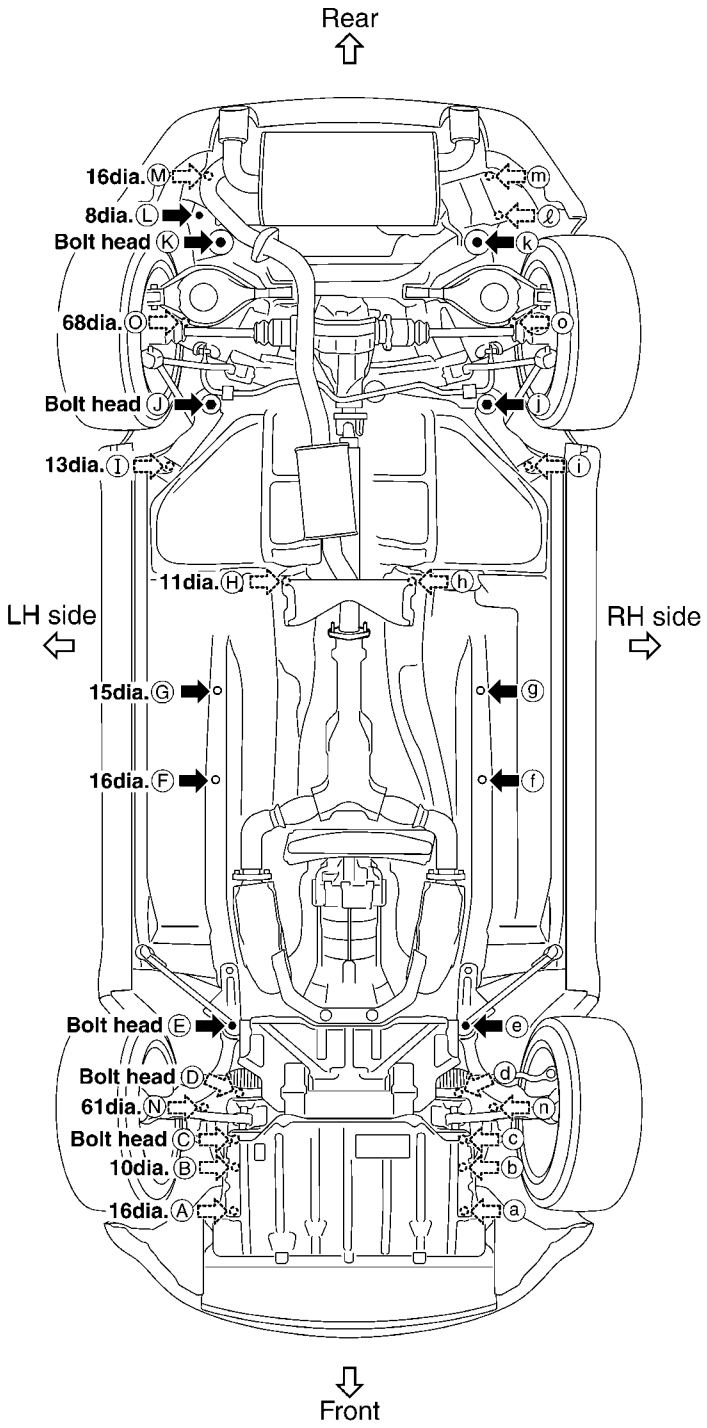


SIIA2347E

Measurement points

Unit : mm

As viewed from underside.



Coordinates:

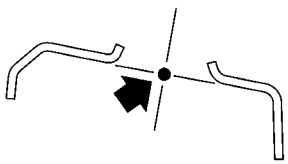
Ⓐ,ⓐ	Ⓘ,ⓘ
X:413	**X:605**
Y:-368	**Y:2191**
Z:305	**Z:128**
Ⓑ,ⓑ	Ⓙ,ⓙ
X:415	**X:473**
Y:-238	**Y:2404**
Z:274	**Z:114**
Ⓒ,ⓒ	Ⓚ,ⓚ
X:405	**X:452**
Y:-100	**Y:2964**
Z:225	**Z:179**
Ⓓ,ⓓ	Ⓛ
X:405	**X:550**
Y:39	**Y:3065**
Z:224	**Z:316**
Ⓔ,ⓔ	ⓛ
X:388	**X:-500**
Y:279	**Y:3073**
Z:82	**Z:316**
Ⓕ,ⓕ	Ⓜ,ⓜ
X:438	**X:533**
Y:1100	**Y:3275**
Z:79	**Z:316**
Ⓖ,ⓖ	
X:440	
Y:1400	
Z:79	
Ⓗ,ⓗ	
X:205	
Y:1777	
Z:69	

Front and rear strut tower centers

Coordinates:

Ⓝ,ⓝ
X:432
Y:28
Z:682

Ⓞ,ⓞ
X:524
Y:2682
Z:785



Front: Ⓝ,ⓝ **61dia.**
Rear: Ⓞ,ⓞ **68dia.**

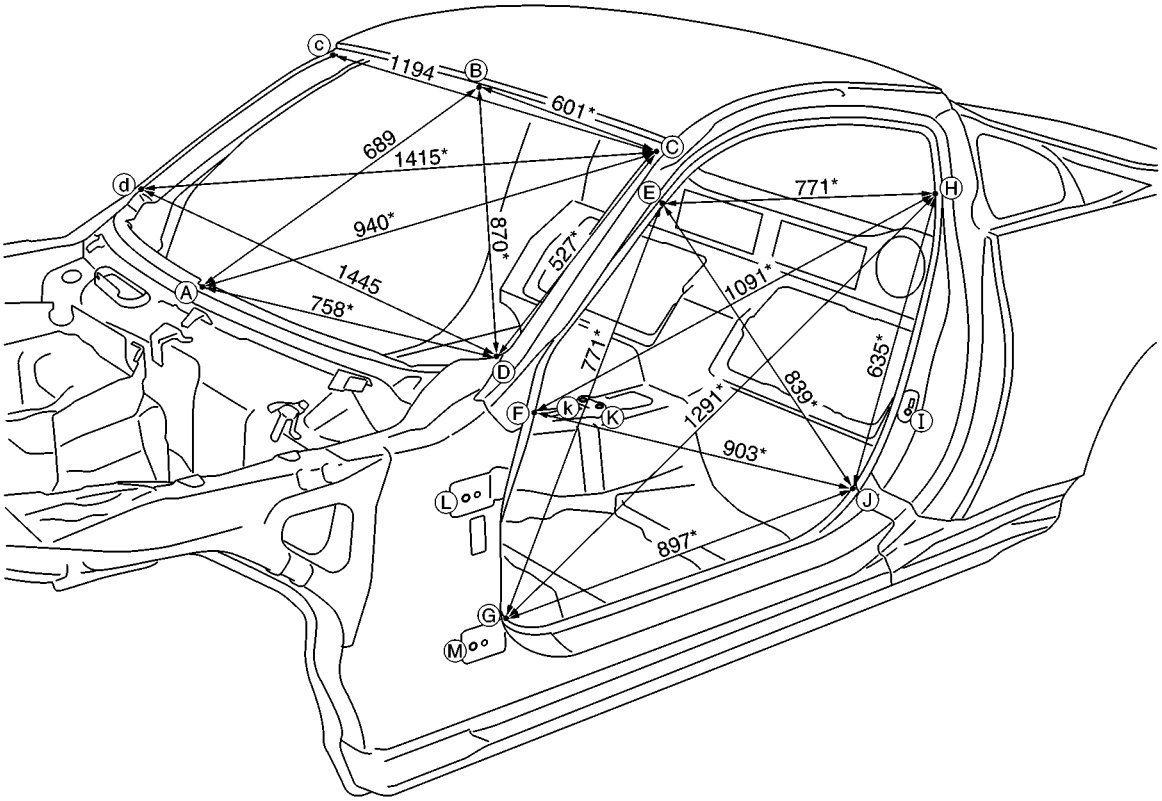
SIIA2348E

PASSENGER COMPARTMENT (COUPE)

Measurement

Unit : mm

Figures marked with a (*) indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.

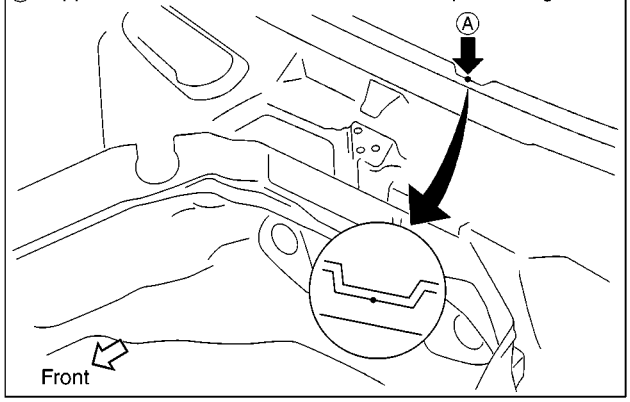


Point	Dimension	Point	Dimension	Point	Dimension
Ⓔ~ⓔ	1,317	Ⓖ~ⓗ	1,909*	Ⓚ~Ⓕ	1,052*
Ⓔ~ⓖ	1,583*	Ⓖ~ⓙ	1,707*	Ⓚ~Ⓖ	1,043*
Ⓔ~ⓗ	1,546*	Ⓗ~ⓗ	1,363	Ⓚ~Ⓗ	956*
Ⓔ~ⓙ	1,618*	Ⓗ~ⓙ	1,543*	Ⓚ~Ⓙ	715*
Ⓕ~ⓕ	1,440	Ⓙ~ⓙ	1,452	Ⓛ~Ⓘ	1,178*
Ⓖ~ⓖ	1,452	Ⓚ~Ⓔ	993*	Ⓜ~Ⓘ	1,181*

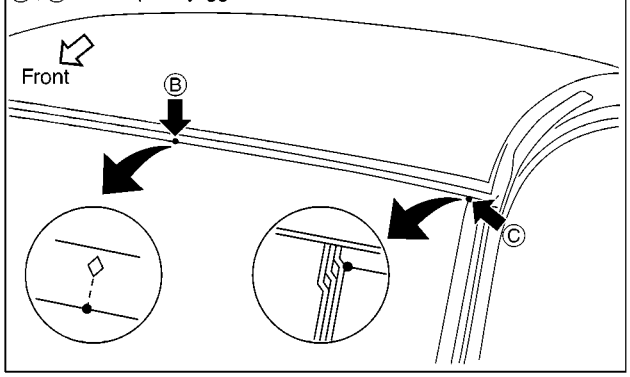
SIIA1988E

Measurement points

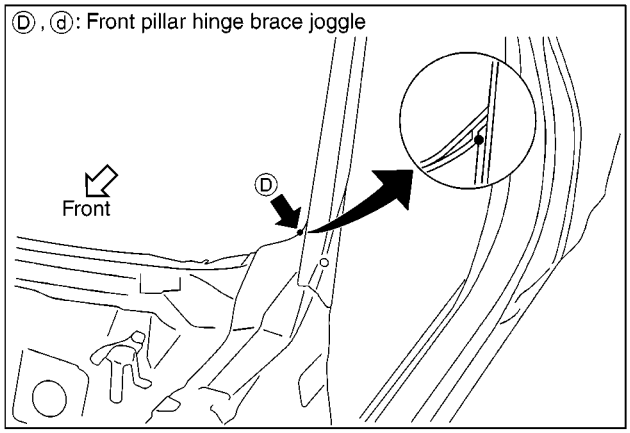
Ⓐ : Upper dash crossmember indent of center positioning mark



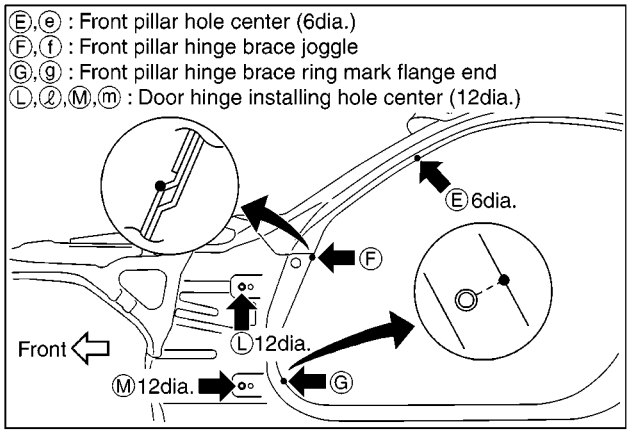
Ⓑ : Front roof flange end of center positioning mark
Ⓒ , ⓒ : Front pillar joggle



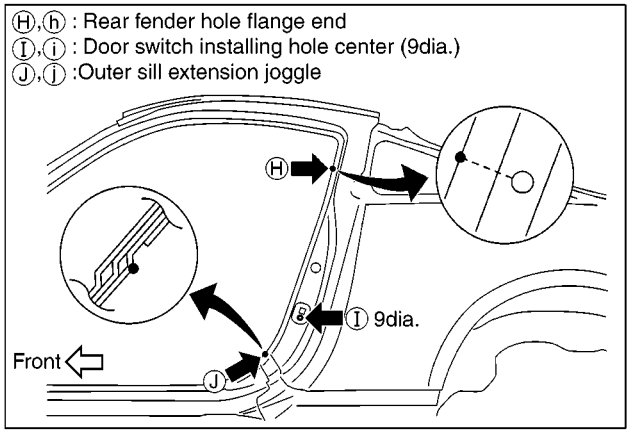
Ⓓ , ⓓ : Front pillar hinge brace joggle



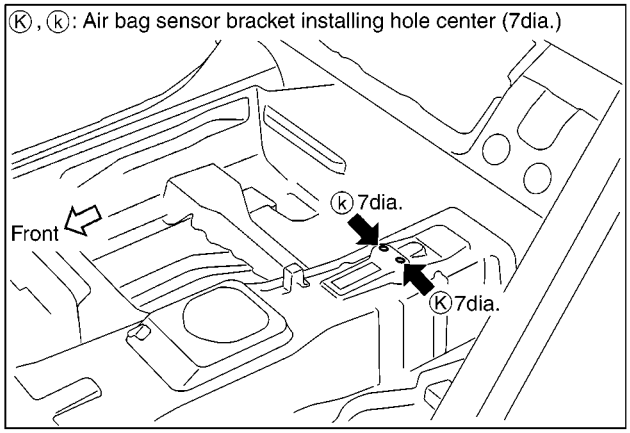
Ⓔ,ⓔ : Front pillar hole center (6dia.)
Ⓕ,ⓕ : Front pillar hinge brace joggle
Ⓖ,ⓖ : Front pillar hinge brace ring mark flange end
Ⓛ,ⓛ,Ⓜ,ⓜ : Door hinge installing hole center (12dia.)



Ⓗ,ⓗ : Rear fender hole flange end
Ⓘ,ⓘ : Door switch installing hole center (9dia.)
Ⓙ,ⓙ :Outer sill extension joggle



Ⓚ , ⓚ : Air bag sensor bracket installing hole center (7dia.)



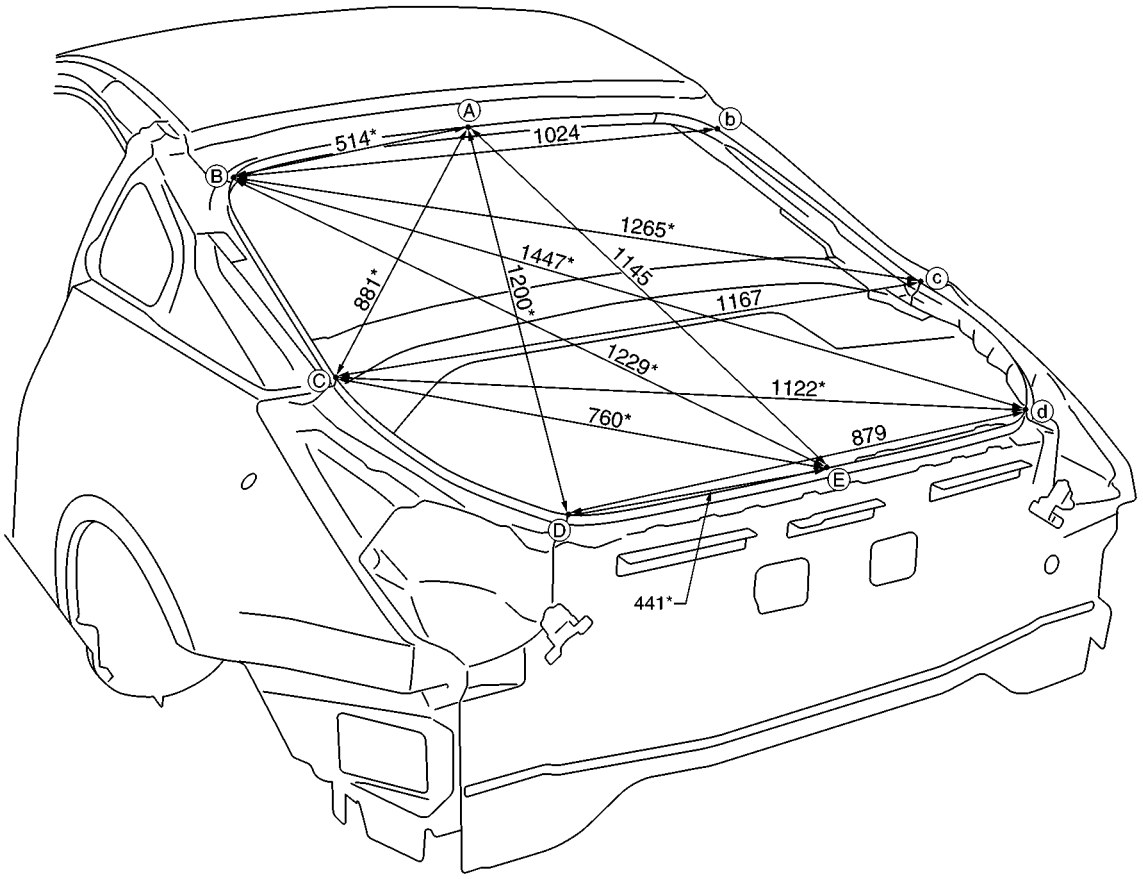
SIIA2351E

REAR BODY (COUPE)

Measurement

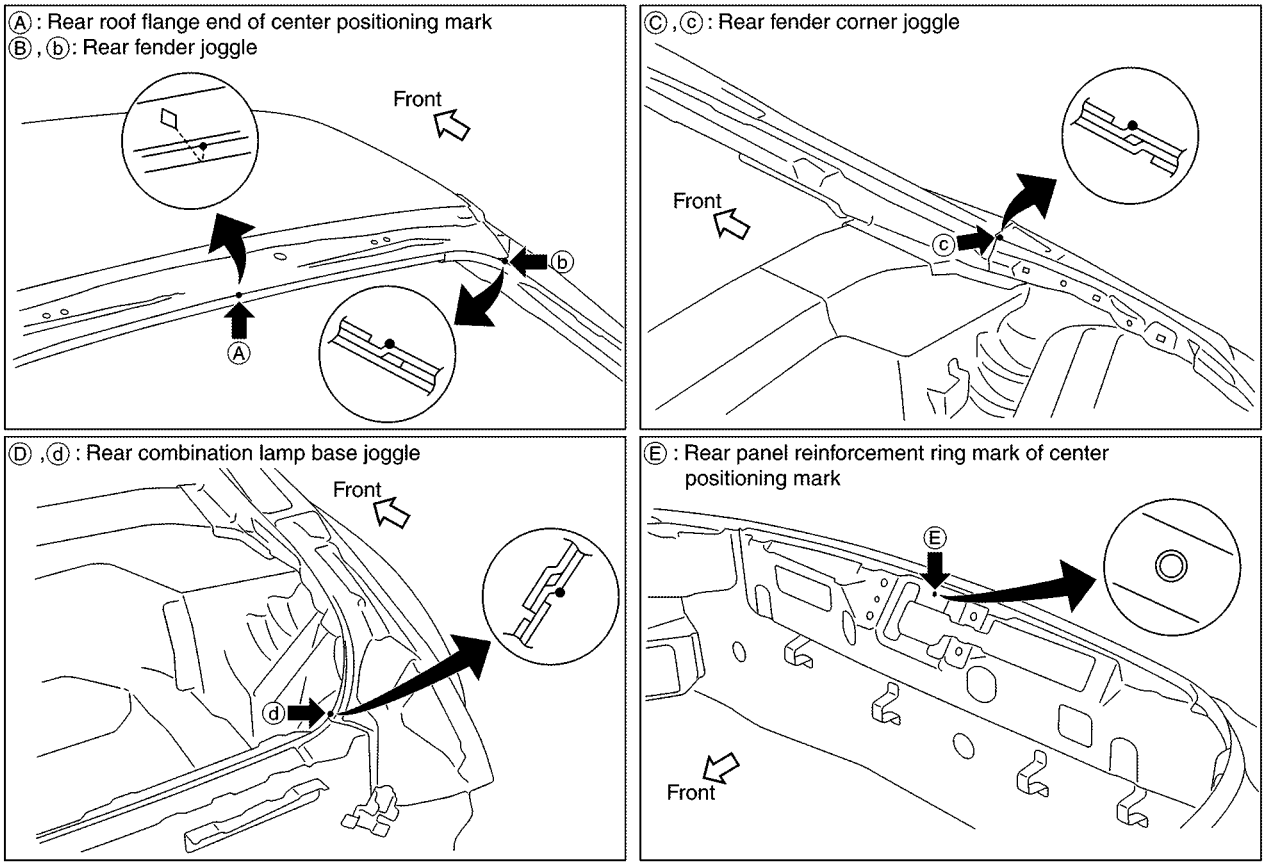
Figures marked with a (*) indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.

Unit : mm



SIIA1990E

Measurement points



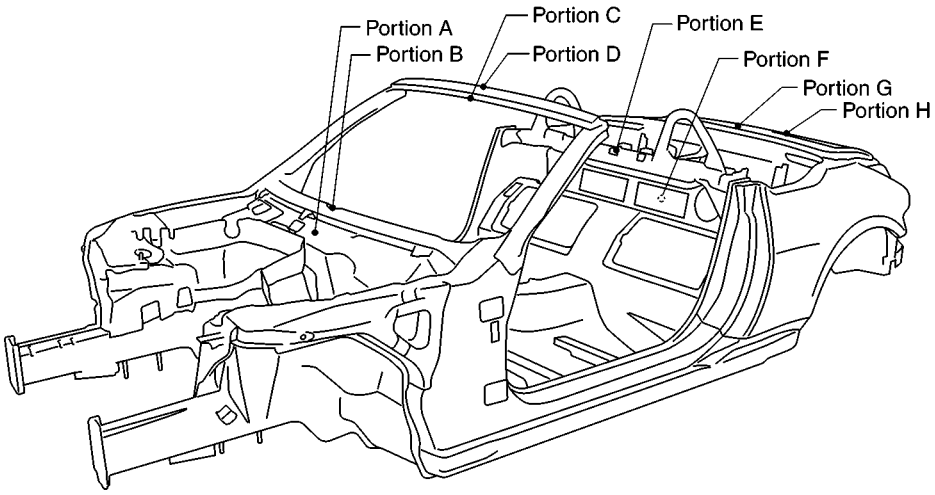
SIIA1991E

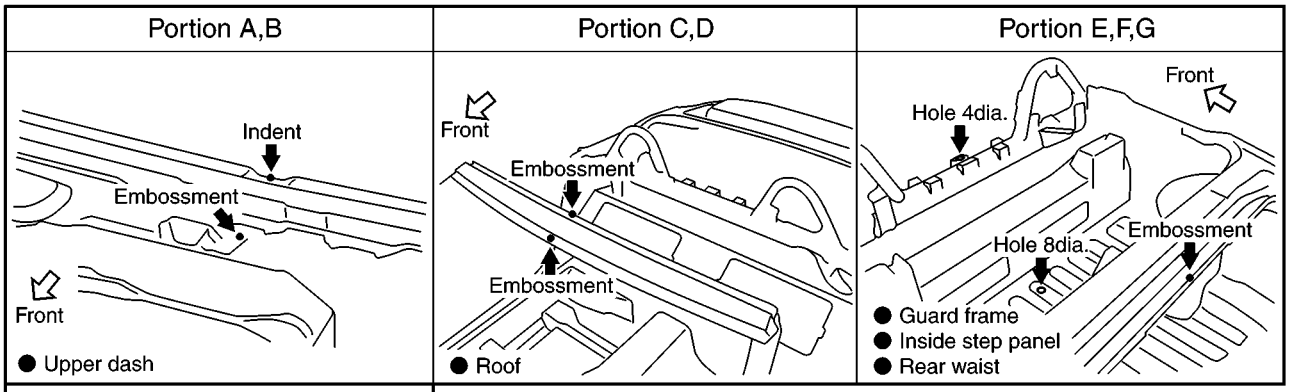
Body Alignment (Roadster)

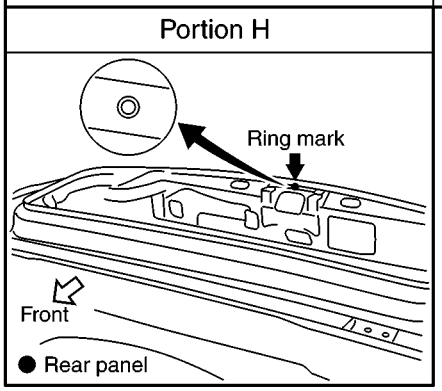
AIS0044O

BODY CENTER MARKS (ROADSTER)

A mark has been placed on each part of the body to indicate the vehicle center. When repairing parts damaged by an accident which might affect the vehicle frame (members, pillars, etc.), more accurate and effective repair will be possible by using these marks together with body alignment specifications.



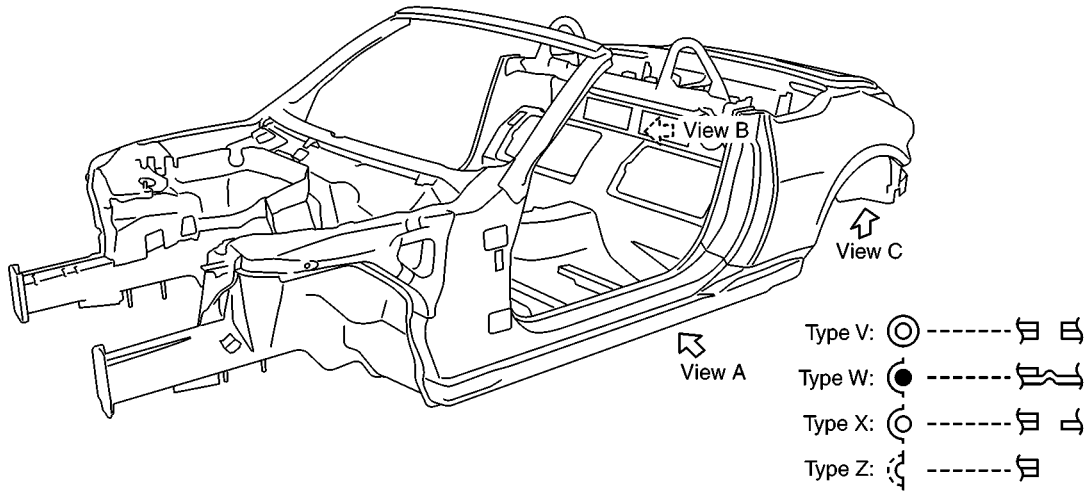


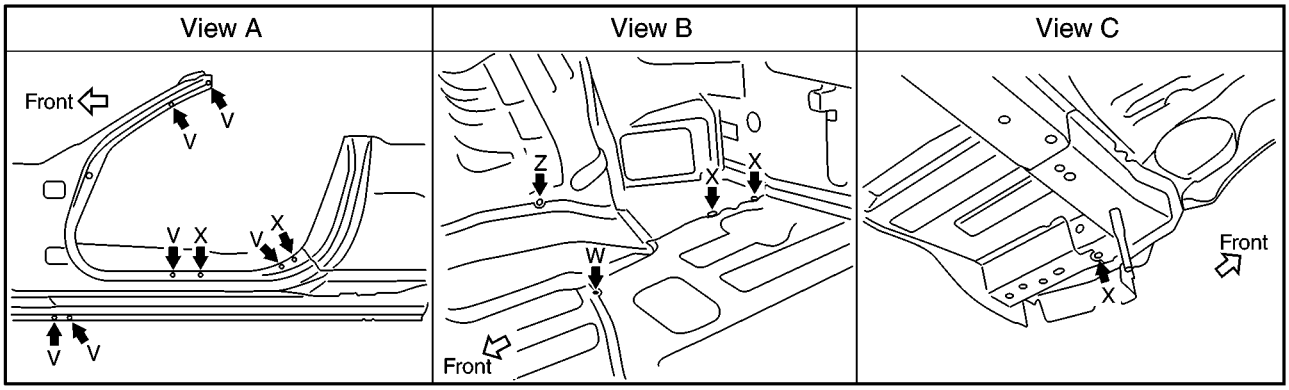


SIIA2304E

PANEL PARTS MATCHING MARKS (ROADSTER)

A mark has been placed on each body panel to indicate the parts matching positions. When repairing parts damaged by an accident which might affect the vehicle structure (members, pillars, etc.), more accurate and effective repair will be possible by using these marks together with body alignment specifications.

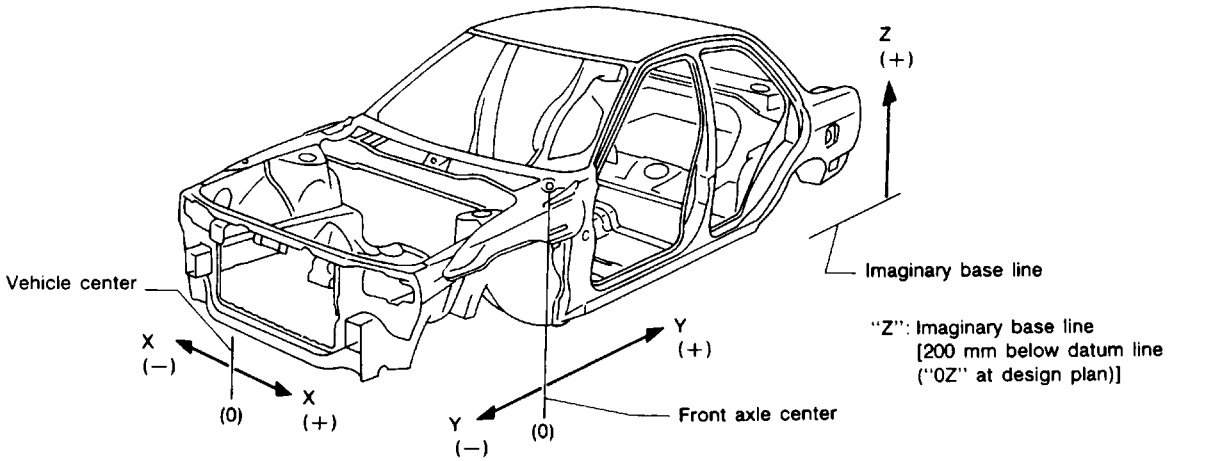




SIIA2305E

DESCRIPTION

- All dimensions indicated in the figures are actual.
- When using a tracking gauge, adjust both pointers to equal length. Then check the pointers and gauge itself to make sure there is no free play.
- When a measuring tape is used, check to be sure there is no elongation, twisting or bending.
- Measurements should be taken at the center of the mounting holes.
- An asterisk (*) following the value at the measuring point indicates that the measuring point on the other side is symmetrically the same value.
- The coordinates of the measurement points are the distances measured from the standard line of ″X″, ″Y″ and ″Z″.

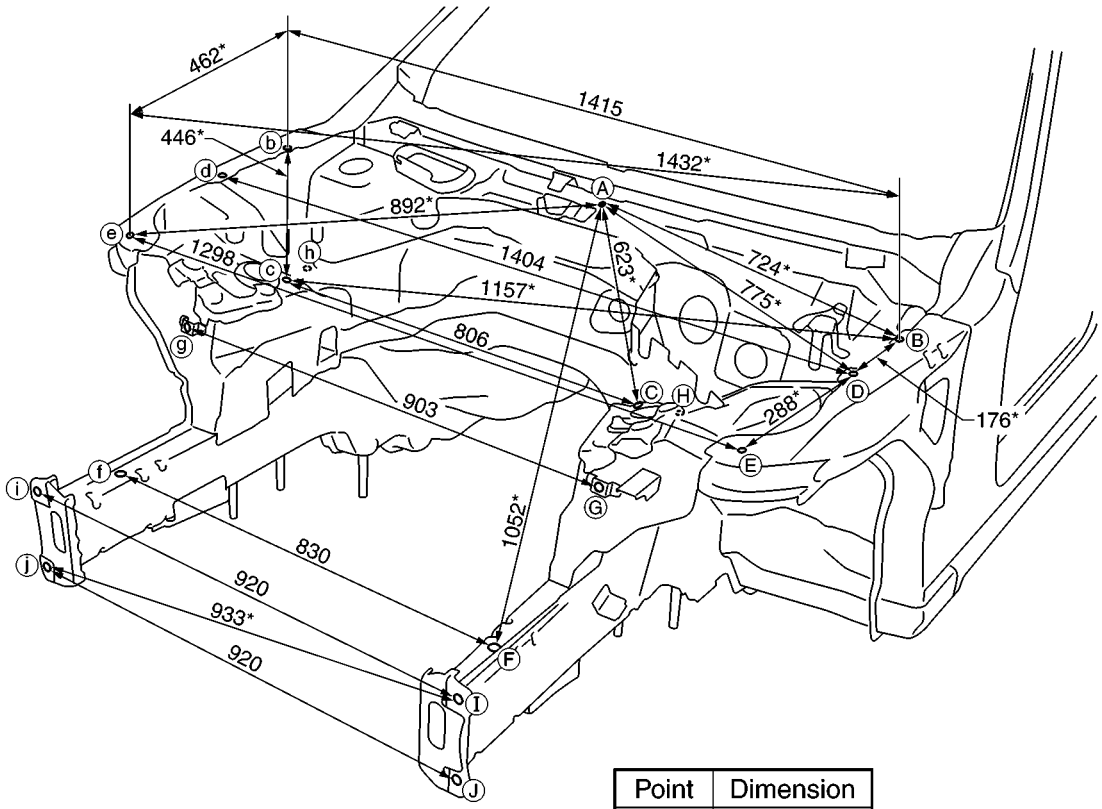


ENGINE COMPARTMENT

Measurement

Figures marked with a (*) indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.

Unit : mm

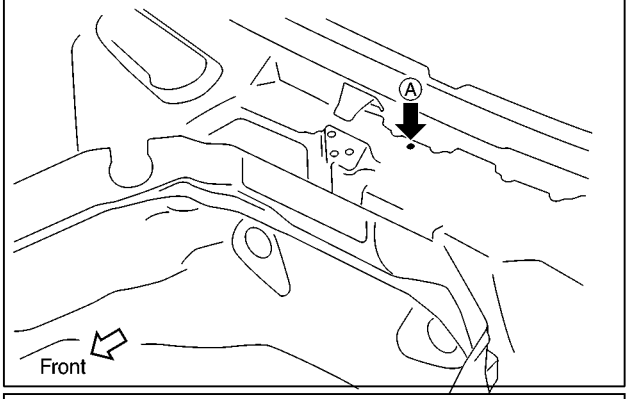


Point	Dimension
Ⓒ~ⓖ	883*
Ⓗ~ⓗ	903

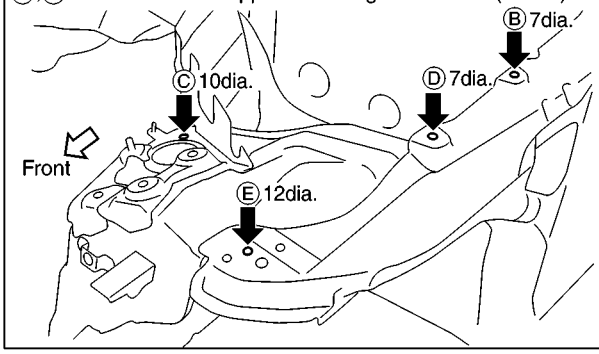
SIIA2306E

Measurement points

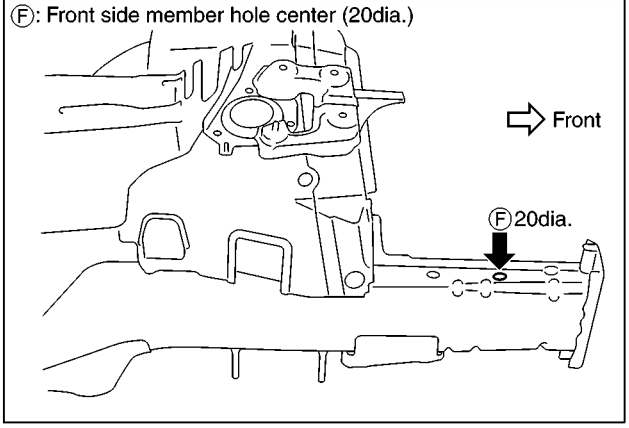
Ⓐ : Upper dash positioning mark center of center positioning mark



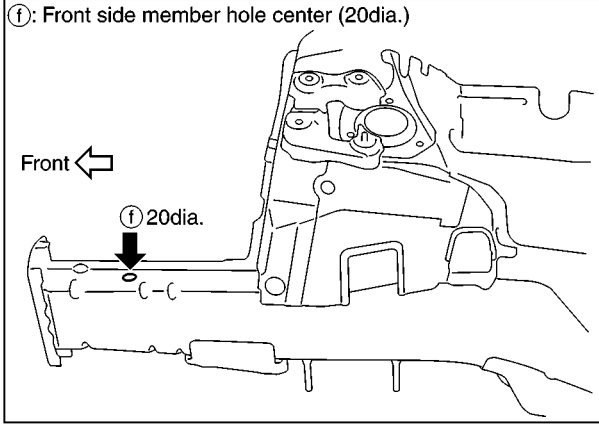
Ⓑ,ⓑ,Ⓓ,ⓓ : Front fender installing hole center (7dia.)
Ⓒ,ⓒ : Front strut installing hole center (10dia.)
Ⓔ,ⓔ : Radiator core support installing hole center (12dia.)



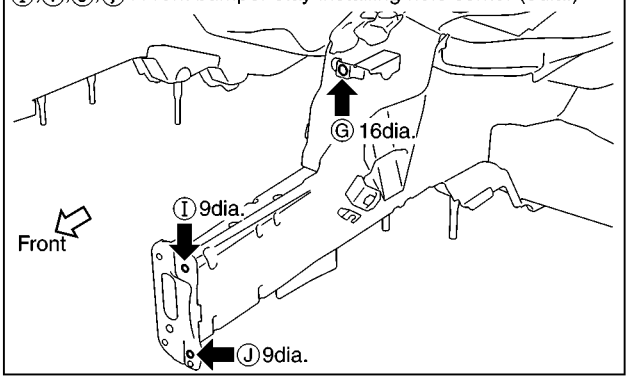
Ⓕ: Front side member hole center (20dia.)



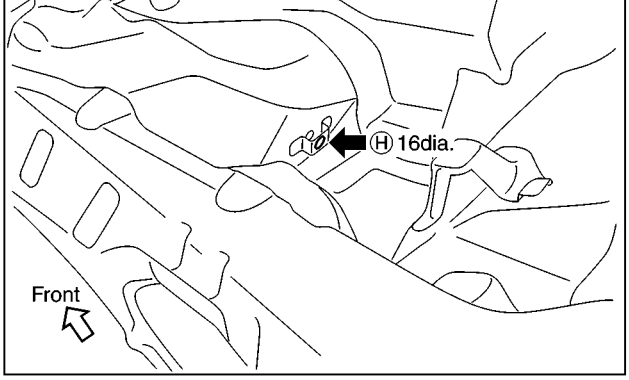
ⓕ: Front side member hole center (20dia.)



Ⓖ,ⓖ : Nut holder hole center (16dia.)
Ⓘ,ⓘ,Ⓙ,ⓙ : Front bumper stay installing hole center (9dia.)



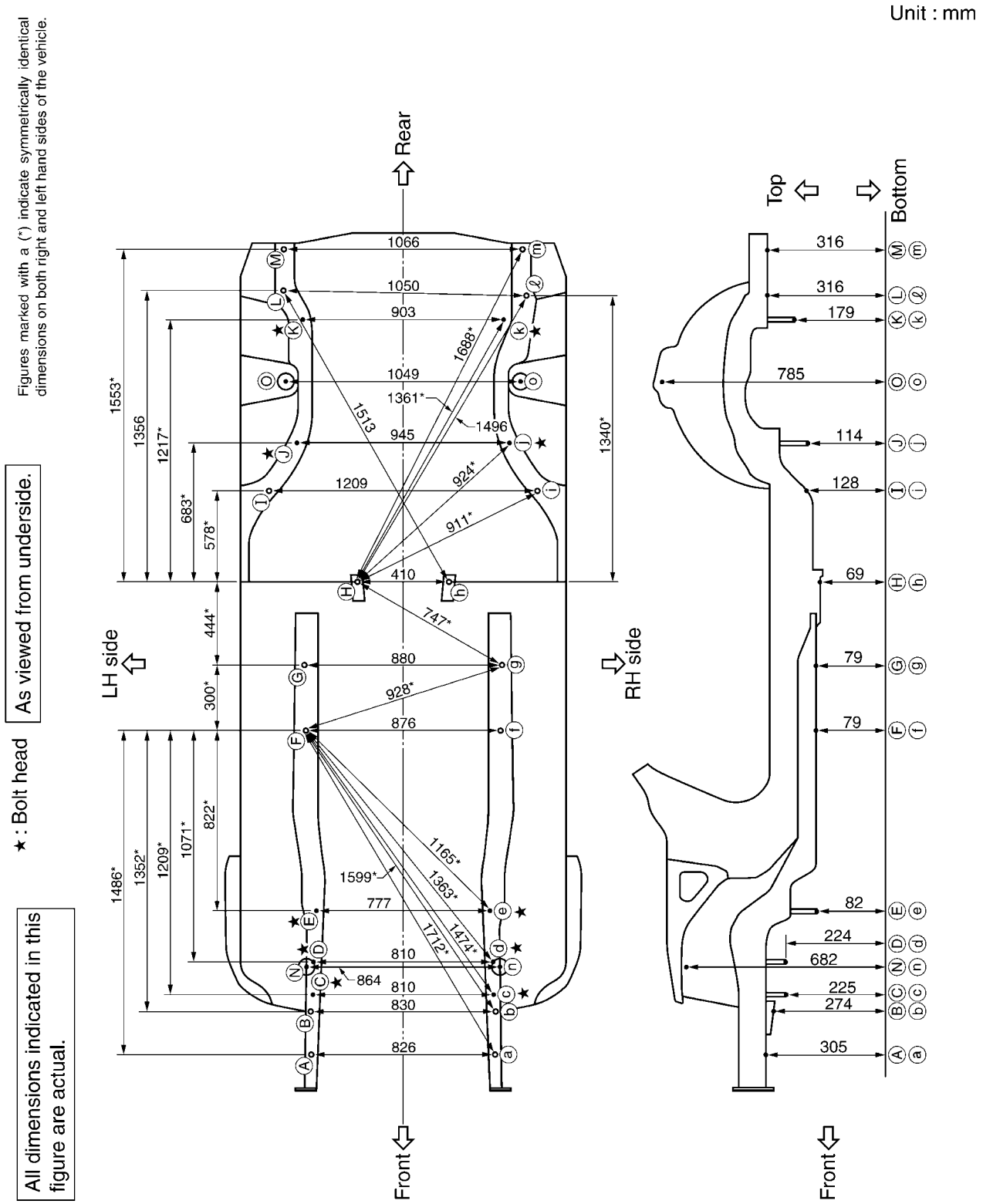
Ⓗ,ⓗ: Nut holder hole center (16dia.)



SIIA2307E

UNDERBODY
Measurement

Unit : mm

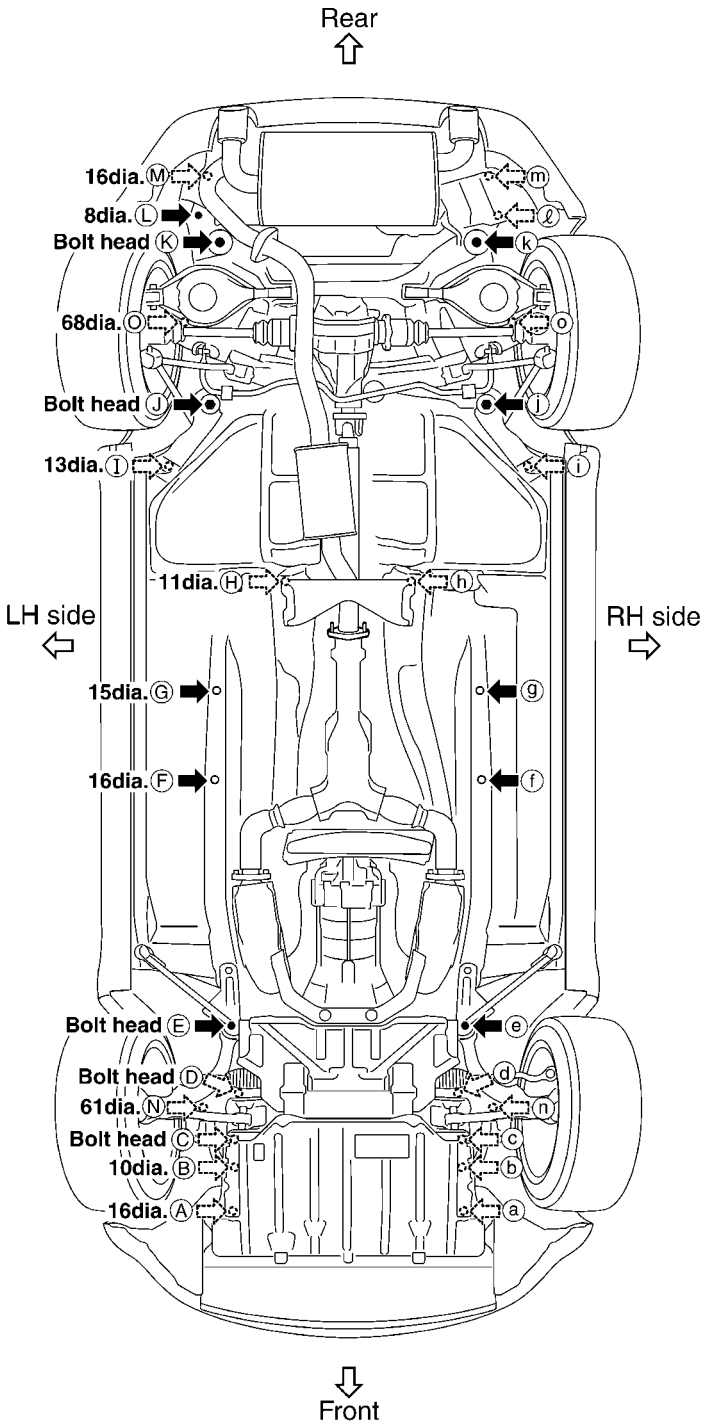


SIIA2347E

Measurement points

Unit : mm

As viewed from underside.



Coordinates:

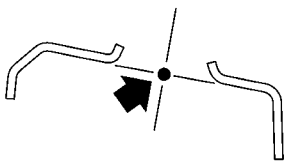
Ⓐ,ⓐ	Ⓘ,ⓘ
X:413	**X:605**
Y:-368	**Y:2191**
Z:305	**Z:128**
Ⓑ,ⓑ	Ⓙ,ⓙ
X:415	**X:473**
Y:-238	**Y:2404**
Z:274	**Z:114**
Ⓒ,ⓒ	Ⓚ,ⓚ
X:405	**X:452**
Y:-100	**Y:2964**
Z:225	**Z:179**
Ⓓ,ⓓ	Ⓛ
X:405	**X:550**
Y:39	**Y:3065**
Z:224	**Z:316**
Ⓔ,ⓔ	ⓛ
X:388	**X:-500**
Y:279	**Y:3073**
Z:82	**Z:316**
Ⓕ,ⓕ	Ⓜ,ⓜ
X:438	**X:533**
Y:1100	**Y:3275**
Z:79	**Z:316**
Ⓖ,ⓖ	
X:440	
Y:1400	
Z:79	
Ⓗ,ⓗ	
X:205	
Y:1777	
Z:69	

Front and rear strut tower centers

Coordinates:

Ⓝ,ⓝ
X:432
Y:28
Z:682

Ⓞ,ⓞ
X:524
Y:2682
Z:785



Front: Ⓝ,ⓝ **61dia.**
Rear: Ⓞ,ⓞ **68dia.**

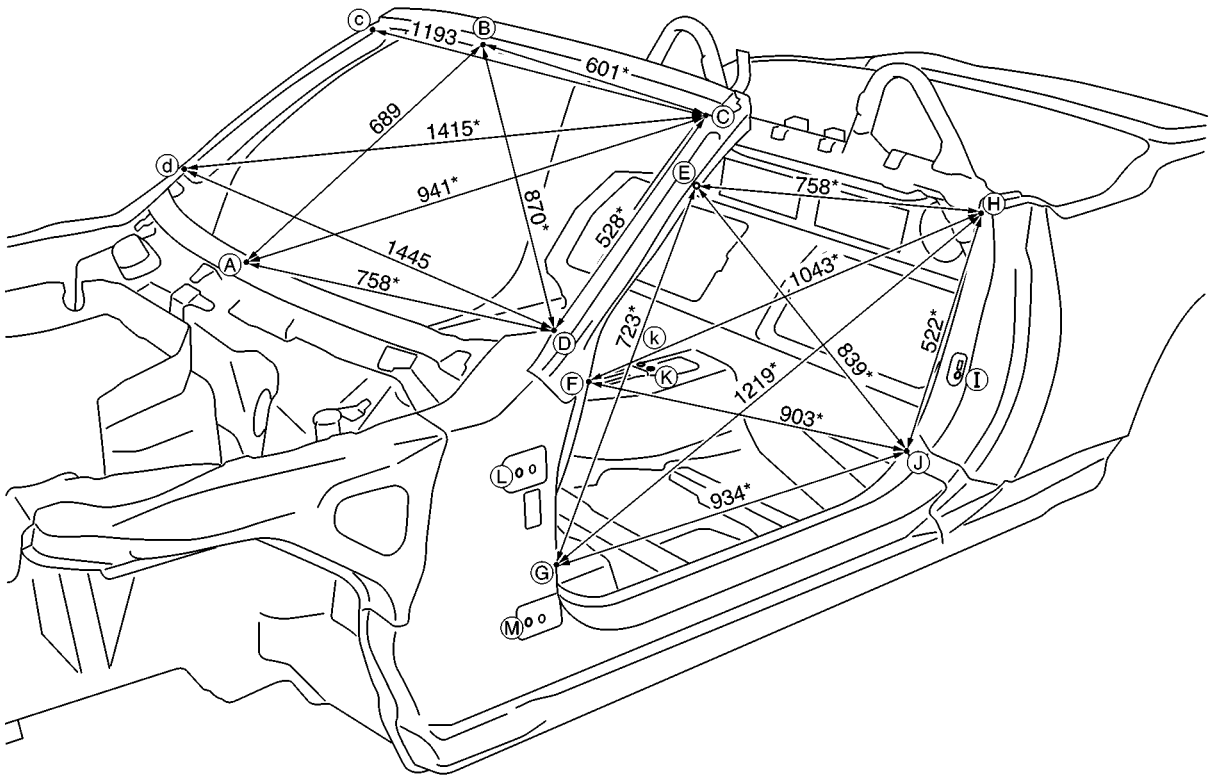
SIIA2348E

PASSENGER COMPARTMENT (ROADSTER)

Measurement

Unit : mm

Figures marked with a (*) indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.

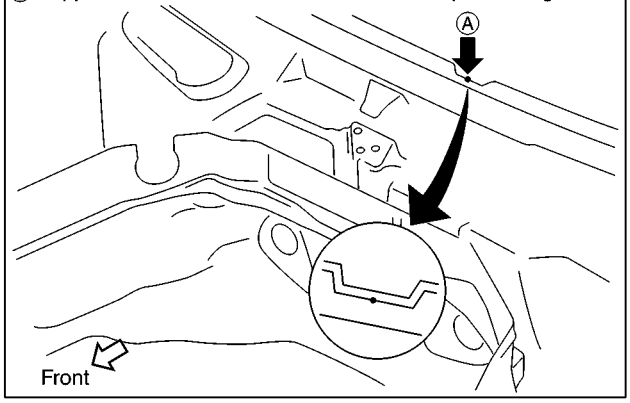


Point	Dimension	Point	Dimension	Point	Dimension
Ⓔ~ⓔ	1,317	Ⓖ~ⓗ	1,882*	Ⓚ~Ⓕ	1,052*
Ⓔ~ⓖ	1,561*	Ⓖ~ⓙ	1,727*	Ⓚ~Ⓖ	1,071*
Ⓔ~ⓗ	1,563*	Ⓗ~ⓗ	1,417	Ⓚ~Ⓗ	902*
Ⓔ~ⓙ	1,618*	Ⓗ~ⓙ	1,527*	Ⓚ~Ⓙ	715*
Ⓕ~ⓕ	1,440	Ⓙ~ⓙ	1,452	Ⓛ~Ⓘ	1,178*
Ⓖ~ⓖ	1,452	Ⓚ~Ⓔ	993*	Ⓜ~Ⓘ	1,181*

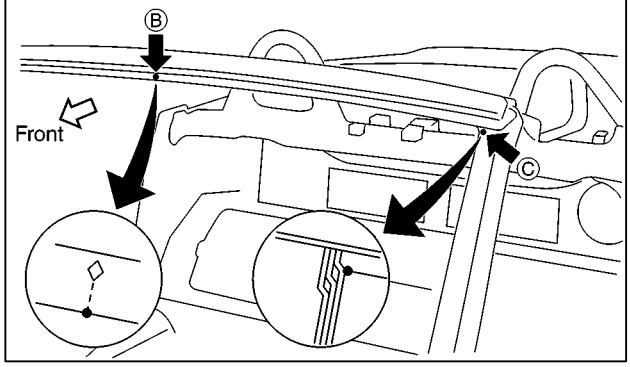
SIIA2308E

Measurement points

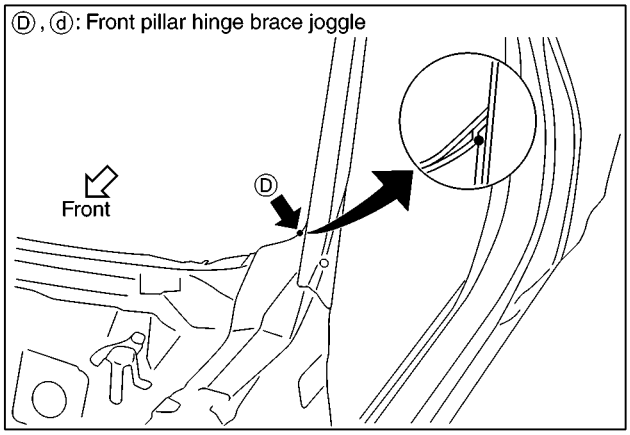
Ⓐ : Upper dash crossmember indent of center positioning mark



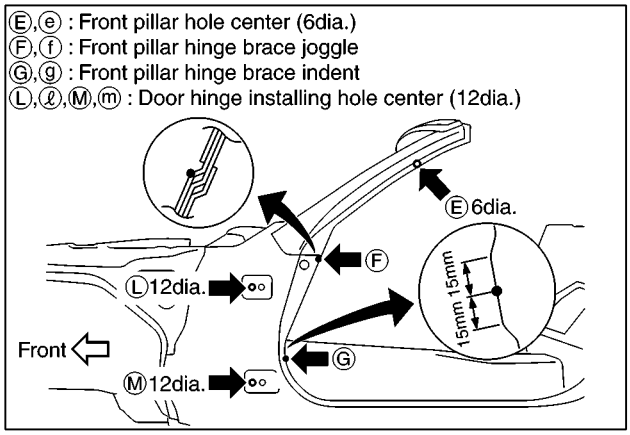
Ⓑ : Front roof flange end of center positioning mark
Ⓒ, ⓒ : Front pillar joggle



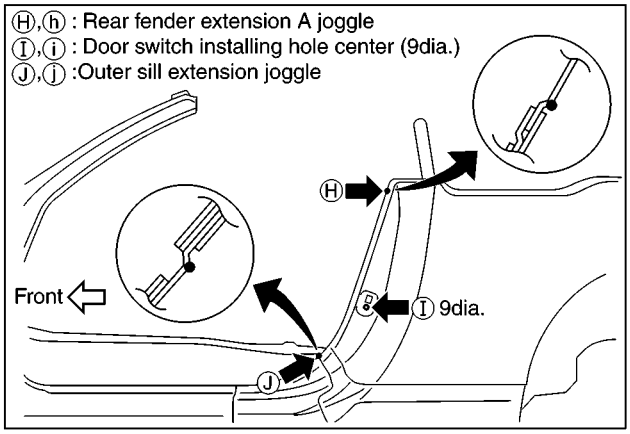
Ⓓ, ⓓ : Front pillar hinge brace joggle



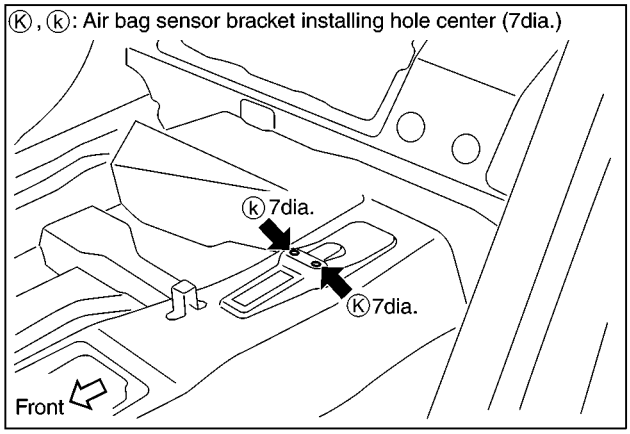
Ⓔ, ⓔ : Front pillar hole center (6dia.)
Ⓕ, ⓕ : Front pillar hinge brace joggle
Ⓖ, ⓖ : Front pillar hinge brace indent
Ⓛ, ⓛ, Ⓜ, ⓜ : Door hinge installing hole center (12dia.)



Ⓗ, ⓗ : Rear fender extension A joggle
Ⓘ, ⓘ : Door switch installing hole center (9dia.)
Ⓙ, ⓙ : Outer sill extension joggle



Ⓚ, ⓚ : Air bag sensor bracket installing hole center (7dia.)

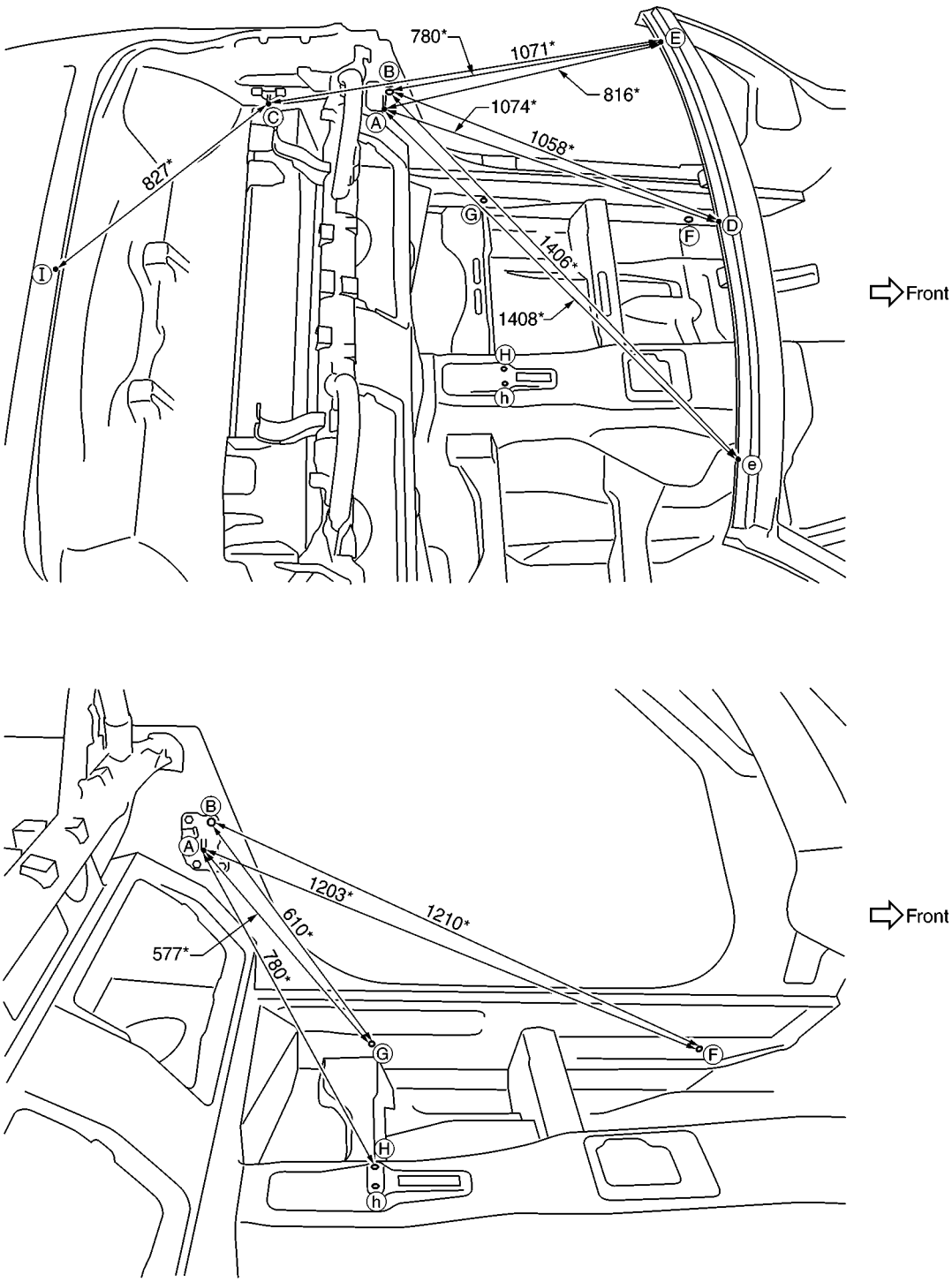


SIIA2309E

SOFT TOP MOUNTING BRACKET (ROADSTER)

Measurement

Figures marked with a (*) indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.

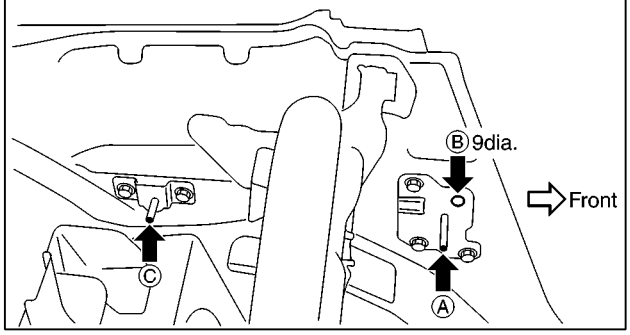


Point	Dimension
Ⓐ~ⓐ	1,344

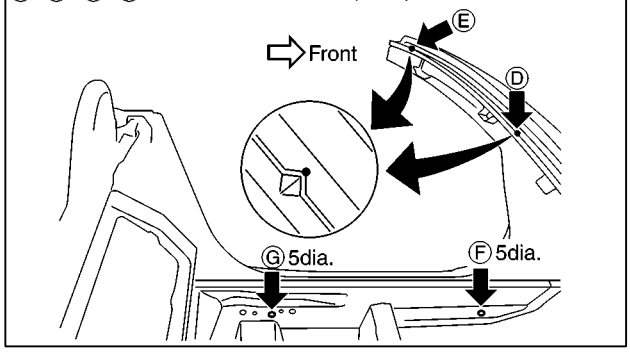
SIIA2325E

Measurement points

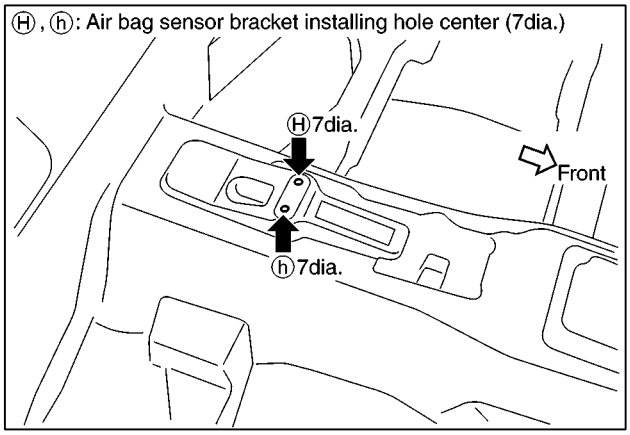
Ⓐ, ⓐ: Soft top unit installing pin top
Ⓑ, ⓑ: Soft top unit installing hole center (9dia.)
Ⓒ, ⓒ: Soft top unit installing bolt top



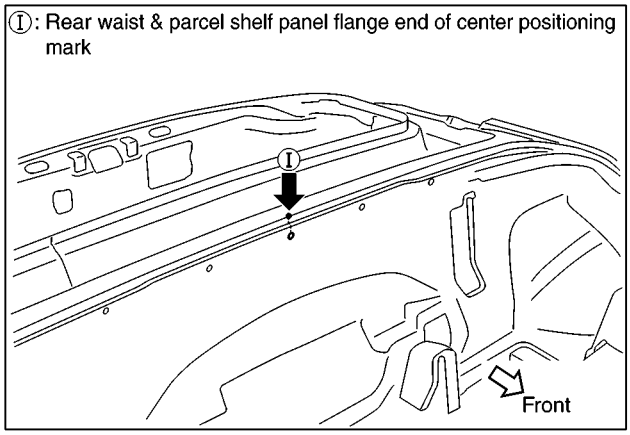
Ⓓ: Roof flange end of center positioning mark
Ⓔ, ⓔ: Roof flange end
Ⓕ, ⓕ, Ⓖ, ⓖ: Inner sill hole center (5dia.)



Ⓗ, ⓗ: Air bag sensor bracket installing hole center (7dia.)



Ⓘ: Rear waist & parcel shelf panel flange end of center positioning mark



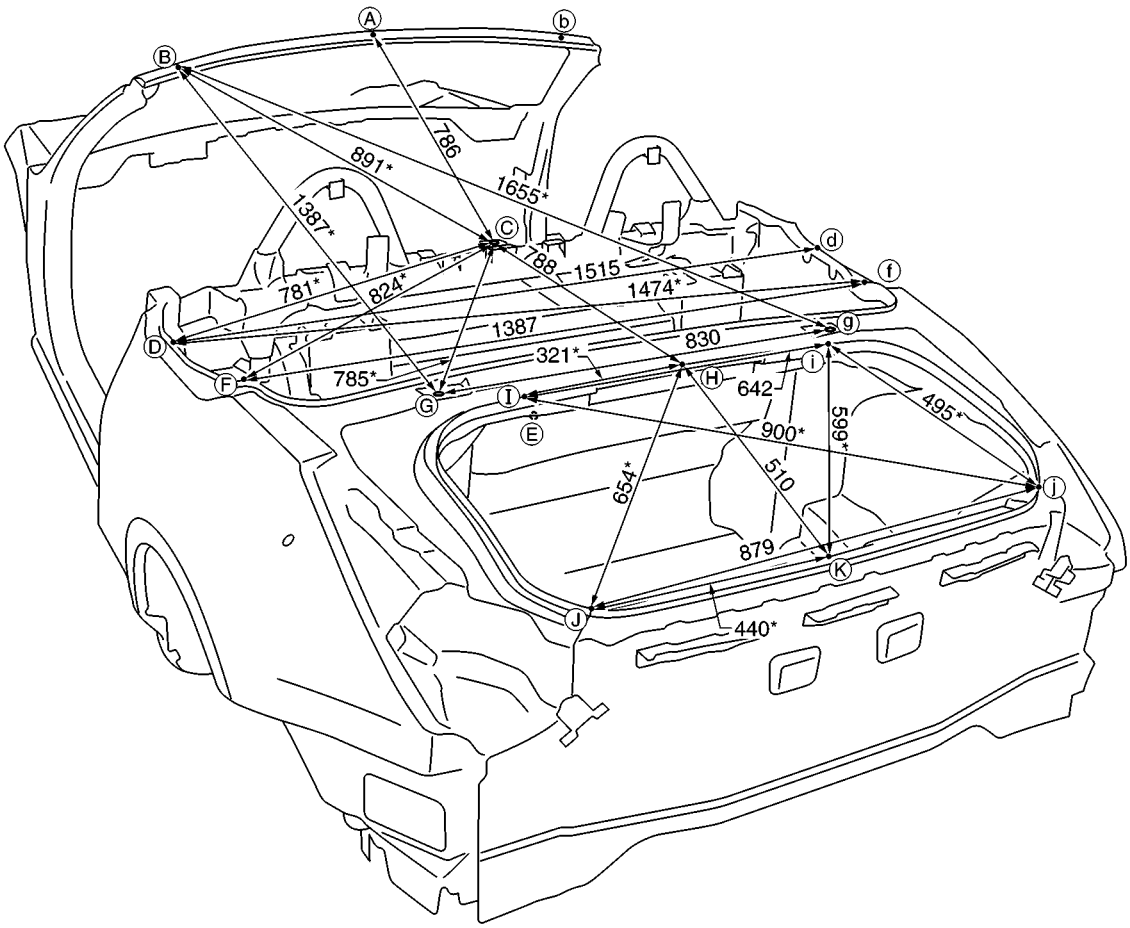
SIIA2326E

REAR BODY (ROADSTER)

Measurement

Figures marked with a (*) indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.

Unit : mm

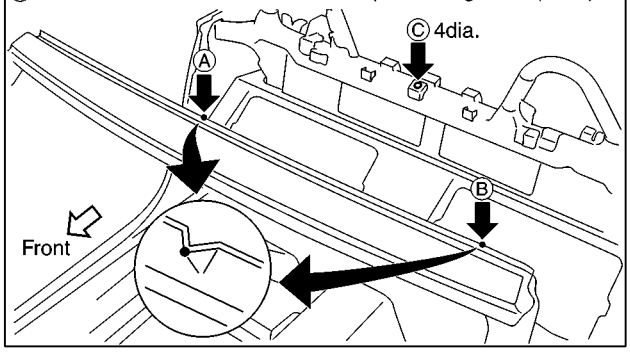


Point	Dimension
Ⓔ~Ⓓ	821*
Ⓔ~Ⓕ	767*
Ⓔ~Ⓖ	622*
Ⓔ~Ⓗ	580

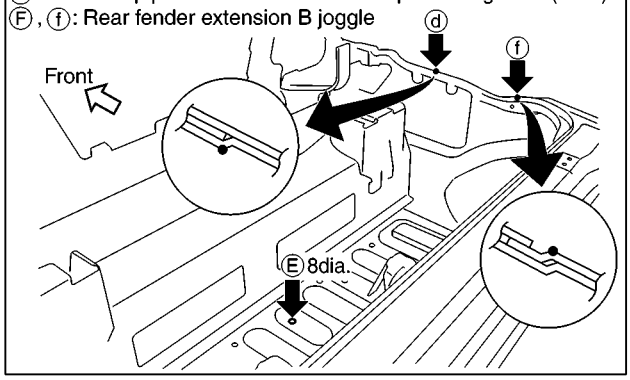
SIIA2310E

Measurement points

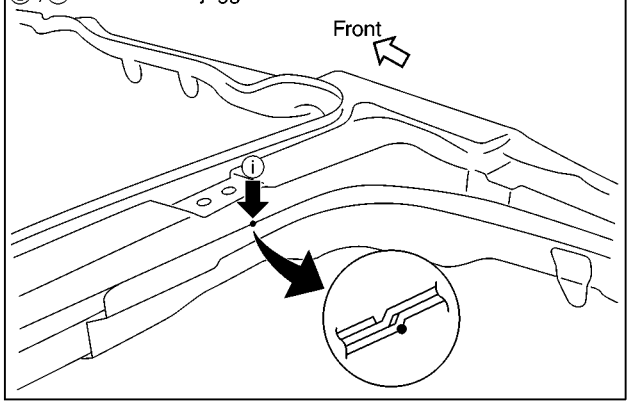
Ⓐ : Roof flange end of center positioning mark
Ⓑ , ⓑ : Outer front roof rail flange end
Ⓒ : Guard frame hole center of center positioning mark (4dia.)



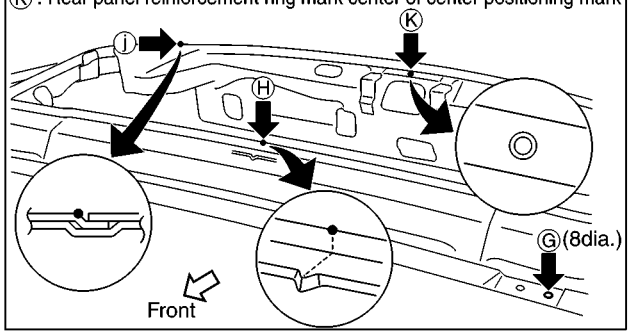
Ⓓ , ⓓ : Inner rear pillar joggle
Ⓔ : Inside step panel hole center of center positioning mark (8dia.)
Ⓕ , ⓕ : Rear fender extension B joggle



Ⓘ , ⓘ : Parcel shelf joggle



Ⓖ , ⓖ : Storage lid hinge installing hole center (8dia.)
Ⓗ : Rear waist flange end of center positioning mark
Ⓙ , ⓙ : Rear combination lamp base joggle
Ⓚ : Rear panel reinforcement ring mark center of center positioning mark



SIIA2311E

Handling Precautions For Plastics (Coupe)

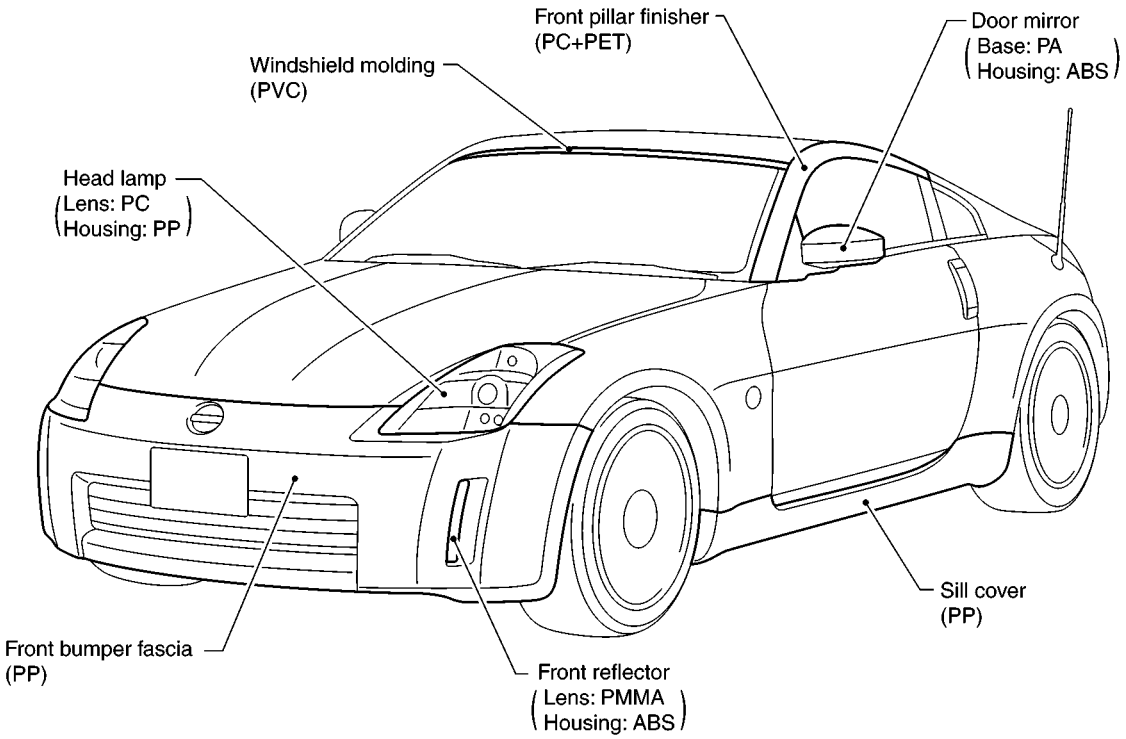
AIS0044P

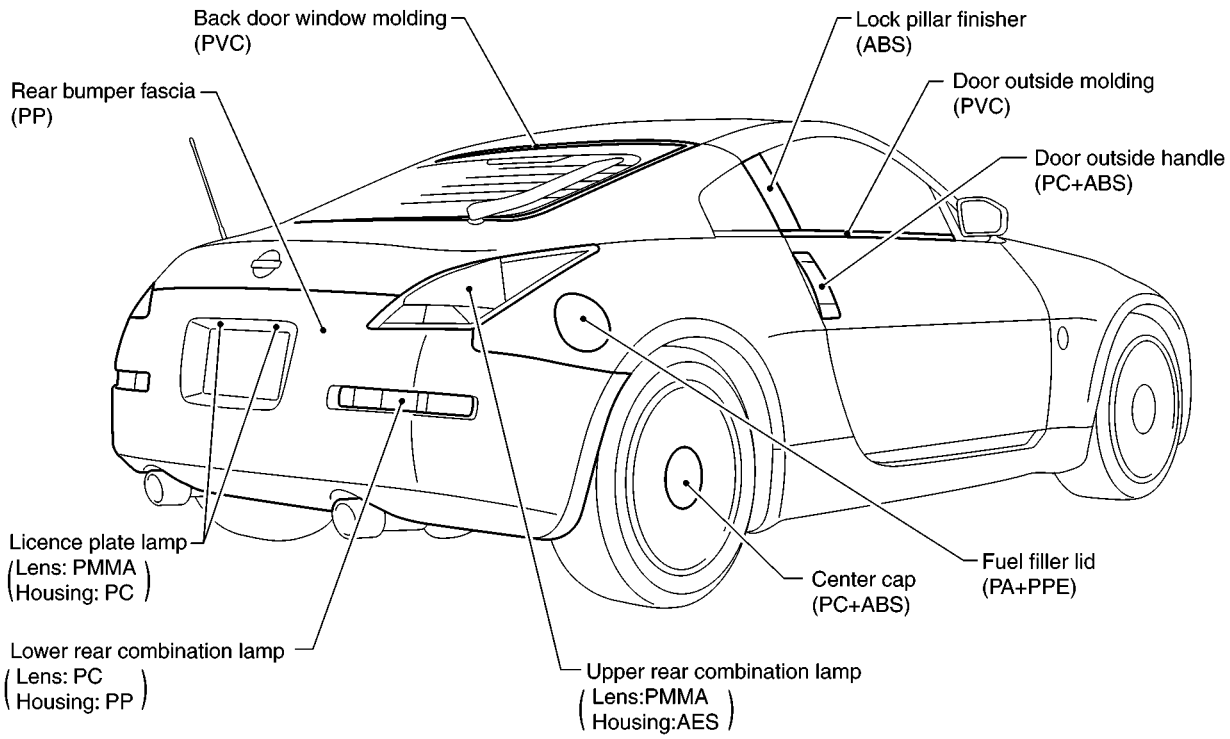
HANDLING PRECAUTIONS FOR PLASTICS

Abbre-viation	Material name	Heat resisting temperature °C(°F)	Resistance to gasoline and solvents	Other cautions
PE	Polyethylene	60(140)	Gasoline and most solvents are harmless if applied for a very short time (wipe up quickly).	Flammable
PVC	Poly Vinyl Chloride	80(176)	Same as above.	Poison gas is emitted when burned.
EPM/ EPDM	Ethylene Propylene (Diene) copolymer	80(176)	Same as above.	Flammable
PP	Polypropylene	90(194)	Same as above.	Flammable, avoid battery acid.
UP	Unsaturated Polyester	90(194)	Same as above.	Flammable
PS	Polystyrene	80(176)	Avoid solvents.	Flammable
ABS	Acrylonitrile Butadiene Styrene	80(176)	Avoid gasoline and solvents.	
AES	Acrylonitrile Ethylene Styrene	80(176)	Same as above.	
PMMA	Poly Methyl Methacrylate	85(185)	Same as above.	
EVAC	Ethylene Vinyl Acetate	90(194)	Same as above.	
ASA	Acrylonitrile Styrene Acrylate	100(222)	Same as above.	Flammable
PPE	Poly Phenylene Ether	110(230)	Same as above.	
PC	Polycarbonate	120(248)	Same as above.	
PAR	Polyarylate	180(356)	Same as above.	
PUR	Polyurethane	90(194)	Same as above.	
POM	Poly Oxymethylene	120(248)	Same as above.	Avoid battery acid.
PBT+ PC	Poly Butylene Terephthalate + Polycarbonate	120(248)	Same as above.	Flammable
PA	Polyamide	140(284)	Same as above.	Avoid immersing in water.
PBT	Poly Butylene Terephthalate	140(284)	Same as above.	
PET	Polyester	180(356)	Same as above.	
PEI	Polyetherimide	200(392)	Same as above.	

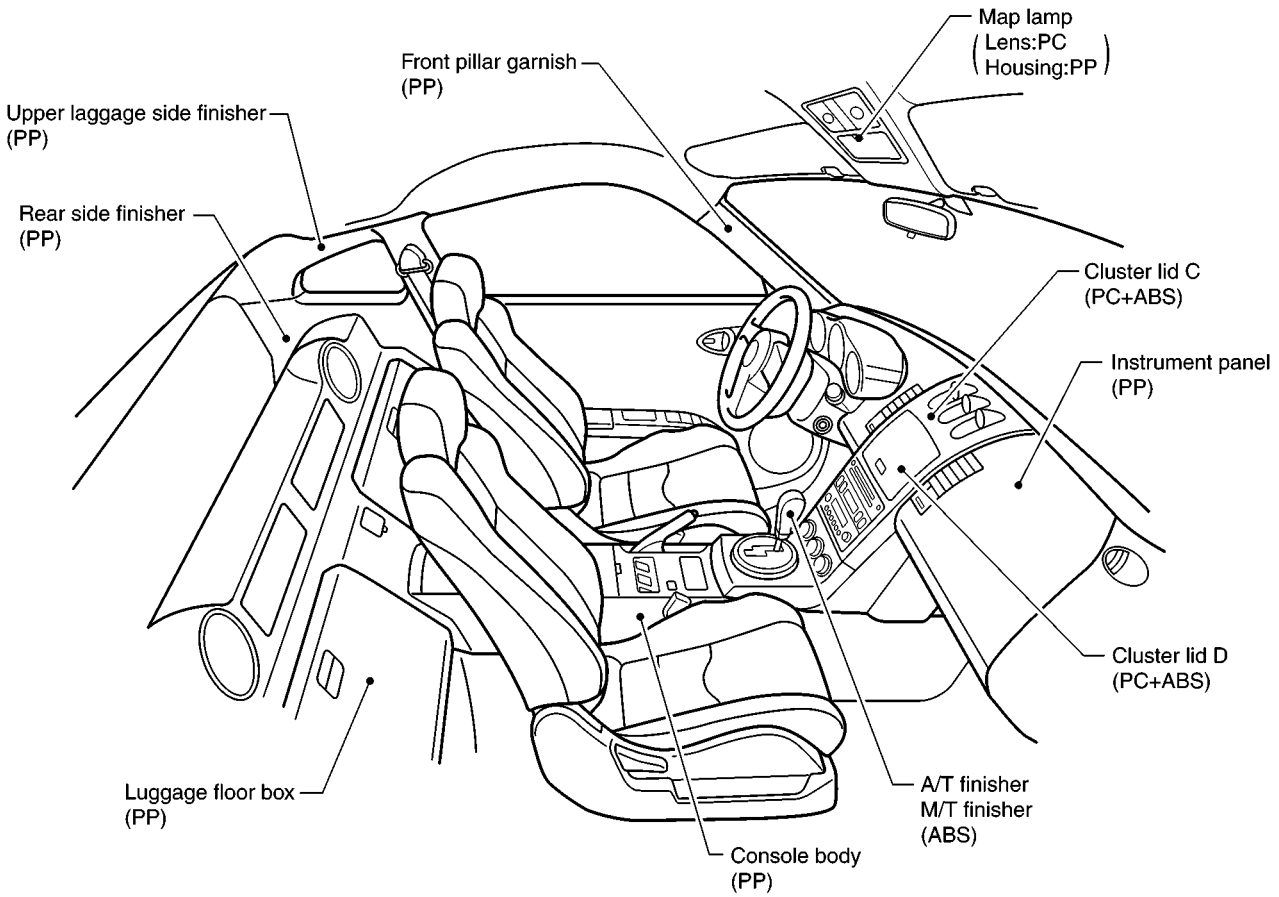
1. When repairing and painting a portion of the body adjacent to plastic parts, consider their characteristics (influence of heat and solvent) and remove them if necessary or take suitable measures to protect them.
2. Plastic parts should be repaired and painted using methods suiting the materials' characteristics.

LOCATION OF PLASTIC PARTS (COUPE)





SIIA2360E


Map lamp
Lens:PC
Housing:PP
Front pillar garnish
(PP)
Upper laggage side finisher
(PP)
Rear side finisher
(PP)
Cluster lid C
(PC+ABS)
Instrument panel
(PP)
Cluster lid D
(PC+ABS)
Luggage floor box
(PP)
A/T finisher
M/T finisher
(ABS)
Console body
(PP)

SIIA1983E

Handling Precautions For Plastics (Roadster)

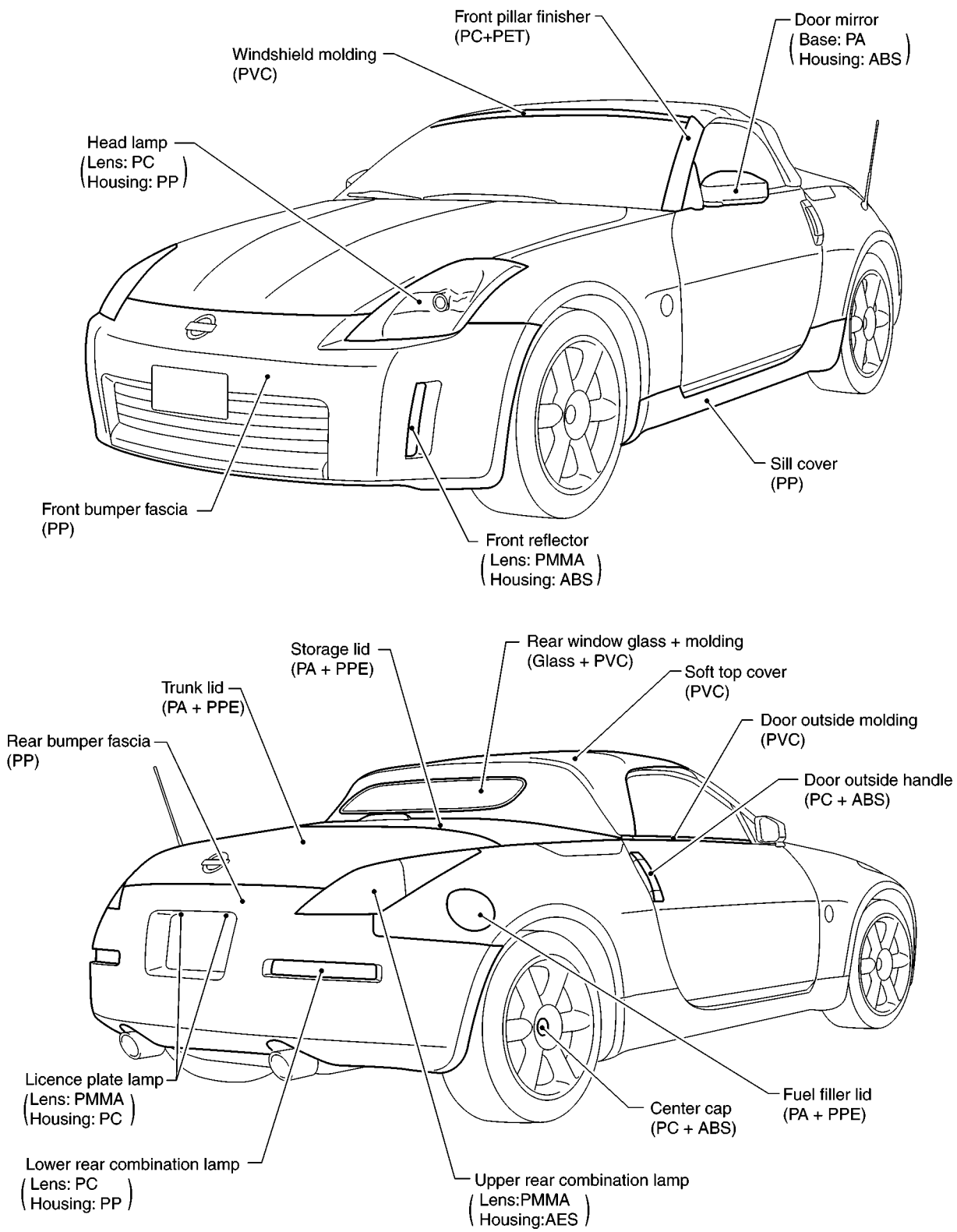
AIS0044Q

HANDLING PRECAUTIONS FOR PLASTICS

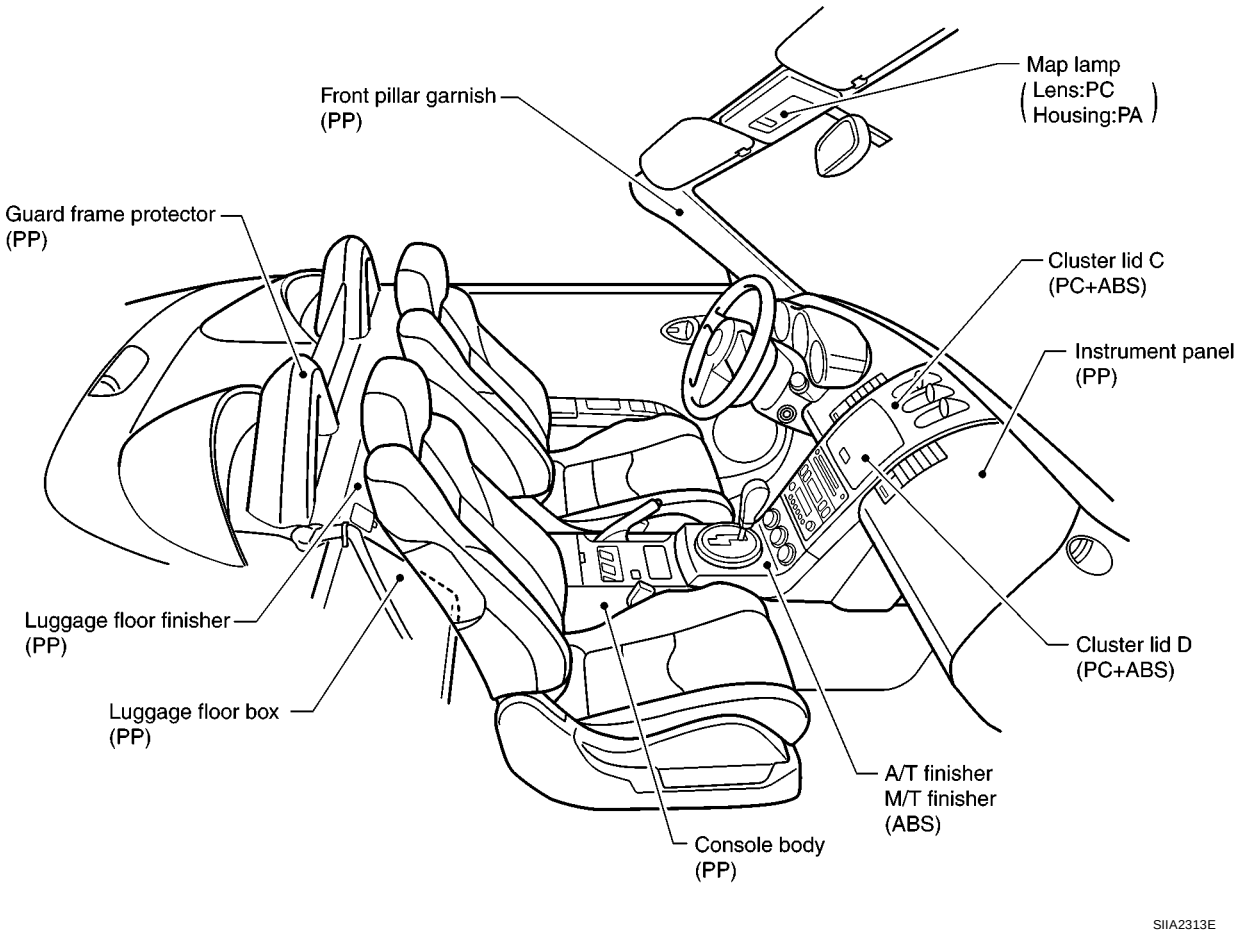
Abbre-viation	Material name	Heat resisting temperature °C(°F)	Resistance to gasoline and solvents	Other cautions
PE	Polyethylene	60(140)	Gasoline and most solvents are harmless if applied for a very short time (wipe up quickly).	Flammable
PVC	Poly Vinyl Chloride	80(176)	Same as above.	Poison gas is emitted when burned.
EPM/ EPDM	Ethylene Propylene (Diene) copolymer	80(176)	Same as above.	Flammable
PP	Polypropylene	90(194)	Same as above.	Flammable, avoid battery acid.
UP	Unsaturated Polyester	90(194)	Same as above.	Flammable
PS	Polystyrene	80(176)	Avoid solvents.	Flammable
ABS	Acrylonitrile Butadiene Styrene	80(176)	Avoid gasoline and solvents.	
AES	Acrylonitrile Ethylene Styrene	80(176)	Same as above.	
PMMA	Poly Methyl Methacrylate	85(185)	Same as above.	
EVAC	Ethylene Vinyl Acetate	90(194)	Same as above.	
ASA	Acrylonitrile Styrene Acrylate	100(222)	Same as above.	Flammable
PPE	Poly Phenylene Ether	110(230)	Same as above.	
PC	Polycarbonate	120(248)	Same as above.	
PAR	Polyarylate	180(356)	Same as above.	
PUR	Polyurethane	90(194)	Same as above.	
POM	Poly Oxymethylene	120(248)	Same as above.	Avoid battery acid.
PBT+ PC	Poly Butylene Terephthalate + Polycarbonate	120(248)	Same as above.	Flammable
PA	Polyamide	140(284)	Same as above.	Avoid immersing in water.
PBT	Poly Butylene Terephthalate	140(284)	Same as above.	
PET	Polyester	180(356)	Same as above.	
PEI	Polyetherimide	200(392)	Same as above.	

1. When repairing and painting a portion of the body adjacent to plastic parts, consider their characteristics (influence of heat and solvent) and remove them if necessary or take suitable measures to protect them.
2. Plastic parts should be repaired and painted using methods suiting the materials' characteristics.

LOCATION OF PLASTIC PARTS (ROADSTER)



SIIA2361E


Map lamp
Lens:PC
Housing:PA
Front pillar garnish
(PP)
Guard frame protector
(PP)
Cluster lid C
(PC+ABS)
Instrument panel
(PP)
Luggage floor finisher
(PP)
Cluster lid D
(PC+ABS)
Luggage floor box
(PP)
A/T finisher
M/T finisher
(ABS)
Console body
(PP)
SIIA2313E

Precautions In Repairing High Strength Steel

AIS0044R

High strength steel is used for body panels in order to reduce vehicle weight.
Accordingly, precautions in repairing automotive bodies made of high strength steel are described below:

HIGH STRENGTH STEEL (HSS) USED IN NISSAN VEHICLES

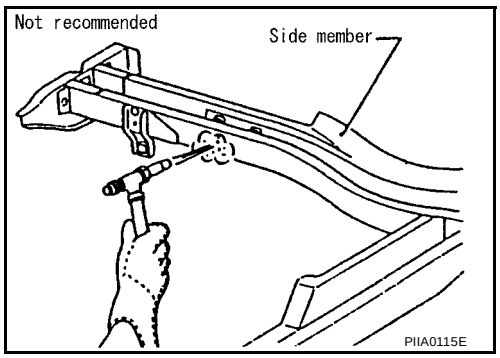
Tensile strength	Nissan/Infiniti designation	Major applicable parts
373 N/mm^2 (38kg/mm^2 ,54klb/sq in)	SP130	● Front & rear side member assembly ● Hoodledge assembly ● Upper dash ● Body side ● Other reinforcements
785-981 N/mm^2 (80-100kg/mm^2 ,114-142klb/sq in)	SP150	● Front door guard beam

SP130 is the most commonly used HSS.

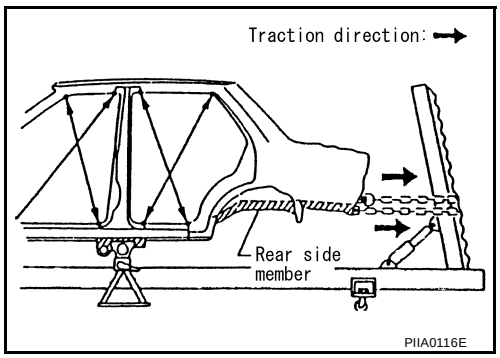
Read the following precautions when repairing HSS:

1. Additional points to consider

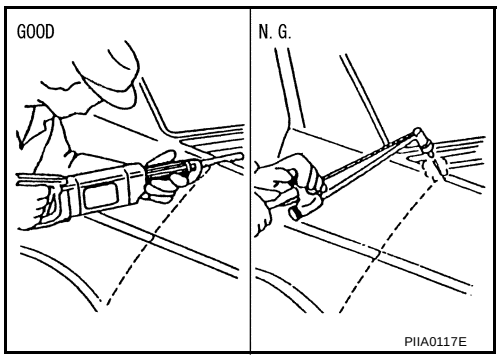
- The repair of reinforcements (such as side members) by heating is not recommended since it may weaken the component. When heating is unavoidable, do not heat HSS parts above 550°C (1,022°F).
  Verify heating temperature with a thermometer.
  (Crayon-type and other similar type thermometer are appropriate.)



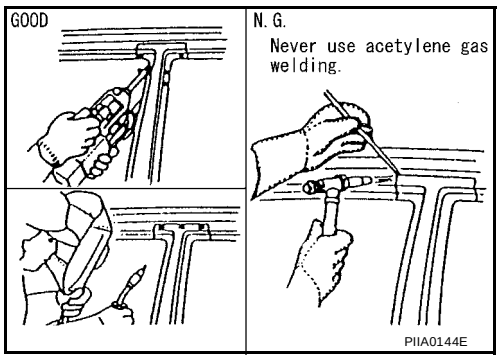
- When straightening body panels, use caution in pulling any HSS panel. Because HSS is very strong, pulling may cause deformation in adjacent portions of the body. In this case, increase the number of measuring points, and carefully pull the HSS panel.



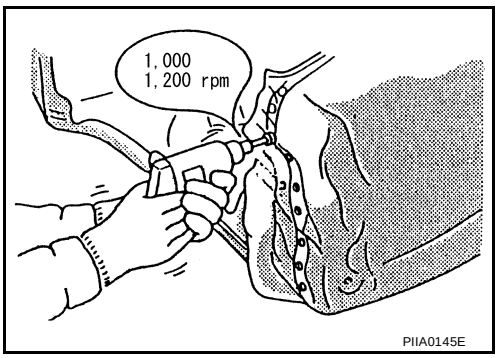
- When cutting HSS panels, avoid gas (torch) cutting if possible. Instead, use a saw to avoid weakening surrounding areas due to heat. If gas (torch) cutting is unavoidable, allow a minimum margin of 50 mm (1.97in).



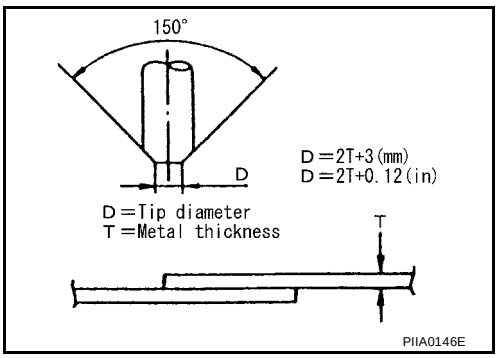
- When welding HSS panels, use spot welding whenever possible in order to minimize weakening surrounding areas due to heat.
  If spot welding is impossible, use M.I.G. welding. Do not use gas (torch) welding because it is inferior in welding strength.



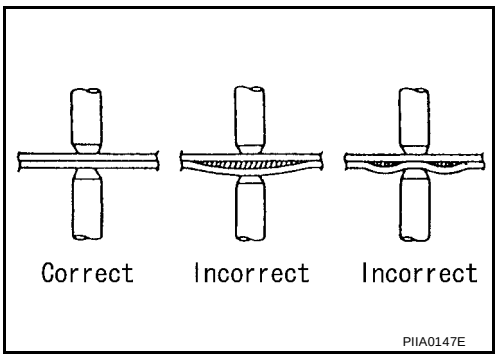
- The spot weld on HSS panels is harder than that of an ordinary steel panel.
  Therefore, when cutting spot welds on a HSS panel, use a low speed high torque drill (1,000 to 1,200 rpm) to increase drill bit durability and facilitate the operation.



2. Precautions in spot welding HSS
   This work should be performed under standard working conditions. Always note the following when spot welding HSS:
   - The electrode tip diameter must be sized properly according to the metal thickness.



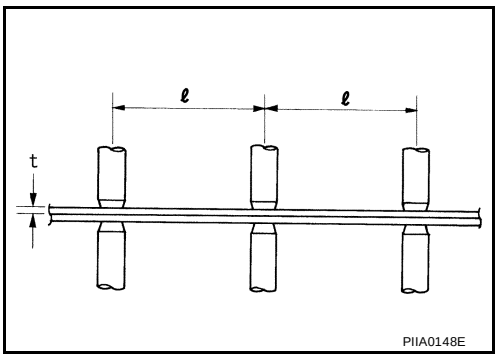
- The panel surfaces must fit flush to each other, leaving no gaps.



- Follow the specifications for the proper welding pitch.

Unit:mm

Thickness (t)	Minimum pitch (l)
0.6 (0.024)	10 (0.39) or over
0.8 (0.031)	12 (0.47) or over
1.0 (0.039)	18 (0.71) or over
1.2 (0.047)	20 (0.79) or over
1.6 (0.063)	27 (1.06) or over
1.8 (0.071)	31 (1.22) or over



Replacement Operations (Coupe)

AIS0044S

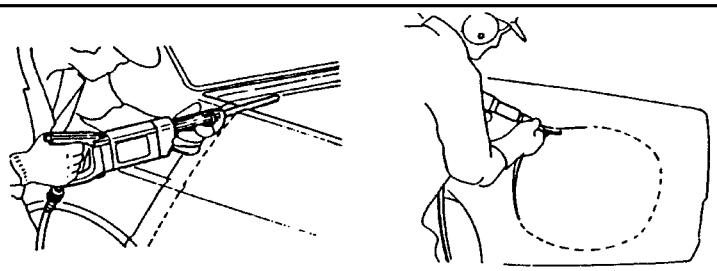
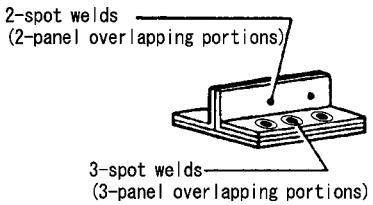
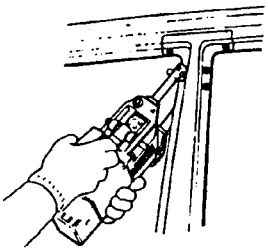
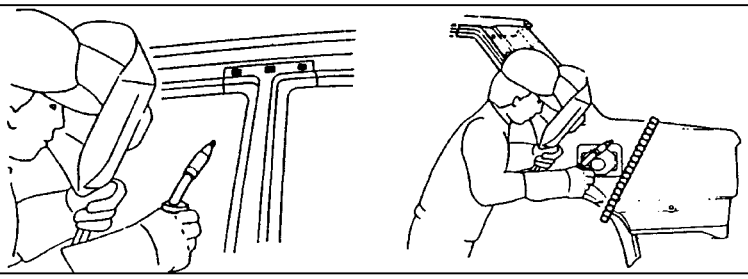
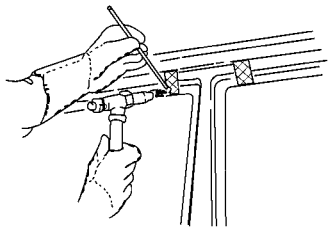
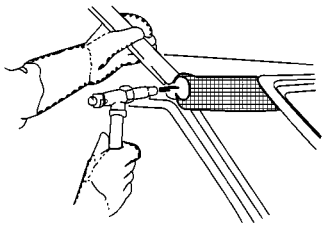
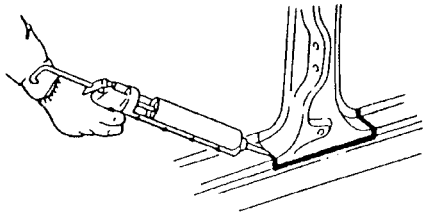
DESCRIPTION

This section is prepared for technicians who have attained a high level of skill and experience in repairing collision-damaged vehicles and also use modern service tools and equipment. Persons unfamiliar with body repair techniques should not attempt to repair collision-damaged vehicles by using this section.

Technicians are also encouraged to read Body Repair Manual (Fundamentals) in order to ensure that the original functions and quality of the vehicle can be maintained. The Body Repair Manual (Fundamentals) contains additional information, including cautions and warning, that are not including in this manual. Technicians should refer to both manuals to ensure proper repairs.

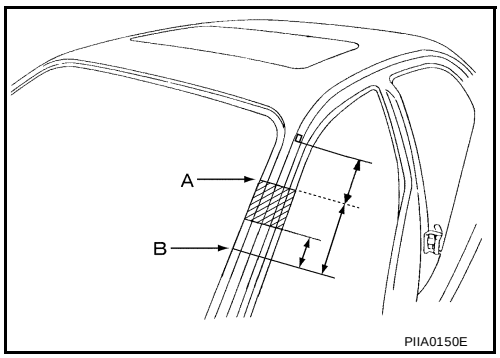
Please note that these information are prepared for worldwide usage, and as such, certain procedures might not apply in some regions or countries.

The symbols used in this section for cutting and welding / brazing operations are shown below.

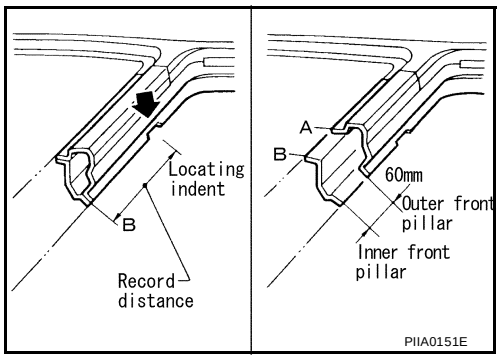
Saw cut or air chisel cut	
Spot weld 2-spot welds	 
Spot weld 3-spot welds	
MIG plug weld	
MIG seam weld/ Point weld	
Brazing	
Soldering	
Sealing	

PIIA0149E

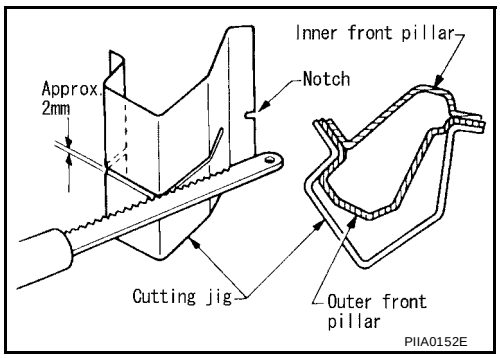
- Front pillar butt joint can be determined anywhere within shaded area as shown in the figure. The best location for the butt joint is at position A due to the construction of the vehicle. Refer to the front pillar section.



- Determine cutting position and record distance from the locating indent. Use this distance when cutting the service part. Cut outer front pillar over 60 mm above inner front pillar cut position.

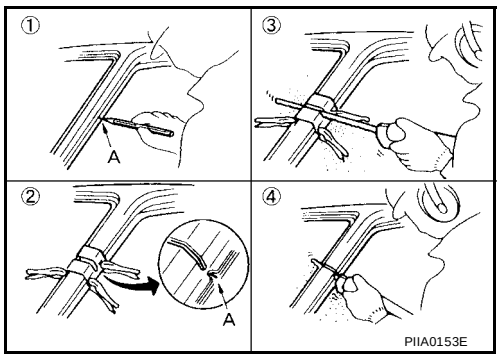


- Prepare a cutting jig to make outer pillar easier to cut. Also, this will permit service part to be accurately cut at joint position.



- An example of cutting operation using a cutting jig is as follows.

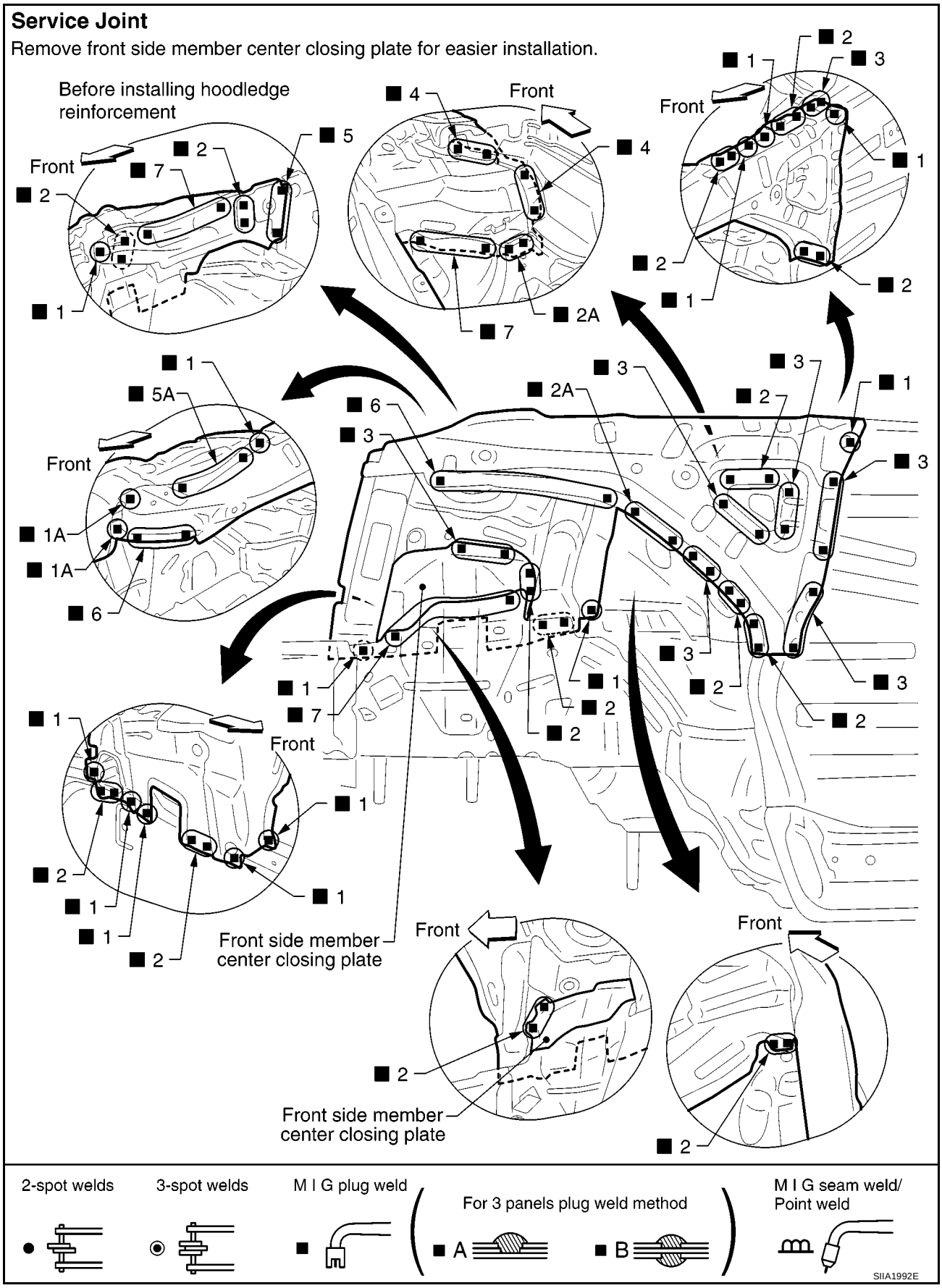
1. Mark cutting lines.
   A: Cut position of outer pillar
   B: Cut position of inner pillar
2. Align cutting line with notch on jig. Clamp jig to pillar.
3. Cut outer pillar along groove of jig. (At position A)
4. Remove jig and cut remaining portions.
5. Cut inner pillar at position B in same manner.



HOODLEDGE (COUPE)

Service Joint

Remove front side member center closing plate for easier installation.

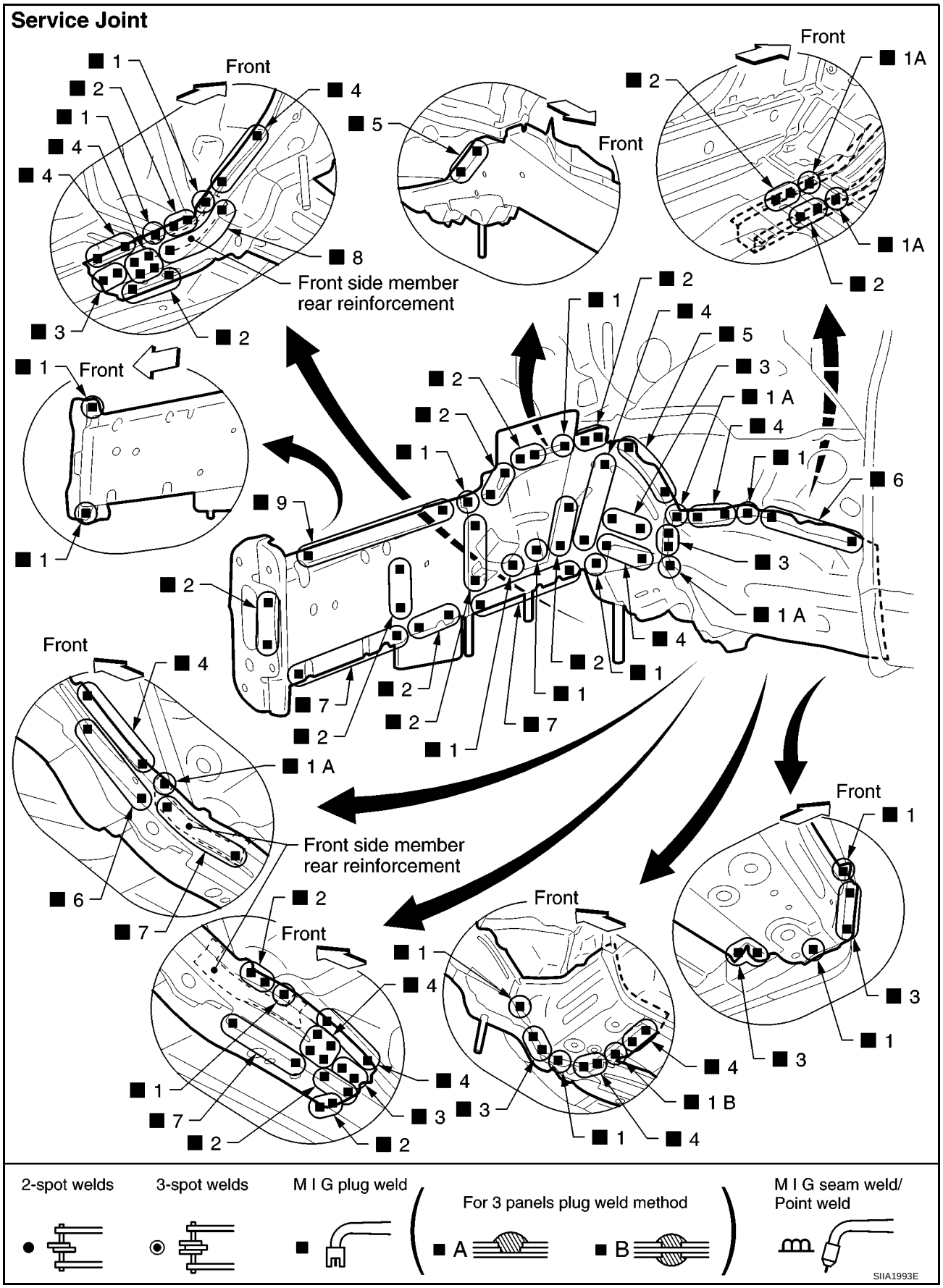


Change parts

- Front strut housing (LH)
- Upper front hoodledge (LH)
- Hoodledge reinforcement (LH)

FRONT SIDE MEMBER (COUPE)

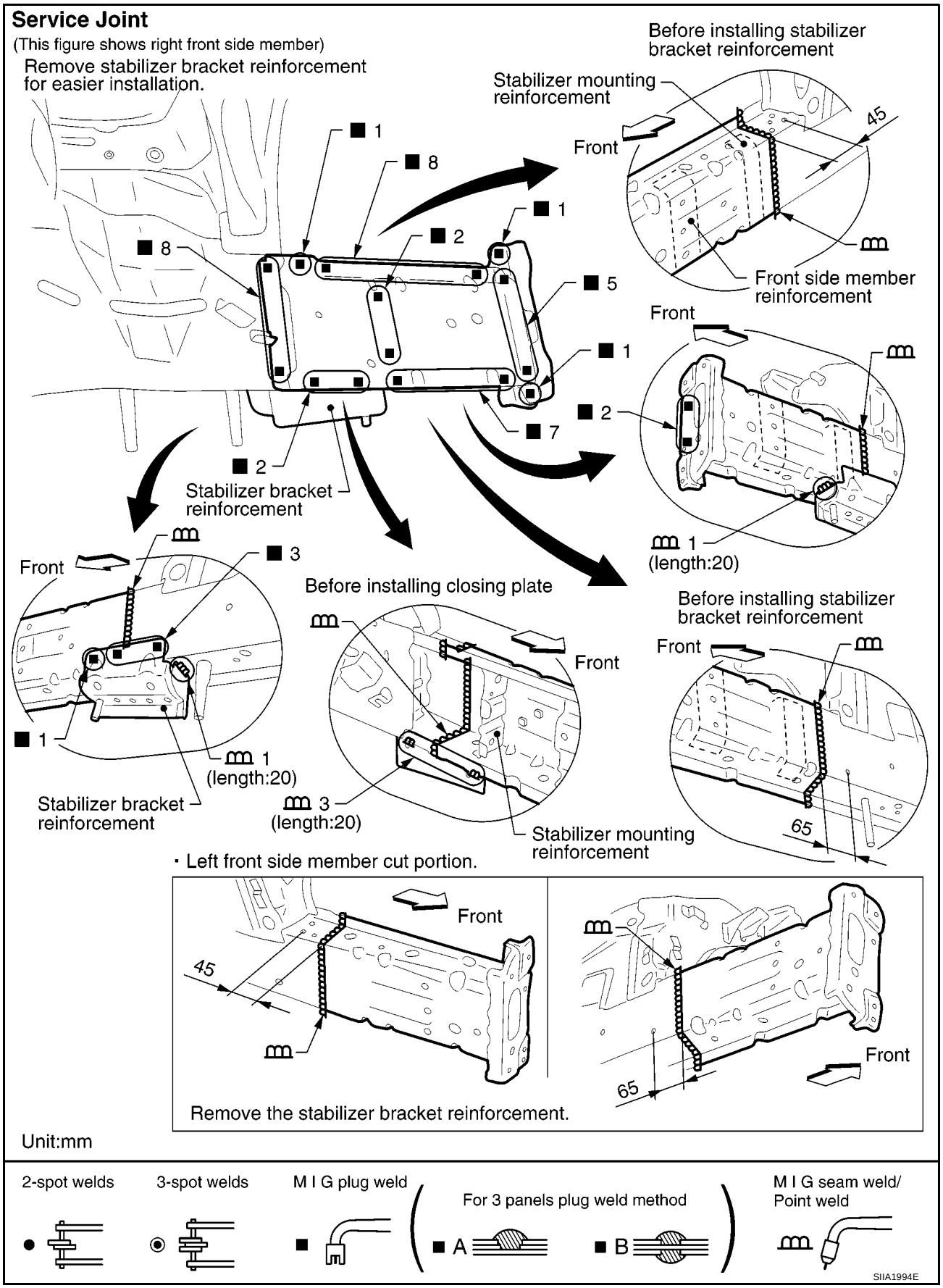
- Work after hoodledge has been removed.



Change parts

- Front side member assembly (LH)
- Front side member outrigger assembly (LH)
- Front side member closing plate assembly (LH)
- Front side member rear reinforcement (LH)

FRONT SIDE MEMBER (PARTIAL REPLACEMENT) (COUPE)

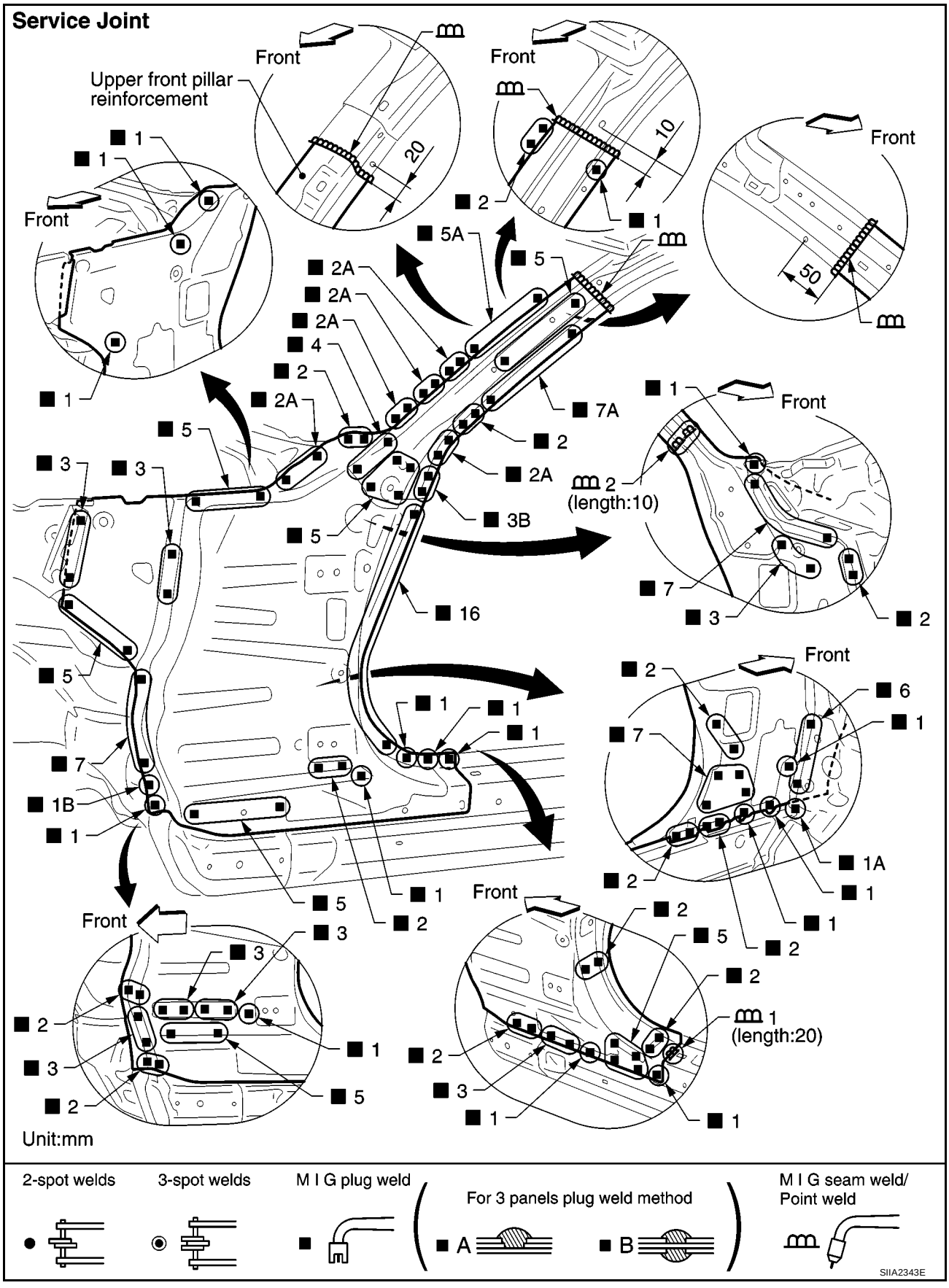


Change parts

- Front side member assembly (RH)
- Front side member front closing plate (RH)
- Outer front towing hook bracket (RH)

FRONT PILLAR (COUPE)

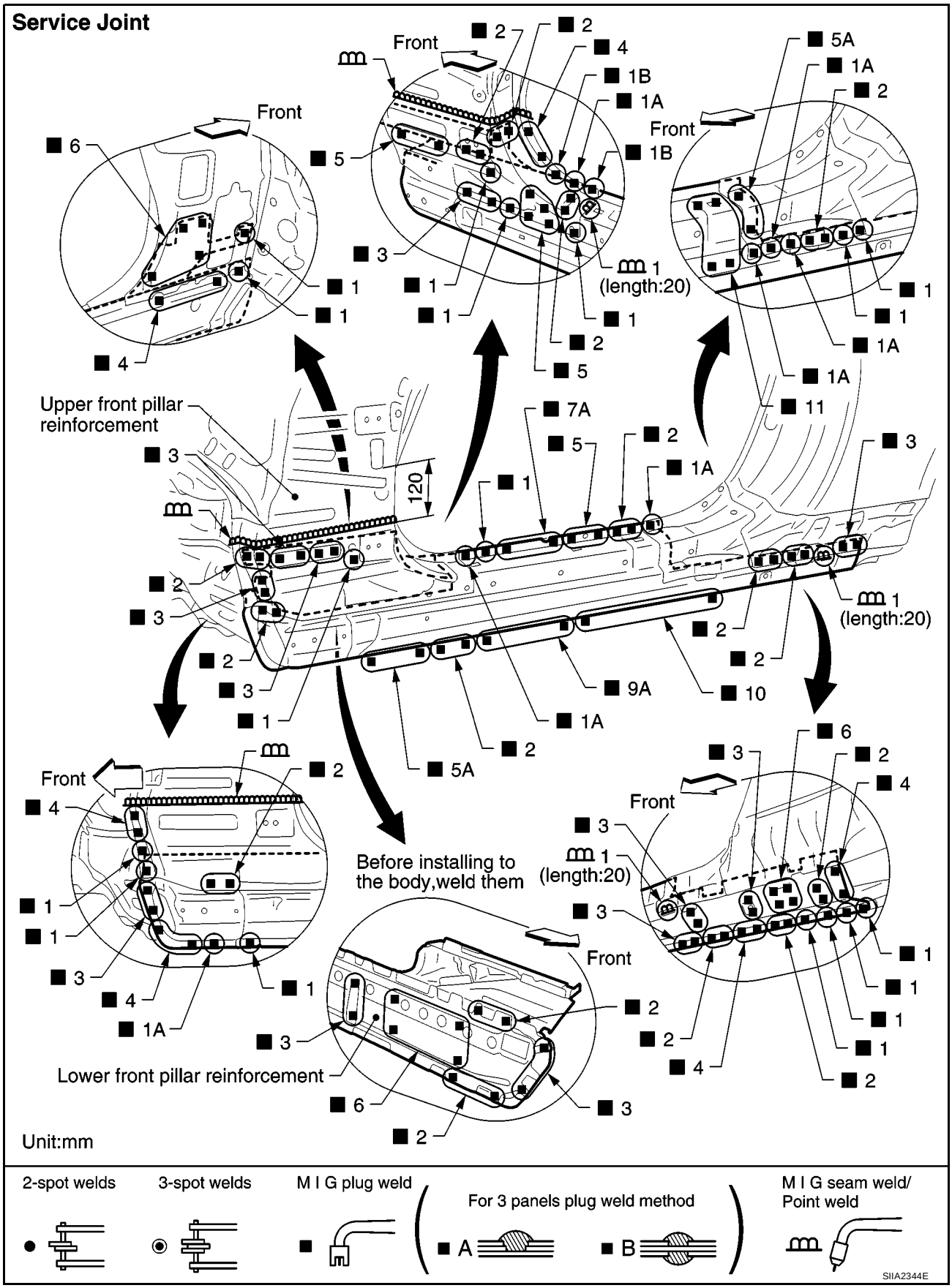
- Work after hoodledge reinforcement has been removed.



Change parts

- Front pillar reinforcement assembly (LH)
- Outer front pillar (LH)
- Inner side roof rail (LH)
- Upper rear hoodledge (LH)

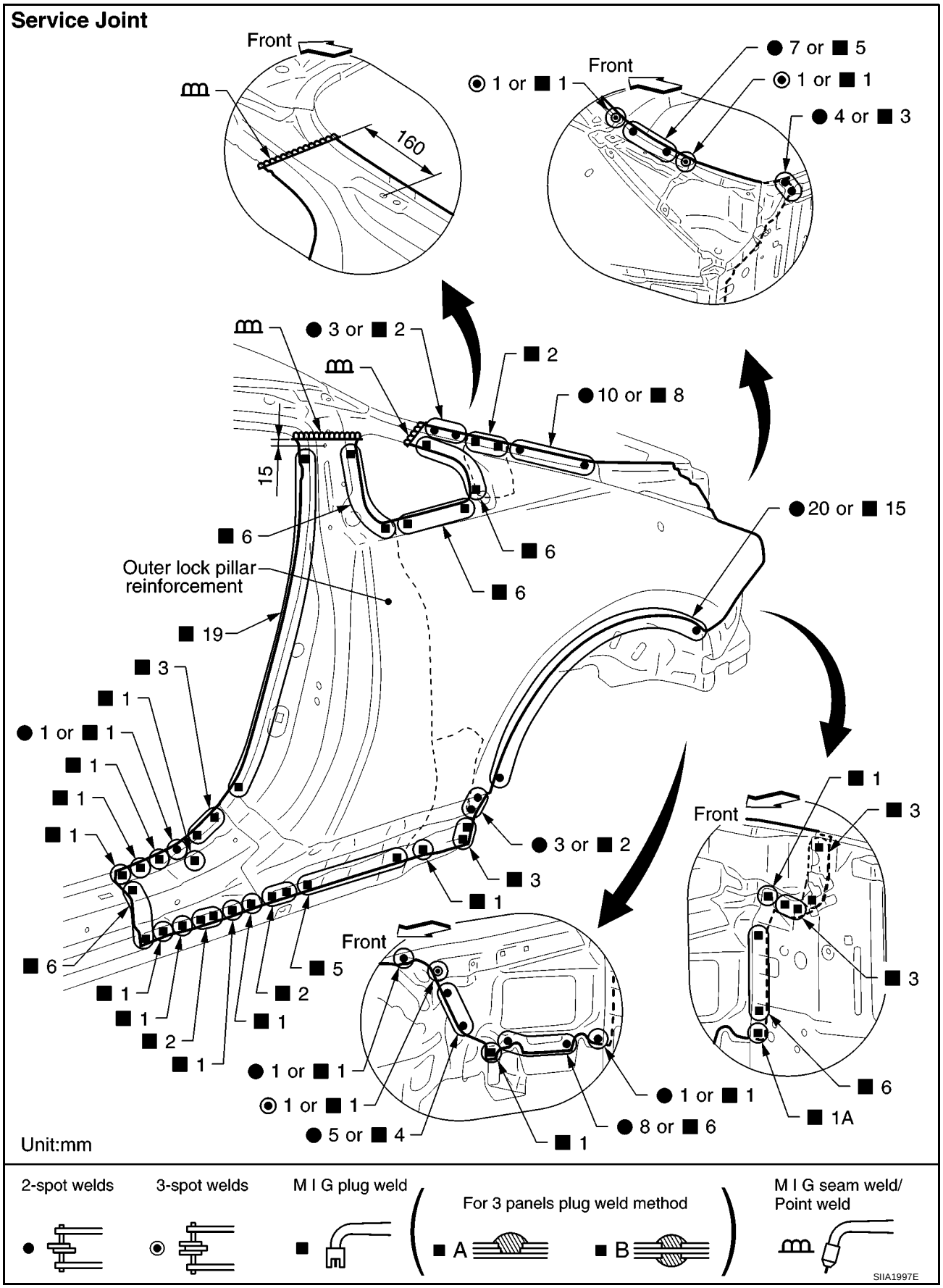
OUTER SILL (COUPE)



Change parts

- Outer sill reinforcement assembly (LH)
- Lower front pillar reinforcement (LH)

REAR FENDER (COUPE)



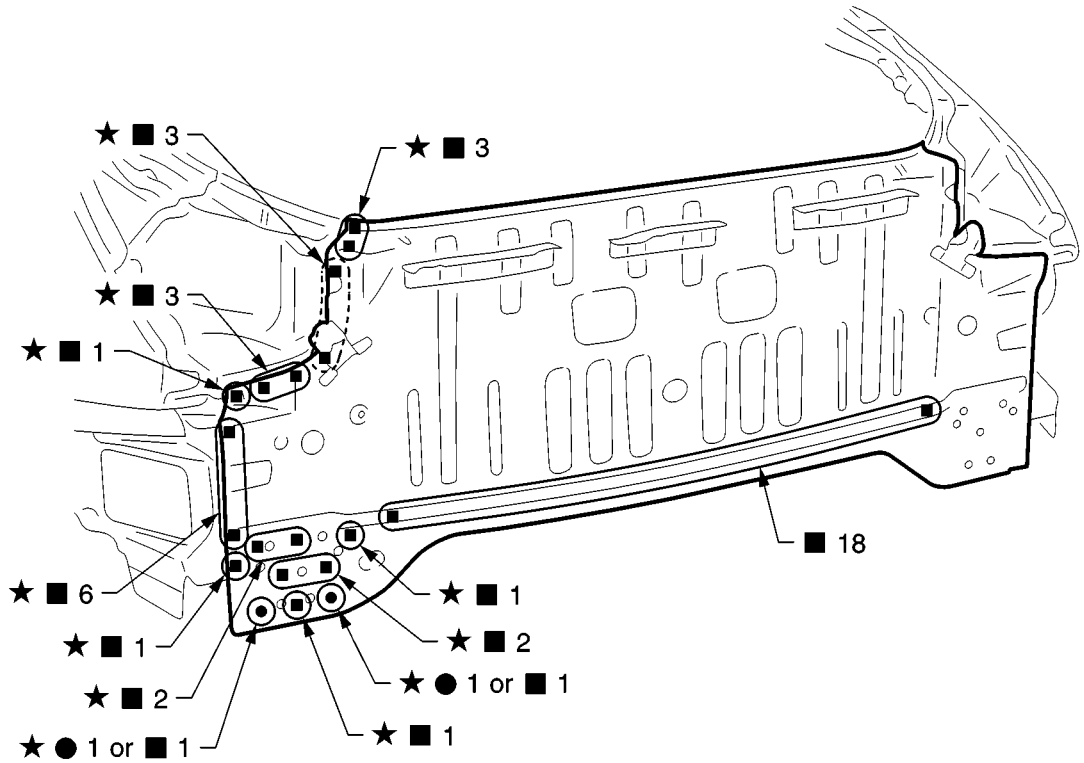
Change parts

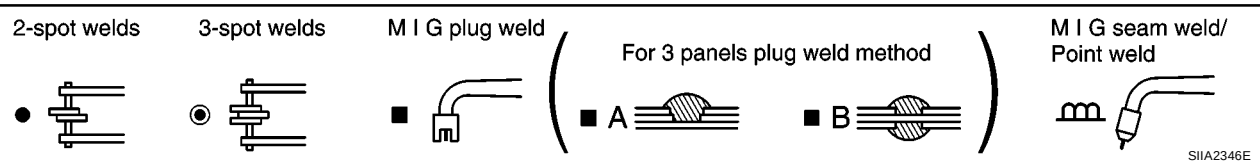
- Rear fender assembly (LH)

REAR PANEL (COUPE)

Service Joint

★ indicates that there is an equivalent welding portion with the same dimensions on the opposite side.





Change parts

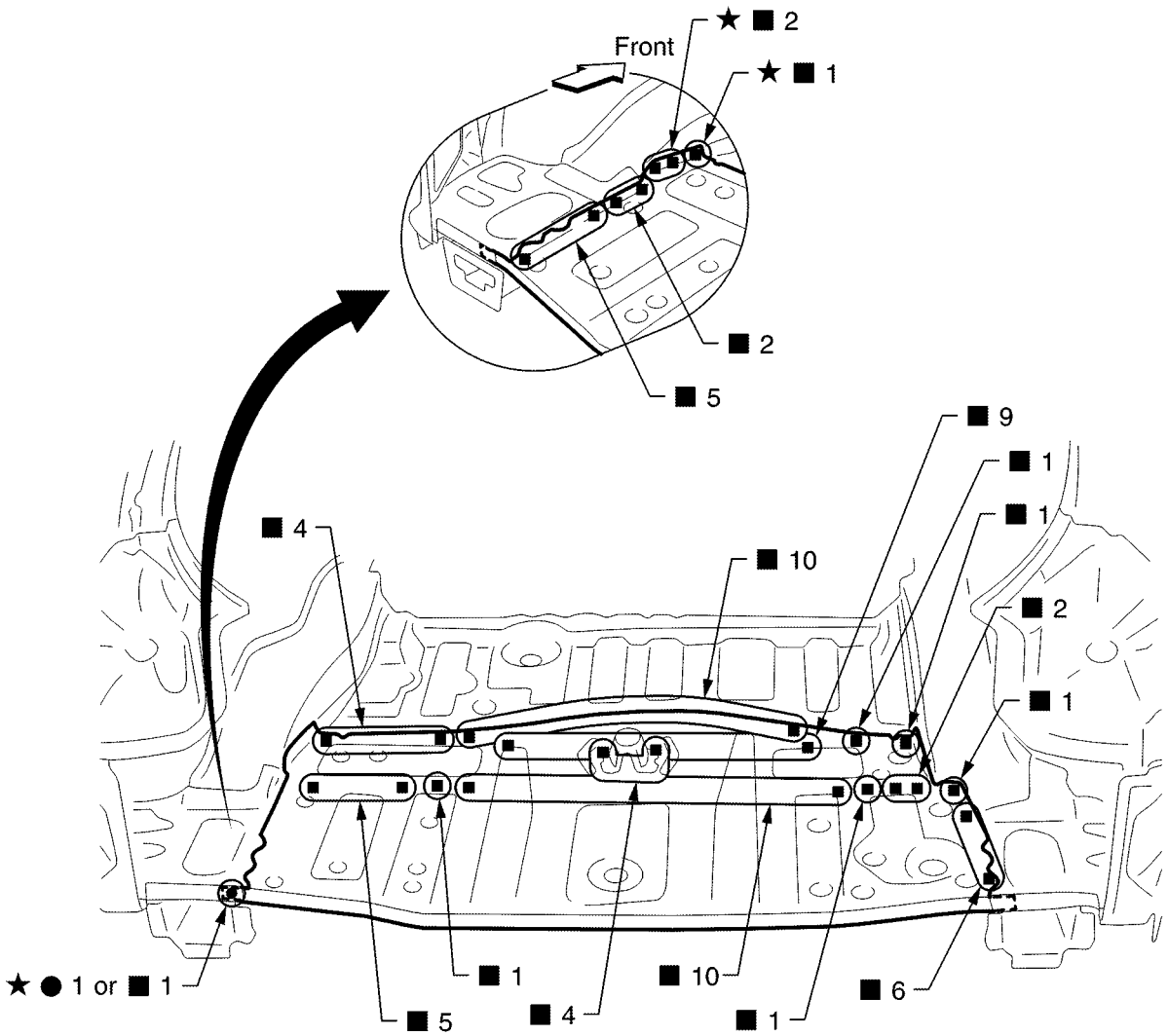
- ● Rear panel assembly

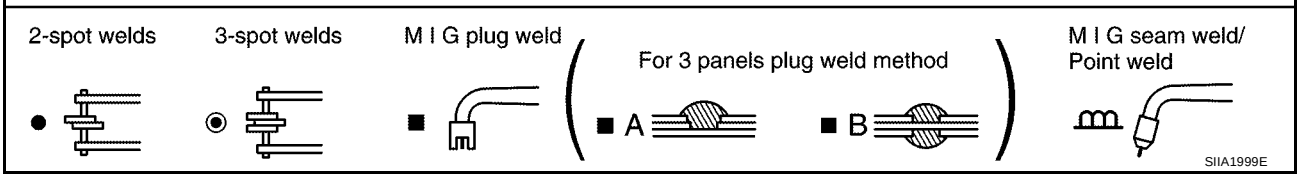
REAR FLOOR REAR (COUPE)

- Work after rear panel assembly has been removed.

Service Joint

★ indicates that there is an equivalent welding portion with the same dimensions on the opposite side.





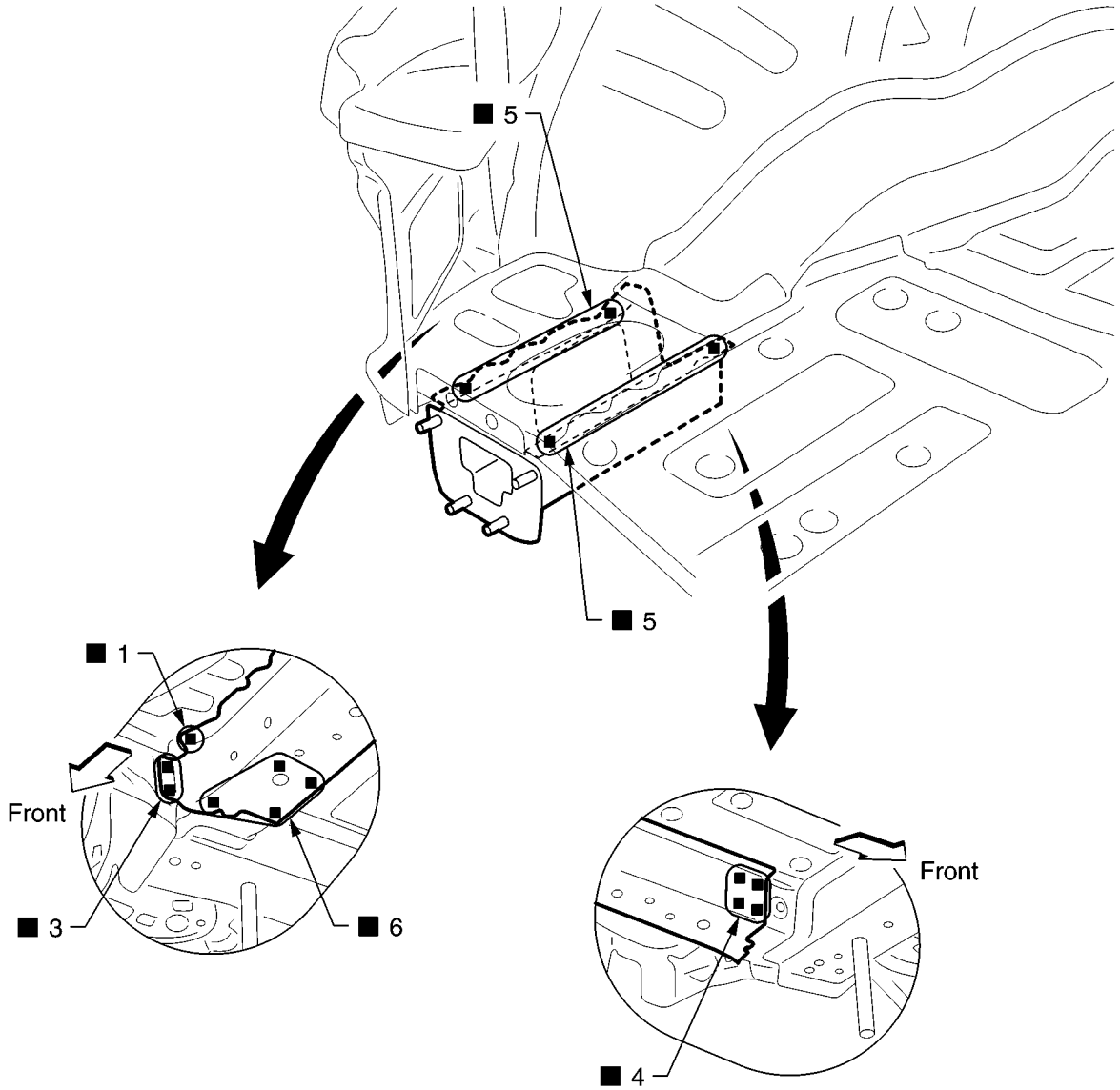
Change parts

- Rear floor rear
- Spare tire clamp bracket

REAR SIDE MEMBER EXTENSION (COUPE)

- Work after rear panel assembly has been removed.

Service Joint



2-spot welds | 3-spot welds | M I G plug weld | For 3 panels plug weld method (A, B) | M I G seam weld/ Point weld

SIIA2000E

Change parts

- Rear side member extension (LH)

Replacement Operations (Roadster)

AIS0044T

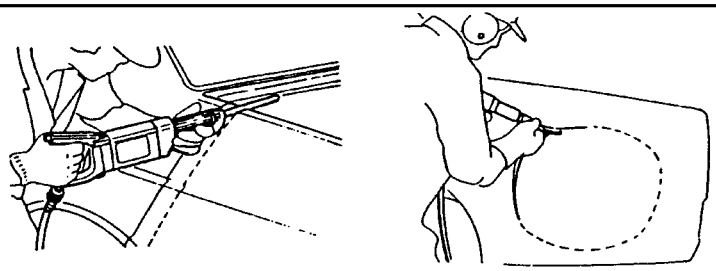
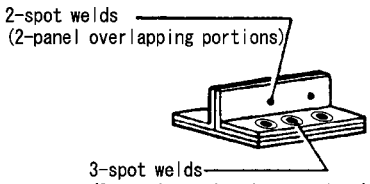
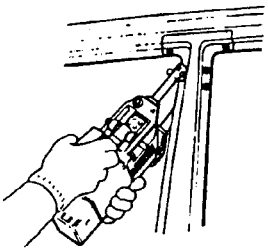
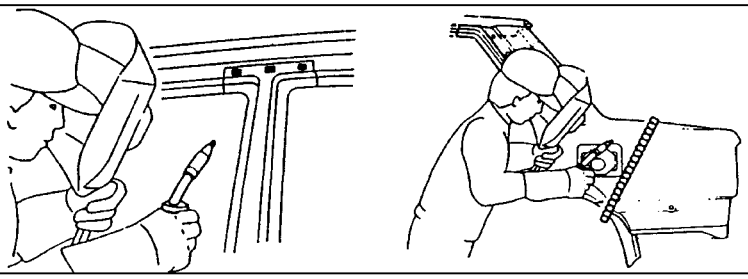
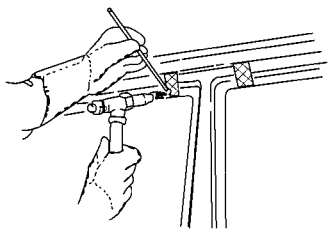
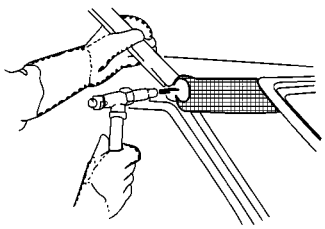
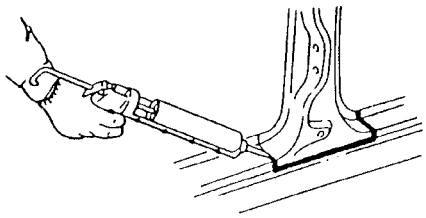
DESCRIPTION

This section is prepared for technicians who have attained a high level of skill and experience in repairing collision-damaged vehicles and also use modern service tools and equipment. Persons unfamiliar with body repair techniques should not attempt to repair collision-damaged vehicles by using this section.

Technicians are also encouraged to read Body Repair Manual (Fundamentals) in order to ensure that the original functions and quality of the vehicle can be maintained. The Body Repair Manual (Fundamentals) contains additional information, including cautions and warning, that are not including in this manual. Technicians should refer to both manuals to ensure proper repairs.

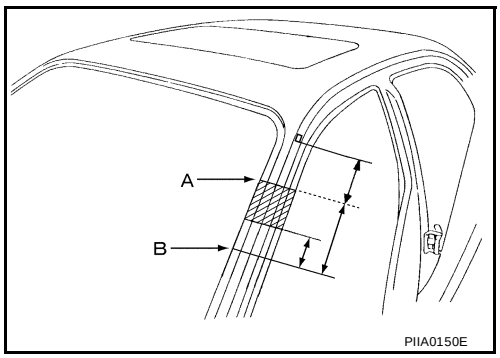
Please note that these information are prepared for worldwide usage, and as such, certain procedures might not apply in some regions or countries.

The symbols used in this section for cutting and welding / brazing operations are shown below.

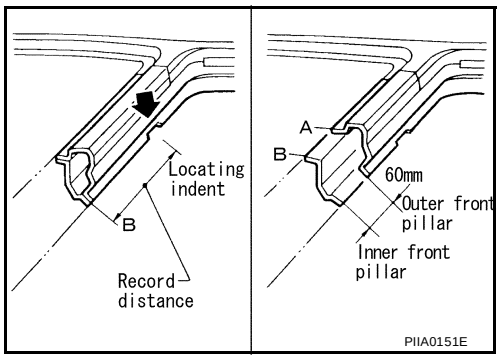
Saw cut or air chisel cut	
Spot weld 2-spot welds	 
Spot weld 3-spot welds	
MIG plug weld	
MIG seam weld/ Point weld	
Brazing	
Soldering	
Sealing	

PIIA0149E

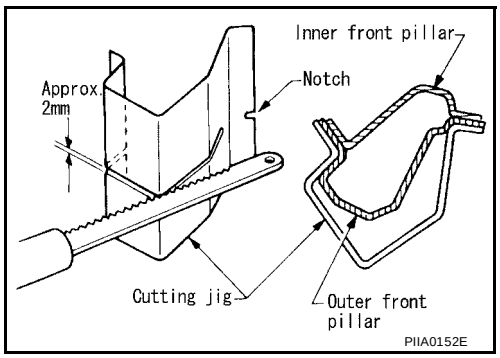
- Front pillar butt joint can be determined anywhere within shaded area as shown in the figure. The best location for the butt joint is at position A due to the construction of the vehicle. Refer to the front pillar section.



- Determine cutting position and record distance from the locating indent. Use this distance when cutting the service part. Cut outer front pillar over 60 mm above inner front pillar cut position.

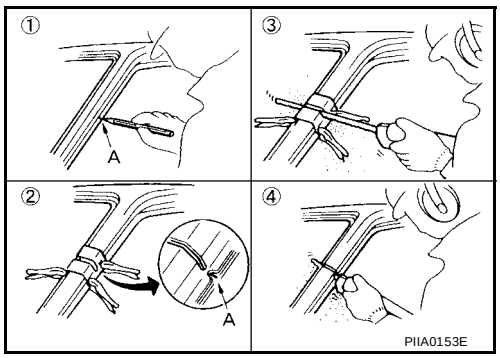


- Prepare a cutting jig to make outer pillar easier to cut. Also, this will permit service part to be accurately cut at joint position.

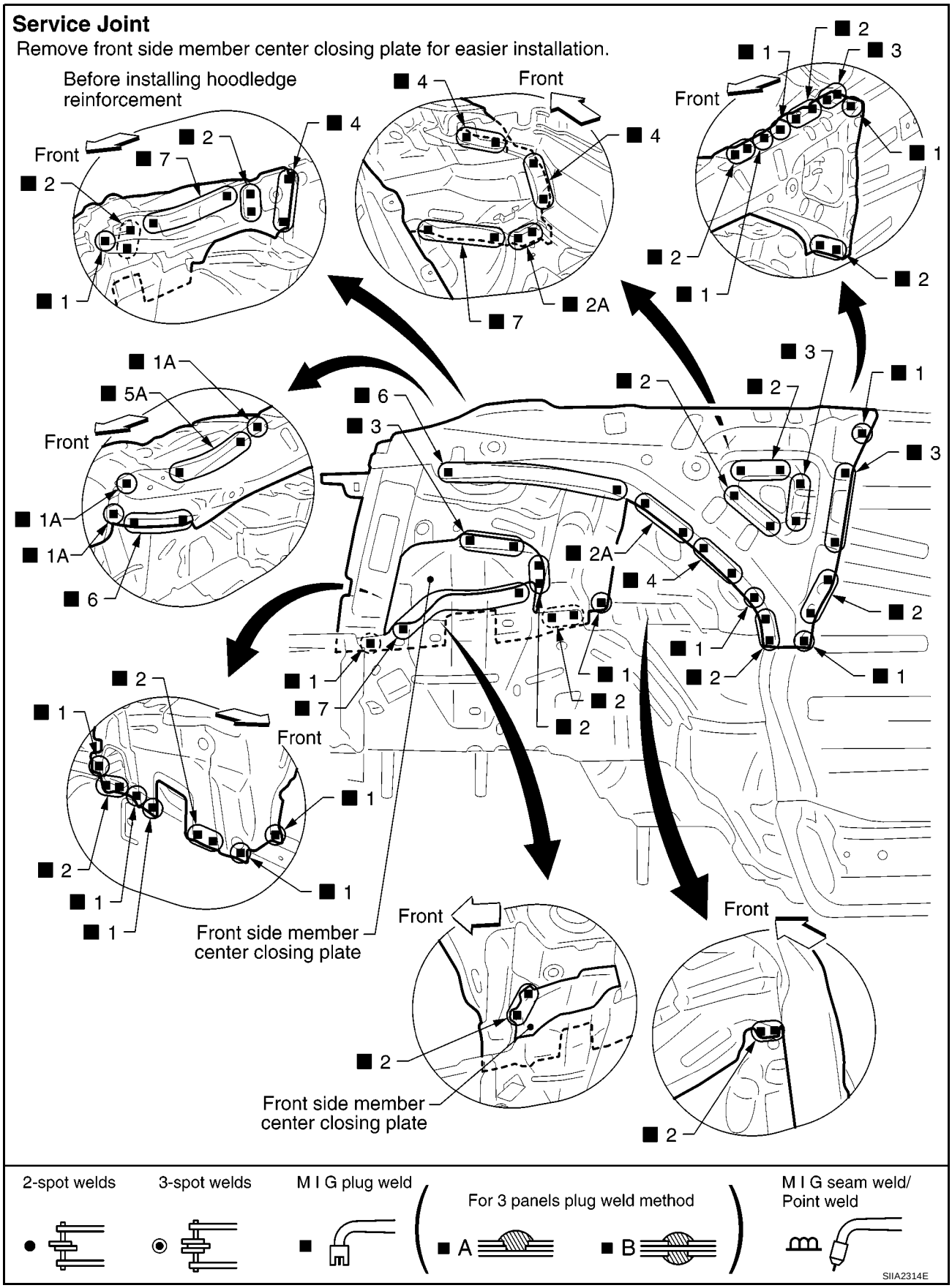


- An example of cutting operation using a cutting jig is as follows.

1. Mark cutting lines.
   A: Cut position of outer pillar
   B: Cut position of inner pillar
2. Align cutting line with notch on jig. Clamp jig to pillar.
3. Cut outer pillar along groove of jig. (At position A)
4. Remove jig and cut remaining portions.
5. Cut inner pillar at position B in same manner.



HOODLEDGE (ROADSTER)

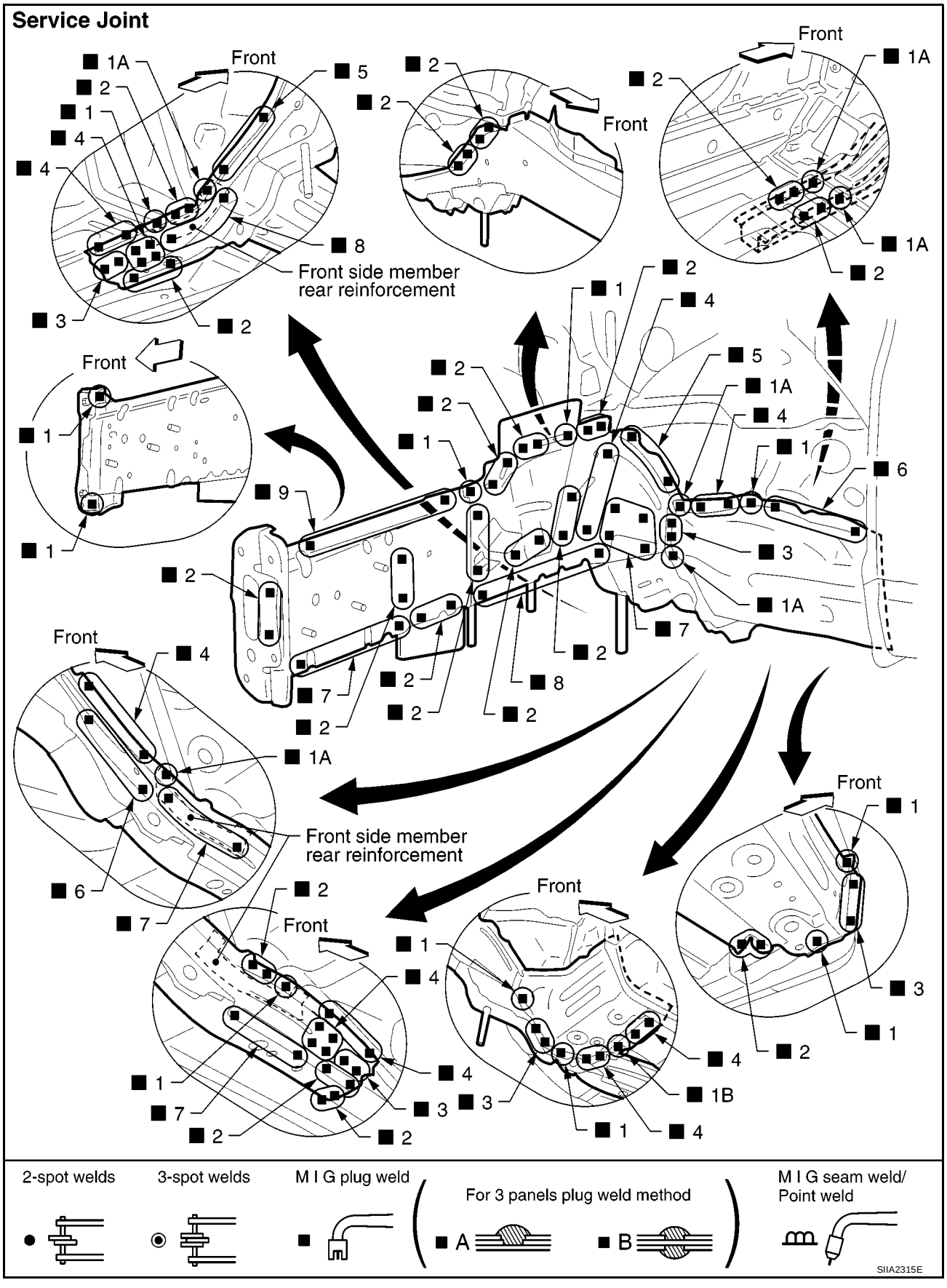


Change parts

- Front strut housing (LH)
- Upper front hoodledge (LH)
- Hoodledge reinforcement (LH)

FRONT SIDE MEMBER (ROADSTER)

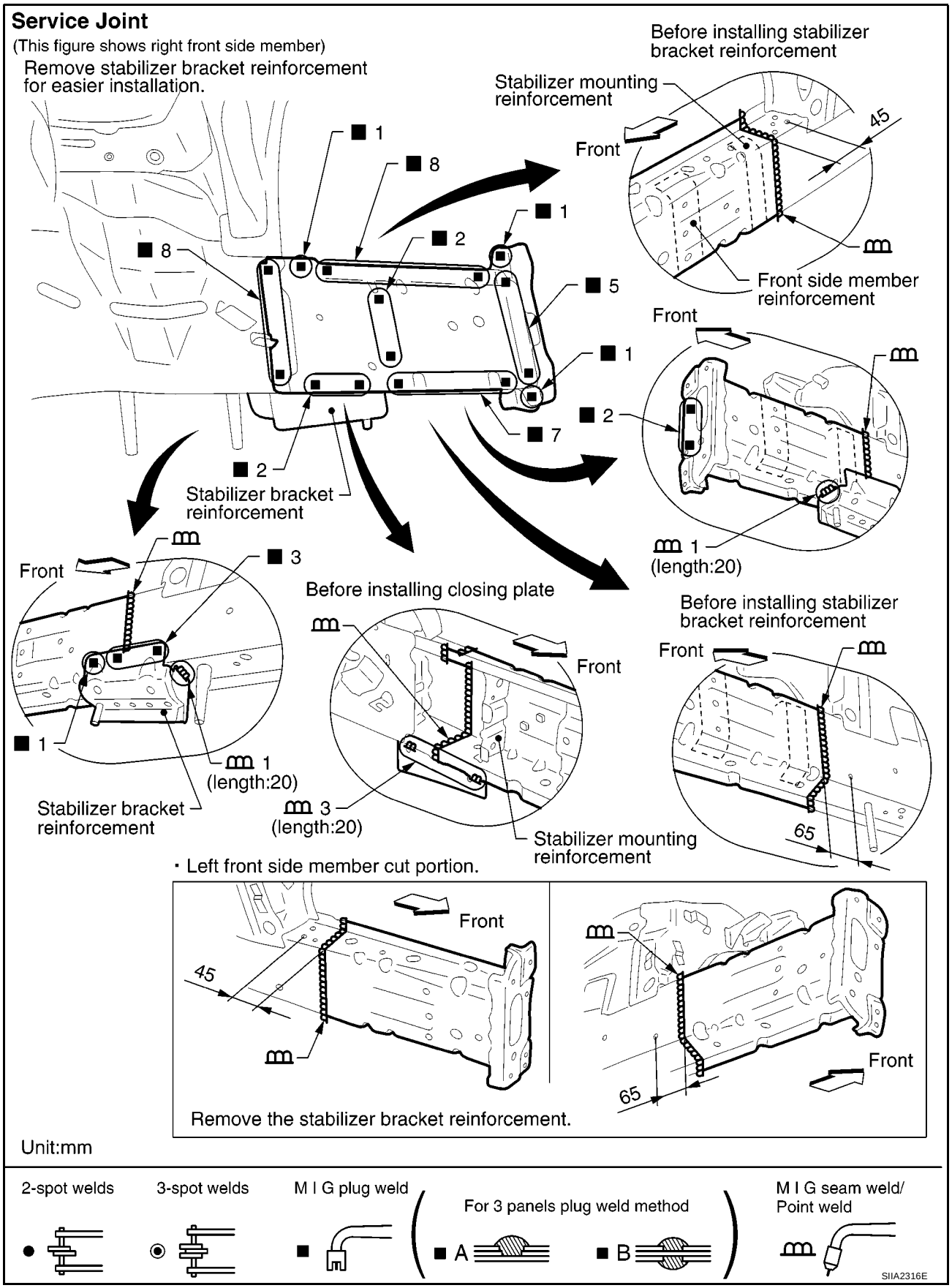
- Work after hoodledge has been removed.



Change parts

- Front side member assembly (LH)
- Front side member outrigger assembly (LH)
- Front side member closing plate assembly (LH)
- Front side member rear reinforcement (LH)

FRONT SIDE MEMBER (PARTIAL REPLACEMENT) (ROADSTER)

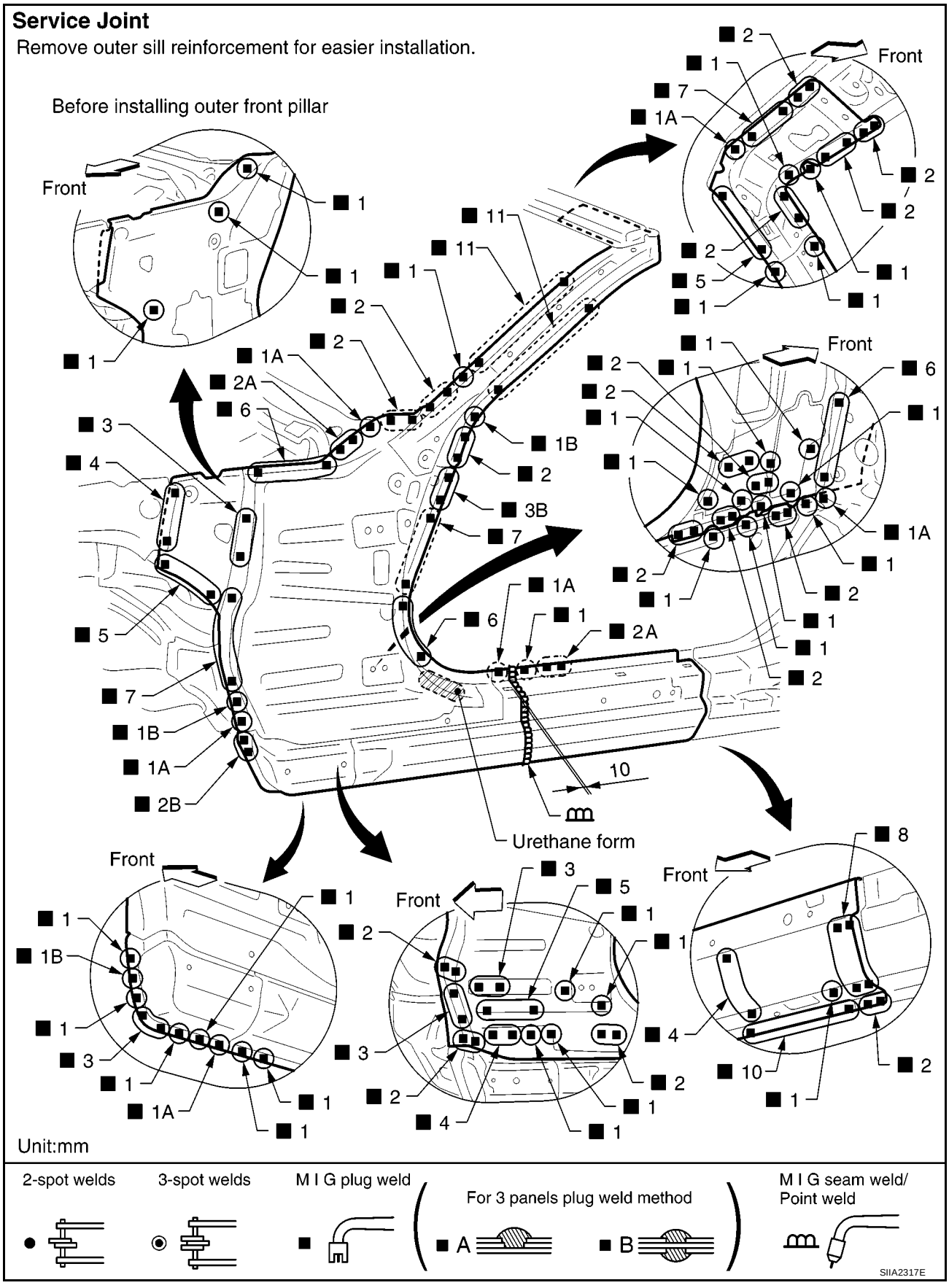


Change parts

- Front side member assembly (RH)
- Front side member front closing plate (RH)
- Outer front towing hook bracket (RH)

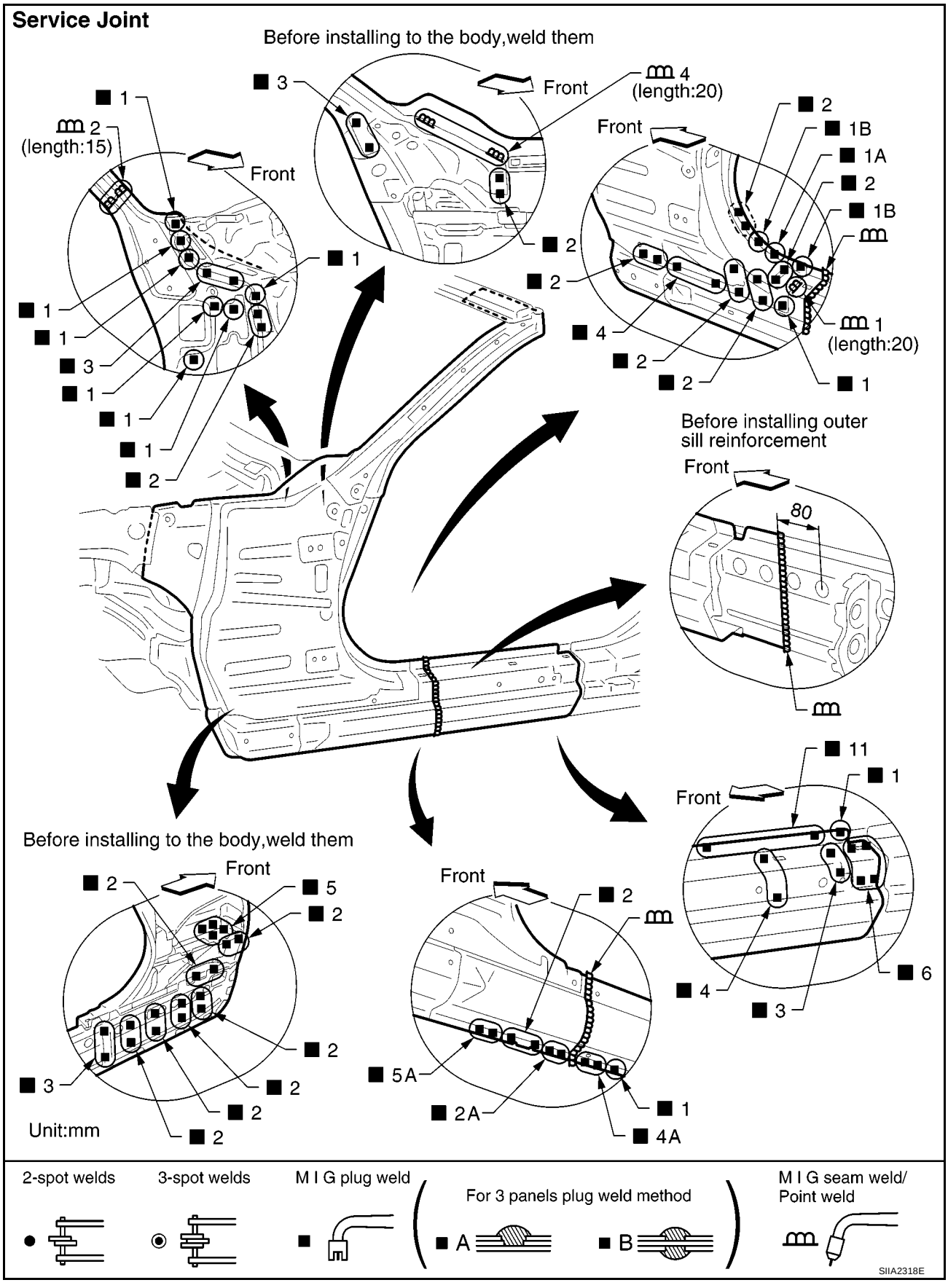
FRONT PILLAR (ROADSTER)

- Work after hoodledge reinforcement has been removed.



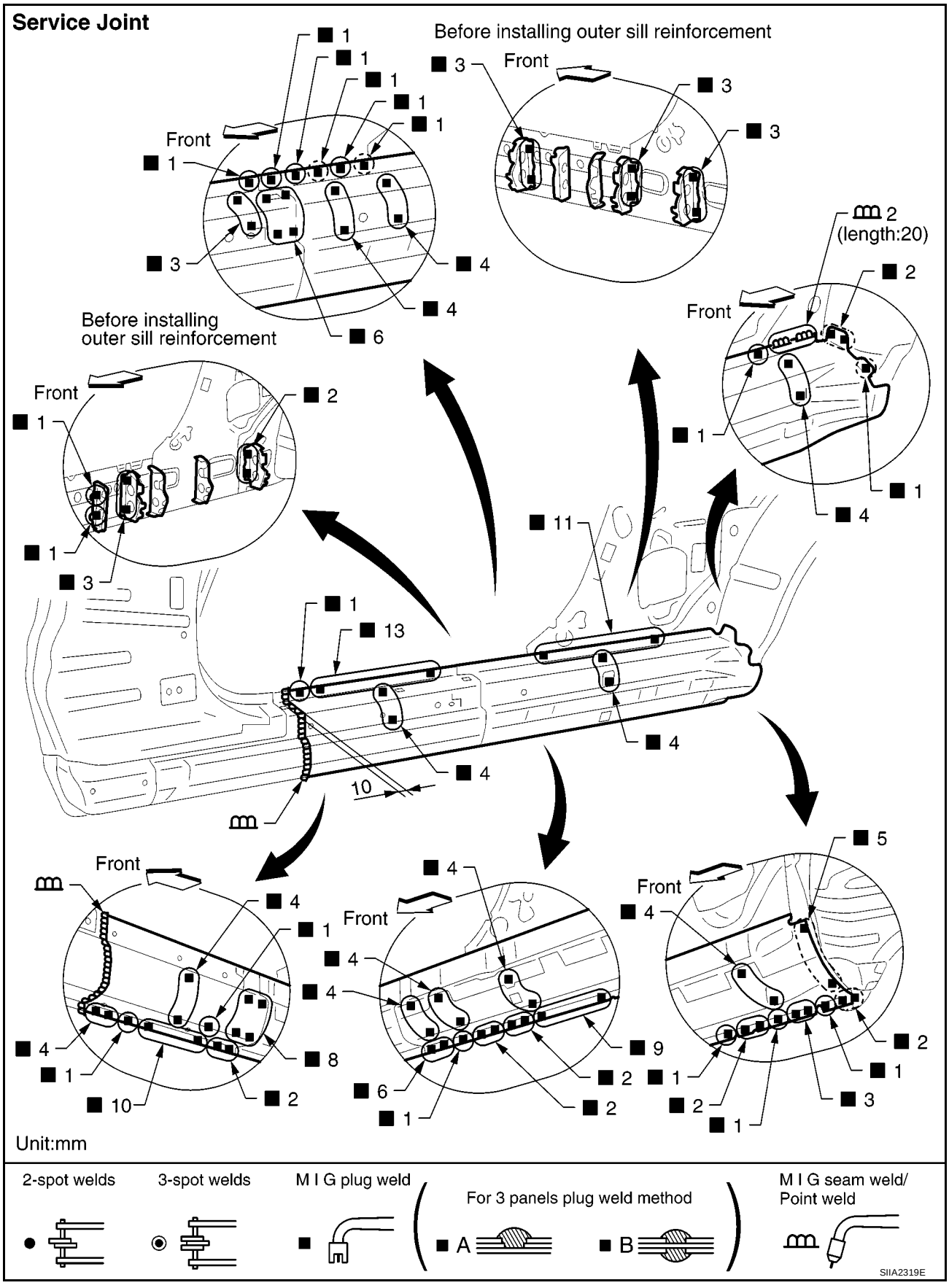
Change parts

- Outer front pillar assembly (LH)
- Outer front sill reinforcement assembly (LH)
- Inner side roof rail (LH)
- Upper rear hoodledge (LH)
- Lower front pillar reinforcement assembly (LH)



OUTER SILL (ROADSTER)

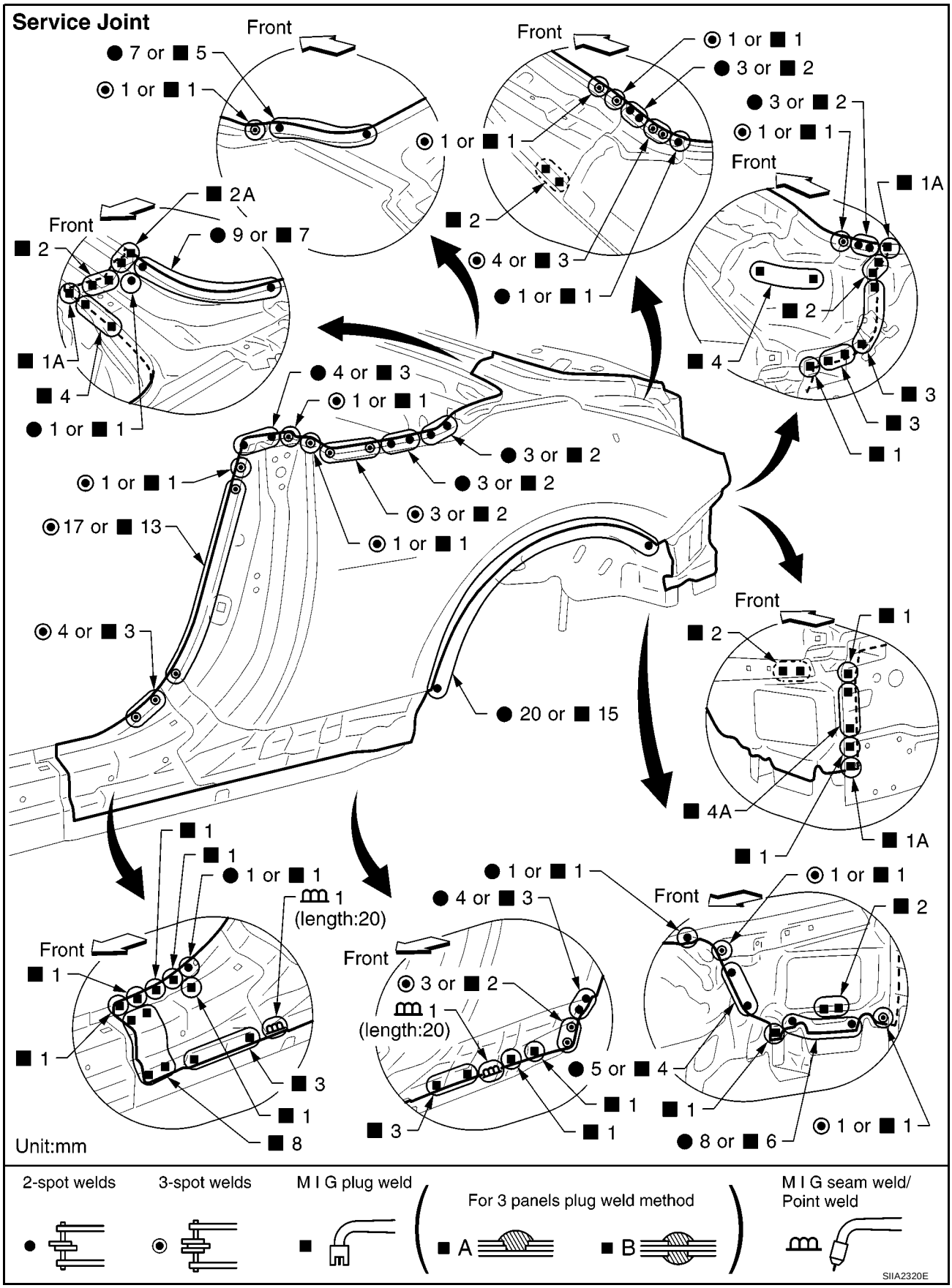
- Work after rear fender, lock pillar reinforcement and rear side waist reinforcement have been removed.



Change parts

- Outer front sill reinforcement assembly (LH)
- Outer rear sill reinforcement assembly (LH)

REAR FENDER (ROADSTER)



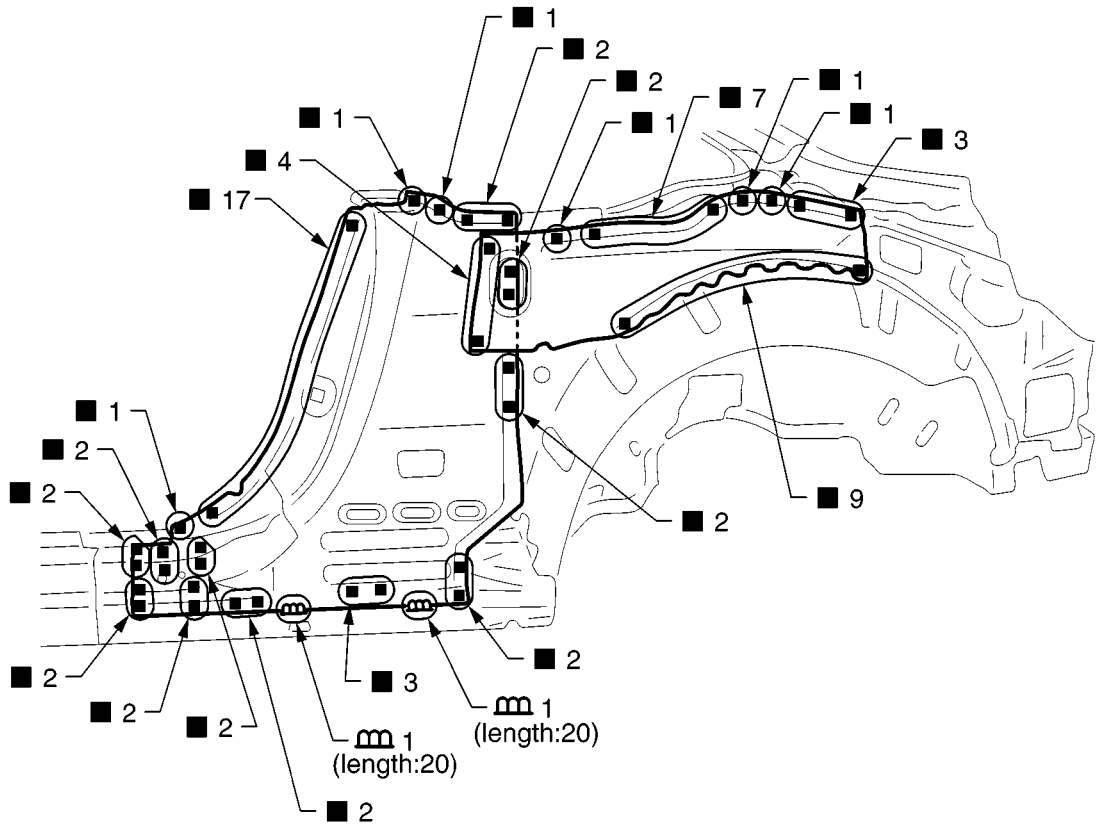
Change parts

- ● Rear fender assembly (LH)

LOCK PILLAR REINFORCEMENT (ROADSTER)

- Work after rear fender has been removed.

Service Joint



Unit:mm

2-spot welds ● | 3-spot welds ◉ | M I G plug weld ■ | For 3 panels plug weld method (■ A | ■ B) | M I G seam weld/ Point weld

SIIA2321E

Change parts

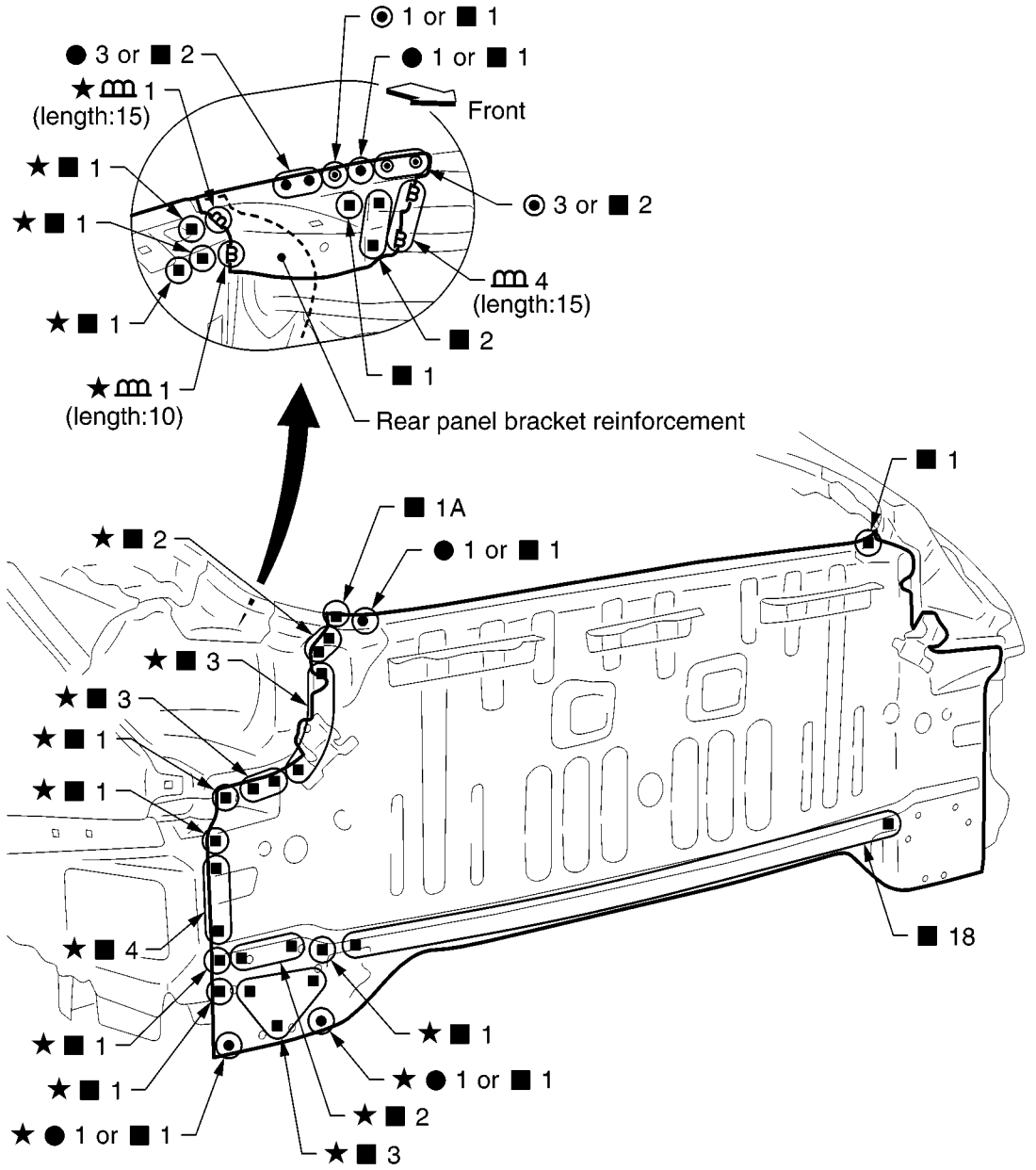
- Outer lock pillar reinforcement (LH)
- Rear side waist reinforcement (LH)

REAR PANEL (ROADSTER)

Service Joint

Remove rear panel bracket reinforcement for easier installation.

★ indicates that there is an equivalent welding portion with the same dimensions on the opposite side.



Unit:mm

2-spot welds ● | 3-spot welds ◉ | M I G plug weld ■ | For 3 panels plug weld method (■ A, ■ B) | M I G seam weld/ Point weld

SIIA2322E

Change parts

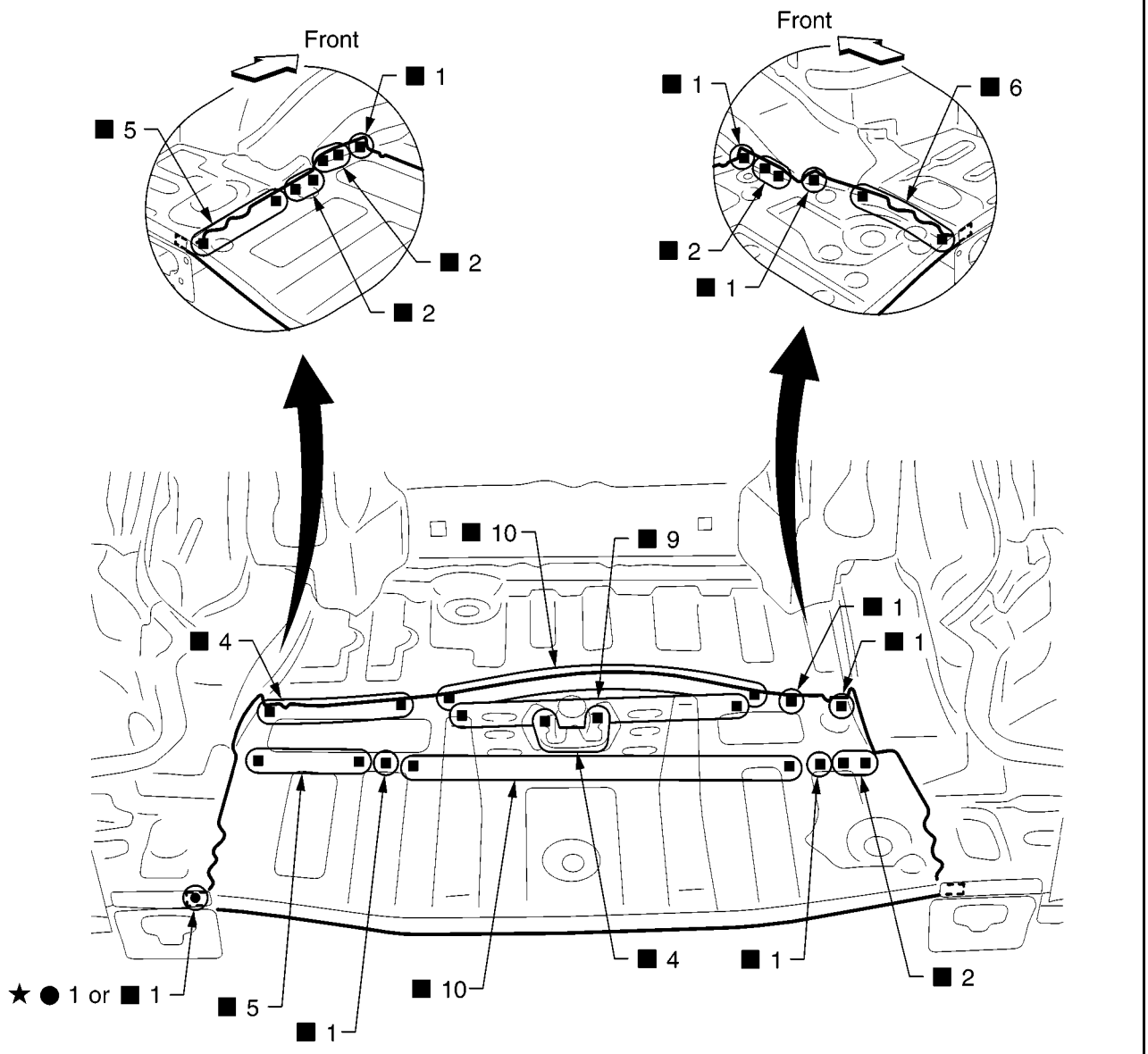
- ● Rear panel assembly

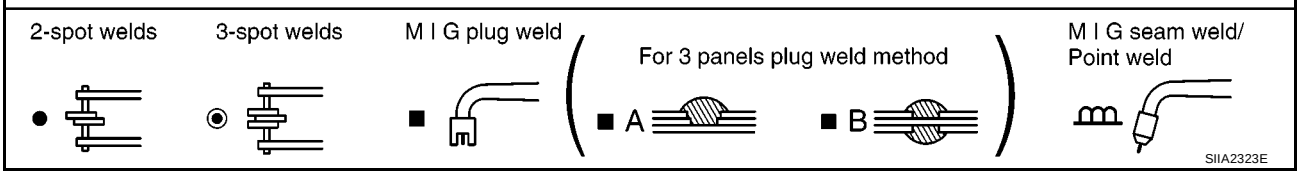
REAR FLOOR REAR (ROADSTER)

- Work after rear panel assembly has been removed.

Service Joint

★ indicates that there is an equivalent welding portion with the same dimensions on the opposite side.





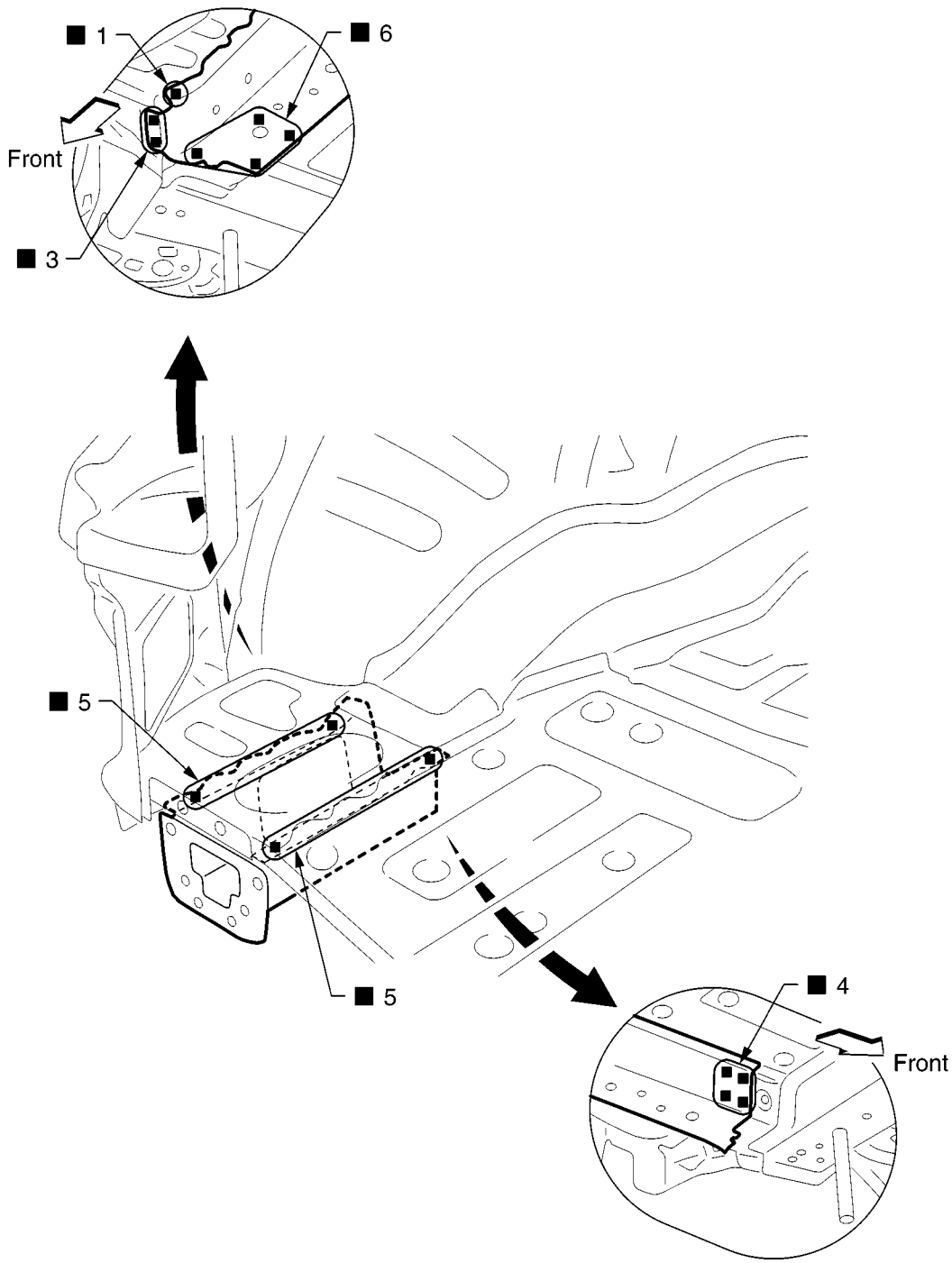
Change parts

- Rear floor rear
- Spare tire clamp bracket

REAR SIDE MEMBER EXTENSION (ROADSTER)

- Work after rear panel assembly has been removed.

Service Joint



Change parts

- Rear side member extension (LH)

SECTION GW

GLASSES, WINDOW SYSTEM & MIRRORS

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

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The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

AIS001OY

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Handling for Adhesive and Primer

AIS000EW

- Do not use an adhesive which is past its usable date. Shelf life of this product is limited to six months after the date of manufacture. Carefully adhere to the expiration or manufacture date printed on the box.
- Keep primers and adhesive in a cool, dry place. Ideally, they should be stored in a refrigerator.
- Open the seal of the primer and adhesive just before application. Discard the remainder.
- Before application, be sure to shake the primer container to stir the contents. If any floating material is found, do not use it.
- If any primer or adhesive contacts the skin, wipe it off with gasoline or equivalent and wash the skin with soap.
- When using primer and adhesive, always observe the precautions in the instruction manual.

Wiring Diagrams and Trouble Diagnosis

AIS000EX

When you read wiring diagrams, refer to the following:

- GI-15, "How to Read Wiring Diagrams"
- PG-4, "POWER SUPPLY ROUTING CIRCUIT"

When you perform trouble diagnosis, refer to the following:

- GI-11, "HOW TO FOLLOW TEST GROUPS IN TROUBLE DIAGNOSES"
- GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident"

Check for any service bulletins before servicing the vehicle.

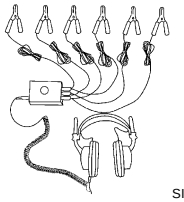
PREPARATION

PFP:00002

Special Service Tools

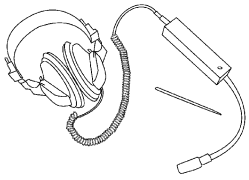
AIS000EY

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
(J39570) Chassis ear  SIIA0993E	Locating the noise
(J43980) NISSAN Squeak and Rattle Kit SIIA0994E	Repairing the cause of noise

Commercial Service Tools

AIS000EZ

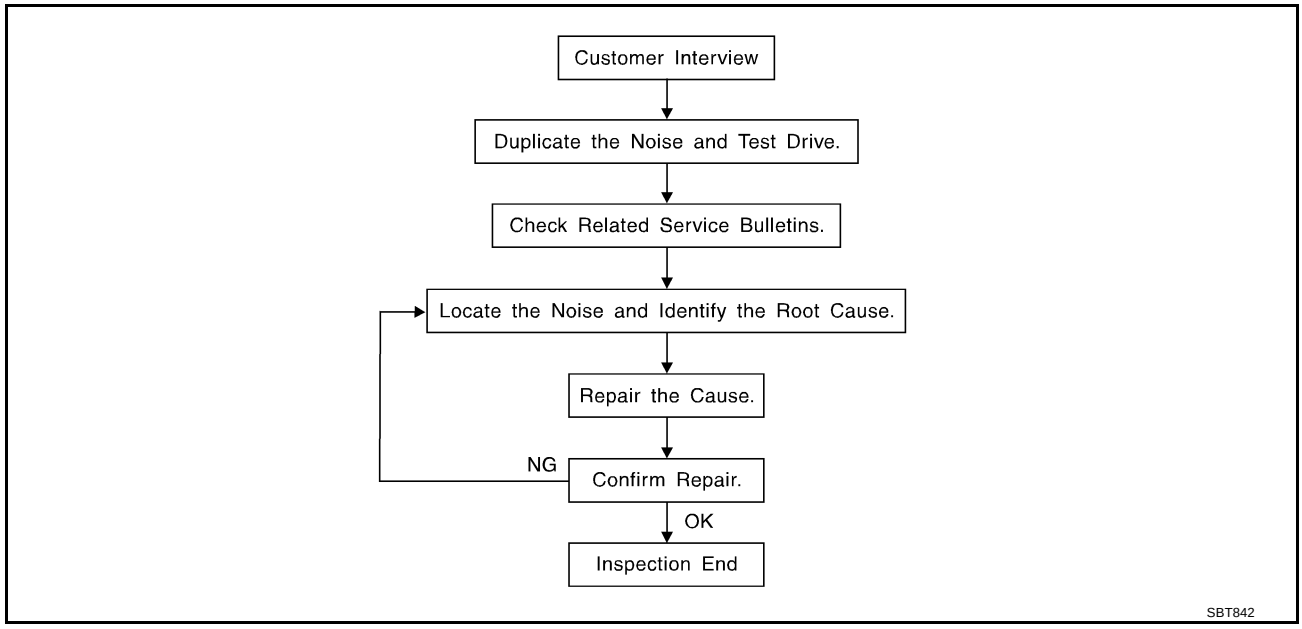
Tool name	Description
Engine ear  SIIA0995E	Locating the noise

SQUEAK AND RATTLE TROUBLE DIAGNOSES

PFP:00000

Work Flow

AIS000F0



CUSTOMER INTERVIEW

Interview the customer if possible, to determine the conditions that exist when the noise occurs. Use the Diagnostic Worksheet during the interview to document the facts and conditions when the noise occurs and any customer's comments; refer to GW-9, "Diagnostic Worksheet" . This information is necessary to duplicate the conditions that exist when the noise occurs.

- The customer may not be able to provide a detailed description or the location of the noise. Attempt to obtain all the facts and conditions that exist when the noise occurs (or does not occur).
- If there is more than one noise in the vehicle, be sure to diagnose and repair the noise that the customer is concerned about. This can be accomplished by test driving the vehicle with the customer.
- After identifying the type of noise, isolate the noise in terms of its characteristics. The noise characteristics are provided so the customer, service adviser and technician are all speaking the same language when defining the noise.
- Squeak —(Like tennis shoes on a clean floor)
  Squeak characteristics include the light contact/fast movement/brought on by road conditions/hard surfaces=higher pitch noise/softer surfaces=lower pitch noises/edge to surface=chirping
- Creak—(Like walking on an old wooden floor)
  Creak characteristics include firm contact/slow movement/twisting with a rotational movement/pitch dependent on materials/often brought on by activity.
- Rattle—(Like shaking a baby rattle)
  Rattle characteristics include the fast repeated contact/vibration or similar movement/loose parts/missing clip or fastener/incorrect clearance.
- Knock —(Like a knock on a door)
  Knock characteristics include hollow sounding/sometimes repeating/often brought on by driver action.
- Tick—(Like a clock second hand)
  Tick characteristics include gentle contacting of light materials/loose components/can be caused by driver action or road conditions.
- Thump—(Heavy, muffled knock noise)
  Thump characteristics include softer knock/dead sound often brought on by activity.
- Buzz—(Like a bumble bee)
  Buzz characteristics include high frequency rattle/firm contact.
- Often the degree of acceptable noise level will vary depending upon the person. A noise that you may judge as acceptable may be very irritating to the customer.
- Weather conditions, especially humidity and temperature, may have a great effect on noise level.

DUPLICATE THE NOISE AND TEST DRIVE

If possible, drive the vehicle with the customer until the noise is duplicated. Note any additional information on the Diagnostic Worksheet regarding the conditions or location of the noise. This information can be used to duplicate the same conditions when you confirm the repair.
If the noise can be duplicated easily during the test drive, to help identify the source of the noise, try to duplicate the noise with the vehicle stopped by doing one or all of the following:

1) Close a door.
2) Tap or push/pull around the area where the noise appears to be coming from.
3) Rev the engine.
4) Use a floor jack to recreate vehicle “twist”.
5) At idle, apply engine load (electrical load, half-clutch on M/T models, drive position on A/T models).
6) Raise the vehicle on a hoist and hit a tire with a rubber hammer.

- Drive the vehicle and attempt to duplicate the conditions the customer states exist when the noise occurs.
- If it is difficult to duplicate the noise, drive the vehicle slowly on an undulating or rough road to stress the vehicle body.

CHECK RELATED SERVICE BULLETINS

After verifying the customer concern or symptom, check ASIST for Technical Service Bulletins (TSBs) related to that concern or symptom.
If a TSB relates to the symptom, follow the procedure to repair the noise.

LOCATE THE NOISE AND IDENTIFY THE ROOT CAUSE

1. Narrow down the noise to a general area. To help pinpoint the source of the noise, use a listening tool (Chassis Ear: J39570, Engine Ear and mechanics stethoscope).
2. Narrow down the noise to a more specific area and identify the cause of the noise by:

- removing the components in the area that you suspect the noise is coming from.
  Do not use too much force when removing clips and fasteners, otherwise clips and fastener can be broken or lost during the repair, resulting in the creation of new noise.
- tapping or pushing/pulling the component that you suspect is causing the noise.
  Do not tap or push/pull the component with excessive force, otherwise the noise will be eliminated only temporarily.
- feeling for a vibration with your hand by touching the component(s) that you suspect is (are) causing the noise.
- placing a piece of paper between components that you suspect are causing the noise.
- looking for loose components and contact marks.
  Refer to GW-7, "Generic Squeak and Rattle Troubleshooting" .

REPAIR THE CAUSE

- If the cause is a loose component, tighten the component securely.
- If the cause is insufficient clearance between components:
  - separate components by repositioning or loosening and retightening the component, if possible.
  - insulate components with a suitable insulator such as urethane pads, foam blocks, felt cloth tape or urethane tape. A Nissan Squeak and Rattle Kit (J43980) is available through your authorized Nissan Parts Department.

CAUTION:
Do not use excessive force as many components are constructed of plastic and may be damaged.
Always check with the Parts Department for the latest parts information.
The following materials are contained in the Nissan Squeak and Rattle Kit (J43980). Each item can be ordered separately as needed.
URETHANE PADS [1.5 mm (0.059 in) thick]
Insulates connectors, harness, etc.
76268-9E005: 100 × 135 mm (3.94 × 5.31 in)/76884-71L01: 60 × 85 mm (2.36 × 3.35 in)/76884-71L02: 15 × 25 mm (0.59 × 0.98 in)
INSULATOR (Foam blocks)
Insulates components from contact. Can be used to fill space behind a panel.
73982-9E000: 45 mm (1.77 in) thick, 50 × 50 mm (1.97 × 1.97 in)/73982-50Y00: 10 mm (0.39 in) thick, 50 × 50 mm (1.97 × 1.97 in)

INSULATOR (Light foam block)
80845-71L00: 30 mm (1.18 in) thick, 30 × 50 mm (1.18 × 1.97 in)
FELT CLOTHTAPE
Used to insulate where movement does not occur. Ideal for instrument panel applications.
68370-4B000: 15 × 25 mm (0.59 × 0.98 in) pad/68239-13E00: 5 mm (0.20 in) wide tape roll. The following materials, not found in the kit, can also be used to repair squeaks and rattles.
UHMW (TEFLON) TAPE
Insulates where slight movement is present. Ideal for instrument panel applications.
SILICONE GREASE
Used in place of UHMW tape that will be visible or not fit.
Note: Will only last a few months.
SILICONE SPRAY
Use when grease cannot be applied.
DUCT TAPE
Use to eliminate movement.

CONFIRM THE REPAIR

Confirm that the cause of a noise is repaired by test driving the vehicle. Operate the vehicle under the same conditions as when the noise originally occurred. Refer to the notes on the Diagnostic Worksheet.

Generic Squeak and Rattle Troubleshooting

AIS000F1

Refer to Table of Contents for specific component removal and installation information.

INSTRUMENT PANEL

Most incidents are caused by contact and movement between:

1. The cluster lid A and instrument panel
2. Acrylic lens and combination meter housing
3. Instrument panel to front pillar garnish
4. Instrument panel to windshield
5. Instrument panel mounting pins
6. Wiring harnesses behind the combination meter
7. A/C defroster duct and duct joint

These incidents can usually be located by tapping or moving the components to duplicate the noise or by pressing on the components while driving to stop the noise. Most of these incidents can be repaired by applying felt cloth tape or silicon spray (in hard to reach areas). Urethane pads can be used to insulate wiring harness.

CAUTION:
Do not use silicone spray to isolate a squeak or rattle. If you saturate the area with silicone, you will not be able to recheck the repair.

CENTER CONSOLE

Components to pay attention to include:

1. Shifter assembly cover to finisher
2. A/C control unit and cluster lid C
3. Wiring harnesses behind audio and A/C control unit

The instrument panel repair and isolation procedures also apply to the center console.

DOORS

Pay attention to the:

1. Finisher and inner panel making a slapping noise
2. Inside handle escutcheon to door finisher
3. Wiring harnesses tapping
4. Door striker out of alignment causing a popping noise on starts and stops

Tapping or moving the components or pressing on them while driving to duplicate the conditions can isolate many of these incidents. You can usually insulate the areas with felt cloth tape or insulator foam blocks from the Nissan Squeak and Rattle Kit (J43980) to repair the noise.

TRUNK

Trunk noises are often caused by a loose jack or loose items put into the trunk by the owner.
In addition look for:

1. Trunk lid dumpers out of adjustment
2. Trunk lid striker out of adjustment
3. The trunk lid torsion bars knocking together
4. A loose license plate or bracket

Most of these incidents can be repaired by adjusting, securing or insulating the item(s) or component(s) causing the noise.

SUNROOF/HEADLINING

Noises in the sunroof/headlining area can often be traced to one of the following:

1. Sunroof lid, rail, linkage or seals making a rattle or light knocking noise
2. Sunvisor shaft shaking in the holder
3. Front or rear windshield touching headlining and squeaking

Again, pressing on the components to stop the noise while duplicating the conditions can isolate most of these incidents. Repairs usually consist of insulating with felt cloth tape.

SEATS

When isolating seat noise it's important to note the position the seat is in and the load placed on the seat when the noise is present. These conditions should be duplicated when verifying and isolating the cause of the noise.
Cause of seat noise include:

1. Headrest rods and holder
2. A squeak between the seat pad cushion and frame
3. The rear seatback lock and bracket

These noises can be isolated by moving or pressing on the suspected components while duplicating the conditions under which the noise occurs. Most of these incidents can be repaired by repositioning the component or applying urethane tape to the contact area.

UNDERHOOD

Some interior noise may be caused by components under the hood or on the engine wall. The noise is then transmitted into the passenger compartment.
Causes of transmitted underhood noise include:

1. Any component mounted to the engine wall
2. Components that pass through the engine wall
3. Engine wall mounts and connectors
4. Loose radiator mounting pins
5. Hood bumpers out of adjustment
6. Hood striker out of adjustment

These noises can be difficult to isolate since they cannot be reached from the interior of the vehicle. The best method is to secure, move or insulate one component at a time and test drive the vehicle. Also, engine RPM or load can be changed to isolate the noise. Repairs can usually be made by moving, adjusting, securing, or insulating the component causing the noise.

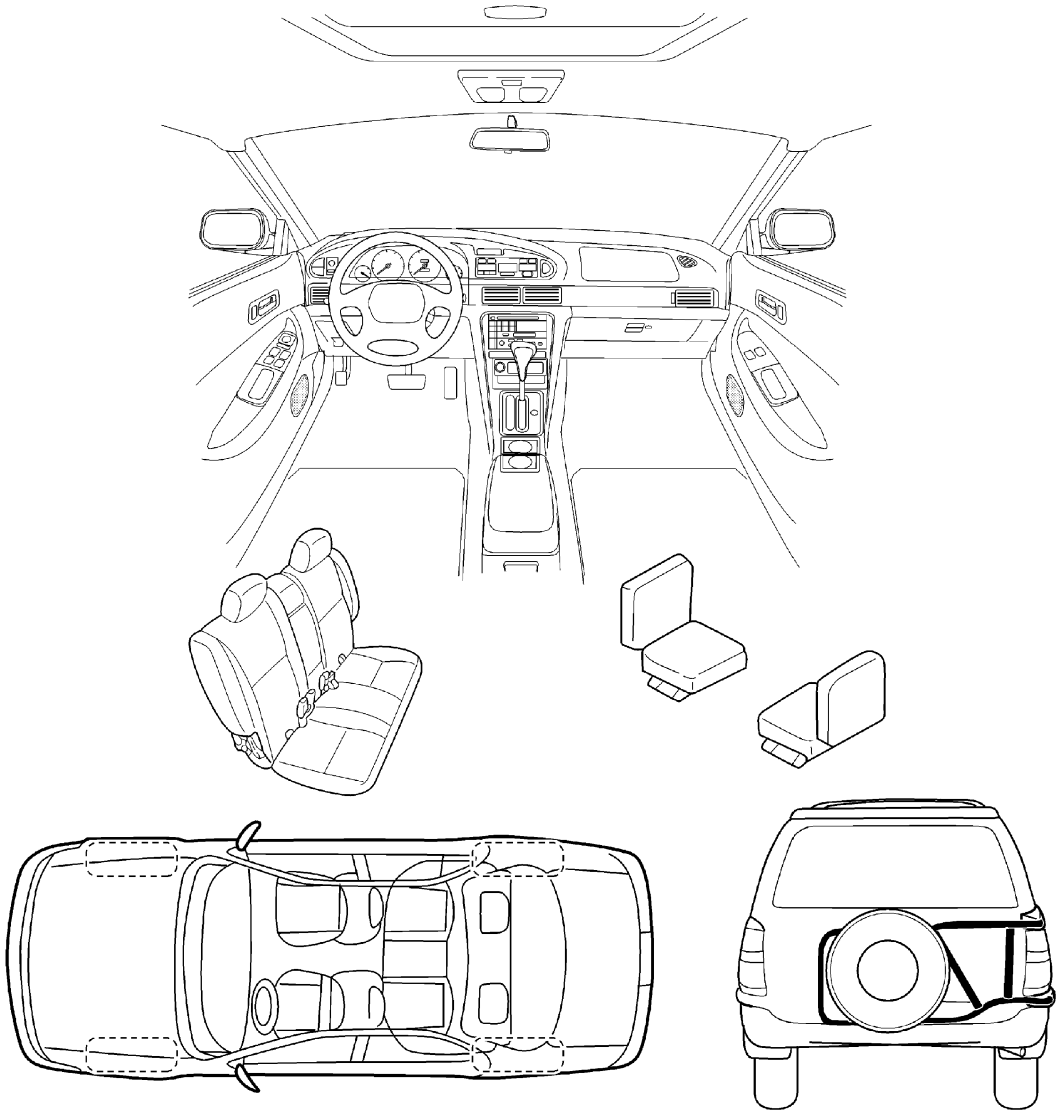
Diagnostic Worksheet

AIS000F2

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET

Dear Nissan Customer:
We are concerned about your satisfaction with your Nissan vehicle. Repairing a squeak or rattle sometimes can be very difficult. To help us fix your Nissan right the first time, please take a moment to note the area of the vehicle where the squeak or rattle occurs and under what conditions. You may be asked to take a test drive with a service advisor or technician to ensure we confirm the noise you are hearing.

I. WHERE DOES THE NOISE COME FROM? (circle the area of the vehicle)
The illustrations are for reference only, and may not reflect the actual configuration of your vehicle.



Continue to the back of the worksheet and briefly describe the location of the noise or rattle. In addition, please indicate the conditions which are present when the noise occurs.

PIIB0723E

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET- page 2

Briefly describe the location where the noise occurs:

_____

_____

II. WHEN DOES IT OCCUR? (check the boxes that apply)

❑ anytime
❑ 1st time in the morning
❑ only when it is cold outside
❑ only when it is hot outside
❑ after sitting out in the sun
❑ when it is raining or wet
❑ dry or dusty conditions
❑ other: _____

III. WHEN DRIVING:

❑ through driveways
❑ over rough roads
❑ over speed bumps
❑ only at about ____ mph
❑ on acceleration
❑ coming to a stop
❑ on turns : left, right or either (circle)
❑ with passengers or cargo
❑ other: _____
❑ after driving ____ miles or ____ minutes

IV. WHAT TYPE OF NOISE?

❑ squeak (like tennis shoes on a clean floor)
❑ creak (like walking on an old wooden floor)
❑ rattle (like shaking a baby rattle)
❑ knock (like a knock on a door)
❑ tick (like a clock second hand)
❑ thump (heavy, muffled knock noise)
❑ buzz (like a bumble bee)

TO BE COMPLETED BY DEALERSHIP PERSONNEL
Test Drive Notes:

_____

_____

	YES	NO	Initials of person performing
Vehicle test driven with customer	❑	❑	_____
- Noise verified on test drive	❑	❑	
- Noise source located and repaired	❑	❑	_____
- Follow up test drive performed to confirm repair	❑	❑	_____

VIN: _____ Customer Name: _____

W.O. #: _____ Date: _____

This form must be attached to Work Order

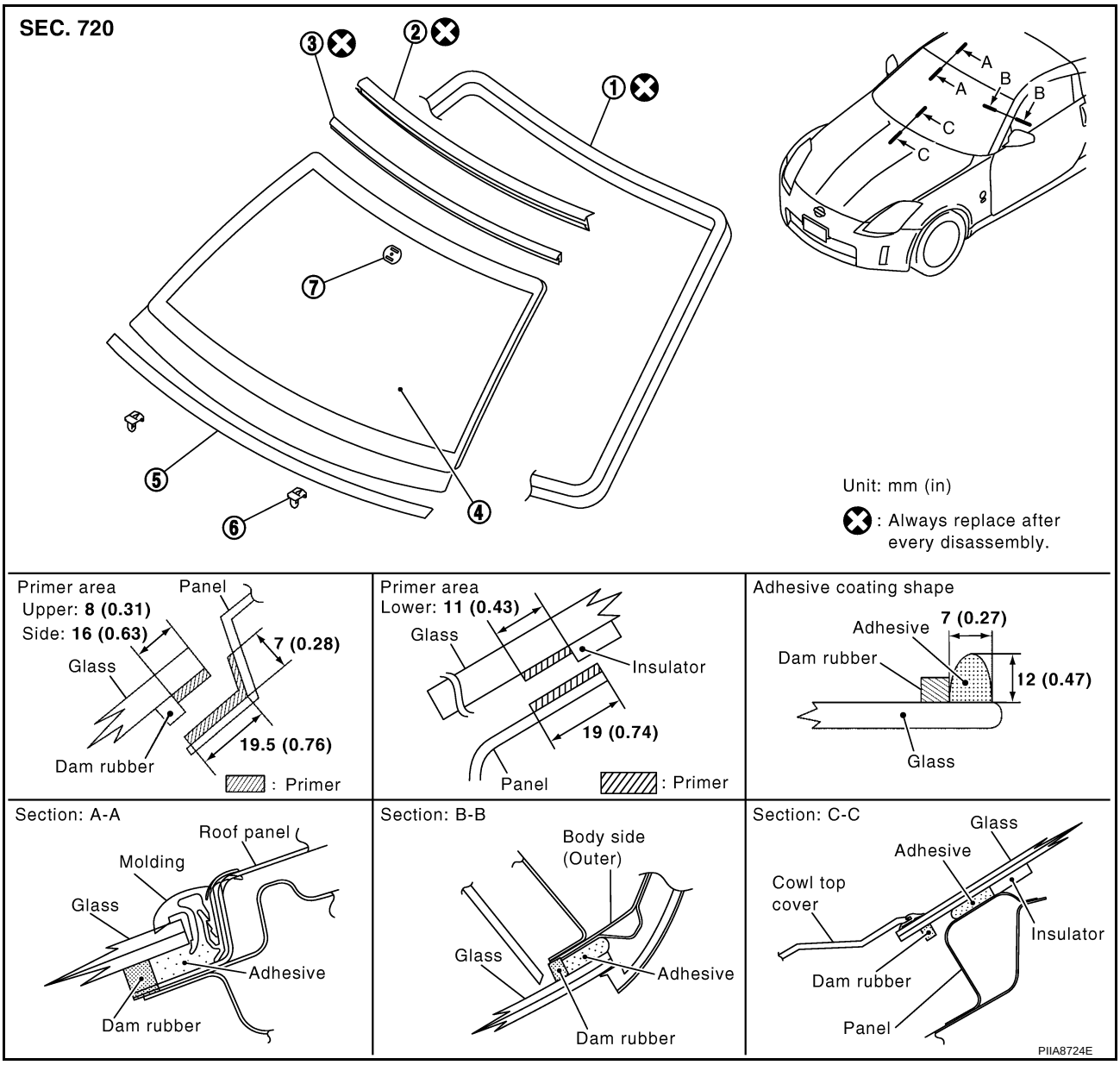
SBT844

WINDSHIELD GLASS

PFP:72712

Removal and Installation

AIS000F3



1. Dam rubber
2. Fastener
3. Molding (upper)
4. Windshield glass
5. Insulator
6. Spacer
7. Mirror base

REMOVAL (COUPE)

1. Remove the front pillar finisher. Refer to EI-31, "Removal and Installation (for Coupe Models)" .
2. Partially remove the headlining (front edge). Refer to EI-44, "Removal and Installation (for Coupe Models)" .
3. Remove the front pillar garnish. Refer to EI-35, "Removal and Installation (for Coupe Models)" .
4. Remove the front wiper arms. Refer to WW-31, "Removal and Installation for Front Wiper Arms, Adjustment for Wiper Arms Stop Location" .
5. Remove the cowl top cover. Refer to EI-20, "COWL TOP" .
6. Apply a protective tape around the windshield glass to protect the painted surface from damage.

After removing moldings, remove glass using piano wire or power cutting tool and an inflatable pump bag.

- If a windshield glass is to be reused, mark the body and the glass with mating marks.

WARNING:

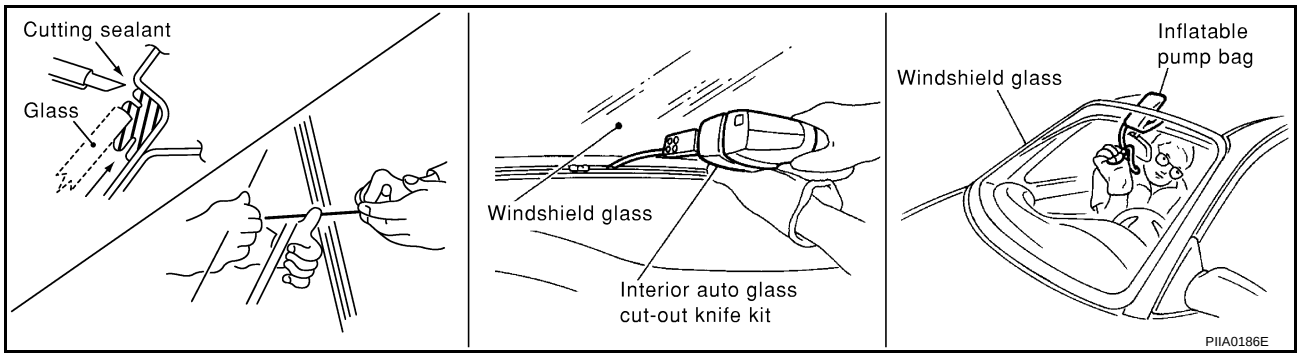
When cutting the glass from the vehicle, always wear safety glasses and heavy gloves to help prevent glass splinters from entering your eyes or cutting your hands.

CAUTION:

- **When a windshield glass is to be reused, do not use a cutting knife or power cutting tool.**
- **Be careful not to scratch the glass when removing.**

NOTE:

Do not set or stand the glass on its edge. Small chips may develop into cracks.



REMOVAL (ROADSTER)

1. Open the soft top.
2. Remove the front pillar finisher. Refer to EI-32, "Removal and Installation (for Roadster Models)" .
3. Remove the roof front finisher. Refer to EI-45, "Removal and Installation (for Roadster Models)" .
4. Remove the front pillar garnish. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
5. Remove the front wiper arms. Refer to WW-31, "Removal and Installation for Front Wiper Arms, Adjustment for Wiper Arms Stop Location" .
6. Remove the cowl top cover. Refer to EI-20, "COWL TOP" .
7. Apply a protective tape around the windshield glass to protect the painted surface from damage.

After removing moldings, remove glass using piano wire or power cutting tool and an inflatable pump bag.

- If a windshield glass is to be reused, mark the body and the glass with mating marks.

WARNING:

When cutting the glass from the vehicle, always wear safety glasses and heavy gloves to help prevent glass splinters from entering your eyes or cutting your hands.

CAUTION:

- **When a windshield glass is to be reused, do not use a cutting knife or power cutting tool.**
- **Be careful not to scratch the glass when removing.**

NOTE:

Do not set or stand the glass on its edge. Small chips may develop into cracks.

INSTALLATION

- Use a genuine Nissan Urethane Adhesive Kit or equivalent and follow the instructions furnished with it.
- While the urethane adhesive is curing, open a door window. This will prevent the glass from being forced out by passenger compartment air pressure when a door is closed.
- The molding must be installed securely so that it is in position and leaves no gap.
- Inform the customer that the vehicle should remain stationary until the urethane adhesive has completely cured (preferably 24 hours). Curing time varies with temperature and humidity.

WARNING:

- **Keep heat and open flames away as primers and adhesive are flammable.**
- **The materials contained in the kit are harmful if swallowed, and may irritate skin and eyes. Avoid contact with the skin and eyes.**
- **Use in an open, well ventilated location. Avoid breathing the vapors. They can be harmful if inhaled. If affected by vapor inhalation, immediately move to an area with fresh air.**
- **Driving the vehicle before the urethane adhesive has completely cured may affect the performance of the windshield in case of an accident.**

CAUTION:

- **Do not use an adhesive which is past its usable term. Shelf life of this product is limited to six months after the date of manufacture. Carefully adhere to the expiration or manufacture date printed on the box.**
- **Keep primers and adhesive in a cool, dry place. Ideally, they should be stored in a refrigerator.**
- **Do not leave primers or adhesive cartridge unattended with their caps open or off.**
- **The vehicle should not be driven for at least 24 hours or until the urethane adhesive has completely cured. Curing time varies depending on temperature and humidity. The curing time will increase under lower temperature and lower humidity.**

Repairing Water Leaks

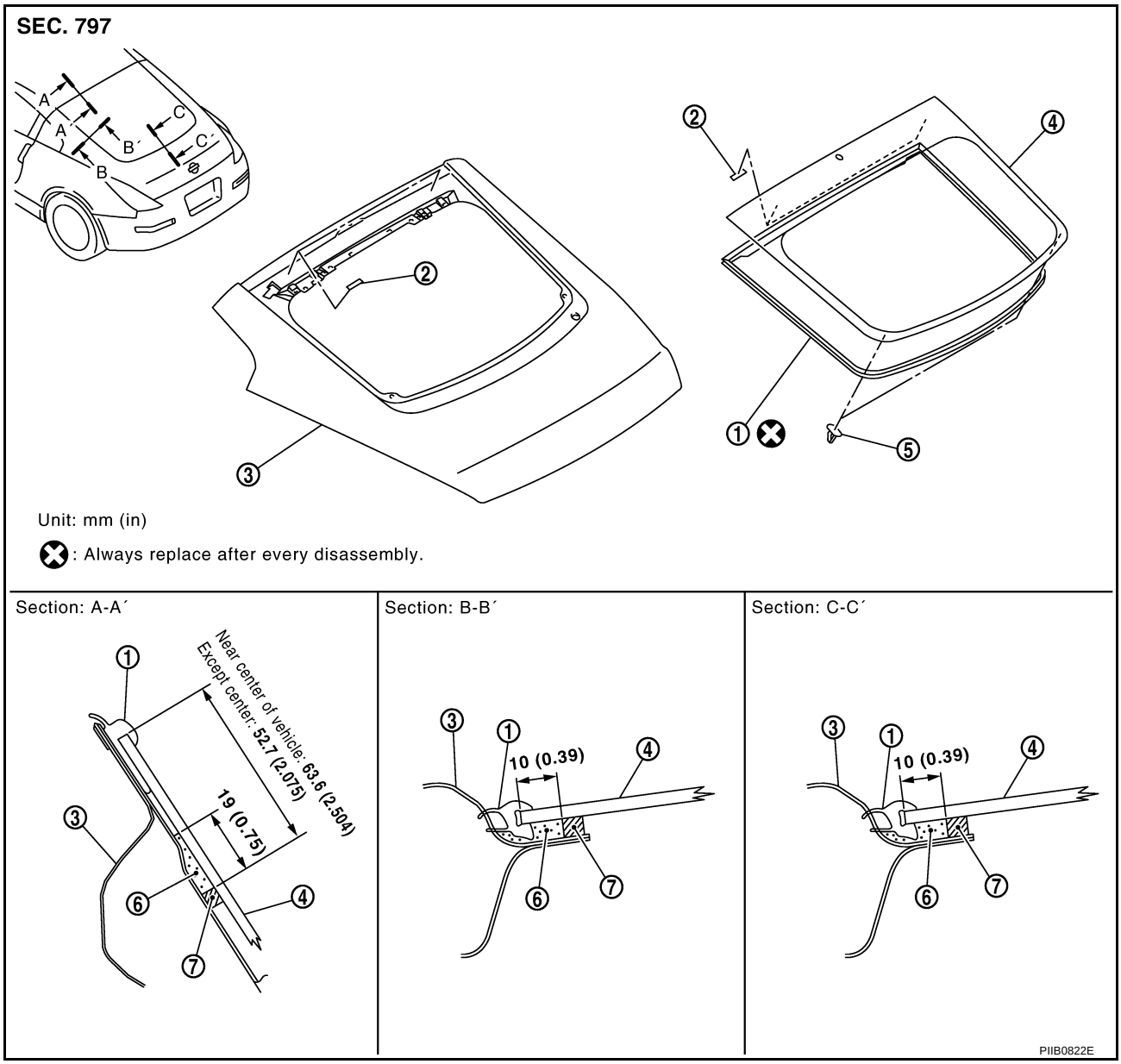
Leaks can be repaired without removing and reinstalling glass.
If water is leaking between the urethane adhesive material and body or glass, determine the extent of leakage. This can be done by applying water to the windshield area while pushing glass outward.
To stop the leak, apply primer (if necessary) and then urethane adhesive to the leak point.

BACK DOOR WINDOW GLASS

PFP:90300

Removal and Installation

AIS0015Q



1. Back door window molding
2. Dual lock fastener
3. Back door
4. Back door window glass
5. Holder
6. Adhesive
7. Dam rubber

REMOVAL

1. Remove back door finisher. Refer to EI-47, "BACK DOOR FINISHER" .
2. Remove rear wiper arm. Refer to WW-49, "Removal and Installation for Rear Wiper Arm, Adjustment for Wiper Arms Stop Location" .
3. Remove connectors and grounds for rear window defogger.
4. Apply a protective tape around the back door window glass to protect the painted surface from damage. remove glass using piano wire or power cutting tool and an inflatable pump bag.

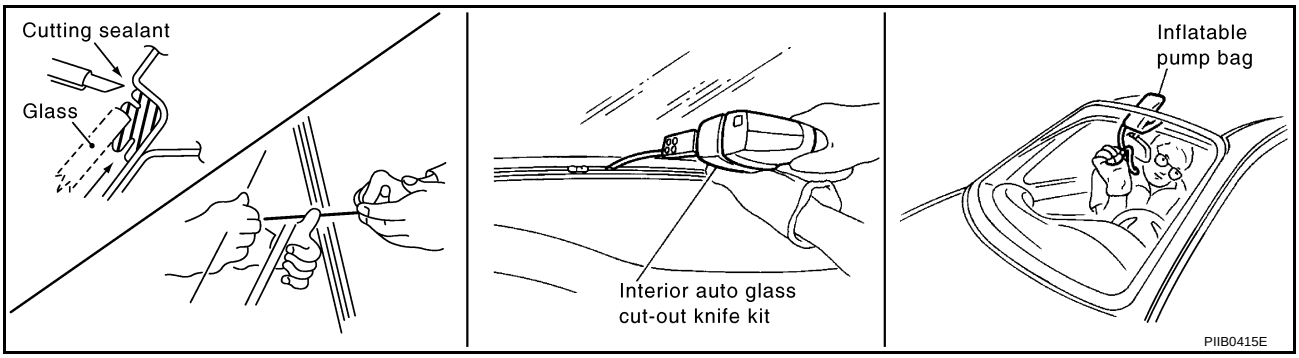
- If a back door window glass is to be reused, mark the body and the glass with mating marks.

WARNING:

When cutting the glass from the vehicle, always wear safety glasses and heavy gloves to help prevent glass splinters from entering your eyes or cutting your hands.

CAUTION:

- **When a back door window glass is to be reused, do not use a cutting knife or power cutting tool.**
- **Be careful not to scratch the glass when removing.**
- **Do not set or stand the glass on its edge. Small chips may develop into cracks.**



INSTALLATION

- Use a genuine Nissan Urethane Adhesive Kit or equivalent and follow the instructions furnished with it.
- While the urethane adhesive is curing, open a door window. This will prevent the glass from being forced out by passenger compartment air pressure when a door is closed.
- Inform the customer that the vehicle should remain stationary until the urethane adhesive has completely cured (preferably 24 hours). Curing time varies with temperature and humidity.

WARNING:

- **Keep heat and open flames away as primers and adhesive are flammable.**
- **The materials contained in the kit are harmful if swallowed, and may irritate skin and eyes. Avoid contact with the skin and eyes.**
- **Use in an open, well ventilated location. Avoid breathing the vapors. They can be harmful if inhaled. If affected by vapor inhalation, immediately move to an area with fresh air.**
- **Driving the vehicle before the urethane adhesive has completely cured may affect the performance of the back door window in case of an accident.**

CAUTION:

- **Do not use an adhesive which is past its usable term. Shelf life of this product is limited to six months after the date of manufacture. Carefully adhere to the expiration or manufacture date printed on the box.**
- **Keep primers and adhesive in a cool, dry place. Ideally, they should be stored in a refrigerator.**
- **Do not leave primers or adhesive cartridge unattended with their caps open or off.**
- **The vehicle should not be driven for at least 24 hours or until the urethane adhesive has completely cured. Curing time varies depending on temperature and humidity. The curing time will increase under lower temperature and lower humidity.**

Repairing Water Leaks

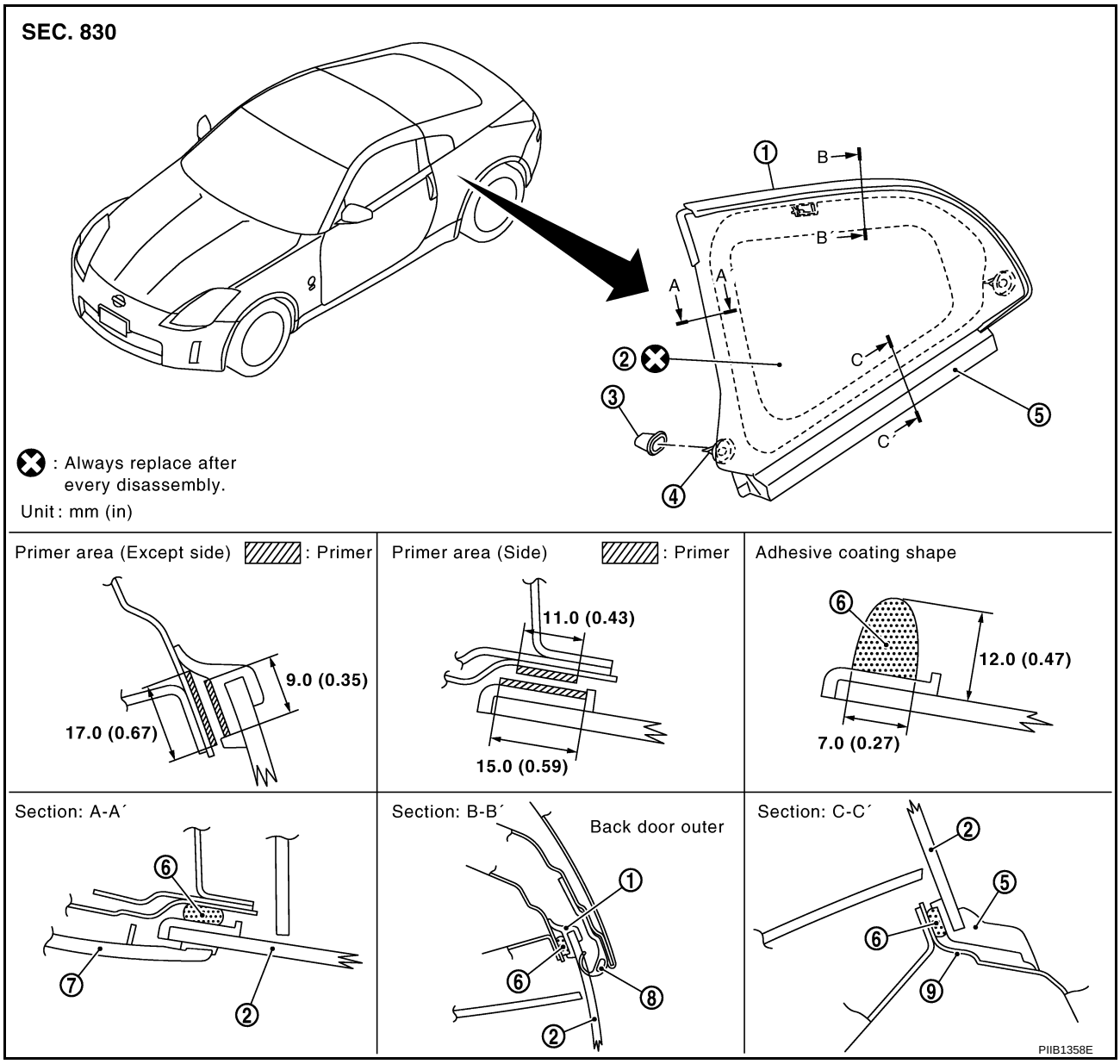
Leaks can be repaired without removing and reinstalling glass.
If water is leaking between the urethane adhesive material and body or glass, determine the extent of leakage. This can be done by applying water to the back door window area while pushing glass outward.
To stop the leak, apply primer (if necessary) and then urethane adhesive to the leak point.

SIDE WINDOW GLASS

PFP:83300

Removal and Installation

AIS001NV



1. Side window glass molding (upper)
2. Side window glass
3. Grommet
4. Clip
5. Side window glass molding (lower)
6. Adhesive
7. Lock pillar finisher
8. Back door molding
9. Rear fender

REMOVAL

1. Remove rear side finisher. Refer to EI-35, "BODY SIDE TRIM" .
2. Remove rear pillar finisher. Refer to EI-35, "BODY SIDE TRIM" .
3. Remove headlining. Refer to EI-44, "HEADLINING" .
4. Remove lock pillar finisher. Refer to EI-31, "ROOF SIDE MOLDING" .

- If a side window glass is to be reused, mark the body and the glass with mating marks.

WARNING:

When cutting the glass from the vehicle, always wear safety glasses and heavy gloves to help prevent glass splinters from entering your eyes or cutting your hands.

CAUTION:

- **Be careful not to scratch the glass when removing.**
- **Do not set or stand the glass on its edge. Small chips may develop into cracks.**

INSTALLATION

- Use a genuine Nissan Urethane Adhesive Kit or equivalent and follow the instructions furnished with it.
- While the urethane adhesive is curing, open a door window. This will prevent the glass from being forced out by passenger compartment air pressure when a door is closed.
- The molding must be installed securely so that it is in position and leaves no gap.
- Inform the customer that the vehicle should remain stationary until the urethane adhesive has completely cured (preferably 24 hours). Curing time varies with temperature and humidity.

WARNING:

- **Keep heat and open flames away as primers and adhesive are flammable.**
- **The materials contained in the kit are harmful if swallowed, and may irritate skin and eyes. Avoid contact with the skin and eyes.**
- **Use in an open, well ventilated location. Avoid breathing the vapors. They can be harmful if inhaled. If affected by vapor inhalation, immediately move to an area with fresh air.**
- **Driving the vehicle before the urethane adhesive has completely cured may affect the performance of the side window in case of an accident.**

CAUTION:

- **Do not use an adhesive which is past its usable term. Shelf life of this product is limited to six months after the date of manufacture. Carefully adhere to the expiration or manufacture date printed on the box.**
- **Keep primers and adhesive in a cool, dry place. Ideally, they should be stored in a refrigerator.**
- **Do not leave primers or adhesive cartridge unattended with their caps open or off.**
- **The vehicle should not be driven for at least 24 hours or until the urethane adhesive has completely cured. Curing time varies depending on temperature and humidity. The curing time will increase under lower temperature and lower humidity.**

Repairing Water Leaks

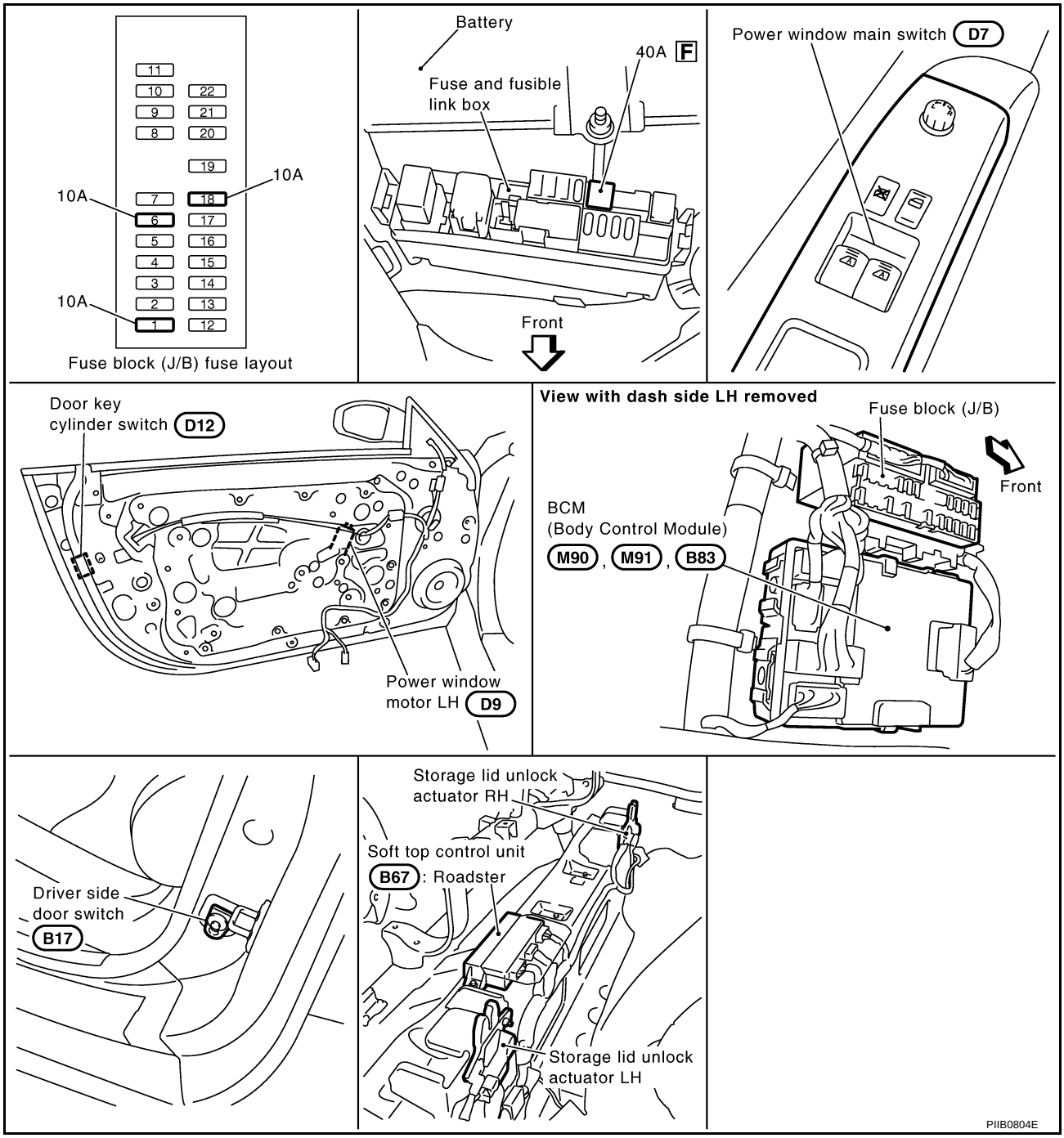
Leaks can be repaired without removing and reinstalling glass.
If water is leaking between the urethane adhesive material and body or glass, determine the extent of leakage. This can be done by applying water to the side window area while pushing glass outward.
To stop the leak, apply primer (if necessary) and then urethane adhesive to the leak point.

POWER WINDOW SYSTEM

PFP:25401

Component Parts and Harness Connector Location

AIS000F5



System Description

AIS000F6

Power is supplied at all times

- through 40A fusible link (letter **F** , located in the fuse and fusible link box)
- to BCM terminal 55.
- through 10A fuse [No. 18, located in the fuse block (J/B)]
- to BCM terminal 42.
- through BCM terminal 54
- to power window main switch terminal 1.
- to power window sub-switch terminal 10.

With ignition switch in ON or START position, power is supplied

- through 10A fuse [No.1, located in the fuse block (J/B)]
- to BCM terminal 38.
- through BCM terminal 53
- to power window main switch terminal 10.

Ground is supplied at all times

- to BCM terminal 52
- through body grounds M30 and M66.
- to power window main switch terminal 15
- through body grounds M30 and M66.
- to power window sub-switch terminal 11
- through body grounds M30 and M66.

MANUAL OPERATION

Driver Side Door

WINDOW UP

When the driver side window switch in the power window main switch is pressed in the up position,
Power is supplied

- through power window main switch terminal 8
- to driver side power window motor terminal 2.

Ground is supplied

- to driver side power window motor terminal 1
- through power window main switch terminal 11.

Then, the motor raises the window until the switch is released.

WINDOW DOWN

When the driver side window switch in the power window main switch is pressed in the down position,
Power is supplied

- through power window main switch terminal 11
- to driver side power window motor terminal 1.

Ground is supplied

- to driver side power window motor terminal 2
- through power window main switch terminal 8.

Then, the motor lowers the window until the switch is released.

Passenger Side Door

POWER WINDOW SUB-SWITCH OPERATION

WINDOW UP

When the power window sub-switch is pressed in the up position,
Power is supplied

- through power window sub-switch terminal 8
- to passenger side power window motor terminal 2.

Ground is supplied

- to passenger side power window motor terminal 1

- through power window sub-switch terminal 9.

Then, the motor raises the window until the switch is released.

WINDOW DOWN

When the power window sub-switch is pressed in the down position,
Power is supplied

- through power window sub-switch terminal 9
- to passenger side power window motor terminal 1.

Ground is supplied

- to passenger side power window motor terminal 2
- through power window sub-switch terminal 8.

Then, the motor lowers the window until the switch is released.

POWER WINDOW MAIN SWITCH OPERATION

Signal is sent

- to power window sub-switch terminal 16
- though power window main switch terminal 12.

The operation of passenger side power window with power window main switch is as same as the operation with power window sub-switch.

POWER WINDOW SERIAL LINK

Power window main switch, power window sub-switch and BCM transmit and receive the signal by power window serial link.
The under mentioned signal is transmitted from BCM to power window main switch.

- Driver side door switch signal
- Keyless power window down signal

The under mentioned signal is transmitted from BCM to power window sub-switch.

- Passenger side door switch signal
- Keyless power window down signal

The under mentioned signal is transmitted from power window main switch to power window sub-switch.

- Passenger side door window operation signal
- Power window control by key cylinder switch signal
- Retained power operation signal
- Power window lock signal

AUTO OPERATION

The power window AUTO feature enables the driver to open or close the window without holding the window switch in the down or up position.

POWER WINDOW LOCK

The power window lock is designed to lock operation of passenger side door window.
When the lock position, power window lock signal is sent by using power window serial link from power window main switch to power window sub-switch.
When power window sub-switch is receiving the lock signal, prohibits the operation of passenger side power window by power window sub-switch.

RETAINED POWER OPERATION

When the ignition switch is turned to the OFF position from ON or START position.
Power is supplied for 45 seconds

- to power window main switch terminal 10
- from BCM terminal 53.

When power and ground are supplied, the BCM continues to be energized, and the power window can be operated.
The retained power operation is canceled when the driver side door is opened.
RAP signal period can be changed by CONSULT-II. Refer to GW-29, "CONSULT-II Inspection Procedure" .

ANTI-PINCH SYSTEM

Power window main switch and power window sub-switch monitors the power window motor operation and the power window position (full closed or other) for driver side and passenger side power window by the signals from encoder and limit switch in power window motor (driver side and passenger side).
When power window main switch detects interruption during the following close operation,

- automatic close operation when ignition switch is in the “ON” position
- automatic close operation during retained power operation
- manual close operation during retained power operation

Power window main switch or power window sub-switch controls each power window motor for open and the power window will be lowered about 150 mm (5.91 in).

POWER WINDOW CONTROL BY THE KEY CYLINDER SWITCH

When ignition key switch is OFF, power window can be opened or closed by turning the door key cylinder UNLOCK / LOCK position more then 1.5 second over condition.

- Power window can be opened as the door key cylinder is kept fully turning to the UNLOCK position.
- Power window can be closed as the door key cylinder is kept fully turning to the LOCK position.

The power window operation by the key cylinder switch stops when the following operations are performed.

- While performing open / close the window, power window is stopped at the position as the door key cylinder is placed on NEUTRAL.
- When the ignition switch is turned ON while the power window control operation by the key cylinder switch.

AUTOMATIC WINDOW ADJUSTING FUNCTION

When the driver's / passenger's door(s) is opened, the window of the opened door is lowered approx. 10 mm (0.39in).
When the door is closed, the window is raised to fully-closed positions.
Automatic window adjusting function system (opening operation) does not operate when the following.

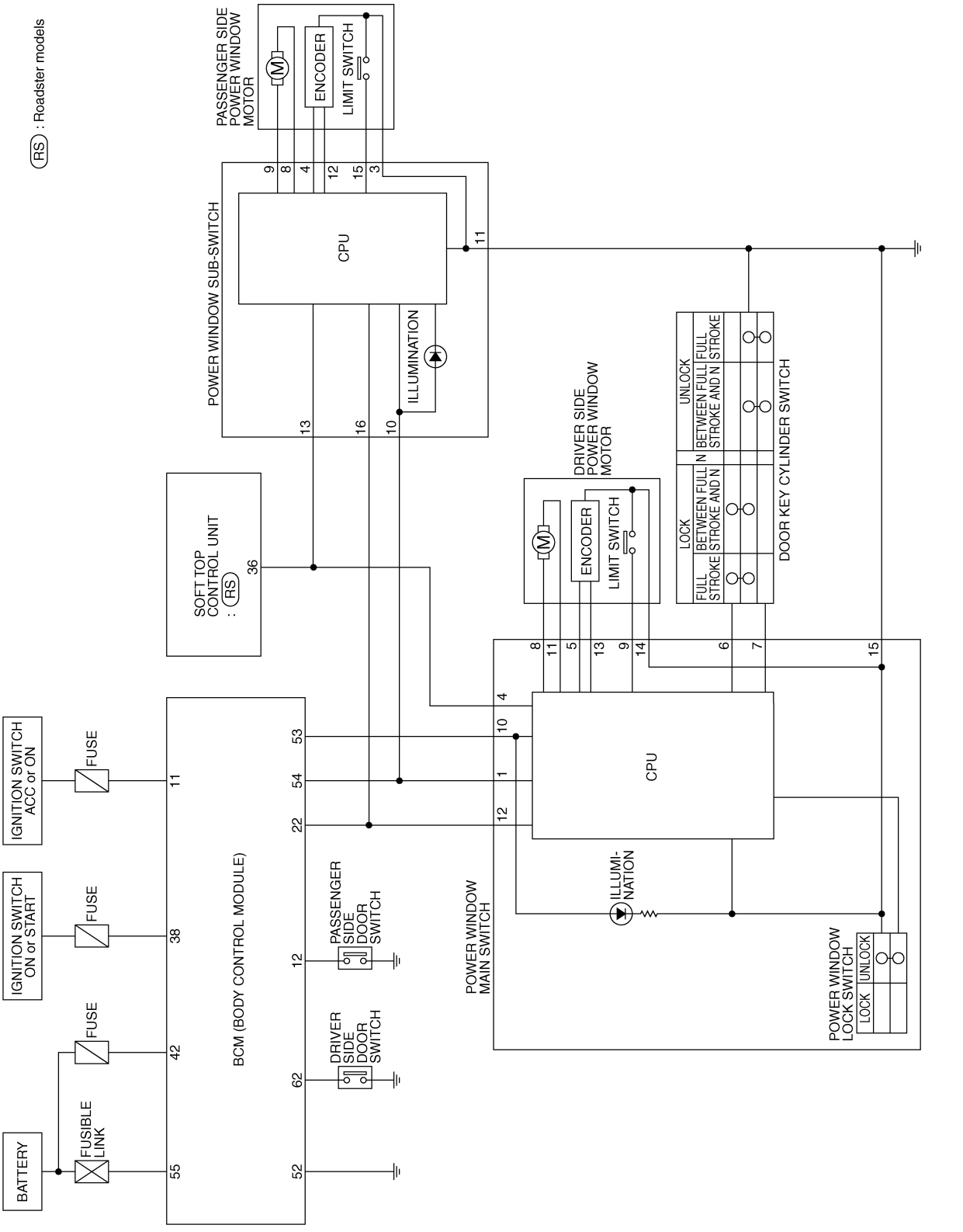
- The window is 10 mm (0.39 in) or more open from fully-closed positions.

Automatic window adjusting function system (closing operation) does not operate when the following.

- The automatic window adjusting function system (opening operation) operation.
- The keyless power window operation.
- The power window control by the key cylinder switch operation.

Schematic

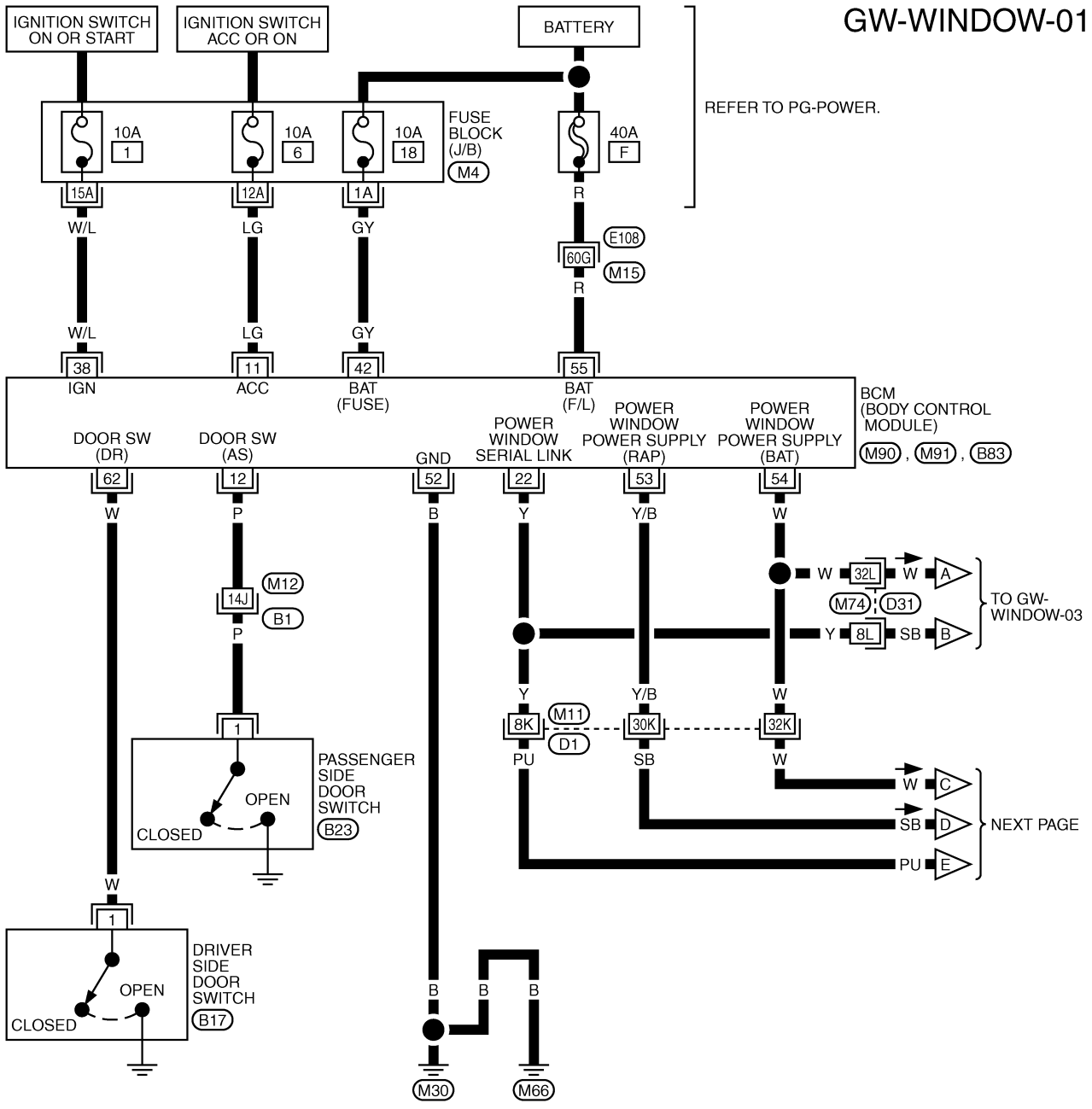
AIS000F7



TIWT0812E

Wiring Diagram — WINDOW —

AIS000F8

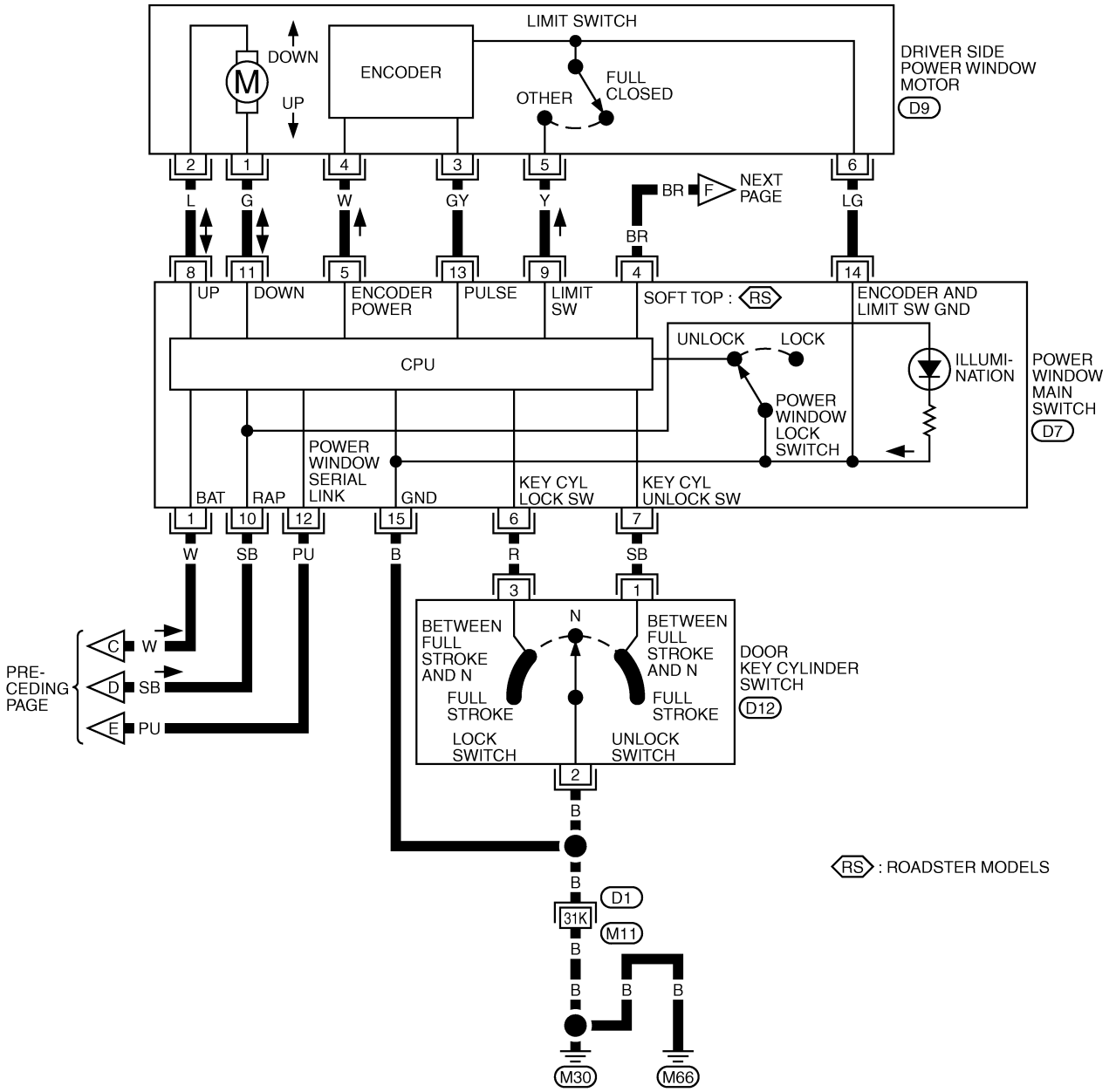


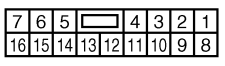
1 2 3 B17, B23 W W

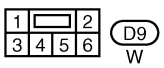
REFER TO THE FOLLOWING.
E108, B1, D1, D31
-SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M90, M91, B83
-ELECTRICAL UNITS

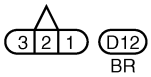
TIWT0813E

GW-WINDOW-02





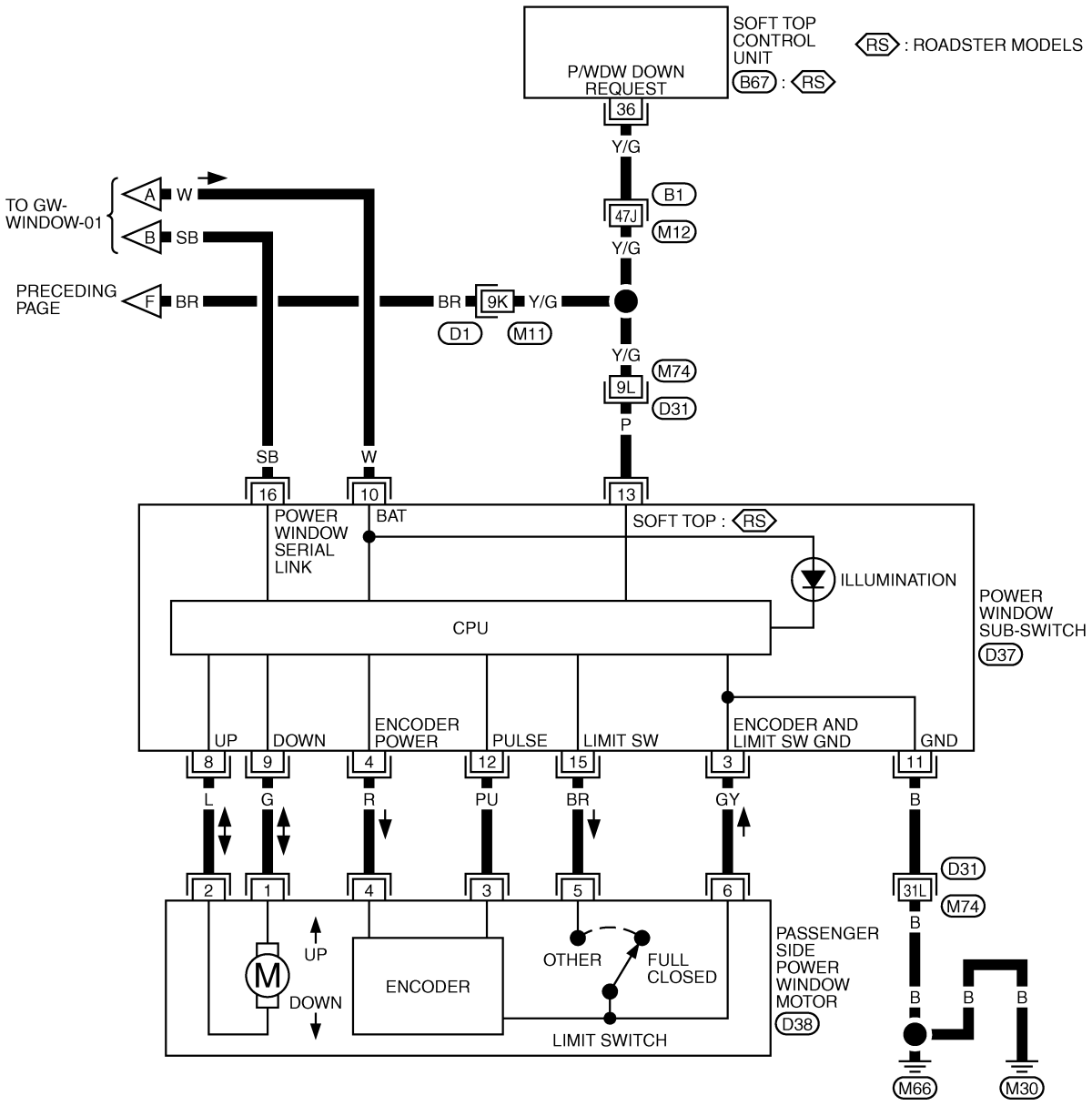


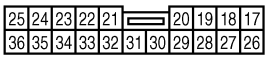


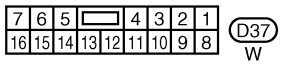
REFER TO THE FOLLOWING.
D1 -SUPER MULTIPLE JUNCTION (SMJ)

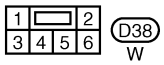
TIWT0711E

GW-WINDOW-03







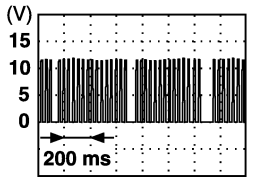


REFER TO THE FOLLOWING.
B1 , D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

TIWT0712E

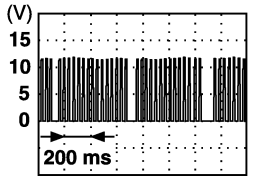
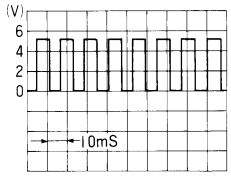
Terminal and Reference Value for BCM

AIS000FC

TERMINAL	WIRE COLOR	ITEM	CONDITION	VOLTAGE (V) (Approx.)
11	LG	Ignition switch ACC power supply (ACC or ON)	Ignition switch (ACC or ON position)	Battery voltage
12	P	Passenger side door switch	ON (open)	0
			OFF (closed)	Battery voltage
22	Y	Power window serial link	—	 PIIA2344J
38	W/L	Ignition switch ON power supply (ON or START)	Ignition switch (ON or START position)	Battery voltage
42	GY	Power source (Fuse)	—	Battery voltage
52	B	Ground	—	0
53	Y/B	Rap signal	IGN SW ON	Battery voltage
			Within 45 second after ignition switch is turned to OFF	Battery voltage
			When driver side or passenger side door is open in power window timer is operates	0
54	W	Power window switch power supply	—	Battery voltage
55	R	Power source (Fusible link)	—	Battery voltage
62	W	Driver side door switch	ON (open)	0
			OFF (closed)	Battery voltage

Terminal and Reference Value for Power Window Main Switch

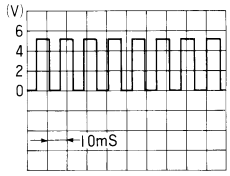
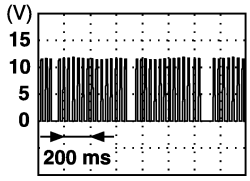
AIS000FD

TERMINAL	WIRE COLOR	ITEM	CONDITION	VOLTAGE (V) (ApproX.)
1	W	BAT power supply	—	Battery voltage
4*	BR	Power window down request signal	When soft top open/close function starts and window down function is operating.	0
			Other than above	5
5	W	Encoder power supply	—	10
6	R	Key cylinder switch lock	Key position (Neutral → Locked)	5 → 0
7	SB	Key cylinder switch unlock	Key position (Neutral → Unlocked)	5 → 0
8	L	Driver side power window motor UP signal	When power window motor UP operation.	Battery voltage
9	Y	Limit switch signal	Driver side door window is between fully-open and just before fully-closed position (ON).	0
			Driver side door window is between just before fully-closed position and fully-closed position (OFF).	5
10	SB	Rap signal	IGN SW ON	Battery voltage
			Within 45 second after ignition switch is turned to OFF	Battery voltage
			When driver side or passenger side door is open in power window timer is operates	0
11	G	Driver side power window motor DOWN signal	When power window motor DOWN operation.	Battery voltage
12	PU	Power window serial link	—	 PIIA2344J
13	GY	Encoder pulse signal	When power window motor operates.	 OCC3383D
14	LG	Limit switch and encoder ground	—	0
15	B	Ground	—	0

*: For Roadster

Terminal and Reference Value for Power Window Sub-Switch

AIS000FE

TERMINAL	WIRE COLOR	ITEM	CONDITION	VOLTAGE (V) (Approx)
3	GY	Limit switch and encoder ground	—	0
4	R	Encoder power supply	—	10
8	L	Passenger side power window motor UP signal	When power window motor UP operation.	Battery voltage
9	G	Passenger side power window motor DOWN signal	When power window motor DOWN operation.	Battery voltage
10	W	BAT power supply	—	Battery voltage
11	B	Ground	—	0
12	PU	Encoder pulse signal	When power window motor operates.	 OCC3383D
13*	P	Power window down request signal	When soft top open/close function starts and window down function is operating.	0
			Except the above	5
15	BR	Limit switch signal	Passenger side door window is between fully-open and just before fully-closed position (ON).	0
			Passenger side door window is between just before fully-closed position and fully-closed position (OFF).	5
16	SB	Power window serial link	—	 PIIA2344J

*: For Roadster

Work Flow

AIS001MK

1. Check the symptom and customer's requests.
2. Understand the outline of system. Refer to GW-19, "System Description" .
3. According to the trouble diagnosis chart, repair or replace the cause of the malfunction. Refer to GW-31, "Trouble Diagnoses Symptom Chart" .
4. Does power window system operate normally? If Yes, GO TO 5, If No, GO TO 3.
5. INSPECTION END

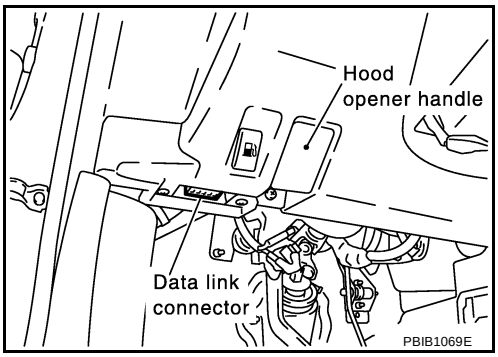
CONSULT-II Inspection Procedure

AIS000FF

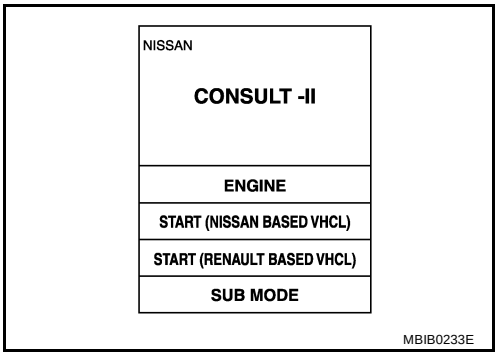
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunction might be detected in self-diagnosis depending on control unit which carry out CAN communication.

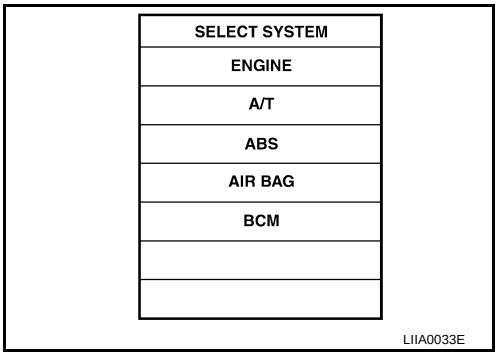
1. Turn ignition switch “OFF”.
2. Connect “CONSULT-II” and CONSULT-II CONVERTER to the data link connector.



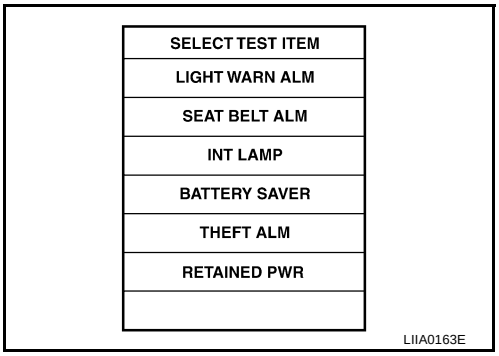
3. Turn ignition switch “ON”.
4. Touch “START (NISSAN BASED VHCL)”.



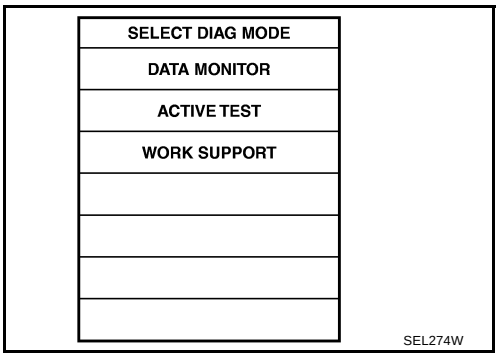
5. Touch “BCM”.
   If “BCM” is not indicated, go to GI-39 , “CONSULT-II Date Link Connector (DLC) Circuit”



6. Touch “RETAINED PWR”.



7. Select diagnosis mode.
“DATE MONITOR”,“ACTIVE TEST” and “WORK SUPPORT” are available.



WORK SUPPORT

Work item	Description
RETAINED PWR	Rap signal’s power supply period can be changed by mode setting. Selects rap signal’s power supply period between three steps ● MODE 1 (45 sec.) / MODE 2 (OFF) / MODE 3 (2 min.).

DATE MONITOR

Monitor item	Description
IGN ON SW	Indicates [ON/OFF] condition of ignition switch.
DOOR SW–DR	Indicates [ON/OFF] condition of driver side door switch.
DOOR SW–AS	Indicates [ON/OFF] condition of passenger side door switch.

ACTIVE TEST

Test item	Description
RETAINED PWR	This test is able to supply RAP signal (power) from BCM (body control module) to power window system and power sunroof system (if equipped). Those systems can be operated when turning on “RETAINED PWR” on CONSULT-II screen even if the ignition switch is turned OFF. **NOTE:** During this test, CONSULT-II can be operated with ignition switch in “OFF” position. “RETAINED PWR” should be turned “ON” or “OFF” on CONSULT-II screen when ignition switch is ON. Then turn ignition switch OFF to check retained power operation. CONSULT-II might be stuck if “RETAINED PWR” is turned to “ON” or “OFF” on CONSULT-II screen when ignition switch is OFF position.

Trouble Diagnoses Symptom Chart

AIS000FG

- Make sure that other systems using the signal of the following systems operate normally.

Symptom	Diagnoses / service procedure	Reference page
None of the power windows can be operated using any switch.	1. BCM power supply and ground circuit check	GW-32
	2. Power window main switch power supply and ground circuit check	GW-46
	3. Power window serial link check	GW-44
	4. Replace BCM.	BCS-17
Driver side power window cannot be operated	1. Driver side power window motor circuit check	GW-33
	2. Replace the power window main switch.	EI-33
Passenger side power window cannot be operated.	1. Power window sub-switch power supply and ground circuit check	GW-48
	2. Power window serial link check	GW-44
	3. Passenger side power window motor circuit check	GW-33
	4. Replace BCM.	BCS-17
Anti-pinch system does not operate normally (driver side).	1. Door window sliding part malfunction ● A foreign material adheres to window glass or grass run rubber. ● Glass run rubber wear or deformation. ● Sash is tilted too much, or not enough.	—
	2. Limit switch adjusting	GW-53
	3. Limit switch circuit check (driver side)	GW-34
	4. Encoder circuit check (driver side)	GW-37
Anti-pinch system does not operate normally (passenger side).	1. Door window sliding part malfunction ● A foreign material adheres to window glass or grass run rubber. ● Glass run rubber wear or deformation. ● Sash is tilted too much, or not enough.	—
	2. Limit switch adjusting	GW-53
	3. Limit switch circuit check (passenger side)	GW-36
	4. Encoder circuit check (passenger side)	GW-39
Power window retained power operation does not operate properly.	1. Check the retained power operation mode setting.	GW-30
	2. Door switch check	GW-42
	3. Replace BCM.	BCS-17
Automatic window adjusting function does not operate.	1. Door switch check	GW-42
	2. Limit switch adjusting	GW-53
	3. Limit switch circuit check (driver side)	GW-34
	4. Limit switch circuit check (passenger side)	GW-36
	5. Power window serial link check	GW-44
	6. Replace BCM.	BCS-17
Does not operate by the key cylinder switch.	1. Door key cylinder switch check	GW-49
	2. Replace the power window main switch.	EI-33
Power window lock switch does not function.	1. Power window serial link check	GW-44
	2. Replace the power window main switch.	EI-33
Auto operation does not operate but manual operate normally (driver side)	1. Encoder circuit check (driver side)	GW-37
	2. Replace power window main switch	EI-33

Symptom	Diagnoses / service procedure	Reference page
Auto operation does not operate but manual operate normally (passenger side)	1. Encoder circuit check (passenger side)	GW-39
	2. Replace power window sub-switch	EI-33

BCM Power Supply and Ground Circuit Check

AIS004VS

1. CHECK FUSE

- Check 10A fuse [No.1, located in fuse block (J/B)]
- Check 10A fuse [No.18, located in fuse block (J/B)]
- Check 40A fusible link (letter **F** , located in the fuse and fusible link box).

NOTE:
Refer to GW-18, "Component Parts and Harness Connector Location" .

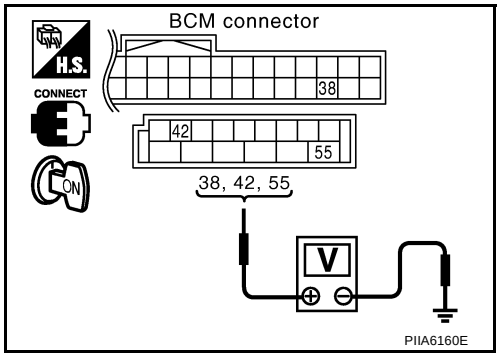
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown out, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between BCM connector M90, M91 terminal 38, 42, 55 and ground.

38 (W/L) – Ground : Battery voltage
42 (GY) – Ground : Battery voltage
55 (R) – Ground : Battery voltage



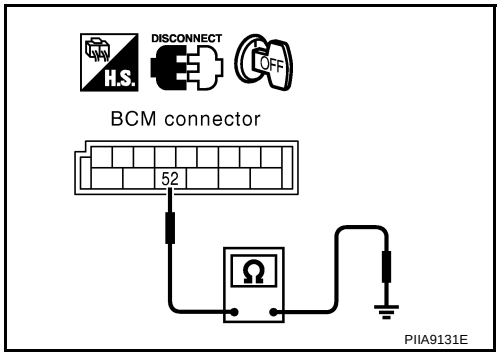
OK or NG

OK >> GO TO 3.
NG >> Check BCM power supply circuit for open or short.

3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check continuity between BCM connector M91 terminal 52 and ground.

52 (B) – Ground :Continuity should exist.



OK or NG

OK >> Power supply and ground circuit is OK.
NG >> Check BCM ground circuit for open or short.

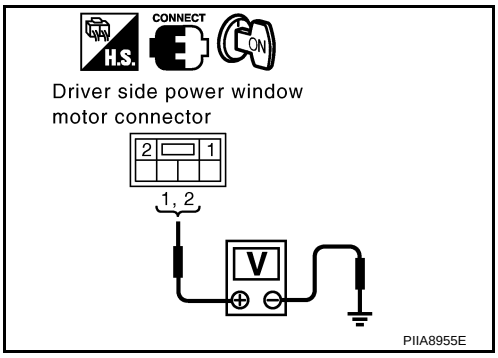
Drive Side Power Window Motor Circuit Check

AIS000FI

1. CHECK POWER WINDOW MAIN SWITCH OUTPUT SIGNAL

1. Turn ignition switch ON.
2. Power window main switch operate, check voltage between driver side power window motor connector and ground.

Connector	Terminals (Wire color)		Condition of power window main switch	Voltage (V) (Approx.)
	(+)	(-)		
D9	1 (G)	Ground	UP	0
			DOWN	Battery voltage
	2 (L)		UP	Battery voltage
			DOWN	0



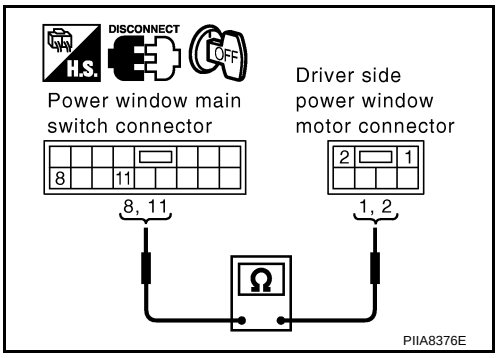
OK or NG

OK >> Replace driver side power window motor.
NG >> GO TO 2.

2. CHECK POWER WINDOW MAIN SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power window main switch and driver side power window motor connector.
3. Check continuity between power window main switch connector D7 terminals 8, 11 and driver side power window motor connector D9 terminals 1, 2.

8 (L) – 2 (L) : Continuity should exist.
11 (G) – 1 (G) : Continuity should exist.



OK or NG

OK >> Further inspection is necessary. Refer to symptom chart.
NG >> Repair or replace harness between power window main switch and driver side power window motor.

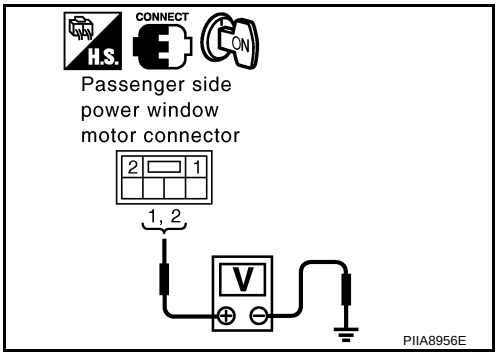
Passenger Side Power Window Motor Circuit Check

AIS000FJ

1. CHECK POWER WINDOW SUB-SWITCH OUTPUT SIGNAL

1. Turn ignition switch ON.
2. Power window sub-switch opreate, check voltage between passenger side power window motor connector and ground.

Connector	Terminals (Wire color)		Condition of power window sub-switch	Voltage (V) (Approx.)
	(+)	(-)		
D38	1 (G)	Ground	Closing	0
			Opening	Battery voltage
	2 (L)		Closing	Battery voltage
			Opening	0



OK or NG

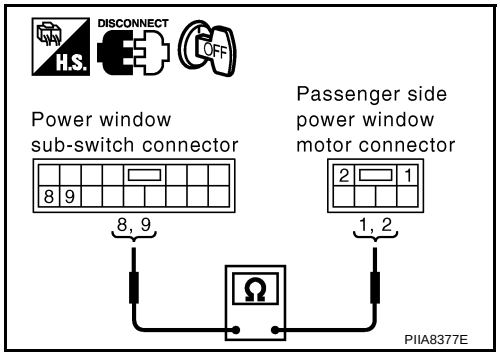
OK >> Replace passenger side power window motor.
NG >> GO TO 2.

2. CHECK POWER WINDOW MOTOR (PASSENGER SIDE) CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power window sub-switch and passenger side power window motor connector.
3. Check continuity between power window sub-switch connector D37 terminals 8, 9 and passenger side power window motor connector D38 terminals 1, 2.

9 (G) – 1 (G) : Continuity should exist.

8 (L) – 2 (L) : Continuity should exist.



OK or NG

OK >> Further inspection is necessary. Refer to symptom chart.

NG >> Repair or replace harness between power window sub-switch and passenger side power window motor.

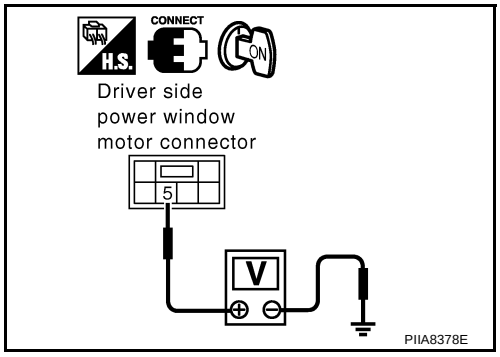
Limit Switch Circuit Check (Driver Side)

AIS000FL

1. CHECK DRIVER DOOR LIMIT SWITCH SIGNAL

1. Turn ignition switch ON.
2. Check voltage between driver side power window motor connector and ground.

Connector	Terminals (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(-)		
D9	5 (Y)	Ground	Driver side door window is between fully-open and just before fully-closed position (ON)	0
			Driver side door window is between just before fully-closed position and fully-closed position (OFF)	5



OK or NG

OK >> Limit switch circuit is OK.

NG >> GO TO 2.

2. CHECK LIMIT SWITCH GROUND CIRCUIT

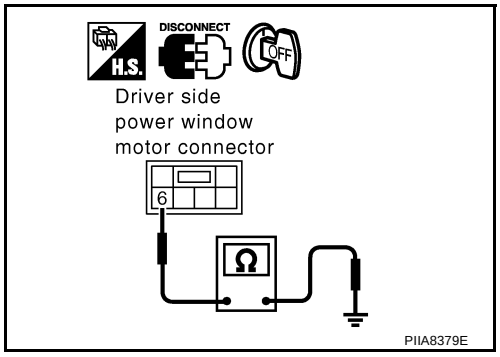
1. Turn ignition switch OFF.
2. Disconnect driver side power window motor connector.
3. Check continuity between driver side power window motor connector D9 terminal 6 and ground.

6 (LG) – Ground : Continuity should exist.

OK or NG

OK >> GO TO 4.

NG >> GO TO 3.



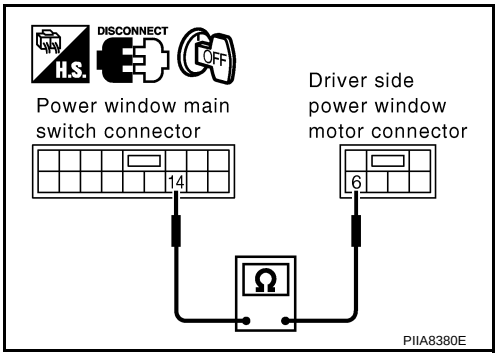
3. CHECK HARNESS CONTINUITY

1. Disconnect power window main switch connector.
2. Check continuity between power window main switch connector D7 terminal 14 and driver side power window motor connector D9 terminal 6.

14 (LG) – 6 (LG) : Continuity should exist.

OK or NG

OK >> Replace power window main switch.
NG >> Repair or replace harness between power window main switch and driver side power window motor.



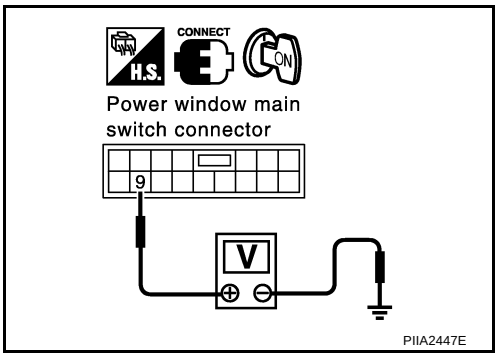
4. CHECK POWER WINDOW MAIN SWITCH OUTPUT SIGNAL

1. Turn ignition switch ON.
2. Check voltage between power window main switch connector D7 terminal 9 and ground.

9 (Y) – Ground : Approx. 5V

OK or NG

OK >> GO TO 5.
NG >> Replace power window main switch.



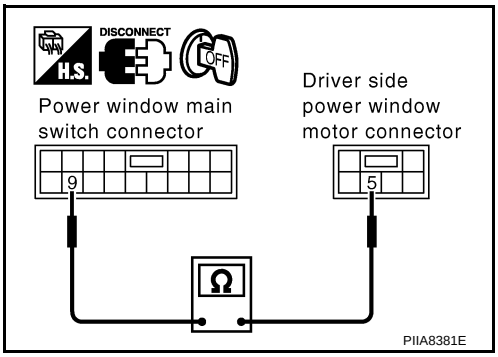
5. CHECK HARNESS CONTINUITY

1. Turn ignition switch OFF.
2. Disconnect power window main switch connector.
3. Check continuity between power window main switch connector D7 terminal 9 and driver side power window motor connector D9 terminal 5.

9 (Y) – 5 (Y) : Continuity should exist.

OK or NG

OK >> Replace driver side power window motor.
NG >> Repair or replace harness between power window main switch and driver side power window motor.



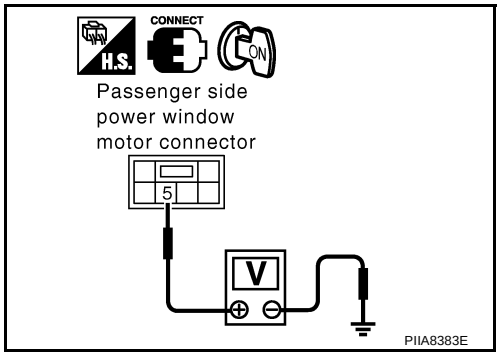
Limit Switch Circuit Check (Passenger Side)

AIS00140

1. CHECK POWER WINDOW LIMIT SWITCH SIGNAL

1. Turn ignition switch ON.
2. Check voltage between passenger side power window motor connector and ground.

Connector	Terminals (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(-)		
D38	5 (BR)	Ground	Passenger side door window is between fully-open and just before fully-closed position (ON)	0
			Passenger side door window is between just before fully-closed position and fully-closed position (OFF)	5



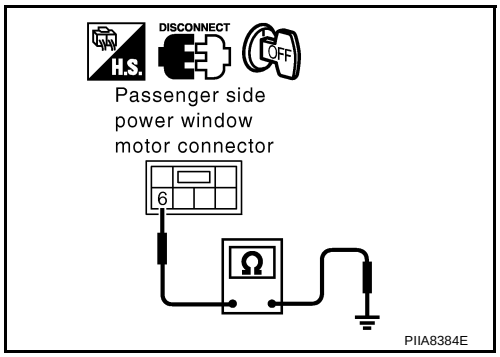
OK or NG

OK >> Limit switch circuit is OK.
NG >> GO TO 2.

2. CHECK LIMIT SWITCH GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect passenger side power window motor connector.
3. Check continuity between passenger side power window motor connector D38 terminal 6 and ground.

6 (GY) – Ground : Continuity should exist.



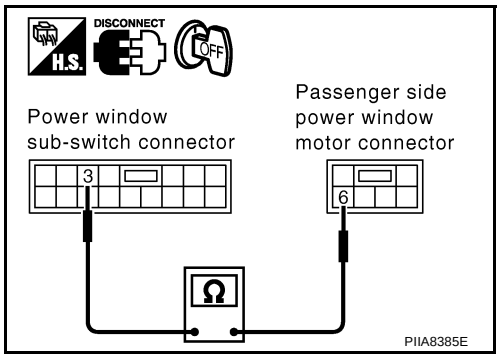
OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. CHECK HARNESS CONTINUITY

1. Disconnect power window sub-switch connector.
2. Check continuity between power window sub-switch connector D37 terminal 3 and passenger side power window motor connector D38 terminal 6.

3 (GY) – 6 (GY) : Continuity should exist.



OK or NG

OK >> Replace power window sub-switch.
NG >> Repair or replace harness between power window sub-switch and passenger side power window motor.

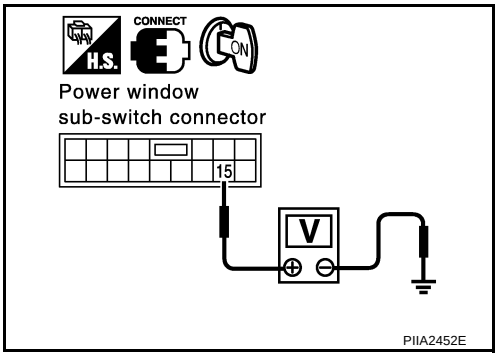
4. CHECK POWER WINDOW SUB-SWITCH OUTPUT SIGNAL

1. Turn ignition switch ON.
2. Check voltage between power window sub-switch connector D37 terminal 15 and ground.

15 (BR) – Ground : Approx. 5V

OK or NG

OK >> GO TO 5.
NG >> Replace power window sub-switch.



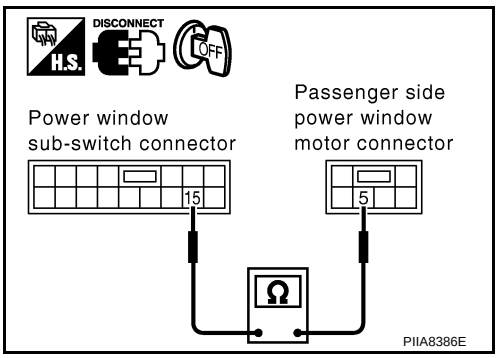
5. CHECK HARNESS CONTINUITY

1. Turn ignition switch OFF.
2. Disconnect power window sub-switch connector.
3. Check continuity between power window sub-switch connector D37 terminal 15 and passenger side power window motor connector D38 terminal 5.

15 (BR) – 5 (BR) : Continuity should exist.

OK or NG

OK >> Replace passenger side power window motor.
NG >> Repair or replace harness between power window sub-switch and passenger side power window motor.



Encoder Circuit Check (Driver Side)

AIS000FM

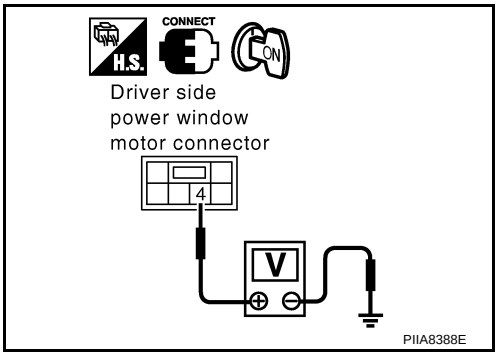
1. CHECK DRIVER SIDE POWER WINDOW MOTOR POWER SUPPLY

1. Turn ignition switch ON.
2. Check voltage between driver side power window motor connector D9 terminal 4 and ground.

4 (W) – Ground : Approx. 10V

OK or NG

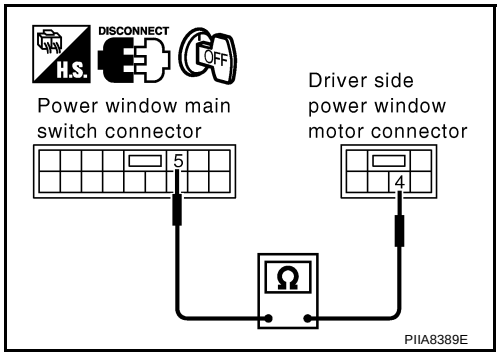
OK >> GO TO 3.
NG >> GO TO 2.



2. CHECK HARNESS CONTINUITY

1. Turn ignition switch OFF.
2. Disconnect power window main switch and driver side power window motor connector.
3. Check continuity between power window main switch connector D7 terminal 5 and driver side power window motor connector D9 terminal 4.

5 (W) – 4 (W) : Continuity should exist.



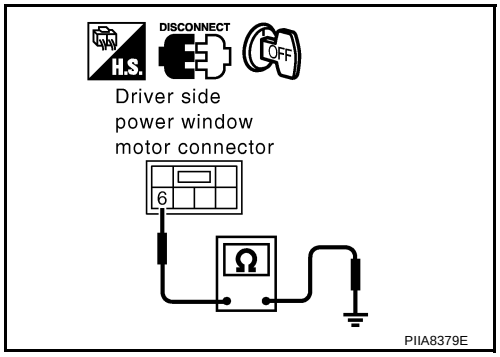
OK or NG

OK >> Replace power window main switch.
NG >> Repair or replace harness between power window main switch and driver side power window motor.

3. CHECK ENCODER GROUND

1. Turn ignition switch OFF.
2. Disconnect driver side power window motor connector.
3. Check continuity between driver side power window motor connector D9 terminal 6 and ground.

6 (LG) – Ground : Continuity should exist.



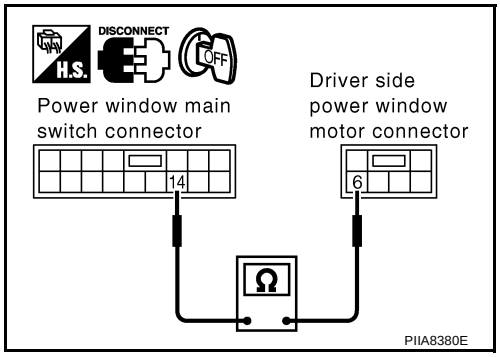
OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. CHECK ENCODER GROUND CIRCUIT

1. Disconnect power window main switch connector.
2. Check continuity between power window main switch connector D7 terminal 14 and driver side power window motor connector D9 terminal 6.

14 (LG) – 6 (LG) : Continuity should exist.

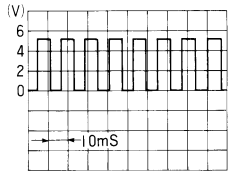


OK or NG

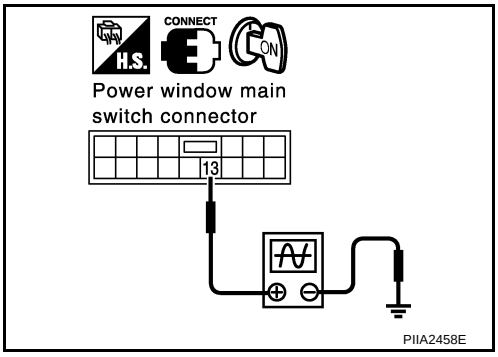
OK >> Replace power window main switch.
NG >> Repair or replace harness between power window main switch and driver side power window motor.

5. CHECK ENCODER SIGNAL

1. Connect driver side power window motor connector.
2. Turn ignition switch ON.
3. Check signal between power window main switch connector and ground with oscilloscope.

Connector	Terminals (Wire color)		Condition	Signal (Reference valve)
	(+)	(-)		
D7	13 (GY)	Ground	opening	

OCC3383D



PIIA2458E

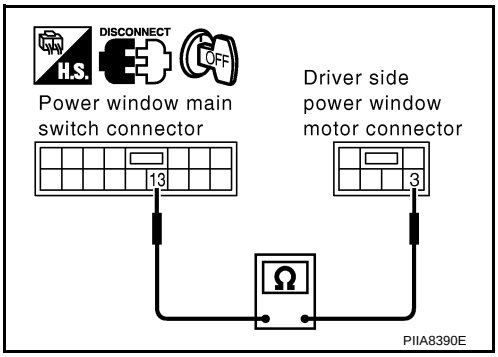
OK or NG

OK >> Replace power window main switch.
NG >> GO TO 6.

6. CHECK ENCODER CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power window main switch and driver side power window motor connector.
3. Check continuity between power window main switch connector D7 terminal 13 and driver side power window motor connector D9 terminal 3.

13 (GY) – 3 (GY) : Continuity should exist.



PIIA8390E

OK or NG

OK >> Replace driver side power window motor.
NG >> Repair or replace harness between power window main switch and driver side power window motor.

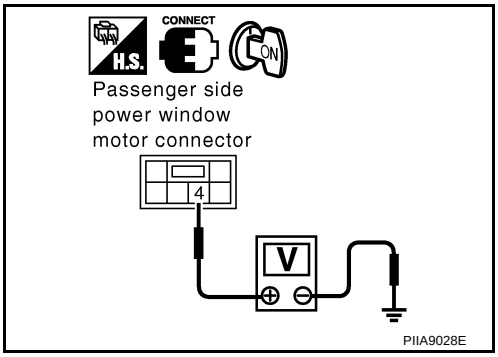
Encoder Circuit Check (Passenger Side)

AIS00141

1. CHECK PASSENGER SIDE POWER WINDOW MOTOR POWER SUPPLY

1. Turn ignition switch ON.
2. Check voltage between passenger side power window motor connector D38 terminal 4 and ground.

4 (R) – Ground : Approx. 10V



PIIA9028E

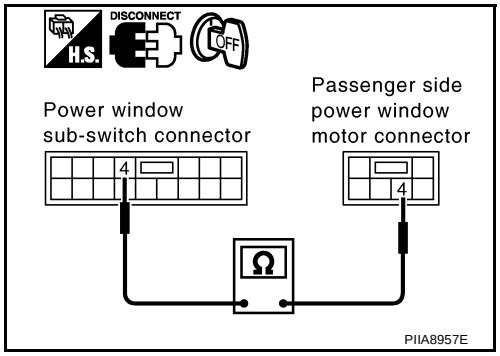
OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. CHECK HARNESS CONTINUITY

1. Turn ignition switch OFF.
2. Disconnect power window sub-switch and passenger side power window motor connector.
3. Check continuity between power window sub-switch connector D37 terminal 4 and passenger side power window motor connector D38 terminal 4.

4 (R) – 4 (R) : Continuity should exist.



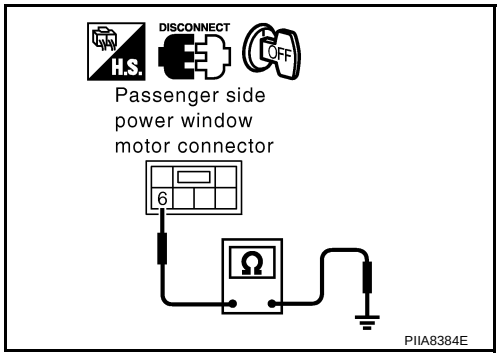
OK or NG

OK >> Replace power window sub-switch.
NG >> Repair or replace harness between power window sub-switch and passenger side power window motor.

3. CHECK ENCODER GROUND

1. Turn ignition switch OFF.
2. Disconnect passenger side power window motor connector.
3. Check continuity between passenger side power window motor connector D38 terminal 6 and ground.

6 (GY) – Ground : Continuity should exist.



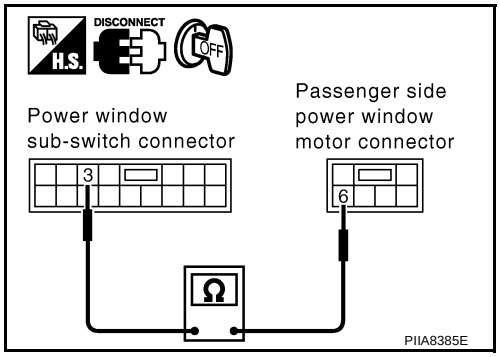
OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. CHECK ENCODER GROUND CIRCUIT

1. Disconnect power window sub-switch connector.
2. Check continuity between power window sub-switch connector D37 terminal 3 and passenger side power window motor connector D38 terminal 6.

3 (GY) – 6 (GY) : Continuity should exist.

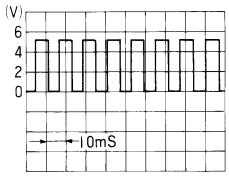


OK or NG

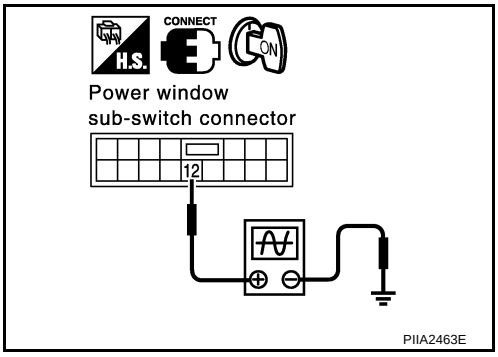
OK >> Replace power window sub switch.
NG >> Repair or replace harness between power window sub-switch and passenger side power window motor.

5. CHECK ENCODER SIGNAL

1. Connect passenger side power window motor connector.
2. Turn ignition ON.
3. Check signal between power window sub-switch connector and ground with oscilloscope.

Connector	Terminals (Wire color)		Condition	Signal (Reference valve)
	(+)	(-)		
D37	12 (PU)	Ground	opening	

OCC3383D



PIIA2463E

OK or NG

OK >> Replace power window sub-switch.
NG >> GO TO 6.

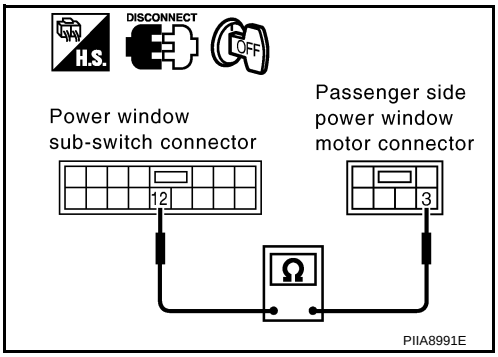
6. CHECK ENCODER CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power window sub-switch and passenger side power window motor connector.
3. Check continuity between power window sub-switch connector D37 terminal 12 and passenger side power window motor connector D38 terminal 3.

12 (PU) – 3 (PU) : Continuity should exist.

OK or NG

OK >> Replace passenger side power window motor.
NG >> Repair or replace harness between power window sub-switch and passenger side power window motor.



PIIA8991E

Door Switch Check

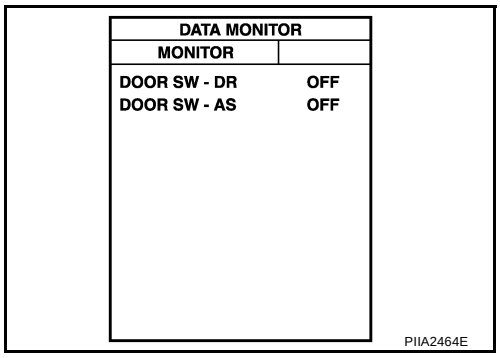
AIS000FN

1. CHECK DOOR SWITCH INPUT SIGNAL

With CONSULT-II

Check door switches (“DOOR SW-DR” and “DOOR SW-AS”) in “DATA MONITOR” mode with CONSULT-II.

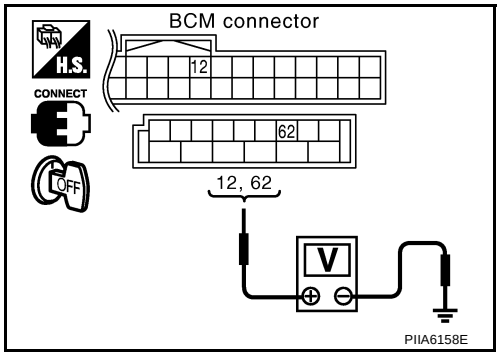
Monitor item	Condition	
DOOR SW-DR	OPEN	: ON
	CLOSE	: OFF
DOOR SW-AS	OPEN	: ON
	CLOSE	: OFF



Without CONSULT-II

Check voltage between BCM connector M90, B83 terminals 12, 62 and ground.

Item	Terminals (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(–)		
Passenger side door switch	12 (P)	Ground	OPEN	0
			CLOSE	Battery voltage
Driver side door switch	62 (W)		OPEN	0
			CLOSE	Battery voltage



OK or NG

OK >> Door switch is OK.
NG >> GO TO 2.

2. CHECK DOOR SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect door switch and BCM connector.
3. Check continuity between BCM connector M90, B83 terminals 12, 62 and door switch connector B17, B23 terminals 1.

Driver side door

62 (W) – 1 (W) : Continuity should exist.

Passenger side door

12 (P) – 1 (P) : Continuity should exist.

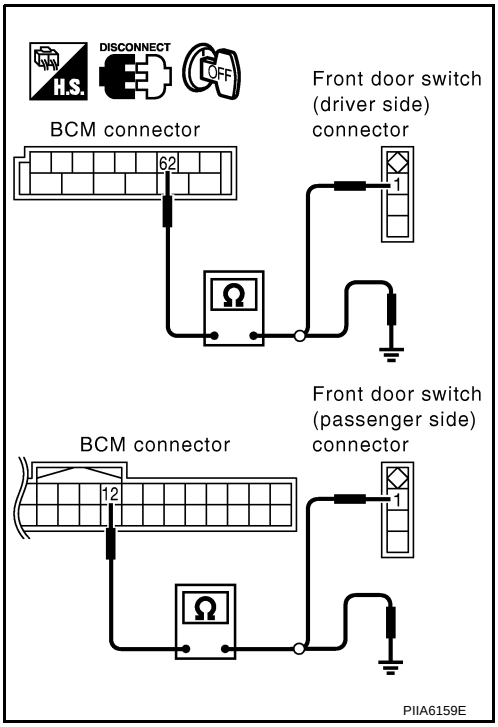
4. Check continuity between BCM connector M90, B83 terminals 12, 62 and ground.

12 (P) – Ground : Continuity should not exist.

62 (Y) – Ground : Continuity should not exist.

OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.



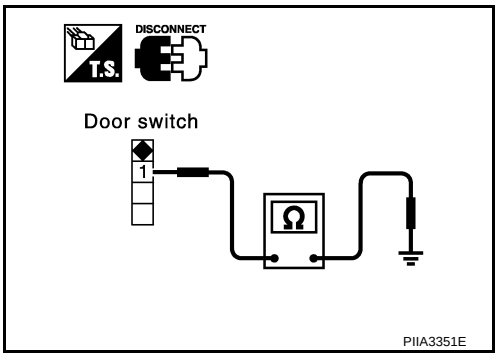
3. CHECK DOOR SWITCH

Check continuity between door switch B17 (driver side) or B23 (passenger side) terminal 1 and body ground part of door switch.

Terminal		Condition of door switch	Continuity
1	Body ground part of door switch	Pushed	No
		Released	Yes

OK or NG

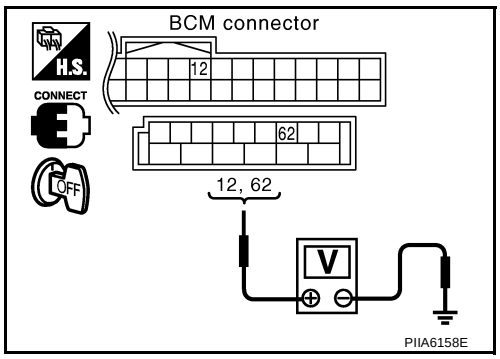
OK >> GO TO 4.
NG >> Replace malfunction door switch.



4. CHECK BCM OUTPUT SIGNAL

1. Connect BCM connector.
2. Check voltage between BCM connector M90, B83 terminals 12, 62 and ground.

12 (P) – Ground : Battery voltage
62 (W) – Ground : Battery voltage



OK or NG

OK >> Check the condition of the harness and the connector.
NG >> Replace BCM.

Power Window Serial Link Check

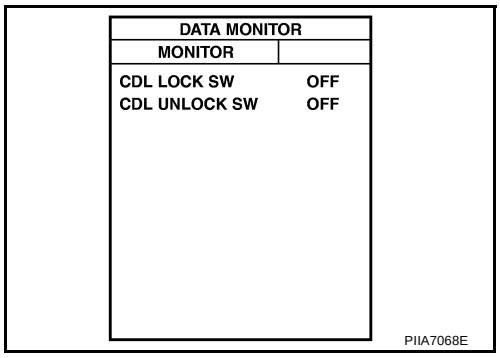
AIS00142

1. CHECK POWER WINDOW SWITCH OUTPUT SIGNAL

With CONSULT-II

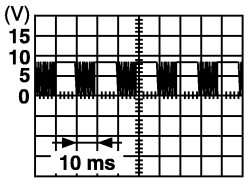
Check door lock and unlock switch (“LOCK SW DR/AS”, “UNLK SW DR/AS”) in DATA MONITOR mode with CONSULT-II. Refer to BL-36, "DATA MONITOR" .

Monitor item	Condition
CDL LOCK SW	LOCK: ON
	UNLOCK: OFF
CDL UNLOCK SW	LOCK: OFF
	UNLOCK: ON

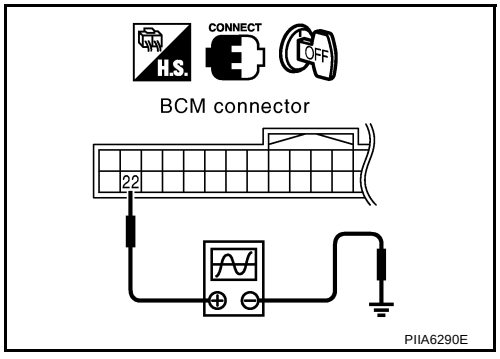


Without CONSULT-II

1. Remove key from ignition switch, and the door of driver side and passenger side is closed.
2. Check signal between BCM connector and ground with oscilloscope when door lock and unlock switch (driver side and passenger side) is turned “LOCK” or “UNLOCK”.
3. Make sure signals which are shown in the figure below can be detected during 10 second just after door lock and unlock switch (driver side and passenger side) is turned “LOCK” or “UNLOCK”.

Connector	Terminals (Wire color)		Signal (Reference valve)
	(+)	(–)	
M90	22 (Y)	Ground	

PIIA1297E



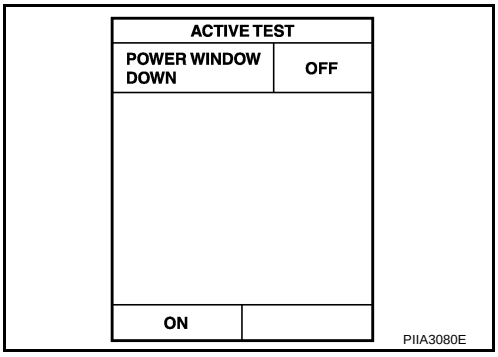
OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK BCM OUTPUT SIGNAL

Check power window serial link (“POWER WINDOW DOWN”) in “ACTIVE TEST” mode with CONSULT-II. Refer to BL-77, "Active Test" .

When “ACTIVE TEST” is perform, is the window of driver side and passenger side lowered?



OK or NG

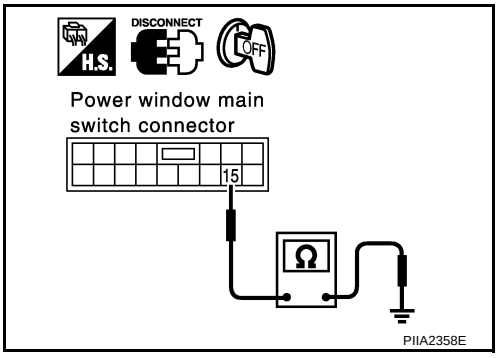
OK >> Further inspection is necessary. Refer to symptom chart.

NG >> Replace BCM.

3. CHECK POWER WINDOW SWITCH GROUND

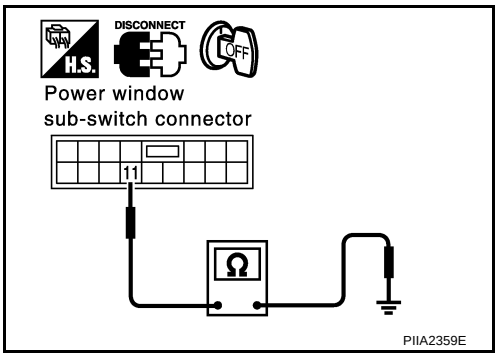
1. Turn ignition switch OFF.
2. Disconnect power window main switch and power window sub-switch connector.
3. Check continuity between power window main switch connector D7 terminals 15 and ground.

15 (B) – Ground : Continuity should exist.



4. Check continuity between power window sub-switch connector D37 terminal 11 and ground.

11 (B) – Ground : Continuity should exist.



OK or NG

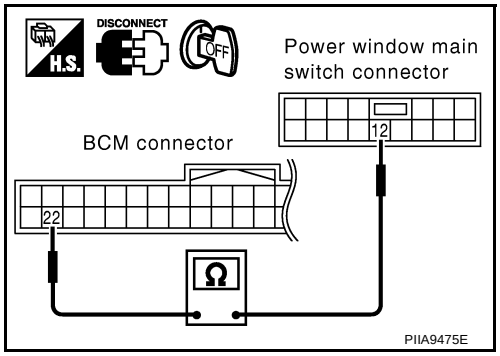
OK >> GO TO 4.

NG >> Repair or replace harness.

4. CHECK POWER WINDOW SERIAL LINK CIRCUIT

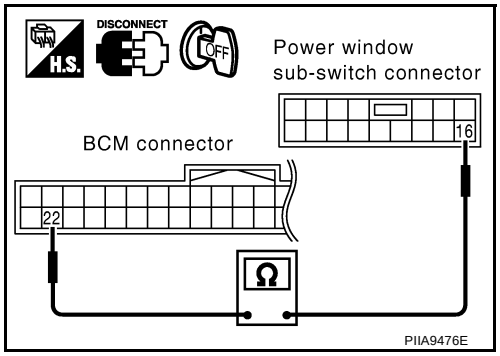
1. Disconnect BCM connector.
2. Check continuity between BCM connector M90 terminal 22 and power window main switch connector D7 terminal 12.

22 (Y) – 12 (PU) : Continuity should exist.



3. Check continuity between BCM connector M90 terminal 22 and power window sub-switch connector D37 terminal 16.

22 (Y) – 16 (SB) : Continuity should exist.



OK or NG

OK >> Replace power window main switch.
NG >> Repair or replace harness.

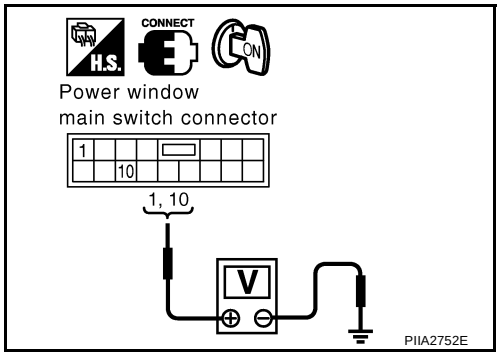
Power Window Main Switch Power Supply and Ground Circuit Check

AIS001MI

1. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between power window main switch connector D7 terminals 1, 10 and ground.

1 (W) – Ground : Battery voltage.
10 (SB) – Ground : Battery voltage.



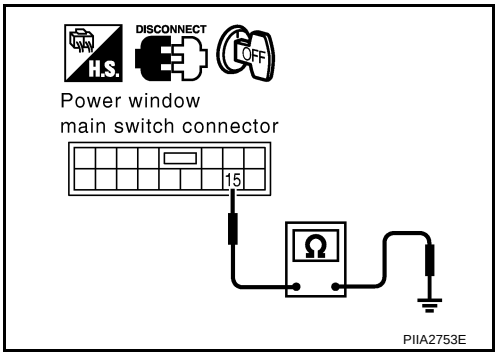
OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power window main switch connector.
3. Check continuity between power window main switch connector D7 terminal 15 and ground.

15 (B) – Ground : Continuity should exist.



OK or NG

OK >> Power window main switch power supply and ground circuits are OK.
NG >> Repair or replace harness.

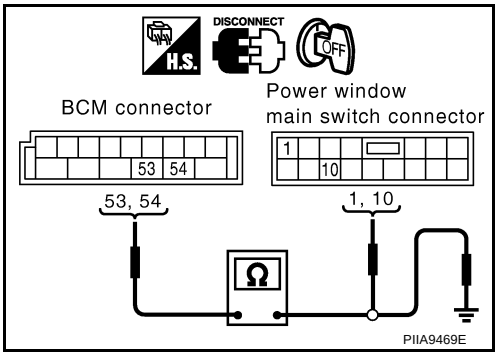
3. CHECK POWER WINDOW MAIN SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM and power window main switch connector.
3. Check continuity between BCM connector M91 terminals 53, 54 and power window main switch connector D7 terminal 1, 10.

53 (Y/B) – 10 (SB) : Continuity should exist.
54 (W) – 1 (W) : Continuity should exist.

4. Check continuity between BCM connector M91 terminals 53, 54 and ground.

53 (Y/B) – Ground : Continuity should not exist.
54 (W) – Ground : Continuity should not exist.



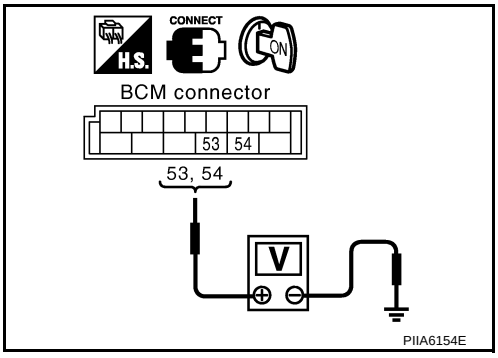
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK BCM OUTPUT SIGNAL

1. Connect BCM connector.
2. Turn ignition switch ON.
3. Check voltage between BCM connector M91 terminals 53, 54 and ground.

53 (Y/B) – Ground : Battery voltage
54 (W) – Ground : Battery voltage



OK or NG

OK >> Check condition of harness and connector.
NG >> Replace BCM.

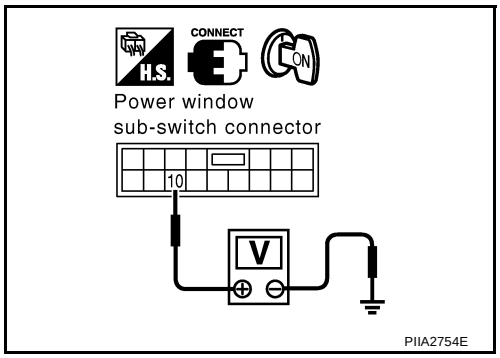
Power Window Sub-switch Power Supply and Ground Check

AIS001MJ

1. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between power window sub-switch connector D37 terminal 10 and ground.

10 (W) – Ground : Battery voltage



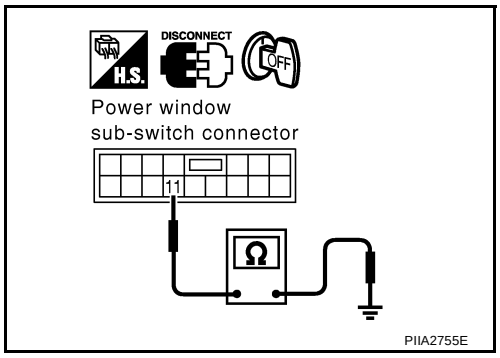
OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power window sub-switch connector.
3. Check continuity between power window sub-switch connector D37 terminal 11 and ground.

11 (B) – Ground : Continuity should exist.



OK or NG

OK >> Power window sub-switch power supply and ground circuit are OK.
NG >> Repair or replace harness.

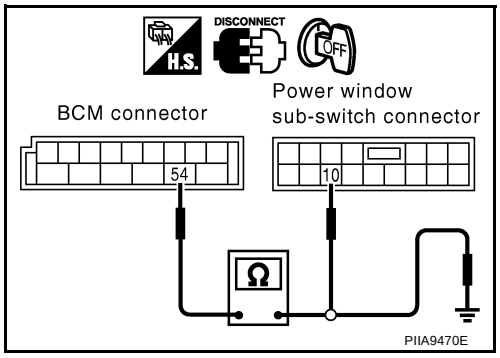
3. CHECK POWER WINDOW SUB-SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM and power window sub-switch connector.
3. Check continuity between BCM connector M91 terminal 54 and power window sub-switch connector D37 terminal 10.

54 (W) – 10 (W) : Continuity should exist.

4. Check continuity between BCM connector M91 terminal 54 and ground.

54 (W) – Ground : Continuity should not exist.



OK or NG

OK >> Check the condition of the harness and the connector.
NG >> Repair or replace harness.

Door Key Cylinder Switch Check

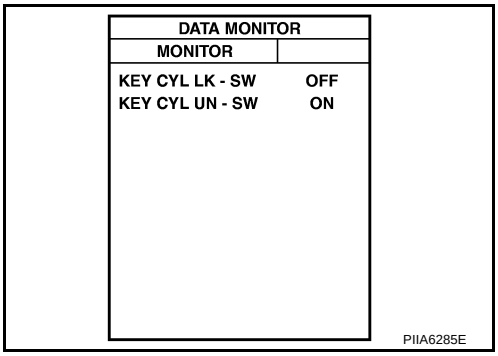
AIS001PS

1. CHECK DOOR KEY CYLINDER SWITCH INPUT SIGNAL

With CONSULT-II

Check door key cylinder switch (“KEY CYL LK-SW”, “KEY CYL UN-SW”) in “DATA MONITOR” mode with CONSULT-II.

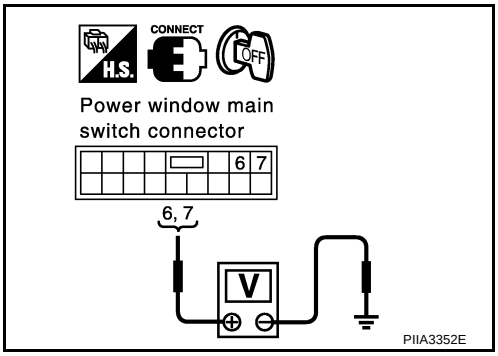
Monitor item	Condition
KEY CYL LK- SW	Lock: ON
	Neutral/Unlock: OFF
KEY CYL UN- SW	Unlock: ON
	Neutral/Lock: OFF



Without CONSULT-II

Check voltage between power window main switch (door lock and unlock switch) connector and ground.

Connector	Terminals (Wire color)		Key position	Voltage (V) (Approx.)
	(+)	(–)		
D7	6 (R)	Ground	Neutral/Unlock	5
			Lock	0
	7 (SB)		Neutral/Lock	5
			Unlock	0



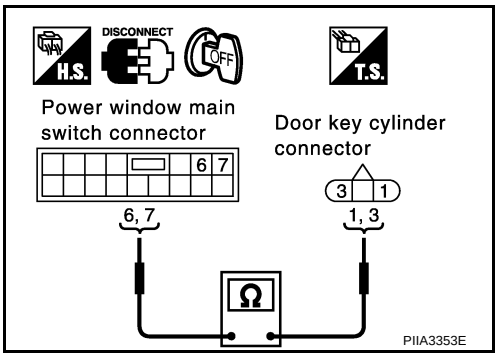
OK or NG

OK >> Door key cylinder switch is OK.
NG >> GO TO 2.

2. CHECK DOOR KEY CYLINDER SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power window main switch (door lock and unlock switch) and door key cylinder switch connector.
3. Check continuity between power window main switch (door lock and unlock switch) connector D7 terminal 6, 7 and door key cylinder switch connector D12 terminals 1, 3.

6 (R) – 3 (R) : Continuity should exist.
7 (SB) – 1 (SB) : Continuity should exist.



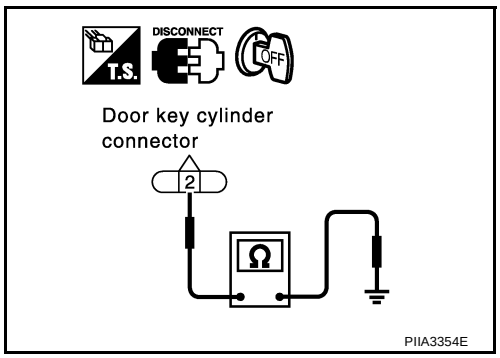
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness between power window main switch and door key cylinder switch.

3. CHECK DOOR KEY CYLINDER SWITCH GROUND

Check continuity between door key cylinder switch connector D12 terminal 2 and ground.

2 (B) – Ground : Continuity should exist.



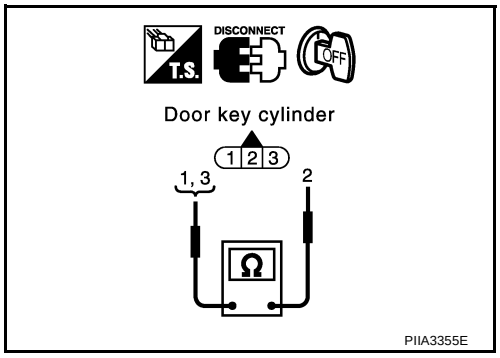
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK DOOR KEY CYLINDER SWITCH

Check continuity between door key cylinder switch connector D12 terminals 1, 3 and 2.

Connector	Terminal		Key position	Continuity
D12	1	2	Neutral/Lock	No
			Unlock	Yes
	3		Neutral/Unlock	No
			Lock	Yes



OK or NG

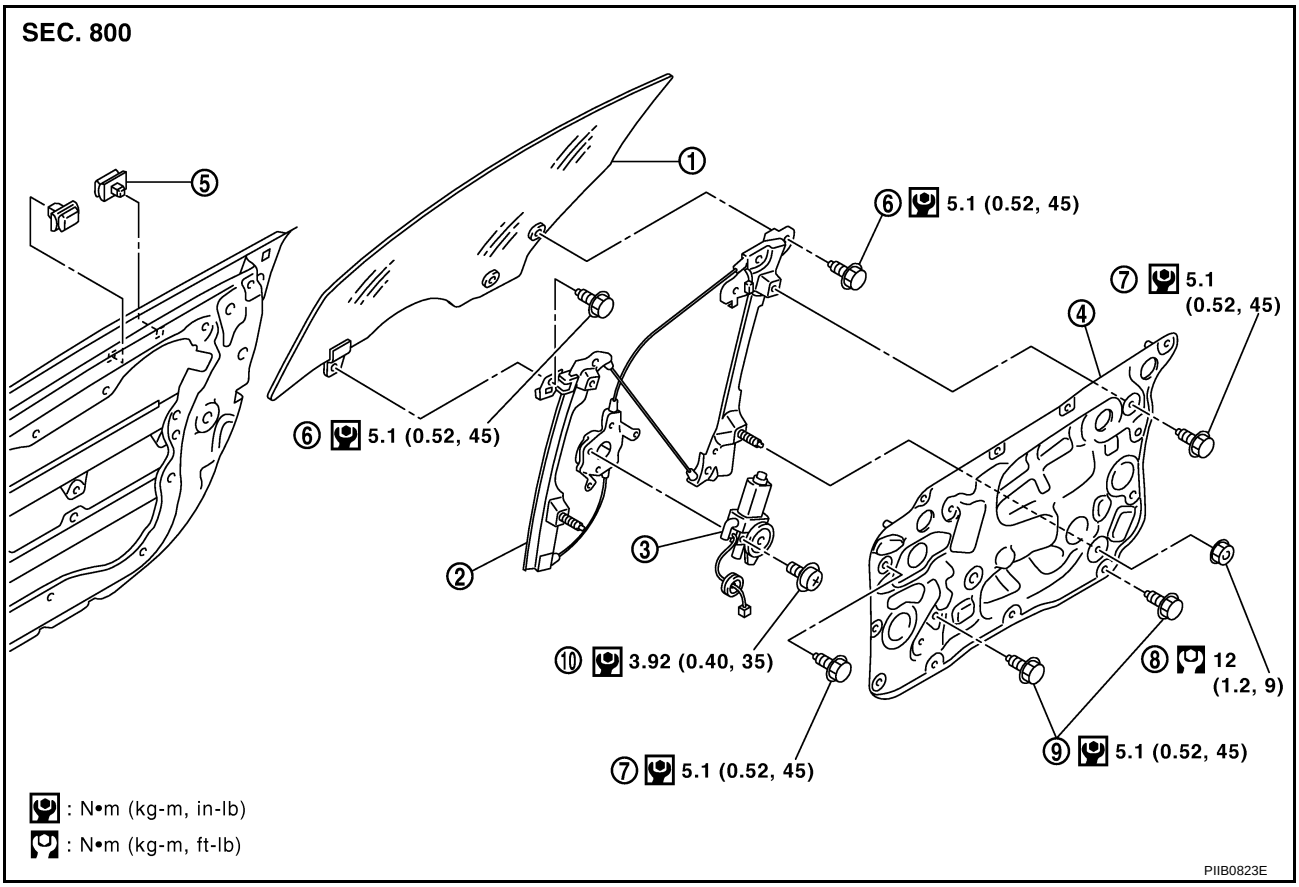
OK >> Check the condition of the harness and the connector.
NG >> Replace door key cylinder switch.

FRONT DOOR GLASS AND REGULATOR

PFP:80300

Removal and Installation

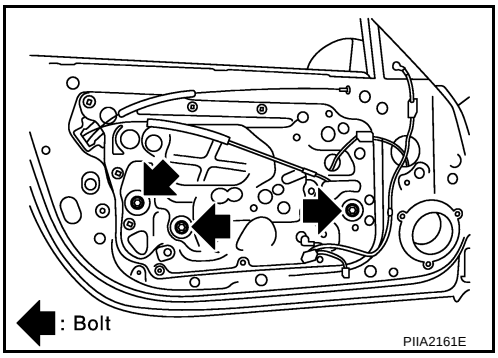
AIS0065O



1. Door glass
2. Regulator assembly
3. Power window motor
4. Module assembly
5. Glass stabilizer
6. Glass mounting bolt
7. Regulator mounting bolt
8. Regulator mounting nut
9. Module mounting bolt
10. Power window motor mounting bolt

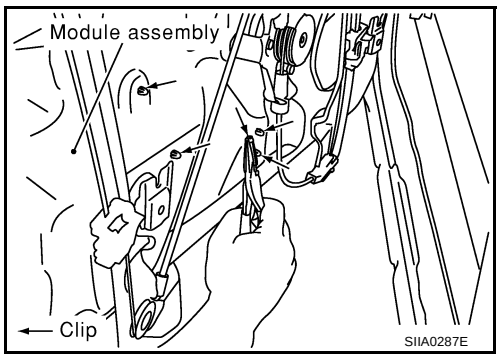
REMOVAL

1. Remove front door finisher. Refer to EI-33, "DOOR FINISHER" .
2. Operate power window main switch to raise/lower door window until glass mounting bolts can be seen.
3. Remove the glass mounting bolts.



4. While holding door window, raise it at rear end to pull the glass toward outside of door.
5. Remove mounting bolts, and remove module assembly.

6. Disconnect harness connector for module assembly, and unclip harness from the back.



INSTALLATION

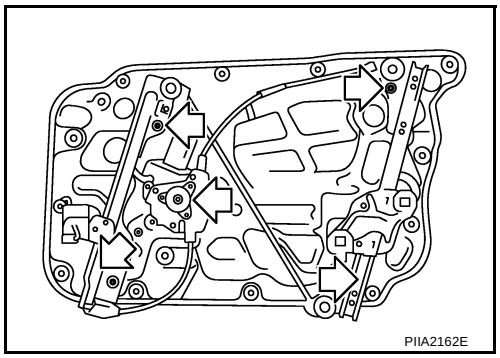
Install in the reverse order of removal.

INSPECTION AFTER REMOVAL

Check regulator assembly for the following items. If a malfunction is detected, replace or grease it.

- Wire wear
- Regulator deformation
- Grease condition for each sliding part

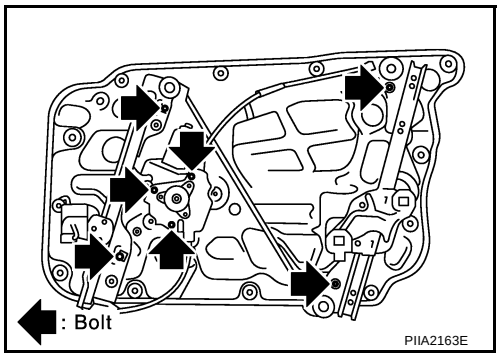
The arrows in the figure show the application points of body grease.



DISASSEMBLY AND ASSEMBLY

Disassembly

Remove power window motor and guide rail from module assembly.



Assembly

Assemble in the reverse order of disassembly.

SETTING AFTER INSTALLATION

Setting of Limit Switch

If any of the following work has been done, set the limit switch (integrated in the motor).

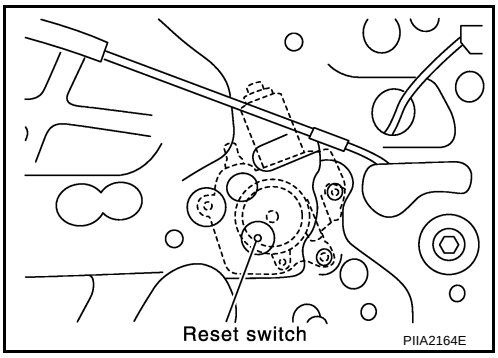
- Removal and installation of regulator.
- Removal and installation of motor from regulator.

Resetting

After installing each component to vehicle, follow the steps below.

1. Raise glass to the top position.
2. While pressing and holding reset switch, lower glass to the bottom position.
3. Release reset switch, and check reset switch returns to the original position, and then raise the glass to the top position.

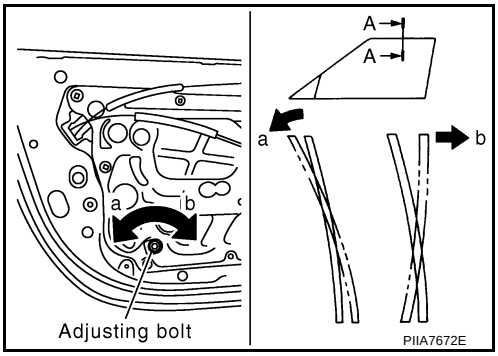
CAUTION:
Do not operate the glass automatically to raise the glass to the top position.
Do not operate the door switch is turning on.



FITTING INSPECTION

- Check that glass is securely fit into glass run groove.
- Lower glass slightly [approx. 10 to 20 mm (0.39 to 0.79 in)] and check the distance between the edge of glass and the roof end. If the distance is not constant, adjust the glass position by loosening and tightening following bolts.
  - Regulator mounting bolt and nut
  - Glass and guide rail mounting bolt
- Raise the glass fully and adjust the glass top end and body side welt fitting with the adjusting bolt at the lower of the regulator rear rail.

NOTE:
- Turn the adjusting bolt clockwise to move the door glass upper end outward.
- Turn the adjusting bolt counterclockwise to move the door glass upper end inward.
- If water leaks, repair the fitting (Roadster only). Refer to RF-115, "Repairing Method for Water Leakage Around Doors" .



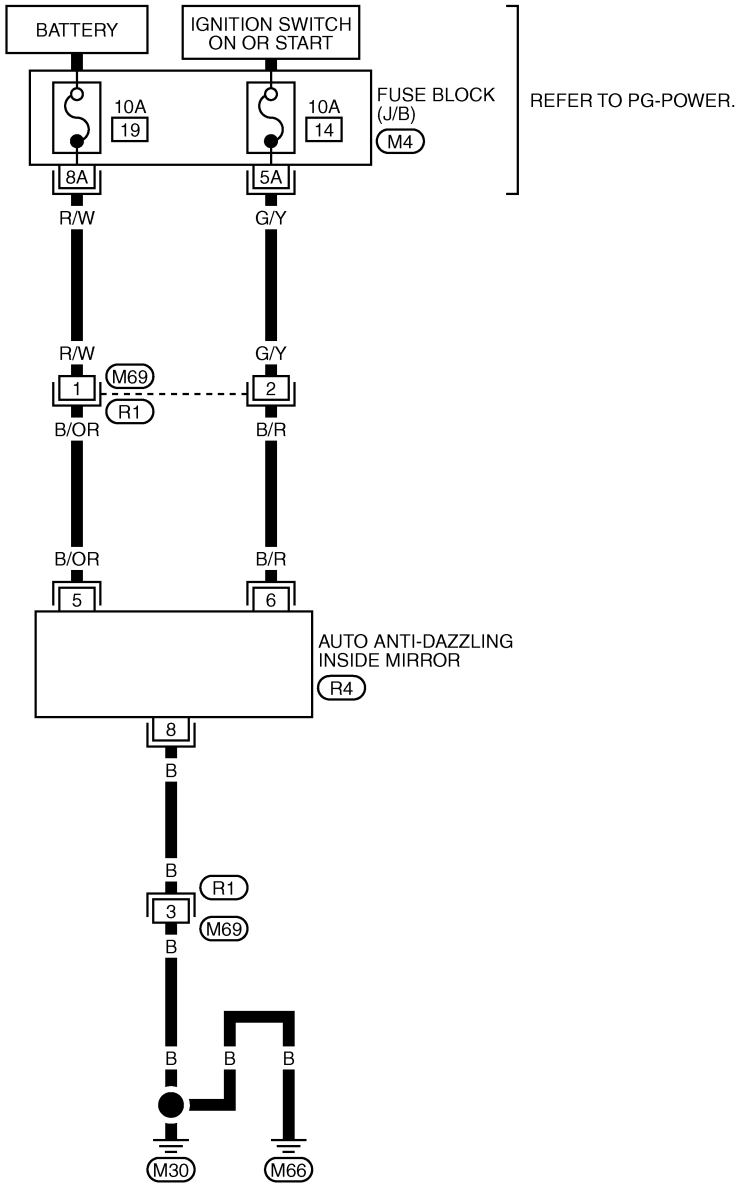
INSIDE MIRROR

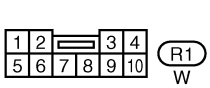
PFP:96321

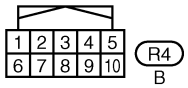
Wiring Diagram –I/MIRR–

AIS000FQ

GW-I/MIRR-01





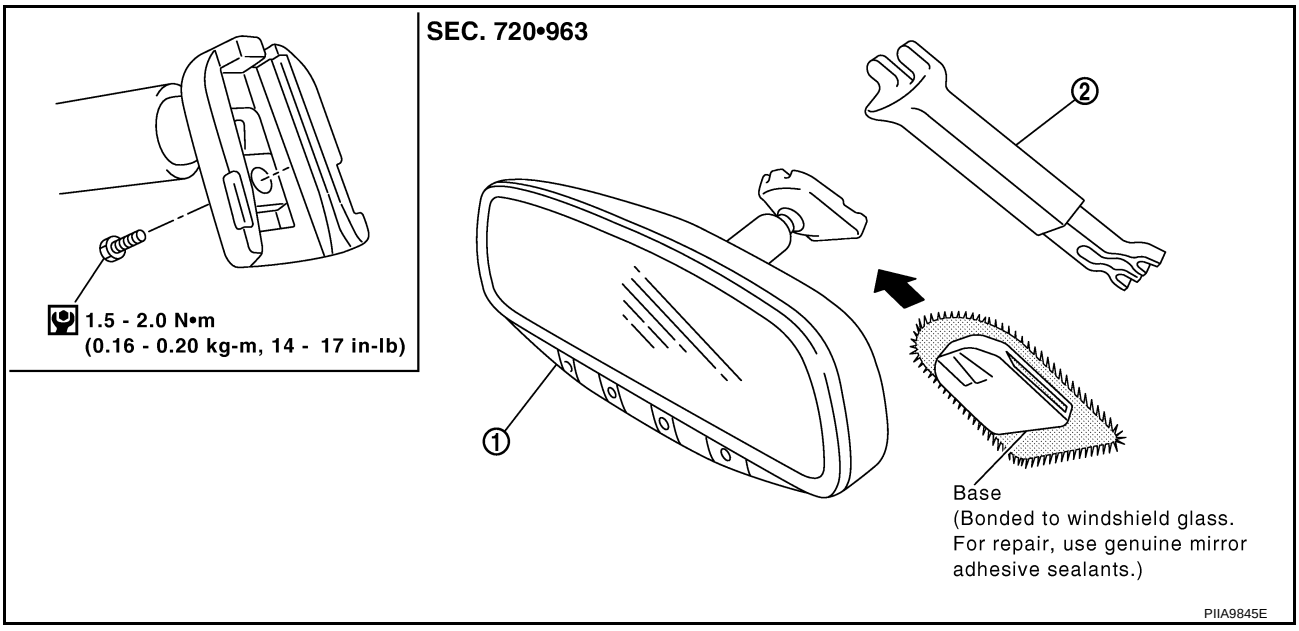


REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TIWT0257E

Removal and Installation

AIS000FR



1. Inside mirror
2. Inside mirror finisher

REMOVAL

1. Remove inside mirror finisher.
2. Remove screw of the mirror base.
3. Slide the mirror base upward to remove.
4. Disconnect the connector.

INSTALLATION

Install in the reverse order of removal.

CAUTION:

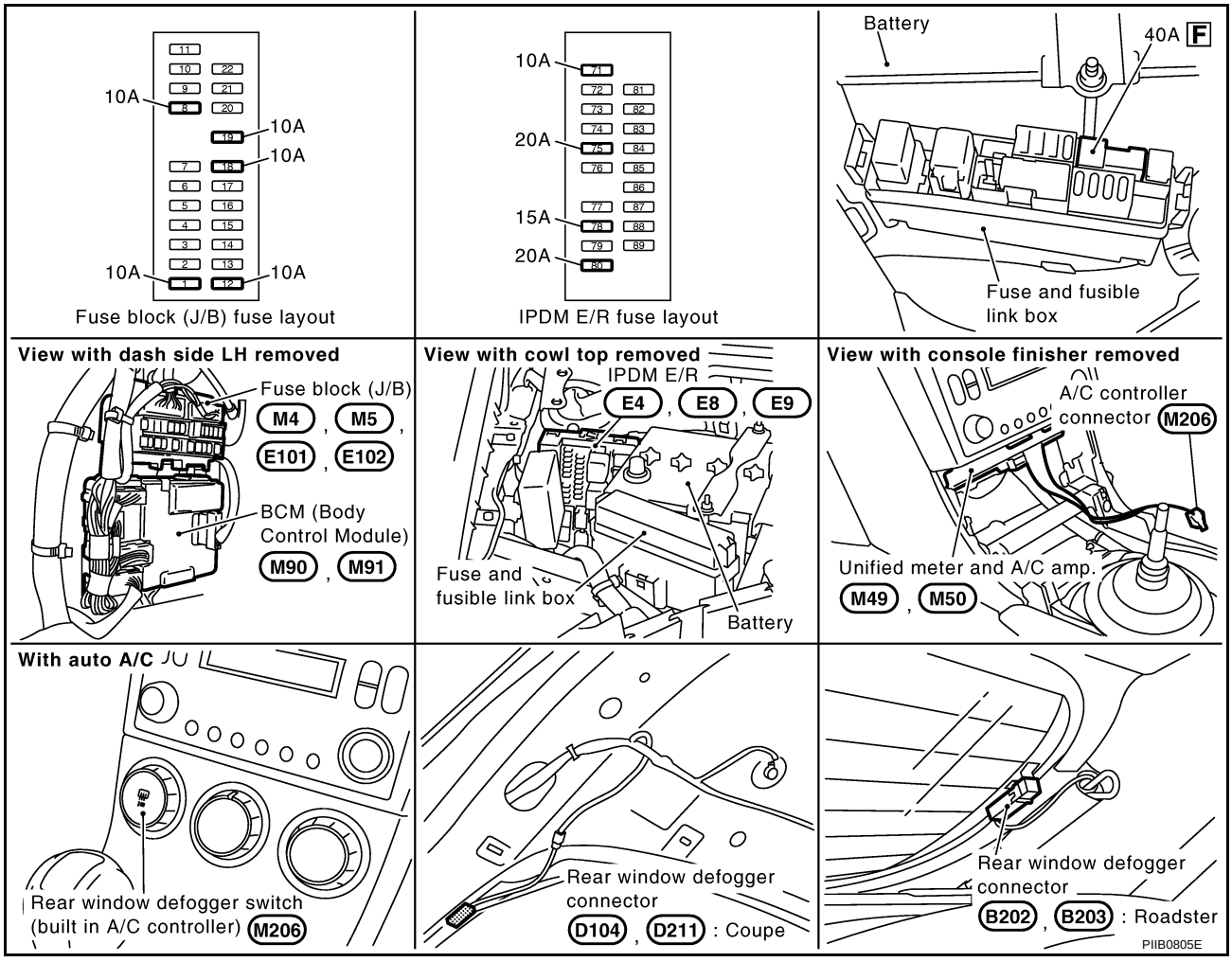
Apply Genuine Mirror Adhesive or equivalent to bonding surface of mounting bracket. Refer to GI-47, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

REAR WINDOW DEFOGGER

PFP:25350

Component Parts and Harness Connector Location

AIS003XN



System Description

AIS000FT

The rear window defogger system is controlled by BCM (Body Control Module) and IPDM E/R (Intelligent Power Distribution Module Engine Room). The rear window defogger operates only for approximately 15 minutes.

Power is supplied at all times

- through 20A fuse [No. 75 and 80, located in the IPDM E/R]
- to rear window defogger relay terminal 3 and 6.
- through 40A fusible link (letter **F** , located in the fuse and fusible link box)
- to BCM terminal 55.
- through 10A fuse [No. 18, located in the fuse block (J/B)]
- to BCM terminal 42.
- through 10A fuse [No. 19, located in the fuse block (J/B)]
- to unified meter and A/C amp. terminal 21.

With the ignition switch turned to ON or START position, power is supplied

- through 10A fuse [No. 1, located in the fuse block (J/B)]
- to BCM terminal 38.
- through 10A fuse [No. 12, located in the fuse block (J/B)]
- to unified meter and A/C amp. terminal 22 and rear window defogger relay terminal 1
- and then through unified meter and A/C amp.
- to A/C controller (rear window defogger switch) terminal 72 and 84.

Ground is supplied

- to BCM terminal 52
- through body grounds M30, and M66.
- to unified meter and A/C amp. terminal 29 and 30
- through body grounds M30 and M66.
- to internal CPU of IPDM E/R terminal 38 and 60
- through body grounds E17, E43 and F152.

When A/C controller (rear window defogger switch) is turned to ON,
Rear window defogger switch signals are transmitted,

- through A/C controller. terminal 87
- to unified meter and A/C amp.

Then ground is supplied

- to BCM terminal 9
- through unified meter and A/C amp. terminal 38
- through unified meter and A/C amp. terminal 30
- through body grounds M30 and M66.

Then BCM recognizes that rear window defogger switch is turned to ON.
Then it sends rear window defogger switch signals to IPDM E/R via DATA LINE (CAN H, CAN L).
When IPDM receives rear window defogger switch signals,
Ground is supplied

- to rear window defogger relay terminal 2
- through IPDM E/R terminal 52
- through internal CPU of IPDM E/R
- through IPDM E/R terminal 60
- through body grounds E17, E43 and F152, and then rear window defogger relay is energized.

When rear window defogger relay is turned ON,
Signals are transmitted

- to rear window defogger terminal 1
- through rear window defogger relay terminals 5 and 7 (For Coupe)
- through rear window defogger relay terminal 5. (For Roadster)

Rear window defogger terminal 2 is grounded through body ground D212. (For Coupe)
Rear window defogger terminal 2 is grounded through body ground B5, B6 and T14. (For Roadster)
With power and ground supplied, rear window defogger filaments heat and defog the rear window.
When rear window defogger relay is turned to ON,
Power is supplied

- through rear window defogger relay terminals 5 and 7 (For Coupe)
- through rear window defogger relay terminal 7 (For Roadster)
- through fuse block (J/B) terminal 2C
- through 10A fuse [No. 8, located in the fuse block (J/B)]
- through fuse block (J/B) terminal 5B
- to door mirror defogger (Driver side and passenger side) terminal 2.

Door mirror defogger (Driver side and passenger side) terminal 1 is grounded through body grounds M30 and M66.
With power and ground supplied, door mirror defogger filaments heat and defog the mirror.
When rear window defogger relay is turned to ON,
Power is supplied

- to unified meter and A/C amp. terminal 56
- through rear window defogger relay terminals 5 and 7 (For Coupe)
- through rear window defogger relay terminal 5. (For Roadster)

Then ground is supplied

- to A/C controller terminal 78

- through unified meter and A/C amp.
- through unified meter and A/C amp. terminal 29 and 30
- through body grounds M30 and M66.

This energizes rear window defogger indicator.

CAN Communication System Description

AIS001O8

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

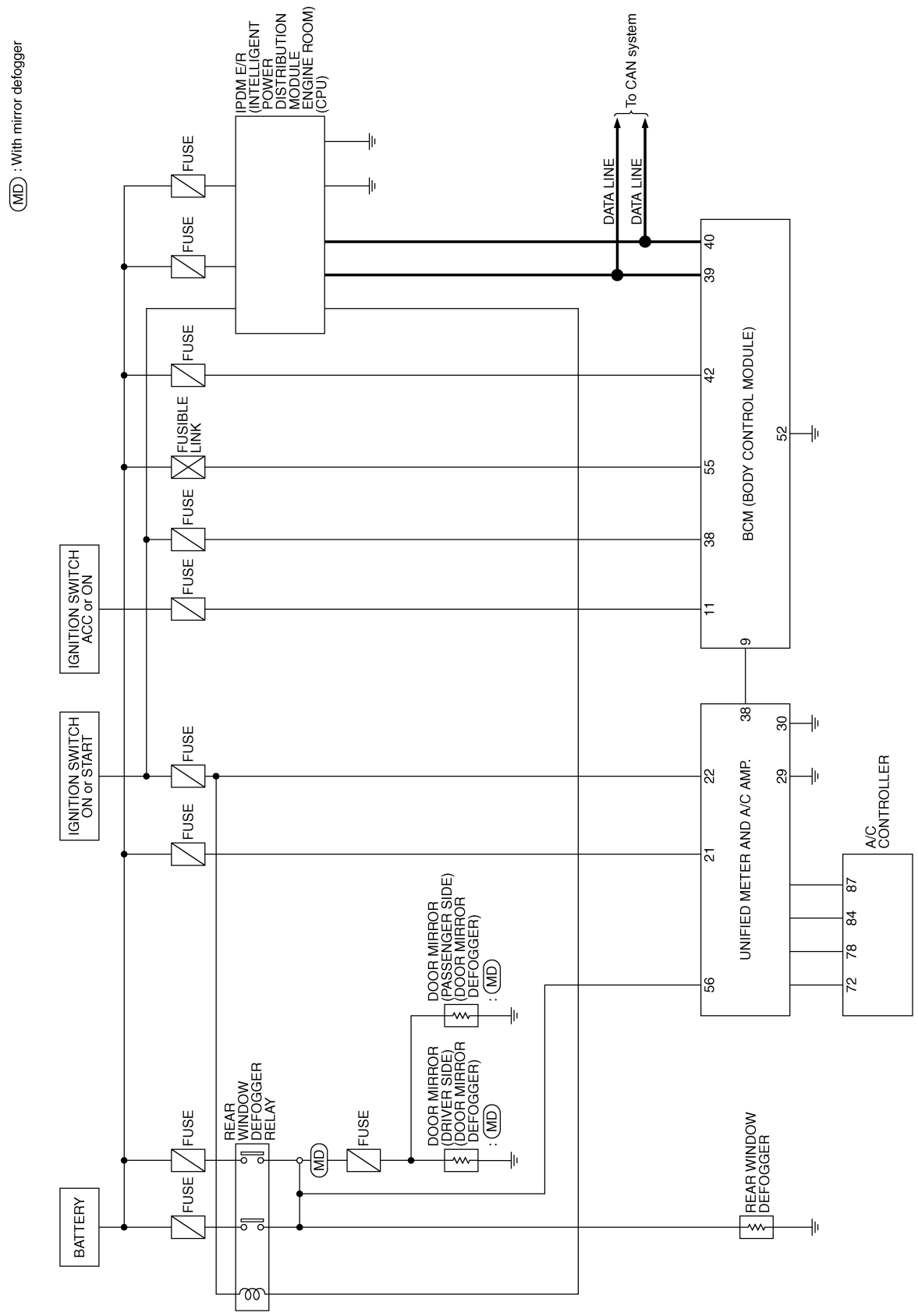
CAN Communication Unit

AIS0040Z

Refer to LAN-5, "CAN Communication Unit" .

Schematic – DEF –/ For Coupe

AIS000FV

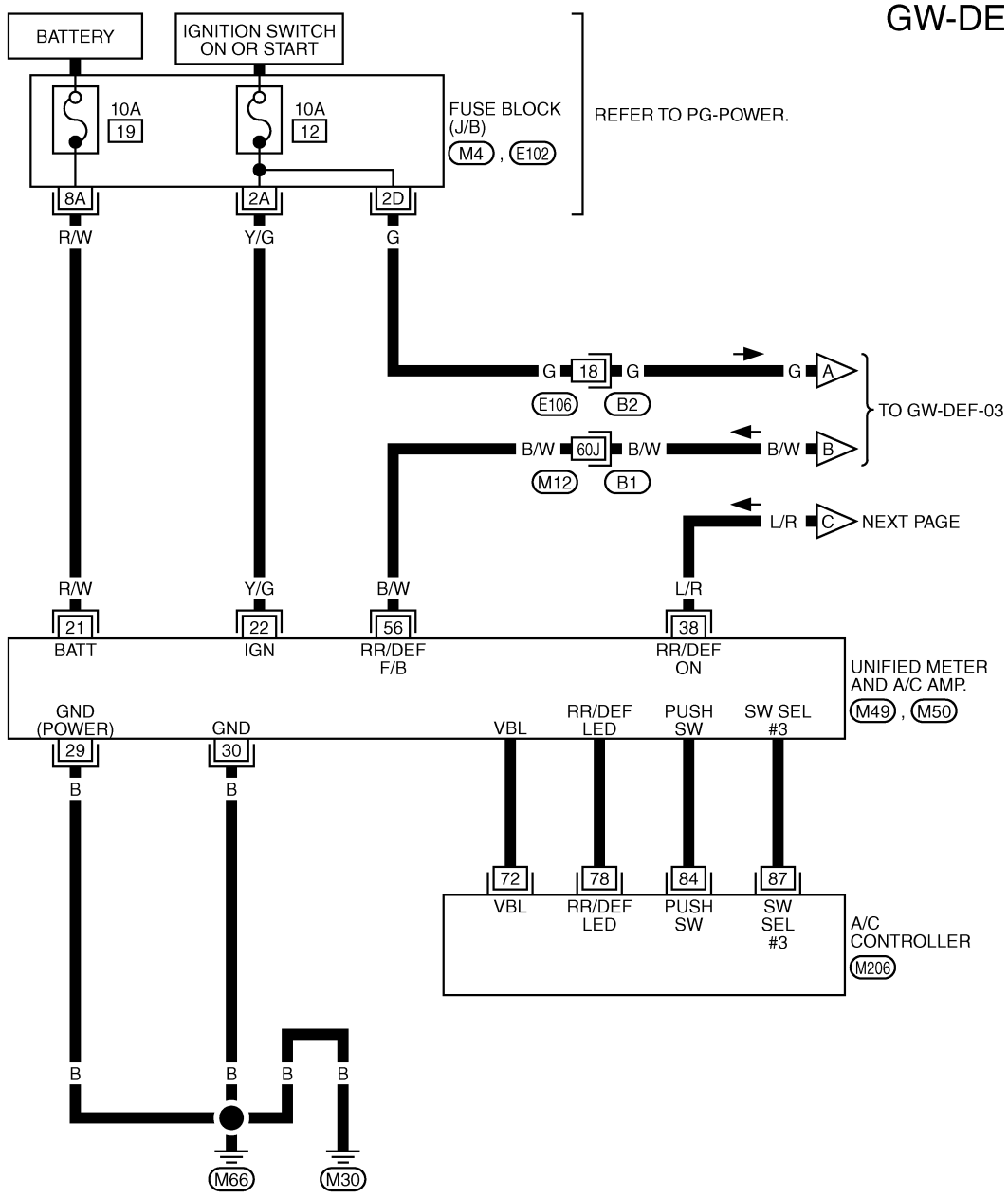


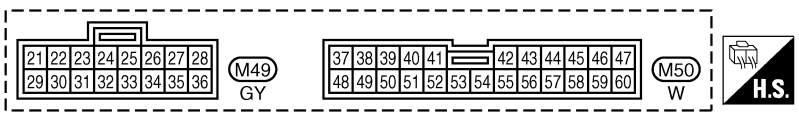
TIWT0816E

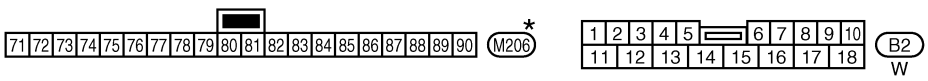
Wiring Diagram –DEF–/ For Coupe

AIS000FW

GW-DEF-01







*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

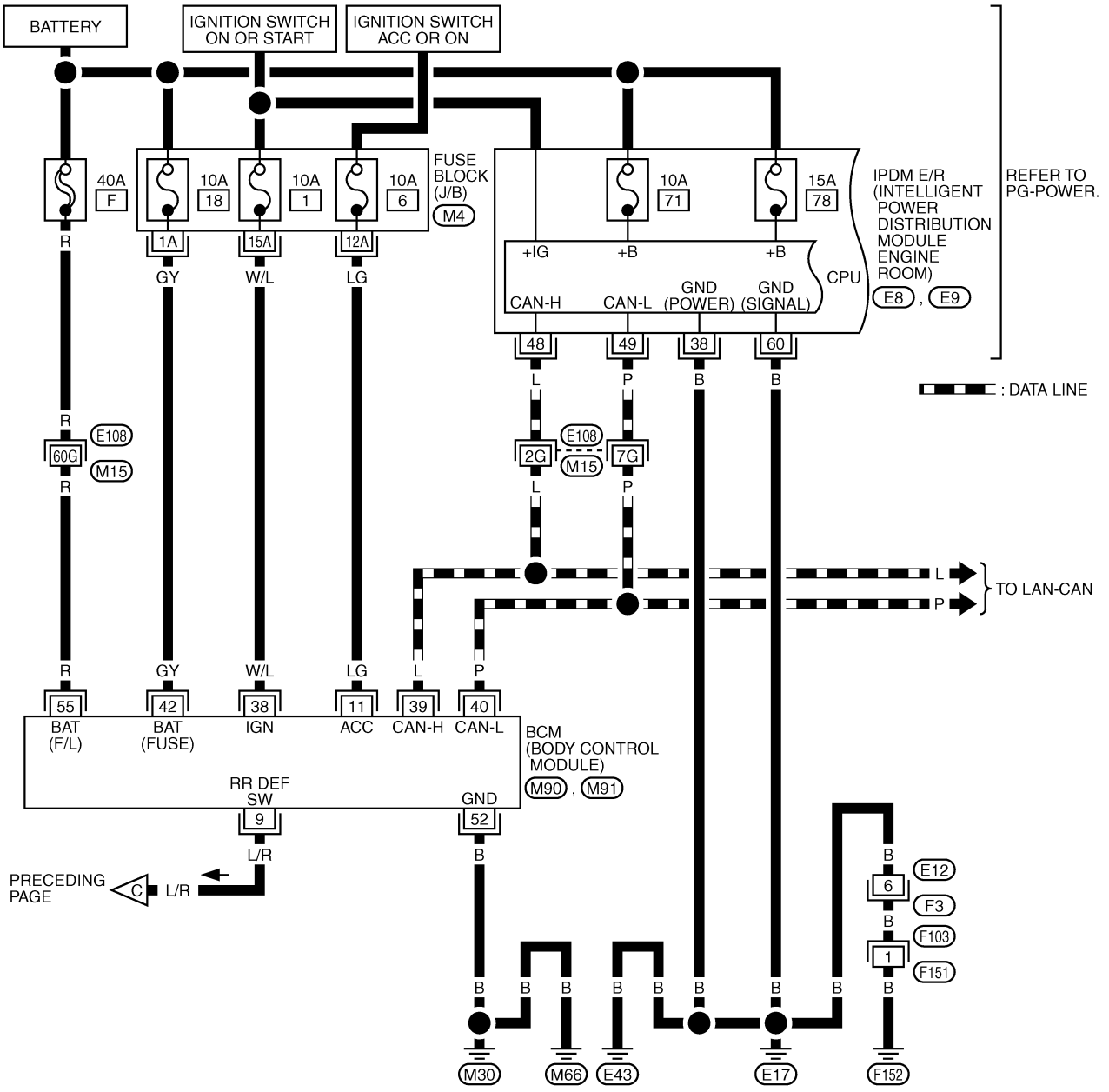
REFER TO THE FOLLOWING.

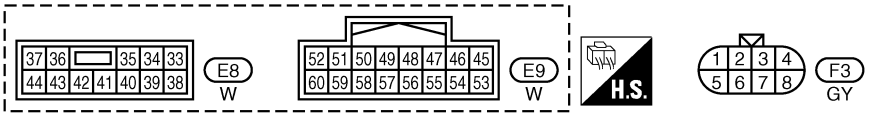
B1 -SUPER MULTIPLE JUNCTION (SMJ)

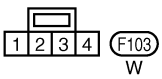
M4 , E102 -FUSE BLOCK-JUNCTION BOX (J/B)

TIWT0505E

GW-DEF-02







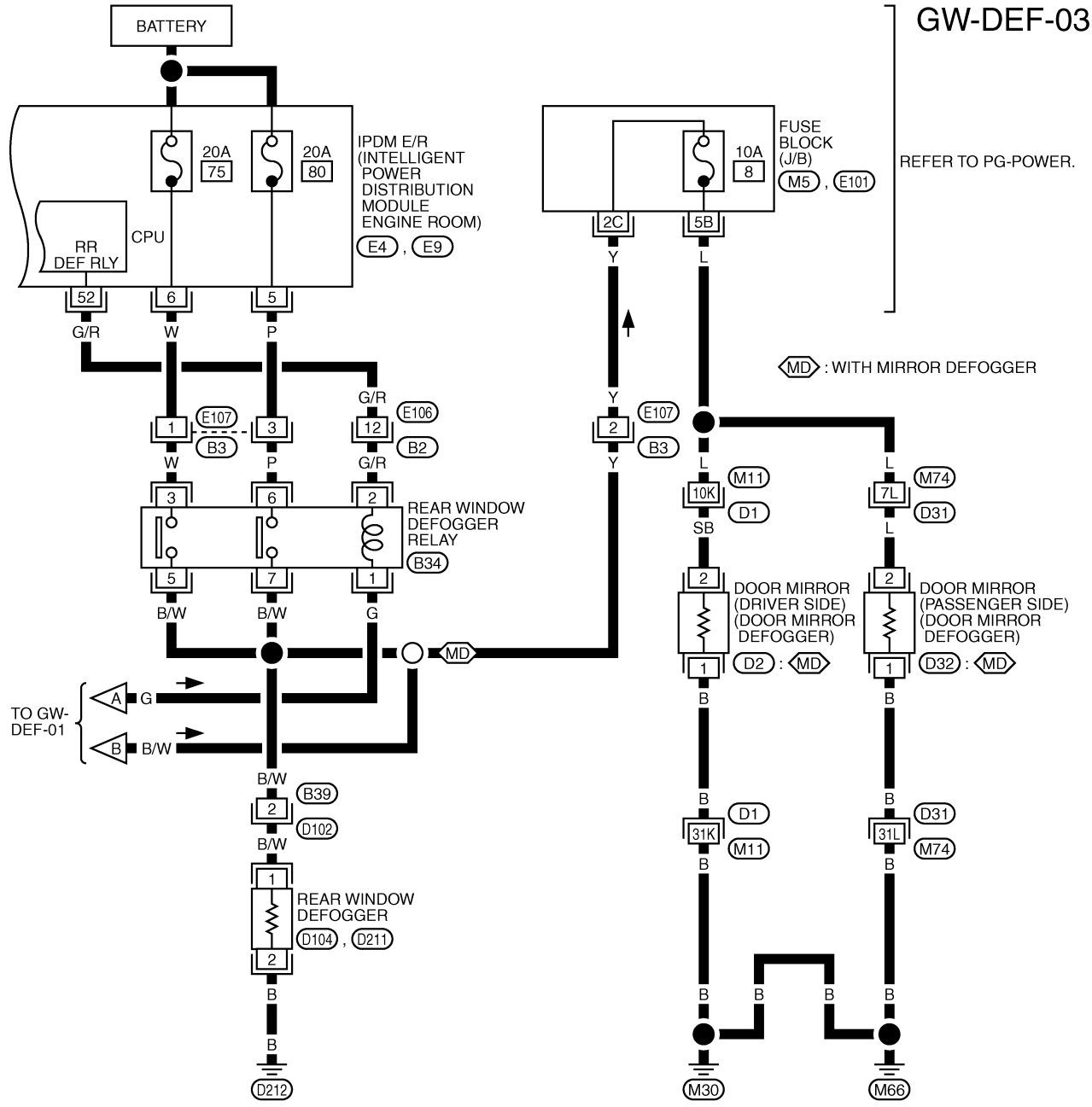
REFER TO THE FOLLOWING.

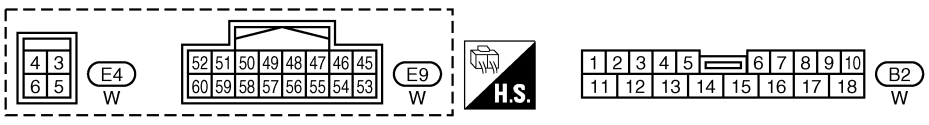
E108 -SUPER MULTIPLE JUNCTION (SMJ)

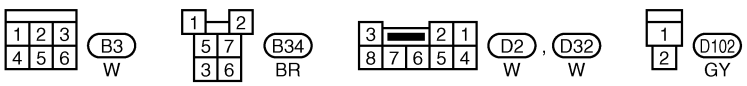
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

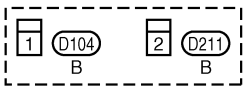
M90 , M91 -ELECTRICAL UNITS

TIWT0818E









REFER TO THE FOLLOWING.

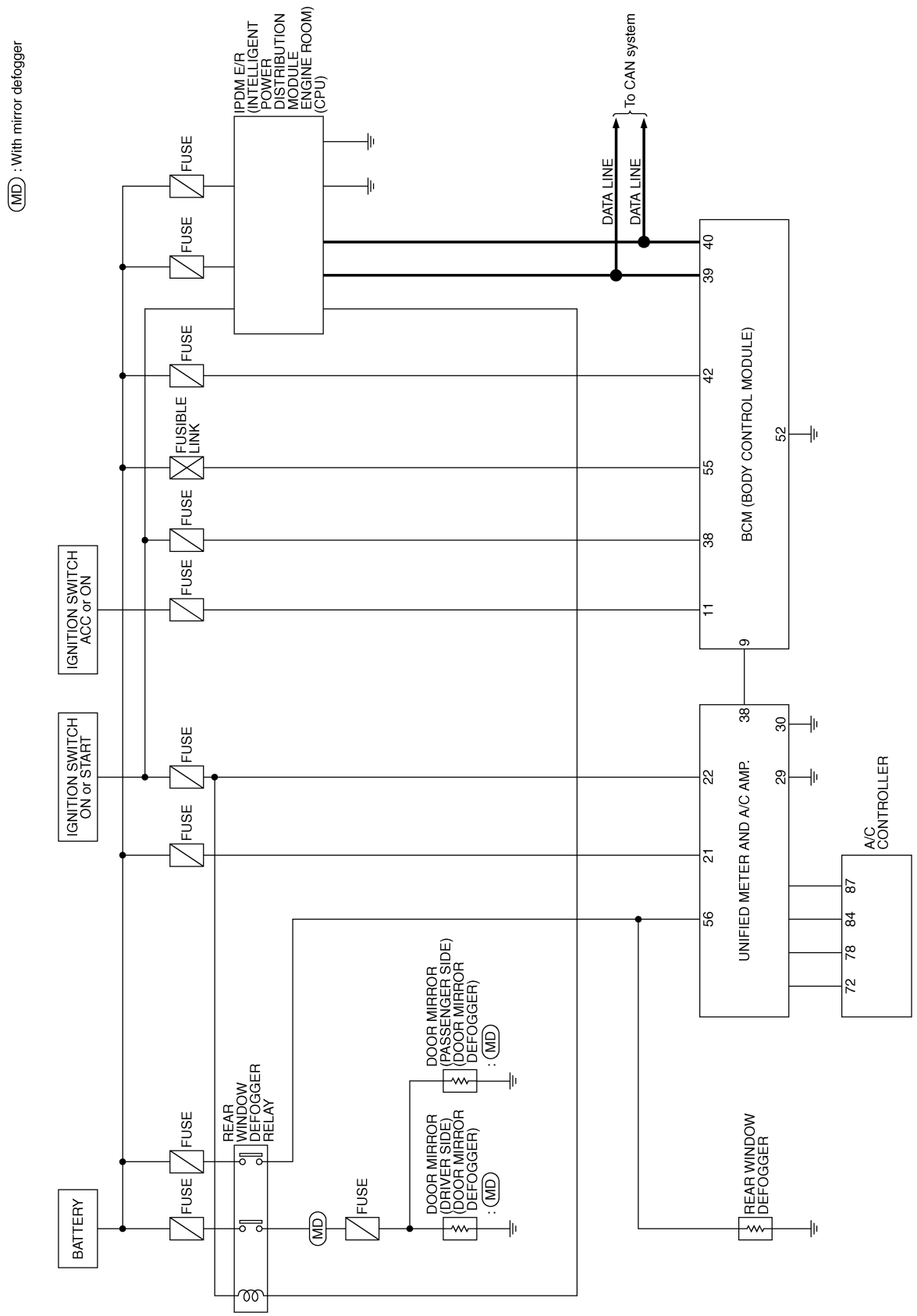
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

M5 , E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TIWT0819E

Schematic – DEF –/ For Roadster

AIS003XO

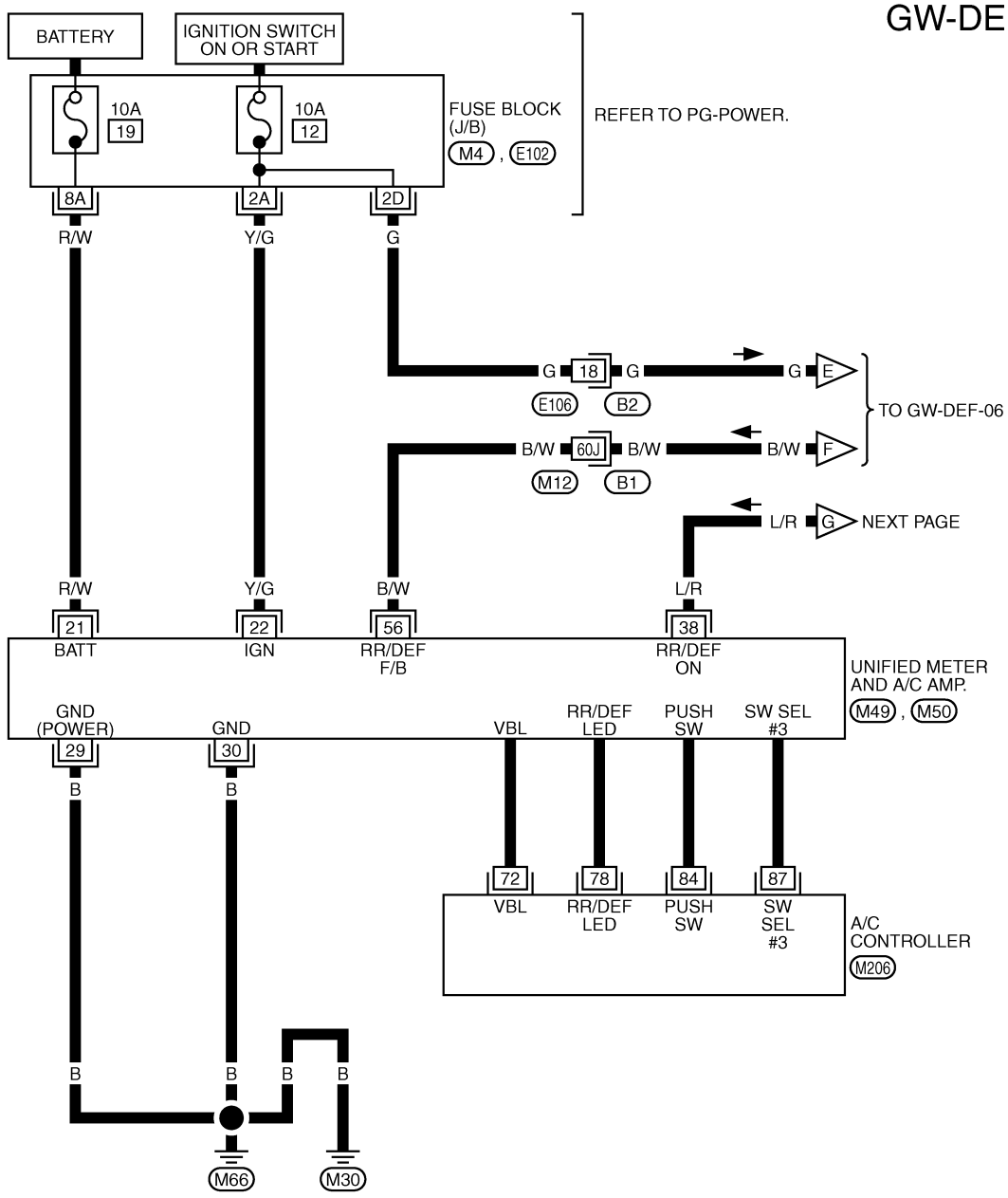


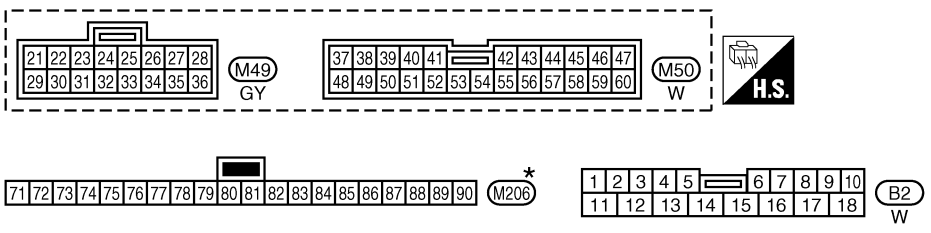
TIWT0820E

Wiring Diagram –DEF–/ For Roadster

AIS003XP

GW-DEF-04





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

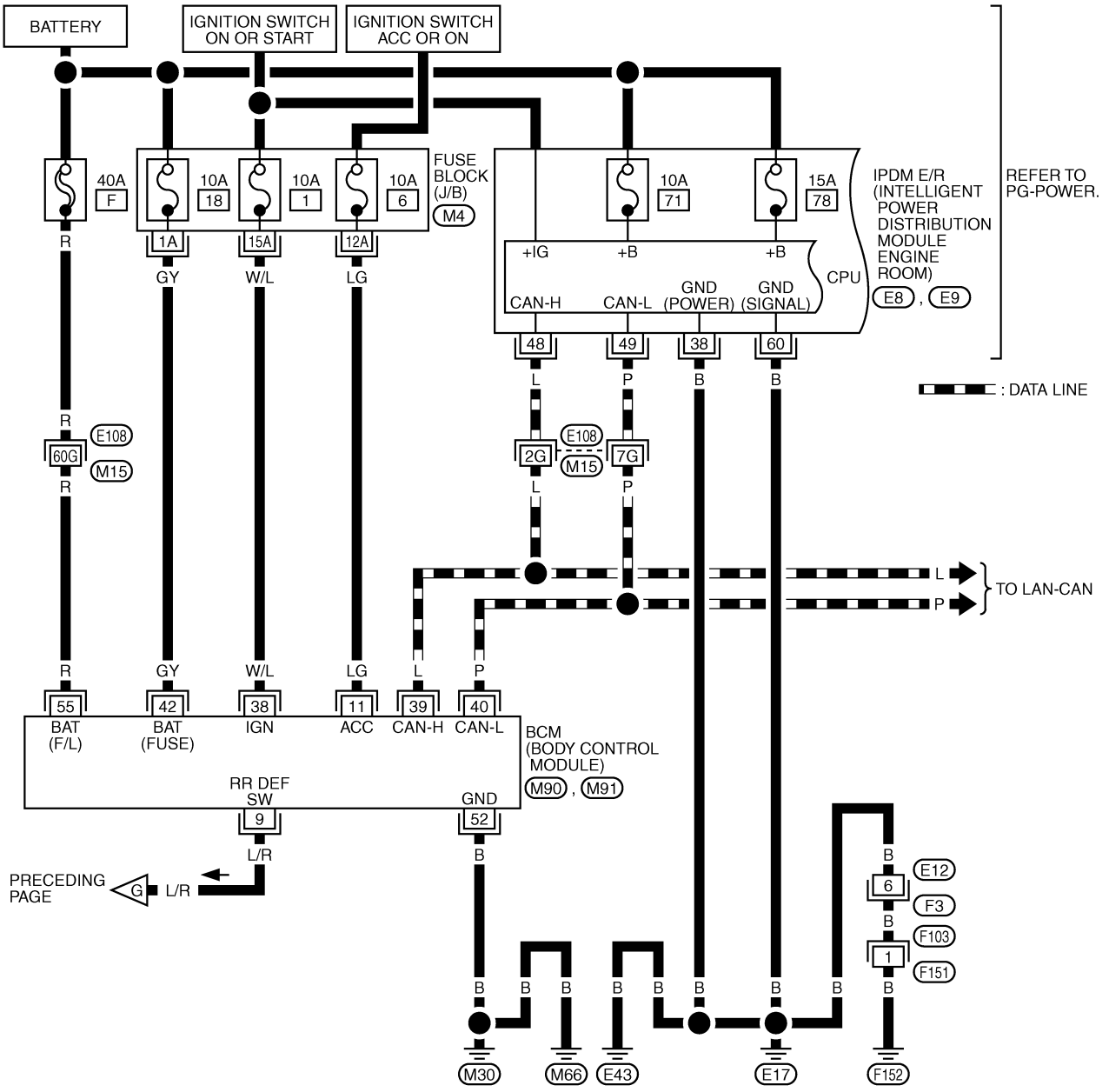
REFER TO THE FOLLOWING.

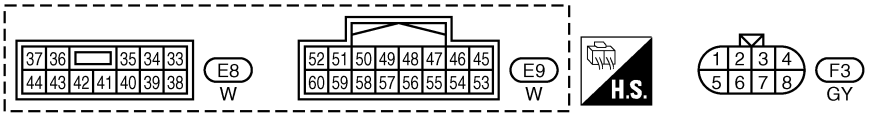
B1 -SUPER MULTIPLE JUNCTION (SMJ)

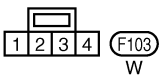
M4 , E102 -FUSE BLOCK-JUNCTION BOX (J/B)

TIWT0717E

GW-DEF-05







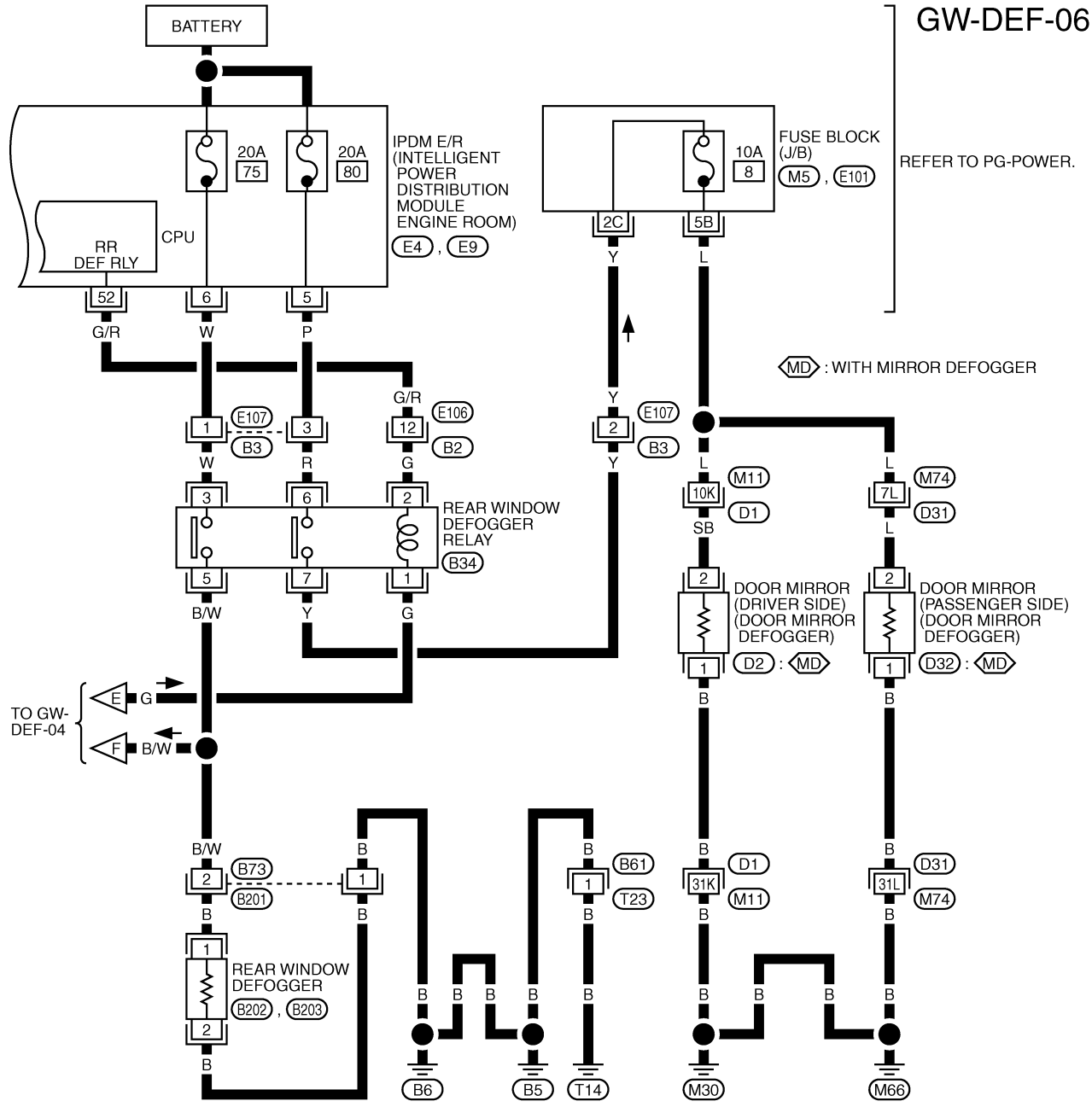
REFER TO THE FOLLOWING.

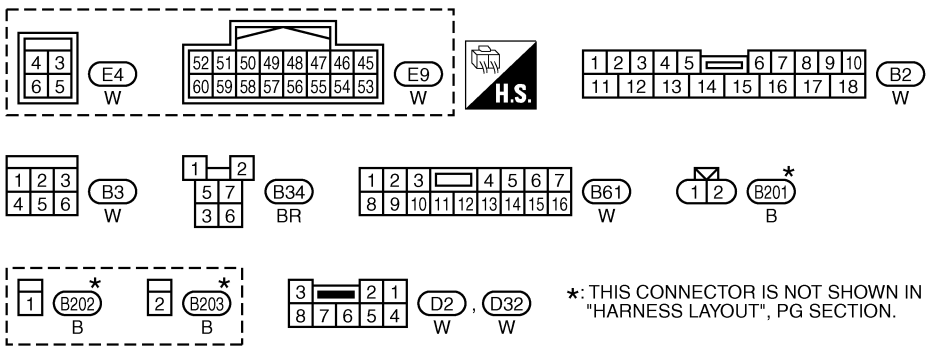
E108 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

M90, M91 -ELECTRICAL UNITS

TIWT0822E





REFER TO THE FOLLOWING.

D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

M5 , E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TIWT0823E

Terminal and Reference Value for BCM

AIS000FX

TERMINAL	WIRE COLOR	ITEM	CONDITION		VOLTAGE (V) (Approx.)
9	L/R	Rear window defogger switch signal	Rear window defogger switch	: ON	0
				: OFF	5
11	LG	Ignition switch ACC power supply (ACC or ON)	Ignition switch (ACC or ON position)		Battery voltage
38	W/L	Ignition switch ON power supply (ON or START)	Ignition switch (ON or START position)		Battery voltage
39	L	CAN-H	—		—
40	P	CAN-L	—		—
42	GY	Power source (Fuse)	—		Battery voltage
52	B	Ground	—		0
55	R	Power source (Fusible link)	—		Battery voltage

Terminal and Reference Value for IPDM E/R.

AIS000FY

TERMINAL	WIRE COLOR	ITEM	CONDITION		VOLTAGE (V) (Approx.)
5	P	Battery power supply	—		Battery voltage
6	W	Battery power supply	—		Battery voltage
38	B	Ground (Signal)	—		0
48	L	CAN-H	—		—
49	P	CAN-L	—		—
52	G/R	Rear window defogger relay control signal	Rear window defogger switch	: ON	0
				: OFF	Battery voltage
60	B	Ground (Power)	—		0

Terminal and Reference Value for Unified Meter and A/C Amp.

AIS0014K

TERMINAL	WIRE COLOR	ITEM	CONDITION		VOLTAGE (V) (Approx.)
21	R/W	Power source (Fuse)	—		Battery voltage
22	Y/G	Ignition switch ON power supply (ON or START)	Ignition switch (ON or START position)		Battery voltage
29	B	Ground (Power)	—		0
30	B	Ground	—		0
38	L/R	Rear window defogger switch signal	Rear window defogger switch.	: ON	0
				: OFF	5
56	B/W	Rear window defogger ON signal	Rear window defogger switch	: ON	Battery voltage
				: OFF	0
72	—	Indicator power supply	Ignition switch (ON or START position)		5
78	—	Rear window defogger indicator signal	Rear window defogger switch	: ON	0
				: OFF	5
84	—	A/C control push switch power supply	Ignition switch (ON or START position)		5
87	—	Rear window defogger switch ON signal	Rear window defogger switch	: ON	0
				: OFF	5

CONSULT-II Function

AIS000G1

The following functions are executed by combining data received and command transmitted via the communication line from the BCM or IPDM E/R.

BCM diagnosis position	Inspection items and diagnosis mode		Description
BCM C/U*1	Self-diagnosis results		Carries out the self-diagnosis.
	Data monitor	CAN diagnosis support monitor	Displays CAN communication system diagnosis, disabled transmission status, and communication status of each unit communicated with BCM.
		Selection from menu	Displays the input data to BCM on real-time basis.
IPDM E/R*2	Self-diagnosis results		Carries out the self-diagnosis.
	Data monitor		Displays the input data to IPDM E/R on real–time basis.
	Active test		Gives a drive signal to rear window defogger to activate it.
REAR DEFOGGER	Data monitor		Displays the input remote keyless entry system data to BCM on real–time basis.
	Active test		Gives a drive signal to rear window defogger to activate it.

*1 : Refer to BCS-14, "CONSULT-II" .

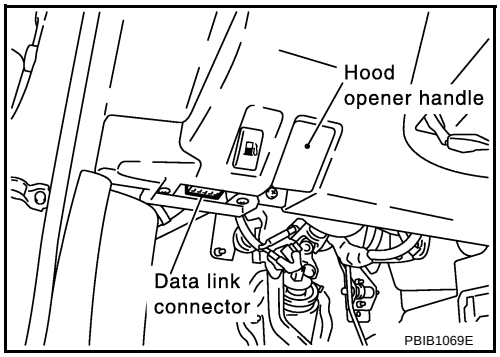
*2 : Refer to PG-20, "CONSULT-II" .

CONSULT-II INSPECTION PROCEDURE FOR REAR WINDOW DEFOGGER

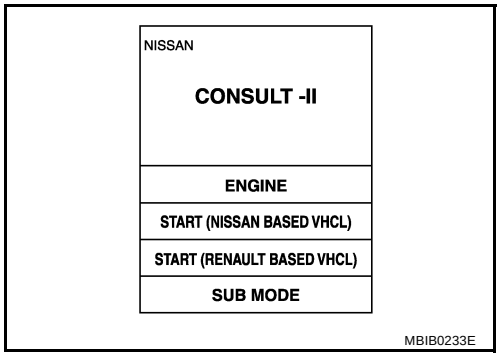
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

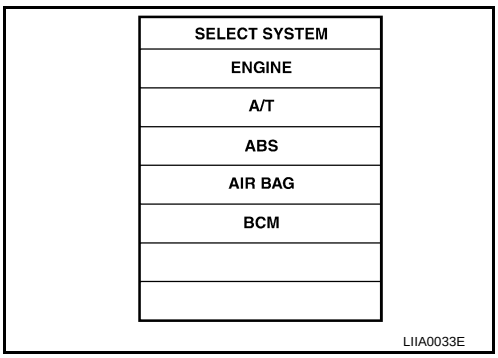
1. Turn ignition switch “OFF”.
2. Connect “CONSULT-II” and CONSULT-II CONVERTER to data link connector.



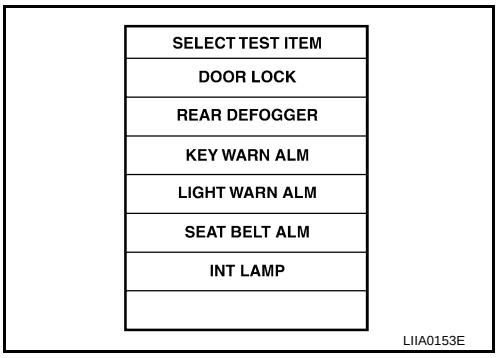
3. Turn ignition switch “ON”.
4. Touch “START (NISSAN BASED VHCL)”.



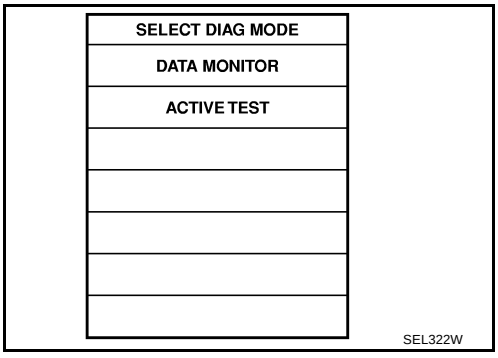
5. Touch “BCM”.
If “BCM” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



6. Touch “REAR DEFOGGER”.



7. Select diagnosis mode,“DATA MONITOR” and “ACTIVE TEST” are available.



DATA MONITOR
Display Item List

Monitor item “Operation”		Content
REAR DEF SW	“ON/OFF”	Displays “Press (ON)/others (OFF)” status determined with the rear window defogger switch.
IGN ON SW	“ON/OFF”	Displays “IGN (ON)/OFF” status determined with the ignition switch signal.

ACTIVE TEST
Display Item List

Test item	Content
REAR DEFOGGER	Gives a drive signal to the rear window defogger to activate it.

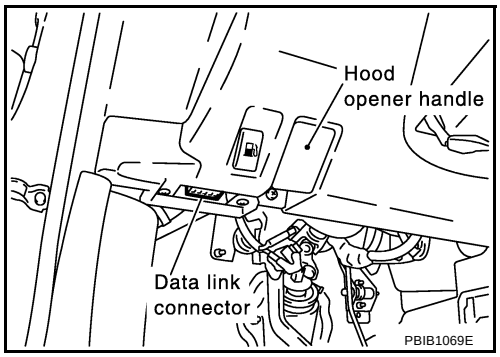
CONSULT-II INSPECTION PROCEDURE FOR IPDM E/R

CAUTION:

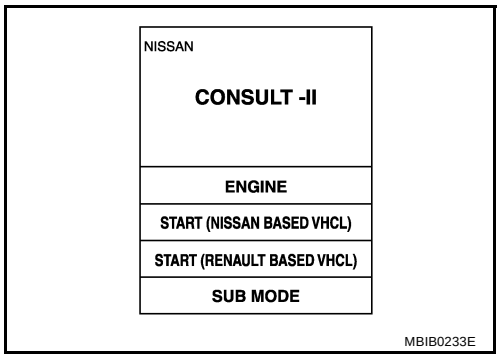
If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

“IPDM E/R”

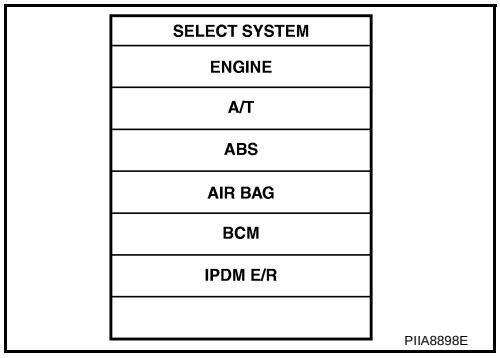
1. Turn ignition switch “OFF”.
2. Connect “CONSULT-II” and “CONSULT-II CONVERTER” to the data link connector.



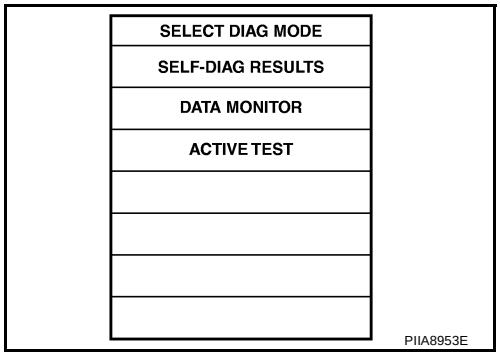
3. Turn ignition switch “ON”.
4. Touch “START(NISSAN BASED VHCL)”.



5. Touch “IPDM E/R”.
   If “IPDM E/R” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



6. Select diagnosis mode.
   “SELF-DIAG RESULTS”, “DATA MONITOR” and “ACTIVE TEST” are available.



DATA MONITOR

Monitored Item	Description
RR DEF REQ	Indicates [ON/OFF] condition of rear window defogger function by IPDM E/R.

ACTIVE TEST

Test Item	Description
REAR DEFOGGER	This test is able to check rear window defogger operation. Rear window defogger operates when “ON” on CONSULT-II screen is touched.

Work Flow

AIS000FZ

1. Check the symptom and customer's requests.
2. Understand the outline of system. Refer to GW-56, "System Description" .
3. According to the trouble diagnosis chart, repair or replace the cause of the malfunction. Refer to GW-71, "Trouble Diagnoses Symptom Chart" .
4. Does rear window defogger operate normally? YES: GO TO 5, NO: GO TO 4.
5. INSPECTION END

Trouble Diagnoses Symptom Chart

AIS00158

Make sure that other systems using the signal of the following systems operate normally.

Symptom	Diagnoses / service procedure	Refer to page
Rear window defogger and door mirror defogger do not operate (With door mirror defogger)	1. CAN communication inspection using CONSLUT-II (self-diagnosis)	BCS-16
	2. IPDM E/R operation check	GW-72
	3. Rear window defogger switch circuit check	GW-72
	4. Rear window defogger power supply circuit check	GW-73
	5. Replace IPDM E/R.	PG-30
Rear window defogger does not operated. (Without door mirror defogger)	1. CAN communication inspection using CONSLUT-II (self-diagnosis)	BCS-16
	2. IPDM E/R operation check	GW-72
	3. Rear window defogger switch circuit check	GW-72
	4. Rear window defogger power supply circuit check	GW-73
	5. Rear window defogger circuit check	GW-75*1 GW-76*2
	6. Filament check	GW-80
	7. Replace IPDM E/R.	PG-30
Rear window defogger does not operate but door mirror defoggers operate. (With door mirror defogger)	1. Rear window defogger circuit check	GW-75*1 GW-76*2
	2. Filament check	GW-80
Both of door mirror defoggers do not operate but rear window defogger operates. (With door mirror defogger)	Door mirror defogger power supply circuit check	GW-77
Driver side door mirror defogger does not operate.	Driver side door mirror defogger circuit check	GW-78
Passenger side door mirror defogger does not operate.	Passenger side door mirror defogger circuit check	GW-78

*1 : For Coupe

*2 : For Roadster

IPDM E/R Operation Check

AIS004GT

1. CHECK IPDM E/R OPERATION

With CONSULT-II

Check IPDM E/R “REAR DEFOGGER” in “ACTIVE TEST” mode with CONSULT-II.
Refer to GW-71, "ACTIVE TEST" .

When “ACTIVE TEST” is performed, does rear defogger switch indicator illuminate?

YES or NO

YES >> GO TO diagnosis/service procedure 3 in “Trouble Diagnosis Symptom Chart”. Refer to GW-71 .
NO >> GO TO diagnosis/service procedure 4 in “Trouble Diagnosis Symptom Chart”. Refer to GW-71 .

Rear Window Defogger Switch Circuit Check

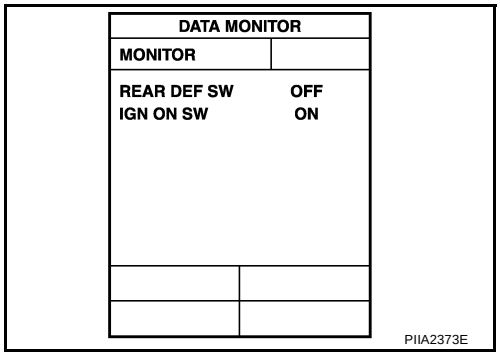
AIS001CR

1. CHECK REAR WINDOW DEFOGGER SWITCH OPERATION

With CONSULT-II

Check (“REAR DEF SW” and “IGN ON SW”) in DATA MONITOR mode with CONSULT-II. Refer to GW-69, "DATA MONITOR" .

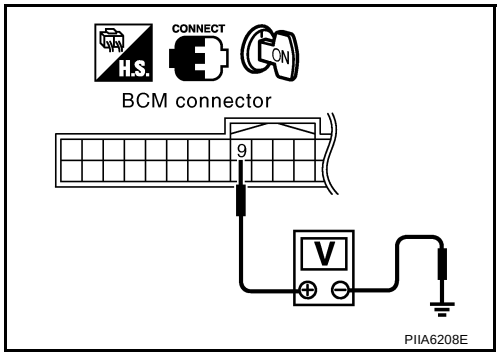
When rear defogger switch is turned to ON
REAR DEF SW :ON
When ignition switch is turned to ON
IGN ON SW :ON



With out CONSULT-II

1. Turn ignition switch ON.
2. Check voltage between BCM connector ground.

Connector	Terminal (Wire color)		Condition		Voltage (V) (Approx.)
	(+)	(–)			
M90	9 (L/R)	Ground	Rear window defogger switch	: ON	0
				: OFF	5



OK or NG

OK >> Rear window defogger switch check is OK.
NG >> GO TO 2.

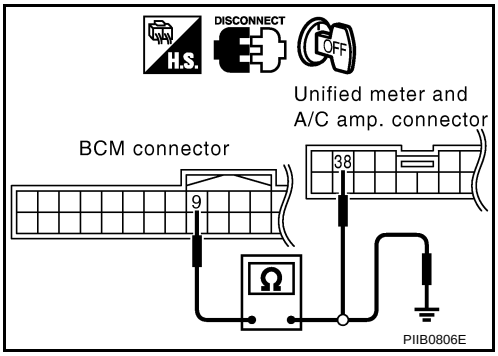
2. REAR WINDOW DEFOGGER SWITCH SIGNAL CIRCUIT HARNESS CONTINUITY INSPECTION

1. Disconnect BCM connector and unified meter and A/C amp.connector.
2. Check continuity between BCM connector M90 terminal 9 and unified meter and A/C amp. connector M50 terminal 38.

9 (L/R) – 38 (L/R) : Continuity should exist

3. Check continuity between BCM harness connector M90 terminal 9 (L/R) and ground

9 (L/R) – Ground : Continuity should not exist



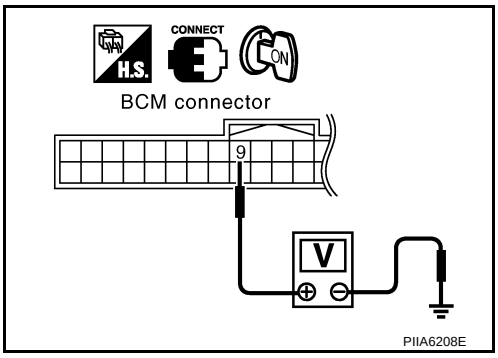
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness between BCM and unified meter and A/C amp.

3. CHECK BCM OUTPUT SIGNAL

1. Connect BCM connector.
2. Turn ignition switch ON.
3. Check voltage between BCM connector M90 terminal 9 and ground.

9 (L/R) – Ground :Approx. 5



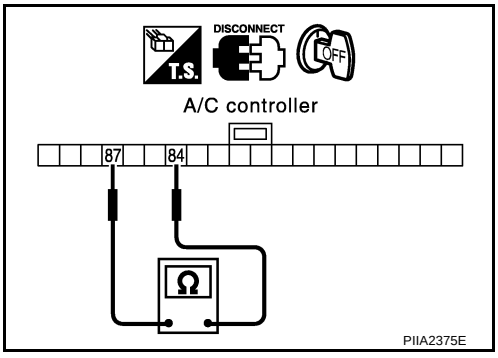
OK or NG

OK >> GO TO 4.
NG >> Replace BCM.

4. REAR WINDOW DEFOGGER SWITCH INSPECTION

1. Disconnected A/C controller connector.
2. Rear window defogger switch operate, check continuity A/C controller terminal 84 and 87.

Terminal		Condition		Continuity
84	87	Rear window defogger switch	: ON	Yes
			: OFF	No



OK or NG

OK >> Replace unified meter and A/C amp.
NG >> Replace A/C controller.

Rear Window Defogger Power Supply Circuit Check

AIS0014M

1. CHECK FUSE

Check 10A fuse [No. 12, located in fuse block (J/B)].

NOTE:
Refer to GW-56, "Component Parts and Harness Connector Location" .

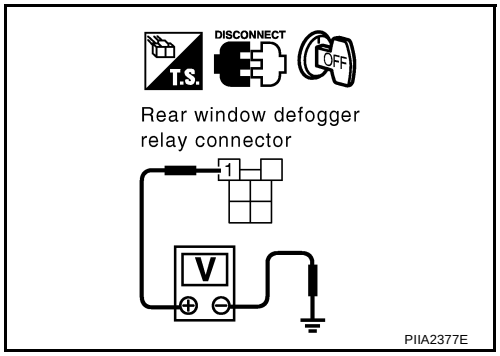
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse, refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. REAR WINDOW DEFOGGER RELAY POWER SUPPLY CIRCUIT INSPECTION

1. Turn ignition switch OFF.
2. Disconnect rear window defogger relay connector.
3. Check voltage between rear window defogger relay harness connector B34 terminal 1 and ground.

1 (G) – Ground : Battery voltage



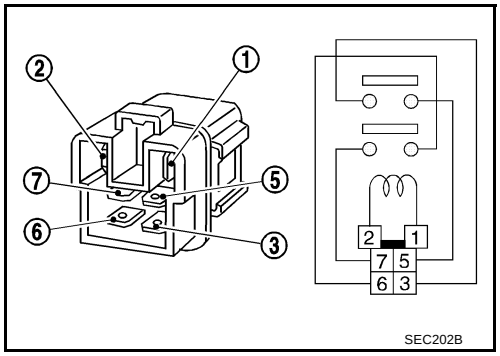
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness between fuse block (J/B) and rear window defogger relay.

3. REAR WINDOW DEFOGGER RELAY INSPECTION

1. Remove rear window defogger relay.
2. Check continuity between terminals 3 and 5, 6 and 7.

Terminal		Condition	Continuity
3	5	12V direct current supply between terminals 1 and 2	Yes
		No current supply	No
6	7	12V direct current supply between terminals 1 and 2	Yes
		No current supply	No



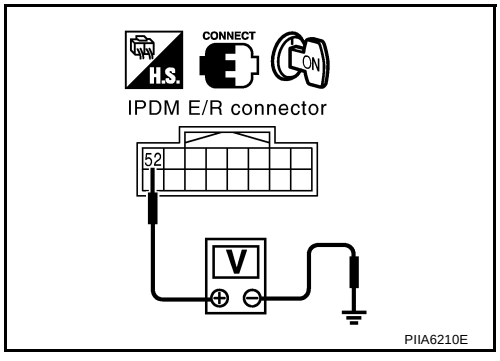
OK or NG

OK >> GO TO 4.
NG >> Replace rear window defogger relay.

4. REAR WINDOW DEFOGGER RELAY GROUND CIRCUIT INSPECTION

1. Installation rear window defogger relay.
2. Connect rear window defogger relay connector.
3. Turn ignition switch ON.
4. Turn rear window defogger switch OFF.
5. Check voltage between IPDM E/R connector E9 terminal 52 and ground.

52 (G/R) – Ground : Battery voltage



OK or NG

OK >> Rear window defogger power supply circuit is OK.
NG >> GO TO 5.

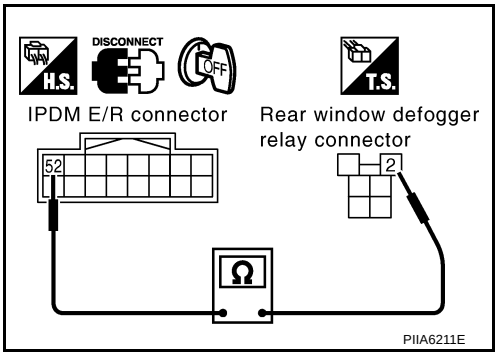
5. CHECK HARNESS CONTINUITY

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and rear window defogger relay.
3. Check continuity between IPDM E/R connector E9 terminal 52 and rear window defogger relay connector B34 terminal 2.

52 (G/R) - 2 (G/R or G) :Continuity should exist.

OK or NG

OK >> Check the condition of harness and the connector.
NG >> Repair or replace harness between IPDM E/R and rear window defogger relay.



Rear Window Defogger Circuit Check / For Coupe

AIS0014N

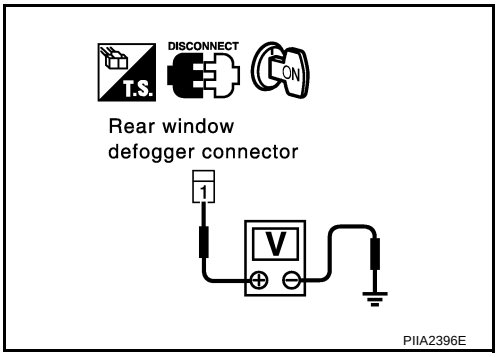
1. REAR WINDOW DEFOGGER POWER SUPPLY CIRCUIT INSPECTION

1. Turn ignition switch OFF.
2. Disconnect rear window defogger connector.
3. Turn ignition switch ON.
4. Check voltage between rear window defogger connector and ground.

Connector	Terminal (Wire color)		Condition		Voltage [V] (Approx.)
	(+)	(–)			
D104	1 (B/W)	Ground	Rear window defogger switch	: ON	Battery voltage
				: OFF	0

OK or NG

OK >> GO TO 2.
NG >> GO TO 3.



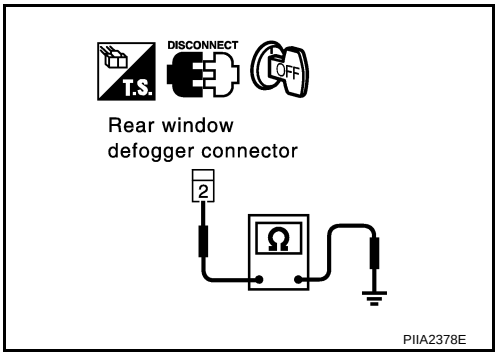
2. REAR WINDOW DEFOGGER GROUND HARNESS INSPECTION

1. Turn ignition switch OFF.
2. Disconnect rear window defogger connector.
3. Check continuity between rear window defogger connector D211 terminal 2 and ground.

2 (B) – Ground : Continuity should exist

OK or NG

OK >> Rear window defogger circuit is OK.
NG >> Repair or replace harness between rear window defogger and ground.



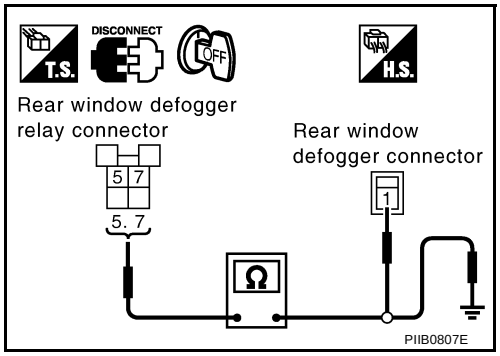
3. CHECK HARNESS CONTINUITY

1. Turn ignition switch OFF.
2. Disconnect rear window defogger relay connector.
3. Check continuity between rear window defogger relay connector B34 terminal 5, 7 and rear window defogger connector D104 terminal 1.

   5 (B/W) – 1 (B/W) : Continuity should exist.
   7 (B/W) – 1 (B/W) : Continuity should exist.

4. Check continuity between rear window defogger relay connector B34 terminal 5, 7 and ground.

   5 (B/W) – Ground : Continuity should not exist.
   7 (B/W) – Ground : Continuity should not exist.



OK or NG

OK >> Check the condition of the harness and the connector.
NG >> Repair or replace harness between rear window defogger relay and rear window defogger.

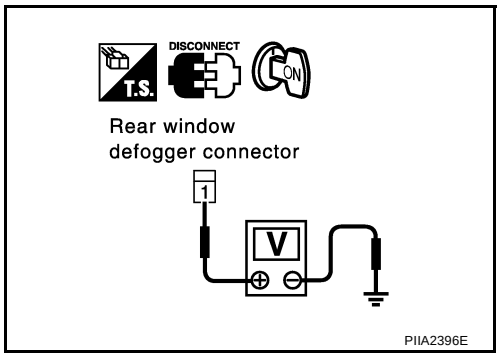
Rear Window Defogger Circuit Check / For Roadster

AIS003XT

1. REAR WINDOW DEFOGGER POWER SUPPLY CIRCUIT INSPECTION

1. Turn ignition switch OFF.
2. Disconnect rear window defogger connector.
3. Turn ignition switch ON.
4. Check voltage between rear window defogger connector and ground.

Connector	Terminal (Wire color)		Condition		Voltage [V] (Approx.)
	(+)	(–)			
B202	1 (B)	Ground	Rear window defogger relay	: ON	Battery voltage
				: OFF	0



OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

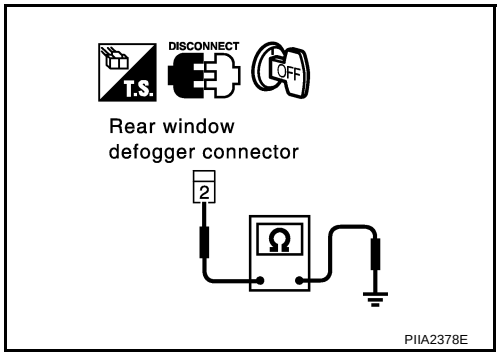
2. REAR WINDOW DEFOGGER GROUND HARNESS INSPECTION

1. Turn ignition switch OFF.
2. Disconnect rear window defogger connector.
3. Check continuity between rear window defogger connector D203 terminal 2 and ground.

   2(B) – Ground : Continuity should exist

OK or NG

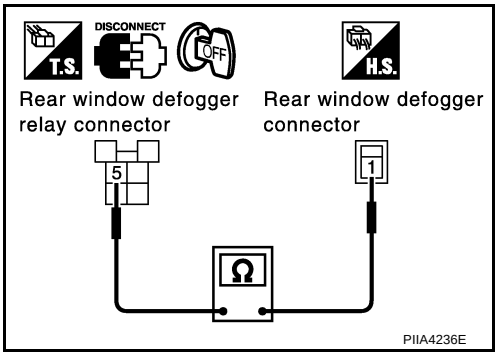
OK >> Rear window defogger circuit is OK.
NG >> Repair or replace harness between rear window defogger and ground.



3. CHECK HARNESS CONTINUITY

1. Turn ignition switch OFF.
2. Disconnect rear window defogger relay connector.
3. Check continuity between rear window defogger relay connector B34 terminal 5 and rear window defogger connector B202 terminal 1.

5 (B/W) – 1 (B) : Continuity should exist.



OK or NG

OK >> Check the condition of the harness and the connector.
NG >> Repair or replace harness between rear window defogger relay and rear window defogger.

Door Mirror Defogger Power Supply Circuit Check

AIS0014O

1. CHECK FUSE

- Check 10A fuse [No. 8, located in fuse block (J/B)].

NOTE:
Refer to GW-56, "Component Parts and Harness Connector Location" .

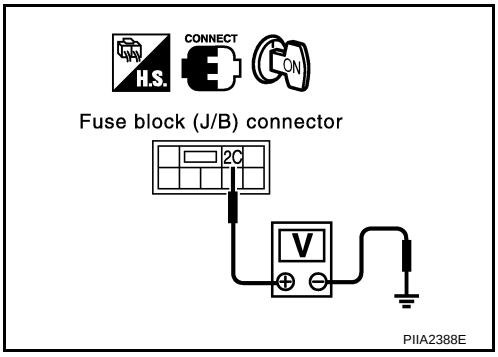
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse, refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. DOOR MIRROR DEFOGGER POWER SUPPLY CIRCUIT INSPECTION 1

1. Turn ignition switch ON.
2. Rear window defogger switch operate, check voltage between fuse block (J/B) connector and ground.

Connector	Terminal (Wire color)		Condition		Voltage [V] (Approx.)
	(+)	(–)			
E101	2C (Y)	Ground	Rear window defogger switch	: ON	Battery voltage
				: OFF	0



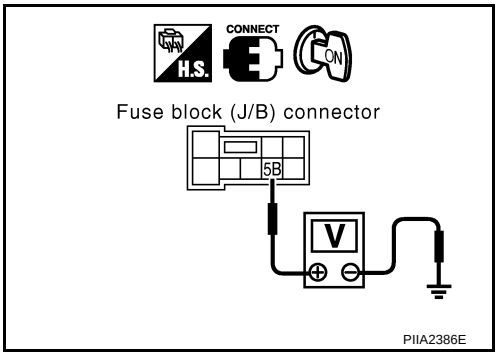
OK or NG

OK >> GO TO 3.
NG >> Repair or replace between harness rear window defogger relay and fuse block (J/B)

3. DOOR MIRROR DEFOGGER POWER SUPPLY INSPECTION 2

Rear window defogger switch operate, check voltage between Fuse block (J/B) connector and ground.

Connector	Terminal (Wire color)		Condition		Voltage [V] (Approx.)
	(+)	(–)			
M5	5B (L)	Ground	Rear window defogger switch	: ON	Battery voltage
				: OFF	0



OK or NG

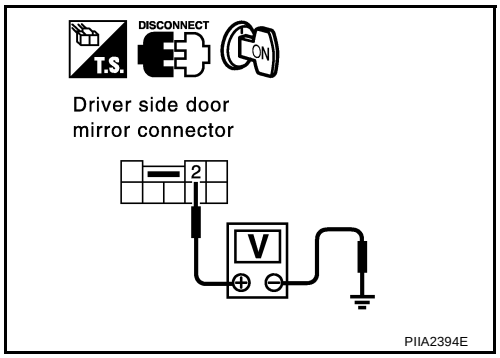
OK >> Repair or replace harness between fuse block (J/B) and door mirror defogger (driver side, passenger side).
NG >> Replace fuse block (J/B).

Driver Side Door Mirror Defogger Circuit Check

AIS00156

1. DOOR MIRROR DEFOGGER POWER SUPPLY CIRCUIT INSPECTION

1. Turn ignition switch OFF.
2. Disconnect driver side door mirror defogger connector.
3. Turn ignition switch ON.
4. Rear window defogger switch operate, check voltage between driver side door mirror defogger connector and ground.



Connector	Terminal (Wire color)		Condition		Voltage [V] (Approx.)
	(+)	(–)			
D2	2 (SB)	Ground	Rear window defogger switch	: ON	Battery voltage
				: OFF	0

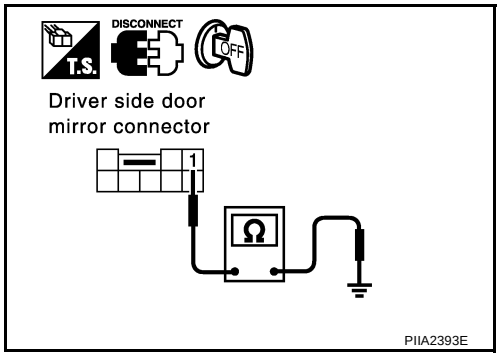
OK or NG

OK >> GO TO 2.
NG >> Repair or replace harness between fuse block (J/B) and driver side door mirror defogger.

2. DOOR MIRROR DEFOGGER GROUND HARNESS INSPECTION

1. Turn ignition switch OFF.
2. Check continuity between driver side door mirror defogger connector D2 terminal 1 (B) and ground.

1 (B) – Ground : Continuity should exist.



OK or NG

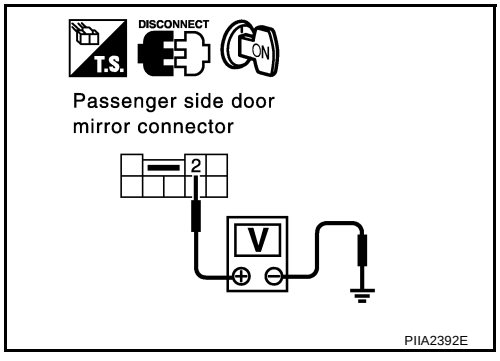
OK >> Check door mirror defogger firmament continuity.
NG >> Repair or replace harness between driver side door mirror defogger and ground.

Passenger Side Door Mirror Defogger Circuit Check

AIS00157

1. DOOR MIRROR DEFOGGER POWER SUPPLY CIRCUIT INSPECTION

1. Turn ignition switch ON.
2. Disconnect passenger side door mirror defogger connector.
3. Rear window defogger switch operate, check voltage between passenger side door mirror defogger connector and ground.



Connector	Terminal (Wire color)		Condition		Voltage [V] (Approx.)
	(+)	(–)			
D32	2 (L)	Ground	Rear window defogger switch	: ON	Battery voltage
				: OFF	0

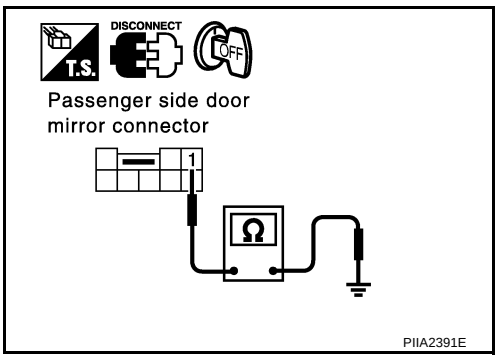
OK or NG

OK >> GO TO 2.
NG >> Repair or replace harness between fuse block (J/B) and passenger side door mirror defogger.

2. DOOR MIRROR DEFOGGER GROUND HARNESS INSPECTION

1. Turn ignition switch OFF.
2. Check continuity between passenger side door mirror defogger connector D32 terminal 1 and ground.

1 (B) – Ground : Continuity should exist.



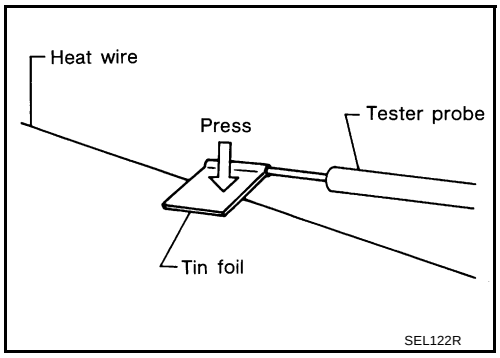
OK or NG

OK >> Check door mirror defogger firmament continuity.
NG >> Repair or replace harness between passenger side door mirror defogger and ground.

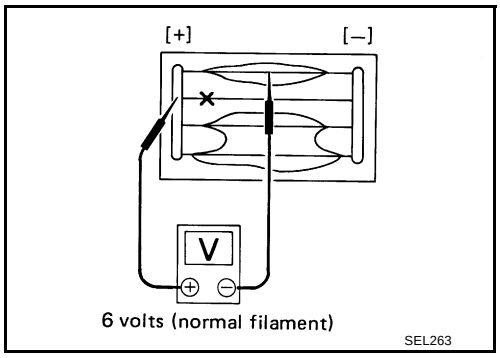
Filament Check

AIS000G3

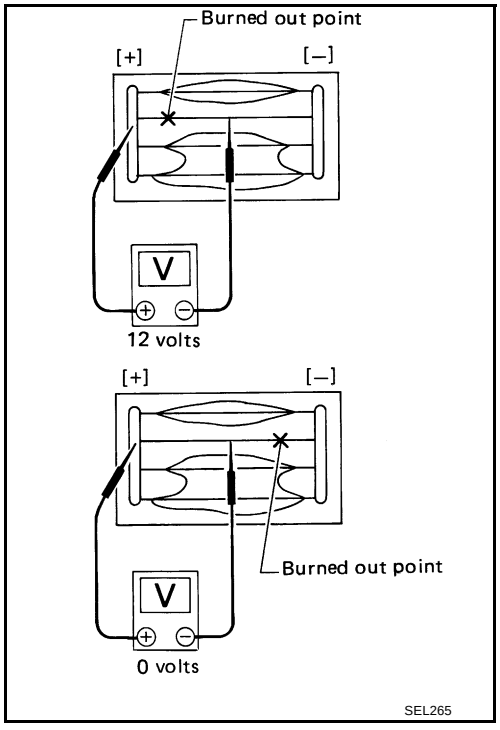
1. When measuring voltage, wrap tin foil around the top of the negative probe. Then press the foil against the wire with your finger.



2. Attach probe circuit tester (in Volt range) to middle portion of each filament.



3. If a filament is burned out, circuit tester registers 0 or battery voltage.
4. To locate burned out point, move probe to left and right along filament. Test needle will swing abruptly when probe passes the point.



Filament Repair

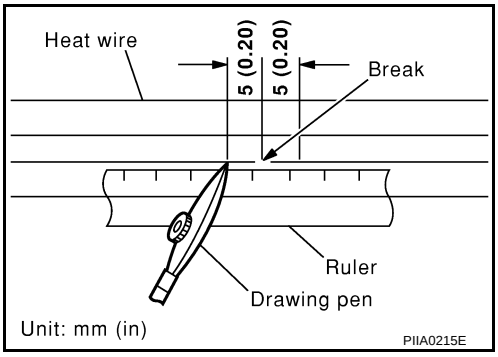
AIS000G4

REPAIR EQUIPMENT

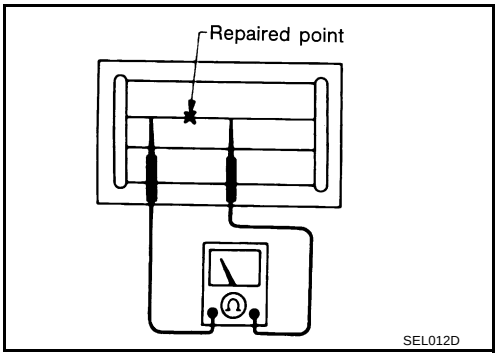
- Conductive silver composition (Dupont No. 4817 or equivalent)
- Ruler 30 cm (11.8 in) long
- Drawing pen
- Heat gun
- Alcohol
- Cloth

REPAIRING PROCEDURE

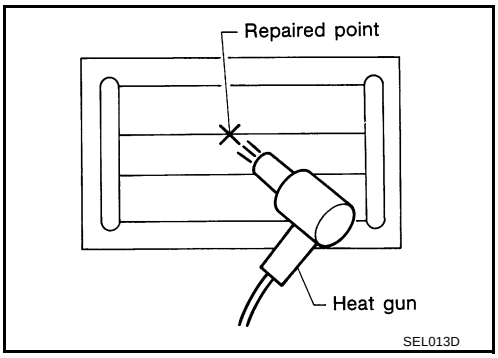
1. Wipe broken heat wire and its surrounding area clean with a cloth dampened in alcohol.
2. Apply a small amount of conductive silver composition to tip of drawing pen.
   Shake silver composition container before use.
3. Place ruler on glass along broken line. Deposit conductive silver composition on break with drawing pen. Slightly overlap existing heat wire on both sides [preferably 5 mm (0.20 in)] of the break.



4. After repair has been completed, check repaired wire for continuity. This check should be performed 10 minutes after silver composition is deposited.
   Do not touch repaired area while test is being performed.



5. Apply a constant stream of hot air directly to the repaired area for approximately 20 minutes with a heat gun. A minimum distance of 3 cm (1.2 in) should be kept between repaired area and hot air outlet.
   If a heat gun is not available, let the repaired area dry for 24 hours.



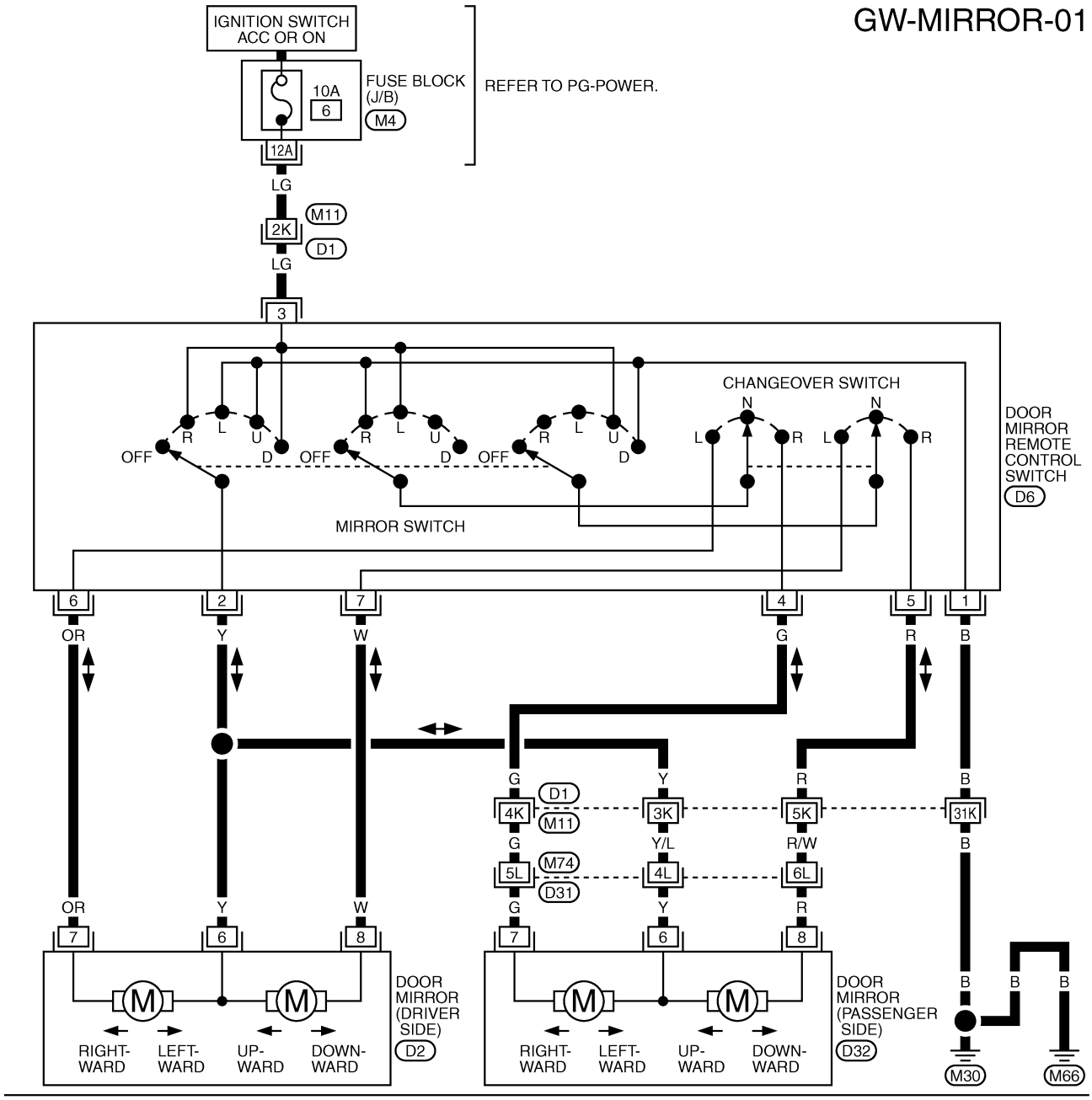
DOOR MIRROR

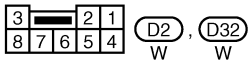
PFP:96301

Wring Diagram –MIRROR–

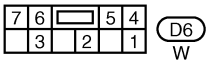
AIS000G5

GW-MIRROR-01





D2 W , D32 W



D6 W

REFER TO THE FOLLOWING.

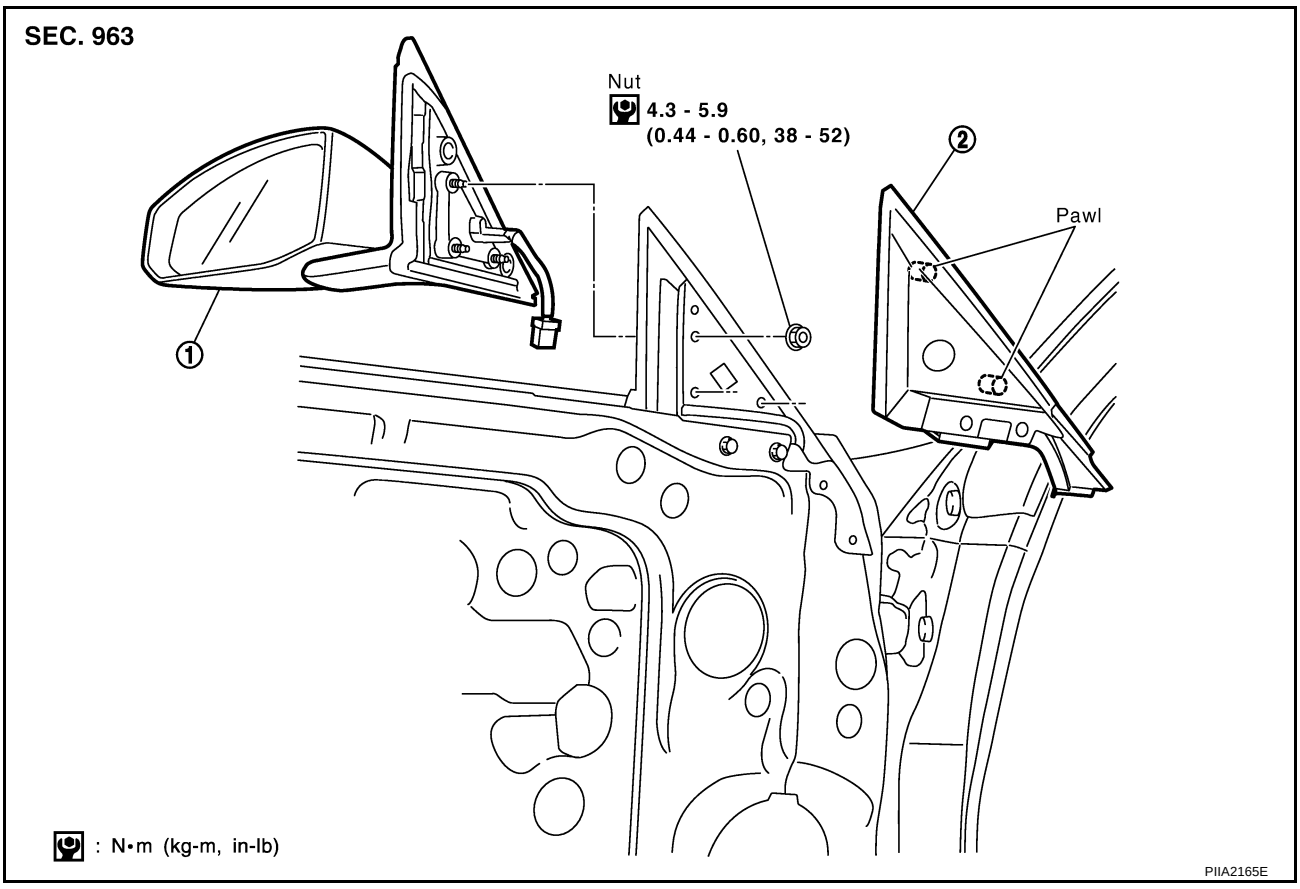
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TIWT0262E

Removal and Installation

AIS000G6



1. Door mirror assembly
2. Corner cover inner

REMOVAL

1. Remove door finisher. Refer to EI-33, "DOOR FINISHER" .
2. Remove corner cover inner.
3. Disconnect door mirror harness connector.
4. Remove door mirror mounting nuts, and remove door mirror assembly.

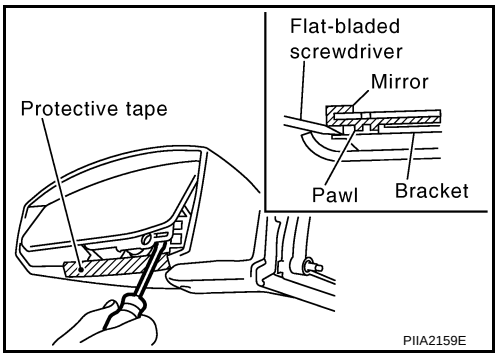
INSTALLATION

Install in the reverse order of removal.

DISASSEMBLY

1. Place the mirror body with mirror glass facing upward.
2. Put strip of protective tape on mirror body.
3. As shown in the figure insert a small slotted screwdriver into the recess between mirror base (mirror holder) and mirror holder bracket and push up pawls to remove mirror holder lower half side.

   NOTE:
   When pushing up pawls do not attempt to use one recess only, be sure to push up with both recesses.
   Insert screwdriver into recesses, and push up while rotating (twist) to make work easier.



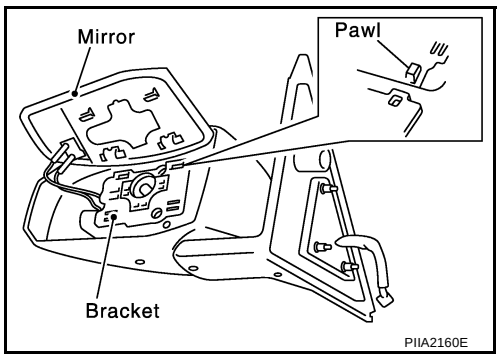
4. Remove terminals of mirror heater attachment.
5. Lightly lift up lower side of mirror surface from mirror surface, and detach pawls of upper side as if pulling it out. Remove mirror surface from mirror body.

NOTE:
Be certain not to allow grease on sealing agent in center of mirror body assembly (actuator) or back side of mirror surface (mirror holder).

ASSEMBLY

1. Place mirror holder bracket and mirror body assembly (actuator) in a horizontal position.
2. Connect terminals of heater installed mirror.
3. Fit the upper pawls on the mirror face onto the mirror holder bracket first, then press the lower side of mirror face until a click sound is heard to engage the lower pawls.

NOTE:
After installation, visually check that lower pawls are securely engaged from the bottom of mirror face.



SECTION RF
ROOF

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PRECAUTIONS

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Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

AIS003Y9

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

AIS003YA

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions

AIS003YB

- Disconnect both battery cables in advance.
- Never tamper with or force air bag lid open, as this may adversely affect air bag performance.
- Be careful not to scratch pad and other parts.
- When removing or disassembling any part, be careful not to damage or deform it. Protect parts, which may get in the way with cloth.
- When removing parts with a screwdriver or other tool, protect parts by wrapping them with vinyl or tape.
- Keep removed parts protected with cloth.
- If a clip is deformed or damaged, replace it.
- If an unreusable part is removed, replace it with a new one.
- Tighten bolts and nuts firmly to the specified torque.
- After re-assembly has been completed, make sure each part functions correctly.
- Remove stains in the following way.

Water-soluble stains:
Dip a soft cloth in warm water, and then squeeze it tightly. After wiping the stain, wipe with a soft dry cloth.
Oil stain:
Dissolve a synthetic detergent in warm water (density of 2 to 3% or less), dip the cloth, then clean off the stain with the cloth. Next, dip the cloth in fresh water and squeeze it tightly. Then clean off the detergent completely. Then wipe the area with a soft dry cloth.

- Do not use any organic solvent, such as thinner or benzine.

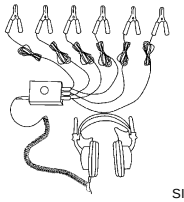
PREPARATION

PFP:00002

Special Service Tools

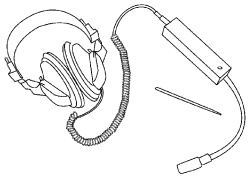
AIS003YC

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
(J39570) Chassis ear  SIIA0993E	Locating the noise
(J43980) NISSAN Squeak and Rattle Kit SIIA0994E	Repairing the cause of noise

Commercial Service Tools

AIS003YD

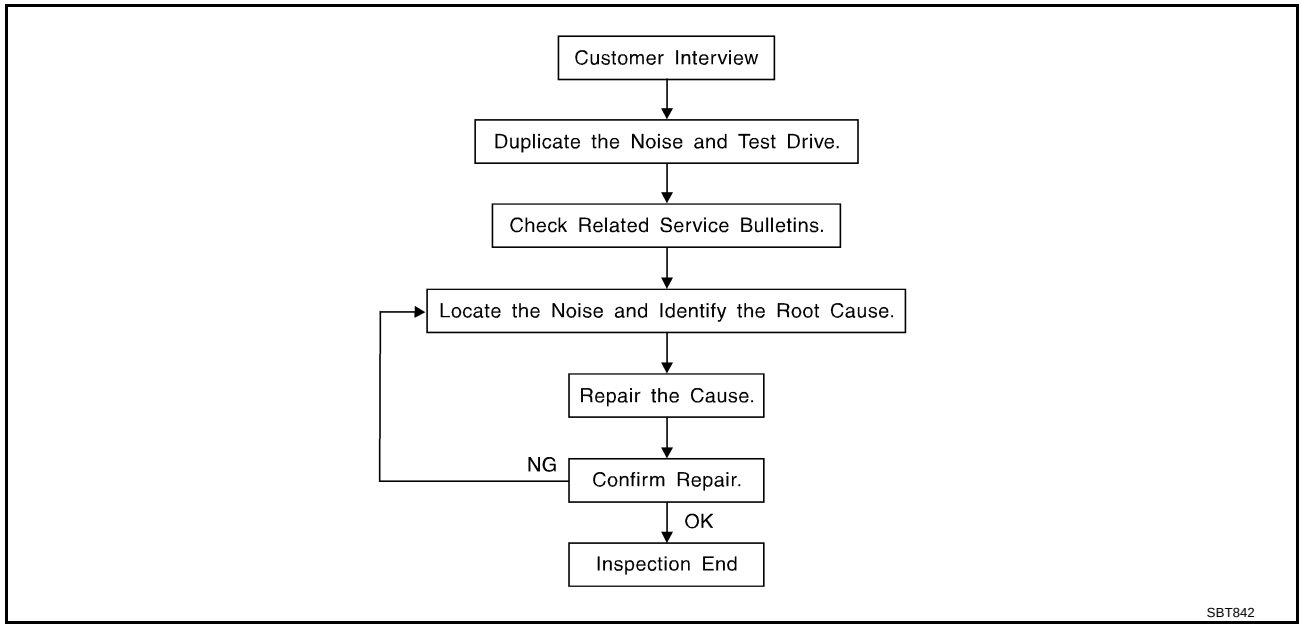
Tool name	Description
Engine ear  SIIA0995E	Locating the noise

SQUEAK AND RATTLE TROUBLE DIAGNOSES

PFP:00000

Work Flow

AIS003YE



CUSTOMER INTERVIEW

Interview the customer if possible, to determine the conditions that exist when the noise occurs.Use the Diagnostic Worksheet during the interview to document the facts and conditions when the noise occurs and any customer's comments; refer to RF-9, "Diagnostic Worksheet" . This information is necessary to duplicate the conditions that exist when the noise occurs.

- The customer may not be able to provide a detailed description or the location of the noise. Attempt to obtain all the facts and conditions that exist when the noise occurs (or does not occur).
- If there is more than one noise in the vehicle, be sure to diagnose and repair the noise that the customer is concerned about. This can be accomplished by test driving the vehicle with the customer.
- After identifying the type of noise, isolate the noise in terms of its characteristics.The noise characteristics are provided so the customer, service adviser and technician are all speaking the same language when defining the noise.
- Squeak —(Like tennis shoes on a clean floor)
  Squeak characteristics include the light contact/fast movement/brought on by road conditions/hard surfaces=higher pitch noise/softer surfaces=lower pitch noises/edge to surface=chirping
- Creak—(Like walking on an old wooden floor)
  Creak characteristics include firm contact/slow movement/twisting with a rotational movement/pitch dependent on materials/often brought on by activity.
- Rattle—(Like shaking a baby rattle)
  Rattle characteristics include the fast repeated contact/vibration or similar movement/loose parts/missing clip or fastener/incorrect clearance.
- Knock —(Like a knock on a door)
  Knock characteristics include hollow sounding/sometimes repeating/often brought on by driver action.
- Tick—(Like a clock second hand)
  Tick characteristics include gentle contacting of light materials/loose components/can be caused by driver action or road conditions.
- Thump—(Heavy, muffled knock noise)
  Thump characteristics include softer knock/dead sound often drought on by activity.
- Buzz—(Like a bumble bee)
  Buzz characteristics include high frequency rattle/firm contact.
- Often the degree of acceptable noise level will vary bepending upon the person. A noise that you may judge as acceptable may be very irritating to the customer.
- Weather conditions, especially humidity and temperature, may have a great effect on noise level.

DUPLICATE THE NOISE AND TEST DRIVE

If possible, drive the vehicle with the customer until the noise is duplicated. Note any additional information on the Diagnostic Worksheet regarding the conditions or location of the noise. This information can be used to duplicate the same conditions when you confirm the repair.
If the noise can be duplicated easily during the test drive, to help identify the source of the noise, try to duplicate the noise with the vehicle stopped by doing one or all of the following:

1) Close a door.
2) Tap or push/pull around the area where the noise appears to be coming from.
3) Rev the engine.
4) Use a floor jack to recreate vehicle “twist”.
5) At idle, apply engine load (electrical load, half-clutch on M/T model, drive position on A/T model).
6) Raise the vehicle on a hoist and hit a tire with a rubber hammer.

- Drive the vehicle and attempt to duplicate the conditions the customer states exist when the noise occurs.
- If it is difficult to duplicate the noise, drive the vehicle slowly on an undulating or rough road to stress the vehicle body.

CHECK RELATED SERVICE BULLETINS

After verifying the customer concern or symptom, check ASIST for Technical Service Bulletins (TSBs) related to that concern or symptom.
If a TSB relates to the symptom, follow the procedure to repair the noise.

LOCATE THE NOISE AND IDENTIFY THE ROOT CAUSE

1. Narrow down the noise to a general area.To help pinpoint the source of the noise, use a listening tool (Chassis Ear: J39570, Engine Ear mechanics stethoscope).
2. Narrow down the noise to a more specific area and identify the cause of the noise by:

- removing the components in the area that you suspect the noise is coming from.
  Do not use too much force when removing clips and fasteners, otherwise clips and fastener can be broken or lost during the repair, resulting in the creation of new noise.
- tapping or pushing/pulling the component that you suspect is causing the noise.
  Do not tap or push/pull the component with excessive force, otherwise the noise will be eliminated only temporarily.
- feeling for a vibration with your hand by touching the component(s) that you suspect is (are) causing the noise.
- placing a piece of paper between components that you suspect are causing the noise.
- looking for loose components and contact marks.
  Refer to RF-7, "Generic Squeak and Rattle Troubleshooting" .

REPAIR THE CAUSE

- If the cause is a loose component, tighten the component securely.
- If the cause is insufficient clearance between components:
  - separate components by repositioning or loosening and retightening the component, if possible.
  - insulate components with a suitable insulator such as urethane pads, foam blocks, felt cloth tape or urethane tape. A Nissan Squeak and Rattle Kit (J43980) is available through your authorized Nissan Parts Department.

CAUTION:
Do not use excessive force as many components are constructed of plastic and may be damaged.
Always check with the Parts Department for the latest parts information.
The following materials are contained in the Nissan Squeak and Rattle Kit (J43980).Each item can be ordered separately as needed.
URETHANE PADS [1.5 mm (0.059 in) thick]
Insulates connectors, harness, etc.
76268-9E005: 100 × 135 mm (3.94 × 5.31 in)/76884-71L01: 60 × 85 mm (2.36 × 3.35 in)/76884-71L02: 15 × 25 mm (0.59 × 0.98 in)
INSULATOR (Foam blocks)
Insulates components from contact.Can be used to fill space behind a panel.
73982-9E000: 45 mm (1.77 in) thick, 50 × 50 mm (1.97 × 1.97 in)/73982-50Y00: 10 mm (0.39 in) thick, 50 × 50 mm (1.97 × 1.97 in)

INSULATOR (Light foam block)
80845-71L00: 30 mm (1.18 in) thick, 30 × 50 mm (1.18 × 1.97 in)
FELT CLOTHTAPE
Used to insulate where movement does not occur.Ideal for instrument panel applications.
68370-4B000: 15 × 25 mm (0.59 × 0.98 in) pad/68239-13E00: 5 mm (0.20 in) wide tape roll The following materials, not found in the kit, can also be used to repair squeaks and rattles.
UHMW(TEFLON) TAPE
Insulates where slight movement is present. Ideal for instrument panel applications.
SILICONE GREASE
Used in place of UHMW tape that will be visible or not fit.
Note: Will only last a few months.
SILICONE SPRAY
Use when grease cannot be applied.
DUCT TAPE
Use to eliminate movement.

CONFIRM THE REPAIR

Confirm that the cause of a noise is repaired by test driving the vehicle. Operate the vehicle under the same conditions as when the noise originally occurred. Refer to the notes on the Diagnostic Worksheet.

Generic Squeak and Rattle Troubleshooting

AIS003YF

Refer to Table of Contents for specific component removal and installation information.

INSTRUMENT PANEL

Most incidents are caused by contact and movement between:

1. The cluster lid A and instrument panel
2. Acrylic lens and combination meter housing
3. Instrument panel to front pillar garnish
4. Instrument panel to windshield
5. Instrument panel mounting pins
6. Wiring harnesses behind the combination meter
7. A/C defroster duct and duct joint

These incidents can usually be located by tapping or moving the components to duplicate the noise or by pressing on the components while driving to stop the noise. Most of these incidents can be repaired by applying felt cloth tape or silicon spray (in hard to reach areas). Urethane pads can be used to insulate wiring harness.

CAUTION:
Do not use silicone spray to isolate a squeak or rattle. If you saturate the area with silicone, you will not be able to recheck the repair.

CENTER CONSOLE

Components to pay attention to include:

1. Shifter assembly cover to finisher
2. A/C control unit and cluster lid C
3. Wiring harnesses behind audio and A/C control unit

The instrument panel repair and isolation procedures also apply to the center console.

DOORS

Pay attention to the:

1. Finisher and inner panel making a slapping noise
2. Inside handle escutcheon to door finisher
3. Wiring harnesses tapping
4. Door striker out of alignment causing a popping noise on starts and stops

Tapping or moving the components or pressing on them while driving to duplicate the conditions can isolate many of these incidents. You can usually insulate the areas with felt cloth tape or insulator foam blocks from the Nissan Squeak and Rattle Kit (J43980) to repair the noise.

TRUNK

Trunk noises are often caused by a loose jack or loose items put into the trunk by the owner.
In addition look for:

1. Trunk lid dumpers out of adjustment
2. Trunk lid striker out of adjustment
3. The trunk lid torsion bars knocking together
4. A loose license plate or bracket

Most of these incidents can be repaired by adjusting, securing or insulating the item(s) or component(s) causing the noise.

SUNROOF/HEADLINING

Noises in the sunroof/headlining area can often be traced to one of the following:

1. Sunroof lid, rail, linkage or seals making a rattle or light knocking noise
2. Sunvisor shaft shaking in the holder
3. Front or rear windshield touching headlining and squeaking

Again, pressing on the components to stop the noise while duplicating the conditions can isolate most of these incidents. Repairs usually consist of insulating with felt cloth tape.

SEATS

When isolating seat noise it's important to note the position the seat is in and the load placed on the seat when the noise is present. These conditions should be duplicated when verifying and isolating the cause of the noise.
Cause of seat noise include:

1. Headrest rods and holder
2. A squeak between the seat pad cushion and frame
3. The rear seatback lock and bracket

These noises can be isolated by moving or pressing on the suspected components while duplicating the conditions under which the noise occurs. Most of these incidents can be repaired by repositioning the component or applying urethane tape to the contact area.

UNDERHOOD

Some interior noise may be caused by components under the hood or on the engine wall. The noise is then transmitted into the passenger compartment.
Causes of transmitted underhood noise include:

1. Any component mounted to the engine wall
2. Components that pass through the engine wall
3. Engine wall mounts and connectors
4. Loose radiator mounting pins
5. Hood bumpers out of adjustment
6. Hood striker out of adjustment

These noises can be difficult to isolate since they cannot be reached from the interior of the vehicle. The best method is to secure, move or insulate one component at a time and test drive the vehicle. Also, engine RPM or load can be changed to isolate the noise. Repairs can usually be made by moving, adjusting, securing, or insulating the component causing the noise.

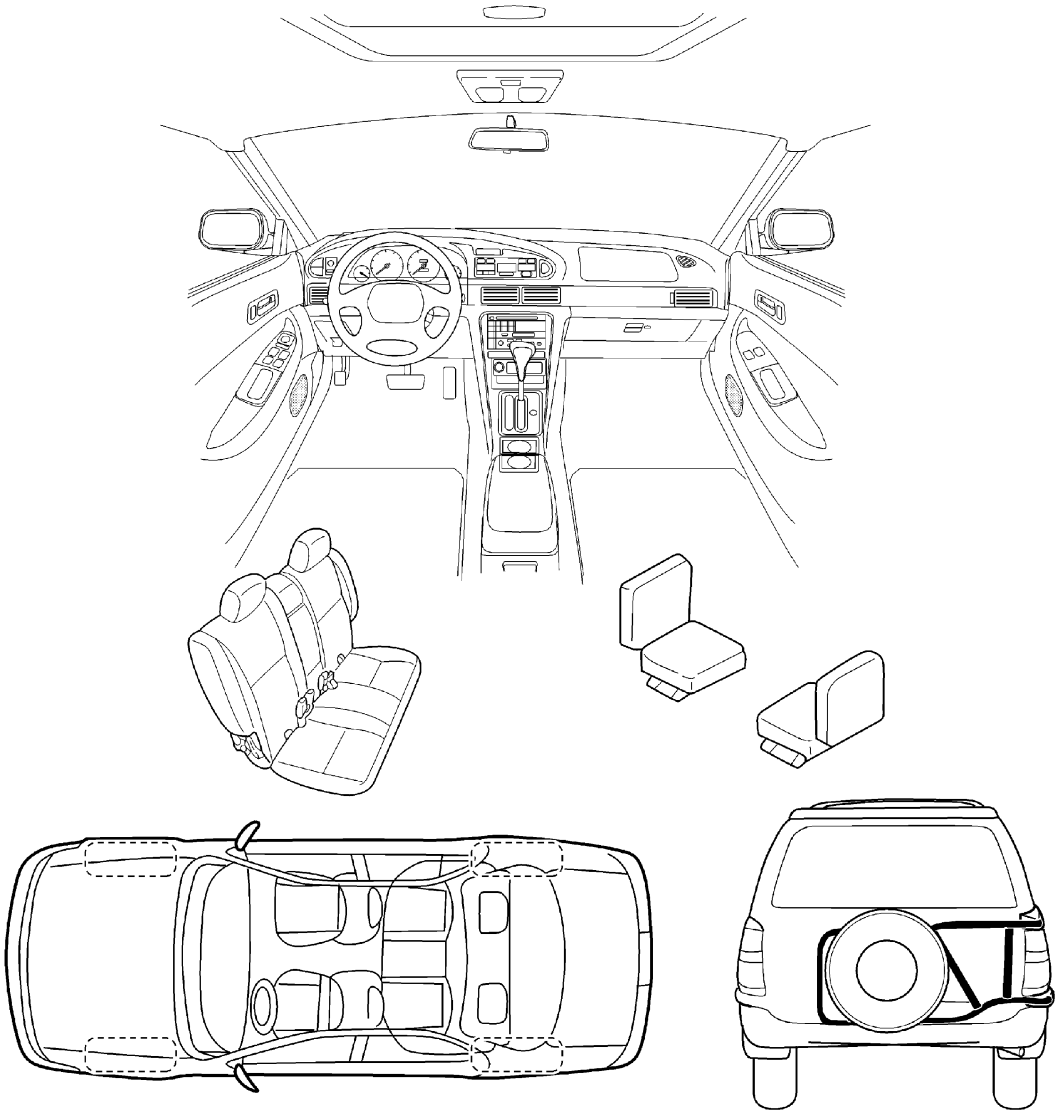
Diagnostic Worksheet

AIS003YG

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET

Dear Nissan Customer:
We are concerned about your satisfaction with your Nissan vehicle. Repairing a squeak or rattle sometimes can be very difficult. To help us fix your Nissan right the first time, please take a moment to note the area of the vehicle where the squeak or rattle occurs and under what conditions. You may be asked to take a test drive with a service advisor or technician to ensure we confirm the noise you are hearing.

I. WHERE DOES THE NOISE COME FROM? (circle the area of the vehicle)
The illustrations are for reference only, and may not reflect the actual configuration of your vehicle.



Continue to the back of the worksheet and briefly describe the location of the noise or rattle. In addition, please indicate the conditions which are present when the noise occurs.

PIIB0723E

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET- page 2

Briefly describe the location where the noise occurs:

_____

_____

II. WHEN DOES IT OCCUR? (check the boxes that apply)

❑ anytime
❑ 1st time in the morning
❑ only when it is cold outside
❑ only when it is hot outside
❑ after sitting out in the sun
❑ when it is raining or wet
❑ dry or dusty conditions
❑ other: _____

III. WHEN DRIVING:

❑ through driveways
❑ over rough roads
❑ over speed bumps
❑ only at about ____ mph
❑ on acceleration
❑ coming to a stop
❑ on turns : left, right or either (circle)
❑ with passengers or cargo
❑ other: _____
❑ after driving ____ miles or ____ minutes

IV. WHAT TYPE OF NOISE?

❑ squeak (like tennis shoes on a clean floor)
❑ creak (like walking on an old wooden floor)
❑ rattle (like shaking a baby rattle)
❑ knock (like a knock on a door)
❑ tick (like a clock second hand)
❑ thump (heavy, muffled knock noise)
❑ buzz (like a bumble bee)

TO BE COMPLETED BY DEALERSHIP PERSONNEL
Test Drive Notes:

_____

_____

	YES	NO	Initials of person performing
Vehicle test driven with customer	❑	❑	_____
- Noise verified on test drive	❑	❑	
- Noise source located and repaired	❑	❑	_____
- Follow up test drive performed to confirm repair	❑	❑	_____

VIN: _____ Customer Name: _____

W.O. #: _____ Date: _____

This form must be attached to Work Order

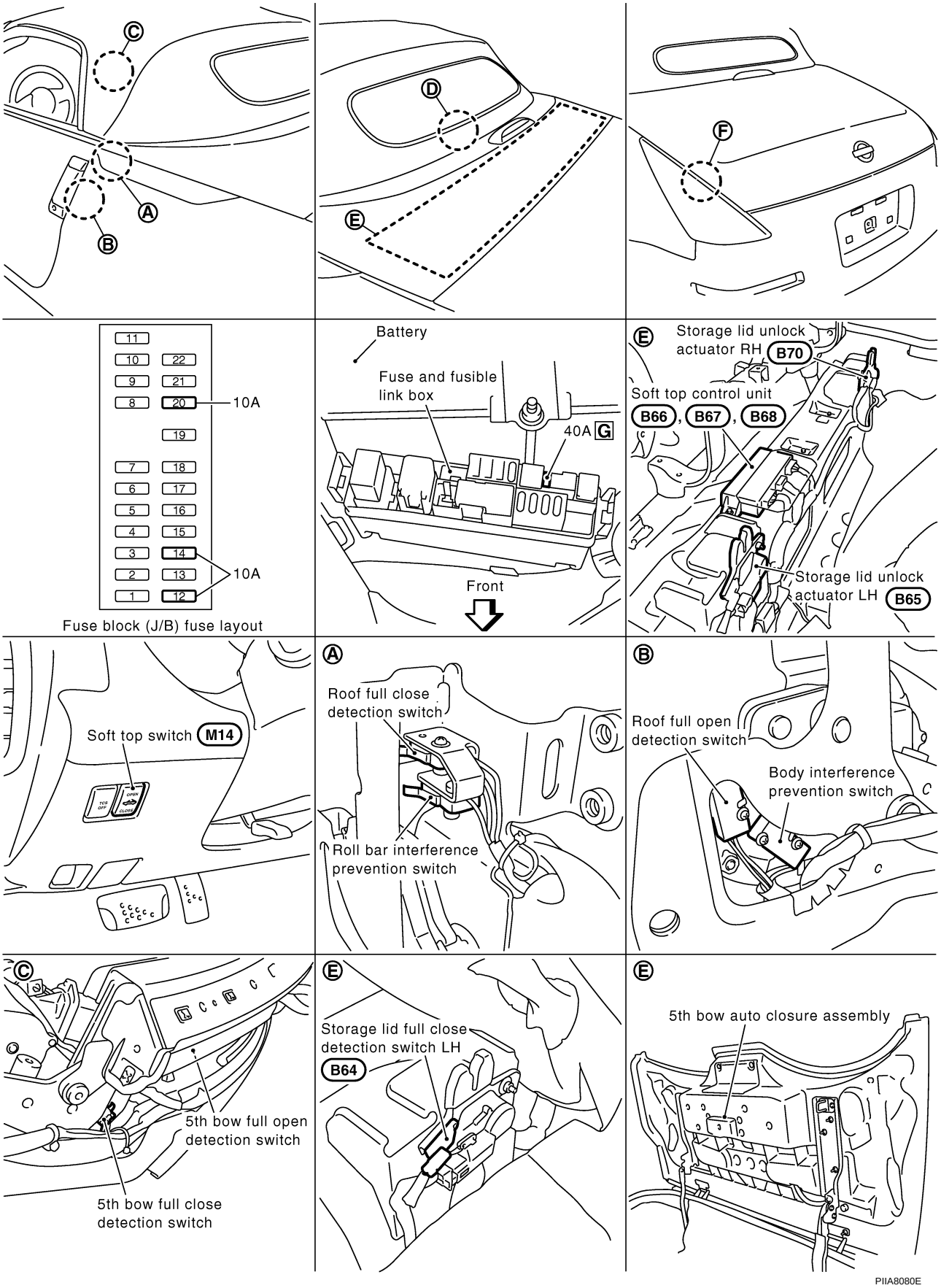
SBT844

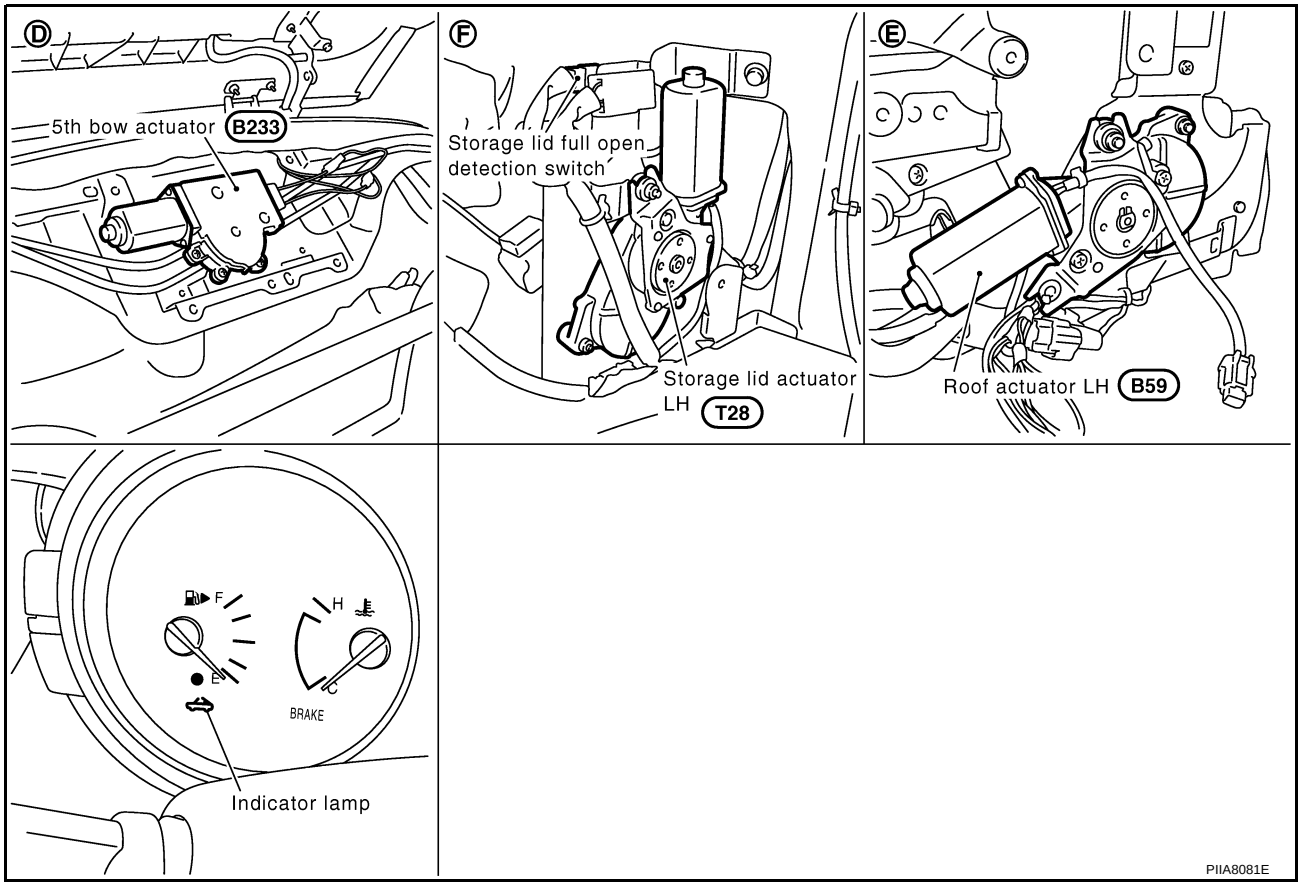
SOFT TOP

PFP:97002

Component Parts and Harness Connector Location

AIS005Z3





Following Parts Are Built Into 5th Bow Auto Closure Assembly.

- 5th bow half-latch switch built in 5th bow lock assembly in storage lid.
- 5th bow full-latch switch built in 5th bow lock assembly in storage lid.
- 5th bow ending switch built in 5th bow lock assembly in storage lid.
- 5th bow unlock actuator.
- 5th bow closure motor.

NOTE:
Always replace following switches as a 5th bow lock assembly.

- 5th bow half-latch switch
- 5th bow full-latch switch
- 5th bow ending switch.

5th bow full open detection switch and 5th bow full close detection switch are built into 5th bow switch assembly located at plate rail RR. Replace above switches as a plate rail RR.

System Description

AIS005Z4

An electronic soft top open/close system has been adopted that allows the soft top to be opened or closed using the soft top switch.
The following parts operate, linked with the operation of the soft top.

- When the soft top begins to operate, the passenger seat tilts forward. When operation is completed, it returns to its original position.
  (It does not move when the seat cancel switch is ON.)
- When the soft top begins to operate, both power windows activate to the fully-open position.
  (They do not activate to the fully-closed position after operation is completed.)
  Moreover, power window cannot be operated while soft top is operating.

When the soft top switch is released, soft top operation stops.

CONDITIONS FOR OPERATION

Operation is avairable when all of the conditions below are satisfied.

- Ignition switch is ON.
- The brake pedal is ON.
- Vehicle speed is 4 km/h (2 MPH) or less.
- Battery voltage is approximately 10 V or more.

CAUTION:
Run the engine when operating or inspecting the soft top to prevent battery dies.

CONDITIONS FOR STOPPING OPERATION

Operation of the soft top stops when the conditions below are satisfied while the soft top is operating.

- Any of the above operation conditions is no longer satisfied.
- The passenger side power seat is operated. (It does not move when seat cancel switch is ON.)

OUTLINE OF OPERATION

Refer to the illustrations for the positions of the soft top, and the conditions of switch and actuator operation.

OPERATION: FULL CLOSE → FULL OPEN

Refer to RF-19, "State Chart" .

- CONDITION: FULL CLOSE

Item	Condition
5th bow half-latch switch	: OFF
5th bow full-latch switch	: OFF
5th bow ending switch	: OFF
5th bow full open detection switch	: OFF
5th bow full close detection switch	: OFF
Storage lid full open detection switch	: OFF
Storage lid full close detection switch LH	: OFF
Storage lid full close detection switch RH	: OFF
Roof full open detection switch	: OFF
Roof full close detection switch	: OFF
Body interference prevention switch	: OFF
Roll bar interference prevention switch	: OFF

- CONDITION: OP 1
  When the soft top switch is pushed to OPEN, the indicator lamp illuminates, windows activate to the fully-open position and the passenger seat tilts forward by approximately 6 degrees by power window down request signal. When passenger seat tilts forward by approximately 6 degrees, seat back position signal is turned ON.

Item	Condition
Soft top switch (OPEN)	: ON (Until the operation ends)
Indicator lamp	: ON
Power window down request signal	: ON
Seat back position signal	: OFF → ON

- CONDITION: OP 2
  The 5th bow unlock actuator operates, releasing the 5th bow lock.

Item	Condition
5th bow unlock actuator	: ON

- CONDITION: OP 3
  The 5th bow actuator moves the 5th bow up.

Item	Condition
5th bow half-latch switch	: OFF → ON
5th bow actuator	: UP
5th bow unlock actuator	: ON → OFF

- CONDITION: OP 4
  The 5th bow is rising.

Item	Condition
5th bow actuator	: UP
5th bow full close detection switch	: OFF → ON
5th bow closure motor	: OPEN → STOP
5th bow full-latch switch	: OFF → ON
5th bow ending switch	: OFF → ON

- CONDITION: OP 5
  The 5th bow stops in the fully-open position. The storage lid unlock actuator operates, releasing the storage lid lock.

Item	Condition
5th bow full open detection switch	: OFF → ON
5th bow actuator	: UP → STOP
Storage lid unlock actuator (LH and RH)	: ON
Storage lid full close detection switch (RH)	: OFF → ON

- CONDITION: OP 6
  The storage lid actuator operates, raising the storage lid.

Item	Condition
Storage lid full close detection switch (LH)	: OFF → ON
Storage lid actuator (LH and RH)	: OPEN
Storage lid unlock actuator (LH and RH)	: ON → OFF

- CONDITION: OP 7
  The storage lid stops in the fully-open position. The 5th bow actuator moves the 5th bow down.

Item	Condition
Storage lid full open detection switch	: OFF → ON
Storage lid actuator (LH and RH)	: OPEN → STOP
5th bow actuator	: DOWN
5th bow full open detection switch	: ON → OFF

- CONDITION: OP 8
  The 5th bow actuator stops in the fully-closed position. The roof actuator operates (OPEN operation), opening the roof.

Item	Condition
5th bow full close detection switch	: ON → OFF
5th bow actuator	: DOWN → STOP
Roof actuator (LH and RH)	: OPEN
Roof full close detection switch	: OFF → ON

- CONDITION: OP 9
  While the roof is opening, the 5th bow actuator moves the 5th bow up.

Item	Condition
Roof actuator (LH and RH)	: OPEN
5th bow actuator	: UP
5th bow full close detection switch	: OFF → ON
Roll bar interference prevention switch	: OFF → ON

- CONDITION: OP 10
  While the roof is opening, the 5th bow stops in the fully-open position.

Item	Condition
Roof actuator (LH and RH)	: OPEN
5th bow full open detection switch	: OFF → ON
5th bow actuator	: UP → STOP
Body interference prevention switch	: OFF → ON

- CONDITION: OP 11
  The roof is stored and stops motion. The storage lid actuator operates (DOWN operation) to lower the storage lid.
  The passenger seat also returns to its original position.

Item	Condition
Roof full open detection switch	: OFF → ON
Roof actuator (LH and RH)	: OPEN → STOP
Storage lid actuator (LH and RH)	: CLOSE
Storage lid full open detection switch	: ON → OFF
Storage lid full close detection switch (LH)	: ON → OFF

- CONDITION: OP 12
  At the fully-closed position, the storage lid inverts and stops. The passenger seat tilts back. Opening operation is completed, and the indicator lamp turns OFF.

Item	Condition
Storage lid full close detection switch (RH)	: ON → OFF
Storage lid actuator (LH and RH)	: CLOSE → OPEN → STOP
Indicator lamp	: ON → OFF

OPERATION: FULL OPEN → FULL CLOSE

Refer to RF-21, "State Chart" .

- CONDITION: FULL OPEN

Item	Condition
5th bow half-latch switch	: ON
5th bow full-latch switch	: ON
5th bow ending switch	: ON
5th bow full open detection switch	: ON
5th bow full close detection switch	: ON
Storage lid full open detection switch	: OFF
Storage lid full close detection switch LH	: OFF
Storage lid full close detection switch RH	: OFF
Roof full open detection switch	: ON
Roof full close detection switch	: ON
Body interference prevention switch	: ON
Roll bar interference prevention switch	: ON

- CONDITION: CL 1
  When the soft top switch is pressed to the CLOSE side, the indicator lamp illuminates, storage lid unlock actuator also operates, releasing the storage lid lock.

Item	Condition
Soft top switch (CLOSE)	: ON (Until the operation ends)
Indicator lamp	: ON
Storage lid unlock actuator	: ON
Storage lid full close detection switch (RH)	: OFF → ON

- CONDITION: CL 2
  Windows activate to the fully-open position and the passenger seat tilts forward by approximately 6 degrees by power window down request signal. Storage lid actuator operates to raise the storage lid. When passenger seat tilts forward by approximately 6 degrees, seat back position signal is turned ON.

Item	Condition
Storage lid full close detection switch (LH)	: OFF → ON
Storage lid actuator (LH and RH)	: UP
Power window down request signal	: ON
Storage lid unlock actuator	: ON → OFF
Seat back position signal	: OFF → ON

- CONDITION: CL 3
  The storage lid stops at the fully-open position. The roof actuator operates (CLOSE operation) to close the roof.

Item	Condition
Storage lid full open detection switch	: OFF → ON
Storage lid actuator (LH and RH)	: OPEN → STOP
Roof actuator (LH and RH)	: CLOSE
Roof full open detection switch	: ON → OFF
Body interference prevention switch	: ON → OFF

- CONDITION: CL 4
  While the roof is closing, the 5th bow actuator operates (DOWN operation) to lower the 5th bow.

Item	Condition
Roof actuator (LH and RH)	: CLOSE
5th bow actuator	: DOWN
5th bow full open detection switch	: ON → OFF

- CONDITOIN: CL 5
  The roof is closing, and 5th bow is lowering.

Item	Condition
Roof actuator (LH and RH)	: CLOSE
5th bow full close detection switch	: ON → OFF
5th bow actuator	: DOWN → STOP
Roll bar interference prevention switch	: ON → OFF

- CONDITION: CL 6
  The roof stops at the fully-closed position. The 5th bow actuator inverts, raising the 5th bow.

Item	Condition
Roof full close detection switch	: ON → OFF
Roof actuator (LH and RH)	: CLOSE → STOP
5th bow actuator	: UP
5th bow full close detection switch	: OFF → ON

- CONDITON: CL 7
  The 5th bow stops in the fully-open position. The storage lid actuator operates (DOWN operation) lower the storage lid.

Item	Condition
5th bow full open detection switch	: OFF → ON
5th bow actuator	: UP → STOP
Storage lid actuator (LH and RH)	: CLOSE
Storage lid full open detection switch	: ON → OFF
Storage lid full close detection switch (LH)	: ON → OFF

- CONDITION: CL 8
  The storage lid inverts and stops at the fully-closed position. The 5th bow actuator operates (DOWN operation) to lower the 5th bow.

Item	Condition
Storage lid full close detection switch (RH)	: ON → OFF
Storage lid actuator	: CLOSE → OPEN → STOP
5th bow actuator	: DOWN
5th bow full open detection switch	: ON → OFF

- CONDITION: CL 9
  The 5th bow is lowering.

Item	Condition
5th bow actuator	: DOWN
5th bow full close detection switch	: ON → OFF

- CONDITION: CL 10
  5th bow auto closure operates. The passenger seat tilts back. Closing operation is completed, and the indicator lamp turns OFF. The passenger seat also returns to its original position.

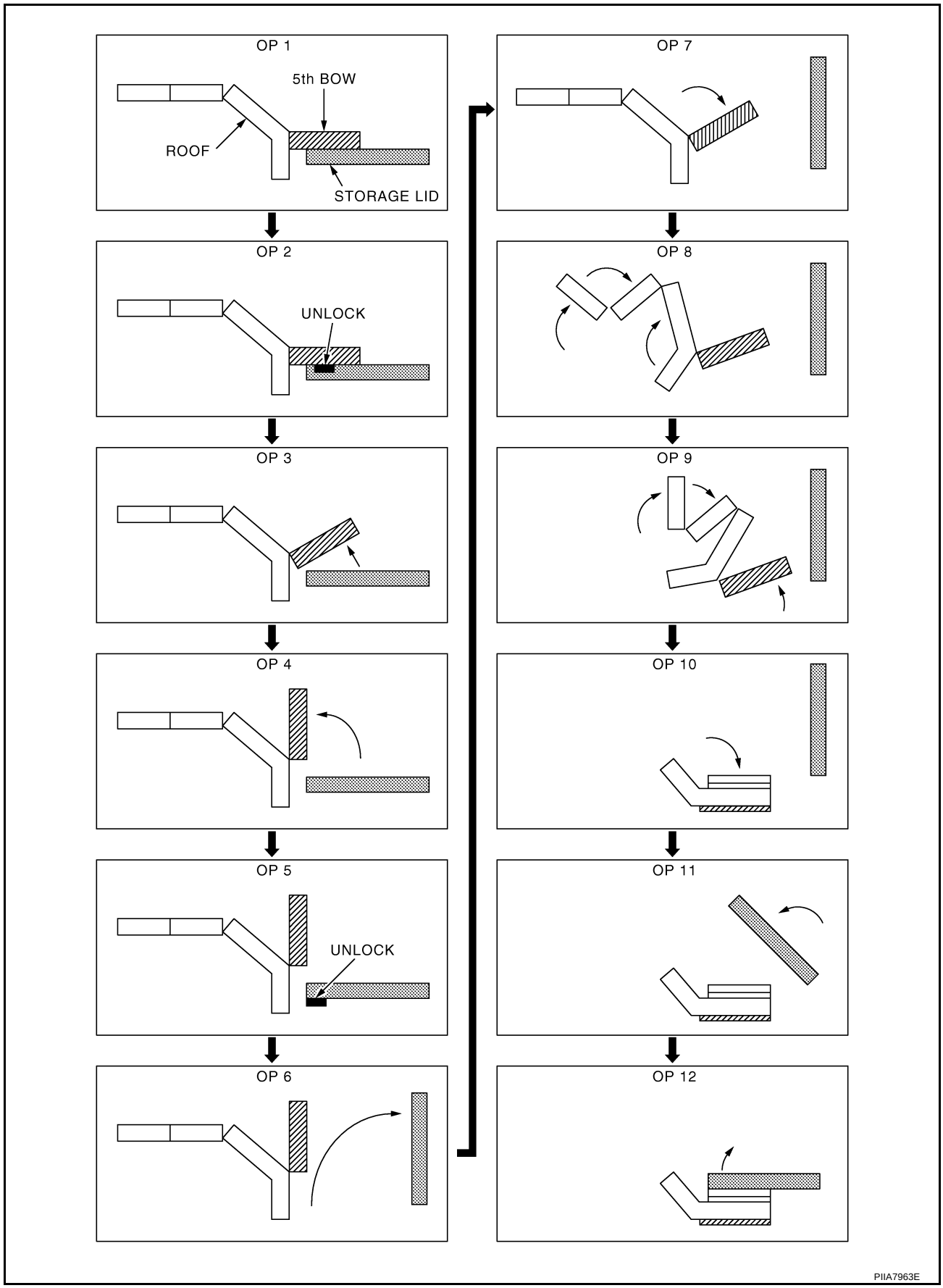
Item	Condition
5th bow actuator	: DOWN → STOP
5th bow half-latch switch	: ON → OFF
5th bow full-latch switch	: ON → OFF
5th bow ending switch	: ON → OFF
5th bow closure motor	: CLOSE → STOP
Indicator lamp	: ON → OFF

Operation Chart

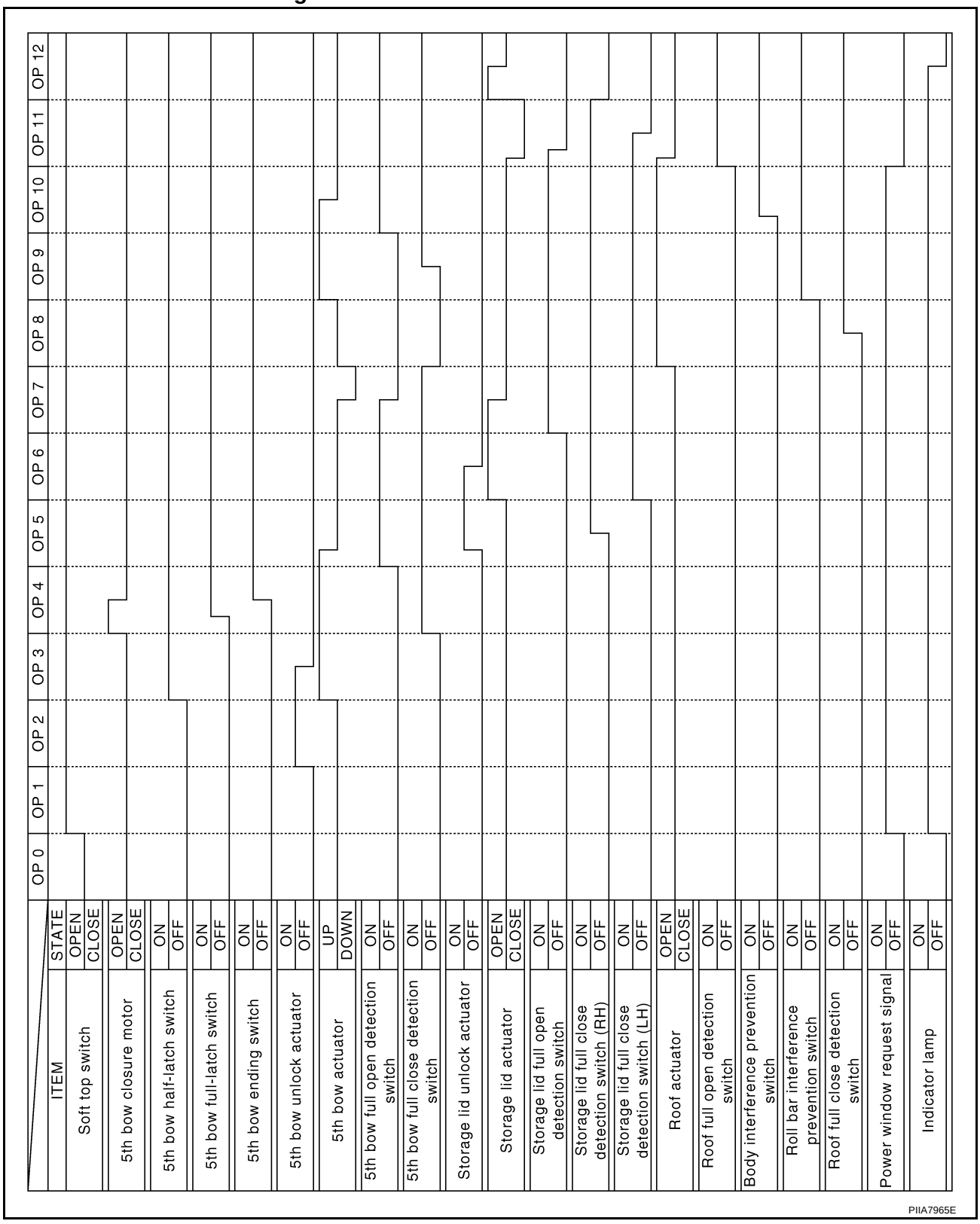
AIS005Z5

CLOSE → OPEN

State Chart

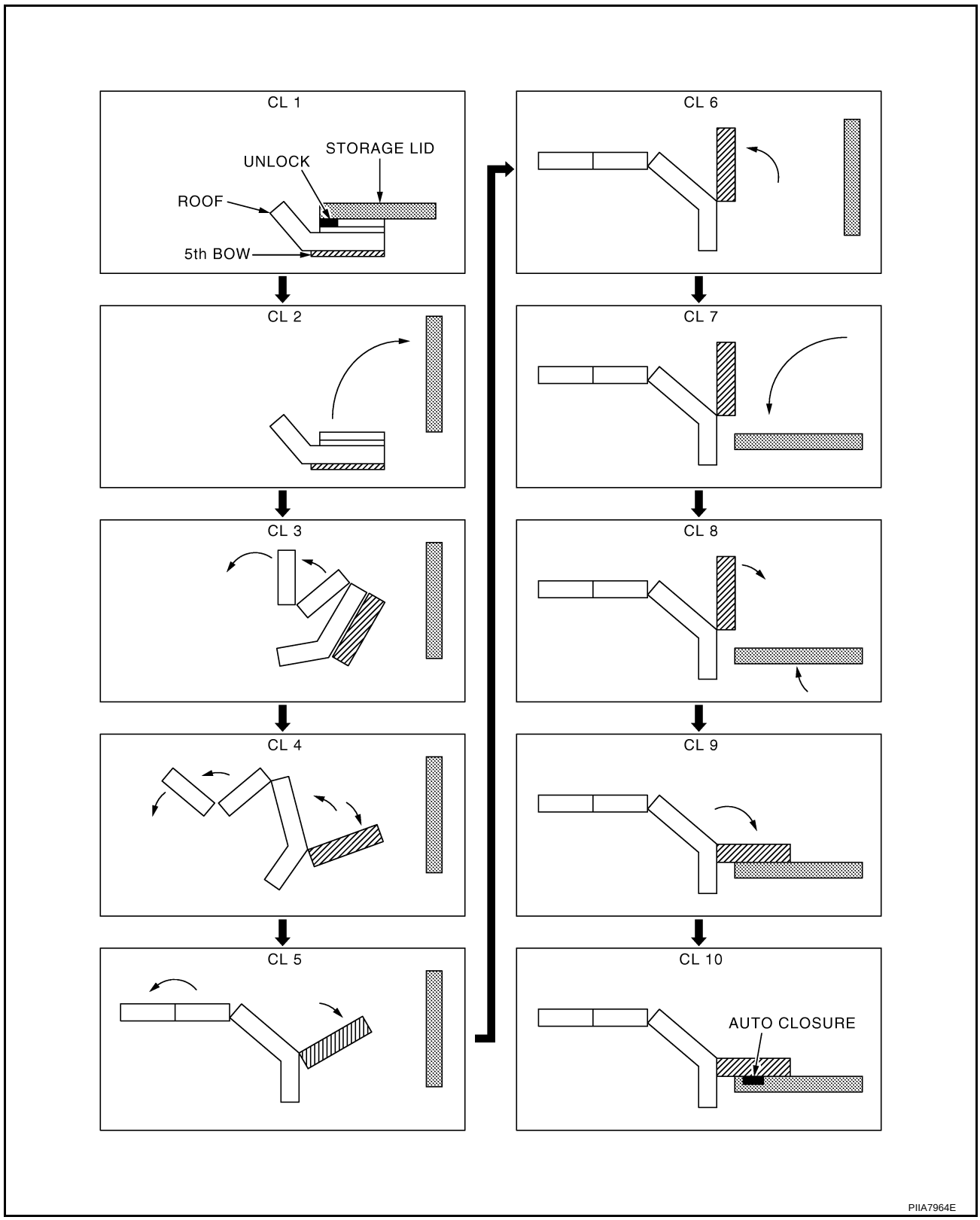


Each Switch and Actuator Signal Chart

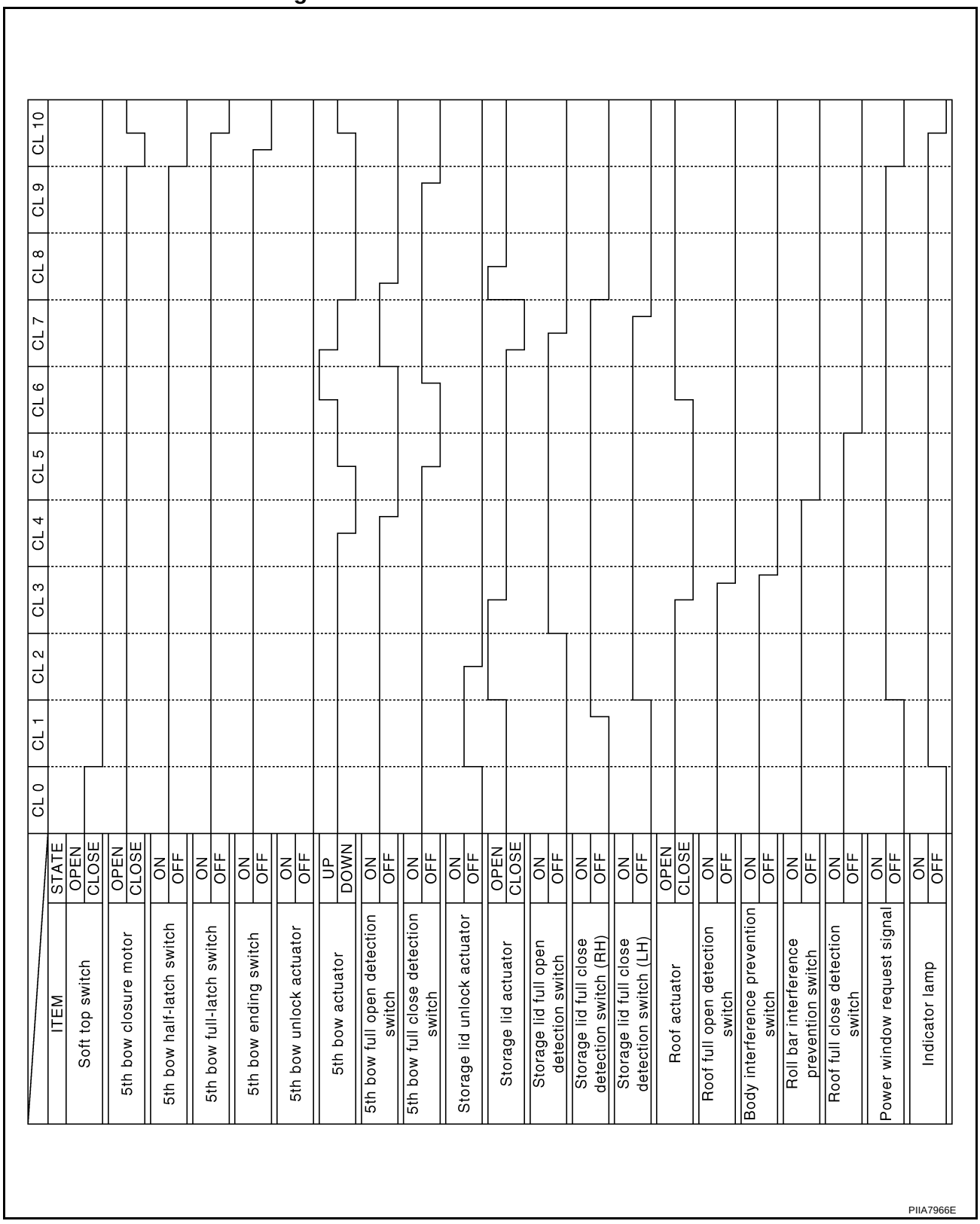


OPEN → CLOSE

State Chart



Each Switch and Actuator Signal Chart



Indicator Lamp

AIS005Z6

The indicator lights, turns off or blinks according to the operating state.

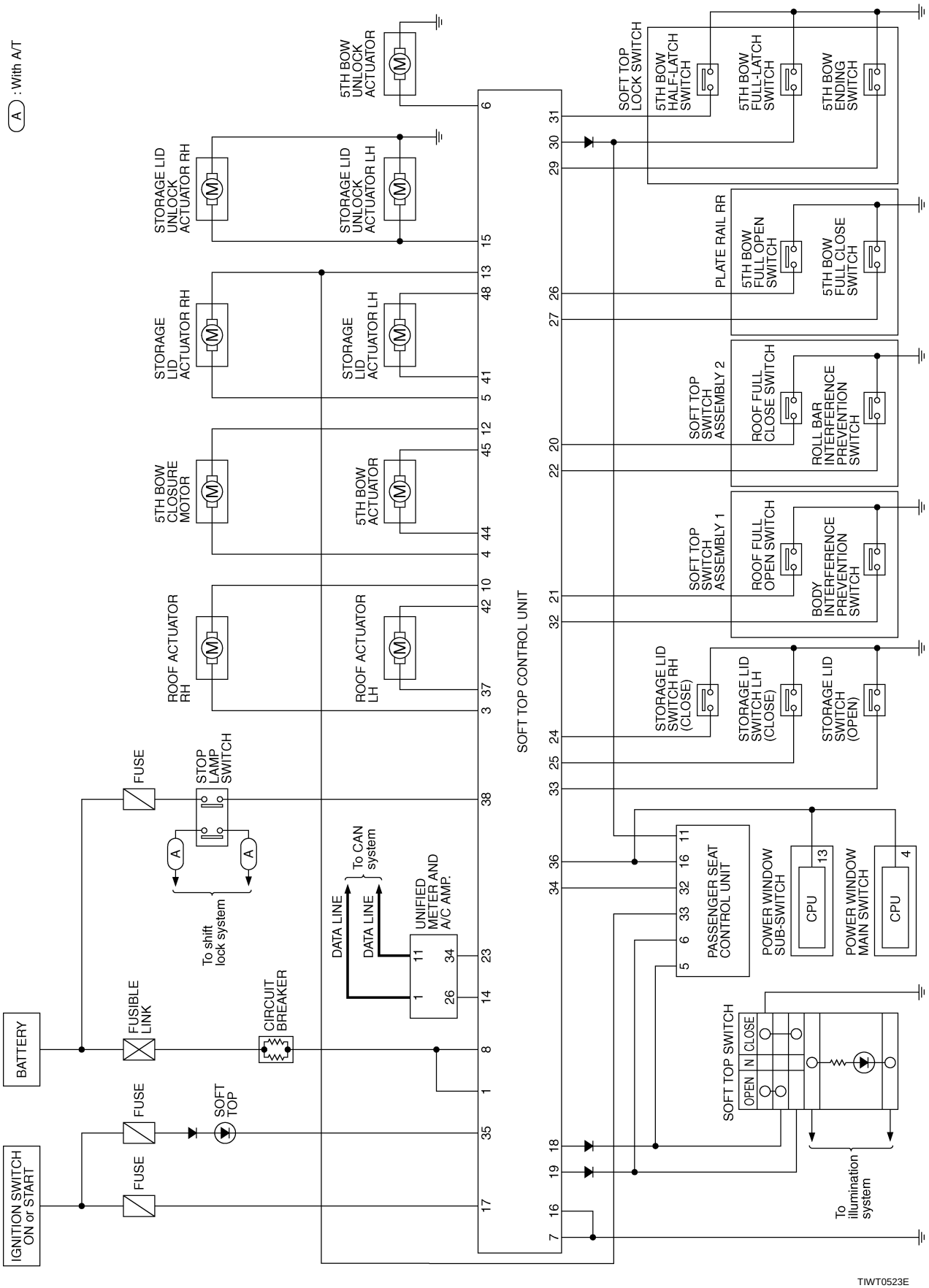
Turns OFF : The operation stops or completes or any switch is malfunctioning
Lights : The soft top is operating or the operation stops on the way
Blinks : The soft top can not operate or stops operation by malfunction

State of roof		The operation stops when the soft top is;		Operation
		full open or full close	in position on the way	
Operational condition		Turning off	Lighting	Lighting
Out of operational condition	When battery voltage decreases remarkably	Turning off	Lighting	Lighting
	Brake pedal is not depressed	Turning off	Lighting	Lighting
	Vehicle speed is 5 km/h (3 MPH) or more	Turning off	Lighting	Lighting
	Ignition switch: OFF	Turning off	Turning off*	Turning off*
Malfunction of	any switch of the system	Turning off	Lighting	Blinking
	soft top control unit	Blinking	Blinking	Blinking
	vehicle speed signal	Blinking	Blinking	Blinking

*: The soft top operates for approximately 30 seconds after turn ignition switch OFF.

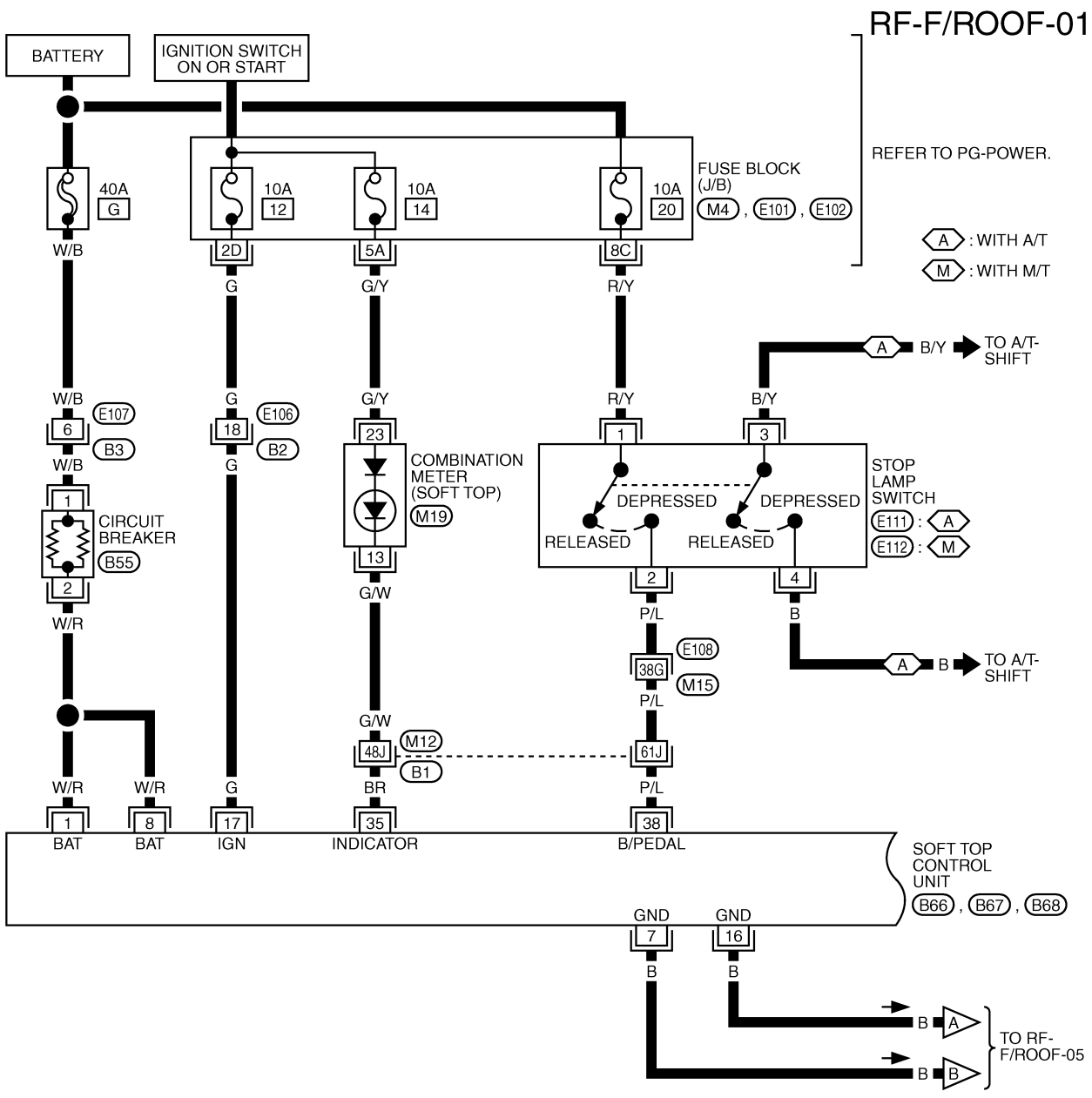
Schematic

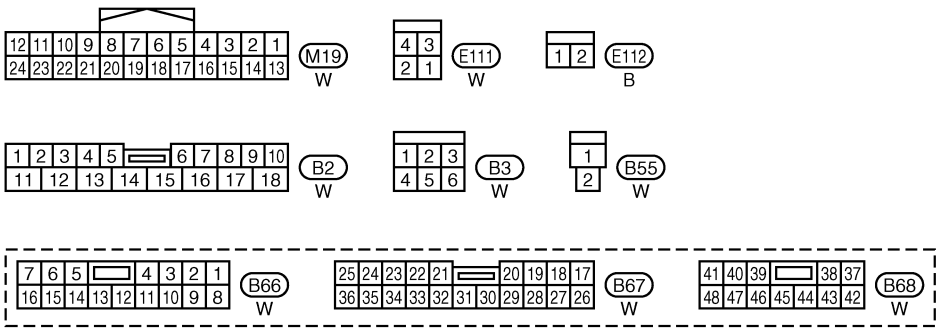
AIS005Z7



Wiring Diagram

AIS005Z8

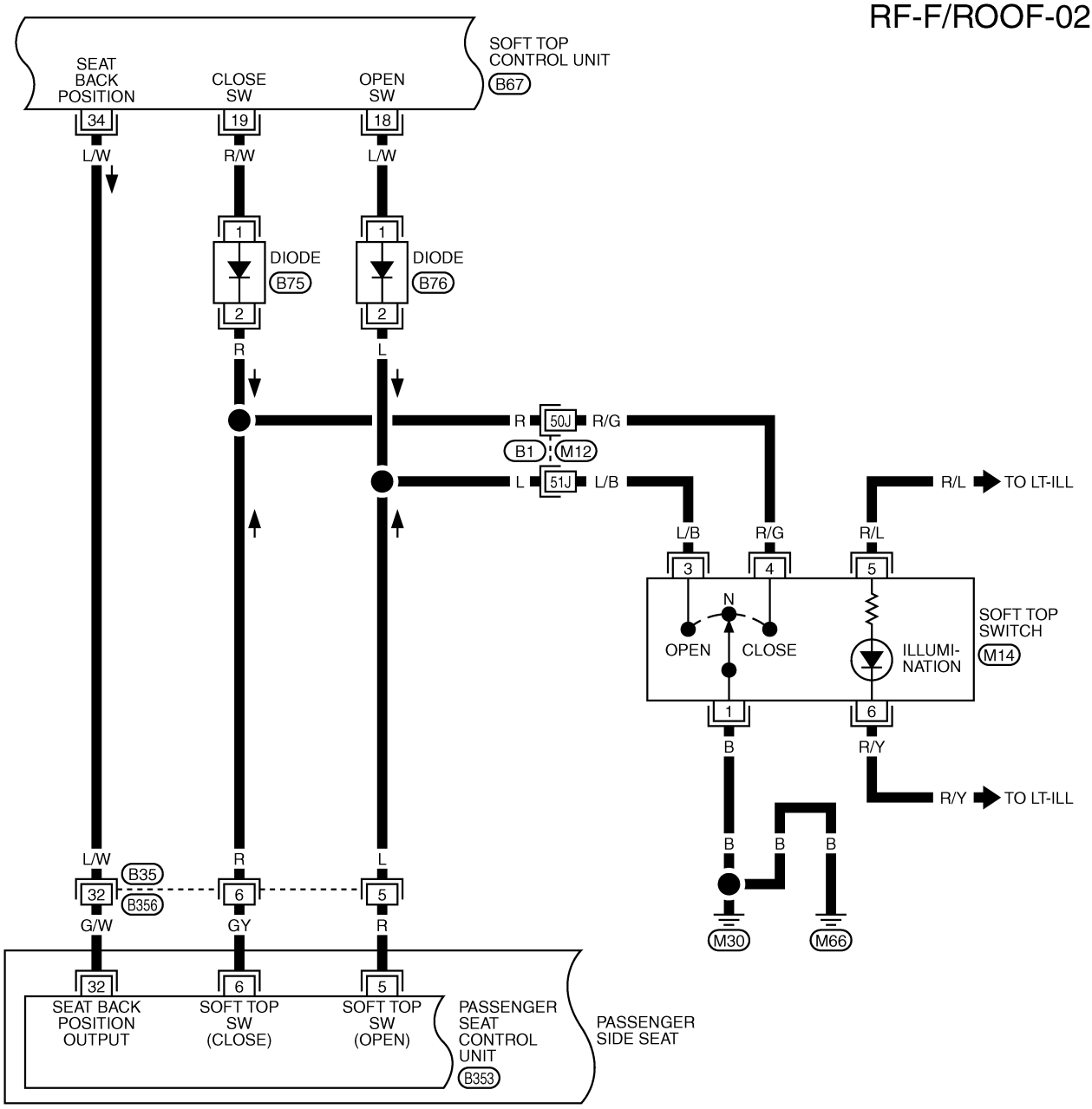


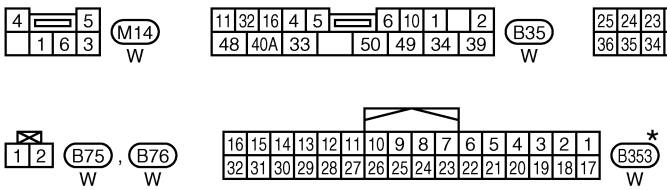


REFER TO THE FOLLOWING.
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , E101 , E102 -FUSE BLOCK- JUNCTION BOX (J/B)

TIWT0765E

RF-F/ROOF-02



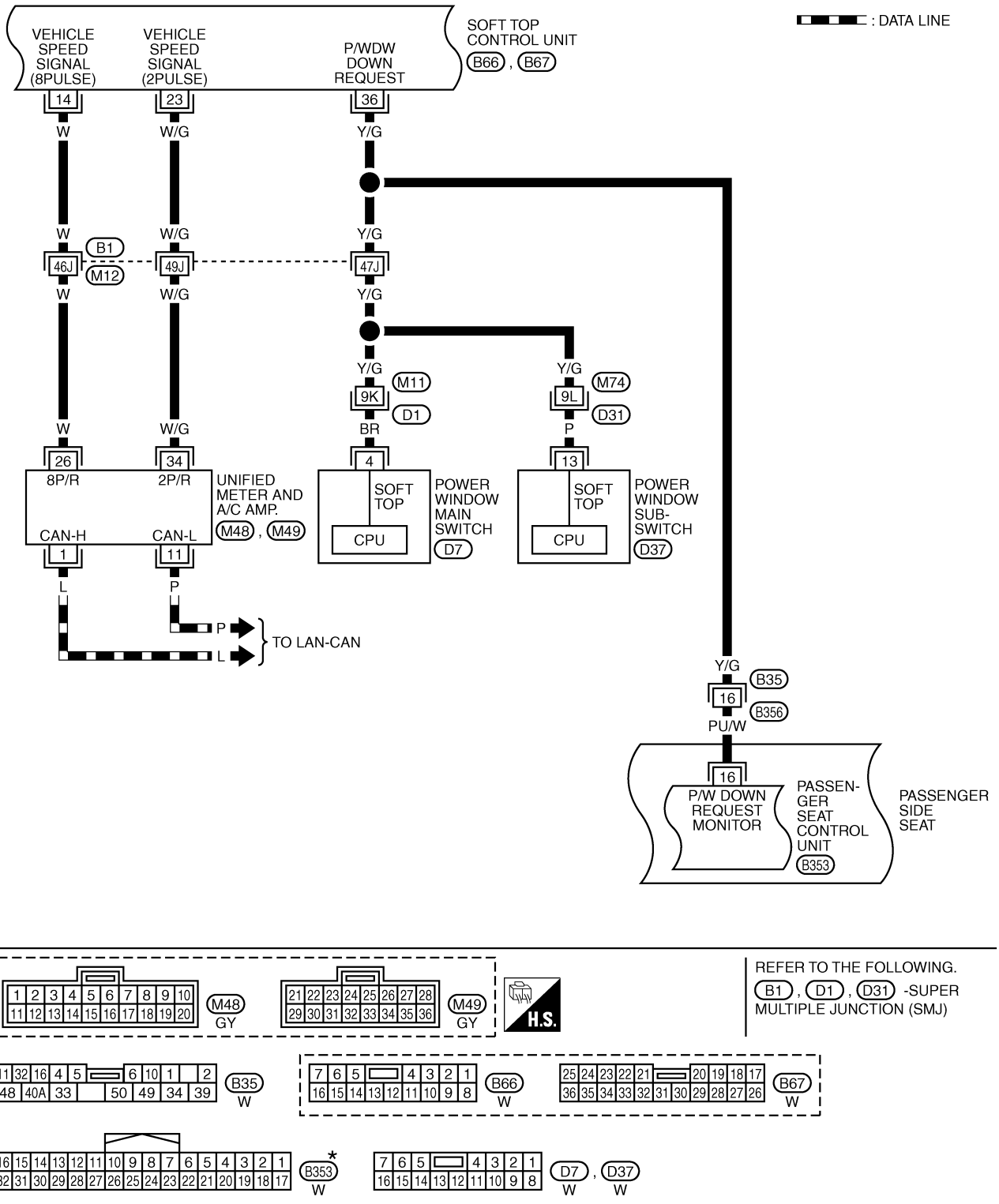


REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT0525E

RF-F/ROOF-03



TIWT0778E

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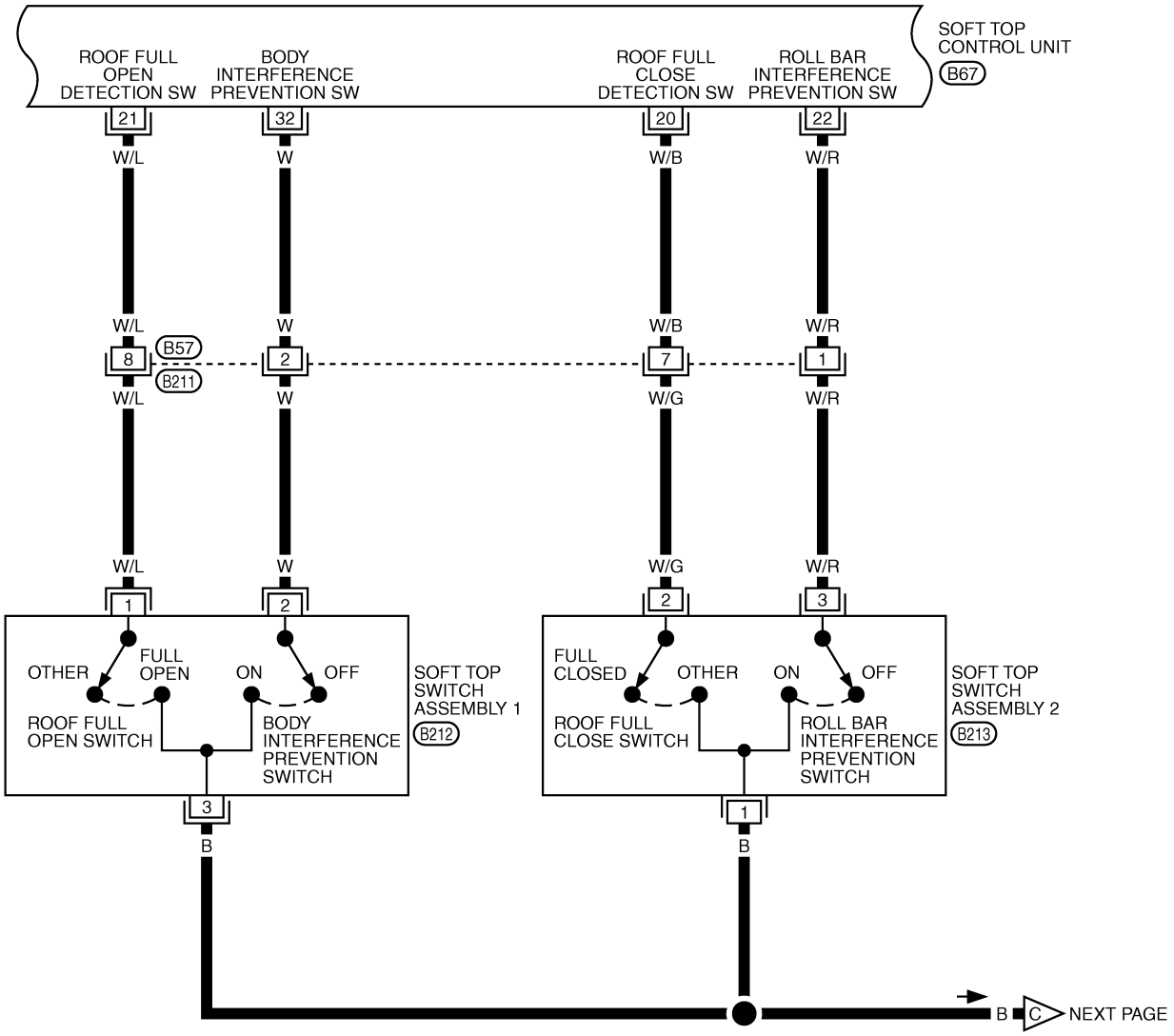

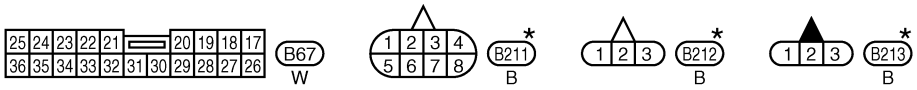

*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT0766E

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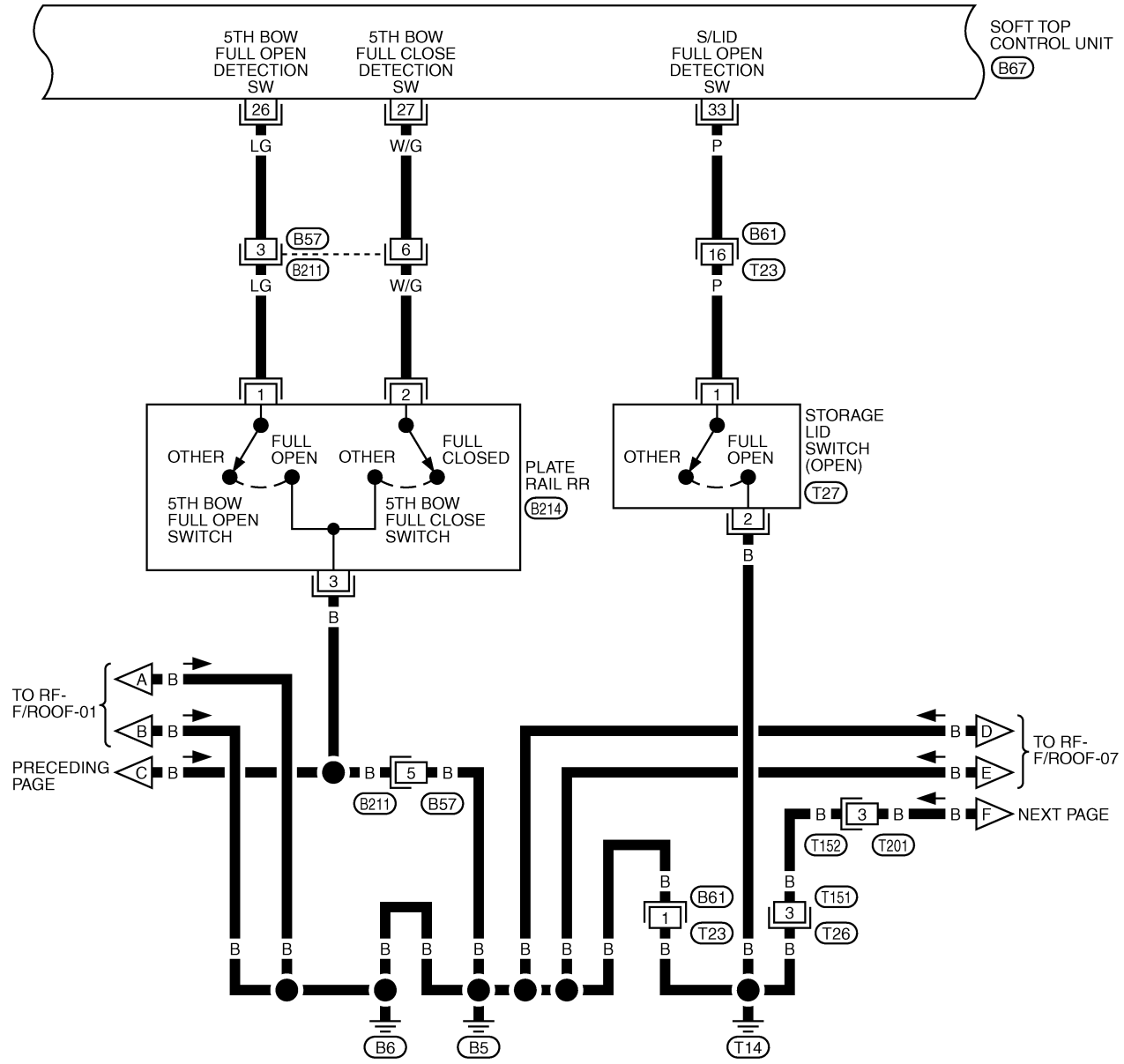
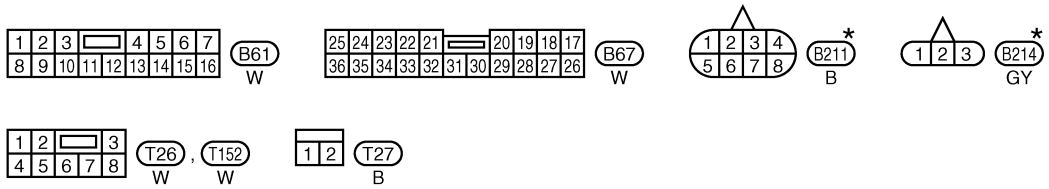
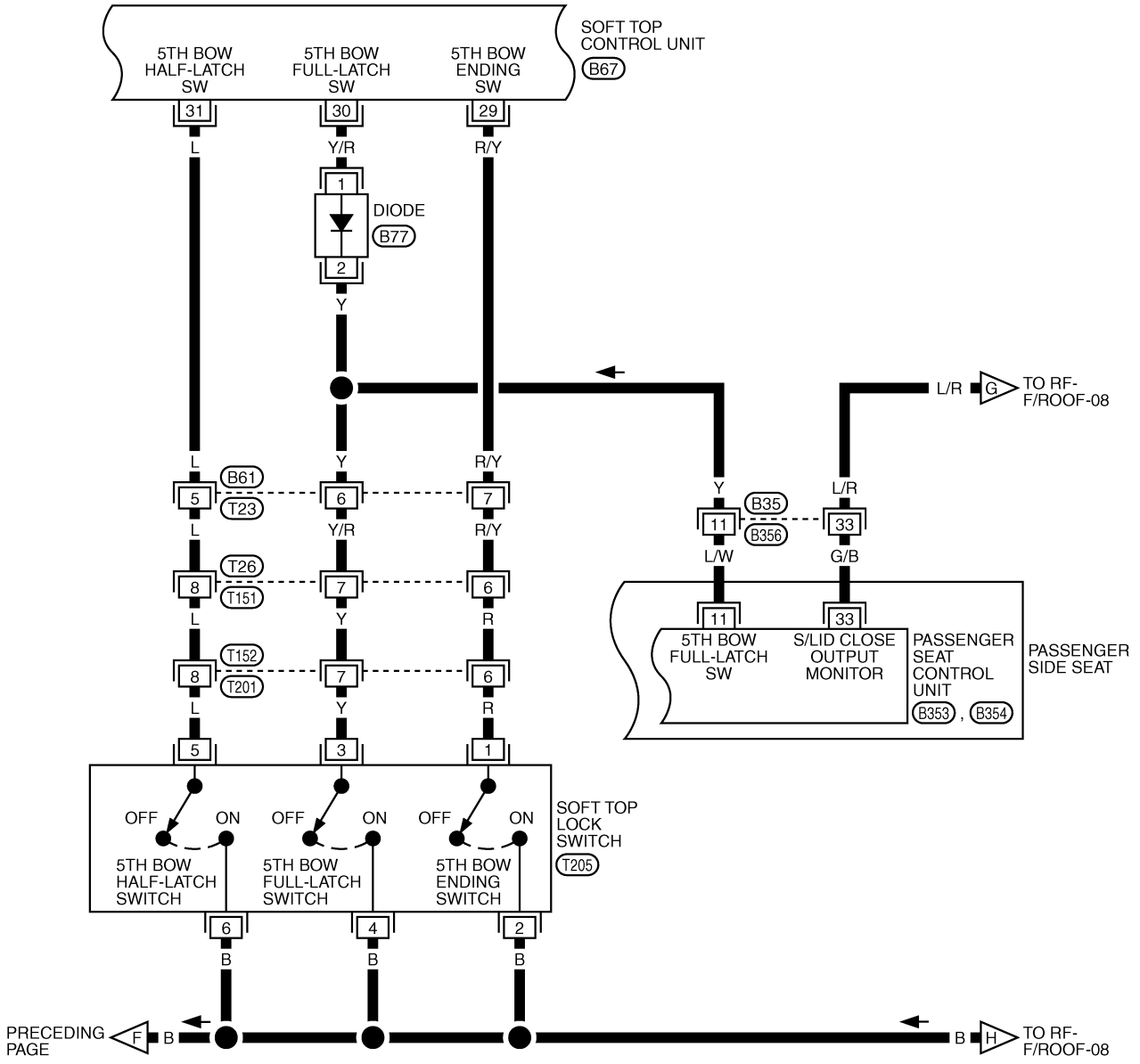


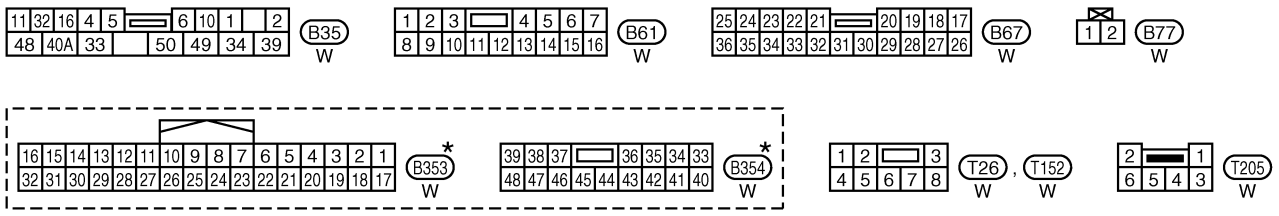


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT0767E

RF-F/ROOF-06

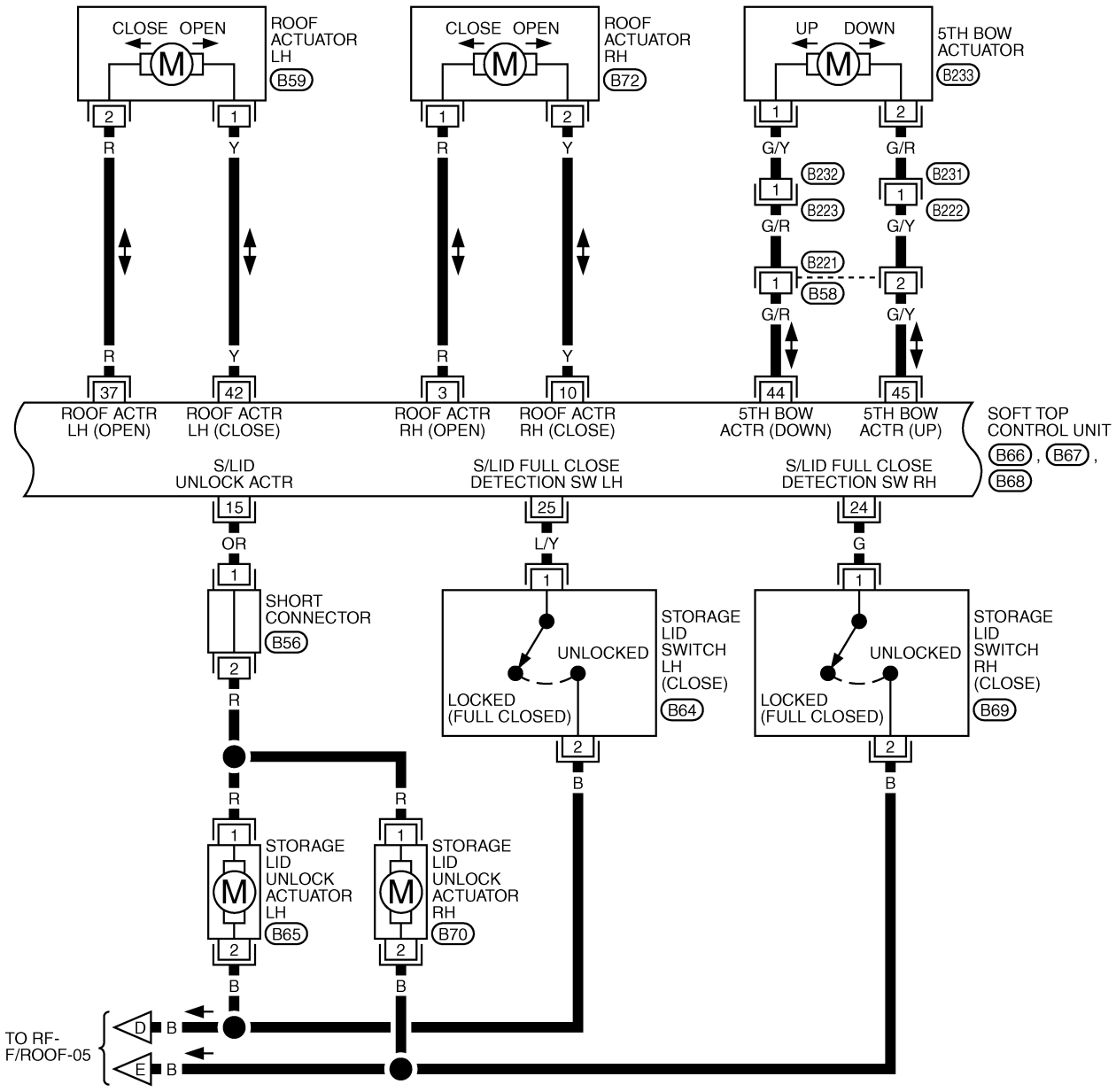


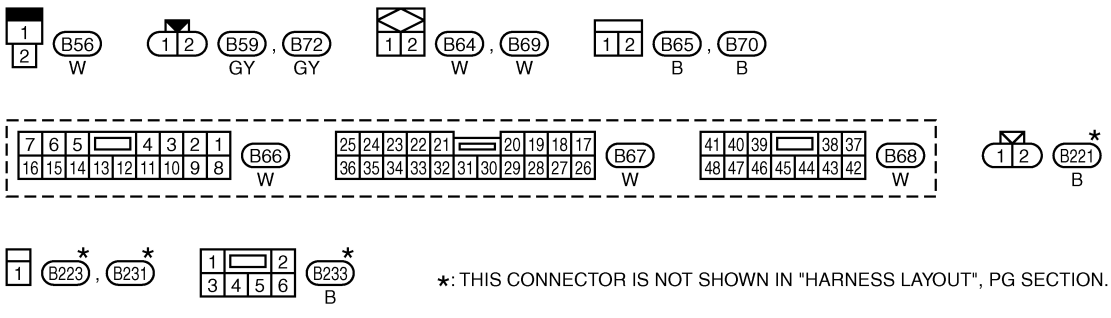


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT0768E

RF-F/ROOF-07

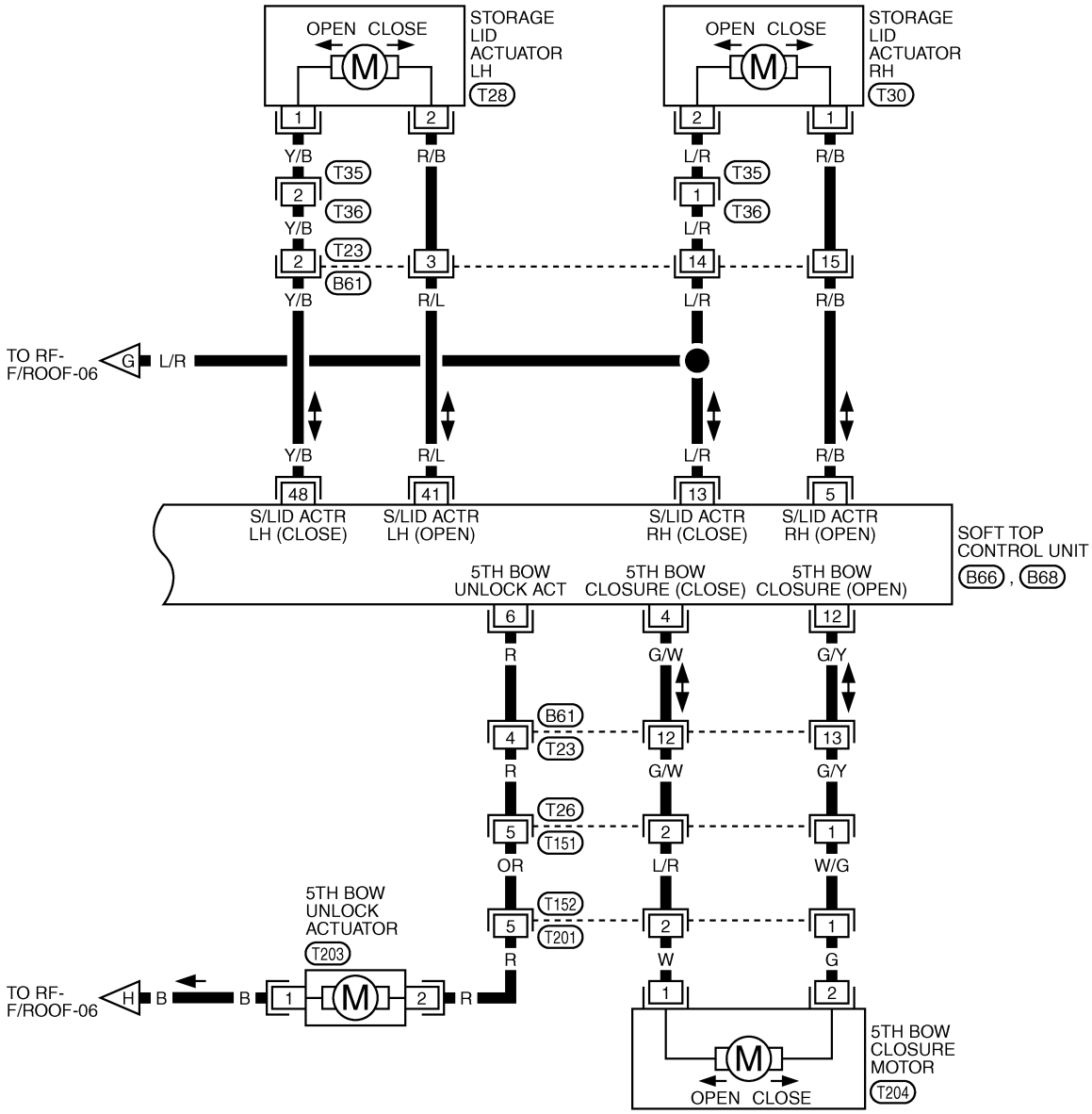


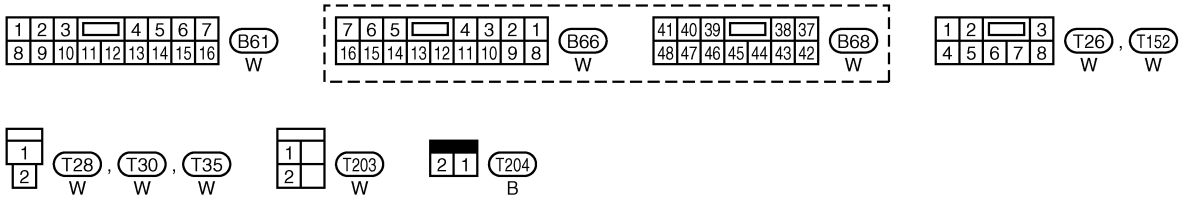


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT0769E

RF-F/ROOF-08





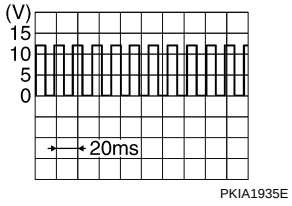
TIWT0770E

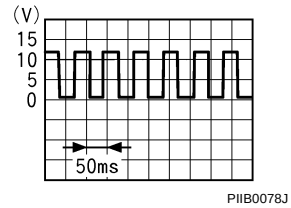
Terminal and Reference Value of Soft Top Control Unit

AIS005Z9

CLOSE → OPEN OPERATION

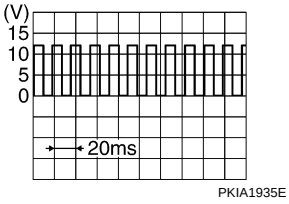
The operation chart for roof position. Refer to RF-19, "State Chart" .

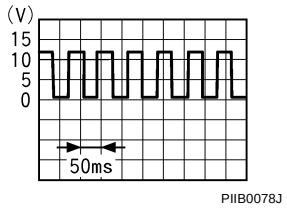
Terminal	Wire color	Item	Condition (Roof position: OP)	Voltage (V) (Approx.)
1	W/R	Battery power supply	—	Battery voltage
3	R	Roof actuator RH (OPEN) signal	OP8 → OP11	0 → Battery voltage → 0
			Other than above	0
4	G/W	5th bow closure motor (CLOSE) signal	—	0
5	R/B	Storage lid actuator RH (OPEN) signal	OP6 → OP7	0 → Battery voltage → 0
			OP12	
			Other than above	0
6	R	5th bow unlock actuator signal	OP2 → OP3	0 → Battery voltage → 0
			Other than above	0
7	B	Ground	—	0
8	W/R	Battery power supply	—	Battery voltage
10	Y	Roof actuator RH (CLOSE) signal	—	0
12	G/Y	5th bow closure motor (OPEN) signal	OP4	0 → Battery voltage → 0
			Other than above	0
13	L/R	Storage lid actuator RH (CLOSE) signal	OP11 → OP12	0 → Battery voltage → 0
			Other than above	0
14	W	Speed signal (8 pulse)	Speed meter operate [When vehicle speed is Approx. 40km/h (25 MPH)]	 PKIA1935E
15	OR	Storage lid unlock actuator signal	OP5 → OP6	0 → Battery voltage → 0
			Other than above	0
16	B	Ground	—	0
17	G	Ignition switch (ON or START)	Ignition switch (ON or START position)	Battery voltage
18	L/W	Soft top switch (OPEN) signal	Soft top switch open operate	0
			Other than above	5
19	R/W	Soft top switch (CLOSE) signal	Soft top switch close operate	0
			Other than above	5
20	W/B	Roof full close detection switch signal	OP8	5 → 0
21	W/L	Roof full open detection switch signal	OP11	5 → 0
22	W/R	Roll bar interference prevention switch signal	OP9	5 → 0

Terminal	Wire color	Item	Condition (Roof position: OP)		Voltage (V) (Approx.)
23	W/G	Speed signal (2 pulse)	Speed meter operate [When vehicle speed is Approx. 40 km/h (25 MPH)]		 PIIB0078J
24	G	Storage lid full close detection switch (RH) signal	OP5 → OP12		5 → 0 → 5
25	L/Y	Storage lid full close detection switch (LH) signal	OP6 → OP11		5 → 0 → 5
26	LG	5th bow full open detection switch signal	OP5 → OP7		5 → 0 → 5
			OP10		5 → 0
27	W/G	5th bow full close detection switch signal	OP4 → OP8		5 → 0 → 5
			OP9		5 → 0
29	R/Y	5th bow ending switch signal	OP4		5 → 0
30	Y/R	5th bow full-latch switch signal	OP4		5 → 0
31	L	5th bow half-latch switch signal	OP3		5 → 0
32	W	Body interference prevention switch signal	OP10		5 → 0
33	P	Storage lid full open detection switch signal	OP7 → OP11		5 → 0 → 5
34	L/W	Seat back position signal	When passenger seat inclines forward		0
			Other than above		5
35	BR	Indicator lamp signal	OP1 → OP12		0
			Other than above		Battery voltage
36	Y/G	Power window down signal	OP1→OP11		0
			Other than above		5
37	R	Roof actuator LH (OPEN) signal	OP8 → OP11		0 → Battery voltage → 0
			Other than above		0
38	P/L	Brake pedal signal	Brake pedal	: Depressed	Battery voltage
				: Released	0
41	R/L	Storage lid actuator LH (OPEN) signal	OP6 → OP7		0 → Battery voltage → 0
			OP12		
			Other than above		0
42	Y	Roof actuator LH (CLOSE) signal	—		0
44	G/R	5th bow actuator (DOWN) signal	OP7 → OP8		0 → Battery voltage → 0
			Other than above		0
45	G/Y	5th bow actuator (UP) signal	OP3 → OP5		0 → Battery voltage → 0
			OP9 → OP10		
			Other than above		0
48	Y/B	Storage lid actuator LH (CLOSE) signal	OP11 → OP12		0 → Battery voltage → 0
			Other than above		0

OPEN → CLOSE OPERATION

The operation chart for roof position. Refer to RF-21, "State Chart" .

Terminal	Wire color	Item	Condition (Roof position: CL)	Voltage (V) (Approx.)
1	W/R	Battery power supply	—	Battery voltage
3	R	Roof actuator RH (OPEN) signal	—	0
4	G/W	5th bow closure motor (CLOSE) signal	CL10	0 → Battery voltage → 0
			Other than above	0
5	R/B	Storage lid actuator RH (OPEN) signal	CL2 → CL3	0 → Battery voltage → 0
			CL8	
			Other than above	0
6	R	5th bow unlock actuator signal	—	0
7	B	Ground	—	0
8	W/R	Battery power supply	—	Battery voltage
10	Y	Roof actuator RH (CLOSE) signal	CL3 → CL6	0 → Battery voltage → 0
			Other than above	0
12	G/Y	5th bow closure motor (OPEN) signal	—	0
13	L/R	Storage lid actuator RH (CLOSE) signal	CL7 → CL8	0 → Battery voltage → 0
			Other than above	0
14	W	Speed signal (8 pulse)	Speed meter operate [When vehicle speed is Approx. 40 km/h (25 MPH)]	 PKIA1935E
15	OR	Storage lid unlock actuator signal	CL1 → CL2	0 → Battery voltage → 0
			Other than above	0
16	B	Ground	—	0
17	G	Ignition switch (ON or START)	Ignition switch (ON or START position)	Battery voltage
18	L/W	Soft top switch (OPEN) signal	Soft top switch open operate	0
			Other than above	5
19	R/W	Soft top switch (CLOSE) signal	Soft top switch close operate	0
			Other than above	5
20	W/B	Roof full close detection switch signal	CL6	0 → 5
21	W/L	Roof full open detection switch signal	CL3	0 → 5
22	W/R	Roll bar interference prevention switch signal	CL5	0 → 5

Terminal	Wire color	Item	Condition (Roof position: CL)		Voltage (V) (Approx.)
23	W/G	Speed signal (2 pulse)	Speed meter operate [When vehicle speed is Approx. 40 km/h (25 MPH)]		 PIIB0078J
24	G	Storage lid full close detection switch (RH) signal	CL1 → CL8		5 → 0 → 5
25	L/Y	Storage lid full close detection switch (LH) signal	CL2 → CL7		5 → 0 → 5
26	LG	5th bow full open detection switch signal	CL4		0 → 5
			CL7		5 → 0
			CL8		0 → 5
27	W/G	5th bow full close detection switch signal	CL5 → CL6		0 → 5 → 0
			CL9		0 → 5
29	R/Y	5th bow ending switch signal	CL10		0 → 5
30	Y/R	5th bow full-latch switch signal	CL10		0 → 5
31	L	5th bow half-latch switch signal	CL9 → CL10		0 → 5
32	W	Body interference prevention switch signal	CL3		0 → 5
33	P	Storage lid full open detection switch signal	CL3 → CL7		5 → 0 → 5
34	L/W	Seat back position signal	When passenger seat inclines forward		0
			Other than above		5
35	BR	Indicator lamp signal	CL1 → CL10		0
			Other than above		Battery voltage
36	Y/G	Power window down signal	CL1 → CL10		0
			Other than above		5
37	R	Roof actuator LH (OPEN) signal	—		0
38	P/L	Brake pedal signal	Brake pedal	: Depressed	Battery voltage
				: Released	0
41	R/L	Storage lid actuator LH (OPEN) signal	CL2 → CL3		0 → Battery voltage → 0
			CL8		
			Other than above		0
42	Y	Roof actuator LH (CLOSE) signal	CL3 → CL6		0 → Battery voltage → 0
44	G/R	5th bow actuator (DOWN) signal	CL4 → CL5		0 → Battery voltage → 0
			CL8 → CL10		
45	G/Y	5th bow actuator (UP) signal	CL6 → CL7		0 → Battery voltage → 0
48	Y/B	Storage lid actuator LH (CLOSE) signal	CL7 → CL8		0 → Battery voltage → 0
			Other than above		0

Work Flow

AIS005ZA

1. Check the symptom and customer's requests.
2. Understand the outline of system. Refer to RF-12, "System Description" .
3. According to the trouble diagnosis chart, repair or replace the cause of the malfunction. Refer to RF-37, "Trouble Diagnosis Chart by Symptom" .
4. Does soft top system operate normally? If Yes, GO TO 5. If No, GO TO 3.
5. INSPECTION END.

Trouble Diagnosis Chart by Symptom (CLOSE → OPEN)

AIS005ZB

The operation chart for roof position. Refer to RF-19, "State Chart" .

Symptom	Diagnostic procedure and repair order	Roof position	Refer to page
Roof does not operate	1. Soft top control unit power supply check	OP1	RF-39
	2. Soft top switch (Open) check	OP1	RF-39
	3. Operation permission condition check	OP1	RF-76
	4. Each switch condition check (Open operate)	Full close	RF-79
	5. Seat back position signal check	OP1	RF-82
	6. 5th bow unlock actuator check (Open operate)	OP2	RF-43
	7. 5th bow half-latch switch check (Open operate)	OP2	RF-43
	8. 5th bow actuator check (Open operate)	OP3	RF-45
5th bow operation stops at full open position	1. 5th bow full close detection switch check (Open operate)	OP4	RF-45
	2. 5th bow full open detection switch check (Open operate)	OP5	RF-47
	3. Storage lid unlock actuator check (Open operate)	OP5	RF-48
	4. Storage lid full close detection switch (LH and RH) check (Open operate)	OP5.6	RF-49
	5. Storage lid actuator check (Open operate)	OP6	RF-51
Storage lid operation stops at full open position	1. Storage lid full open detection switch check (Open operate)	OP7	RF-52
Roof does not operate	1. Roof actuator check (Open operate)	OP8	RF-54
Roof stops on the way	1. Roll bar interference prevention switch check (Open operate)	OP8	RF-55
Storage lid operation stops at full open position after the roof is stored.	1. Body interference prevention switch check (Open operate)	OP10	RF-56
	2. Roof full open detection switch check	OP10	RF-57
Passenger side seat back does not operate.	1. Passenger side seat cancel switch check	OP1	SE-50
	2. Passenger side seat operate signal check 1	OP1	RF-81
Passenger side seat bock does not return to former state	1. Passenger side seat operate signal check 2	OP10	RF-82
Power window down does not operate.	1. Power window harness check	OP1	RF-81
Both power window down and passenger seat are not operated.	1. Power window down request signal check	OP1	RF-80
Indicator lamp does not light. (soft top operates properly)	1. Indicator lamp circuit check	—	RF-84

Symptom	Diagnostic procedure and repair order	Roof position	Refer to page
Indicator lamp blinks when IGN SW : OFF → ON is done.	1. Replace soft top control unit	—	RF-85
Indicator lamp blinks when beginning to run.	1. Speed signal check	—	RF-83

(OPEN → CLOSE)

The operation chart for roof position. Refer to RF-21, "State Chart" .

Symptom	Diagnostic procedure and repair order	Roof position	Refer to page
Roof does not operate	1 Soft top control unit power supply check	CL1	RF-39
	2. Soft top switch (Close) check	CL1	RF-41
	3. Operation permission condition check	CL1	RF-76
	4. Each switch condition check (Close operate)	Full open	RF-80
	5. Seat back position signal check	CL1	RF-82
	6. Storage lid unlock actuator check (Close operate)	CL1	RF-58
	7. Storage lid full close detection switch (LH and RH) check (Close operate)	CL1.2	RF-59
	8. Storage lid actuator check (Close operate)	CL2	RF-61
Storage lid operation stops at full open position	1. Roof actuator check (Close operate)	CL2	RF-65
	2. Body interference prevention switch check (Close operate)	CL3	RF-64
Roof stops on the way	1. Storage lid full open detection switch check (Close operate)	CL3	RF-62
	2. Roof full close detection switch check (Close operate)	CL5	RF-66
	3. 5th bow actuator check (Close operate)	CL5	RF-68
Operation stops after 5th bow operates down	1. 5th bow full close detection switch check (Close operate)	CL5	RF-68
Operation stops after 5th bow operates up	1. 5th bow full open detection switch check (Close operate)	CL6	RF-70
Auto closure of 5th bow does not operate.	1. 5th bow half-latch switch check	CL10	RF-71
	2. 5th bow full-latch switch check	CL10	RF-72
	3. 5th bow ending switch check	CL10	RF-74
	4. 5th bow closure motor check	CL10	RF-75
Passenger side seat back does not operate.	1. Passenger side seat cancel switch check	CL1	SE-50
	2. Passenger side seat operate signal check 1	CL1	RF-81
Passenger side seat back does not return to former state	1. Passenger side seat operate signal check 3	CL10	RF-82
Power window down does not operate.	1. Power window harness check	CL1	RF-81
Both power window down and passenger seat are not operated.	1. Power window down request signal check	CL1	RF-80
Indicator lamp does not light. (soft top operates properly)	1. Indicator lamp circuit check	—	RF-84
Indicator lamp blinks when IGN SW : OFF → ON is done.	1. Replace soft top control unit	—	RF-85
Indicator lamp blinks when beginning to run.	1. Speed signal check	—	RF-83

Soft Top Control Unit Power Supply Check (OP, CL)

AIS005ZC

1. CHECK FUSE

- Check 10A fuse [No.12, located in the fuse block (J/B)]
- Check 40A fusible link (letter **G** located in the fuse and fusible link box.)

NOTE:
Refer to RF-11, "Component Parts and Harness Connector Location" .

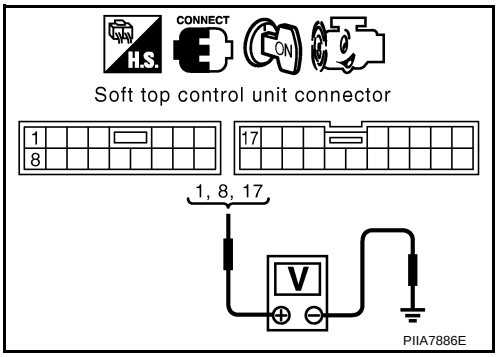
OK or NG

OK >> GO TO 2.
NG >> If fuse blown out, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Start engine.
2. Check voltage between soft top control unit connector B66, 67 terminal 1, 8, 17 and ground.

1 (W/R) - Ground : Battery voltage
8 (W/R) - Ground : Battery voltage
17 (G) - Ground : Battery voltage



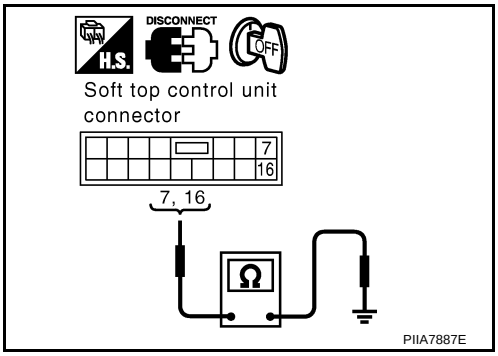
OK or NG

OK >> GO TO 3.
NG >> Check soft top control unit power supply circuit for open or short.

3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit connector.
3. Check continuity between soft top control unit connector B66 terminal 7, 16 and ground.

7 (B) - Ground : Continuity should exist.
16 (B) - Ground : Continuity should exist.



OK or NG

OK >> Power supply and ground circuit are OK.
NG >> Check soft top control unit ground circuit for open or short.

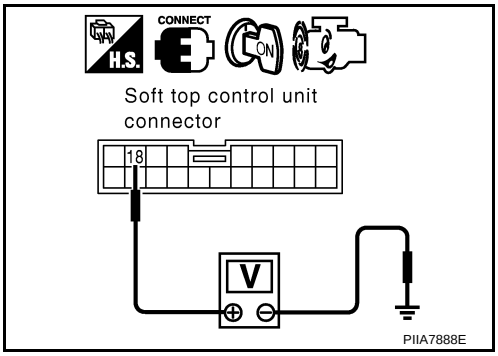
Soft Top Switch (OPEN) Check

AIS005ZD

1. CHECK SOFT TOP OPEN SWITCH SIGNAL

1. Start engine.
2. Check soft top control unit connector and ground.

Connector	Terminal (Wire color)		Soft top switch Condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	18 (L/W)	Ground	OPEN	0
			Other than above	5



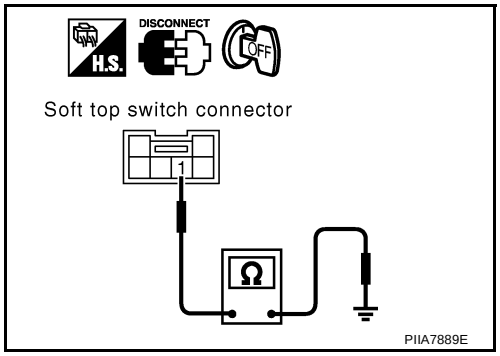
OK or NG

OK >> Soft top switch (OPEN) is OK.
NG >> GO TO 2.

2. CHECK SOFT TOP SWITCH GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top switch connector.
3. Check continuity between soft top switch connector M14 terminal 1 and ground.

1 (B) - Ground : Continuity should exist.



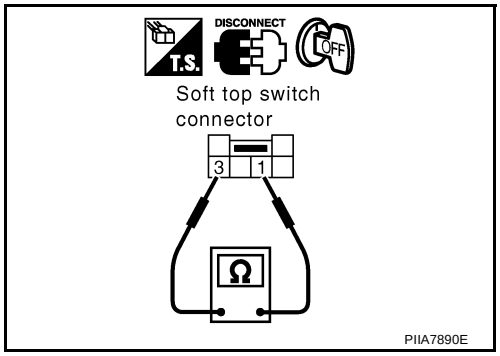
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK SOFT TOP SWITCH

Soft top switch operate, check continuity between soft top switch connector M14 terminal 1 and 3.

Connector	Terminal		Soft top switch Condition	Continuity
M14	1	3	OPEN	Yes
			Other than above	No



OK or NG

OK >> GO TO 4.
NG >> Replace soft top switch.

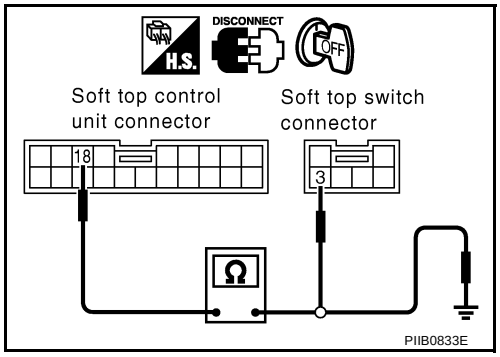
4. CHECK SOFT TOP SWITCH CIRCUIT

1. Check continuity between soft top control unit connector B67 terminal 18 and soft top switch connector M14 terminal 3.

Connector	Terminal (Wire color)	Connector	Terminal (Wire color)	Continuity
	(+)		(-)	
B67	18 (L/W)	M14	3 (L/B)	No
M14	3 (L/B)	B67	18 (L/W)	Yes

2. Check continuity between soft top control unit connector B67 terminal 18 and ground.

18 (L/W) - Ground : Continuity should not exist.



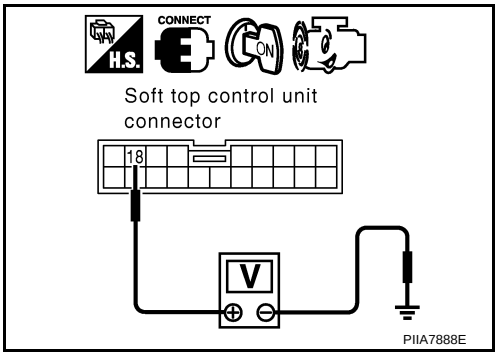
OK or NG

OK >> GO TO 5.
NG >> Repair or replace harness.

5. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 18 and ground.

18 (L/W) - Ground : Approx. 5V



OK or NG

OK >> Check condition of harness and connector.
NG >> Replace soft top control unit.

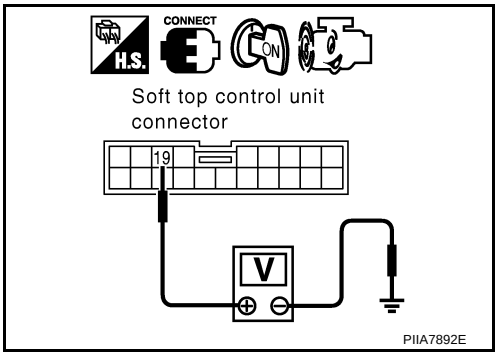
Soft Top Switch (CLOSE) Check

AIS005ZE

1. CHECK SOFT TOP CLOSE SWITCH SIGNAL

1. Start engine.
2. Check soft top control unit connector and ground.

Connector	Terminal (Wire color)		Soft top switch Condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	19 (R/W)	Ground	CLOSE	0
			Other than above	5



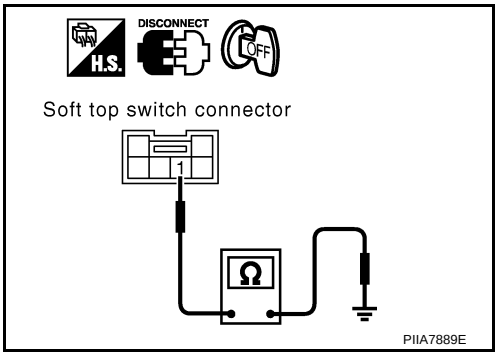
OK or NG

OK >> Soft top switch (CLOSE) is OK.
NG >> GO TO 2.

2. CHECK SOFT TOP SWITCH GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top switch connector.
3. Check continuity between soft top switch connector M14 terminal 1 and ground.

1 (B) - Ground : Continuity should exist.



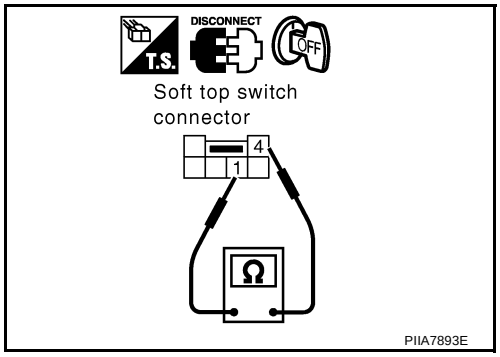
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK SOFT TOP SWITCH

Soft top switch operate, check continuity between soft top switch connector M14 terminal 1 and 4.

Connector	Terminal		Soft top switch Condition	Continuity
M14	1	4	CLOSE	Yes
			Other than above	No



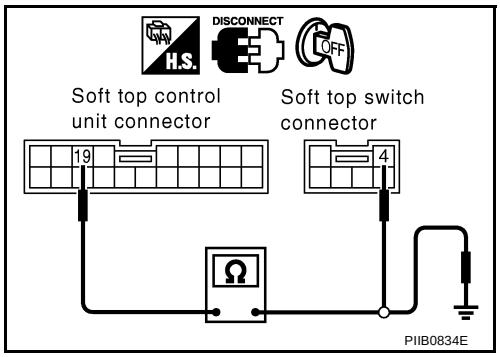
OK or NG

OK >> GO TO 4.
NG >> Replace soft top switch.

4. CHECK SOFT TOP SWITCH CIRCUIT

1. Check continuity between soft top control unit connector B67 terminal 19 and soft top switch connector M14 terminal 4.

Connector	Terminal (Wire color) (+)	Connector	Terminal (Wire color) (-)	Continuity
B67	19 (R/W)	M14	4 (R/G)	No
M14	4 (R/G)	B67	19 (R/W)	Yes



2. Check continuity between soft top control unit connector B67 terminal 19 and ground.

19 (R/W) - Ground : Continuity should not exist.

OK or NG

OK >> GO TO 5.
NG >> Repair or replace harness.

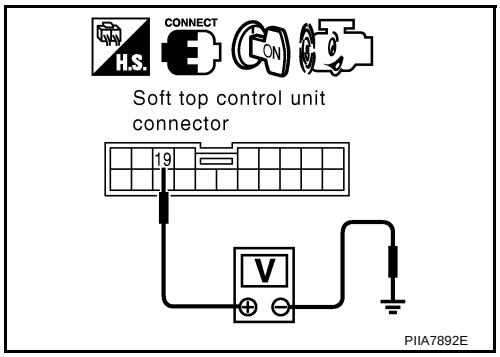
5. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 19 and ground.

19 (R/W) - Ground : Approx. 5V

OK or NG

OK >> Check condition of harness and connector.
NG >> Replace soft top control unit.



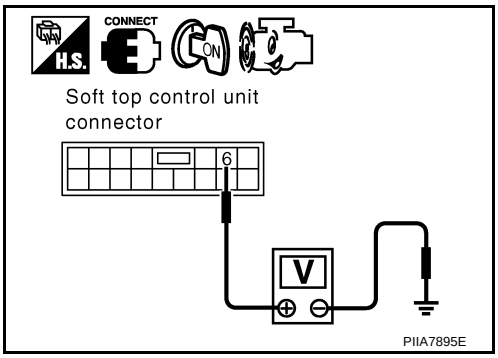
5th Bow Unlock Actuator Check (Open Operate)

AIS005ZF

1. CHECK 5TH BOW UNLOCK ACTUATOR SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Con-nector	Terminal (Wire color)		Roof Condition	Voltage (V) (Approx.)
	(+)	(-)		
B66	6 (R)	Ground	OP1 → OP2	0 → Battery voltage



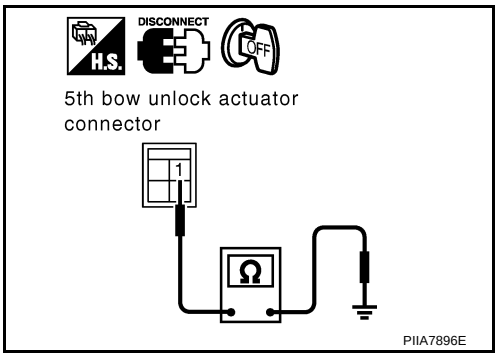
OK or NG

OK >> GO TO 2.
NG >> Replace soft top control unit.

2. CHECK 5TH BOW UNLOCK ACTUATOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect 5th bow unlock actuator connector.
3. Check continuity between 5th bow unlock actuator connector T203 terminal 1 and ground.

1 (B) - Ground : Continuity should exist.



OK or NG

OK >> Replace 5th bow unlock actuator.
NG >> Repair or replace harness.

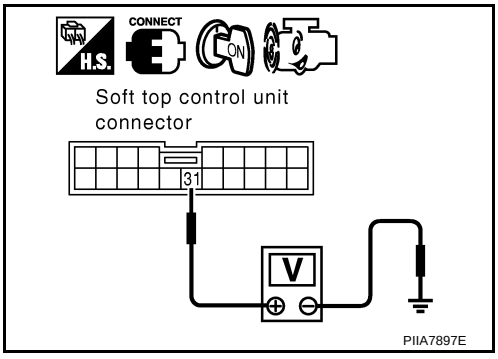
5th Bow Half-Latch Switch Check (Open Operate)

AIS005ZG

1. CHECK 5TH BOW HALF-LATCH SWITCH SIGNAL CHECK

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	31 (L)	Ground	OP2 → OP3	5 → 0



OK or NG

OK >> 5th bow half-latch switch is OK.
NG >> GO TO 2.

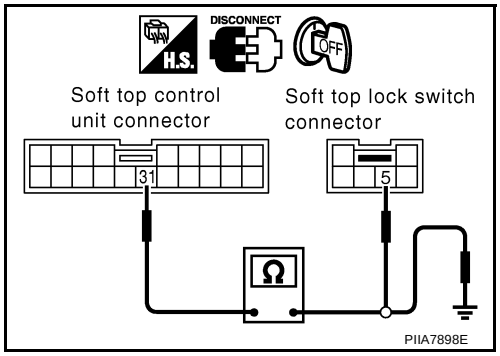
2. CHECK 5TH BOW HALF-LATCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top lock switch (at 5th bow lock assembly in storage lid) connector.
3. Check continuity between soft top control unit connector B67 terminal 31 and soft top lock switch connector T205 terminal 5.

   31 (L) - 5 (L) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 31 and ground.

   31 (L) - Ground : Continuity should not exist.



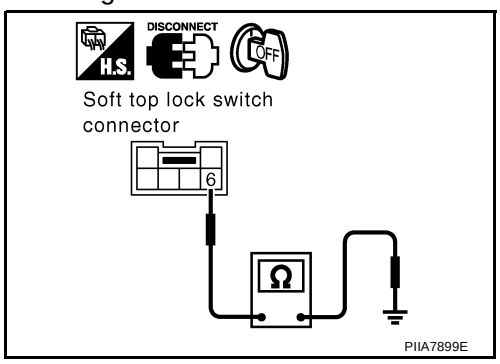
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK 5TH BOW HALF-LATCH SWITCH GROUND CIRCUIT

Check continuity between soft top lock switch connector T205 terminal 6 and ground.

6 (B) - Ground : Continuity should exist.



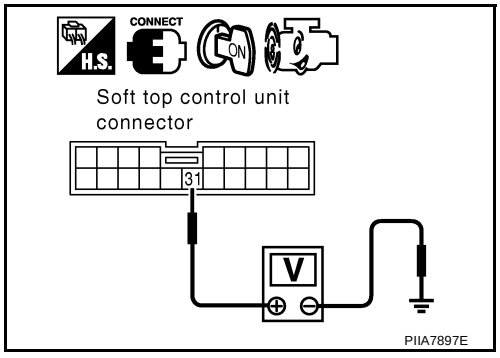
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 31 and ground.

   31 (L) - Ground : Approx. 5V



OK or NG

OK >> Replace 5th bow lock assembly in storage lid.
NG >> Replace soft top control unit.

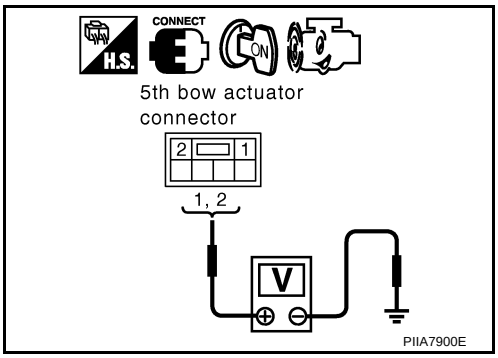
5th Bow Actuator Check (Open Operate)

AIS005ZH

1. CHECK 5TH BOW ACTUATOR INPUT SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between 5th bow actuator connector and ground.

Con-nector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B233	2 (G/R)	Ground	OP2 → OP3	0 → Battery voltage



OK or NG

OK >> Replace 5th bow actuator.
NG >> GO TO 2.

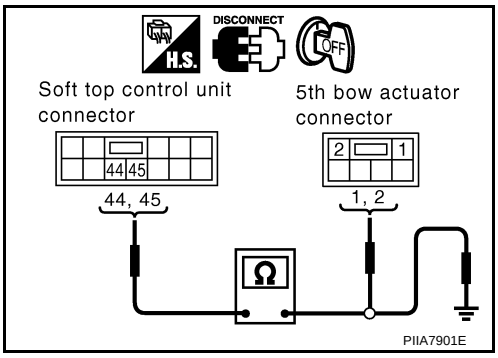
2. CHECK 5TH BOW ACTUATOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and 5th bow actuator connector.
3. Check continuity between soft top control unit connector B68 terminal 44, 45 and 5ht bow actuator connector B233 terminal 1, 2.

44 (G/R) - 1 (G/Y) : Continuity should exist.
45 (G/Y) - 2 (G/R) : Continuity should exist.

4. Check continuity between soft top control unit connector B68 terminal 44, 45 and ground.

44 (G/R) - Ground : Continuity should not exist.
45 (G/Y) - Ground : Continuity should not exist.



OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

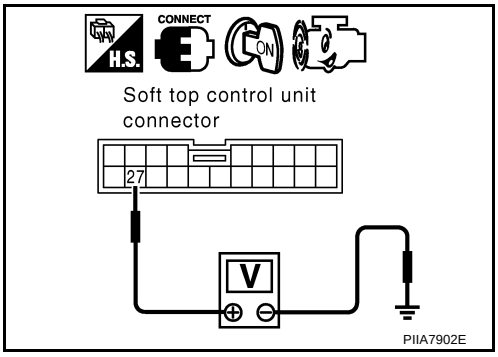
5th Bow Full Close Detection Switch Check (Open Operate)

AIS005ZI

1. CHECK 5TH BOW FULL CLOSE DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	27 (W/G)	Ground	OP3 → OP4	5 → 0



OK or NG

OK >> 5th bow full close switch is OK.
NG >> GO TO 2.

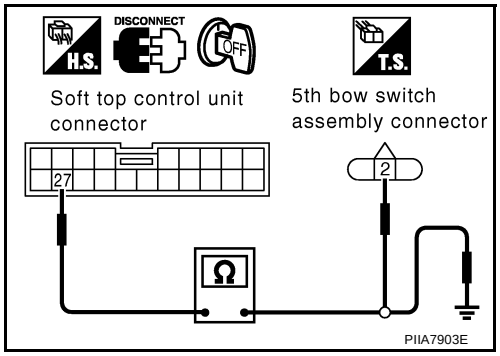
2. CHECK 5TH BOW FULL CLOSE DETECTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and 5th bow switch assembly (at plate rail RR) connector.
3. Check continuity between soft top control unit connector B67 terminal 27 and 5th bow switch assembly connector B214 terminal 2.

   27 (W/G) - 2 (W/G) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 27 and ground.

   27 (W/G) - Ground : Continuity should not exist.



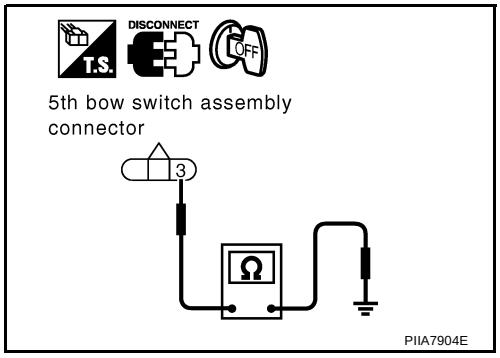
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK 5TH BOW FULL CLOSE DETECTION SWITCH GROUND CIRCUIT

Check continuity between 5th bow switch assembly connector B214 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.



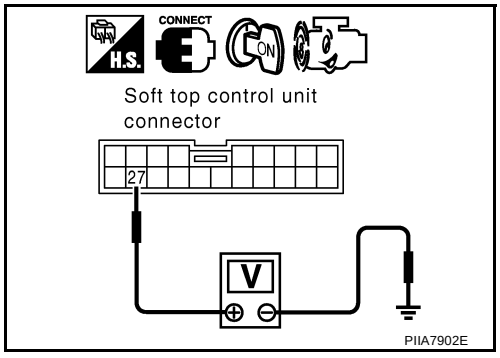
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTORL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 27 and ground.

   27 (W/G) - Ground : Approx. 5V



OK or NG

OK >> Replace plate rail RR.
NG >> Replace soft top control unit.

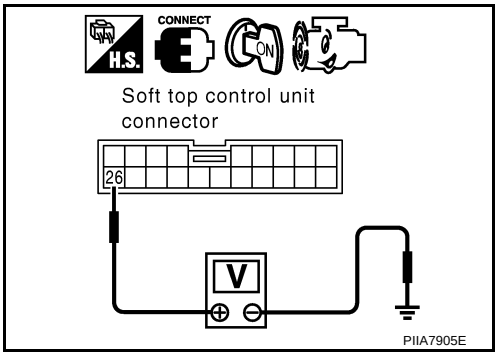
5th Bow Full Open Detection Switch Check (Open Operate)

AIS005ZJ

1. CHECK 5TH BOW FULL OPEN DETECTION SWTICH SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	26 (LG)	Ground	OP4 → OP5	5 → 0



OK or NG

OK >> 5th bow full open switch is OK.
NG >> GO TO 2.

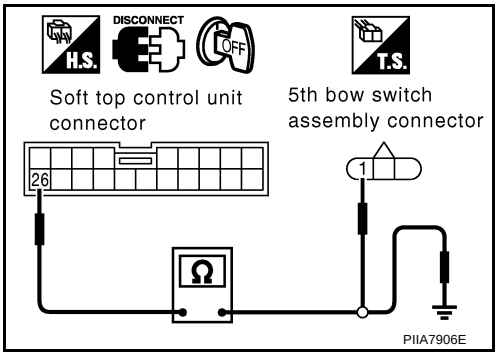
2. CHECK 5TH BOW FULL OPEN DETECTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and 5th bow switch assembly (at plate rail RR) connector.
3. Check continuity between soft top control unit connector B67 terminal 26 and 5th bow switch assembly connector B214 terminal 1.

26 (LG) - 1 (LG) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 26 and ground.

26 (LG) - Ground : Continuity should not exist.



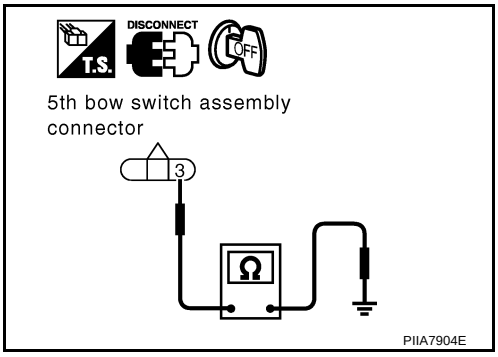
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK 5TH BOW FULL OPEN DETECTION SWITCH GROUND CIRCUIT

Check continuity between 5th bow switch assembly connector B214 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.



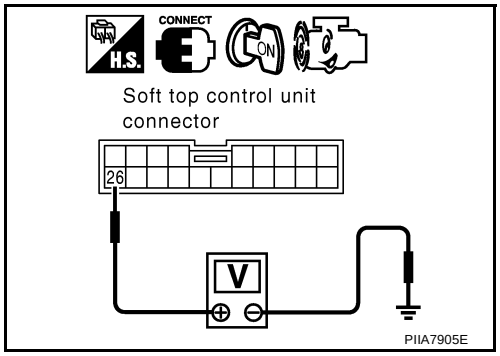
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTORL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 26 and ground.

26 (LG) - Ground : Approx. 5V



OK or NG

OK >> Replace plate rail RR.
NG >> Replace soft top control unit.

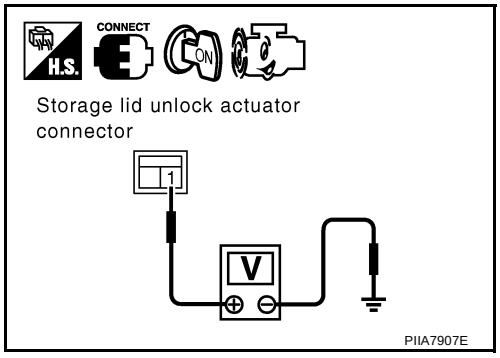
Storage Lid Unlock Actuator Check (Open Operate)

AIS005ZK

1. CHECK STORAGE LID UNLOCK ACTUATOR SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between storage lid unlock actuator (LH or RH) connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B65 (LH) B70 (RH)	1 (R)	Ground	OP5 → OP6	0 → Battery voltage → 0



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

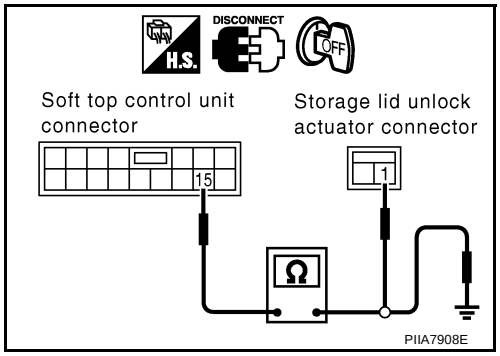
2. CHECK STORAGE LID UNLOCK ACTUATOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid unlock actuator connector.
3. Check continuity between soft top control unit connector B66 terminal 15 and storage lid unlock actuator connector B65 (LH), B70 (RH) terminal 1.

15 (OR) - 1 (R) : Continuity should exist.

4. Check continuity between soft top control unit connector B66 terminal 15 and ground.

15 (OR) - Ground : Continuity should not exist.



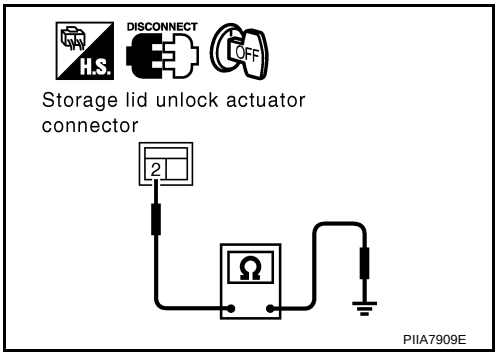
OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

3. CHECK STORAGE LID UNLOCK ACTUATOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect storage lid unlock actuator connector.
3. Check continuity between storage lid unlock actuator connector B65 (LH), B70 (RH) terminal 2 and ground.

2 (B) - Ground : Continuity should exist.



OK or NG

OK >> Replace malfunction storage lid unlock actuator (LH or RH).
NG >> Repair or replace harness.

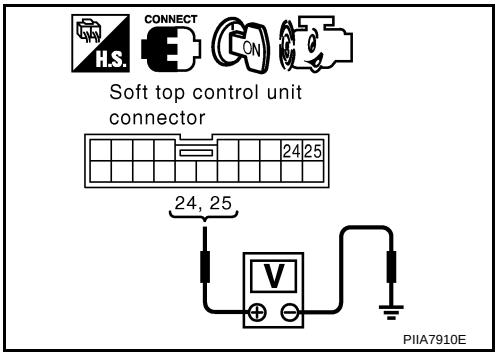
Storage Lid Full Close Detection Switch Check (Open Operate)

AIS005ZL

1. CHECK STORAGE LID FULL CLOSE DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	24 (G)	Ground	OP5	5 → 0
	25 (L/Y)		OP6	



OK or NG

OK >> Storage lid full close detection switch is OK.
NG >> GO TO 2.

2. CHECK STORAGE LID FULL CLOSE DETECTION SWITCH CIRCUIT

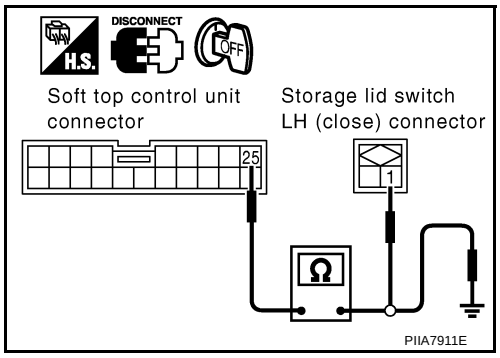
1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid switch (close) connector.
3. Check the following.

– Continuity between soft top control unit connector B67 terminal 25 and storage lid switch LH (close) connector B64 terminal 1.

25 (L/Y) - 1 (L/Y) : Continuity should exist.

– Continuity between soft top control unit connector B67 terminal 25 and ground.

25 (L/Y) - Ground : Continuity should not exist.



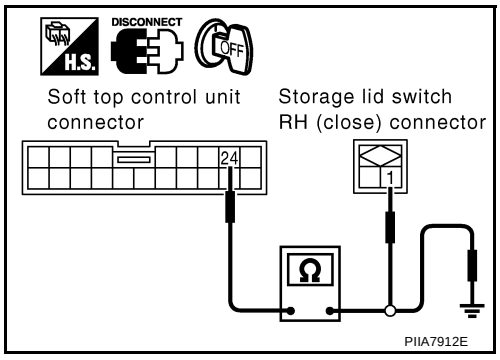
4. Check the following.

– Continuity between soft top control unit connector B67 terminal 24 and storage lid switch RH (close) connector B69 terminal 1.

24 (G) - 1 (G) : Continuity should exist.

– Continuity between soft top control unit connector B67 terminal 24 and ground.

24 (G) - Ground : Continuity should not exist.



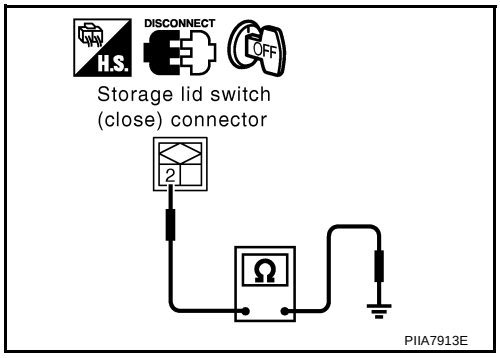
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK STORAGE LID FULL CLOSE DETECTION SWITCH GROUND CIRCUIT

Check continuity between storage lid switch (close) connector B64 (LH), B69 (RH) terminal 2 and ground.

2 (B) - Ground : Continuity should exist.



OK or NG

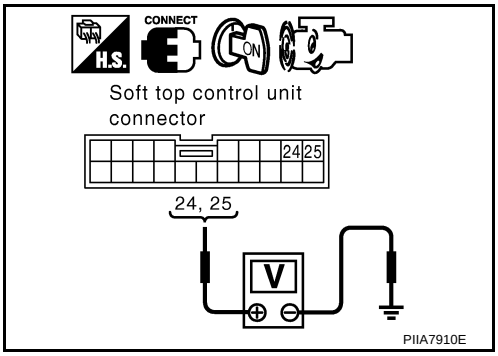
OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 24, 25 and ground.

24 (G) - Ground : Approx. 5V

25 (L/Y) - Ground : Approx. 5V



OK or NG

OK >> Replace malfunction storage lid full close detection switch (LH or RH).

NG >> Replace soft top control unit.

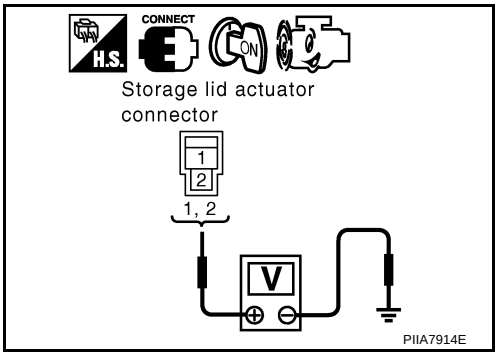
Storage Lid Actuator Check (Open Operate)

AIS005ZM

1. CHECK STORAGE LID ACTUATOR (OPEN) SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between storage lid actuator connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
T28 (LH)	2 (R/B)	Ground	OP6 → OP7	0 → Battery voltage → 0
T30 (RH)	1 (R/B)			



OK or NG

OK >> Replace storage lid actuator (LH or RH).

NG >> GO TO 2.

2. CHECK STORAGE LID ACTUATOR CIRCUIT

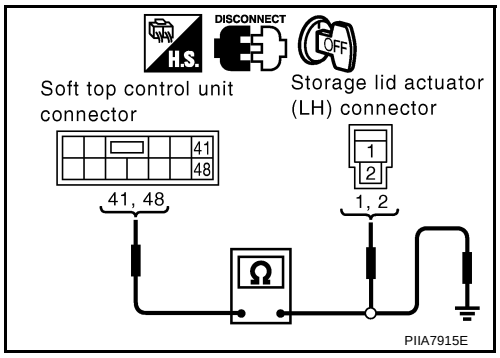
1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid actuator connector.
3. Check the following.

– Continuity between soft top control unit connector B68 terminal 41, 48 and storage lid actuator (LH) connector T28 terminal 1, 2.

41 (R/L) - 2 (R/B) : Continuity should exist.
48 (Y/B) - 1 (Y/B) : Continuity should exist.

– Continuity between soft top control unit connector B68 terminal 41, 48 and ground.

41 (R/L) - Ground : Continuity should not exist.
48 (Y/B) - Ground : Continuity should not exist.



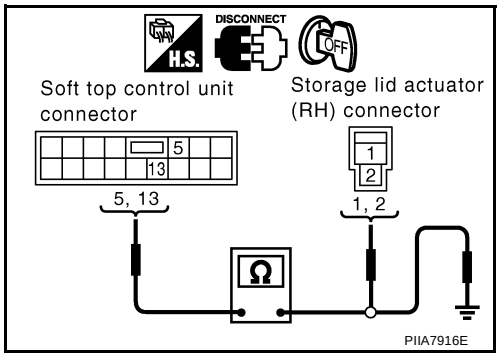
4. Check the following.

– Continuity between soft top control unit connector B66 terminal 5, 13 and storage lid actuator (RH) connector T30 terminal 1, 2.

5 (R/B) - 1 (R/B) : Continuity should exist.
13 (L/R) - 2 (L/R) : Continuity should exist.

– Continuity between soft top control unit connector B66 terminal 5, 13 and ground.

5 (R/B) - Ground : Continuity should not exist.
13 (L/R) - Ground : Continuity should not exist.



OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

Storage Lid Full Open Detection Switch Check (Open Operate)

AIS005ZN

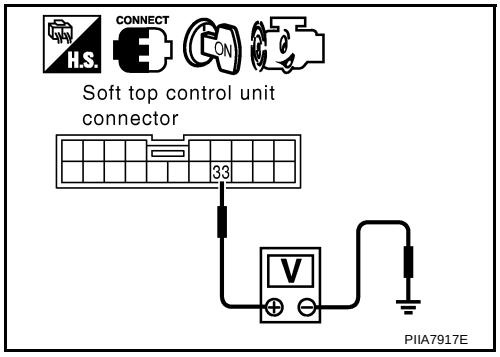
1. CHECK STORAGE LID FULL OPEN DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	33 (P)	Ground	OP6 → OP7	5 → 0

OK or NG

OK >> Storage lid full open detection switch is OK.
NG >> GO TO 2.



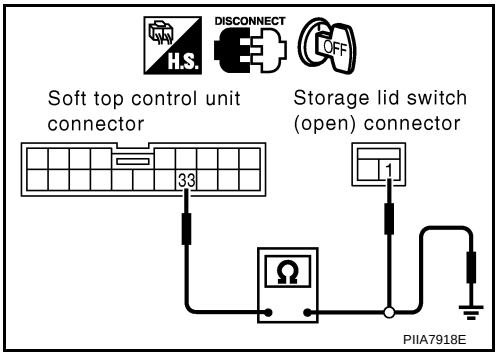
2. CHECK SOTORAGE LID FULL OPEN DETECTION SWTICH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid switch (open) connector.
3. Check continuity between soft top control unit connector B67 terminal 33 and storage lid switch (open) connector T27 terminal 1.

   33 (P) - 1 (P) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 33 and ground.

   33 (P) - Ground : Continuity should not exist.



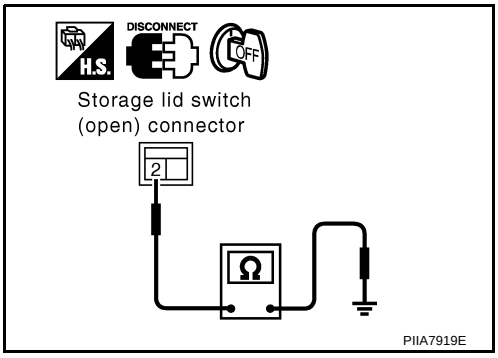
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK STORAGE LID FULL OPEN DETECTION SWITCH GROUND CIRCUIT

Check continuity between storage lid switch (open) connector T27 terminal 2 and ground.

2 (B) - Ground : Continuity should exist.



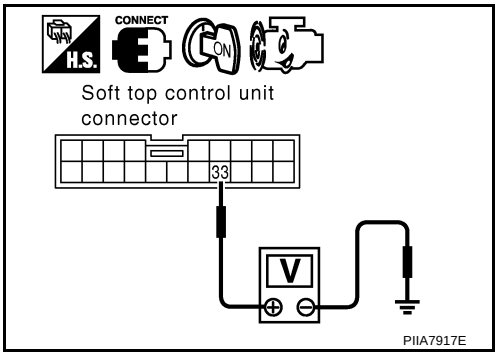
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 33 and ground.

   33 (P) - Ground : Approx. 5V



OK or NG

OK >> Replace storage lid switch (open).
NG >> Replace soft top control unit.

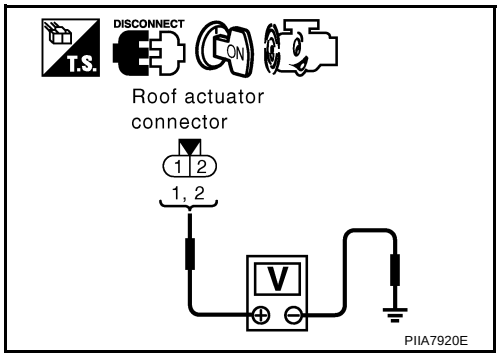
Roof Actuator Check (Open Operate)

AIS005ZO

1. CHECK ROOF ACTUATOR (OPEN) SIGNAL

1. Turn ignition switch OFF.
2. Disconnect roof actuator connector.
3. Start engine.
4. Operate soft top switch (OPEN), check voltage between roof actuator connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B59 (LH)	2 (R)	Ground	OP8 → OP11	0 → Battery voltage → 0
B72 (RH)	1 (R)			



OK or NG

OK >> Replace roof actuator (LH or RH).
NG >> GO TO 2.

2. CHECK ROOF ACTUATOR CIRCUIT

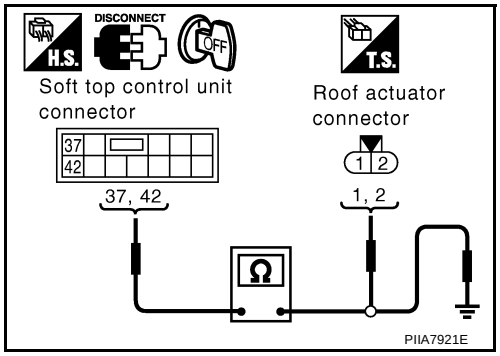
1. Turn ignition switch OFF.
2. Disconnect soft top control unit connector.
3. Check the following.

– Continuity between soft top control unit connector B68 terminal 37, 42 and roof actuator (LH) connector B59 terminal 1, 2.

37 (R) - 2 (R) : Continuity should exist.
42 (Y) - 1 (Y) : Continuity should exist.

– Continuity between soft top control unit connector B68 terminal 37, 42 and ground.

37 (R) - Ground : Continuity should not exist.
42 (Y) - Ground : Continuity should not exist.



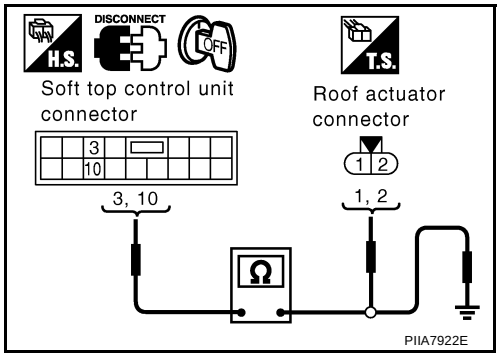
4. Check the following.

– Continuity between soft top control unit connector B66 terminal 3, 10 and roof actuator (RH) connector B72 terminal 1, 2.

3 (R) - 1 (R) : Continuity should exist.
10 (Y) - 2 (Y) : Continuity should exist.

– Continuity between soft top control unit connector B66 terminal 3, 10 and ground.

3 (R) - Ground : Continuity should not exist.
10 (Y) - Ground : Continuity should not exist.



OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

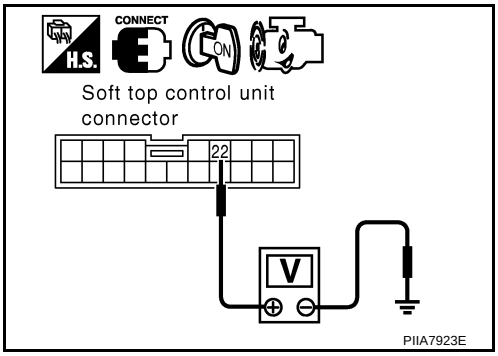
Roll Bar Interference Prevention Switch Check (Open Operate)

AIS005ZP

1. CHECK ROLL BAR INTERFERENCE PREVENTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	22 (W/R)	Ground	OP8 → OP9	5 → 0



OK or NG

OK >> Roll bar interference prevention switch is OK.
NG >> GO TO 2.

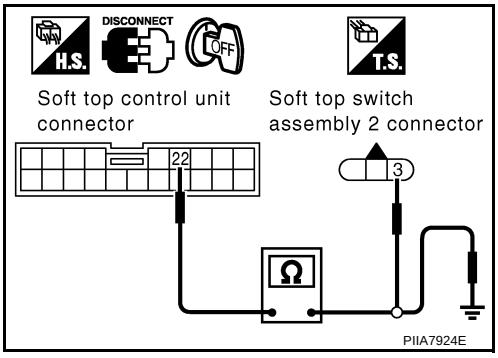
2. CHECK ROLL BAR INTERFERENCE PREVENTION SWTICH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top switch assembly 2 (roll bar interference prevention switch) connector.
3. Check continuity between soft top control unit connector B67 terminal 22 and soft top switch assembly 2 connector B213 terminal 3.

22 (W/R) - 3 (W/R) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 22 and ground.

22 (W/R) - Ground : Continuity should not exist.



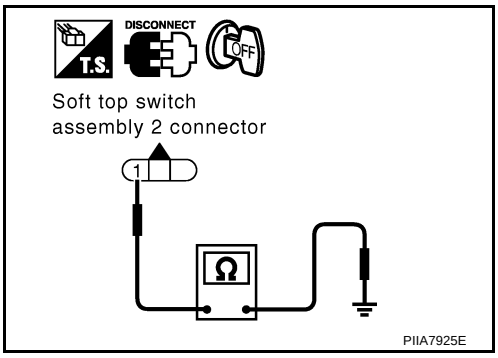
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK ROLL BAR INTERFERENCE PREVENTION SWTICH GROUND CIRCUIT

Check continuity between soft top switch assembly 2 connector B213 terminal 1 and ground.

1 (B) - Ground : Continuity should exist.



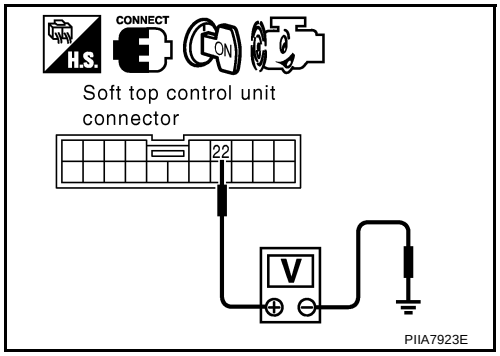
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 22 and ground.

22 (W/R) - Ground : Approx. 5V



OK or NG

OK >> Replace soft top switch assembly 2.
NG >> Replace soft top control unit.

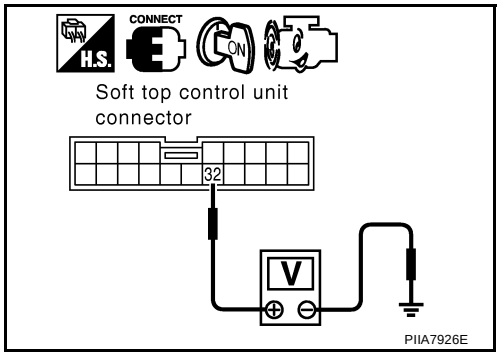
Body Interference Prevention Switch Check (Open Operate)

AIS005ZQ

1. CHECK BODY INTERFERENCE PREVENTION SWITCH

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	32 (W)	Ground	OP10	5 → 0



OK or NG

OK >> Body interference prevention switch is OK.
NG >> GO TO 2.

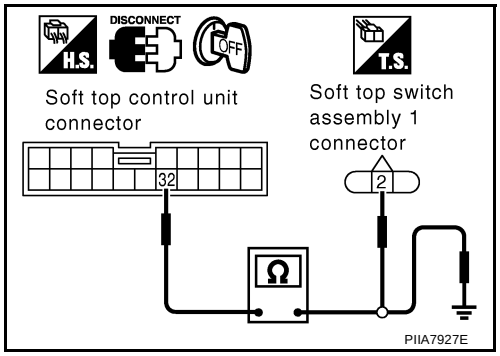
2. CHECK BODY INTERFERENCE PREVENTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top switch assembly 2 (body interference prevention switch) connector.
3. Check continuity between soft top control unit connector B67 terminal 32 and soft top switch assembly 1 connector B212 terminal 2.

32 (W) - 2 (W) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 32 and ground.

32 (W) - Ground : Continuity should not exist.



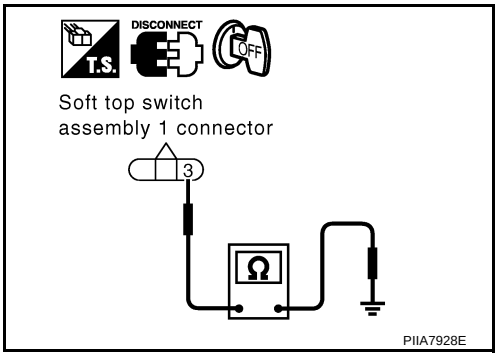
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK BODY INTERFERENCE PREVENTION SWITCH GROUND CIRCUIT

Check continuity between soft top switch assembly 1 connector B212 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.



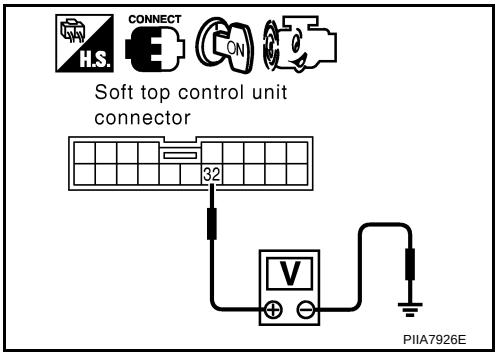
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 32 and ground.

32 (W) - Ground : Approx. 5V



OK or NG

OK >> Replace soft top switch assembly 1.
NG >> Replace soft top control unit.

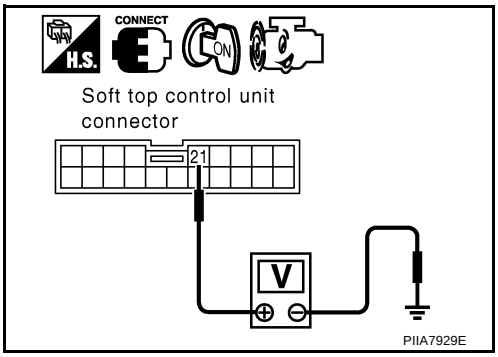
Roof Full Open Detection Switch Check (Open Operate)

AIS005ZR

1. CHECK ROOF FULL OPEN DETECTION SWTICH SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	21 (W/L)	Ground	OP10 → OP11	5 → 0



OK or NG

OK >> Roof full open detection switch is OK.
NG >> GO TO 2.

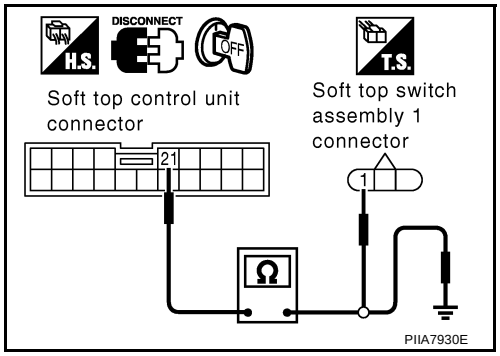
2. CHECK ROOF OPEN DETECTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top switch assembly 1 connector.
3. Check continuity between soft top control unit connector B67 terminal 21 and soft top switch assembly 1 connector B212 terminal 1.

   21 (W/L) - 1 (W/L) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 21 and ground.

   21 (W/L) - Ground : Continuity should not exist.



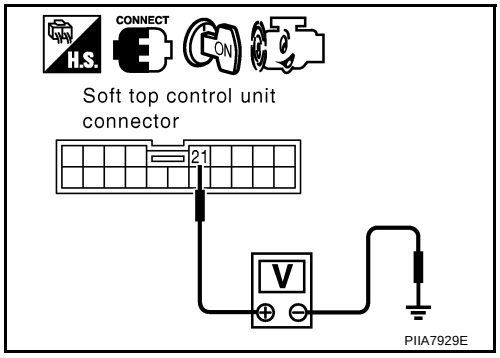
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 21 and ground.

   21 (W/L) - Ground : Approx. 5V



OK or NG

OK >> Replace soft top switch assembly 1.
>> Replace soft top control unit.

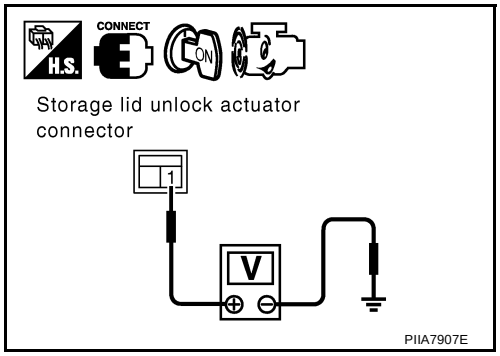
Storage Lid Unlock Actuator Check (Close Operate)

AIS005ZS

1. CHECK STORAGE LID UNLOCK ACTUATOR SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between storage lid unlock actuator connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B65 (LH) B70 (RH)	1 (R)	Ground	CL1 → CL2	0 → Battery voltage → 0



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

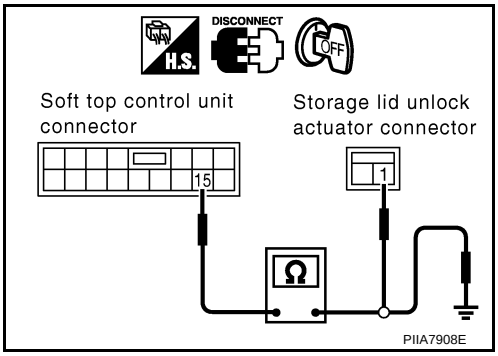
2. CHECK STORAGE LID UNLOCK ACTUATOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid unlock actuator connector.
3. Check continuity between soft top control unit connector B66 terminal 15 and storage lid unlock actuator connector B65 (LH), B70 (RH) terminal 1.

15 (OR) - 1 (R) : Continuity should exist.

4. Check continuity between soft top control unit connector B66 terminal 15 and ground.

15 (OR) - Ground : Continuity should not exist.



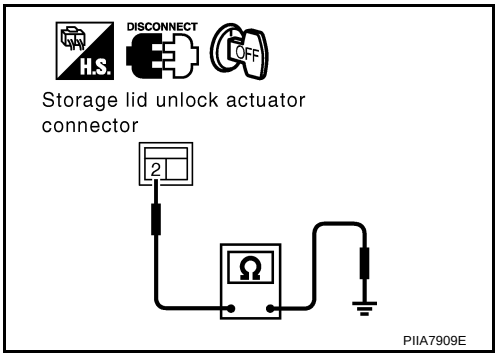
OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

3. CHECK STORAGE LID UNLOCK ACTUATOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect storage lid unlock actuator connector.
3. Check continuity between storage lid unlock actuator connector B65 (LH), B70 (RH) terminal 2 and ground.

2 (B) - Ground : Continuity should exist.



OK or NG

OK >> Replace malfunction storage lid unlock actuator (LH or RH).
NG >> Repair or replace harness.

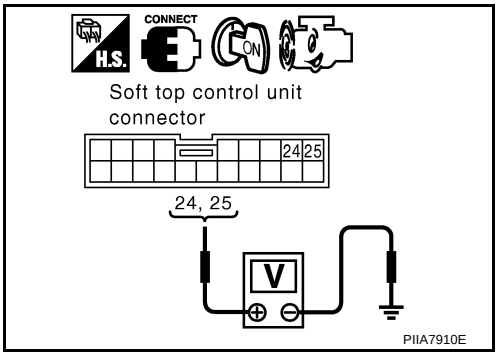
Storage Lid Full Close Detection Switch Check (Close Operate)

AIS005ZT

1. CHECK STORAGE LID FULL CLOSE DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	24 (G) for switch RH	Ground	CL1	5 → 0
	25 (L/Y) for switch LH		CL1 → CL2	



OK or NG

OK >> Storage lid full close detection switch is OK.
NG >> GO TO 2.

2. CHECK STORAGE LID FULL CLOSE DETECTION SWTICH CIRCUIT

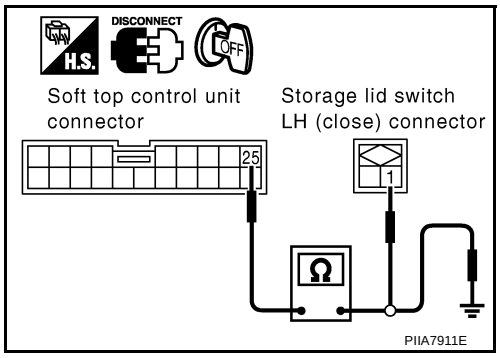
1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid switch (close) connector.
3. Check the following.

– Continuity between soft top control unit connector B67 terminal 25 and storage lid switch LH (close) connector B64 terminal 1.

25 (L/Y) - 1 (L/Y) : Continuity should exist.

– Continuity between soft top control unit connector B67 terminal 25 and ground.

25 (L/Y) - Ground : Continuity should not exist.



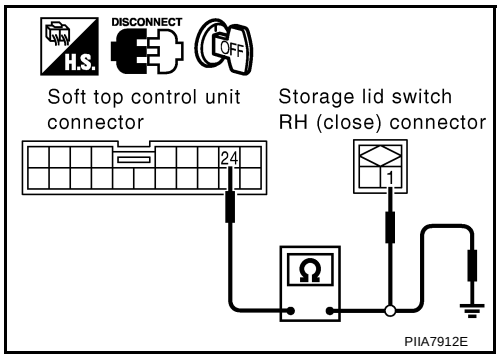
4. Check the following.

– Continuity between soft top control unit connector B67 terminal 24 and storage lid switch RH (close) connector B69 terminal 1.

24 (G) - 1 (G) : Continuity should exist.

– Continuity between soft top control unit connector B67 terminal 24 and ground.

24 (G) - Ground : Continuity should not exist.



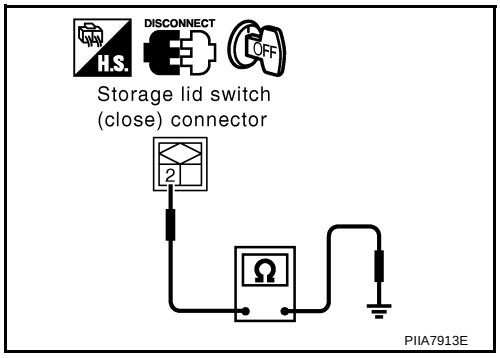
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK STORAGE LID FULL CLOSE DETECTION SWITCH GROUND CIRCUIT

Check continuity between storage lid switch (close) connector B64 (LH), B69 (RH) terminal 2 and ground.

2 (B) - Ground : Continuity should exist.



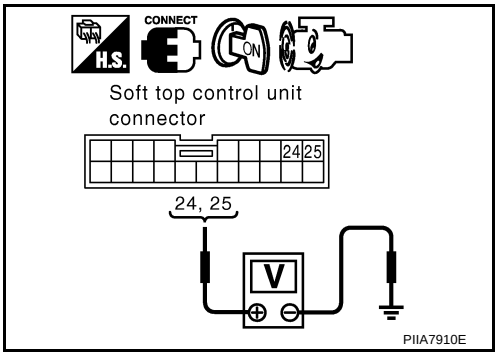
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP ROOF CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 24, 25 and ground.

24 (G) - Ground : Approx. 5V
25 (L/Y) - Ground : Approx. 5V



OK or NG

OK >> Replace storage lid full close detection switch RH or LH.
NG >> Replace soft top control unit.

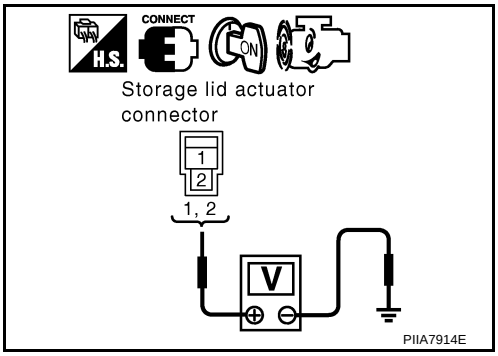
Storage Lid Actuator Check (Close Operate)

AIS005ZU

1. CHECK STORAGE LID ACTUATOR (CLOSE) SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between storage lid actuator connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
T28 (LH)	1 (Y/B)	Ground	CL2 → CL3	0 → Battery voltage → 0
T30 (RH)	2 (L/R)			



OK or NG

OK >> Replace storage lid actuator (LH or RH).
NG >> GO TO 2.

2. CHECK STORAGE LID ACTUATOR CIRCUIT

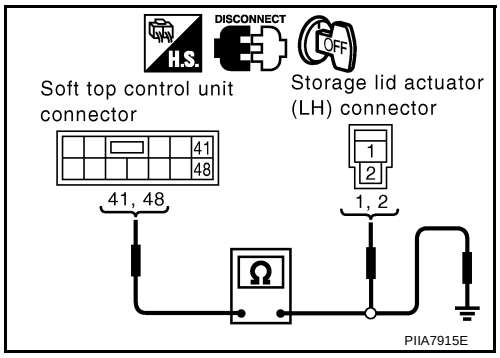
1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid actuator connector.
3. Check the following.

– Continuity between soft top control unit connector B68 terminal 41, 48 and storage lid actuator (LH) connector T28 terminal 1, 2.

41 (R/L) - 2 (R/B) : Continuity should exist.
48 (Y/B) - 1 (Y/B) : Continuity should exist.

– Continuity between soft top control unit connector B68 terminal 41, 48 and ground.

41 (R/L) - Ground : Continuity should not exist.
48 (Y/B) - Ground : Continuity should not exist.



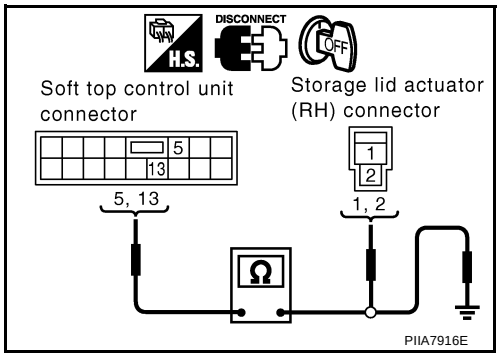
4. Check the following.

– Continuity between soft top control unit connector B66 terminal 5, 13 and storage lid actuator (RH) connector T30 terminal 1, 2.

5 (R/B) - 1 (R/B) : Continuity should exist.
13 (L/R) - 2 (L/R) : Continuity should exist.

– Continuity between soft top control unit connector B66 terminal 5, 13 and ground.

5 (R/B) - Ground : Continuity should not exist.
13 (L/R) - Ground : Continuity should not exist.



OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

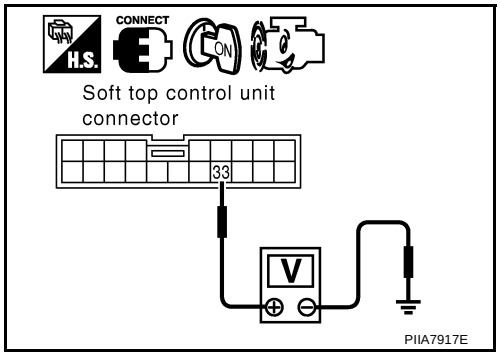
Storage Lid Full Open Detection Switch Check (Close Operate)

AIS005ZV

1. CHECK STORAGE LID FULL OPEN DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	33 (P)	Ground	CL2 → CL3	5 → 0



OK or NG

OK >> Storage lid full open detection switch is OK.
NG >> GO TO 2.

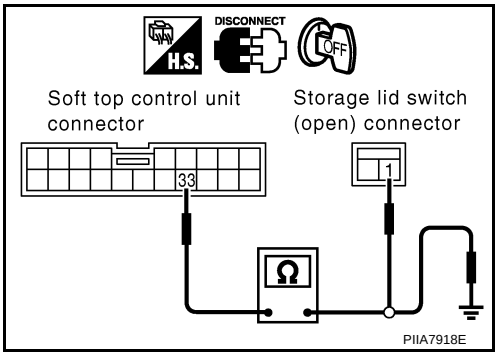
2. CHECK SOTORAGE LID FULL OPEN DETECTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid switch (open) connector.
3. Check continuity between soft top control unit connector B67 terminal 33 and storage lid switch (open) connector T27 terminal 1.

33 (P) - 1 (P) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 33 and ground.

33 (P) - Ground : Continuity should not exist.



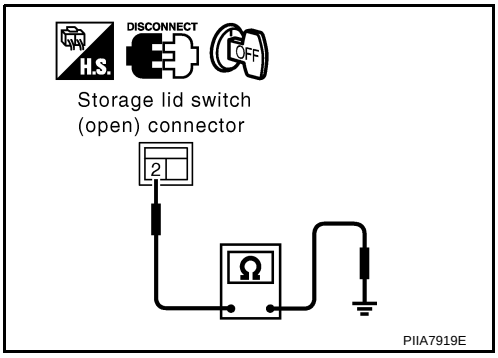
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK STORAGE LID FULL OPEN DETECTION SWITCH GROUND CIRCUIT

Check continuity between storage lid switch (open) connector T27 terminal 2 and ground.

2 (B) - Ground : Continuity should exist.



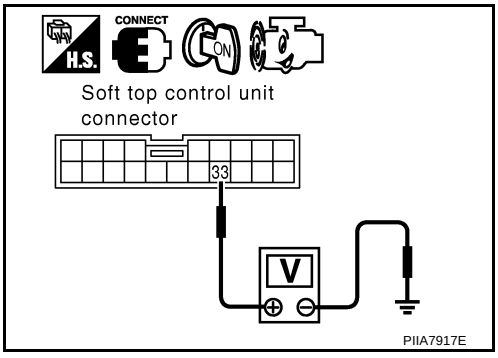
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 33 and ground.

33 (P) - Ground : Approx. 5V



OK or NG

OK >> Replace storage lid switch (open).
NG >> Replace soft top control unit.

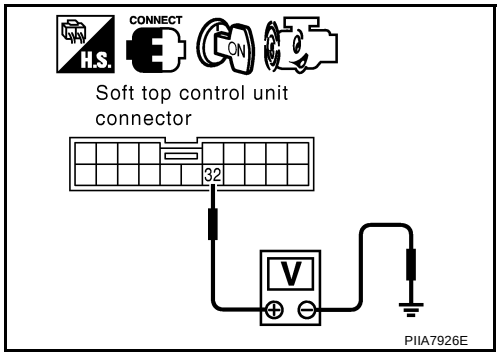
Body Interference Prevention Switch Check (Close Operate)

AIS005ZW

1. CHECK BODY INTERFERENCE PREVENTION SWITCH

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	32 (W)	Ground	CL3	0 → 5



OK or NG

OK >> Body interference prevention switch is OK.
NG >> GO TO 2.

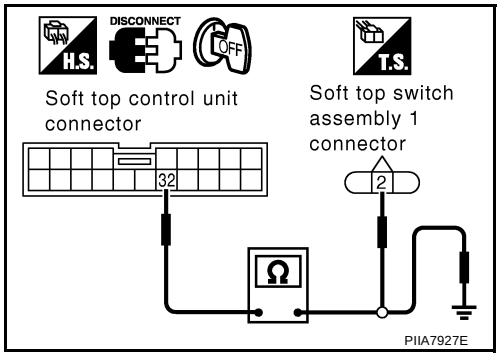
2. CHECK BODY INTERFERENCE PREVENTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top switch assembly 1 (body interference prevention switch) connector.
3. Check continuity between soft top control unit connector B67 terminal 32 and soft top switch assembly 1 connector B212 terminal 2.

32 (W) - 2 (W) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 32 and ground.

32 (W) - Ground : Continuity should not exist.



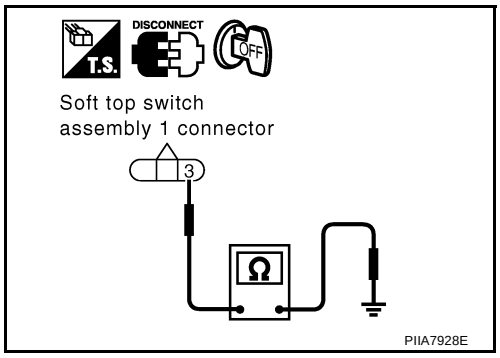
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK BODY INTERFERENCE PREVENTION SWITCH GROUND CIRCUIT

Check continuity between soft top switch assembly 1 connector B212 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.



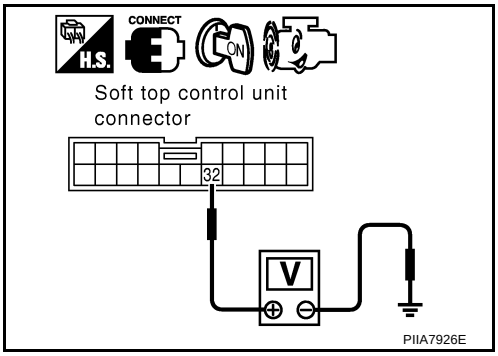
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 32 and ground.

32 (W) - Ground : Approx. 5V



OK or NG

OK >> Replace soft top switch assembly 1.
NG >> Replace soft top control unit.

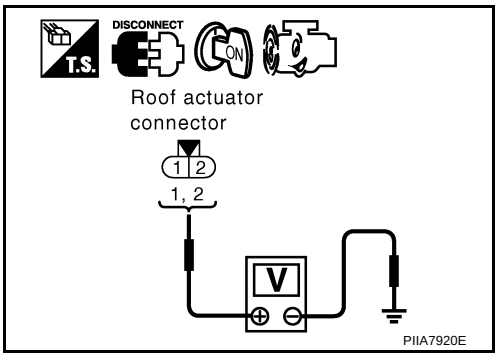
Roof Actuator Check (Close Operate)

AIS005ZX

1. CHECK ROOF ACTUATOR (CLOSE) SIGNAL

1. Turn ignition switch OFF.
2. Disconnect roof actuator connector.
3. Start engine.
4. Operate soft top switch (CLOSE), check voltage between roof actuator connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B59 (LH)	1 (Y)	Ground	CL3 → CL6	0 → Battery voltage → 0
B72 (RH)	2 (Y)			



OK or NG

OK >> Replace roof actuator (LH or RH).
NG >> GO TO 2.

2. CHECK ROOF ACTUATOR CIRCUIT

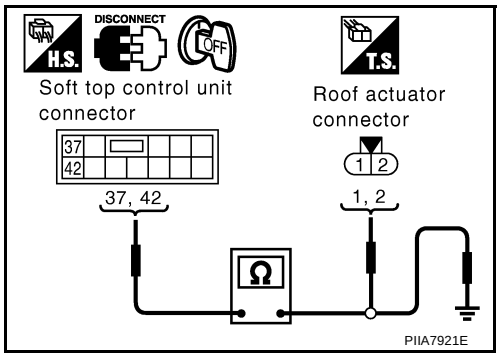
1. Turn ignition switch OFF.
2. Disconnect soft top control unit connector.
3. Check the following.

– Continuity between soft top control unit connector B68 terminal 37, 42 and roof actuator (LH) connector B59 terminal 1, 2.

37 (R) - 2 (R) : Continuity should exist.
42 (Y) - 1 (Y) : Continuity should exist.

– Continuity between soft top control unit connector B68 terminal 37, 42 and ground.

37 (R) - Ground : Continuity should not exist.
42 (Y) - Ground : Continuity should not exist.



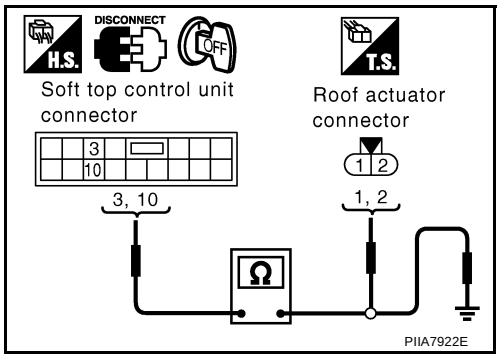
4. Check the following.

– Continuity between soft top control unit connector B66 terminal 3, 10 and roof actuator (RH) connector B72 terminal 1, 2.

3 (R) - 1 (R) : Continuity should exist.
10 (Y) - 2 (Y) : Continuity should exist.

– Continuity between soft top control unit connector B66 terminal 3, 10 and ground.

3 (R) - Ground : Continuity should not exist.
10 (Y) - Ground : Continuity should not exist.



OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

Roof Full Close Detection Switch Check

AIS005ZY

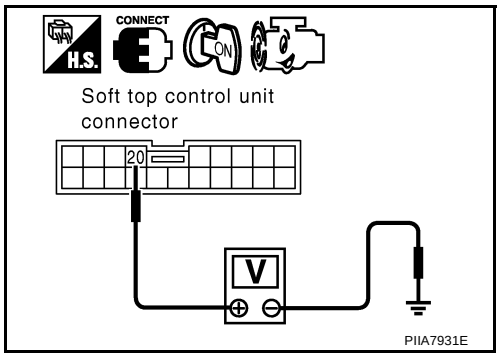
1. CHECK ROOF FULL CLOSE DETECTION SWTICH SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	20 (W/B)	Ground	CL5 → CL6	0 → 5

OK or NG

OK >> Roof full close detection switch is OK.
NG >> GO TO 2.



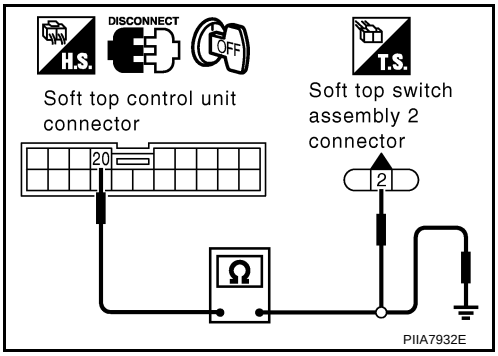
2. CHECK ROOF FULL CLOSE DETECTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top switch assembly 2 (roof full close detection switch) connector.
3. Check continuity between soft top control unit connector B67 terminal 20 and soft top switch assembly 2 connector B213 terminal 2.

20 (W/B) - 2 (W/G) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 20 and ground.

20 (W/B) - Ground : Continuity should not exist.



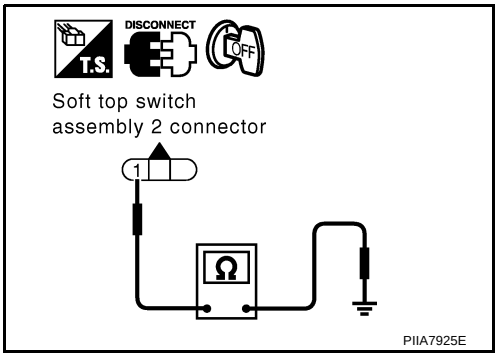
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK ROOF FULL CLOSE DETECTION SWITCH GROUND CIRCUIT

Check continuity between soft top switch assembly 2 connector B213 terminal 1 and ground.

1 (B) - Ground : Continuity should exist.



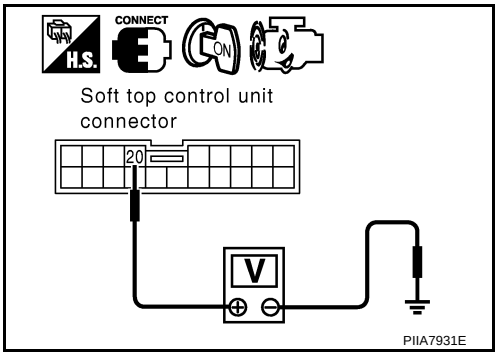
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 20 and ground.

20 (W/B) - Ground : Approx. 5V



OK or NG

OK >> Replace soft top switch assembly 2.
NG >> Replace soft top control unit.

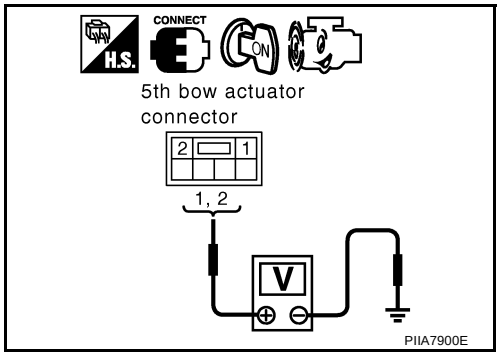
5th Bow Actuator Check (Close Operate)

AIS005ZZ

1. CHECK 5TH BOW ACTUATOR INPUT SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between 5th bow actuator connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B233	1 (G/Y)	Ground	CL4 → CL5	0 → Battery voltage → 0



OK or NG

OK >> Replace 5th bow actuator.
NG >> GO TO 2.

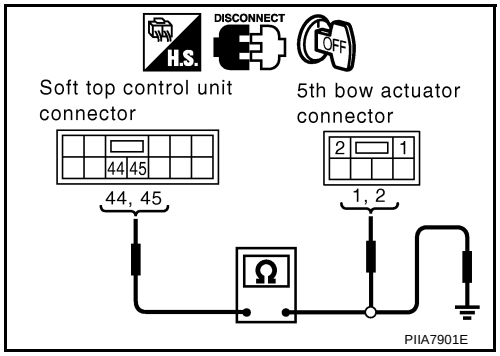
2. CHECK 5TH BOW ACTUATOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and 5th bow actuator connector.
3. Check continuity between soft top control unit connector B68 terminal 44, 45 and 5ht bow actuator connector B233 terminal 1, 2.

44 (G/R) - 1 (G/Y) : Continuity should exist.
45 (G/Y) - 2 (G/R) : Continuity should exist.

4. Check continuity between soft top control unit connector B68 terminal 44, 45 and ground.

44 (G/R) - Ground : Continuity should not exist.
45 (G/Y) - Ground : Continuity should not exist.



OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

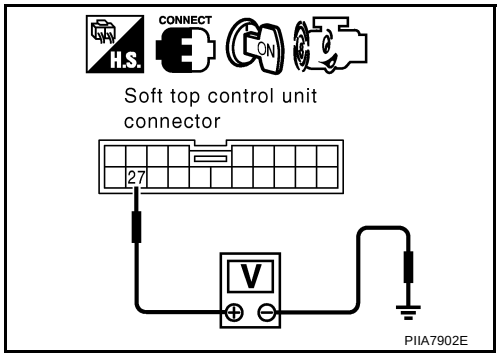
5th Bow Full Close Detection Switch Check (Close Operate)

AIS00600

1. CHECK 5TH BOW FULL CLOSE DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	27 (W/G)	Ground	CL5 → CL6	0 → 5 → 0



OK or NG

OK >> 5th bow full close switch is OK.
NG >> GO TO 2.

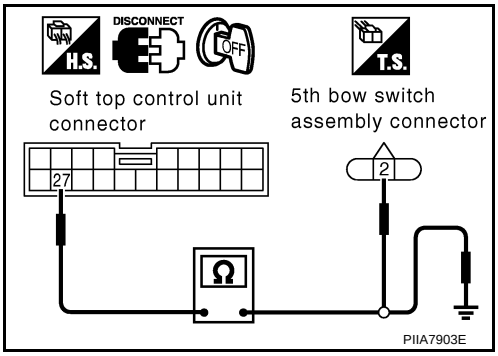
2. CHECK 5TH BOW FULL CLOSE DETECTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and 5th bow switch assembly (at plate rail RR) connector.
3. Check continuity between soft top control unit connector B67 terminal 27 and 5th bow switch assembly connector B214 terminal 2.

27 (W/G) - 2 (W/G) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 27 and ground.

27 (W/G) - Ground : Continuity should not exist.



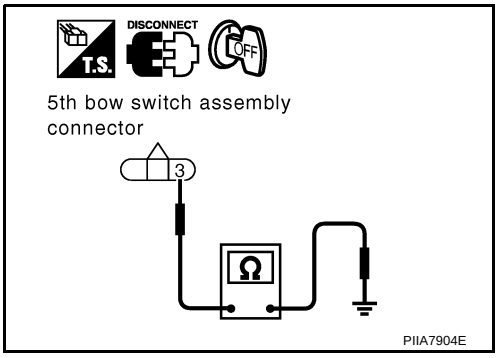
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK 5TH BOW FULL CLOSE DETECTION SWITCH GROUND CIRCUIT

Check continuity between 5th bow switch assembly connector B214 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.



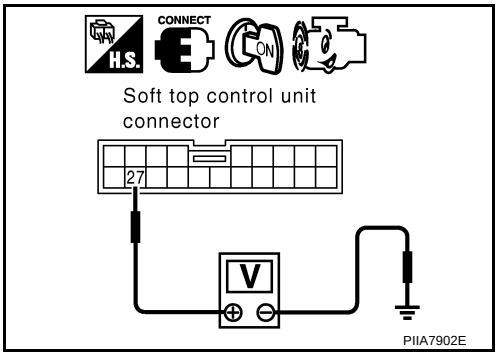
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTORL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 27 and ground.

27 (W/G) - Ground : Approx. 5V



OK or NG

OK >> Replace plate rail RR.
NG >> Replace soft top control unit.

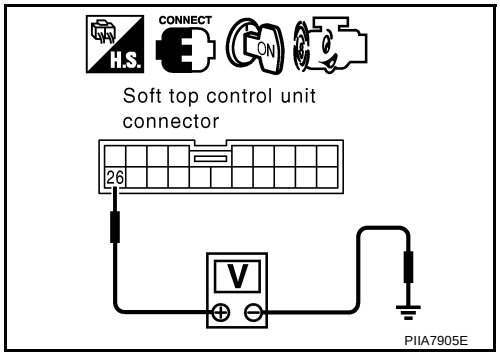
5th Bow Full Open Detection Switch Check (Close Operate)

AIS00601

1. CHECK 5TH BOW FULL OPEN DETECTION SWTICH SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	26 (LG)	Ground	CL6 → CL7	5 → 0



OK or NG

OK >> 5th bow full open switch is OK.
NG >> GO TO 2.

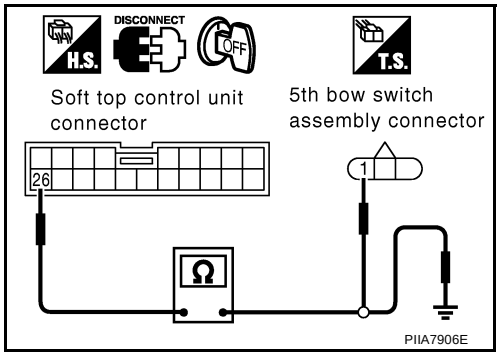
2. CHECK 5TH BOW FULL OPEN DETECTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and 5th bow switch assembly connector.
3. Check continuity between soft top control unit connector B67 terminal 26 and 5th bow switch assembly connector B214 terminal 1.

26 (LG) - 1 (LG) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 26 and ground.

26 (LG) - Ground : Continuity should not exist.



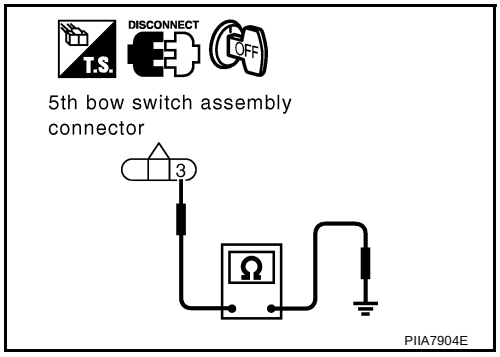
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK 5TH BOW FULL OPEN DETECTION SWITCH GROUND CIRCUIT

Check continuity between 5th bow switch assembly connector B214 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.



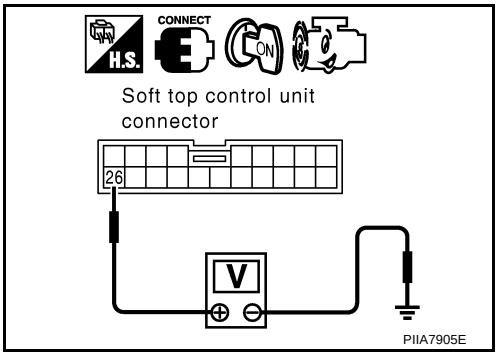
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTORL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 26 and ground.

26 (LG) - Ground : Approx. 5V



OK or NG

OK >> Replace plate rail RR.
NG >> Replace soft top control unit.

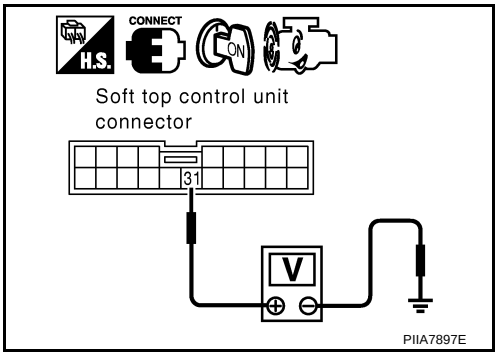
5th Bow Half-Latch Switch Check (Close Operate)

AIS00602

1. CHECK 5TH BOW HALF-LATCH SWITCH SIGNAL CHECK

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	31 (L)	Ground	CL9 → CL10	0 → 5



OK or NG

OK >> 5th bow half-latch switch is OK.
NG >> GO TO 2.

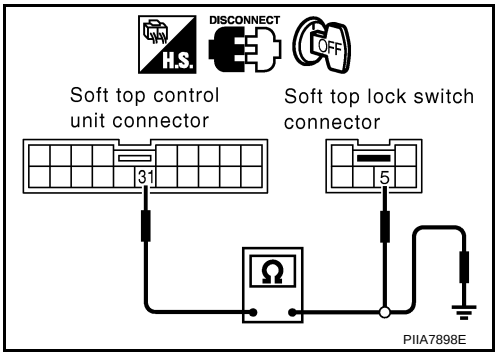
2. CHECK 5TH BOW HALF-LATCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top lock switch (at 5th bow lock assembly in storage lid) connector.
3. Check continuity between soft top control unit connector B67 terminal 31 and soft top lock switch connector T205 terminal 5.

31 (L) - 5 (L) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 31 and ground.

31 (L) - Ground : Continuity should not exist.



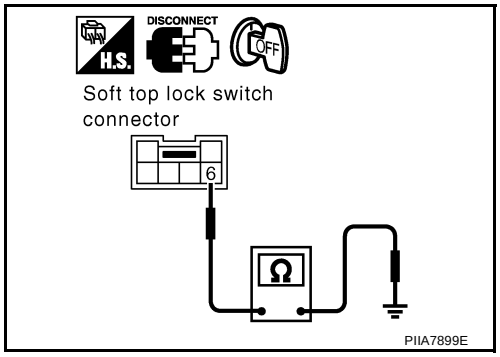
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK 5TH BOW HALF-LATCH SWITCH GROUND CIRCUIT

Check continuity between soft top lock switch connector T205 terminal 6 and ground.

6 (B) - Ground : Continuity should exist.



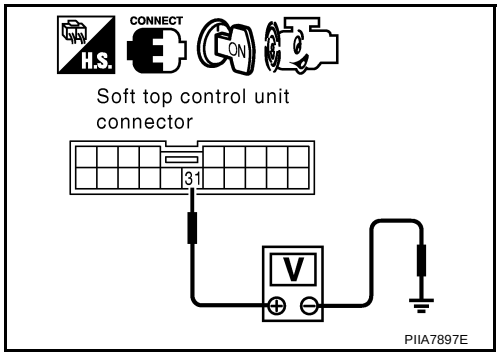
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 31 and ground.

31 (L) - Ground : Approx. 5V



OK or NG

OK >> Replace 5th bow lock assembly in storage lid.
NG >> Replace soft top control unit.

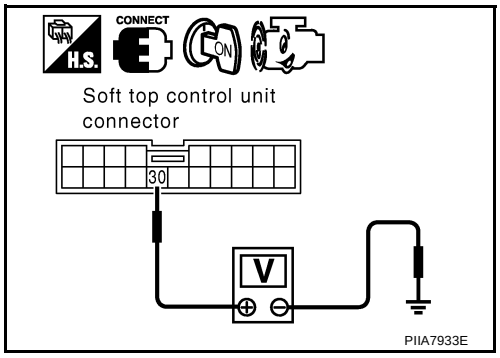
5th Bow Full-Latch Switch Check

AIS00603

1. CHECK 5TH BOW FULL-LATCH SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	30 (Y/R)	Ground	CL10	0 → 5



OK or NG

OK >> 5th bow full-latch switch is OK.
NG >> GO TO 2.

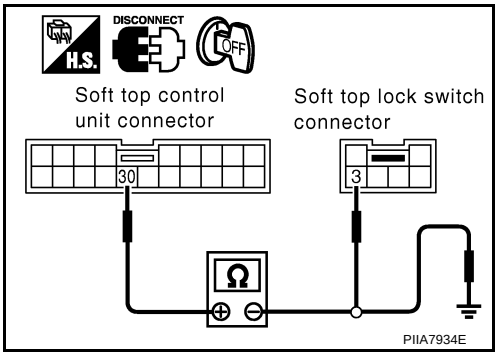
2. CHECK 5TH BOW FULL-LATCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top lock switch (at 5th bow lock assembly in storage lid) connector.
3. Check continuity between soft top control unit connector B67 terminal 30 and soft top lock switch connector T205 terminal 3.

30 (Y/R) - 3 (Y) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 30 and ground.

30 (Y/R) - Ground : Continuity should not exist.



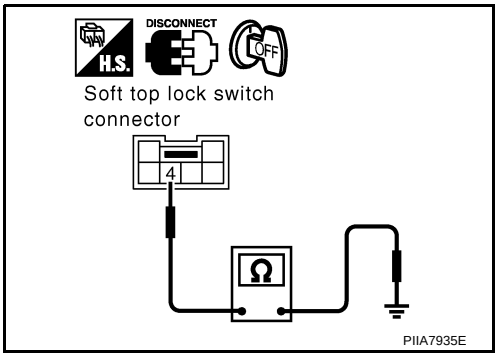
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK 5TH BOW HALF-LATCH SWITCH GROUND CIRCUIT

Check continuity between soft top lock switch connector T205 terminal 4 and ground.

4 (B) - Ground : Continuity should exist.



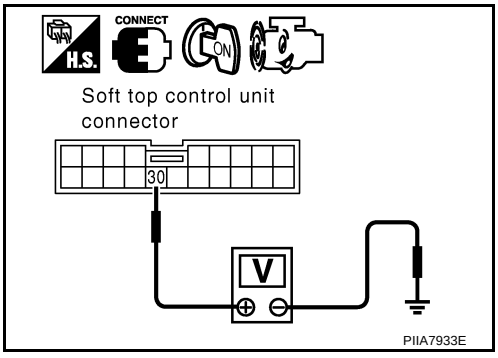
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 30 and ground.

30 (Y/R) - Ground : Approx. 5V



OK or NG

OK >> Replace 5th bow assembly in storage lid.
NG >> Replace soft top control unit.

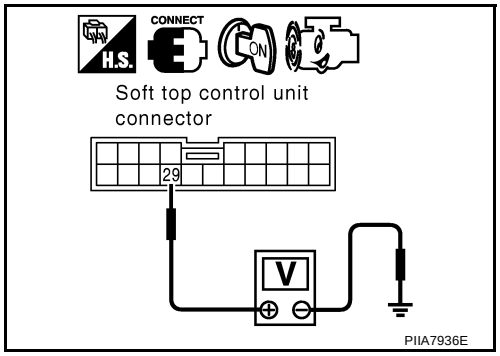
5th Bow Ending Switch Check

AIS00604

1. CHECK 5TH BOW ENDING SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	29 (R/Y)	Ground	CL10	0 → 5



OK or NG

OK >> 5th bow ending switch is OK.
NG >> GO TO 2.

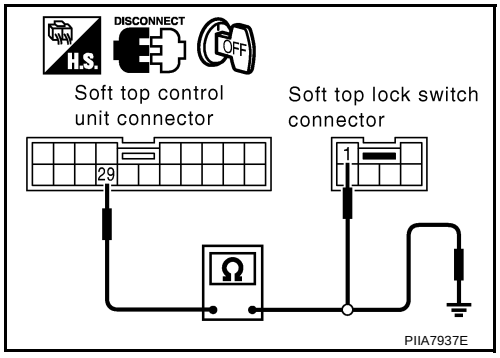
2. CHECK 5TH BOW ENDING CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top lock switch (at 5th bow lock assembly in storage lid) connector.
3. Check continuity between soft top control unit connector B67 terminal 29 and soft top lock switch connector T205 terminal 1.

29 (R/Y) - 1 (R) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 29 and ground.

29 (R/Y) - Ground : Continuity should not exist.



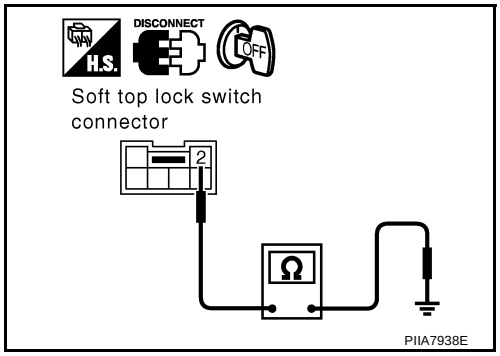
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK 5TH BOW ENDING SWITCH GROUND CIRCUIT

Check continuity between soft top lock switch connector T205 terminal 2 and ground.

2 (B) - Ground : Continuity should exist.



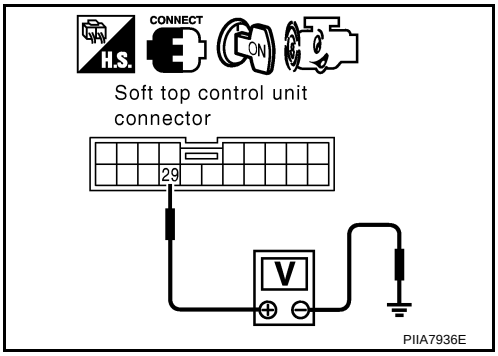
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 29 and ground.

29 (R/Y) - Ground : Approx. 5V



OK or NG

OK >> Replace 5th bow lock assembly in storage lid.
NG >> Replace soft top control unit.

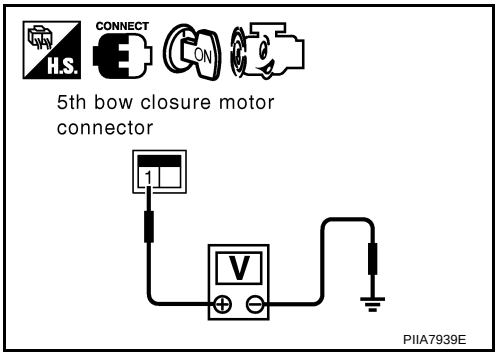
5th Bow Closure Motor Check

AIS00605

1. 5TH BOW CLOSURE MOTOR INPUT SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between 5th bow closure motor connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
T204	1 (W)	Ground	CL9 → CL10	0 → Battery voltage → 0



OK or NG

OK >> Replace 5th bow closure motor.
NG >> GO TO 2.

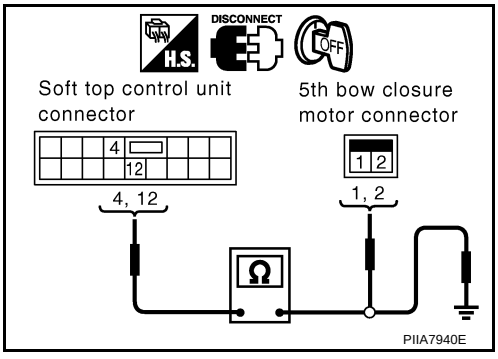
2. CHECK 5TH BOW CLOSURE MOTOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and 5th bow closure motor connector.
3. Check continuity between soft top control unit connector B66 terminal 4, 12 and 5th bow closure motor connector T204 terminal 1, 2.

4 (G/W) - 1 (W) : Continuity should exist.
12 (G/Y) - 2 (G) : Continuity should exist.

4. Check continuity between soft top control unit connector B66 terminal 4, 12 and ground.

4 (G/W) - Ground : Continuity should not exist.
12 (G/Y) - Ground : Continuity should not exist.



OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

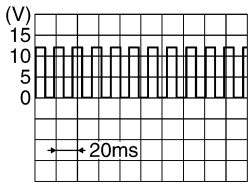
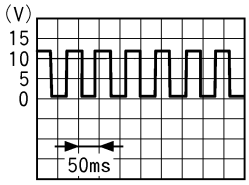
Operation Permission Condition Check

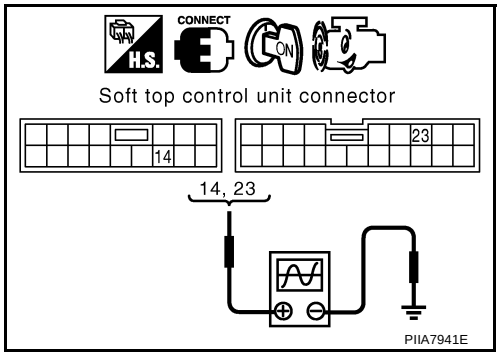
AIS00606

First perform the “SELF-DIAG RESULT” in “BCM” with CONSULT-II, then perform the each trouble diagnosis of malfunction system indicated “SELF-DIAG RESULT” of “BCM”. Refer to BCS-14, "CONSULT-II" .

1. CHECK VEHICLE SPEED SIGNAL

1. Start engine.
2. Check the signal between soft top control unit connector and ground.

Connector	Terminal (Wire color) (+)	Terminal (Wire color) (-)	Condition	Signal (Reference value.)
B66	14 (W)	Ground	Speedometer operated [When vehicle speed is Approx. 40km/h (25MPH)]	 PKIA1935E
B67	23 (W/G)			 PIIB0078J



PIIA7941E

OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. CHECK VEHICLE SPEED SIGNAL CIRCUIT

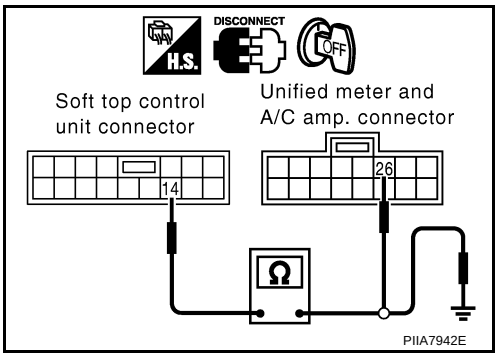
1. Turn ignition switch OFF.
2. Disconnect soft top control unit and unified meter and A/C amp connector.
3. Check the following.

- Continuity between soft top control unit connector B66 terminal 14 and unified meter and A/C amp connector M49 terminal 26.

14 (W) - 26 (W) : Continuity should exist.

- Continuity between soft top control unit connector B66 terminal 14 and ground.

14 (W) - Ground : Continuity should not exist.



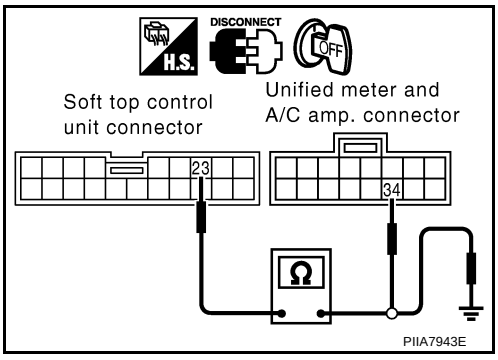
4. Check the following.

- Continuity between soft top control unit connector B67 terminal 23 and unified meter and A/C amp connector M49 terminal 34.

23 (W/G) - 34 (W/G) : Continuity should exist.

- Continuity between soft top control unit connector B67 terminal 23 and ground.

23 (W/G) - Ground : Continuity should not exist.



OK or NG

OK >> Check unified meter and A/C amp. Refer to DI-54, "System Description" .

NG >> Repair or replace harness.

3. CHECK FUSE

- Check 10A fuse [No.20, located in fuse block (J/B)].

NOTE:
Refer to RF-11, "Component Parts and Harness Connector Location" .

OK or NG

OK >> GO TO 4.

NG >> If fuse blown out, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

4. CHECK BRAKE PEDAL SIGNAL

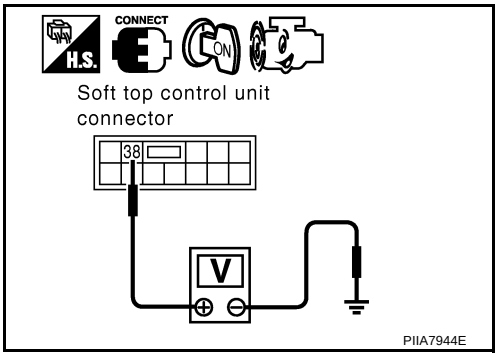
Check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Brake pedal condition	Voltage (V) (Approx.)
	(+)	(-)		
B68	38 (P/L)	Ground	Depressed	Battery voltage
			Released	0

OK or NG

OK >> Operation permission condition is OK.

NG >> GO TO 5.



5. CHECK BRAKE PEDAL SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and stop lamp switch connector.
3. Check the following.

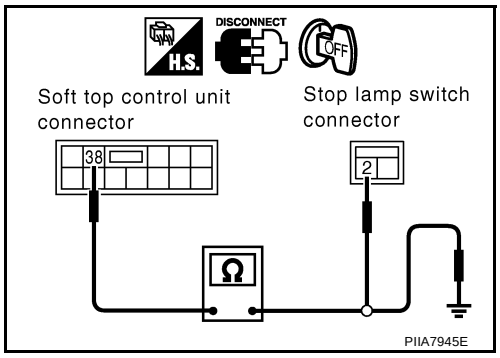
(M/T Models)

- Continuity between soft top control unit connector B68 terminal 38 and stop lamp switch connector E112 terminal 2.

  38 (P/L) - 2 (P/L) : Continuity should exist.

- Continuity between soft top control unit connector B68 terminal 38 and ground.

  38 (P/L) - Ground : Continuity should not exist.



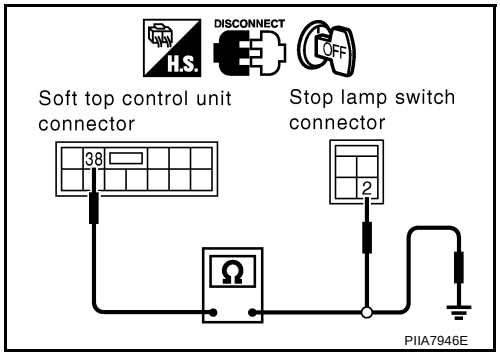
(A/T Models)

- Continuity between soft top control unit connector B68 terminal 38 and stop lamp switch connector E111 terminal 2.

  38 (P/L) - 2 (P/L) : Continuity should exist.

- Continuity between soft top control unit connector B68 terminal 38 and ground.

  38 (P/L) - Ground : Continuity should not exist.



OK or NG

OK >> GO TO 6.
NG >> Repair or replace harness.

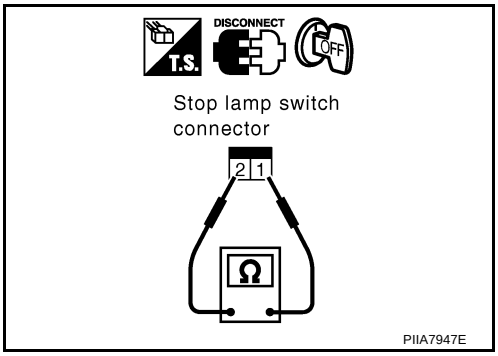
6. CHECK STOP LAMP SWITCH

1. Check the following.

(M/T Models)

– Continuity between stop lamp switch connector E112 terminal 1 and 2.

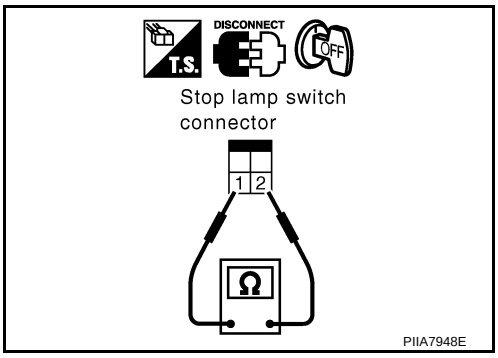
Connector	Terminal		Brake pedal condition	Continuity
E112	1	2	Depressed	Yes
			Released	No



(A/T Models)

– Continuity between stop lamp switch connector E111 terminal 1 and 2.

Connector	Terminal		Brake pedal condition	Continuity
E111	1	2	Depressed	Yes
			Released	No



OK or NG

OK >> Check condition of harness and connector.
NG >> Replace stop lamp switch.

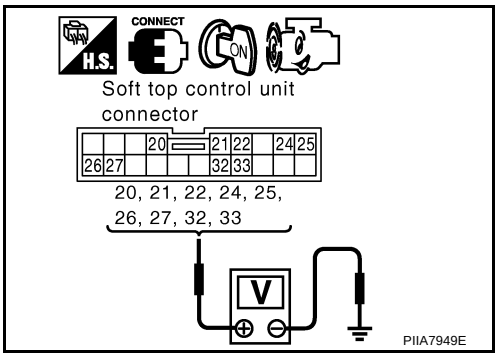
Each Switch Condition Check (Open Operate)

AIS00607

1. CHECK EACH SWITCH SIGNAL

1. Start engine.
2. Check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	20 (W/B)	Ground	Full closed	5
	21 (W/L)			
	22 (W/R)			
	24 (G)			
	25 (L/Y)			
	26 (LG)			
	27 (W/G)			
	32 (W)			
	33 (P)			



OK or NG

OK >> Each switch condition is OK.
NG >> Check malfunction switch.

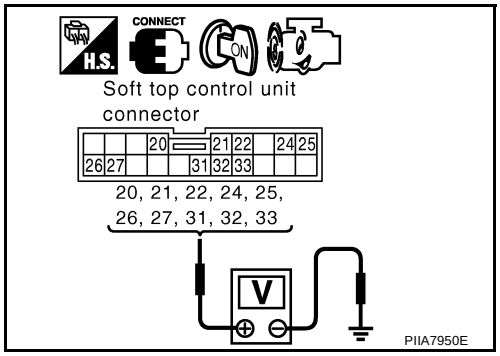
Each Switch Condition Check (Close Operate)

AIS00608

1. CHECK EACH SWITCH SIGNAL

1. Start engine.
2. Check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	20 (W/B)	Ground	Full opened	0
	21 (W/L)			
	22 (W/R)			
	24 (G)			5
	25 (L/Y)			0
	26 (LG)			
	27 (W/G)			
	31 (L)			
	32 (W)			
	33 (P)			5



OK or NG

OK >> Each switch condition is OK.
NG >> Check malfunction switch.

Power Window Down Request Signal Check

AIS00609

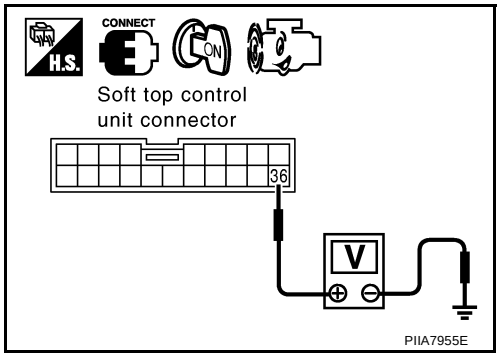
1. CHECK POWER WINDOW REQUEST SIGNAL

1. Start engine.
2. Soft top switch operate, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	36 (Y/G)	Ground	OP1 → OP11	5 → 0 → 5
			CL1 → CL10	

OK or NG

OK >> Check the condition of harness and connector.
NG >> Replace soft top control unit.



Power Window Harness Check

AIS0060A

1. CHECK POWER WINDOW CIRCUIT

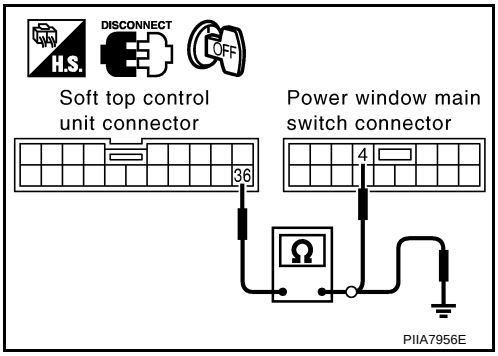
1. Turn ignition switch OFF.
2. Disconnect soft top control unit, power window main switch and power window sub-switch connector.
3. Check the following.

– Continuity between soft top control unit connector B67 terminal 36 and power window main switch connector D7 terminal 4.

36 (Y/G) - 4 (B/R) : Continuity should exist.

– Continuity between soft top control unit connector B67 terminal 36 and ground.

36 (Y/G) - Ground : Continuity should not exist.



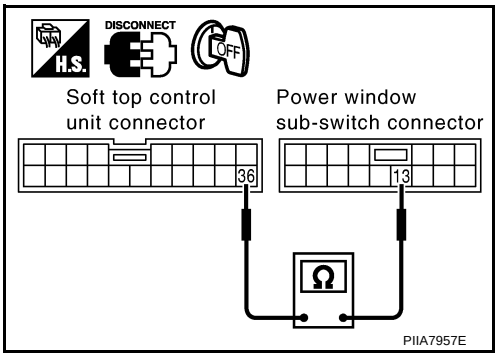
4. Check the following.

– Continuity between soft top control unit connector B67 terminal 36 and power window sub-switch connector D37 terminal 13.

36 (Y/G) - 13 (P) : Continuity should exist.

OK or NG

OK >> Replace malfunction power window switch.
NG >> Repair or replace harness.



Passenger Side Seat Operate Signal Check 1

AIS0060B

1. CHECK PASSENGER SIDE SEAT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and passenger side seat control unit connector.
3. Check continuity between soft top control unit connector B67 terminal 36 and passenger side seat control unit connector B353 terminal 16.

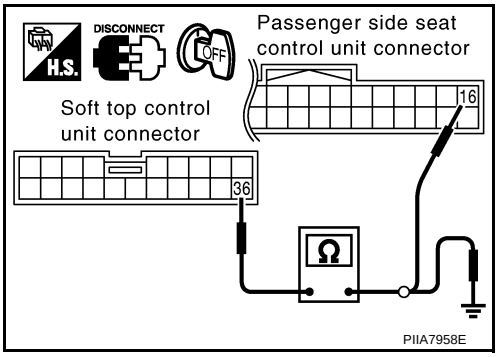
36 (Y/G) - 16 (PU/W) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 36 and ground.

36 (Y/G) - Ground : Continuity should not exist.

OK or NG

OK >> Replace passenger side seat control unit.
NG >> Repair or replace harness.



Passenger Side Seat Operate Signal Check 2

AIS0060C

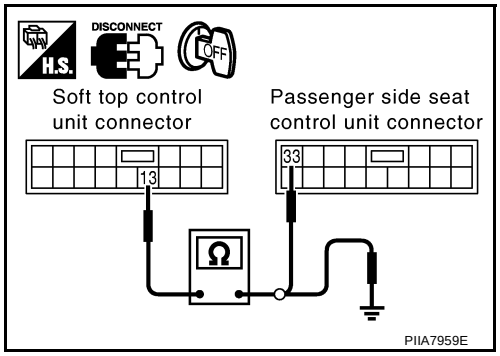
1. CHECK PASSENGER SIDE SEAT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit, storage lid actuator RH and passenger side seat control unit connector.
3. Check continuity between soft top control unit connector B66 terminal 13 and passenger side seat control unit connector B354 terminal 33.

13 (L/R) - 33 (G/B) : Continuity should exist.

4. Check continuity between soft top control unit connector B66 terminal 13 and ground.

13 (L/R) - Ground : Continuity should not exist.



OK or NG

OK >> Replace passenger side seat control unit.
NG >> Repair or replace harness.

Passenger Side Seat Operate Signal Check 3

AIS0060D

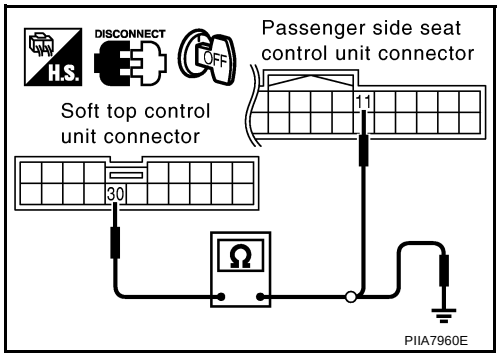
1. CHECK PASSENGER SIDE SEAT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit, passenger side seat control unit and soft top lock switch connector.
3. Check continuity between soft top control unit connector B67 terminal 30 and passenger side seat control unit connector B353 terminal 11.

30 (Y/R) - 11 (L/W) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 30 and ground.

30 (Y/R) - Ground : Continuity should not exist.



OK or NG

OK >> Replace passenger side seat control unit.
NG >> Repair or replace harness.

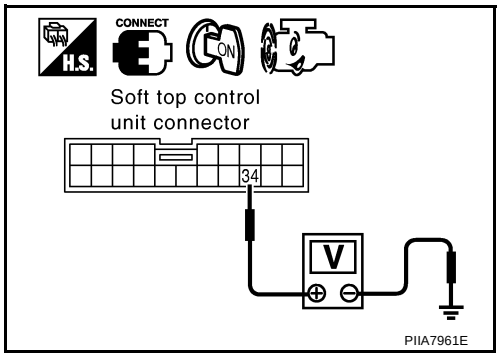
Seat Back Position Signal Check

AIS0060E

1. CHECK SEAT BACK POSITION SIGNAL

1. Start engine.
2. The thing whose seat cancel switch is OFF is confirmed.
3. Soft top switch operate, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Seat condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	34 (L/W)	Ground	When passenger seat inclines forward	5
			Other than above	0



OK or NG

OK >> Replace soft top control unit.
NG >> GO TO 2.

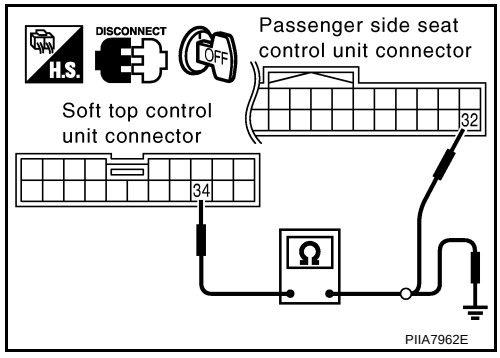
2. CHECK SEAT BACK POSITION SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and passenger side seat control unit connector.
3. Check continuity between soft top control unit connector B67 terminal 34 and passenger side seat control unit connector B353 terminal 32.

34 (L/W) - 32 (G/W) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 34 and ground.

34 (L/W) - Ground : Continuity should not exist.



OK or NG

OK >> Check passenger side seat. Refer to SE-36, "Trouble Diagnosis Symptom Chart" .

NG >> Repair or replace harness.

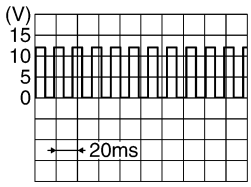
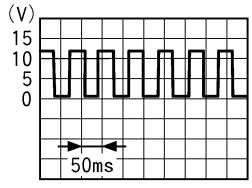
Speed Signal Circuit Check

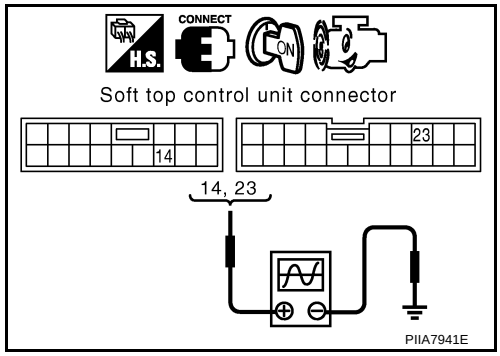
AIS0060F

First perform the “SELF-DIAG RESULT” in “BCM” with CONSULT-II, then perform the each trouble diagnosis of malfunction system indicated “SELF-DIAG RESULT” of “BCM”. Refer to BCS-14, "CONSULT-II" .

1. CHECK VEHICLE SPEED SIGNAL

1. Start engine.
2. Check the signal between soft top control unit connector and ground.

Connector	Terminal (Wire color) (+)	Terminal (Wire color) (-)	Condition	Signal (Reference value.)
B66	14 (W)	Ground	Speedometer operated [When vehicle speed is Approx. 40km/h (25MPH)]	
B67	23 (W/G)	Ground	Speedometer operated [When vehicle speed is Approx. 40km/h (25MPH)]	



OK or NG

OK >> Replace soft top control unit.

NG >> GO TO 2.

2. CHECK VEHICLE SPEED SIGNAL CIRCUIT

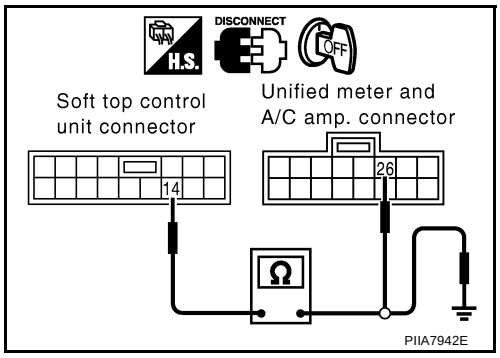
1. Turn ignition switch OFF.
2. Disconnect soft top control unit and unified meter and A/C amp connector.
3. Check the following.

– Continuity between soft top control unit connector B66 terminal 14 and unified meter and A/C amp connector M49 terminal 26.

14 (W) - 26 (W) : Continuity should exist.

– Continuity between soft top control unit connector B66 terminal 14 and ground.

14 (W) - Ground : Continuity should not exist.



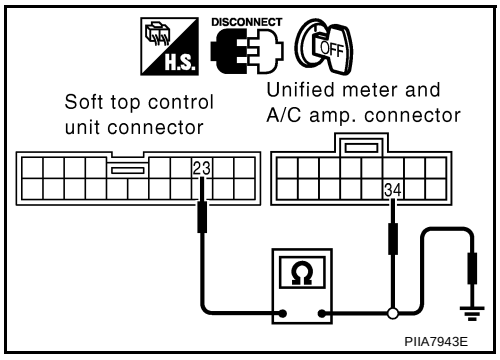
4. Check the following.

– Continuity between soft top control unit connector B67 terminal 23 and unified meter and A/C amp connector M49 terminal 34.

23 (W/G) - 34 (W/G) : Continuity should exist.

– Continuity between soft top control unit connector B67 terminal 23 and ground.

23 (W/G) - Ground : Continuity should not exist.



OK or NG

OK >> Check unified meter and A/C amp. Refer to DI-54, "System Description" .

NG >> Repair or replace harness.

Indicator Lamp Circuit Check

AIS0060G

1. CHECK FUSE

- Check 10A fuse [No.14, located in fuse block (J/B)]

NOTE:
Refer to RF-11, "Component Parts and Harness Connector Location" .

OK or NG

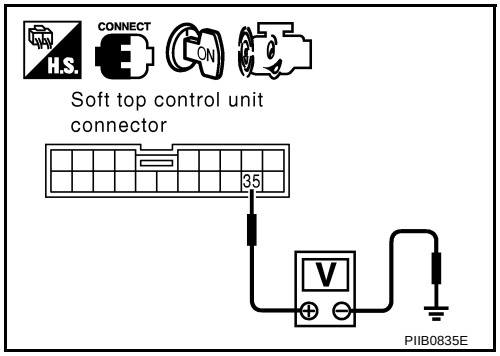
OK >> GO TO 3.

NG >> If fuse blown out, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK INDICATOR LAMP SIGNAL

1. Start engine.
2. Soft top switch operate, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	35 (BR)	Ground	In position on the way	0
			Full open or full close	Battery voltage



OK or NG

OK >> Check the condition of the harness and the connector.

NG - 1 >> If battery voltage : Replace soft top control unit.

NG - 2 >> If 0V : GO TO 3.

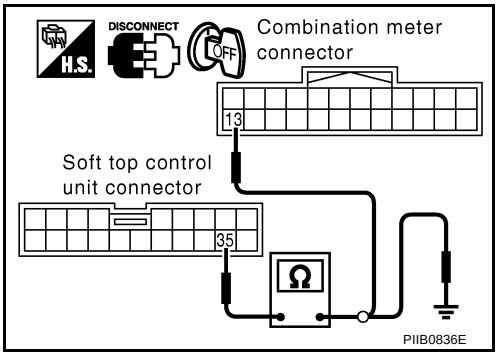
3. CHECK INDICATOR LAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and combination meter connector.
3. Check continuity between soft top control unit connector B67 terminal 35 and combination meter connector M19 terminal 13.

35 (BR) – 13 (G/W) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 35 and ground.

35 (BR) – Ground : Continuity should not exist.



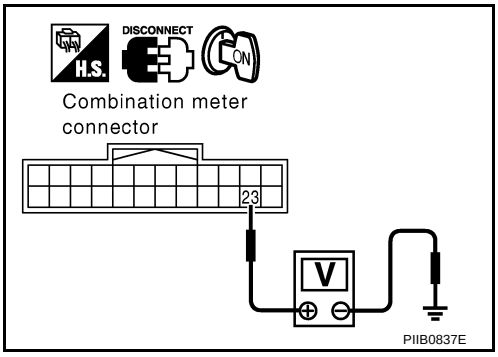
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK INDICATOR LAMP POWER SUPPLY

1. Turn ignition switch ON.
2. Check voltage between combination meter connector M19 terminal 23 and ground.

23 (G/Y) – Ground : Battery voltage



OK or NG

OK >> Check the Condition of the Harness and the Connector.
- If OK : Replace combination meter.
- If NG : Repair or replace harness.

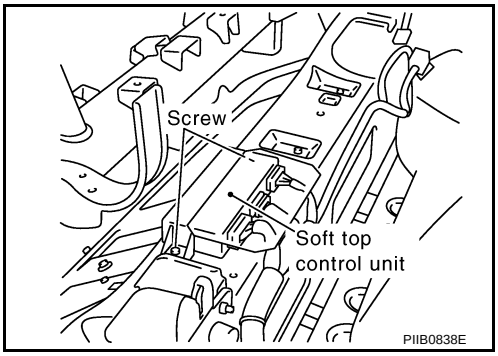
NG >> Repair or replace harness.

Removal and Installation of Soft Top Control Unit

AIS0060H

REMOVAL

1. Push the soft top switch on the close side to clear the soft top strage room, and release the buttom before strage lid starts closing.
2. Remove trim parts and turn the front side of storage room finisher. RF-125, "Removal and Installation of Storage Room Finisher"
3. Disconnect soft top control unit connector, remove the screw and soft top control unit.



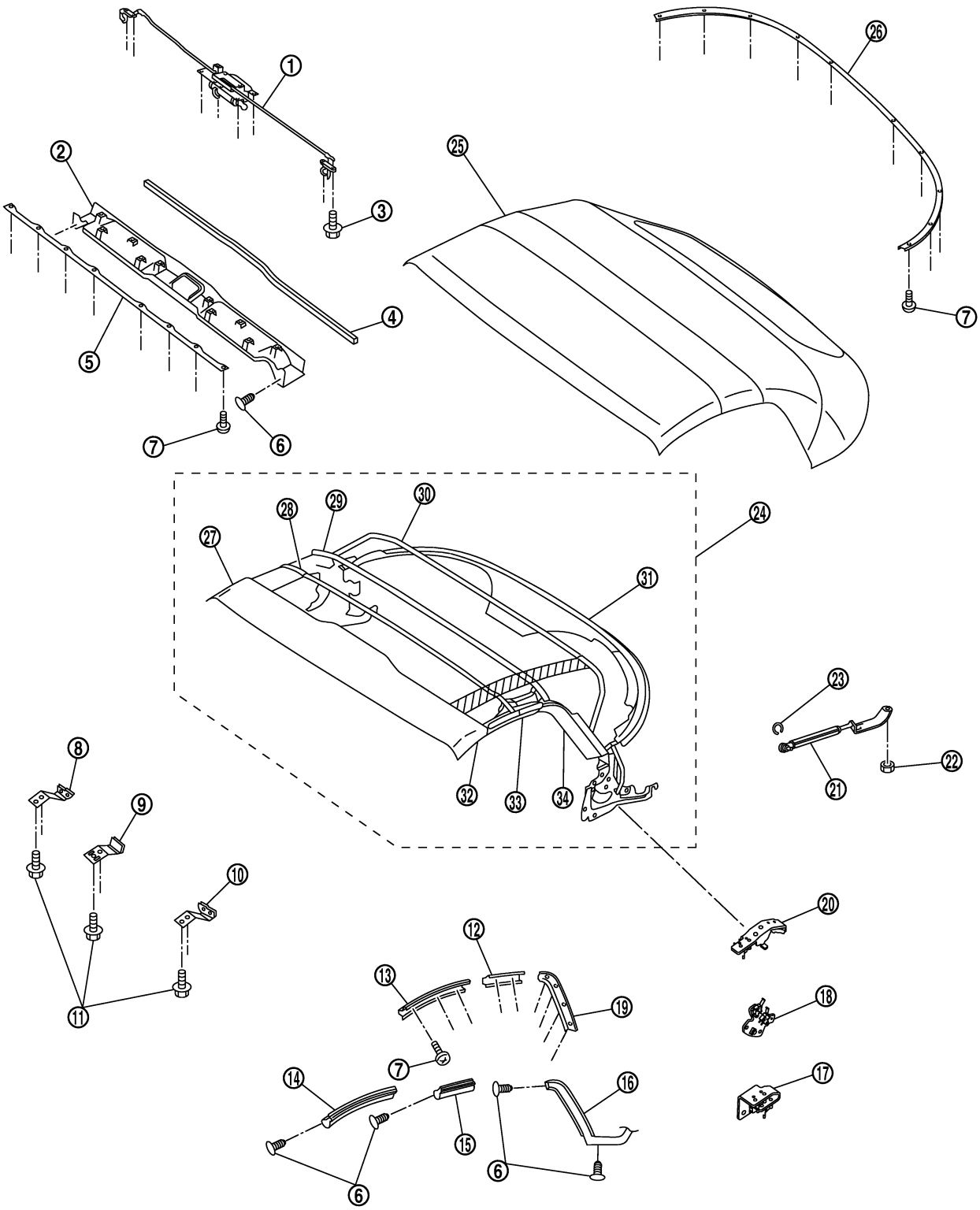
INSTALLATION

Installation in the reverse order of removal.

Component Parts Drawing

AIS0060I

SEC. 737



PIIB1399E

1. Front lock
2. Front lock finisher
3. TORX bolt (T30)
4. Welt
5. Front center retainer
6. Clip
7. Screw
8. Front lock striker, RH
9. Front lock striker, center
10. Front lock striker, LH
11. Bolt
12. B link retainer
13. A link retainer
14. A link weatherstrip
15. B link weatherstrip
16. C link and 5th bow weatherstrip
17. Soft top switch bracket 1
18. Soft top switch bracket 2
19. C link retainer
20. Plate rail RR bracket
21. 5th bow operating strut rod
22. Nut
23. Holder
24. Soft top frame
25. Soft top cover
26. 5th bow retainer
27. 1st bow
28. 2nd bow
29. 3rd bow
30. 4th bow
31. 5th bow
32. A link
33. B link
34. C link

Removal and Installation of Soft Top Assembly

AIS0060J

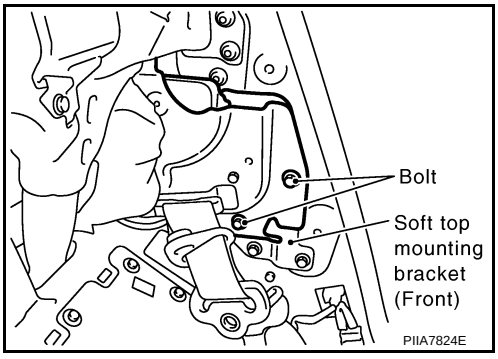
CAUTION:
Install fender cover to protect rear fender.

REMOVAL

1. Fully open storage lid with soft top retracting.
2. Remove seat belt sholder bolt. Refer to SB-6, "REMOVAL OF SEAT BELT RETRACTOR" .
3. Remove rear side finisher. Refer to EI-37, "REAR SIDE FINISHER" .
4. Remove back panel finisher. Refer to EI-42, "BACK PANEL FINISHER" .
5. Loosen bolts at soft top mounting bracket (front).

   CAUTION:
   Do not remove soft top mounting bracket (front) (body side).

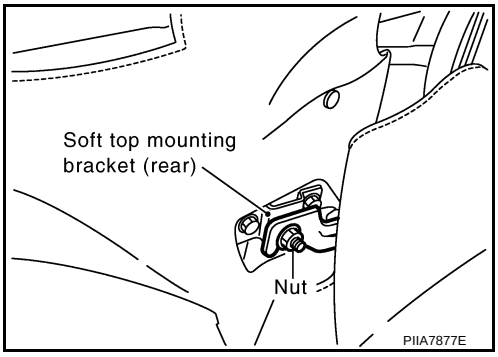
   Nut : 28.0 N·m (2.9 kg-m, 21 ft-lb)



6. Close soft top until 5th bow are raised and folded with C-link. Loosen nut at soft top mounting bracket (rear). Then fold (open) soft top assembly completely.

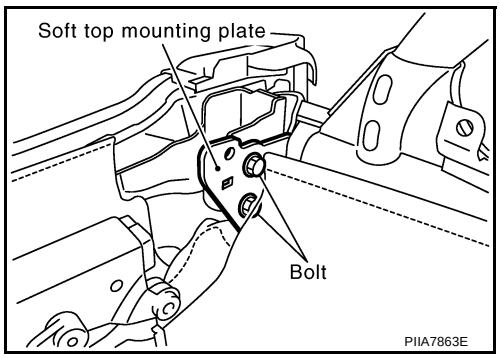
   CAUTION:
   Do not remove soft top mounting bracket (rear) (body side).

   Bolt : 28.0 N·m (2.9 kg-m, 21 ft-lb)



7. Remove back panel bracket.

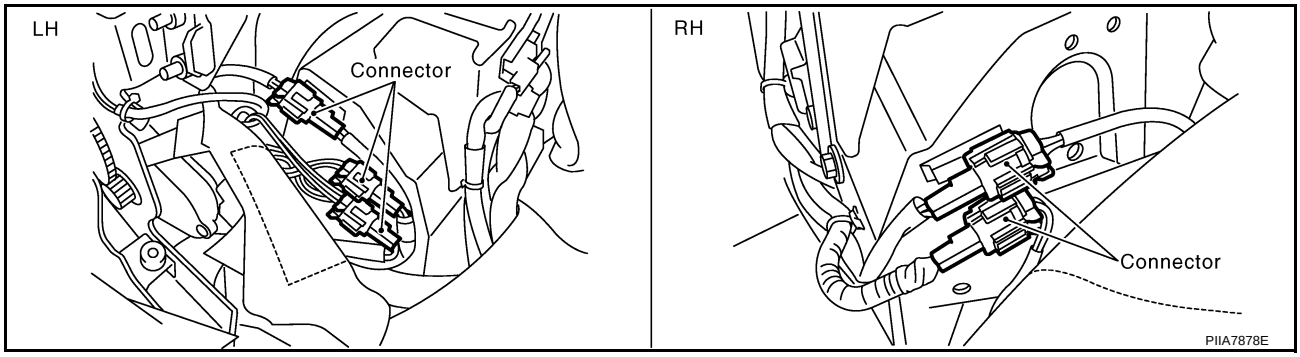
8. Remove bolts, at the soft top mounting plate and shims.



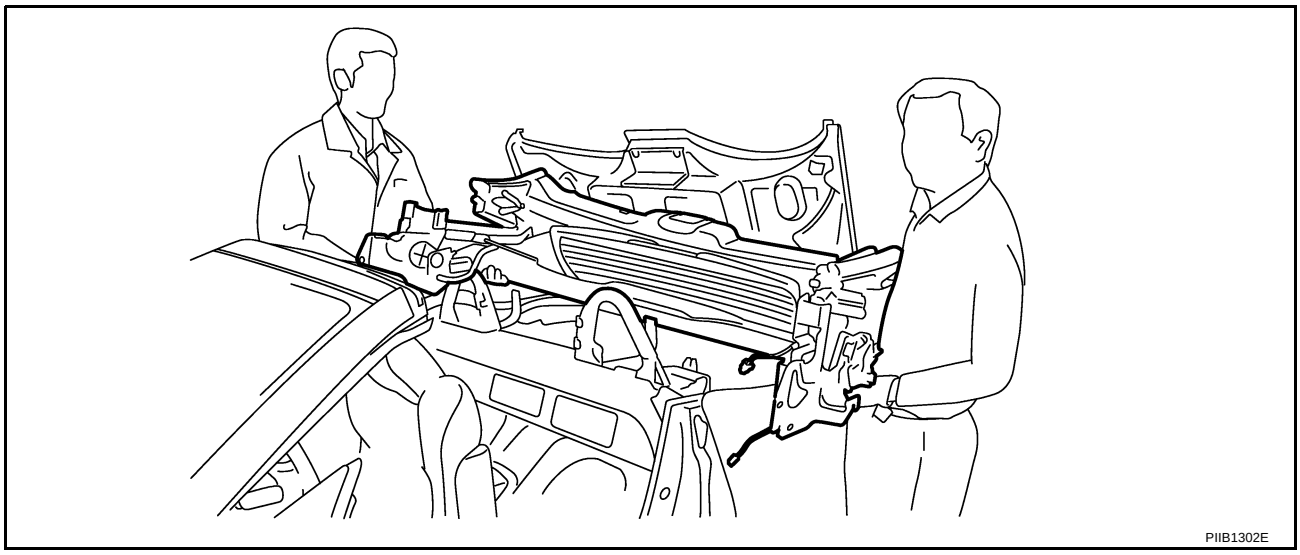
CAUTION:
Do not replace left and right shims with each one with different thickness.

Bolt: 28.0 N·m (2.9 kg-m, 21 ft-lb)

9. Disconnect harness connector.



10. Lift up soft top assembly from left and right, and then remove soft top assembly



CAUTION:
2 workers are required for the heavy load of approximately 40 kg (89 lb).

INSTALLATION

Install in the reverse order of removal except the order of tightening bolts and nuts. (See note below.)

NOTE:

- Before tighten soft top fixing bolts and nuts, make sure that soft top is sat on each pins from soft top mounting brackets without any gaps.
  To sit soft top correctly, follow this order.

1. Push soft top assembly down when nuts at soft top mounting bracket (rear) is tighten.
2. Close soft top until the angle of A-link becomes vertical against ground, then tighten bolts at soft top mounting bracket (front).
3. Tighten bolts at soft top mounting plate with shims, then attach back panel bracket with bolts.

Removal and Installation of Soft Top Cover

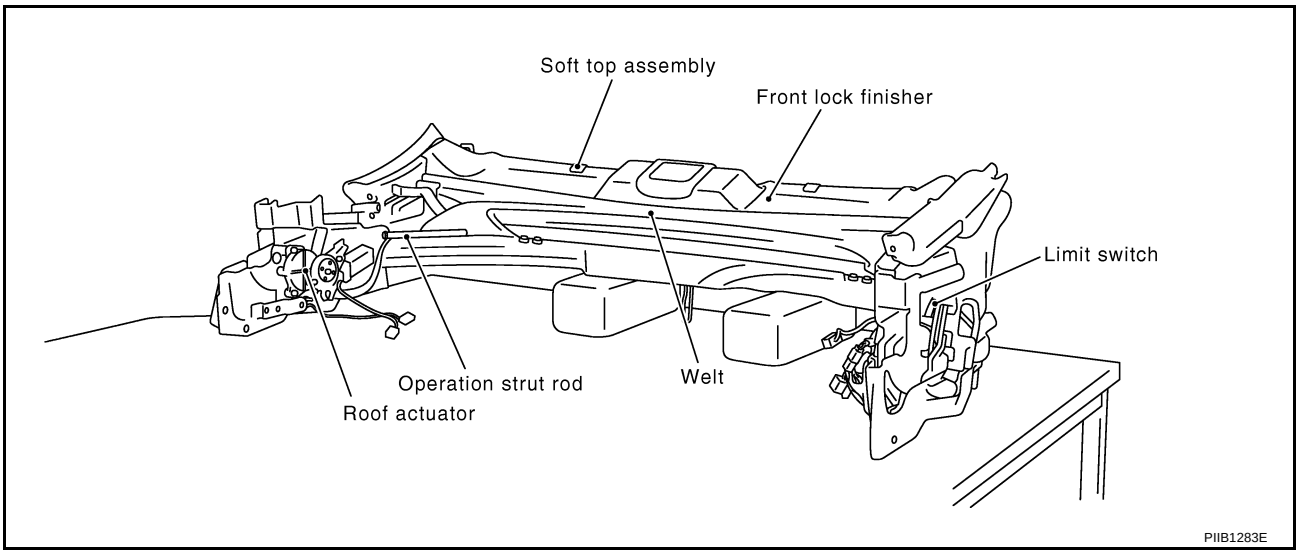
AIS0060K

REMOVAL

CAUTION:

- **Do not reuse used double-faced adhesive tape, nonwoven fabric, EPT seal, pad, etc.**
- **Be careful not to damage soft top assembly during removal. Do not place it upside-down so as to prevent cover from compression scars.**

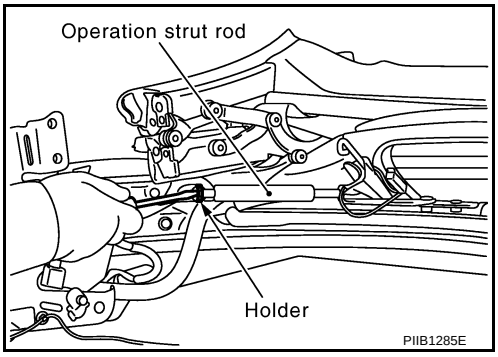
1. Remove soft top assembly from the vehicle. Refer to RF-87, "Removal and Installation of Soft Top Assembly" .
2. Set up the soft top assembly on the table.



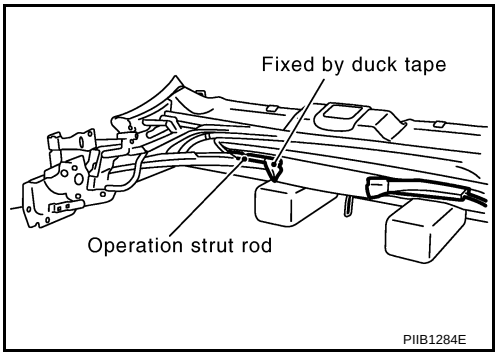
3. Remove roof actuator (RH/LH). Refer to RF-107, "Removal and Installation of Roof Actuator" .
4. Remove holder of 5th bow operation strut rods, and then remove 5th bow operation strut rods.

CAUTION:

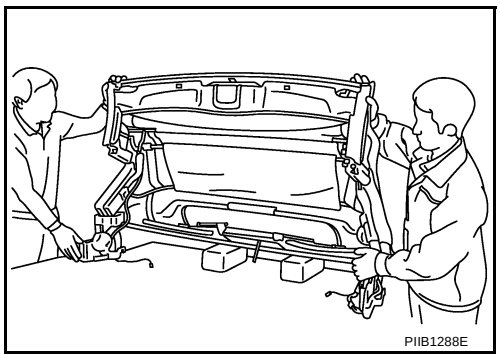
- **When 5th bow operating strut rods are removed, 5th bow drops suddenly.**
  Perform operation while holding 5th bow.



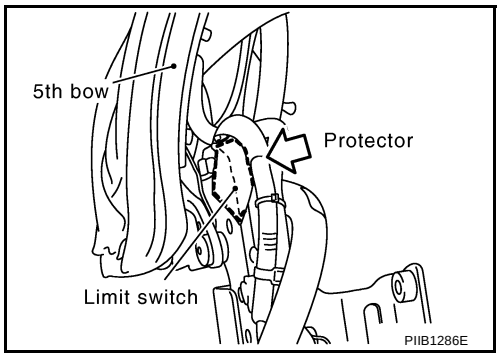
- **Temporarily fix 5th bow operating strut rods on 5th bow finisher after removal.**



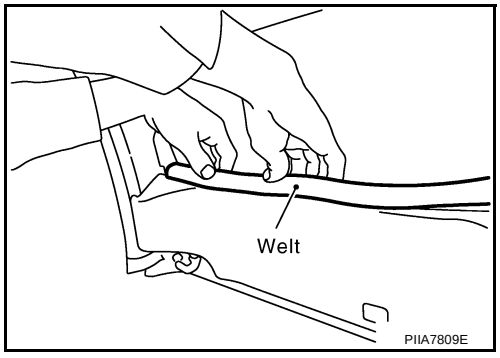
5. Open soft top assembly.



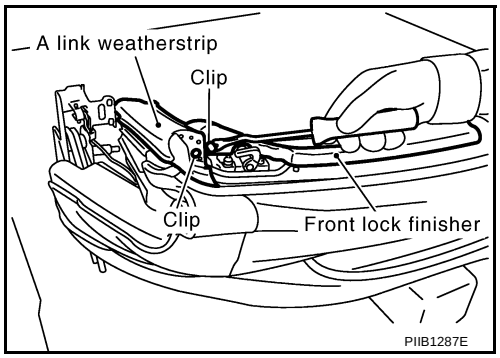
6. Protect the limit switch contact around the rotation axis of the 5th bow on the left side of soft top with tape.



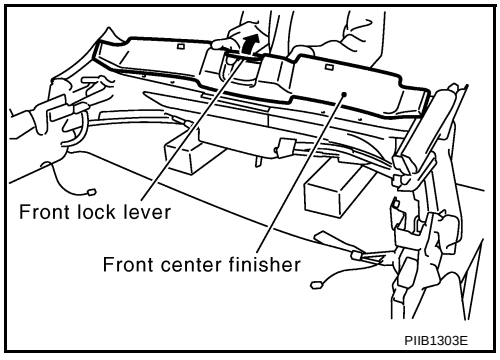
7. Remove welt on the rear end of front lock finisher.



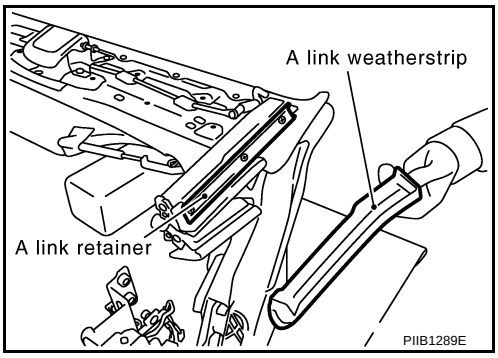
8. Remove left/right clips on the front end of front lock finisher.



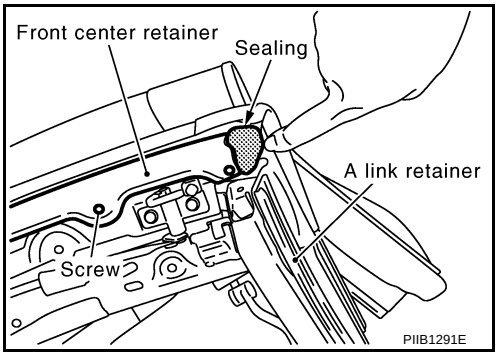
9. Pull up front lock lever, and then disengage clips to remove front lock finisher.



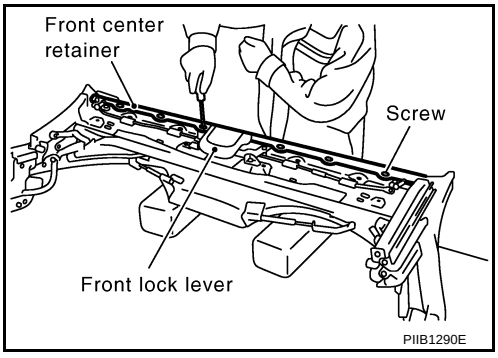
10. Remove clip, and then A link weatherstrip.



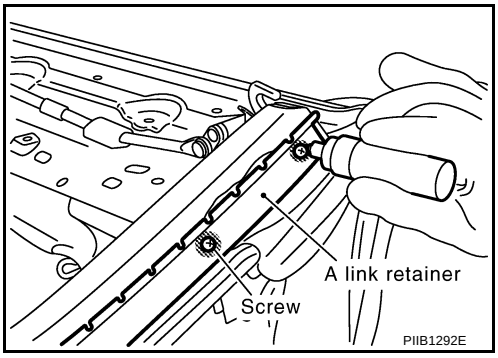
11. Peel a link sealing out.



12. Remove screws, and then remove front center retainer.

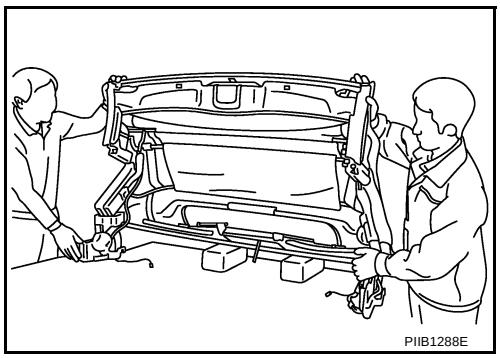


13. Put matching marks to installation position of A link retainer.

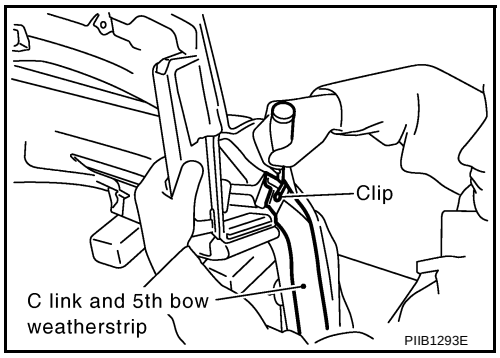


14. Remove screws, and then remove A link retainer.

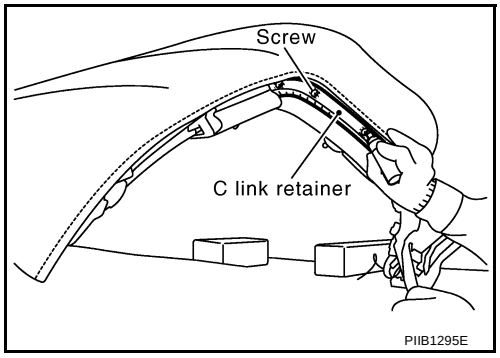
15. Open soft top about 90 degrees.



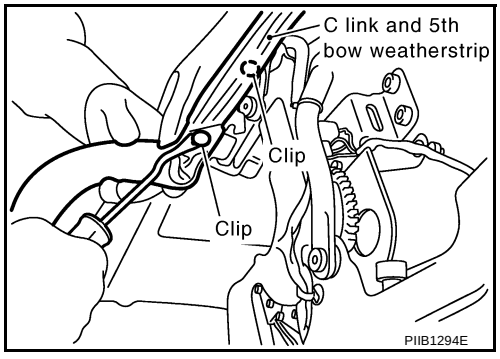
16. Remove clips on the top of C link and 5th bow weatherstrip.



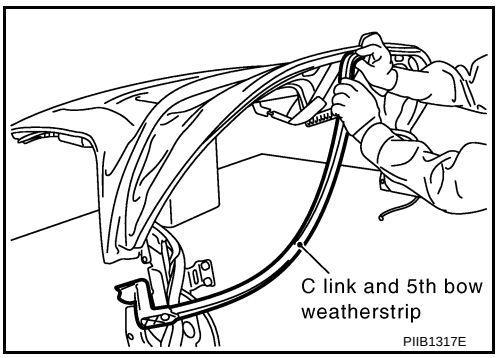
17. Fully open soft top.
18. Put matching marks to installation position on C link retainer.
19. Remove screws, and then remove C link retainer.



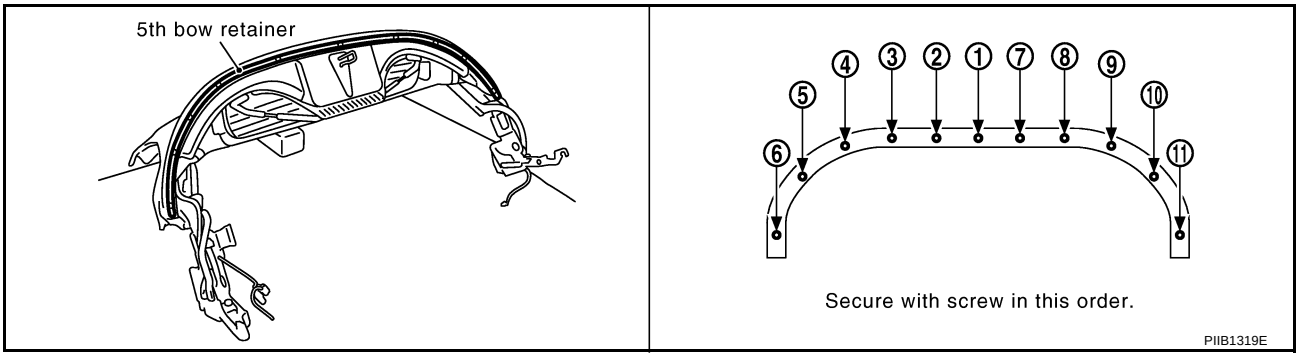
20. Remove clips on the bottom edge of C link and 5th bow weatherstrip.



21. Remove C link and 5th bow weatherstrip from 5th bow.

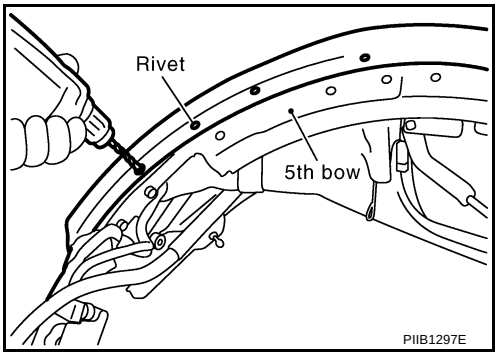


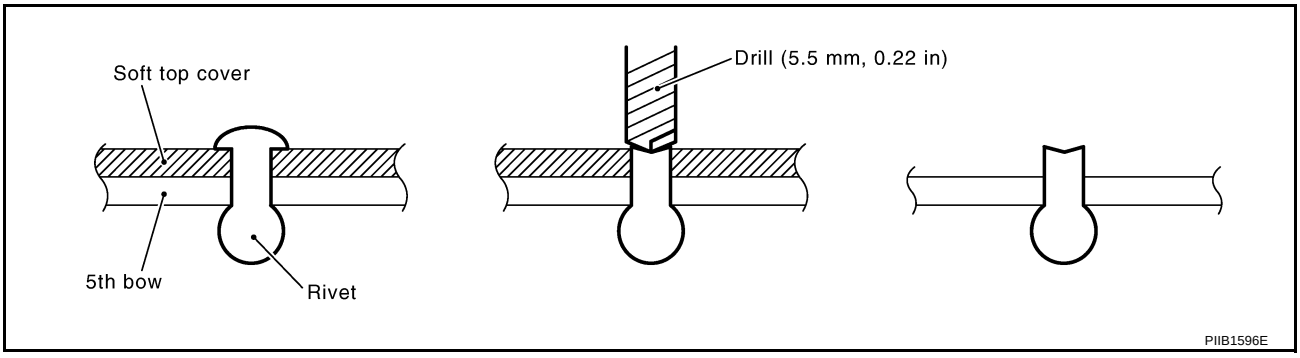
22. Remove screws, and then remove 5th bow retainer.



23. Shave rivets head of soft top cover 5th bow by using a drill.
[Drill bit diameter: 5.5 mm (0.22 in)]

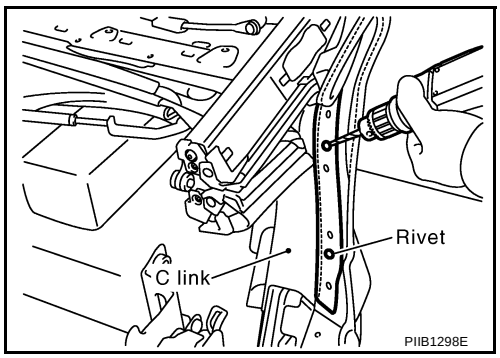
CAUTION:
Do not attempt to remove rivets completely.





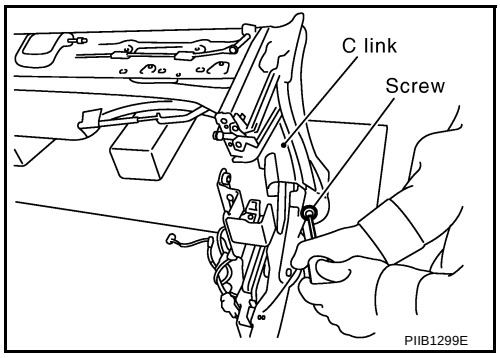
24. Close soft top, and then Shave rivets head and of C link by using a drill.
[Drill bit diameter: 5.5 mm (0.22 in)]

CAUTION:
Do not attempt to remove rivets completely.



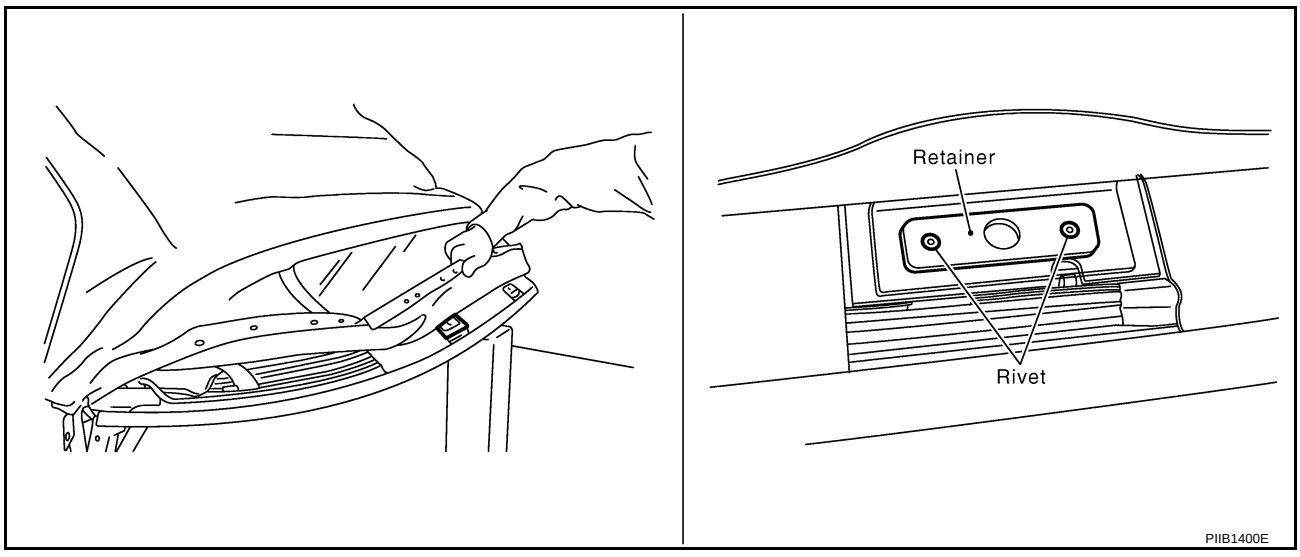
25. Cut EPT seal and remove screws on the bottom of C link.

NOTE:
Check the position when cutting EPT seal.

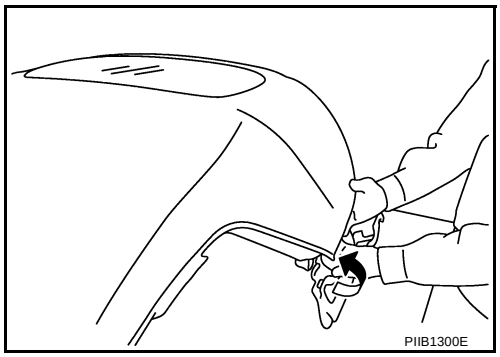


26. Pull up soft top cover from 5th bow finisher.
27. Shave rivets head of 5th bow finisher upper surface, and then remove rivets head and remove retainer.
[Drill bit diameter: 5.5 mm (0.22 in)]

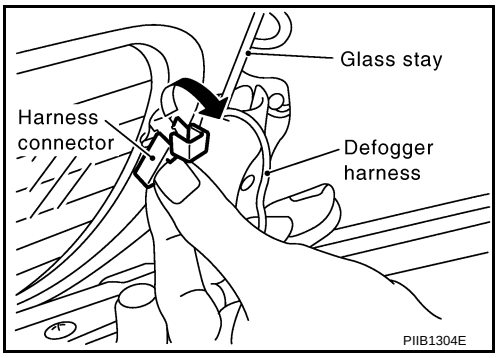
CAUTION:
- **Do not attempt to remove rivets completely.**
- **Be careful not to damage soft top when using a drill.**



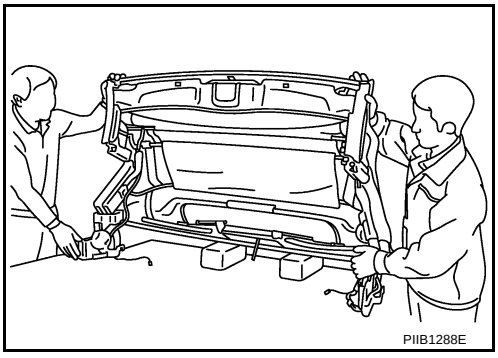
28. Pull up cover from the bottom of C link.



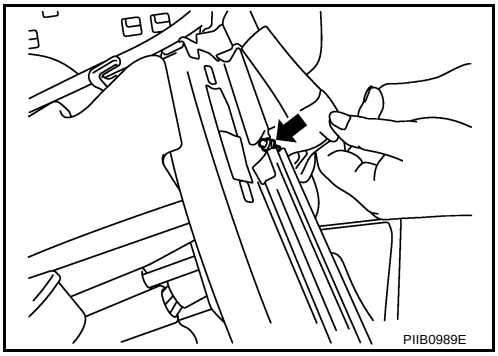
29. Open harness connector cover, and then disconnect defogger harness connector from terminal.



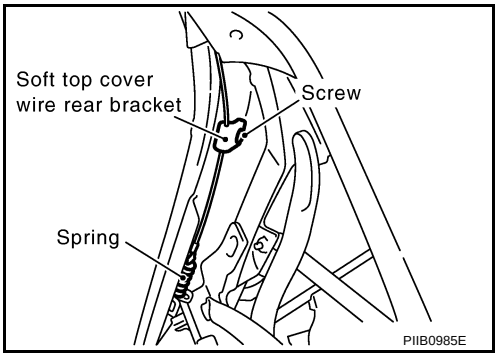
30. Open soft top about 90 degrees.



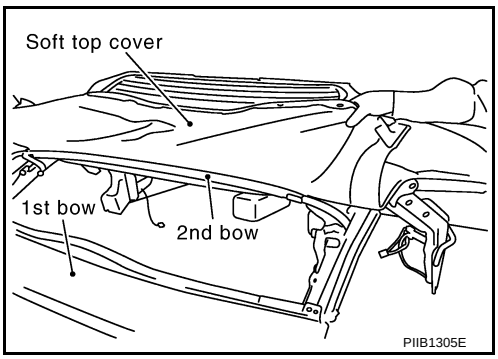
31. Remove soft top wire from A link.



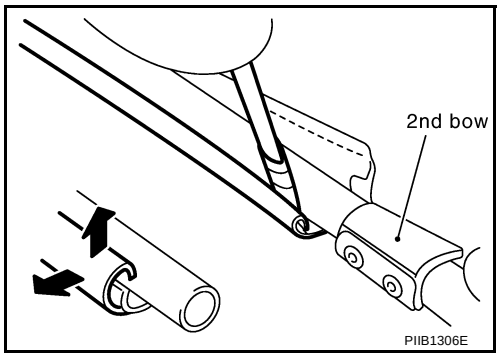
32. Remove soft top cover wire rear bracket from C link.
33. Remove spring from C link.



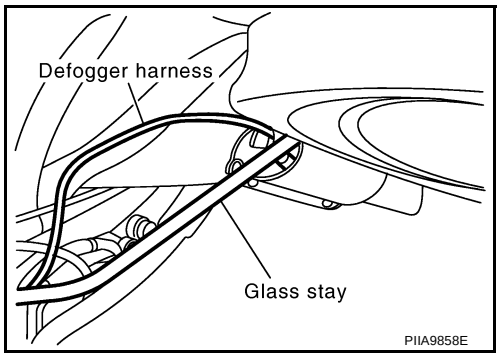
34. Pull out soft top cover frontward from 1st bow.



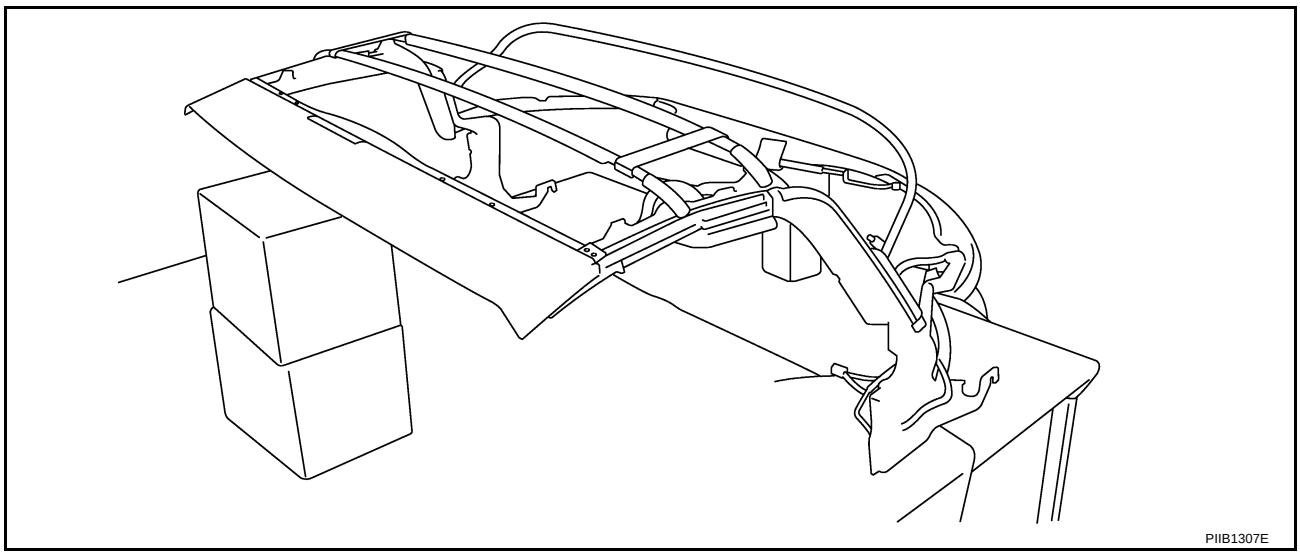
35. Pull up 2nd bow retainer by using a screwdriver, and then remove soft top cover from 2nd bow.



36. Pull up 3rd bow retainer by using a screwdriver, and then remove soft top cover from 3rd bow.
37. Pull out glass stay and defogger harness from sleeve on rear window glass side.



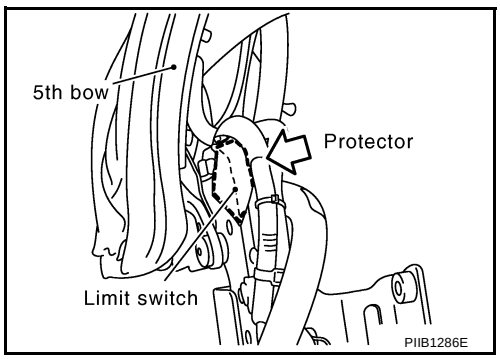
38. Pull out soft top cover from 4th bow and remove soft top cover completely from frame.



INSTALLATION

CAUTION:

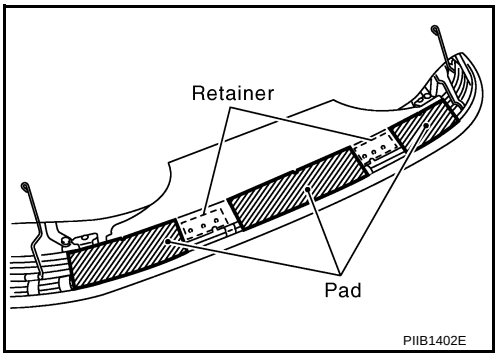
Make sure that the limit switch contact around the rotation axis of the 5th bow on the left side of soft top is protected with tape.



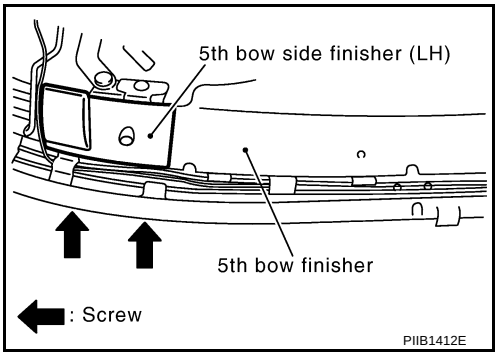
Preparation Work

1. Remove 5th bow finisher pads.

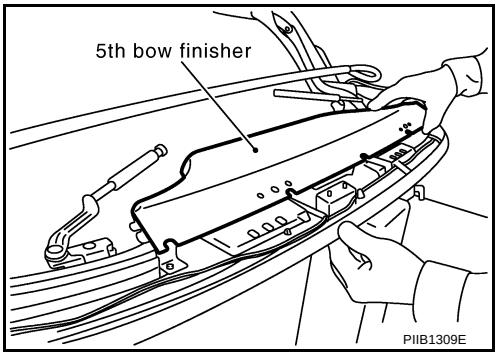
   NOTE:
   Put matching marks so as to check the position when installing.



2. Remove screws, and then remove 5th bow side finisher (RH/LH).

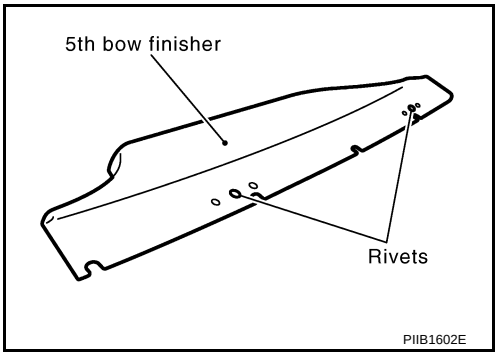


3. Remove clips, and then remove 5th bow finisher.

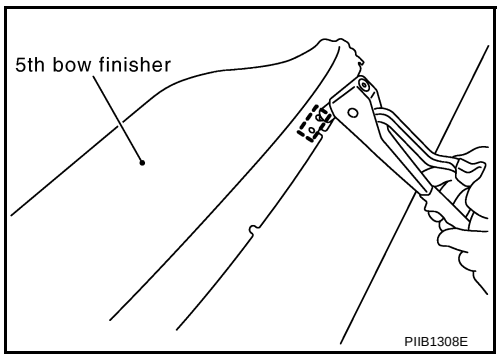


4. Remove rivets head of 5th bow finisher retainer.

   CAUTION:
   Do not attempt to remove rivets completely.

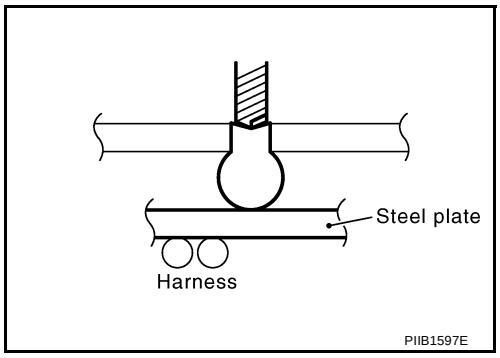


5. Replace retainers under 5th bow finisher with a new part.
   - Put new retainers under 5th bow finisher with rivet.
   - Apply nonwoven fabric to retainer lower edge.



6. Remove remains of soft top cover mounting rivet from 5th bow and C link.

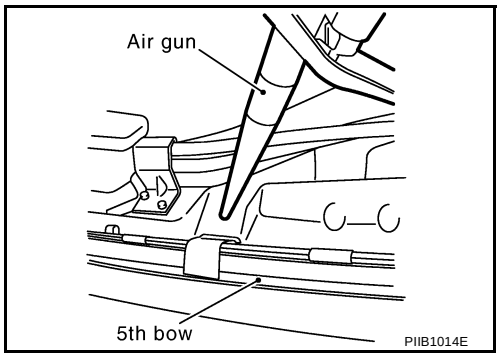
   NOTE:
   - Put a steel plate between a rivet and harnesses on 5th bow for harness protection, when removing the remaining rivets by drill.



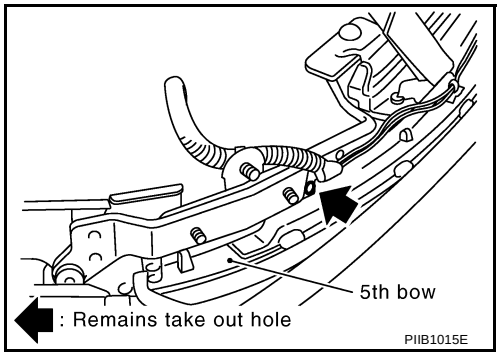
CAUTION:

Take out the remains of rivets completely from 5th bow, other wise the remains cause noise.

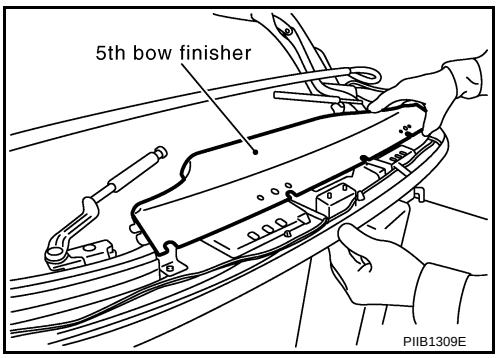
NOTE:
- Blow remains of rivet toward both ends of 5th bow with compressed air if they are in 5th bow.



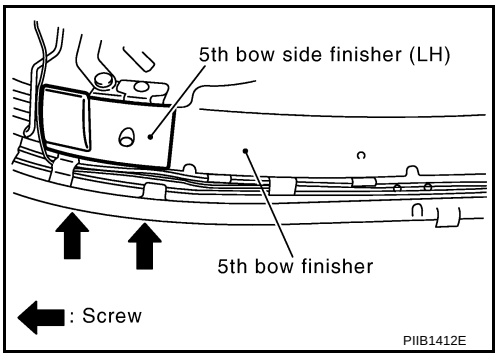
- Remove the remains drawn to both ends by the air blow from the gap.



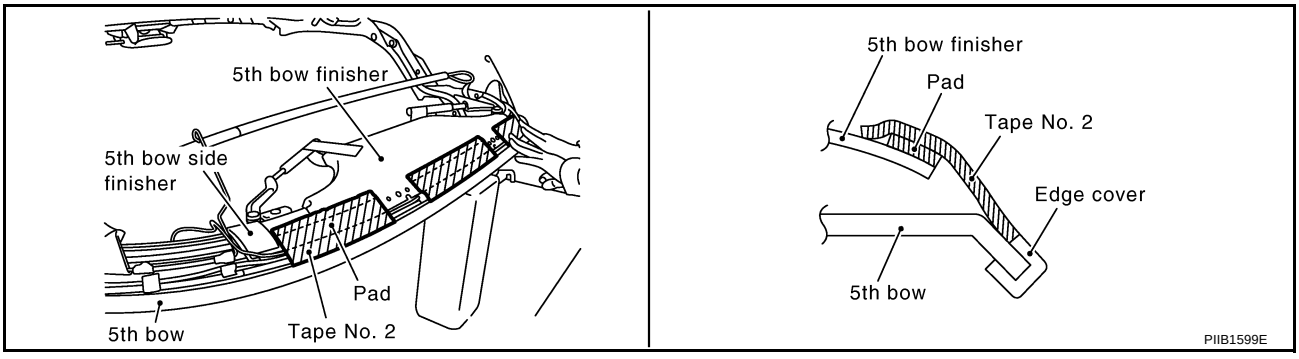
7. Install 5th bow finisher to 5th bow.



8. Install 5th bow side finisher (RH/LH) to 5th bow.



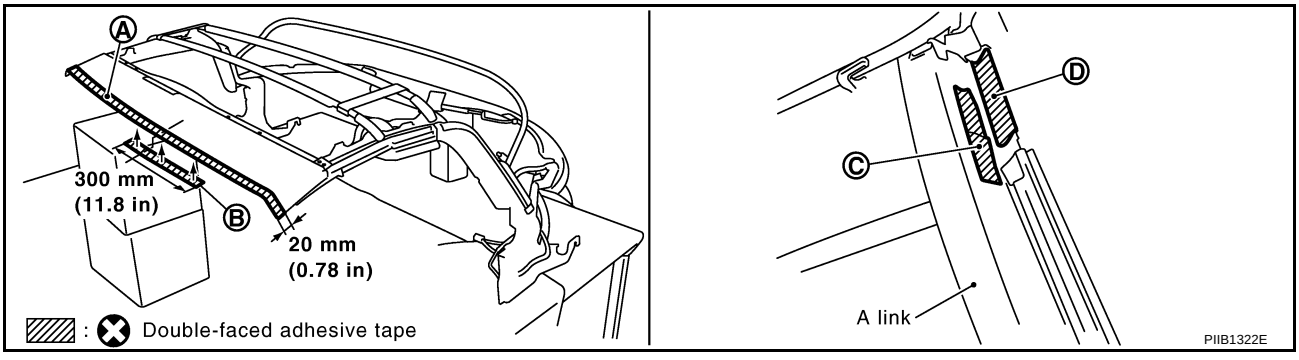
9. Install new pads and fabric tapes.



10. Secure 5th bow finisher harness with new nonwoven fabric if necessary.

Installation

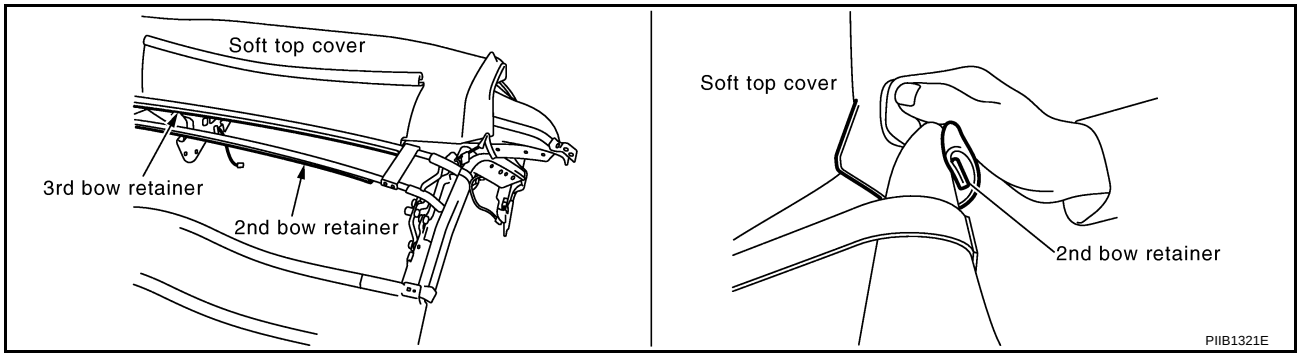
1. Apply double faced adhesive tape for frame.



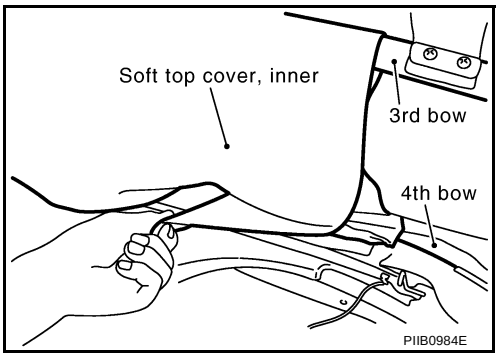
A: Upper side of 1st bow
B: Under side of 1st bow
C: Outer side of A link (between grommets)
D: Outer and under side of 1st bow edge

2. Put soft top cover on frame.

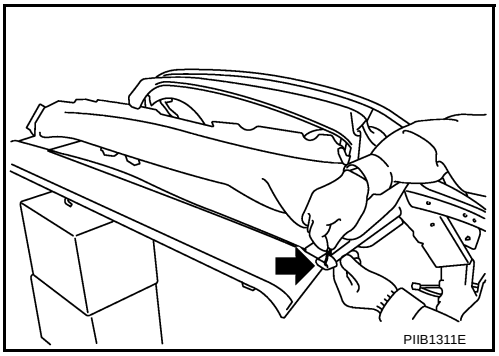
3. Put glass stays and defogger harnesses into sleeves on both side of rear window.
   - Out side bag is for glass stay.
   - Inside bag is for harness.
4. Hook soft top cover inner fabric edge to 3rd bow retainer and press retainer to hold securely.



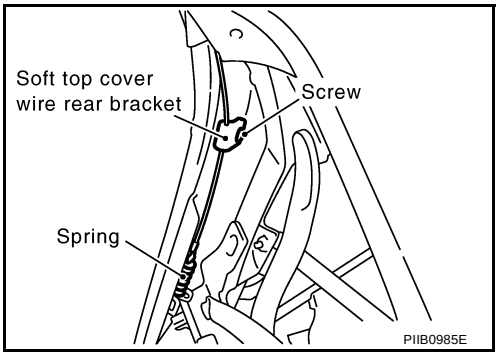
5. Hook soft top cover inner fabric edge to 2nd bow retainer and press retainer to hold securely.
6. Wrap soft top cover around 4th bow and fix soft top cover by velcro fastener.



7. Insert soft top cover wire to A link.

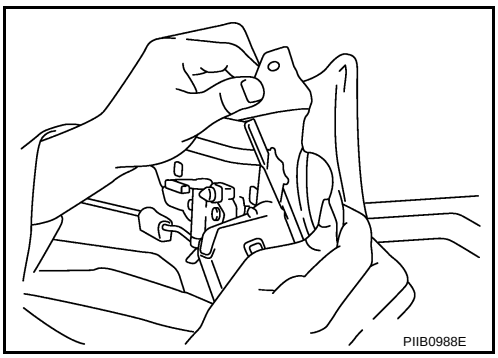


8. Tighten soft top cover wire rear bracket to C link with screw. (Face tension wire outside.)



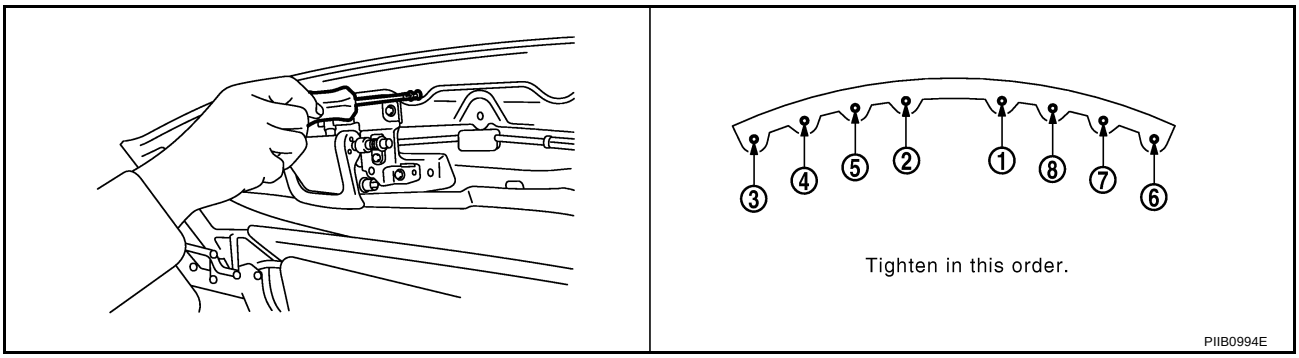
9. Hook soft top cover wire spring on C link and bend the hook of wire spring to prevent unhooking the hook.

10. Put soft top cover on 1st bow.



11. Align soft top cover hole and grommet hole at the 1st bow.

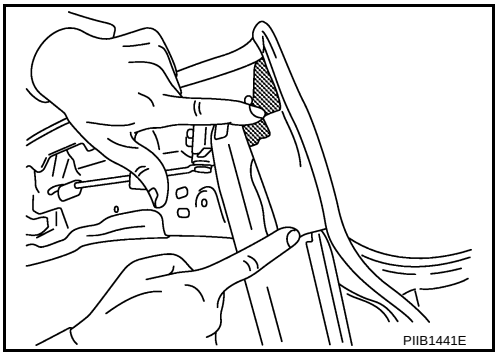
12. Tighten screws on 1st bow with front center retainer.



13. Apply EPT seal to A link installation position.

CAUTION:

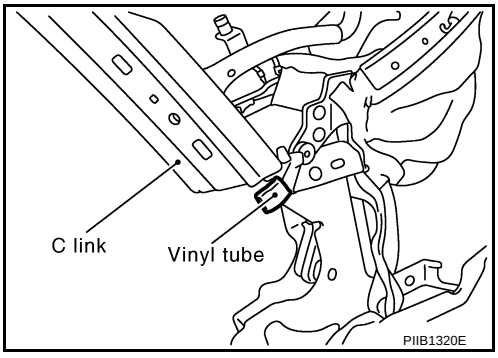
Install EPT seal to the original position.



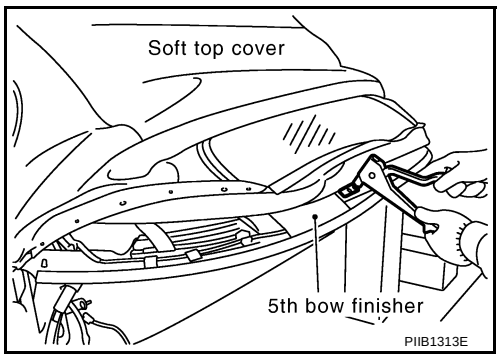
14. Put soft top cover on C link lower.

NOTE:

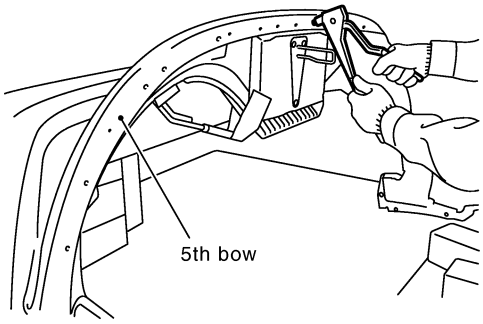
- Make sure that vinyl tube is on C link bottom end bracket.
- Be careful not to pull soft top cover with too much tension.

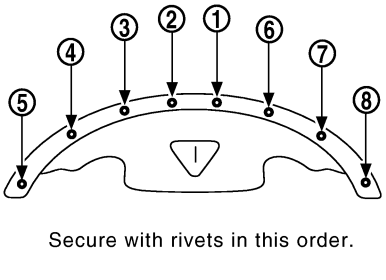


15. Open 5th bow then secure soft top cover to 5th bow finisher upper surface with rivet.

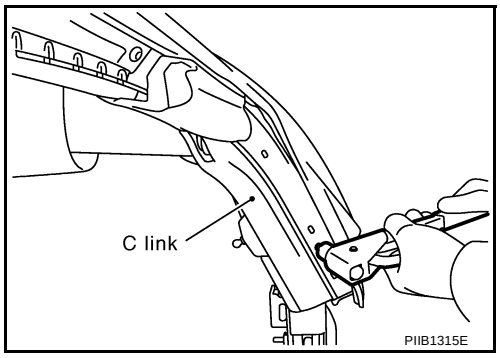


16. Close 5th bow then wrap soft top cover around 5th bow.
17. Secure soft top cover to 5th bow with rivet.





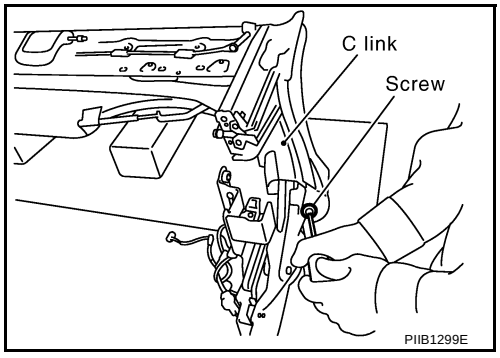
18. Secure soft top cover to C link with rivet.



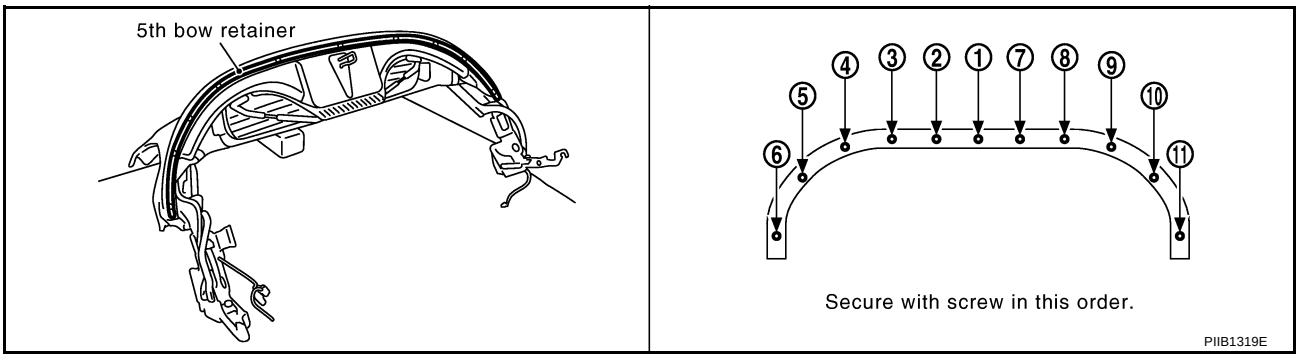
19. Align screw hole on soft top cover and the bottom of C link, and then tighten with screw.

NOTE:

- During tighten up the screw, insert a thin metal rod such as a nail [diameter: 4mm (0.16in)] to a clip hole near the screw to align holes of soft top cloth and its backing plastic plate, and C link frame.
- Tighten screw while holding soft top at certain angle for easy screw installation.



20. Close 5th bow then install 5th bow retainer with screws.

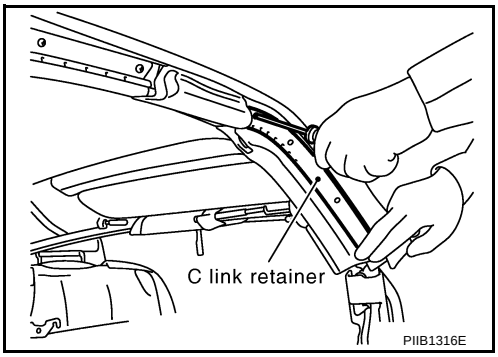


CAUTION:
Apply it to the original position.

NOTE:
During tighten up the screw, insert a thin metal rod such as a nail [diameter: 4mm (0.16in)] to a clip hole near the each end of 5th bow retainer to align holes of the retainer, soft top cloth and its backing plastic plate, and 5th bow.

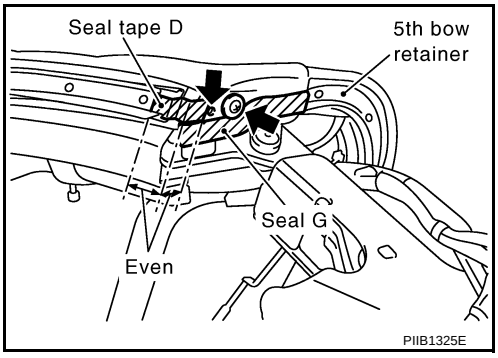
21. Install C link retainer with screws.

NOTE:
Align matching marks on the retainer to screw heads, when installing the retainer.



22. Apply seal to C link lower installation position.

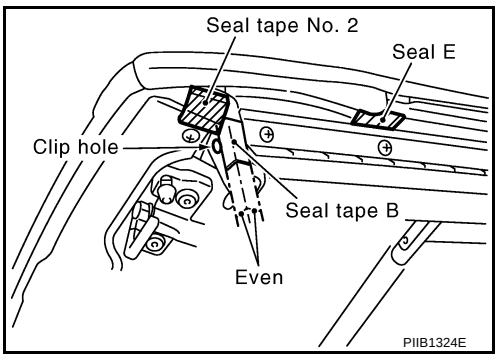
CAUTION:
Make sure not to cover clip hole and screw head.



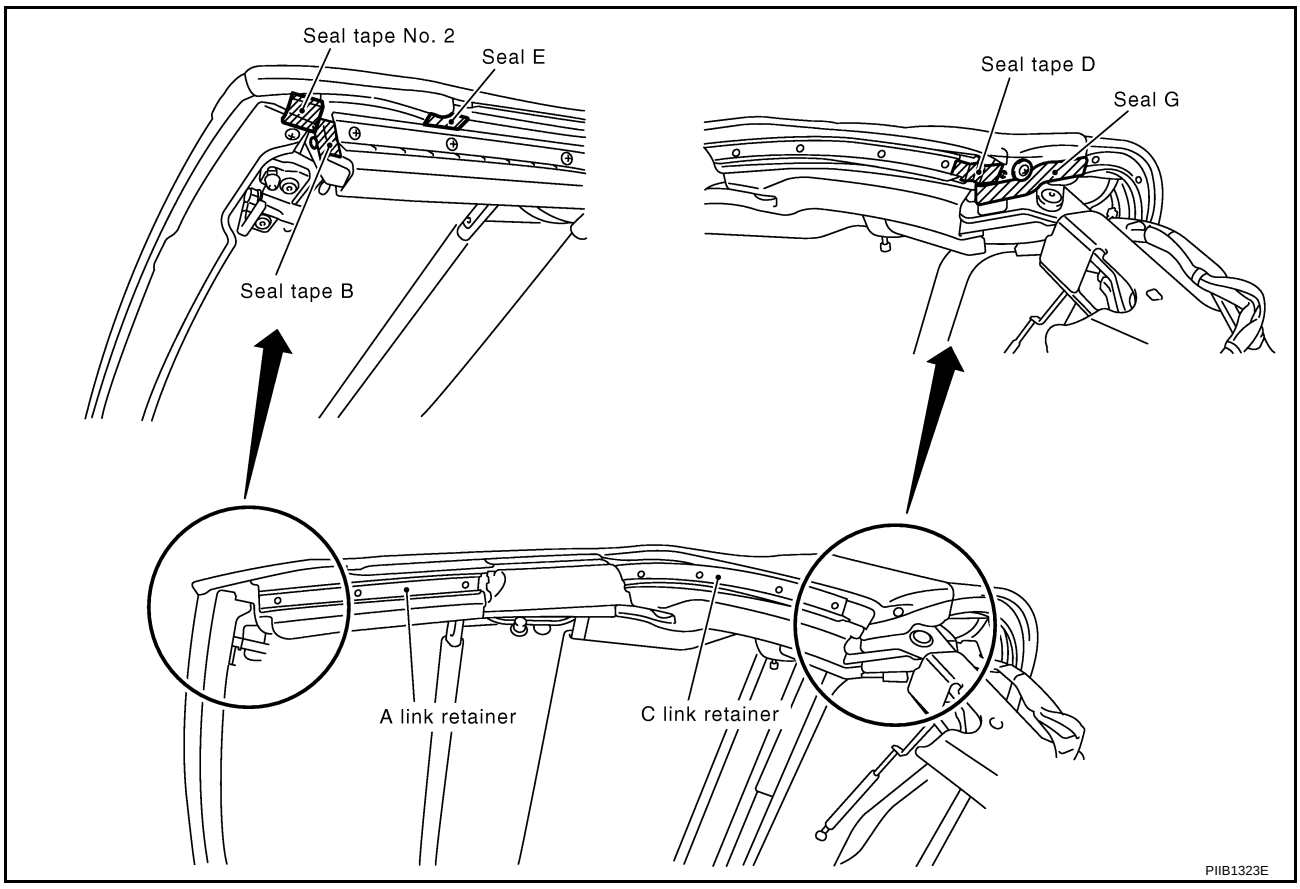
23. Install A link retainer with screws.

NOTE:
Align matching marks on the retainer to screw heads, when installing the retainer.

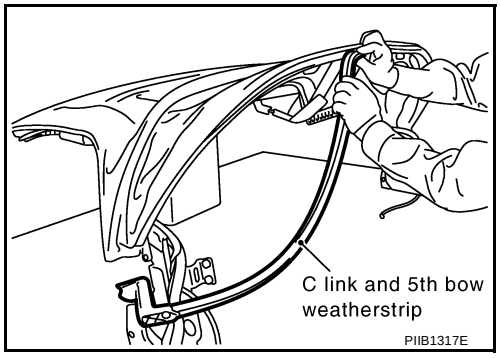
24. Apply seal E to A link installation position.



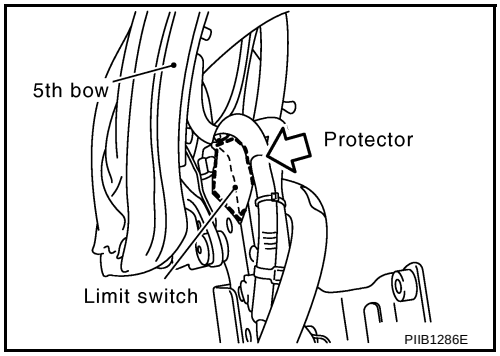
25. Recheck seals for A link and C link.



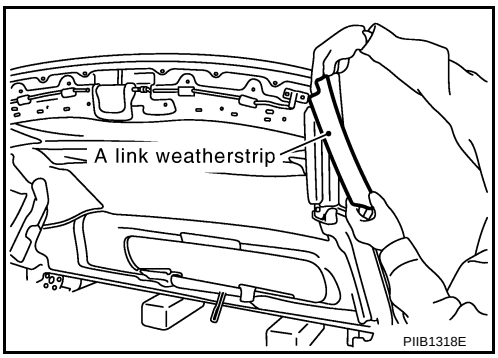
26. Install C link and 5th bow weatherstrip to 5th bow and C link.



27. Remove protection tape on the limit switch.



28. Install A link weatherstrip.



29. Install front lock finisher and welt after closing soft top.
30. Connect defogger harnesses at rear window.
31. Install 5th bow operating strut rods (RH/LH).
32. Install roof actuator (RH/LH). Refer to RF-107, "Removal and Installation of Roof Actuator" .
33. Install soft top assembly to vehicle. Refer to RF-87, "Removal and Installation of Soft Top Assembly" .
34. Check soft top open/close operation.
35. Check door glass contact. Refer to GW-53, "FITTING INSPECTION" .
36. Check for water leakage. Refer to RF-115, "Repairing Method for Water Leakage Around Doors" .

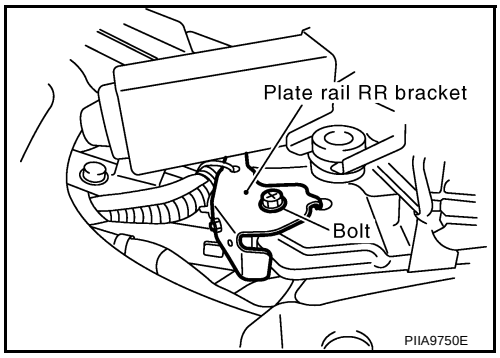
NOTE:
If there are wrinkles on the soft top cover, use a hair dryer to warm up the wrinkled area. Apply warm air from the hair dryer keeping the distance by 150 - 200 mm (5.9 - 7.8 in) and move the dryer to gently warm up soft top cover, for about 5 - 10 minutes until the wrinkle seems to be gone. Not to heat up soft top cover to much.

Removal and Installation of Switches

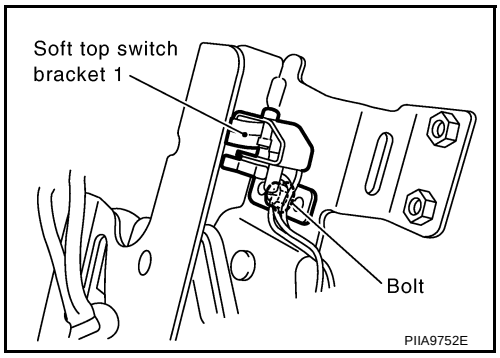
AIS0060L

REMOVAL

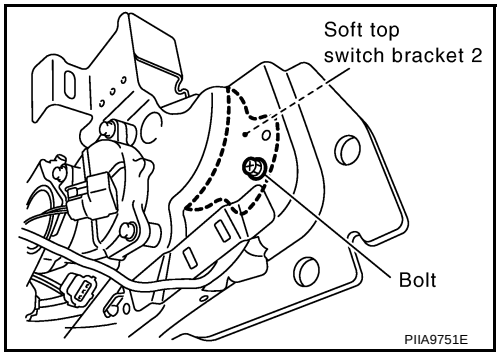
1. Uninstall soft top assembly from the vehicle. Remove roof actuator (RH/LH) from the soft top.
2. Remove harness tie wrap band at the left side of the soft top.
3. Remove limit switches with plate rail RR bracket by removing bolt.



4. Remove limit switches with soft top switch bracket1 by removing bolt.



5. Remove limit switches with soft top switch bracket 2 by removing bolt.



INSTALLATION

Install in the reverse order of removal.

NOTE:

Wire harnesses correctly to avoid following situation.

- Pinching harnesses by frame
- Tangling harnesses by frame and links
- Pulling harnesses between fixing point by harness clips.

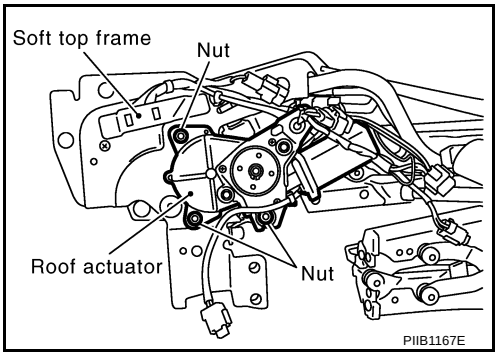
Removal and Installation of Roof Actuator

AIS0060M

REMOVAL

1. Remove soft top assembly. Refer to RF-87, "Removal and Installation of Soft Top Assembly" .
2. Remove nuts and then remove roof actuator (RH/LH).

   NOTE:
   If removal is difficult, rotate motor axis to remove them.



3. Disconnect soft top actuator harness connector.

INSTALLATION

Install in the reverse order of removal.

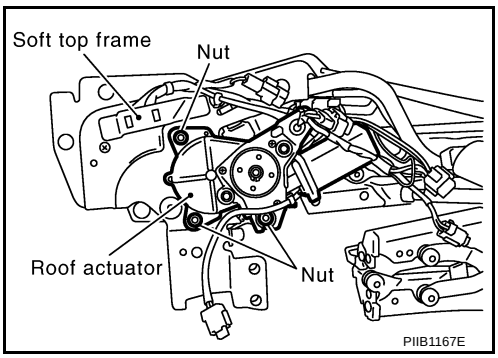
Removal and Installation of 5th Bow Drive Unit

AIS0060N

REMOVAL

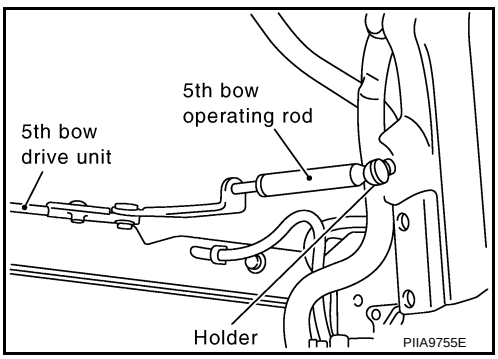
1. Uninstall soft top assembly from the vehicle.
2. Remove roof actuator (RH/LH) from the soft top.

   NOTE:
   If removal is difficult, rotate motor axis to remove them.



3. Disconnect 5th bow operating rod (RH/LH) at the frame side by pulling out the holder.

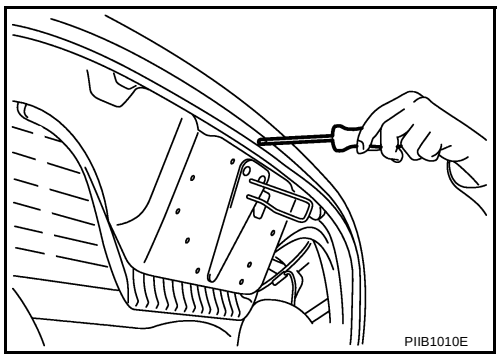
   NOTE:
   This step will make the 5th bow up and down motion easier.



4. Make sure that the limit switch contact around the rotation axis of the 5th bow on the left side of soft top is protected with tape.
5. Open the soft top manually, and put a stand under the 1st bow. Then fix the soft top not to move during this procedure.

   NOTE:
   Put a waste cloth between the front lock and the stand not to make any scratches to the soft top.
6. Remove the C link and 5th bow weatherstrip.

7. Remove the soft top cover retainer (5th bow retainer) from 5th bow by taking out screws.

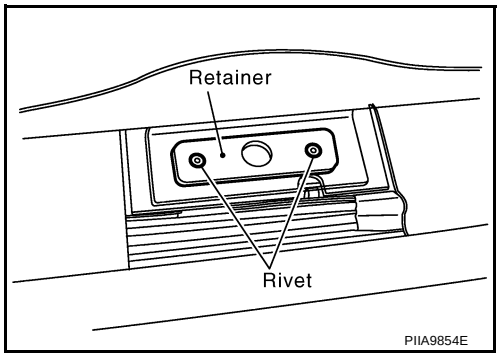


8. Drilling rivets attaching the soft top cover to 5th bow, then pull up the soft top cover bottom edge.

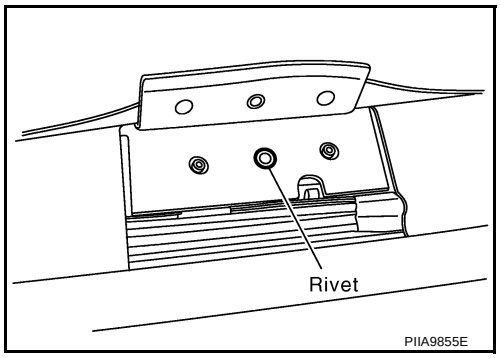
   NOTE:
   Use 4 mm (0.16 in) diameter drill bit to remove the rivet head. When drilling rivets, be careful not to damage the soft top cover.

9. Drilling rivets with retainers attaching with tags from the soft top cover, 5th bow finisher and the 5th bow.

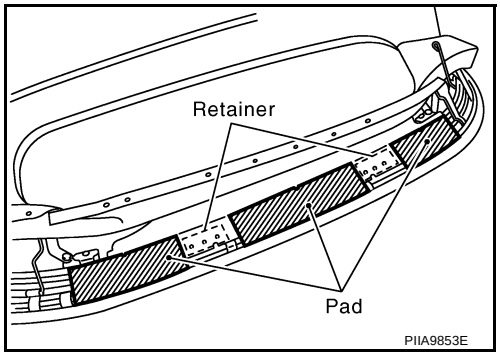
   NOTE:
   Use 4 mm (0.16 in) diameter drill bit to remove the rivet head. The soft top cover is separated from 5th bow.



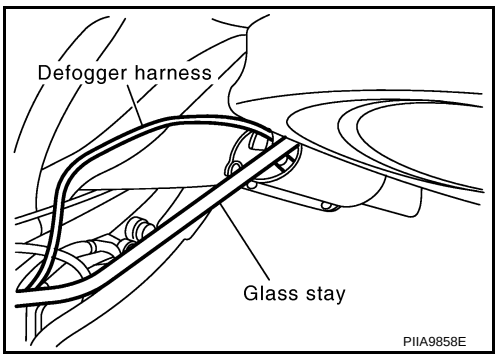
10. Drilling rivets under retainers by using 4 mm (0.16 in) diameter drill bit.



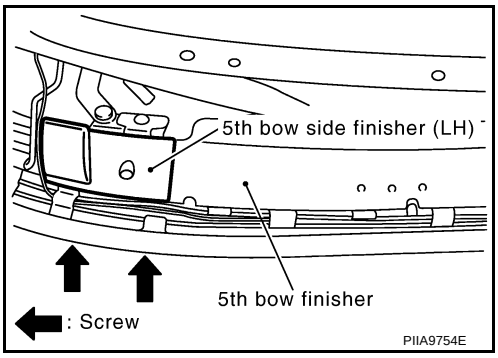
11. Remove pads from 5th bow finisher.



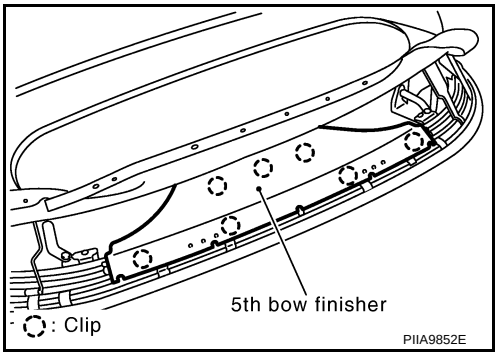
12. Roll the soft top cover bottom edge up, and disconnect defogger harness connector from the rear window glass.
13. Pull out glass stays from sleeves on each side of the rear window glass.



14. Remove 5th bow side finisher (RH/LH) by removing screws.



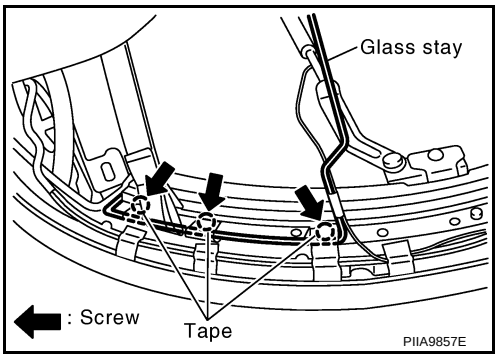
15. Remove 5th bow finisher by pulling the finisher up.



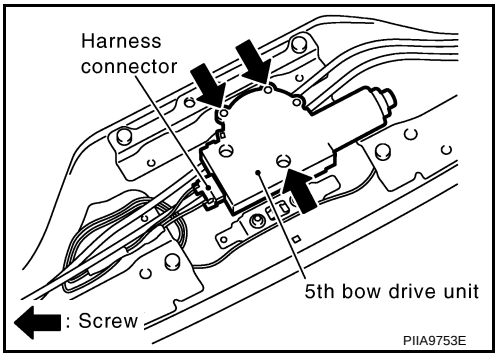
16. Remove glass stays from 5th bow by removing screws from the bottom of the 5th bow.

NOTE:

- When removing glass stays, support 5th bow to avoid a bend of glass stay. This bend may happen by the weight of the 5th bow and the tensile force of the tether from the soft top cover.
- Be careful not to damage the 5th bow nor to be hurt by the falling 5th bow, because the 5th bow is heavy and moves freely after removing glass stays.



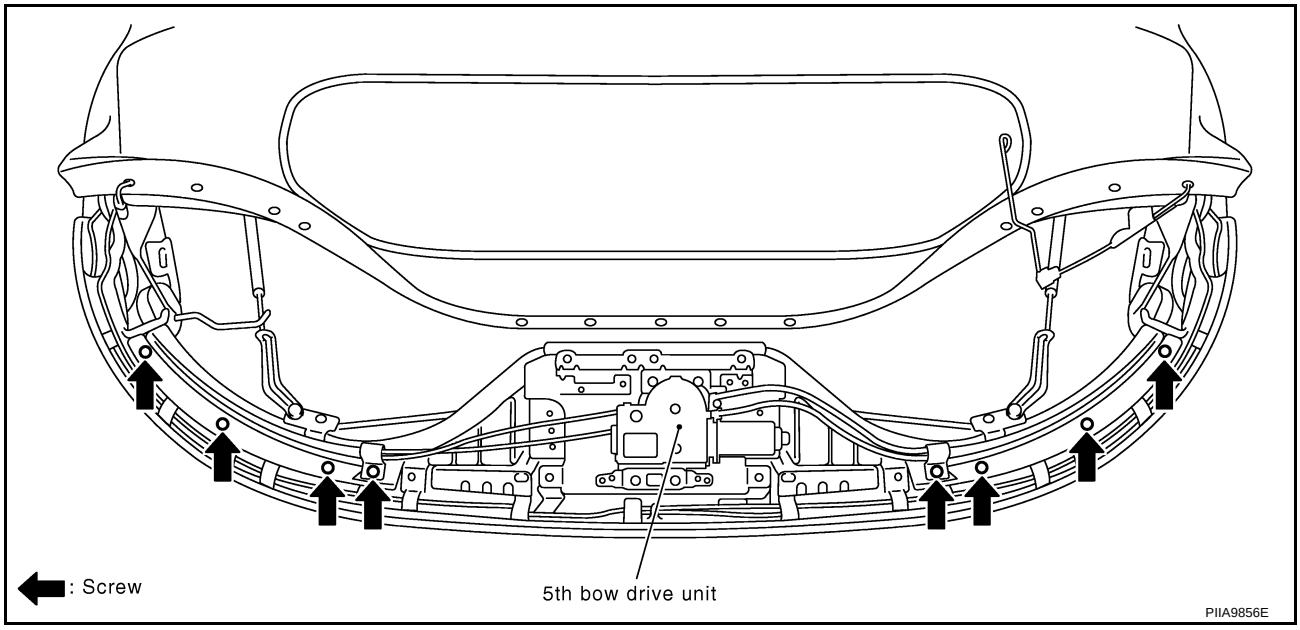
17. Disconnect 5th bow drive unit harness connector.



18. Remove 5th bow drive unit and rails together from 5th bow by removing screws.

NOTE:

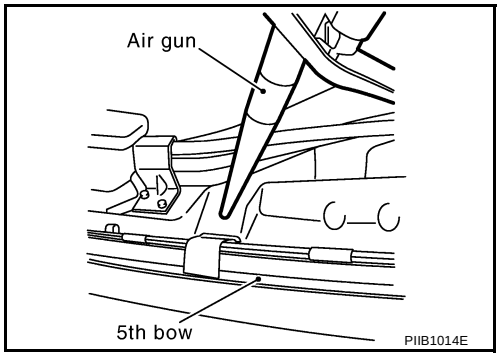
- After removing drive unit and rails, not to pull rails. Otherwise, the wire in the rail may be damaged.
- The screws are not reusable.



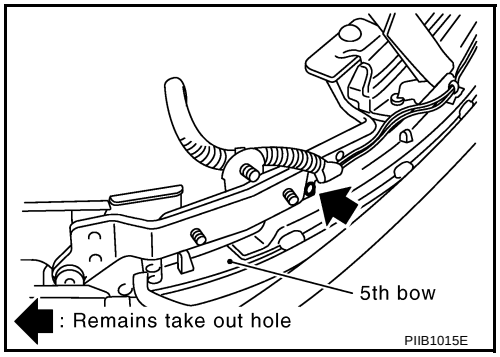
INSTALLATION

Preparation Work

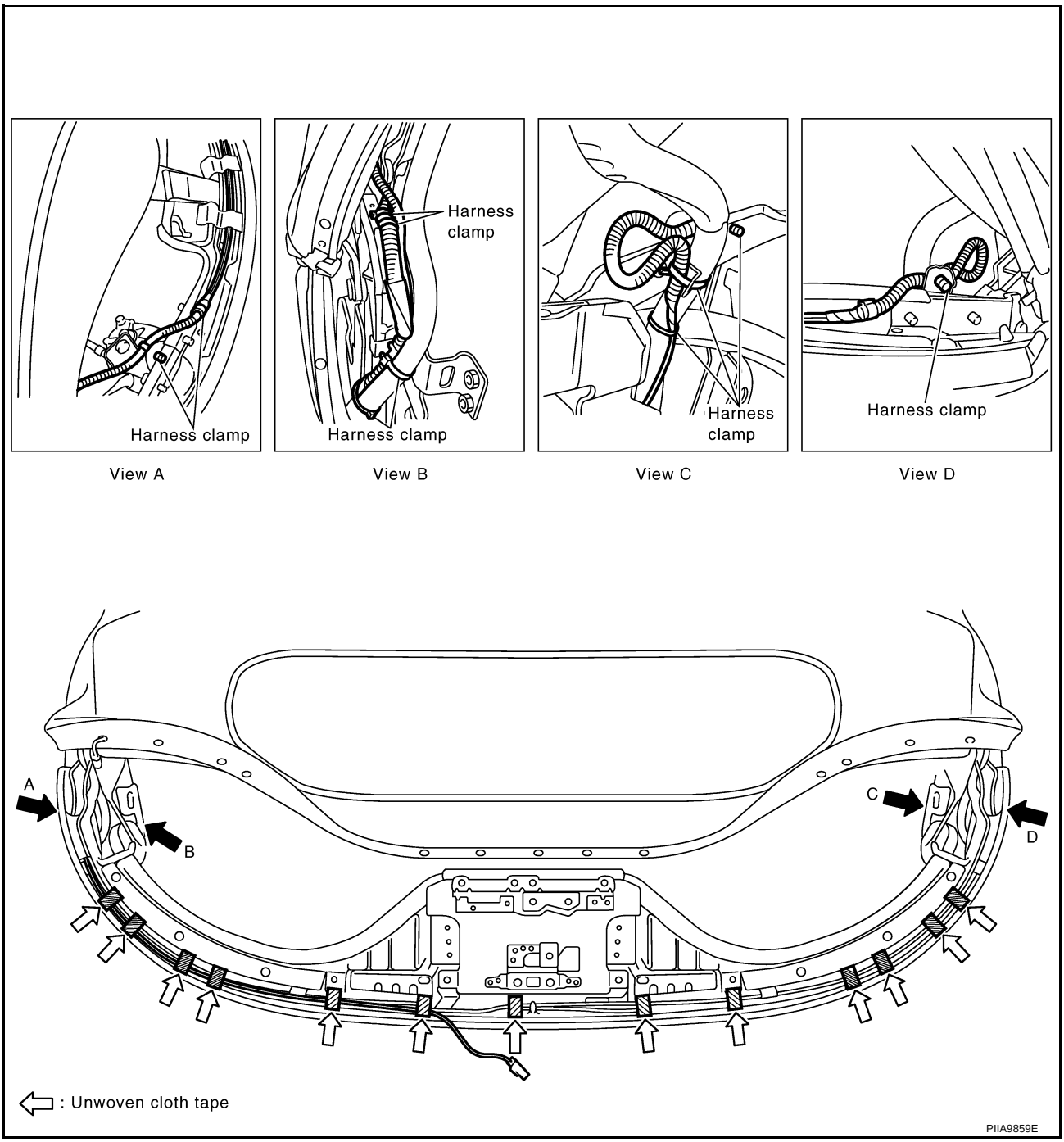
1. Blow remains of rivet toward both ends of 5th bow with compressed air if they are entering into 5th bow.

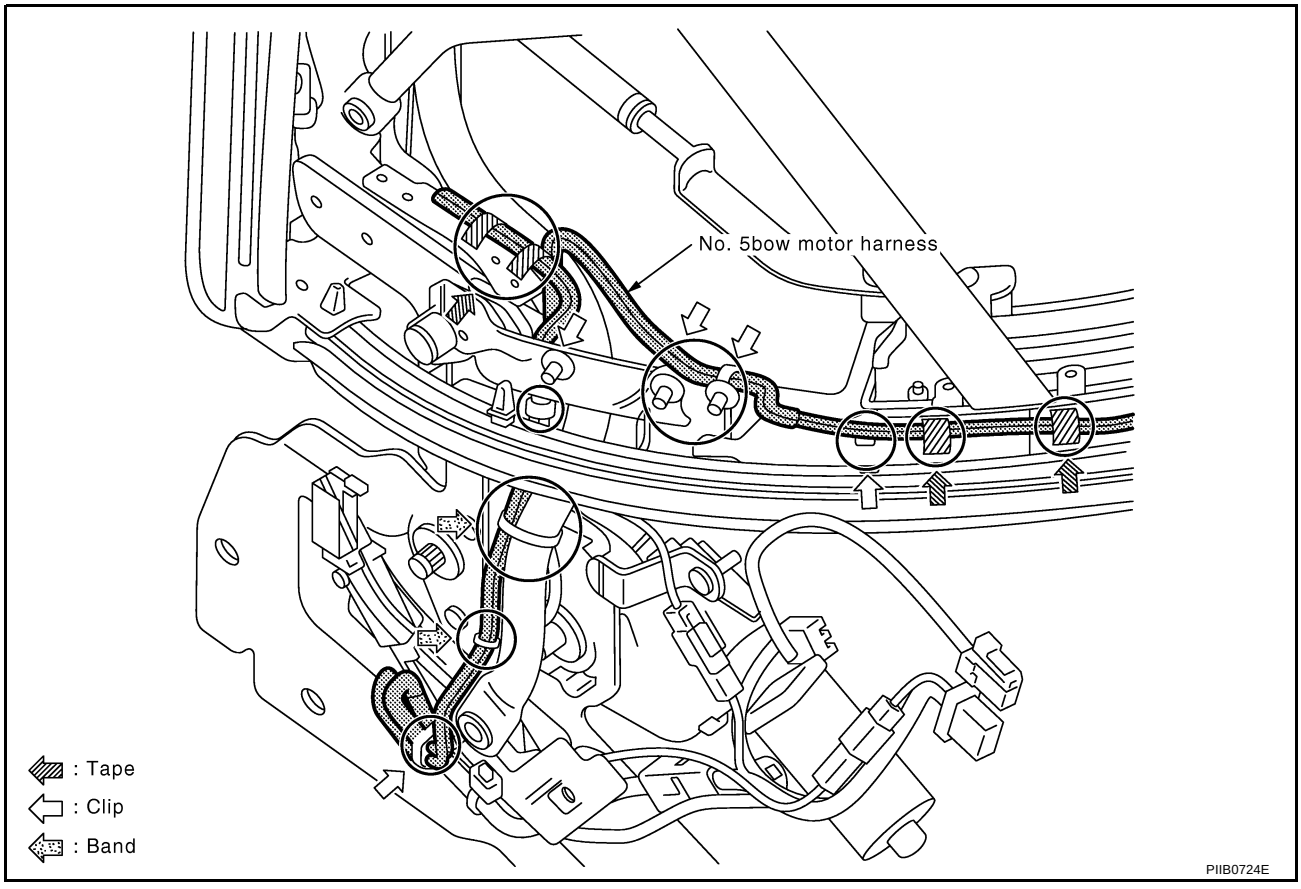


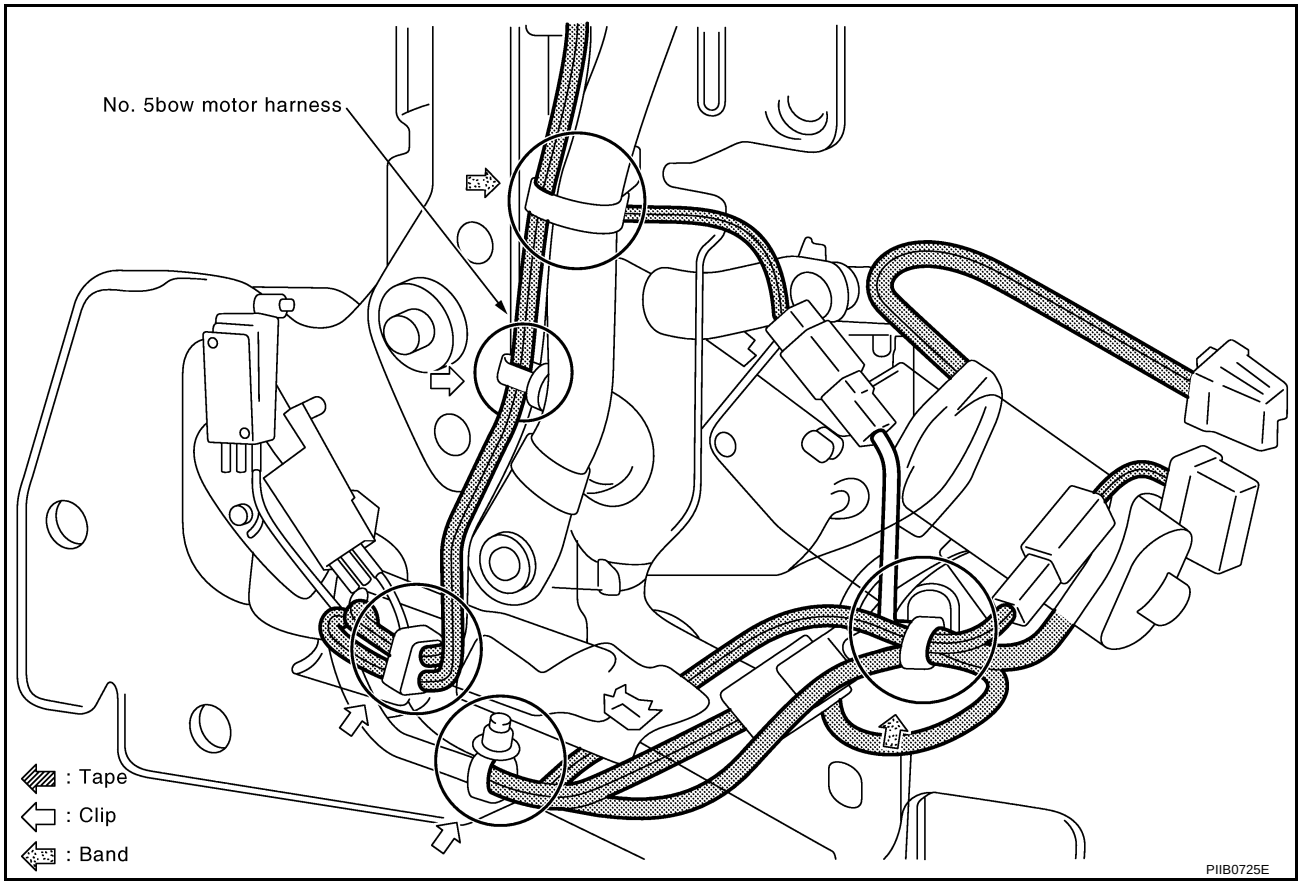
2. Remove the remains drawn to both ends by the air blow from the gap.



3. For fixing harness to 5th bow and Soft top frame, see next figure.




No. 5bow motor harness
: Tape
: Clip
: Band
PIIB0724E


No. 5bow motor harness
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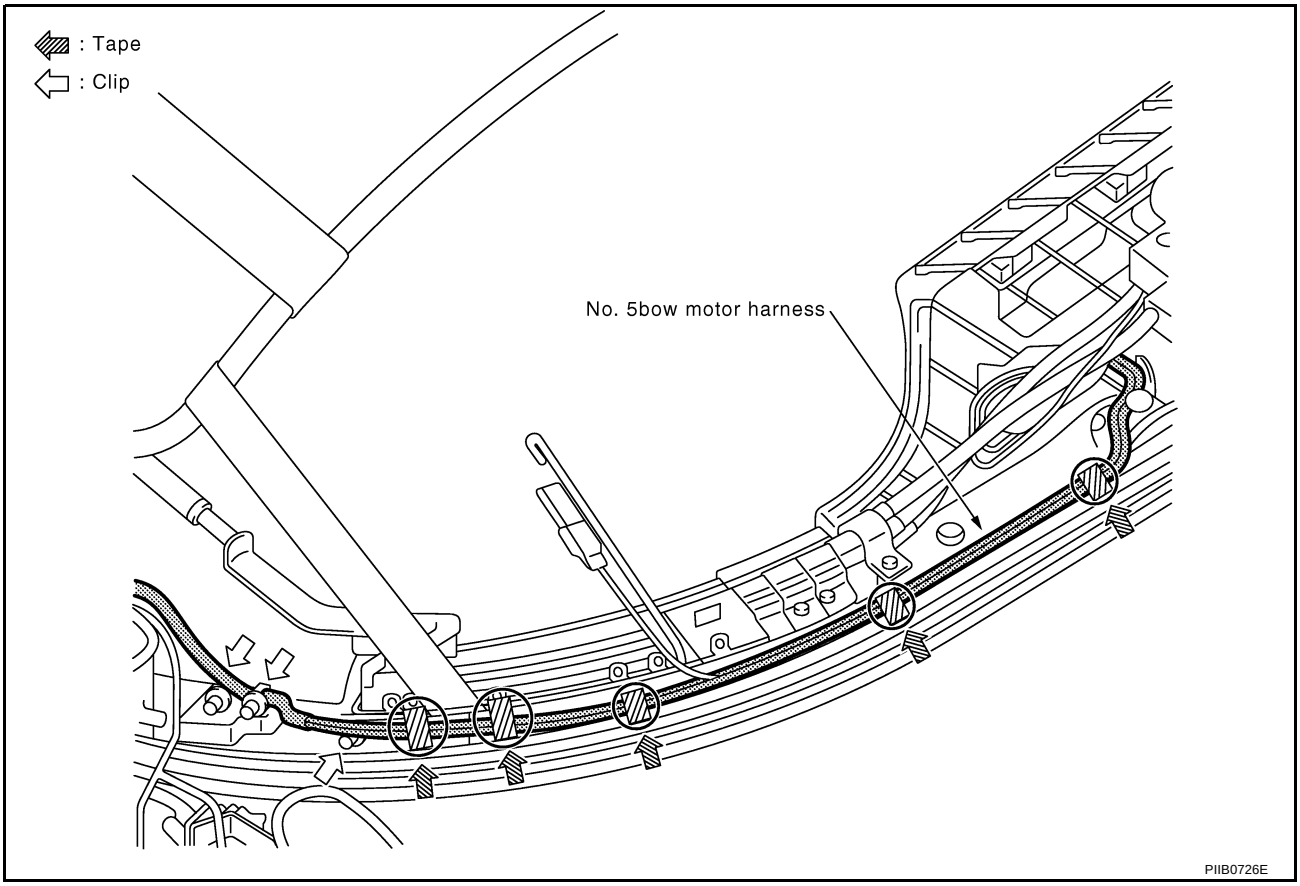
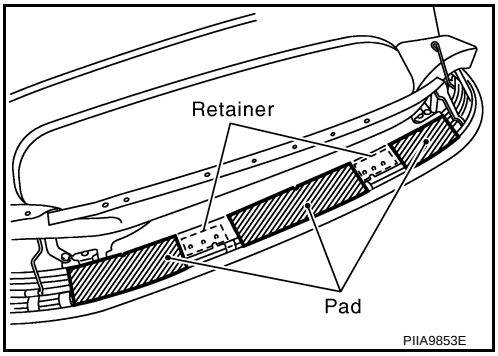
: Clip
: Band
PIIB0725E



4. Replace rivet retainer on back of 5th bow finisher with a new one.
5. Secure 5th bow finisher with rivet, and then apply nonwoven fabric.
6. Install 5th bow finisher and 5th bow finisher (RH/LH).
7. Apply pad on 5th bow finisher.

NOTE:
Apply pad to the original position.



Installation

Install in the reverse order of removal.

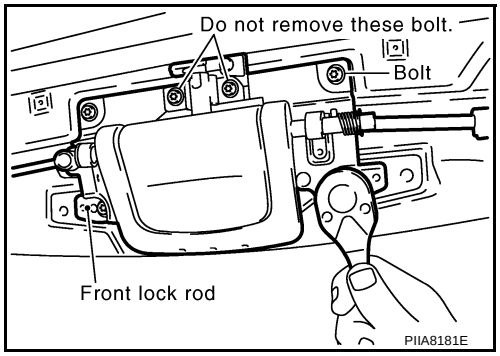
Removal and Installation of Front Lock

AIS0060O

REMOVAL

1. Remove welt and front finisher.
2. Remove bolts, and then remove front lock rod.

   CAUTION:
   Do not remove front lock hook, center bolts.



3. Remove bolts, and then remove front lock striker, LH, center, and RH.

   NOTE:
   Paint matching marks for front lock assembly to check location for installation.

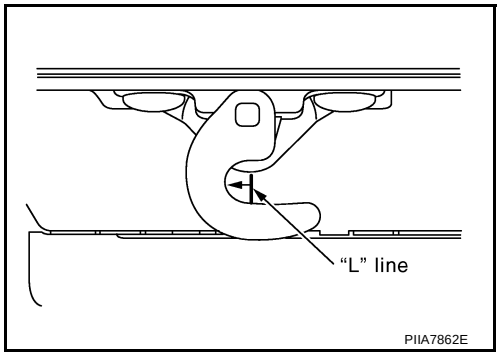
INSTALLATION

Install in the reverse order of removal.

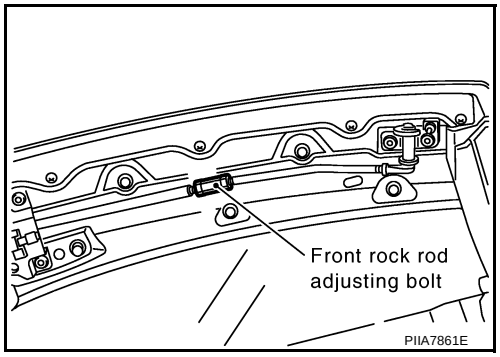
- Always adjust before installation. Refer to RF-114, "INSPECTION AND ADJUSTMENT" .

INSPECTION AND ADJUSTMENT

1. Apply super-check spray on a contact surface of 3 hooks which may touch with rods on the body. Fully close soft top, and then engage front lock.
2. Open soft top, and then make sure that the part, from which iron material is visible by peeling off super-check mark, exceeds “L” line.



3. Adjust hook contact length by adjusting front lock rod length using front lock rod adjust bolt if “L” line is not exceeded in front lock hook, RH and LH.



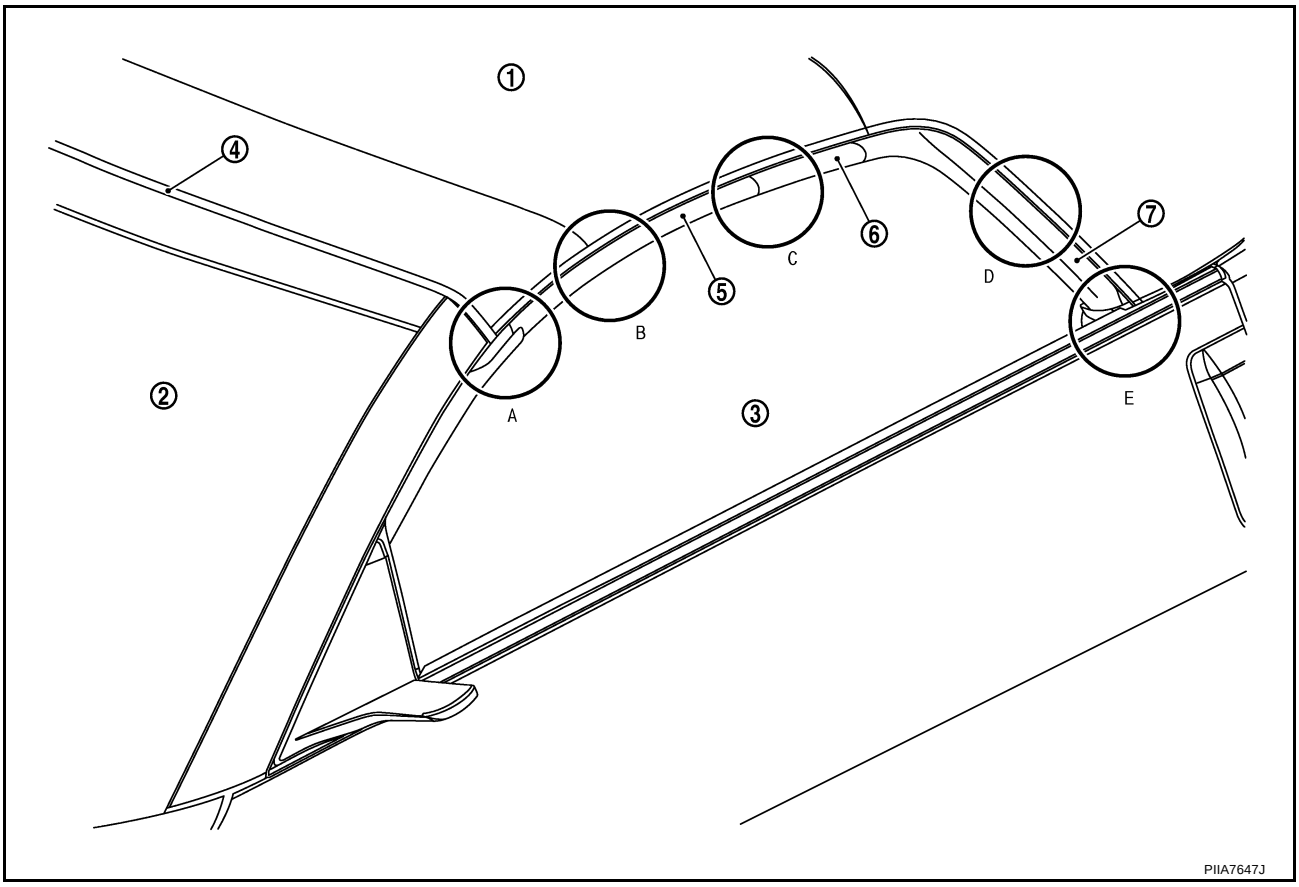
4. There is a part malfunction, if “L” line is not exceeded in front lock center hook. Replace front lock assembly.
5. Make sure that the super check mark exceeds the “L” line, and then measure the fully closed operating force while contacting push-pull gauge to the handle. Make sure that the operating force is 68.6 N (7 kg, 15.4 lb) or less, and then install it.

   NOTE:
   - Replace front lock assembly if the operating force is over the specified value.

- Make sure that operating force when replacing front weatherstrip, center weatherstrip, and rear weatherstrip is 107.8 N (11 kg, 24.2 lb) or less.

Repairing Method for Water Leakage Around Doors

AIS0060P



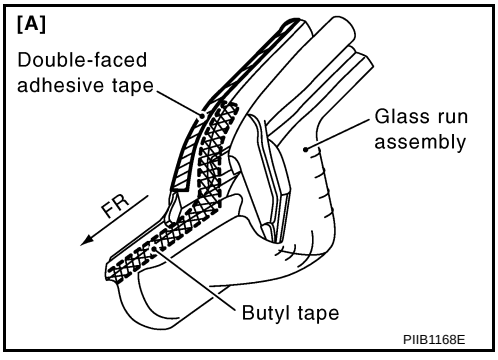
1. Soft top assembly
2. Windshield glass
3. Door glass
4. Glass run assembly
5. A link weatherstrip
6. B link weatherstrip
7. C link and 5th bow weatherstrip

WATER LEAKAGE FROM A

Water may be entering passenger room through back of front pillar.
Cause: Butyl tape on back of glass run assembly may be separating from roof panel.

Repair Procedure 1

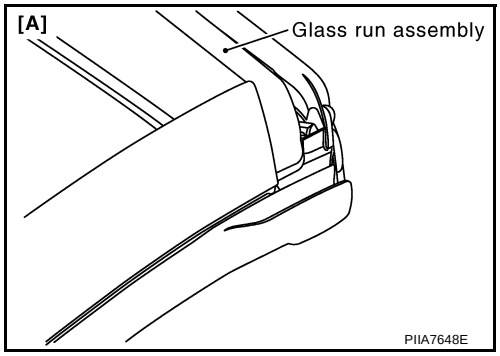
Apply butyl tape on back of glass run assembly again, and correct installing position.



Water may be entering through connection between front pillar and front edge of soft top.
Cause: There may be a gap between glass run assembly and weatherstrip of soft top.

Repair Procedure 2

Replace glass run assembly with a new one to eliminate the gap between glass run assembly and weatherstrip.



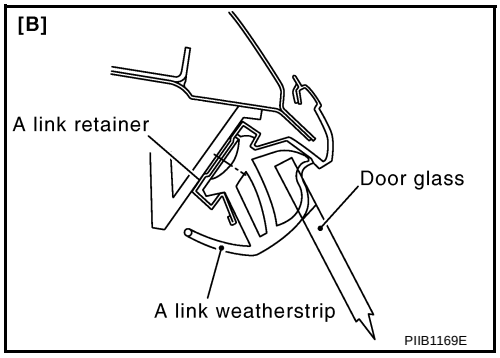
WATER LEAKAGE FROM B

Water may be entering through door glass upper inside edge.
Cause: There may be poor contact between A link weatherstrip of soft top and door glass.

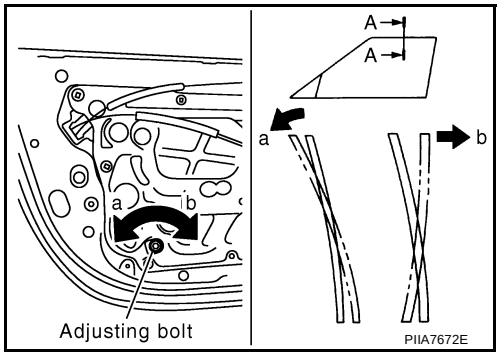
Repair Procedure 3

- Adjust door glass position frontward/backward or upward/downward against soft top assembly.
- Adjust door glass tilt contact by rotating adjusting bolt on regulator lower edge.

CAUTION:
Soft top assembly position may be incorrect when glass upper position is low even if door glass adjustment is performed. Perform soft top assembly adjustment, if necessary. Refer to GW-51, "FRONT DOOR GLASS AND REGULATOR" .



Adjust door glass tilt contact by rotating adjusting bolt on regulator lower edge.

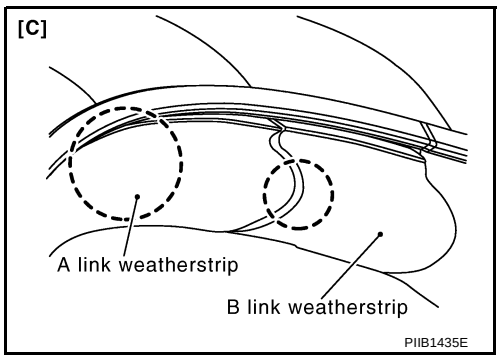


WATER LEAKAGE FROM C

Water may be entering through a joint between soft top weatherstrips.
Cause: There may be a step or a gap at the weatherstrips joint.

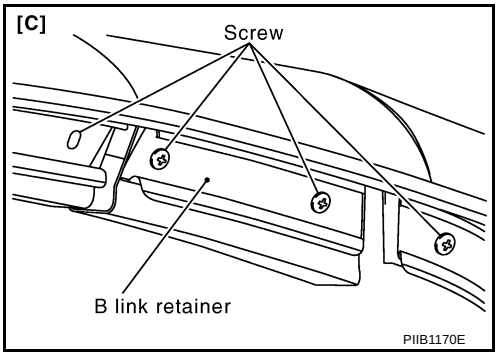
Repair Procedure 4

- Replace weatherstrip with a new one.
- If the step or the gap is not eliminated after replacing weatherstrip, then perform the following procedure.

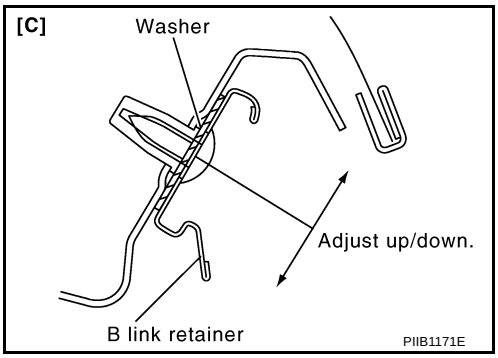


Repair Procedure 5

- Loosen retainer screws.
- Make fine upward/downward position adjustments to the B link retainer.
  (Move the B link retainer of a protruded weatherstrip downward for the adjustment.)



- Insert approximately 0.5 mm (0.02 in) washer into the back of the subsiding weatherstrip retainer, if the step is not eliminated after adjustment.



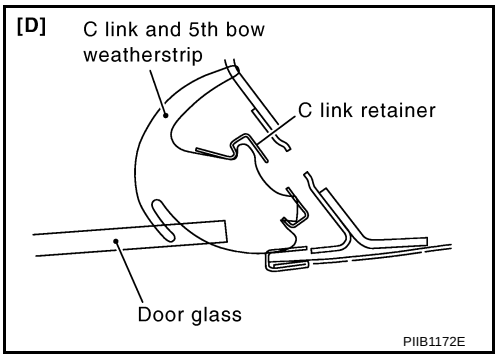
WATER LEAKAGE FROM D

Water may be entering through inside door glass rear.
Cause: There may be poor contact between Clink and 5th bow weatherstrip of soft top and door glass.

Repair Procedure 6

- Adjust door glass position frontward/backward or upward/downward against soft top.
- Adjust door glass tilt contact by rotating adjusting bolt on regulator lower edge.

CAUTION:
Soft top assembly position may be incorrect in the case of glass upper position is low even if door glass adjustment is performed. Perform soft top assembly adjustment if necessary. Refer to GW-51, "FRONT DOOR GLASS AND REGULATOR" .

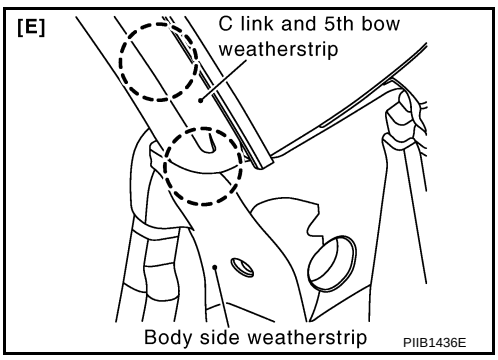


WATER LEAKAGE FROM E

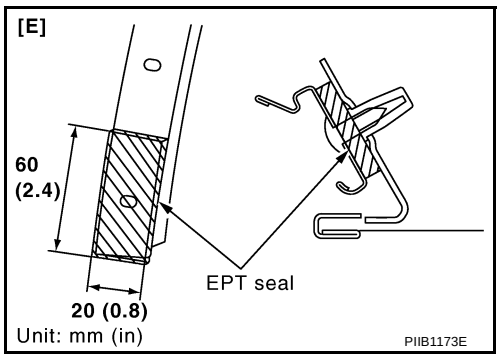
Water may be entering passenger room through weatherstrip joint.
Cause: There may be a step or a gap between C link and 5th bow weatherstrip side and body side of weatherstrip.

Repair Procedure 7

- Remove C link weatherstrip.
- Remove C link retainer.



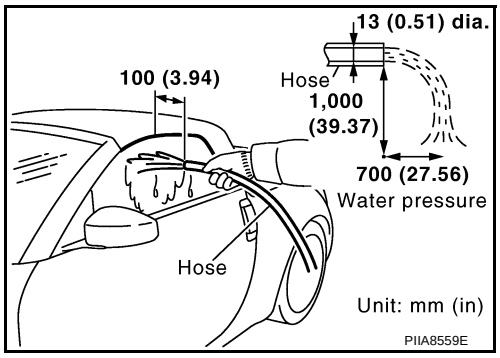
- Apply approximately 5 mm (0.2 in) thick EPT seal to retainer back surface.



WATER LEAKAGE TEST

Visually check for water leakage after repairing.

1. 2 workers are required. One worker checks inside the vehicle, and the other one washes with water.
2. Use 13 mm (0.51 in) diameter hose. Adjust water pressure by following method.
   Hold the hose horizontally, and release water at 1000 mm (39.37 in) height from ground. Adjust the distance, between the ground point just below the hose and the water dropping point, to reach 700 mm (27.56 in). (See the figure.)
3. Keeping the distance between the hose and the testing area by 100 mm (3.94 in), apply water along the area 3 times. During applying water, move the hose by 100 mm (3.94 in)/sec speed.



4. Visually check for water leakage.

Correspondence in Emergency

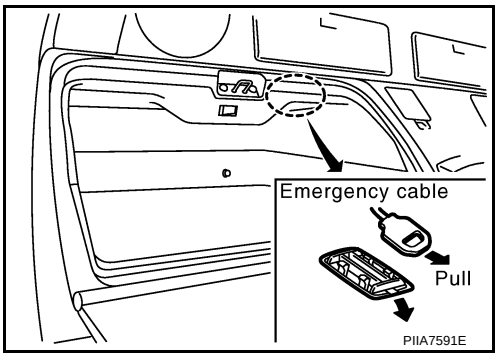
AIS0060Q

If the soft top cannot be operated electrically in the event of a discharged battery or any other system malfunction, the soft top needs to be closed manually or opened manually according to the following procedures.

MANUAL OPERATION (SOFT TOP FULLY OPEN ⇒ FULLY CLOSE)

1. Open The Trunk Lid

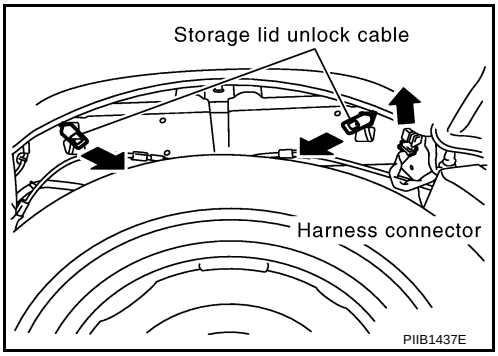
- Open the lid behind the passenger's seat (rear floor box).
- Remove cap of the emergency cable.
- Pull the emergency cable upper surface in the box.
- Open trunk lid.



2. Open The Storage Lid

- Remove floorboard inside of the trunk.
- Disconnect the storage lid motor harness connector upperward, which is located at the right hand side of the trunk.
- Pull down the storage lid lock release cable (right and left sides in the trunk).
- Confirm a clicking sound of lock release.
- Pull up the storage lid from the right and left sides of vehicle (two people are required).

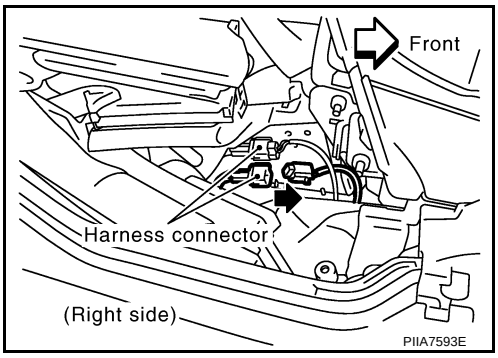
  CAUTION:
  The storage lid is extremely heavy. Pulling it up should be done by two people. Use Hex-wrench to rotate the axis of the gear, when the lid does not move.



3. Close The Soft Top

- Disconnect roof actuator harness connector right and left sides.

  CAUTION:
  2nd disconnect top of roof actuator harness connector right and first disconnect top of roof actuator harness connectors left sides.
- Pull up the soft top right and left sides of the vehicle slowly by hand (two people are required).
- Lock soft top front lock.



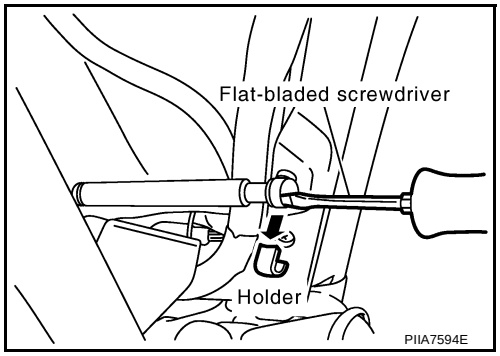
4. Close The Storage Lid

- Push down soft top to body panel.

5. Lower The Soft Top 5th Bow

- Remove both operating rod of soft top 5th bow.

  CAUTION:
  Remove a holder of operating rod end.
  Simultaneously hold soft top 5th bow by hand when removing the holder.



- Push in 5th bow to storage lid (do half lock).

CAUTION:
After closing the soft top manually according to the above procedures, have the soft top operation system checked and/or repaired by a NISSAN dealer as soon as possible.
Avoid leaving the vehicle outside for long periods or driving at high speed. As the rear of the soft top is not locked completely, this may allow wind and rain get into the vehicle.

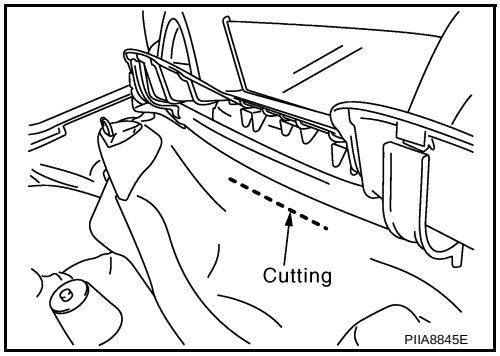
MANUAL OPERATION (SOFT TOP FULLY CLOSE ⇒ FULLY OPEN)

1. Remove The Luggage Floor Trim

- Remove the rear floor box and luggage floor finisher upper. Refer to EI-41, "Removal and Installation (for Roadster Models)" .

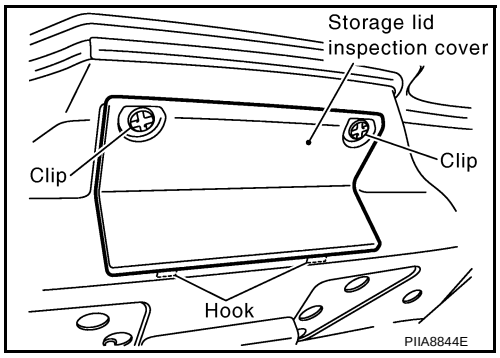
2. Cutting Storage Room Finisher

- Cut storage room finisher from seat side.

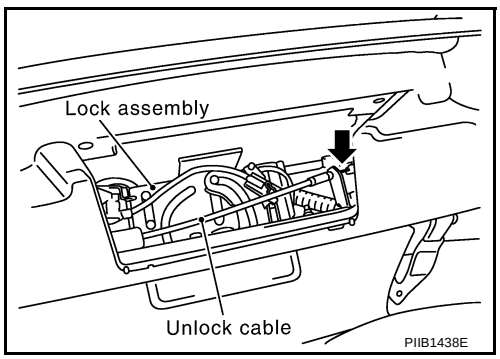


3. Unlock The Storage Lid

- Remove clip of inspection cover.



- Remove the storage lid inspection cover.
- Pull the unlock wire then unlock the soft top 5th bow.



4. Open The Soft Top 5th Bow

- Remove both shock absorber of soft top 5th bow.
- Open the soft top 5th bow (approximate 90 degrees)

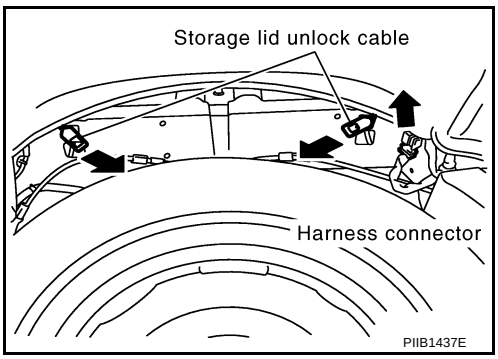
5. Open The Trunk Lid

- Pull the emergency cable.
- Open the trunk lid.

6. Open The Storage Lid

- Remove floorboard inside of the trunk.
- Disconnect the storage lid motor harness connector downward which is in the right hand side of the trunk.
- Pull down the storage lid lock release cable (right and left side of the trunk).
- Confirm a clicking sound of lock release.
- Pull up the storage lid from the right and left sides of vehicle (two people are required).

  CAUTION:
  The storage lid is extremely heavy. Pulling it up should be done by two people. Use Hex-wrench to rotate the axis of the gear, when storage lid does not move.



- Disconnect roof actuator harness connector right and left side (disconnect top of roof actuator harness connector right and left side)

7. Open The Soft Top

- Lower the soft top 5th bow.
- Unlock the front lock.
- Open the soft top right and left side of the vehicle slowly by hand (two person job).

8. Close The Storage Lid

NOTE:
If necessary.

9. Close The Trunk Lid

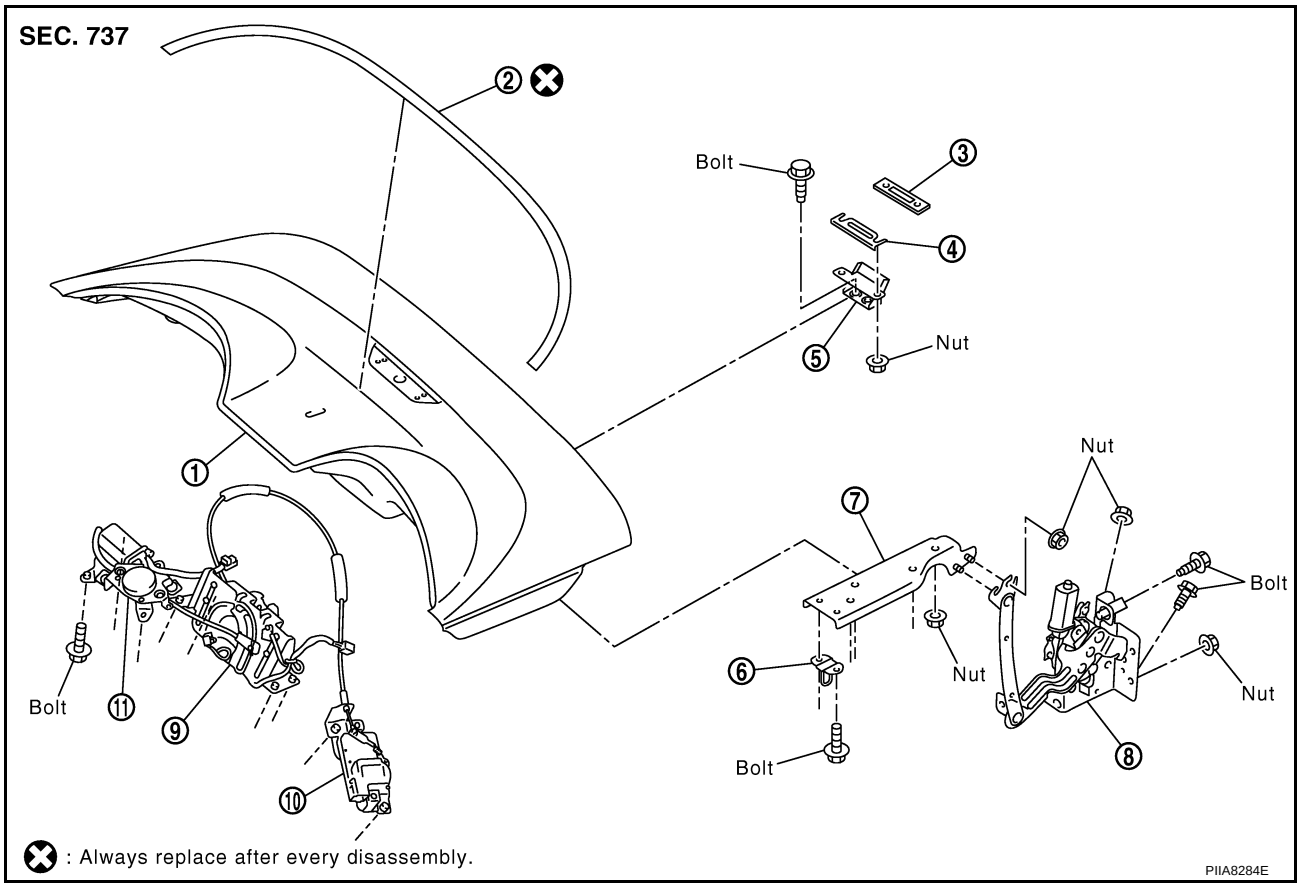
NOTE:
If necessary.

STORAGE LID

PFP:97002

Removal and Installation of Storage Lid Assembly

AIS0060R



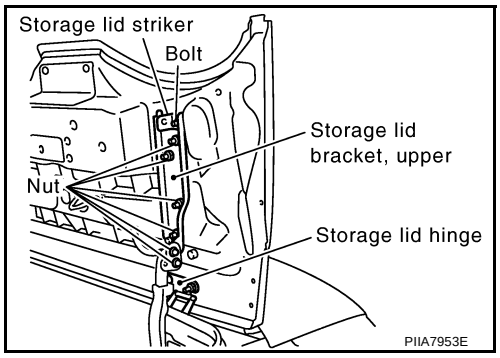
1. Storage lid
2. Storage outer protector
3. Spacer
4. Shim
5. Storage lid hinge
6. Storage lid striker
7. Storage lid upper bracket
8. Storage lid lower bracket
9. 5th bow lock
10. 5th bow unlock actuator
11. 5th bow closure motor

REMOVAL

1. Disconnect storage lid actuator connector.
2. Remove bolts, and then remove storage lid striker.

   NOTE:
   - 2 or more workers are required.
   - Paint matching marks to check location for installation.
3. Remove nuts which is connecting the storage lid upper bracket and the storage lid lower bracket.

   NOTE:
   Paint matching marks to check location for installation
4. Remove nuts of storage lid hinge, and then remove storage lid, spacers and shims.

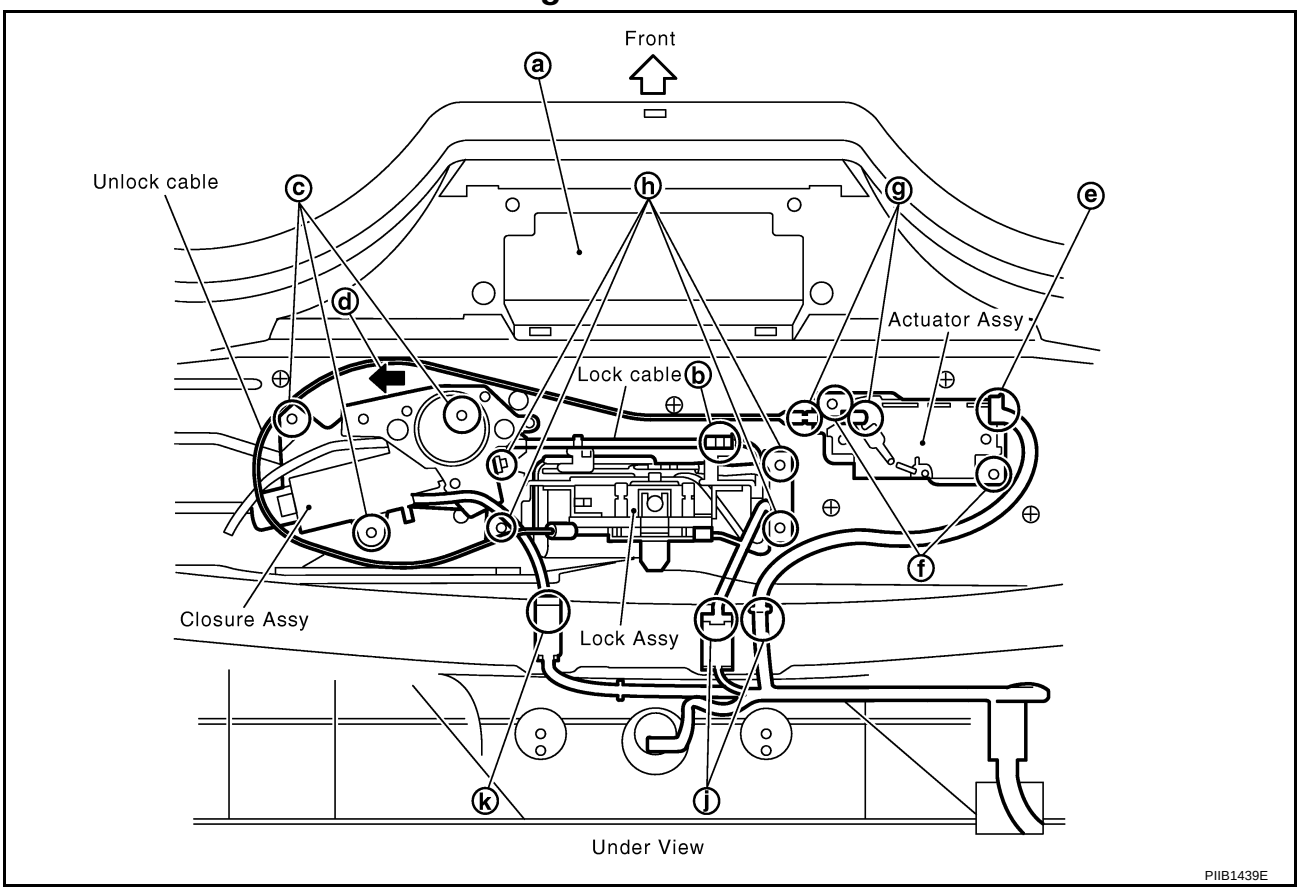


INSTALLATION

1. Install in the reverse order of removal.
2. Install storage lid, and then adjust fitting of lid.

Removal and Installation of Storage Lid Inside Unit

AIS0060S



REMOVAL

NOTE:

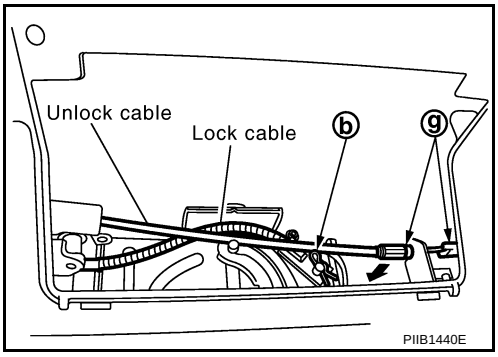
After installing Storage lid on the vehicle, an adjustment of Storage lid position is required in both closed and opened condition.

Put the removed storage lid on the floor or a work bench covered by waste clothes to prevent any scratches.

1. Remove storage lid inspection cover on the front side of Storage lid. (a in the figure)
2. Disconnect a wire from a lock assembly by pulling out a connection pin. (b in the figure)

   NOTE:

   The pin should be taken off by a small pliers not to fell into Storage lid. If the pin fell into Storage lid, then it is very difficult to take the pin out from the lid. And if the pin is left inside the lid, it may make an uncomfortable noise.



3. Remove closure mounting bolt from back of storage lid. (c in the figure)
4. Move closure toward outside of vehicle (because it interferes with unlock). (d in the figure)
5. Disconnect unlock actuator connector. (e in the figure)
6. Disconnect actuator side of unlock cable. (g in the figure)
7. Remove unlock actuator mounting bolt from back of storage lid, and then remove unlock actuator from inspection cover. (f in the figure)
8. Remove lock mounting bolt from back of storage lid, and then move entire lock toward rear of storage lid. (h in the figure)

9. Disconnect lock harness connector, and then remove lock from inspection cover. (j in the figure)
   NOTE:
   Turn lock catcher counterclockwise, and then face it to storage lid inspection hole side to remove because it interferes with storage lid when removing.
10. Disconnect closure harness connector, and then remove closure from inspection cover. (k in the figure)
11. Disconnect unlock actuator, lock, and closure harness connectors from inspection cover.
    (Push in harness connector clip tabs from back of storage lid using a screwdriver so as to remove.)

INSTALLATION

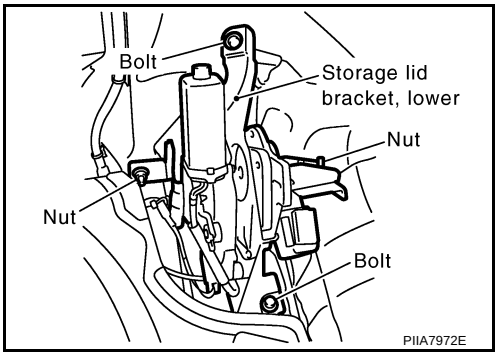
Install in the reverse order of removal.

Removal and Installation of Storage Lid Actuator

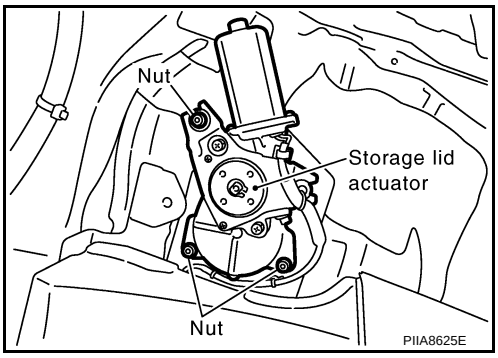
AIS0060T

REMOVAL

1. Remove trank room trim.
2. Remove nuts and bolts, and then remove storage lid lower bracket.



3. Disconnect storage lid actuator harness connector.
4. Remove nuts and remove storage lid actuator from storage lid bracket, lower.

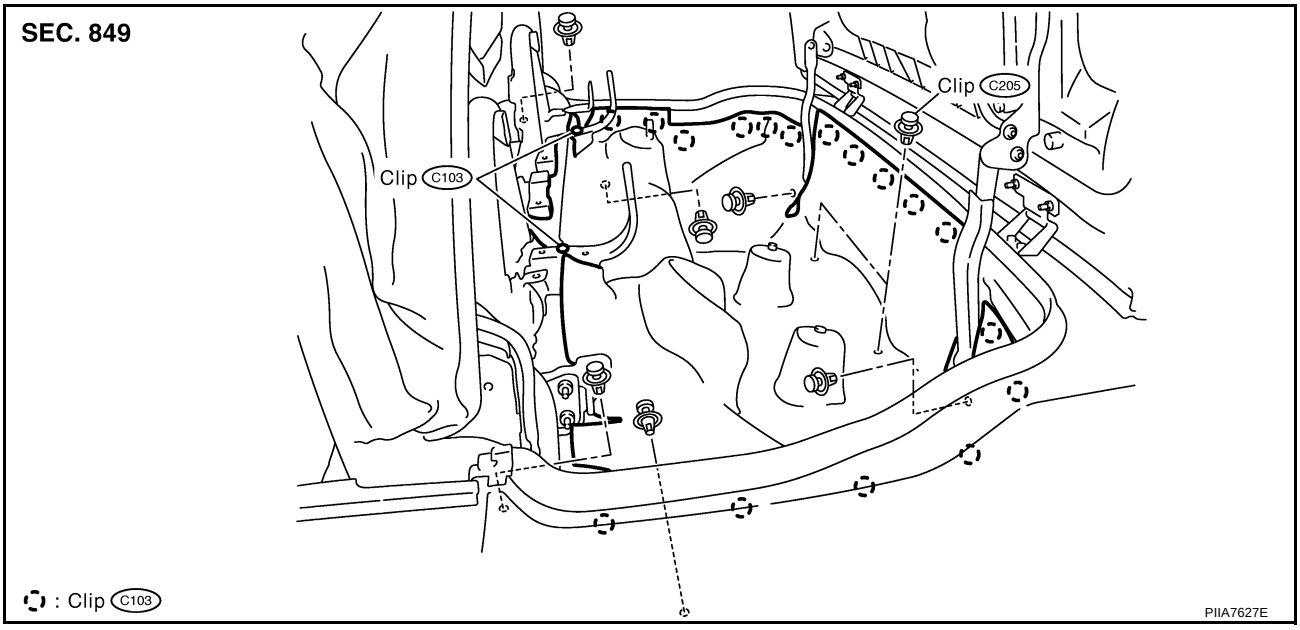


INSTALLATION

Install in the reverse order of removal.

Removal and Installation of Storage Room Finisher

AIS0060U



REMOVAL

1. Remove rear side finisher. Refer to EI-37, "REAR SIDE FINISHER" .
2. Remove bolts, and then soft top mounting bracket (front).
3. Remove bolts, and then soft top mounting bracket (rear).
4. Lift up soft top mounting bracket using a lever, and then remove storage room finisher clips.
5. Remove storage room finisher clips, and then remove rear side of storage room finisher.

6. Lift up back panel finisher clips using remover tools, and then remove front side of storage room finisher.

INSTALLATION

Install in the reverse order of removal.

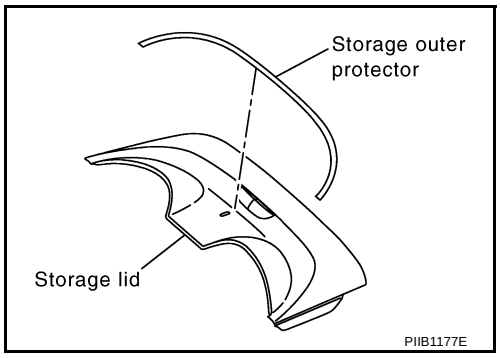
Removal and Installation of Storage Outer Protector

AIS0060V

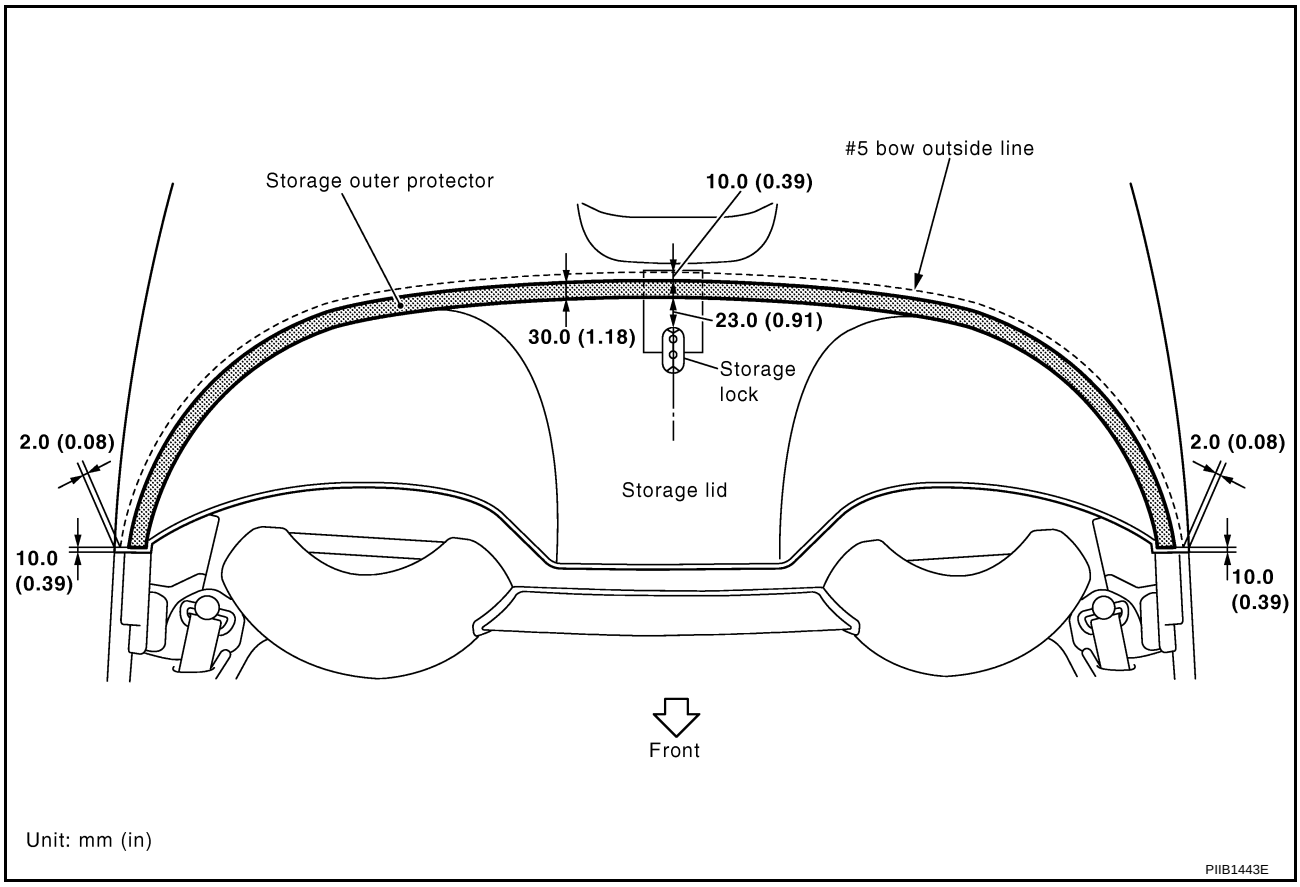
Note the following, and install in the reverse order of removal.

1. Heat the bonded area using a hair dryer, and then remove storage outer protector.

   NOTE:
   Do not reuse storage outer protector after removing.



2. Remove storage room finisher.



3. Clean Storage lid surface.
4. Close Soft top, and draw a line on a storage lid just behind the 5th bow out side edge by a water base marker pen.
5. Apply IPA solution (isopropyl alcohol : water = 1 : 1) on the lid, and set the storage outer protector position from one side. And do the same procedure to another side.
6. Apply left side storage lid outer aligning with left storage lid scribed line.
7. Apply right side storage lid outer aligning with right storage lid scribed line.

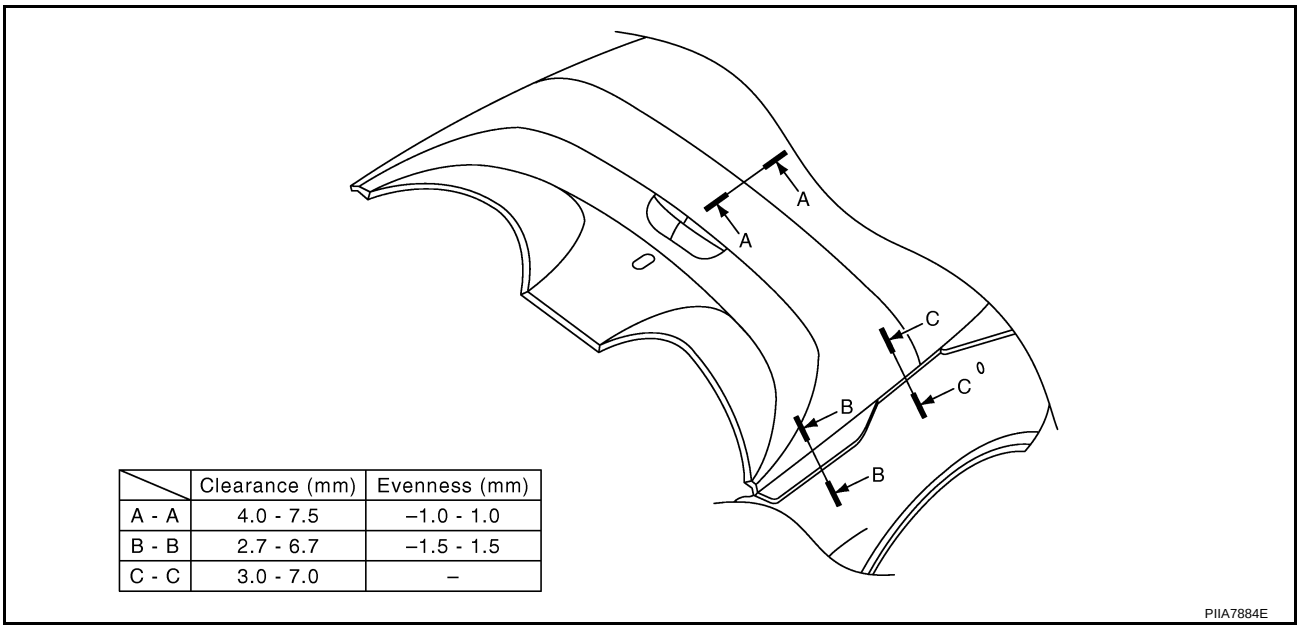
NOTE:
Not to put air or dust under the tape.
After applying the tape on the lid, peal off the protection film on the storage outer protector.

- Secure left, right, and front end of storage room finisher with remaining part when removing using double-faced adhesive tape.

Adjustment of Storage Lid

AIS0060W

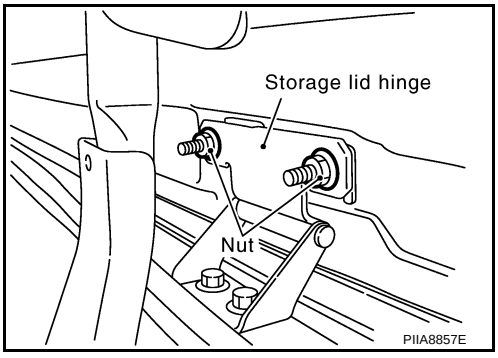
ADJUSTMENT IN FULLY CLOSED POSITION



	Clearance (mm)	Evenness (mm)
A - A	4.0 - 7.5	–1.0 - 1.0
B - B	2.7 - 6.7	–1.5 - 1.5
C - C	3.0 - 7.0	–

A-A Clearance Adjustment

Loosen nuts of storage lid hinge. Adjust storage lid until the clearance is within the specification.

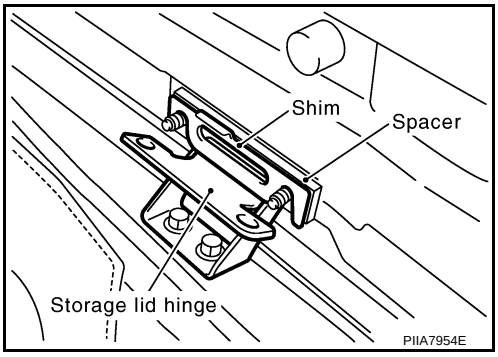


B-B Clearance Adjustment

Loosen nut of storage lid striker lock, and adjust it until the clearance is within the specification.

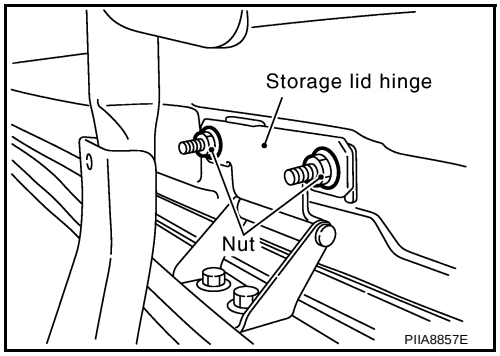
C-C Clearance Adjustment, A-A Evenness Adjustment

Loosen nuts of storage lid hinge. Adjust storage lid height by exchanging or adding shim until the evenness is within the specification.



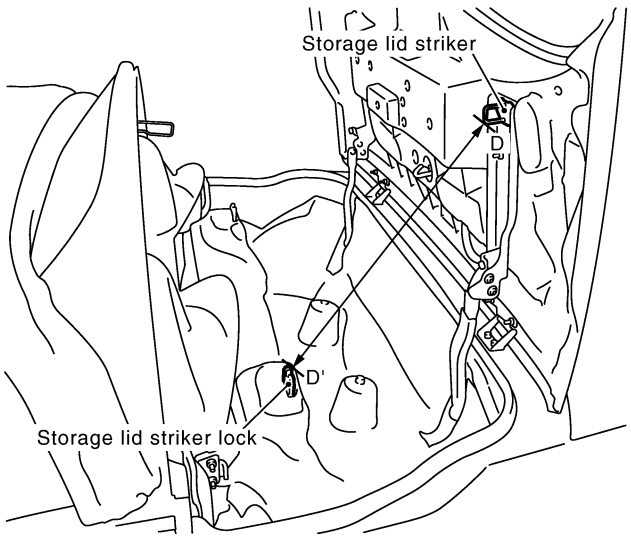
B-B Evenness Adjustment

Loosen nuts of storage lid hinge. Adjust the lid until the evenness is within the specification.

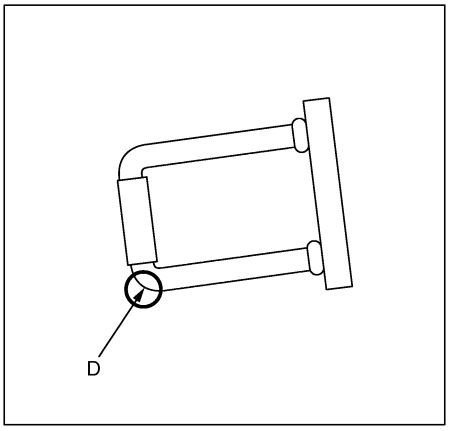


ADJUSTMENT IN FULLY OPENED POSITION

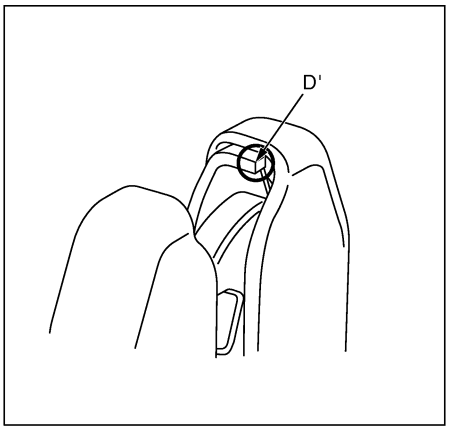
Adjust linkage position of storage lid striker and storage lid striker lock to specified dimension, by loosening nuts fixing storage lid bracket, upper and lower.



	Dimension (mm)
D - D'	566.0



"D" side measurement part

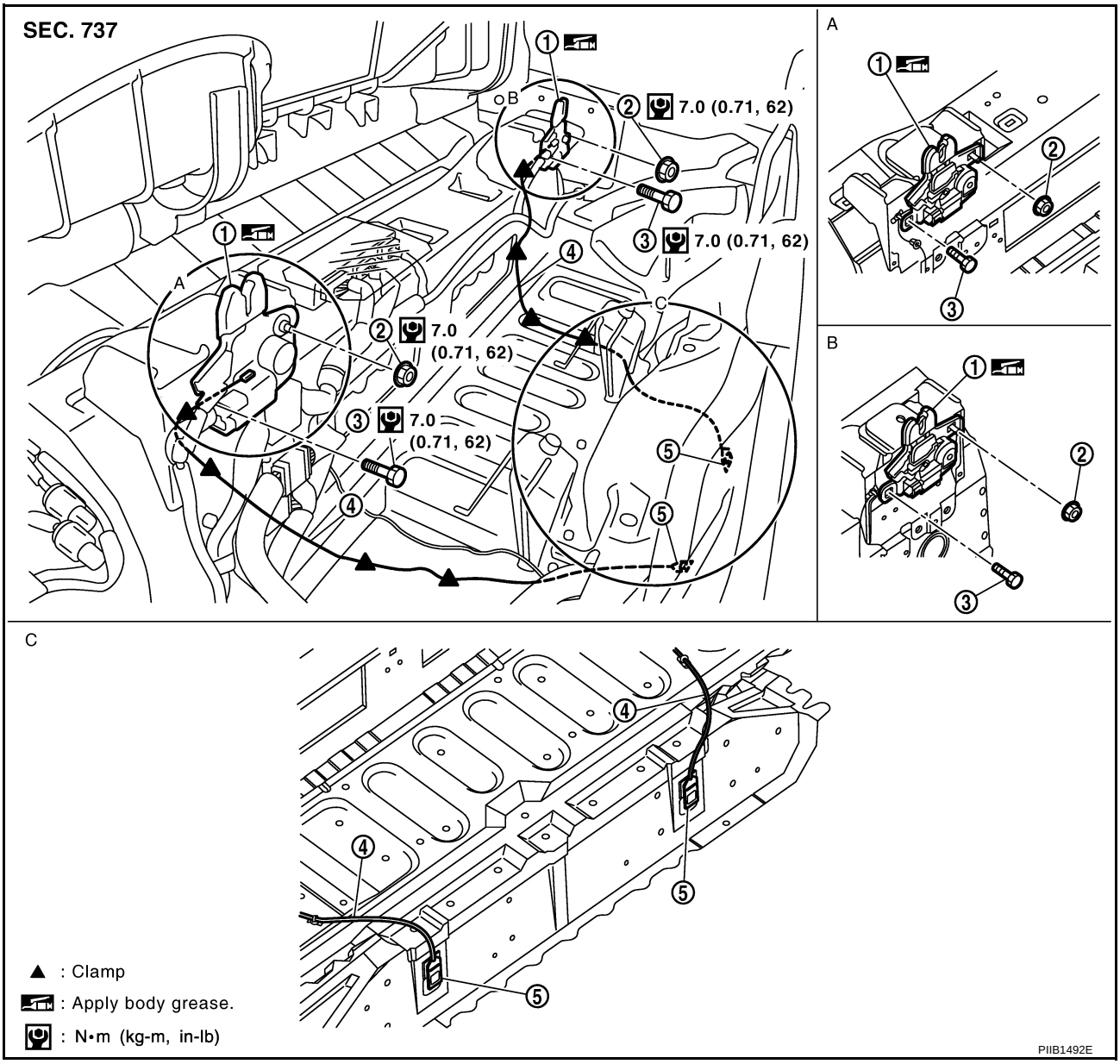


"D'" side measurement part

PIIA8848E

Removal and Installation of Storage Lid Striker Lock & Storage Lid Emergency Opener Cable

AIS0060X



1. Storage lid striker lock assembly
2. Nut
3. Bolt
4. Storage lid emergency opener cable
5. Storage lid emergency opener hook

REMOVAL

1. Remove storage room finisher. Refer to RF-125, "Removal and Installation of Storage Room Finisher" .
2. Remove trunk front finisher. Refer to EI-48, "TRUNK ROOM TRIM & TRUNK LID FINISHER" .
3. Disconnect each clamp of storage lid emergency opener cable.
4. Disconnect each harness connector of storage lid lock assembly.
5. Remove storage lid lock mounting bolts, and then remove storage lid lock assembly.

INSTALLATION

Install in the reverse order of removal.

SECTION EI
EXTERIOR & INTERIOR

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PRECAUTIONS

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Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

AIS000GT

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

AIS001OZ

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Work

AIS000GU

- After removing and installing the opening/closing parts, be sure to carry out fitting adjustments to check their operation.
- Check the lubrication level, damage, and wear of each part. If necessary, grease or replace it.

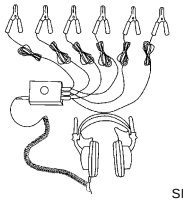
PREPARATION

PFP:00002

Special Service Tools

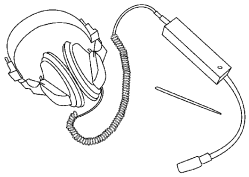
AIS000GW

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
(J-39570) Chassis ear  SIIA0993E	Locationg the noise
(J-43980) NISSAN Squeak and Rattle Kit SIIA0994E	Repairing the cause of noise

Commercial Service Tools

AIS000GX

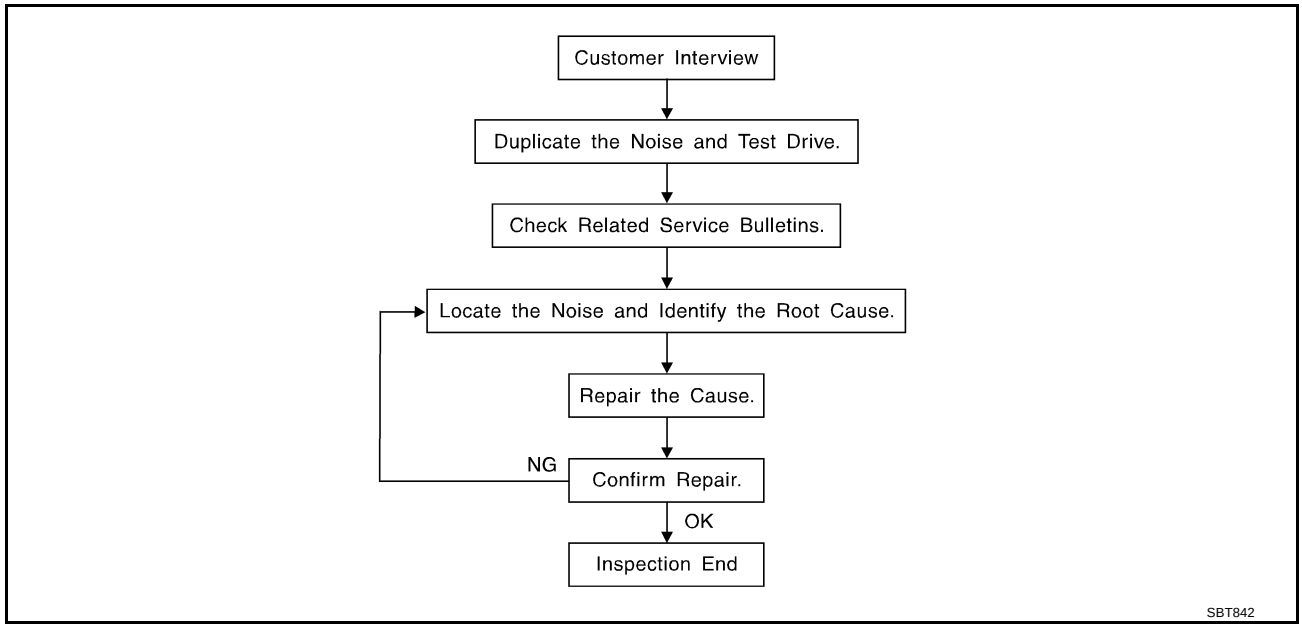
Tool name	Description
Engine ear  SIIA0995E	Locationg the noise

SQUEAK AND RATTLE TROUBLE DIAGNOSES

PFP:00000

Work Flow

AIS000GY



CUSTOMER INTERVIEW

Interview the customer if possible, to determine the conditions that exist when the noise occurs. Use the Diagnostic Worksheet during the interview to document the facts and conditions when the noise occurs and any customer's comments; refer to EI-9, "Diagnostic Worksheet" . This information is necessary to duplicate the conditions that exist when the noise occurs.

- The customer may not be able to provide a detailed description or the location of the noise. Attempt to obtain all the facts and conditions that exist when the noise occurs (or does not occur).
- If there is more than one noise in the vehicle, be sure to diagnose and repair the noise that the customer is concerned about. This can be accomplished by test driving the vehicle with the customer.
- After identifying the type of noise, isolate the noise in terms of its characteristics. The noise characteristics are provided so the customer, service adviser and technician are all speaking the same language when defining the noise.
- Squeak —(Like tennis shoes on a clean floor)
  Squeak characteristics include the light contact/fast movement/brought on by road conditions/hard surfaces=higher pitch noise/softer surfaces=lower pitch noises/edge to surface=chirping
- Creak—(Like walking on an old wooden floor)
  Creak characteristics include firm contact/slow movement/twisting with a rotational movement/pitch dependent on materials/often brought on by activity.
- Rattle—(Like shaking a baby rattle)
  Rattle characteristics include the fast repeated contact/vibration or similar movement/loose parts/missing clip or fastener/incorrect clearance.
- Knock —(Like a knock on a door)
  Knock characteristics include hollow sounding/sometimes repeating/often brought on by driver action.
- Tick—(Like a clock second hand)
  Tick characteristics include gentle contacting of light materials/loose components/can be caused by driver action or road conditions.
- Thump—(Heavy, muffled knock noise)
  Thump characteristics include softer knock/dead sound often brought on by activity.
- Buzz—(Like a bumble bee)
  Buzz characteristics include high frequency rattle/firm contact.
- Often the degree of acceptable noise level will vary depending upon the person. A noise that you may judge as acceptable may be very irritating to the customer.
- Weather conditions, especially humidity and temperature, may have a great effect on noise level.

DUPLICATE THE NOISE AND TEST DRIVE

If possible, drive the vehicle with the customer until the noise is duplicated. Note any additional information on the Diagnostic Worksheet regarding the conditions or location of the noise. This information can be used to duplicate the same conditions when you confirm the repair.
If the noise can be duplicated easily during the test drive, to help identify the source of the noise, try to duplicate the noise with the vehicle stopped by doing one or all of the following:

1) Close a door.
2) Tap or push/pull around the area where the noise appears to be coming from.
3) Rev the engine.
4) Use a floor jack to recreate vehicle “twist”.
5) At idle, apply engine load (electrical load, half-clutch on M/T model, drive position on A/T model).
6) Raise the vehicle on a hoist and hit a tire with a rubber hammer.

- Drive the vehicle and attempt to duplicate the conditions the customer states exist when the noise occurs.
- If it is difficult to duplicate the noise, drive the vehicle slowly on an undulating or rough road to stress the vehicle body.

CHECK RELATED SERVICE BULLETINS

After verifying the customer concern or symptom, check ASIST for Technical Service Bulletins (TSBs) related to that concern or symptom.
If a TSB relates to the symptom, follow the procedure to repair the noise.

LOCATE THE NOISE AND IDENTIFY THE ROOT CAUSE

1. Narrow down the noise to a general area. To help pinpoint the source of the noise, use a listening tool (Chassis Ear: J-39570, Engine Ear and mechanics stethoscope).
2. Narrow down the noise to a more specific area and identify the cause of the noise by:

- removing the components in the area that you suspect the noise is coming from.
  Do not use too much force when removing clips and fasteners, otherwise clips and fastener can be broken or lost during the repair, resulting in the creation of new noise.
- tapping or pushing/pulling the component that you suspect is causing the noise.
  Do not tap or push/pull the component with excessive force, otherwise the noise will be eliminated only temporarily.
- feeling for a vibration with your hand by touching the component(s) that you suspect is (are) causing the noise.
- placing a piece of paper between components that you suspect are causing the noise.
- looking for loose components and contact marks.
  Refer to EI-7, "Generic Squeak and Rattle Troubleshooting" .

REPAIR THE CAUSE

- If the cause is a loose component, tighten the component securely.
- If the cause is insufficient clearance between components:
  - separate components by repositioning or loosening and retightening the component, if possible.
  - insulate components with a suitable insulator such as urethane pads, foam blocks, felt cloth tape or urethane tape. A Nissan Squeak and Rattle Kit (J-43980) is available through your authorized Nissan Parts Department.

CAUTION:
Do not use excessive force as many components are constructed of plastic and may be damaged.
Always check with the Parts Department for the latest parts information.
The following materials are contained in the Nissan Squeak and Rattle Kit (J-43980). Each item can be ordered separately as needed.
URETHANE PADS [1.5 mm (0.059 in) thick]
Insulates connectors, harness, etc.
76268-9E005: 100 × 135 mm (3.94 × 5.31 in)/76884-71L01: 60 × 85 mm (2.36 × 3.35 in)/76884-71L02: 15 × 25 mm (0.59 × 0.98 in)
INSULATOR (Foam blocks)
Insulates components from contact. Can be used to fill space behind a panel.
73982-9E000: 45 mm (1.77 in) thick, 50 × 50 mm (1.97 × 1.97 in)/73982-50Y00: 10 mm (0.39 in) thick, 50 × 50 mm (1.97 × 1.97 in)

INSULATOR (Light foam block)
80845-71L00: 30 mm (1.18 in) thick, 30 × 50 mm (1.18 × 1.97 in)
FELT CLOTHTAPE
Used to insulate where movement does not occur. Ideal for instrument panel applications.
68370-4B000: 15 × 25 mm (0.59 × 0.98 in) pad/68239-13E00: 5 mm (0.20 in) wide tape roll
The following materials, not found in the kit, can also be used to repair squeaks and rattles.
UHMW(TEFLON) TAPE
Insulates where slight movement is present. Ideal for instrument panel applications.
SILICONE GREASE
Used in place of UHMW tape that will be visible or not fit.
Note: Will only last a few months.
SILICONE SPRAY
Use when grease cannot be applied.
DUCT TAPE
Use to eliminate movement.

CONFIRM THE REPAIR

Confirm that the cause of a noise is repaired by test driving the vehicle. Operate the vehicle under the same conditions as when the noise originally occurred. Refer to the notes on the Diagnostic Worksheet.

Generic Squeak and Rattle Troubleshooting

AIS000GZ

Refer to Table of Contents for specific component removal and installation information.

INSTRUMENT PANEL

Most incidents are caused by contact and movement between:

1. Cluster lid A and instrument panel
2. Acrylic lens and combination meter housing
3. Instrument panel to front pillar garnish
4. Instrument panel to windshield
5. Instrument panel mounting pins
6. Wiring harnesses behind the combination meter
7. A/C defroster duct and duct joint

These incidents can usually be located by tapping or moving the components to duplicate the noise or by pressing on the components while driving to stop the noise. Most of these incidents can be repaired by applying felt cloth tape or silicon spray (in hard to reach areas). Urethane pads can be used to insulate wiring harness.

CAUTION:
Do not use silicone spray to isolate a squeak or rattle. If you saturate the area with silicone, you will not be able to recheck the repair.

CENTER CONSOLE

Components to pay attention to include:

1. Shifter assembly cover to finisher
2. A/C control unit and cluster lid C
3. Wiring harnesses behind audio and A/C control unit

The instrument panel repair and isolation procedures also apply to the center console.

DOORS

Pay attention to the:

1. Finisher and inner panel making a slapping noise
2. Inside handle escutcheon to door finisher
3. Wiring harnesses tapping
4. Door striker out of alignment causing a popping noise on starts and stops

Tapping or moving the components or pressing on them while driving to duplicate the conditions can isolate many of these incidents. You can usually insulate the areas with felt cloth tape or insulator foam blocks from the Nissan Squeak and Rattle Kit (J-43980) to repair the noise.

TRUNK

Trunk noises are often caused by a loose jack or loose items put into the trunk by the owner.
In addition look for:

1. Trunk lid dumpers out of adjustment
2. Trunk lid striker out of adjustment
3. Trunk lid torsion bars knocking together
4. A loose license plate or bracket

Most of these incidents can be repaired by adjusting, securing or insulating the item(s) or component(s) causing the noise.

SUNROOF/HEADLINING

Noises in the sunroof/headlining area can often be traced to one of the following:

1. Sunroof lid, rail, linkage or seals making a rattle or light knocking noise
2. Sunvisor shaft shaking in the holder
3. Front or rear windshield touching headlining and squeaking

Again, pressing on the components to stop the noise while duplicating the conditions can isolate most of these incidents. Repairs usually consist of insulating with felt cloth tape.

SEATS

When isolating seat noise it's important to note the position the seat is in and the load placed on the seat when the noise is present. These conditions should be duplicated when verifying and isolating the cause of the noise.
Cause of seat noise include:

1. Headrest rods and holder
2. A squeak between the seat pad cushion and frame
3. Rear seatback lock and bracket

These noises can be isolated by moving or pressing on the suspected components while duplicating the conditions under which the noise occurs. Most of these incidents can be repaired by repositioning the component or applying urethane tape to the contact area.

UNDERHOOD

Some interior noise may be caused by components under the hood or on the engine wall. The noise is then transmitted into the passenger compartment.
Causes of transmitted underhood noise include:

1. Any component mounted to the engine wall
2. Components that pass through the engine wall
3. Engine wall mounts and connectors
4. Loose radiator mounting pins
5. Hood bumpers out of adjustment
6. Hood striker out of adjustment

These noises can be difficult to isolate since they cannot be reached from the interior of the vehicle. The best method is to secure, move or insulate one component at a time and test drive the vehicle. Also, engine RPM or load can be changed to isolate the noise. Repairs can usually be made by moving, adjusting, securing, or insulating the component causing the noise.

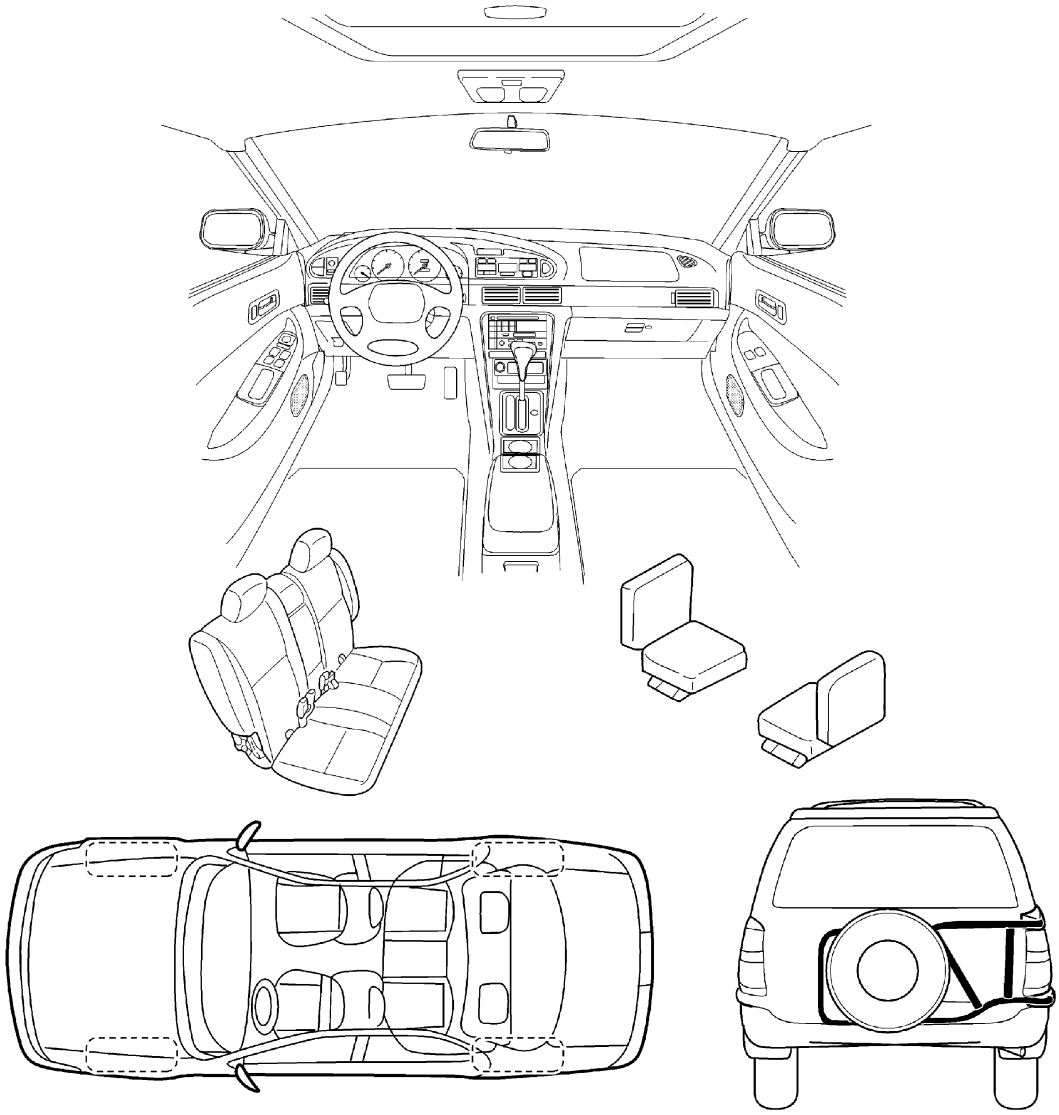
Diagnostic Worksheet

AIS000H0

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET

Dear Nissan Customer:
We are concerned about your satisfaction with your Nissan vehicle. Repairing a squeak or rattle sometimes can be very difficult. To help us fix your Nissan right the first time, please take a moment to note the area of the vehicle where the squeak or rattle occurs and under what conditions. You may be asked to take a test drive with a service advisor or technician to ensure we confirm the noise you are hearing.

I. WHERE DOES THE NOISE COME FROM? (circle the area of the vehicle)
The illustrations are for reference only, and may not reflect the actual configuration of your vehicle.



Continue to the back of the worksheet and briefly describe the location of the noise or rattle. In addition, please indicate the conditions which are present when the noise occurs.

PIIB0723E

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET- page 2

Briefly describe the location where the noise occurs:

_____

_____

II. WHEN DOES IT OCCUR? (check the boxes that apply)

❑ anytime
❑ 1st time in the morning
❑ only when it is cold outside
❑ only when it is hot outside
❑ after sitting out in the sun
❑ when it is raining or wet
❑ dry or dusty conditions
❑ other: _____

III. WHEN DRIVING:

❑ through driveways
❑ over rough roads
❑ over speed bumps
❑ only at about ____ mph
❑ on acceleration
❑ coming to a stop
❑ on turns : left, right or either (circle)
❑ with passengers or cargo
❑ other: _____
❑ after driving ____ miles or ____ minutes

IV. WHAT TYPE OF NOISE?

❑ squeak (like tennis shoes on a clean floor)
❑ creak (like walking on an old wooden floor)
❑ rattle (like shaking a baby rattle)
❑ knock (like a knock on a door)
❑ tick (like a clock second hand)
❑ thump (heavy, muffled knock noise)
❑ buzz (like a bumble bee)

TO BE COMPLETED BY DEALERSHIP PERSONNEL
Test Drive Notes:

_____

_____

	YES	NO	Initials of person performing
Vehicle test driven with customer	❑	❑	_____
- Noise verified on test drive	❑	❑	
- Noise source located and repaired	❑	❑	_____
- Follow up test drive performed to confirm repair	❑	❑	_____

VIN: _____ Customer Name: _____

W.O. #: _____ Date: _____

This form must be attached to Work Order

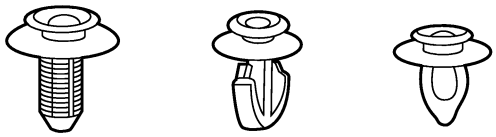
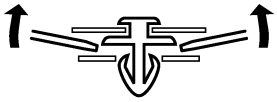
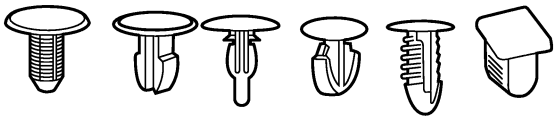
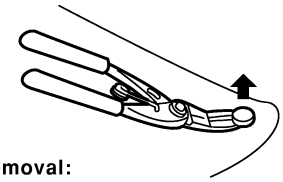
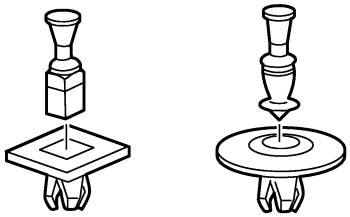
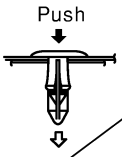
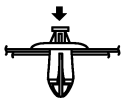
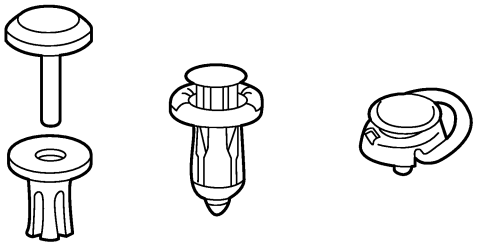
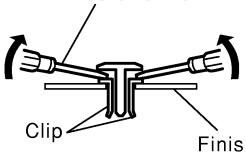
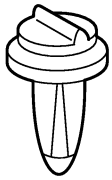
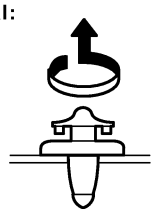
SBT844

CLIP AND FASTENER

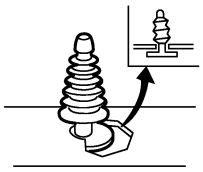
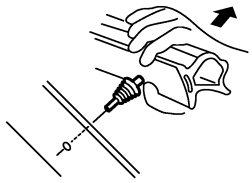
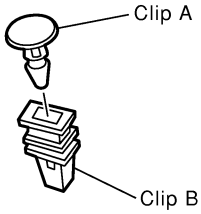
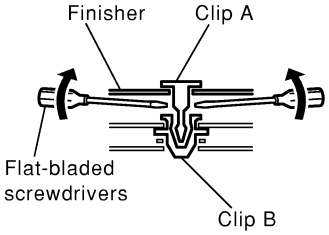
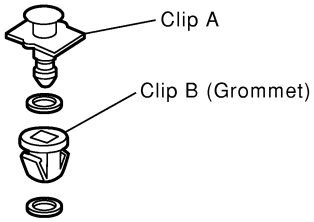
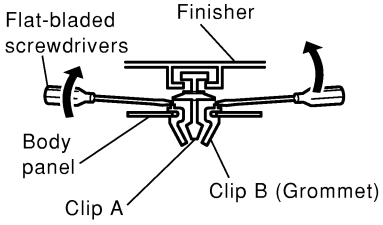
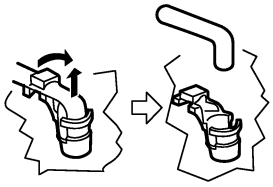
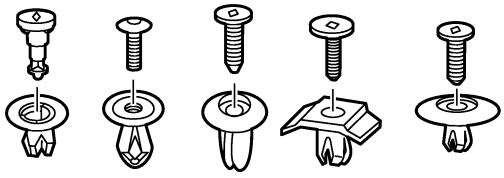
PFP:76906

Clip and Fastener

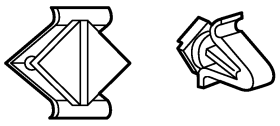
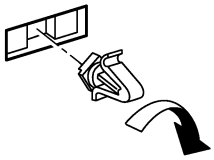
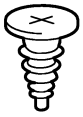
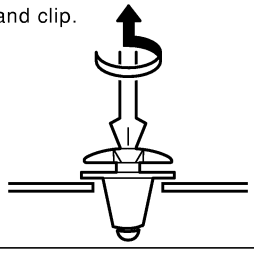
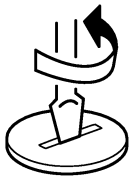
AIS000H1

Symbol No.	Shapes	Removal & Installation
C101		**Removal:** Remove by bending up with flat-bladed screwdrivers or clip remover. 
C103		 **Removal:** Remove with a clip remover.
C203		**Removal:** Push center pin to catching position. (Do not remove center pin by hitting it.) Push  Push  **Installation:**
C205		**Removal:** Flat-bladed screwdriver  Clip Finisher
C206		**Removal:** 

SIIA0315E

Symbol No.	Shapes	Removal & Installation
CE103		**Removal:** 
CF110		**Removal:** 
CF118		**Removal:** 
CR103		**Removal:** Holder portion of clip must be spread out to remove rod. 
CS101		**Removal:** 1. Screw out with a Phillips screwdriver. 2. Remove female portion with flat-bladed screwdriver.

SIIA0316E

Symbol No.	Shapes	Removal & Installation
CG101		**Removal:** Rotate 45° to remove **Removal:** **Installation:** 
CS102		
CS113		**Removal:** Disconnect upper connection of clip with a flat-bladed screwdriver, then remove clip while inserting a flat-bladed screwdriver between body panel and clip. 
C111		

SIIA0317E

FRONT BUMPER

PFP:F2022

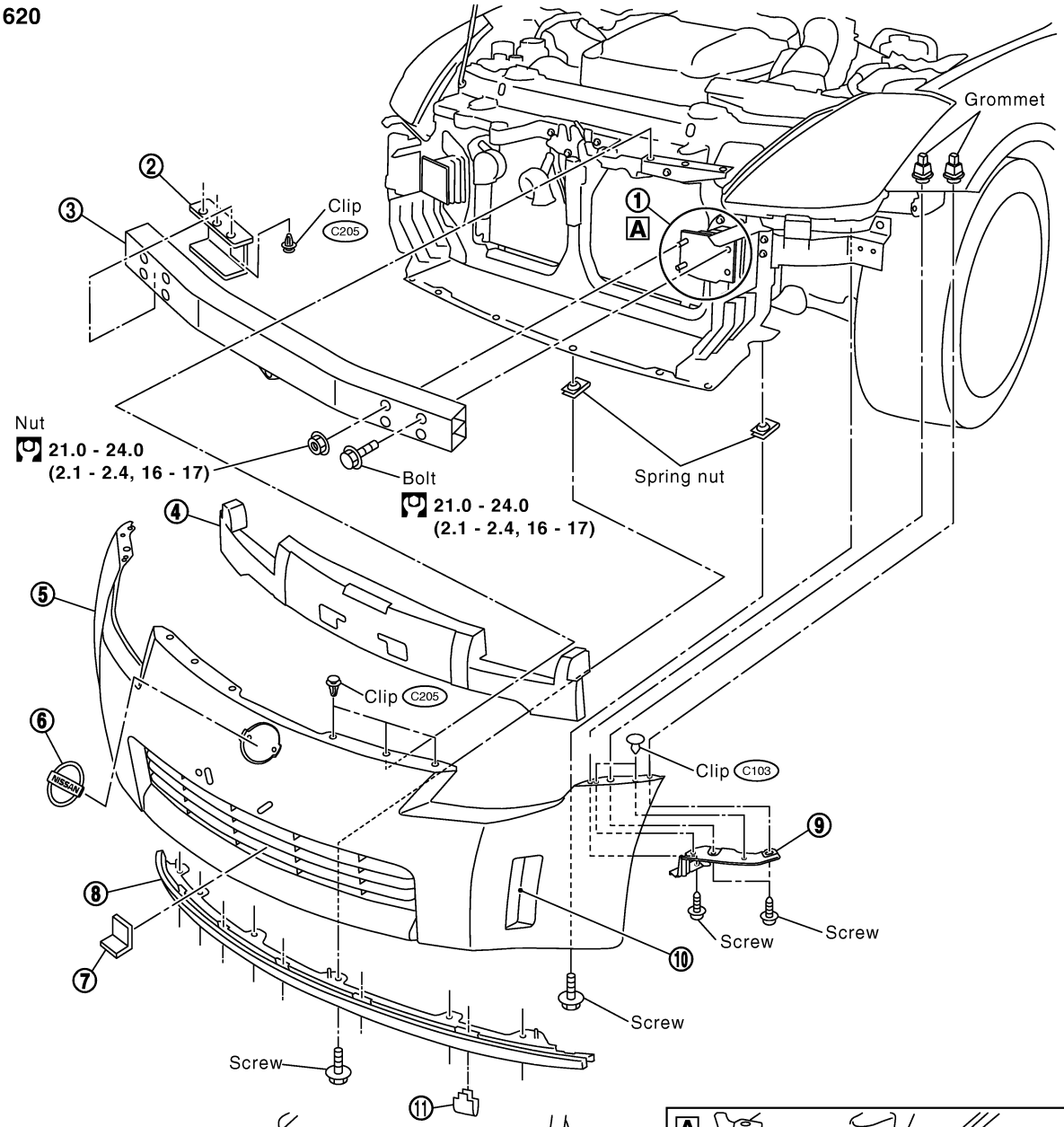
Removal and Installation

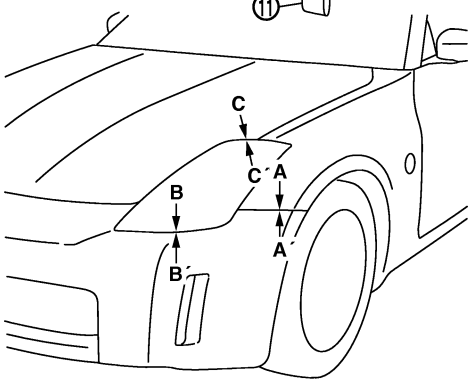
AIS000H2

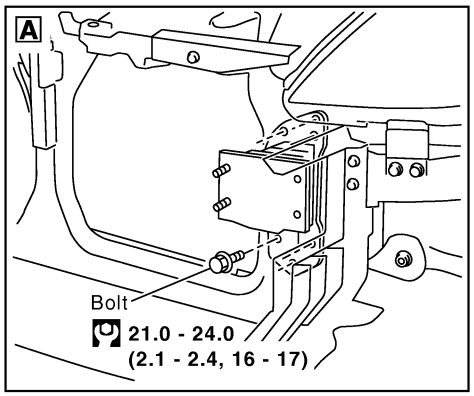
CAUTION:

Bumper fascia is made of resin. Do not apply strong force to it, and be careful to prevent contact with oil.

SEC. 620







Unit: mm (in)
: N•m (kg-m, ft-lb)

Clearance measurement between parts
A - A´: 0 - 0.5 (0 - 0.020)
B - B´: 5.9 - 8.9 (0.232 - 0.350)
C - C´: 1.7 - 5.3 (0.067 - 0.209)

PIIB1147E

1. Bumper stay
2. Bumper shield-sight
3. Bumper reinforcement
4. Energy absorber
5. Bumper fascia assembly
6. Front emblem

7. Front bumper center
8. Air spoiler
9. Bumper side bracket
10. Bumper side reflector
11. Bumper retainer

REMOVAL

1. Remove clips of bumper fascia upper portion.
2. Remove screw of bumper fascia lower portion.
3. Remove screws of bumper fascia both side.
4. Remove screws and bolts of both right/left fender protectors on front side. Refer to EI-21, "FENDER PROTECTOR" .
5. Pull out both right/left of bumper fascia and remove bumper fascia assembly.
6. Remove energy absorber.
7. Remove bolts and nuts of bumper reinforcement and remove bumper fascia.
8. Remove clips of bumper shield-sight and remove bumper shield-sight.
9. Remove bolts of bumper stay and remove bumper stay.

INSTALLATION

Install in the reverse order of removal.

Removal of Bumper Side Reflector (Left Side)

1. Remove bumper assembly.
2. Remove screw of bumper side reflector.

Installation

Install in the reverse order of removal.

Removal of Bumper Side Reflector (Right Side)

1. Remove bumper assembly.
2. Remove screw of bumper side reflector.

Installation

Install in the reverse order of removal.

REAR BUMPER

PFP:H5022

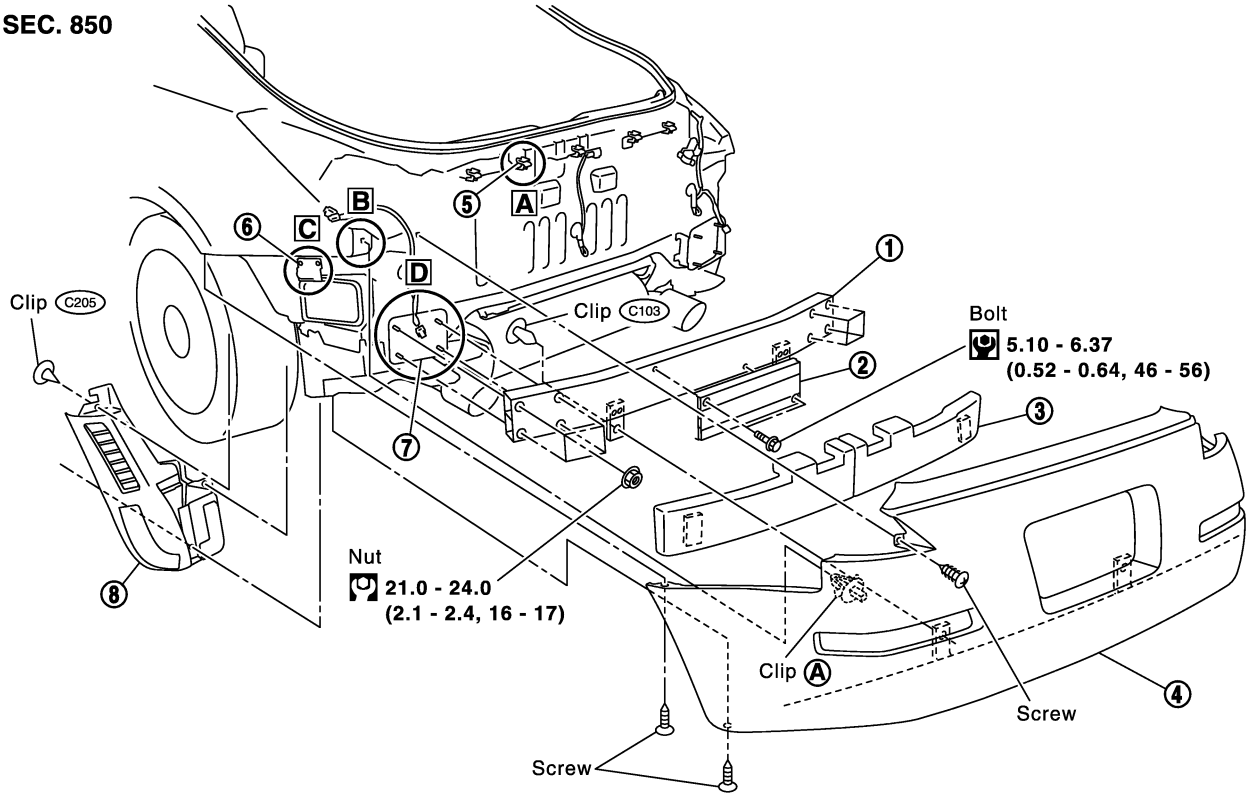
Removal and Installation

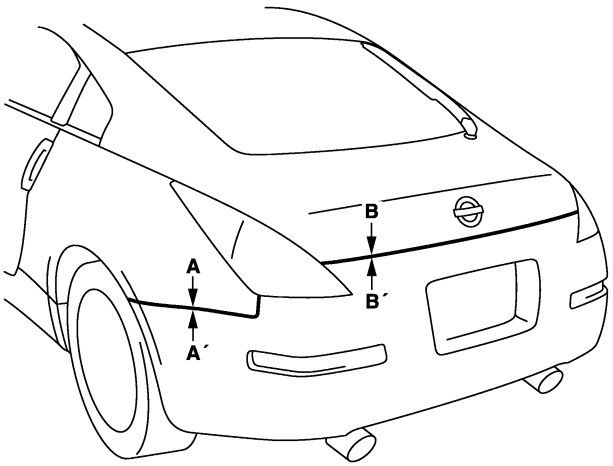
AIS000H3

CAUTION:

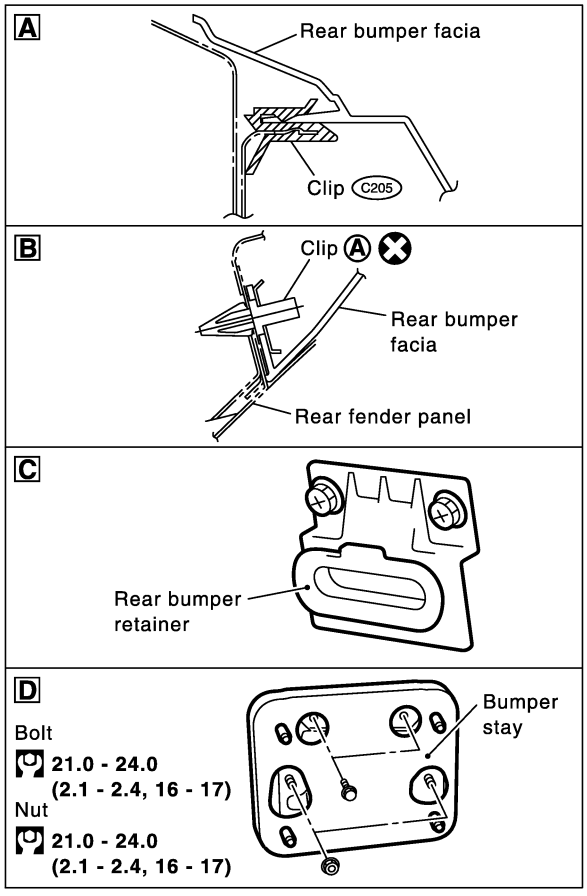
Bumper fascia is made of resin. Do not apply strong force to it, and be careful to prevent contact with oil.

SEC. 850





Clearance measurement between parts
A - A´: 0 - 0.50 (0 - 0.0197)
B - B´: 3.9 - 7.10 (0.1535 - 0.2795)
Unit: mm (in)



PIIA2134E

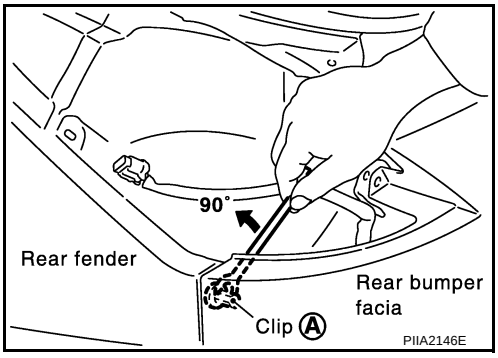
: N•m (kg-m, in-lb)
: N•m (kg-m, ft-lb)
: Always replace after every disassembly.

1. Bumper reinforcement
2. Bumper over rider
3. Energy absorber

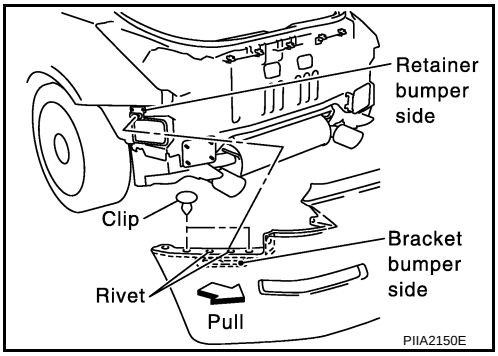
4. Bumper fascia assembly
5. Bumper clip
6. Bumper retainer
7. Bumper stay
8. Closing rear bumper

REMOVAL

1. Remove rear combination lamp assembly. Refer to LT-205, "REAR COMBINATION LAMP" .
2. Remove screw rear combination portion.
3. Remove clips of closing rear bumper.
4. Remove bolt and screw of both edges bumper fascia.
5. Rotate clip (A) in corner of bumper fascia 90 degrees and remove from bracket.
6. Remove clips from lower portion bumper fascie.
7. Pull out upper portion bumper fascie toward rear and disengage from clip.



8. Pull out both edges bumper fascie toward rear and disengage retainer from braked.
9. Disconnect license lamp and turn signal lamp harness connector and remove bumper fascia assembly.
10. Remove bumper energy absorber.
11. Remove screws of bumper over rider.
12. Remove nuts and bolts of bumper reinforcement.
13. Remove bumper stay bolts.



INSTALLATION

Install in the reverse order of removal.

Removal of Bumper Side Brackets

Shave head of rivet with drill [4.0 to 4.5 mm (0.157 to 0.177 in) dia.]

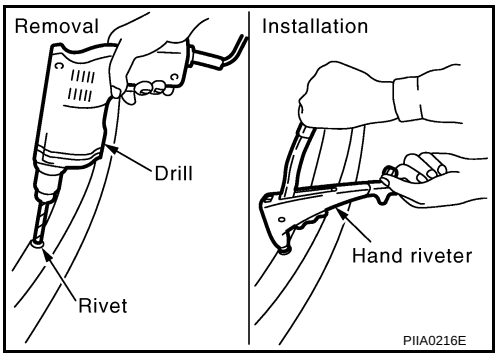
Installation of Bumper Side Brackets

Install bracket to fascia firmly with hand riveter.

NOTE:

Use the following rivet, when installing of bumper side brackets.

Rivet thickness	**: 1.2 – 6.4 mm (0.047 – 0.252 in)**
Under hole diameter	**: 4.1 – 4.4 mm (0.161 – 0.173 in) dia.**

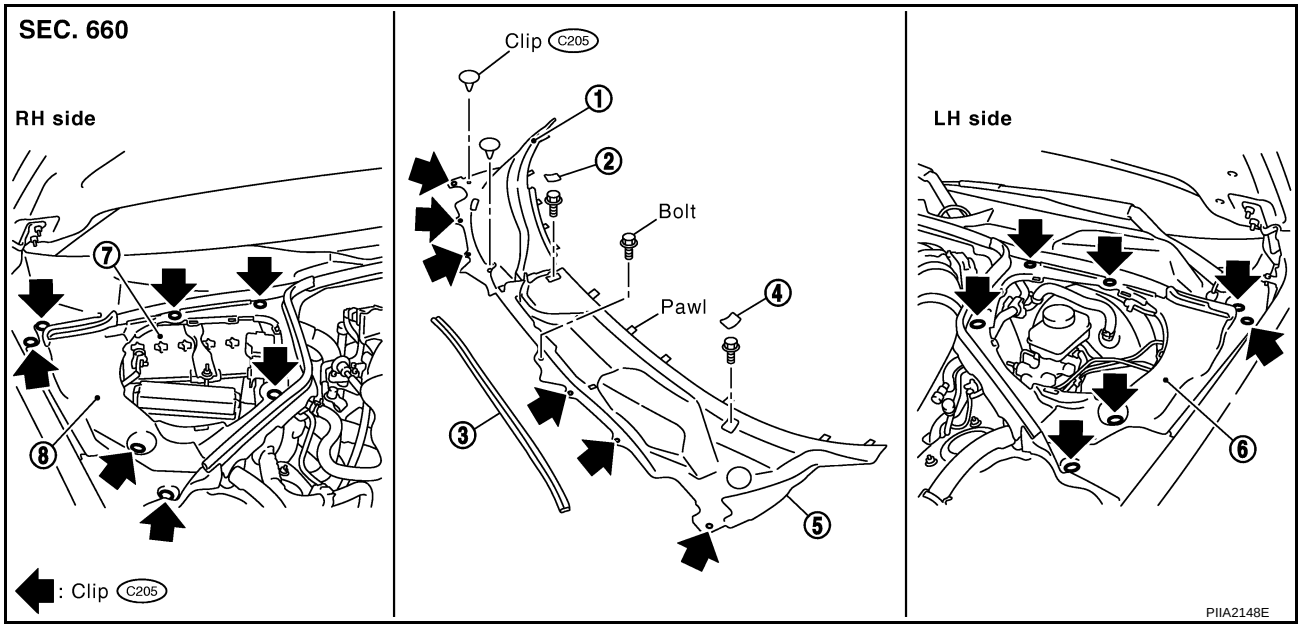


COWL TOP

PFP:66100

Removal and Installation

AIS000H5



1. Cowl top cover (right)
2. Cap
3. Cowl top seal rubber
4. Cap
5. Cowl top cover (left)
6. Hood ledge cover (left)
7. Battery
8. Hood ledge cover (right)

REMOVAL

1. Remove clips of hood ledge cover (left/right).
2. Remove both right/left wiper arms. Refer to WW-31, "Removal and Installation for Front Wiper Arms, Adjustment for Wiper Arms Stop Location" .
3. Remove cowl top seal rubber.
4. Remove clips of cowl top cover (right) and remove cowl top cover (right).
5. Remove clips, cap, screws and remove cowl top cover (left).
6. Remove washer hose from cowl top cover.

INSTALLATION

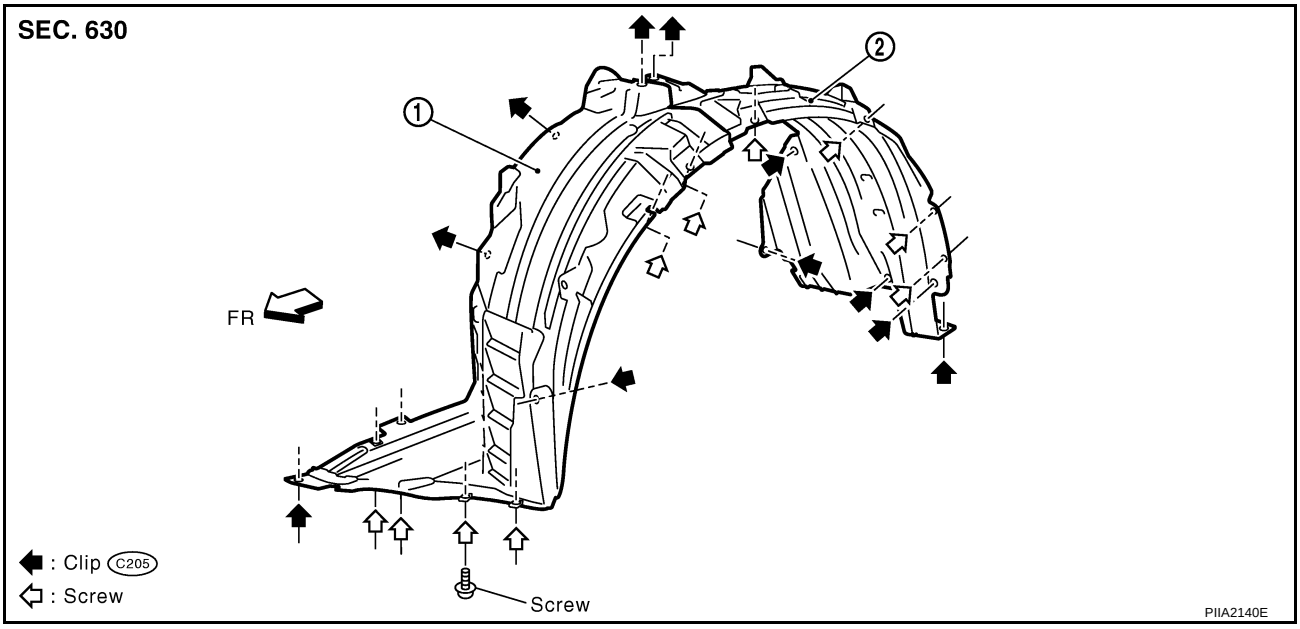
Install in the reverse order of removal.

FENDER PROTECTOR

PFP:63840

Removal and Installation

AIS004U3



1. Fender protector (front)
2. Fender protector (rear)

REMOVAL

1. Remove screws and clips of fender protector.
2. Remove fender protector front and remove fender protector rear.

INSTALLATION

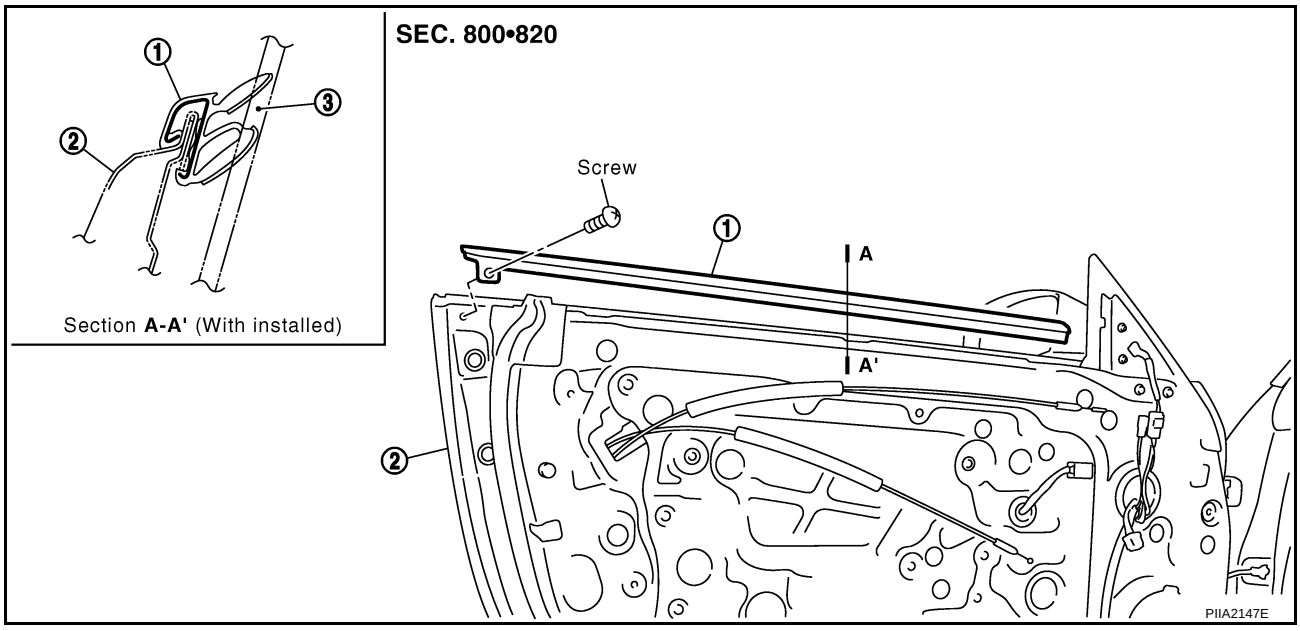
Install in the reverse order of removal.

DOOR OUTSIDE MOLDING

PFP:82820

Removal and Installation

AIS004U4



1. Door outside molding
2. Front door panel
3. Glass

REMOVAL

1. Open windows fully.
2. Remove door finisher. Refer to EI-33, "Removal and Installation" .
3. Remove rear end of door outside molding screw.
4. Disconnect pawls on front edge of molding.
5. Disconnect pawls in the order from front side of door panel portion, with clip clamp remover.
6. Remove slide molding rearward side, after disconnecting all pawls.

INSTALLATION

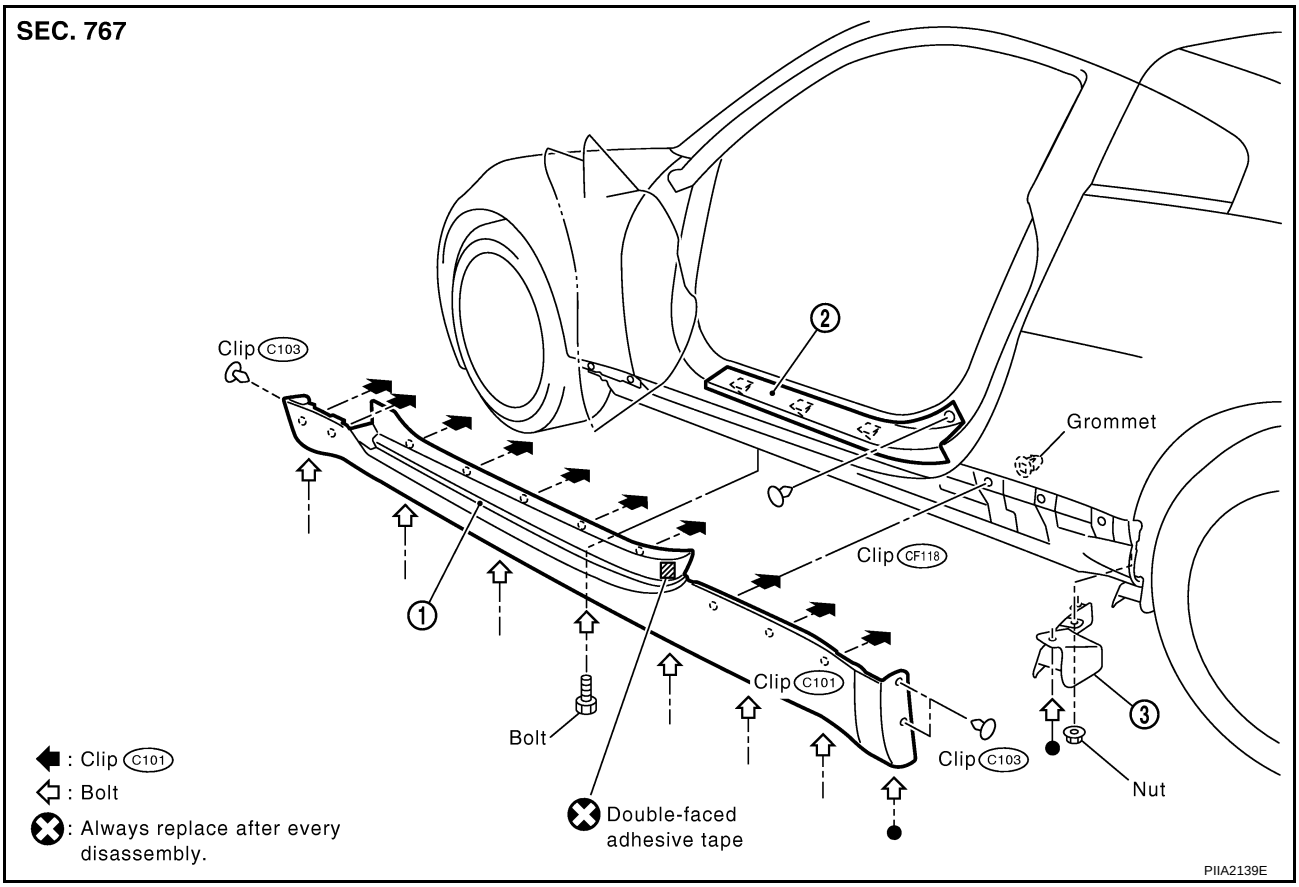
Install in the reverse order of removal.

SIDE SILL FINISHER

PFP:76852

Removal and Installation

AIS004X7



1. Side sill finisher
2. Kicking plate outer
3. Reflector mudguard rear

REMOVAL

1. Remove body side welt. Refer to EI-35, "BODY SIDE TRIM" .
2. Remove kicking plate outer. Refer to EI-35, "BODY SIDE TRIM" .
3. Remove bolts of side sill finisher lower portion.
4. Remove clips of side sill finisher front and rear portion.
5. Remove bolt and nut of reflector mudguard rear.
6. Insert clip clamp remover between panel and side sill finisher, and pull up side sill finisher.

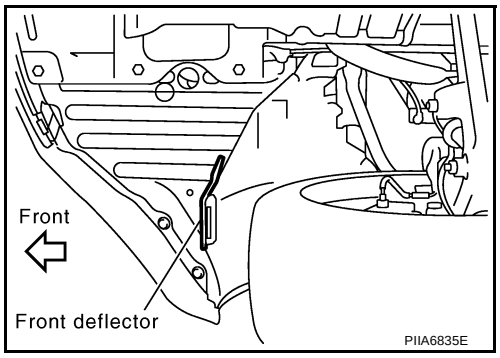
INSTALLATION

Install in the reverse order of removal.

FRONT DEFLECTOR

Removal

Remove screws and clips of front deflector and remove front deflector.



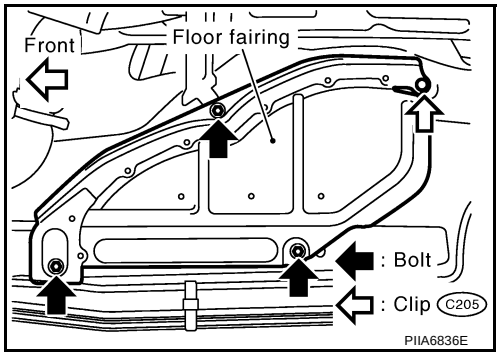
Installation

Install in the reverse order of removal.

FLOOR FAIRING

Removal

Remove bolts and clip of floor fairing and remove floor fairing.



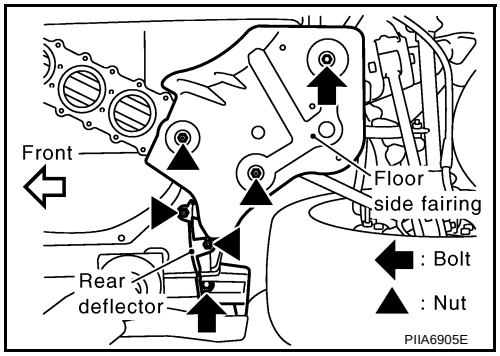
Installation

Install in the reverse order of removal.

FLOOR SIDE FAIRING

Removal

Remove nuts and bolt of floor side fairing and remove floor side fairing.



Installation

Install in the reverse order of removal.

REAR DEFLECTOR

Removal

Remove nuts and bolt of rear deflector and remove rear deflector.

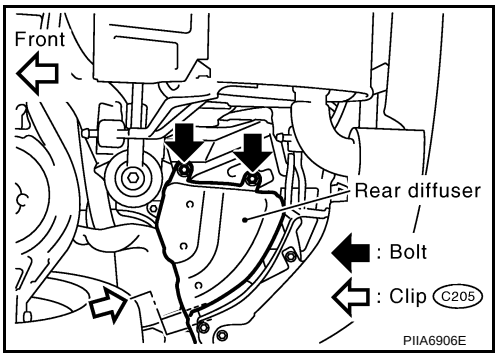
Installation

Install in the reverse order of removal.

REAR DIFFUSER

Removal

Remove bolts and clips of rear diffuser and remove rear diffuser.



Installation

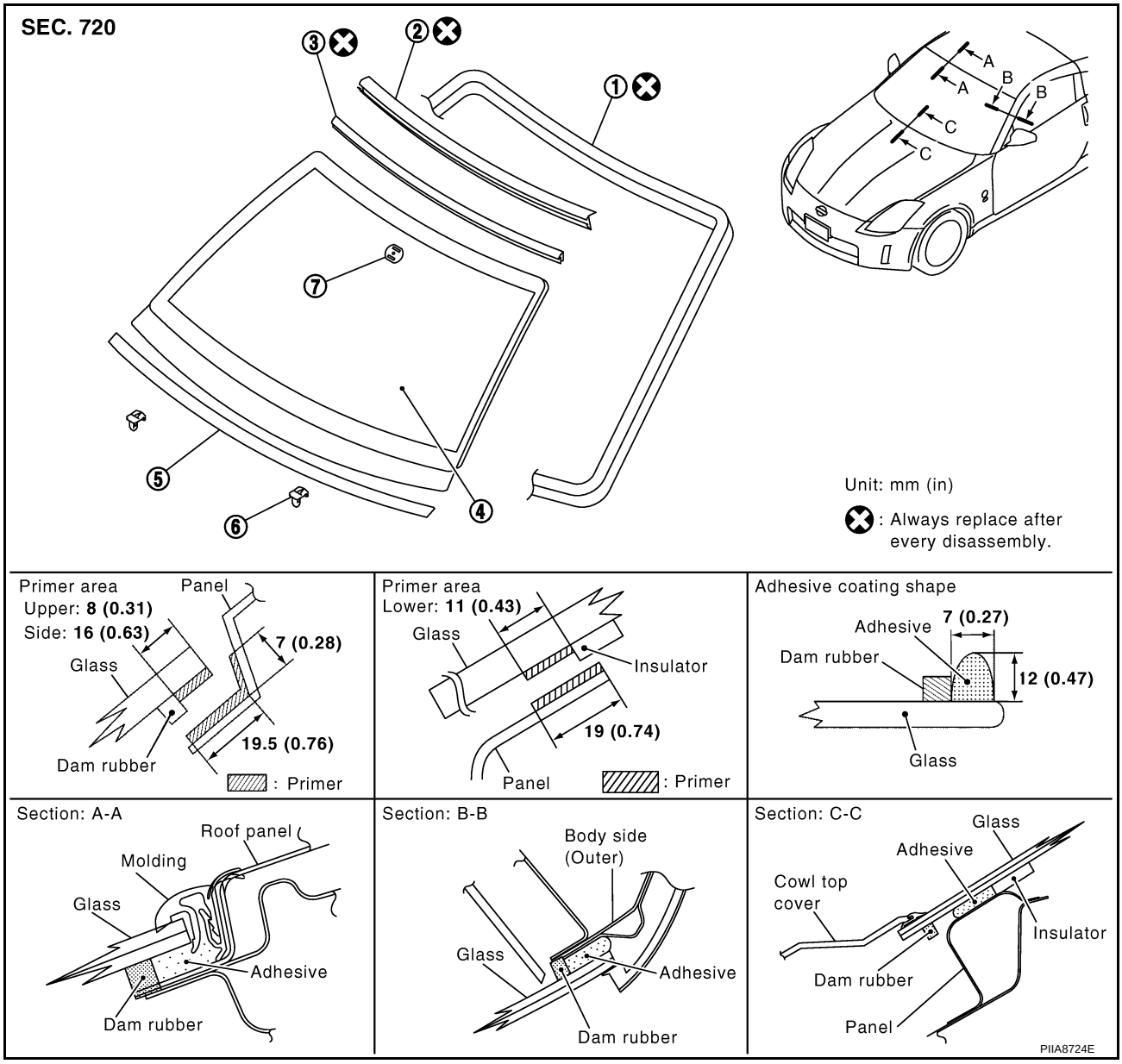
Install in the revers order of removal.

WINDSHIELD MOLDING

PFP:72700

Removal and Installation

AIS0058P



1. Dam rubber
2. Fastener
3. Molding (upper)
4. Windshield glass
5. Insulator
6. Spacer
7. Mirror base

REMOVAL

Remove windshield molding. Refer to GW-11, "WINDSHIELD GLASS" .

NOTE:

- Apply protective tape around circumference of windshield.
- Guiding a cutter knife along glass, cut surface of molding.
- Using pliers, draw out all remaining molding left in flanged area of body, and remove it completely from adhering surface on glass.

INSTALLATION

Install windshield molding. Refer to GW-11, "WINDSHIELD GLASS" .

NOTE:

- Align matching marks on body and glass. Install glass to body.

- Press entire surface of glass lightly to fit it completely.

Using a spatula, repair any adhesive overflow or shortage to make surface smooth. Position windshield moldings and allow their adhesion.

CAUTION:

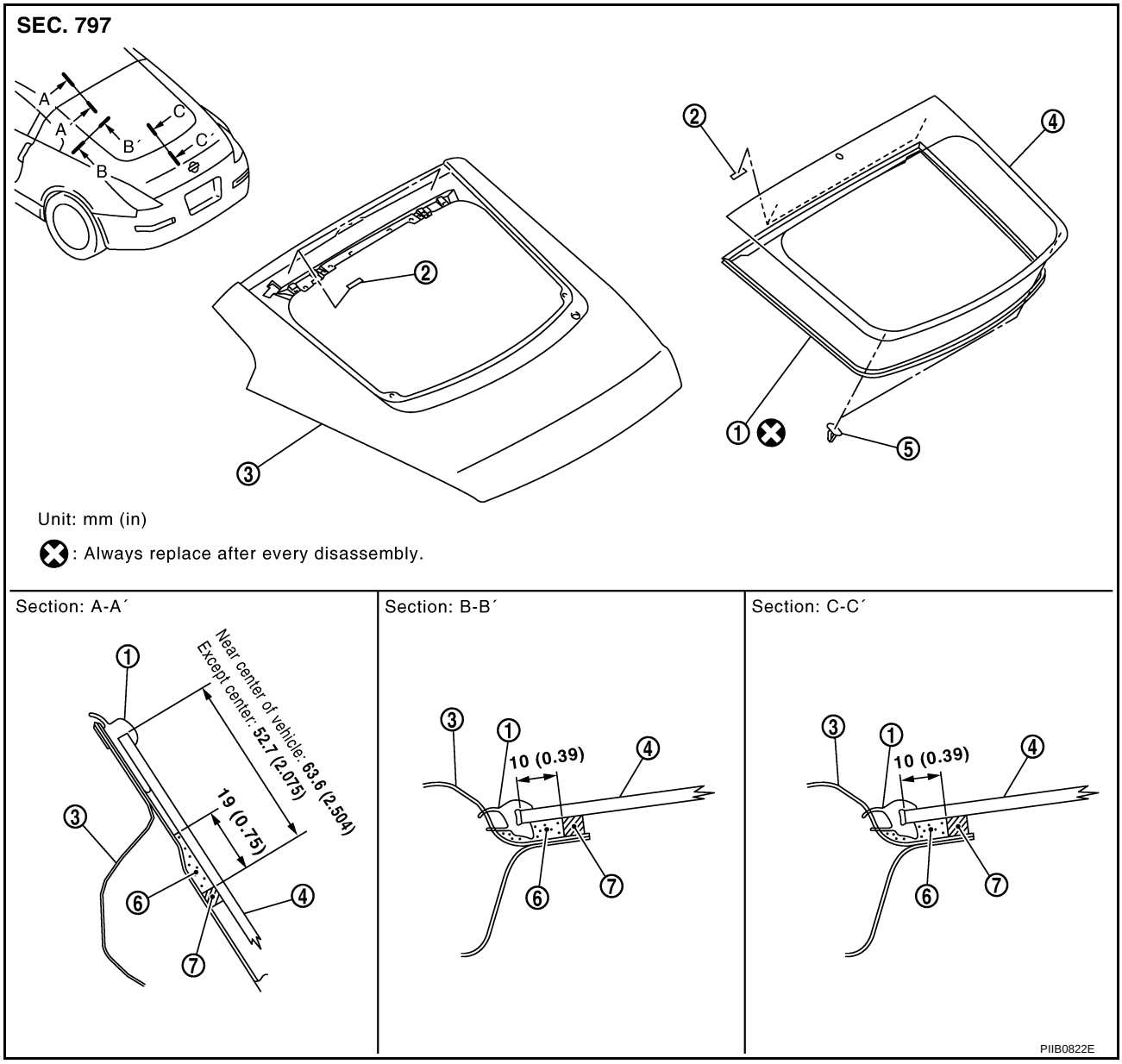
- **Be sure to install windshield molding before adhesive hardens.**
- **After installing glass, keep door windows open and avoid driving vehicle until adhesive has completely cured.**

REAR WINDOW MOLDING

PFP:79762

Removal and Installation

AIS0058Q



1. Back door window molding
2. Dual lock fastener
3. Back door
4. Back door window glass
5. Holder
6. Adhesive
7. Dam rubber

REMOVAL OF BACK DOOR WINDOW MOLDING

Remove back door window molding. Refer to GW-14, "BACK DOOR WINDOW GLASS" .

NOTE:

Apply a strip of protective tape along the contour of back door window glass (molding) to prevent paint surface from being damaged.

INSTALLATION OF BACK DOOR WINDOW MOLDING

Install back door window molding. Refer to GW-14, "BACK DOOR WINDOW GLASS" .

NOTE:

- Clean adhesive portion of back door window glass and around circumference with white gasoline.
- Apply dam rubber to all surfaces of glass.
- Attach back door window molding to side face of glass.

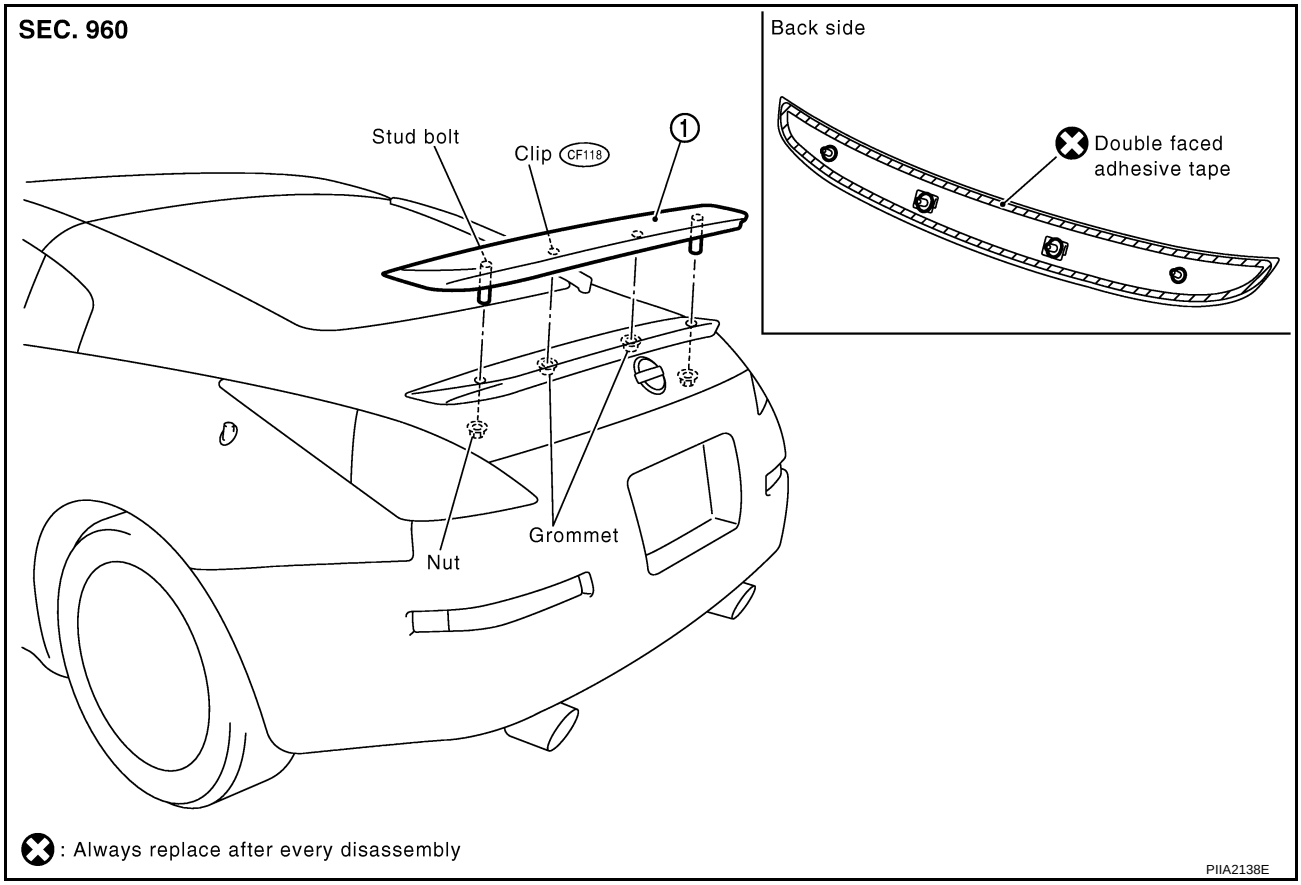
- Back door window molding should not overlap on the surface of back door window glass.

REAR SPOILER

PFP:96030

Removal and Installation

AIS000HH



1. Rear spoiler

REMOVAL

1. Remove back door finisher lower. Refer to EI-46, "Removal and Installation" .
2. Remove nuts of rear spoiler.
3. Remove clip of rear spoiler.
4. Remove double-faced adhesive tapes with wide plastic spatula between back door and rear spoiler.

INSTALLATION

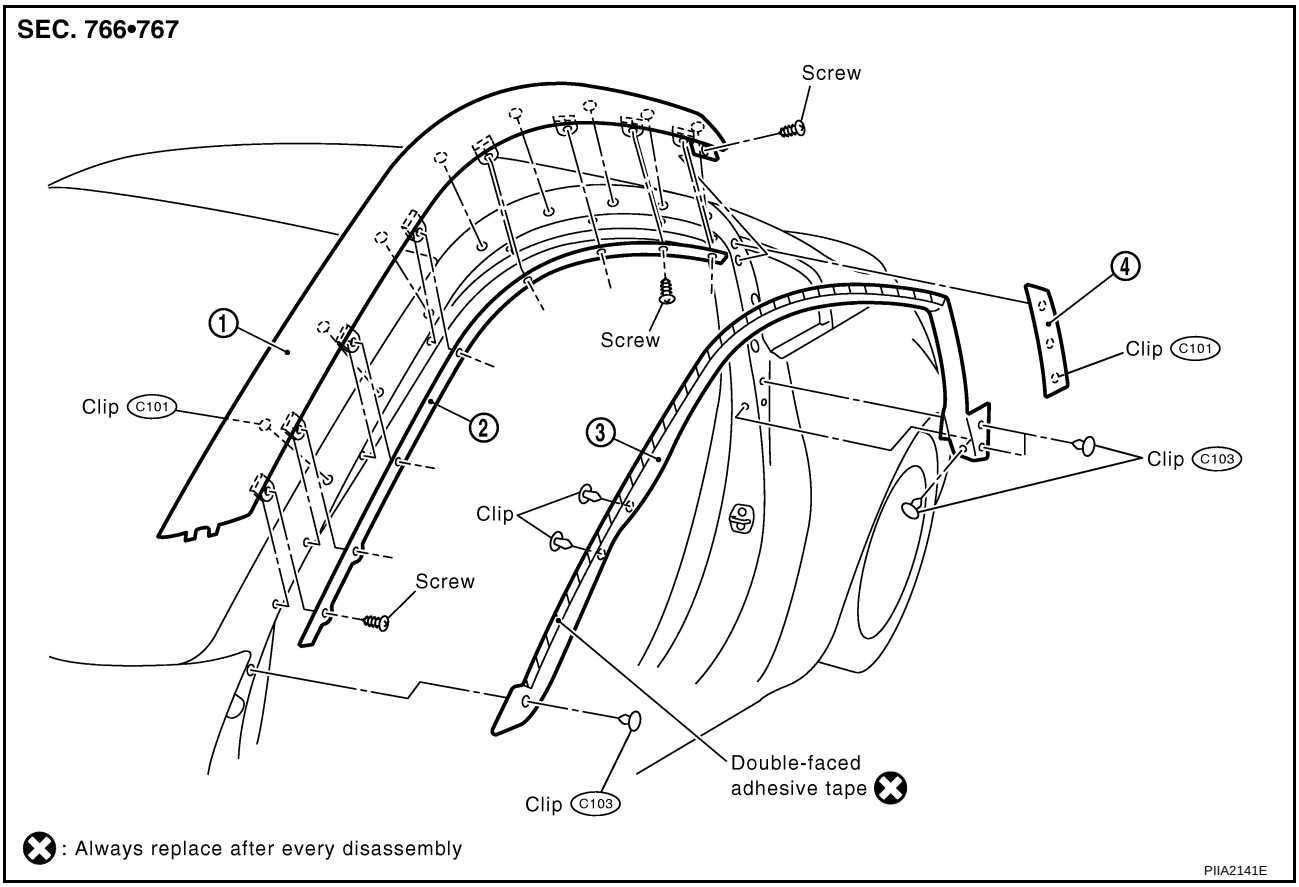
Install in the reverse order of removal.

ROOF SIDE MOLDING

PFP:73854

Removal and Installation (for Coupe Models)

AIS0015K



1. Front pillar finisher
2. Retainer body side weatherstrip
3. Body side weatherstrip
4. Lock pillar finisher

FRONT PILLAR FINISHER

Removal

1. Remove lock pillar finisher.
2. Remove clip and double-faced adhesive tapes of body side weatherstrip.
3. Remove body side weatherstrip.
4. Remove screw of retainer body side weatherstrip.
5. Remove screw and clip of front pillar finisher.
6. Remove front pillar finisher.

Installation

Install in the reverse order of removal.

LOCK PILLER FINISHER

Removal

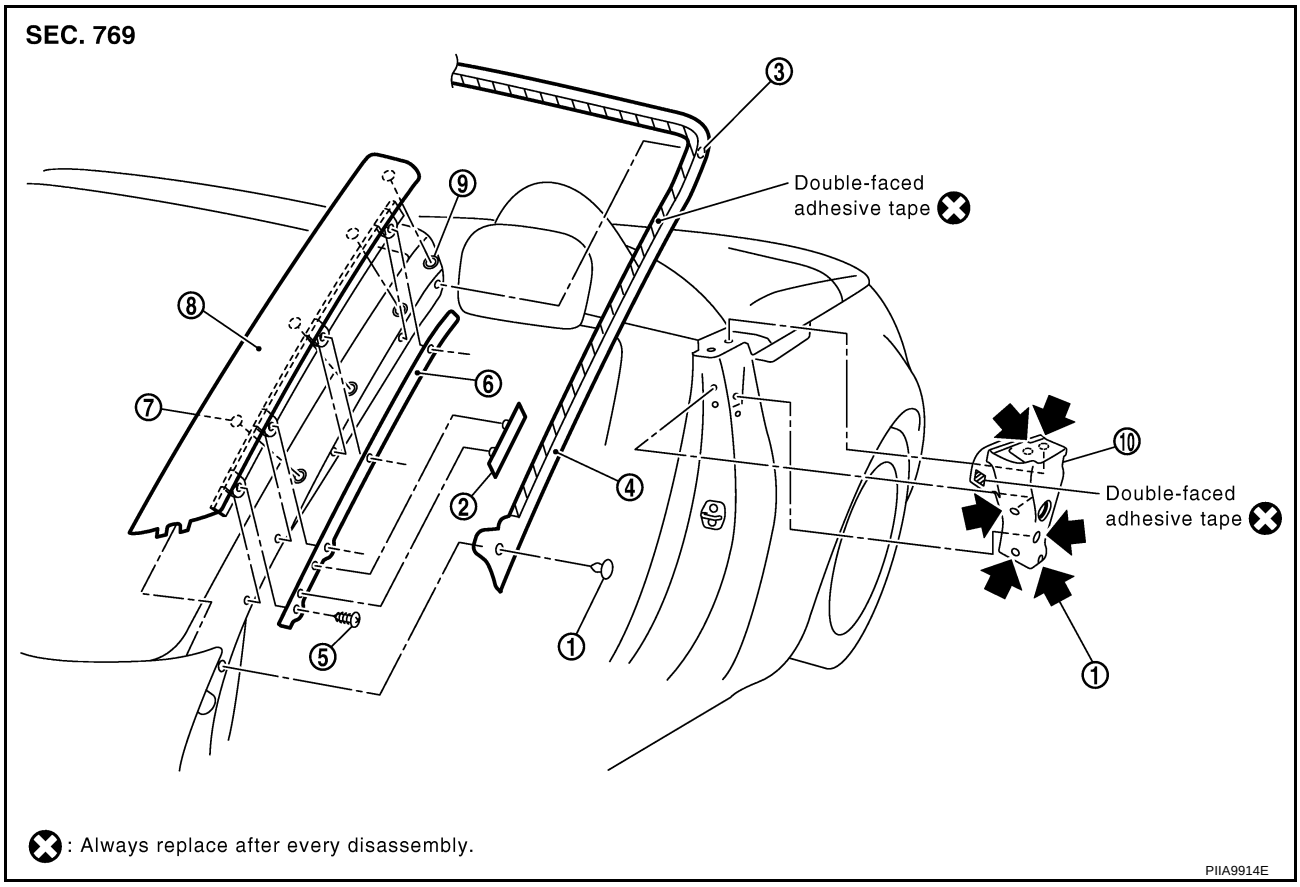
Lift and twist lock pillar finisher up from lock pillar disconnect clips.

Installation

Install in the reverse order of removal.

Removal and Installation (for Roadster Models)

AIS003XA



1. Clip (C103)
2. Clip
3. Clip (CE103)
4. Body side glass-run rubber
5. Screw
6. Retainer
7. Clip (C101)
8. Front pillar finisher
9. Grommet
10. Body side weatherstrip

FRONT PILLAR FINISHER

Removal

1. Open soft top.
2. Remove clip and double-faced adhesive tapes of body side glass-run rubber.
   NOTE:
   Slide body side glass run slightly upward to remove clip on middle portion of glass run rubber side from retainer.
3. Remove body side glass-run rubber.
4. Remove screw of retainer.
5. Remove screw and clips of front pillar finisher.
6. Remove front pillar finisher.

Installation

Install in the reverse order of removal.

BODY SIDE WEATHERSTRIP

Removal

1. Open soft top.
2. Disconnect clips and remove body side weatherstrip.

Installation

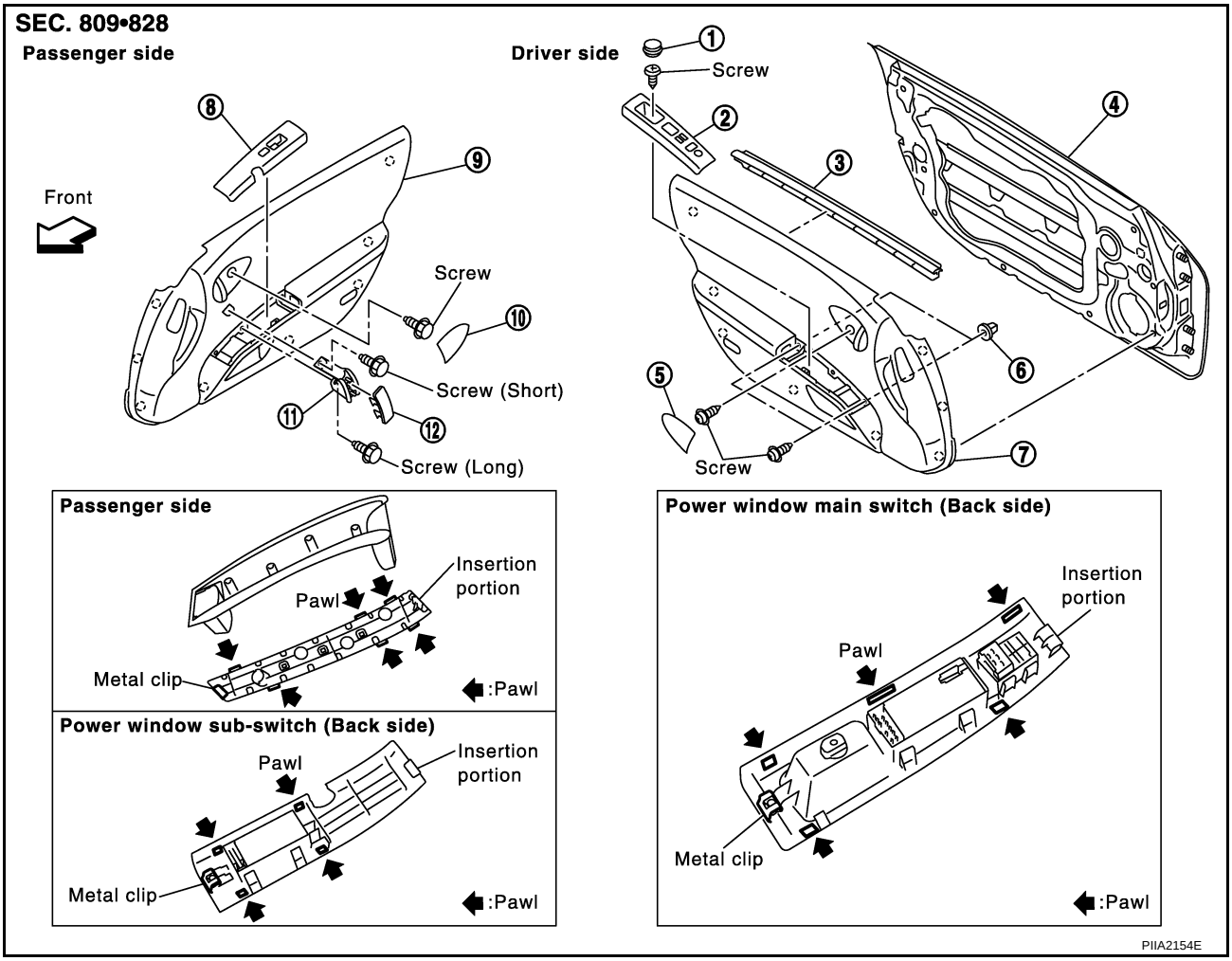
Install in the reverse order of removal.

DOOR FINISHER

PFP:80900

Removal and Installation

AIS000HJ



1.	Cap	2.	Power window main switch finisher	3.	Seal inner
4.	Door panel assembly (driver side)	5.	Inside handle escutcheon	6.	Grommet
7.	Door finisher assembly (driver side)	8.	Power window sub switch finisher	9.	Door finisher assembly (passenger side)
10.	Inside handle escutcheon	11.	Door grip	12.	Door grip finisher

DRIVER DOOR FINISHER

Removal

1. Remove cap inside handle portion and remove screw.
2. Remove finisher power window main switch.
3. Disconnect harness connector power window main switch.
4. Remove screw of power window main switch portion.
5. Pull up door finisher and remove connector inside handle cable and lock knob cable.

Installation

Install in the reverse order of removal.

CAUTION:

To install finisher, check if all clips are matched over holes of panel on vehicle, then push it.

PASSENGER DOOR FINISHER

Removal

1. Remove cap inside handle portion and remove screw.
2. Insert taping flat-bladed screwdriver into edge portion, disconnect pawls, and remove door grip finisher.
3. Remove screw of door grip portion.
4. Remove finisher power window sub switch.
5. Disconnect harness connector power window sub switch.
6. Remove screw of power window sub switch portion.
7. Pull up door finisher and remove connector inside handle cable and lock knob cable.

Installation

Install in the reverse order of removal.

CAUTION:

To install finisher, check if all clips are matched over holes of panel on vehicle, then push it.

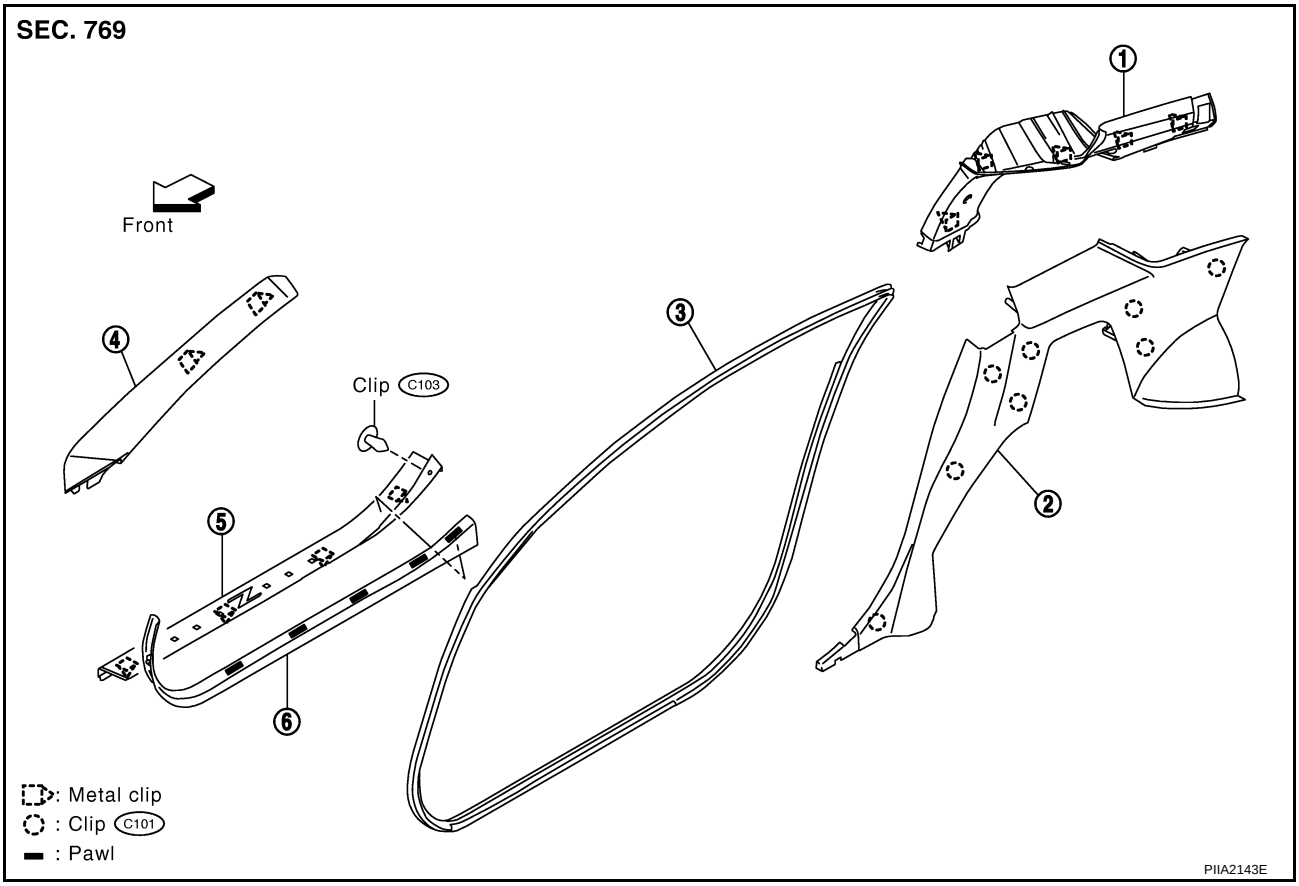
BODY SIDE TRIM

PFP:76913

Removal and Installation (for Coupe Models)

AIS000HK

CAUTION:
Wrap the tip of flat-bladed screwdriver with a cloth when removing metal clips from garnishes.



1. Rear pillar finisher
2. Rear side finisher
3. Body side welt
4. Front pillar garnish
5. Kicking plate outer
6. Kicking plate inner

REAR SIDE FINISHER

Removal

1. Remove kicking plate inner.
2. Remove body side welt.
3. Remove rear side finisher.

Installation

Install in the reverse order of removal.

REAR PILLAR FINISHER

Removal

1. Remove back door weatherstrip. Refer to BL-108, "Removal and Installation of Back Door Weatherstrip" .
2. Remove luggage finisher lower center. Refer to EI-39, "Removal and Installation (for Coupe Models)" .
3. Disconnect harness connector at luggage room lamp.
4. Remove luggage side finisher upper. Refer to EI-39, "Removal and Installation (for Coupe Models)" .
5. Remove seat belt shoulder anchor. Refer to SB-4, "Removal and Installation of Seat Belt (Coupe)" .
6. Remove kicking plate inner.
7. Remove body side welt.
8. Remove rear side finisher.
9. Remove rear pillar finisher.

Installation

Install in the reverse order of removal.

FRONT PILLAR GARNISH

Removal

1. Remove body side welt.
2. Remove front pillar garnish.

Installation

Install in the reverse order of removal.

KICKING PLATE

Removal

1. Remove kicking plate inner.
2. Remove body side welt.
3. Remove clip of kicking plate outer.
4. Remove kicking plate outer.

Installation

Install in the reverse order of removal.

BODY SIDE WELT

Removal

1. Remove kicking plate inner.
2. Remove body side welt.

Installation

Install in the reverse order of removal.

CAUTION:

To install, check if all clips are matched over holes of panel on vehicle, then push on.

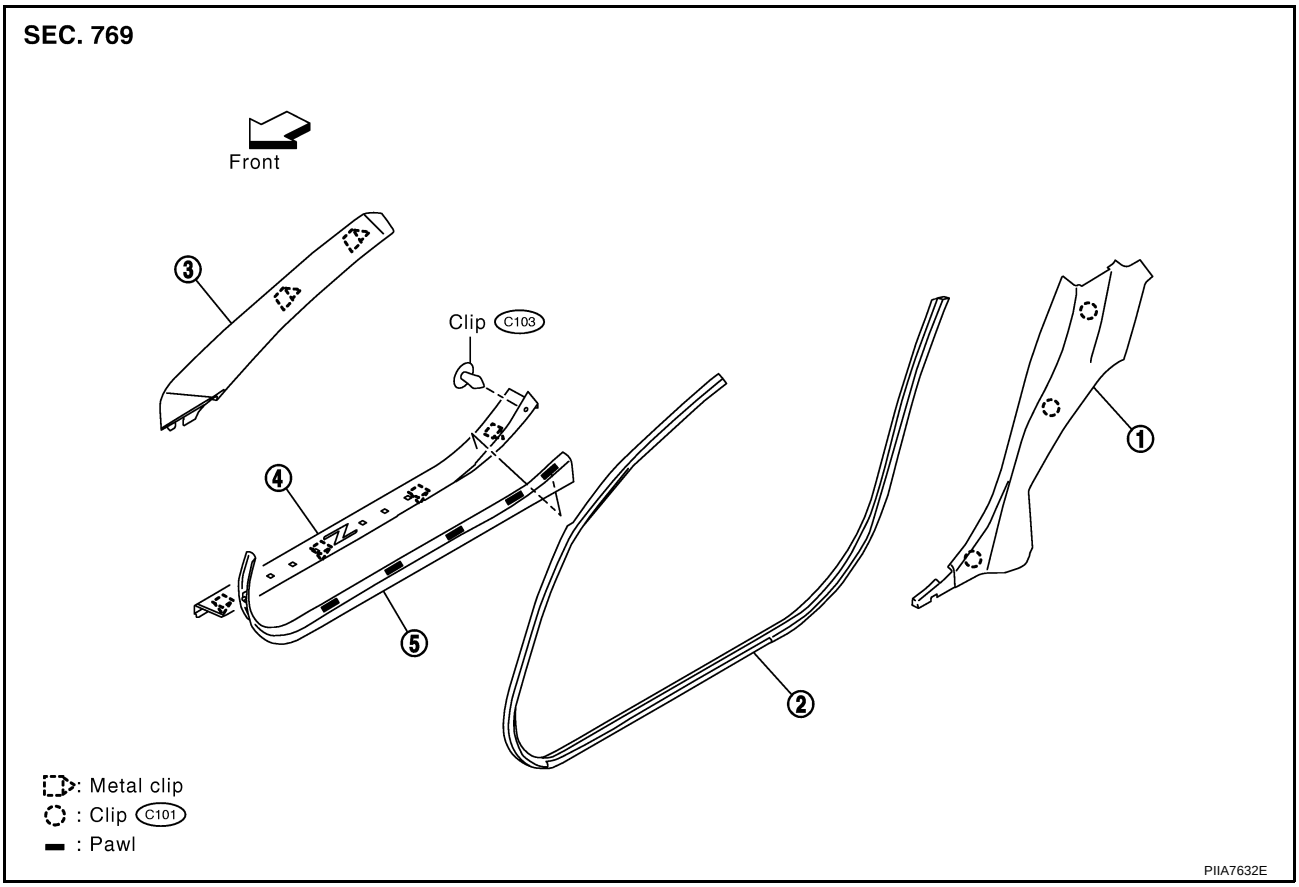
Removal and Installation (for Roadster Models)

AIS003XB

CAUTION:

Wrap the tip of flat-bladed screwdriver with a cloth when removing metal clips from garnishes.

SEC. 769



1. Rear side finisher
2. Body side welt
3. Front pillar garnish
4. Kicking plate outer
5. Kicking plate inner

REAR SIDE FINISHER

Removal

1. Remove kicking plate inner.
2. Remove body side weatherstrip. Refer to EI-32, "Removal and Installation (for Roadster Models)" .
3. Remove body side welt.
4. Remove rear side finisher.

Installation

Install in the reverse order of removal.

FRONT PILLAR GARNISH

Removal

1. Partially remove body side welt.
2. Remove front pillar garnish.

Installation

Install in the reverse order of removal.

KICKING PLATE

Removal

1. Remove kicking plate inner.
2. Remove body side welt.
3. Remove clip of kicking plate outer and remove kicking plate outer.

Installation

Install in the reverse order of removal.

BODY SIDE WELT

Removal

1. Remove kicking plate inner.
2. Remove body side welt.

Installation

Install in the reverse order of removal.

CAUTION:

To install, check if all clips are matched over holes of panel on vehicle, then push on.

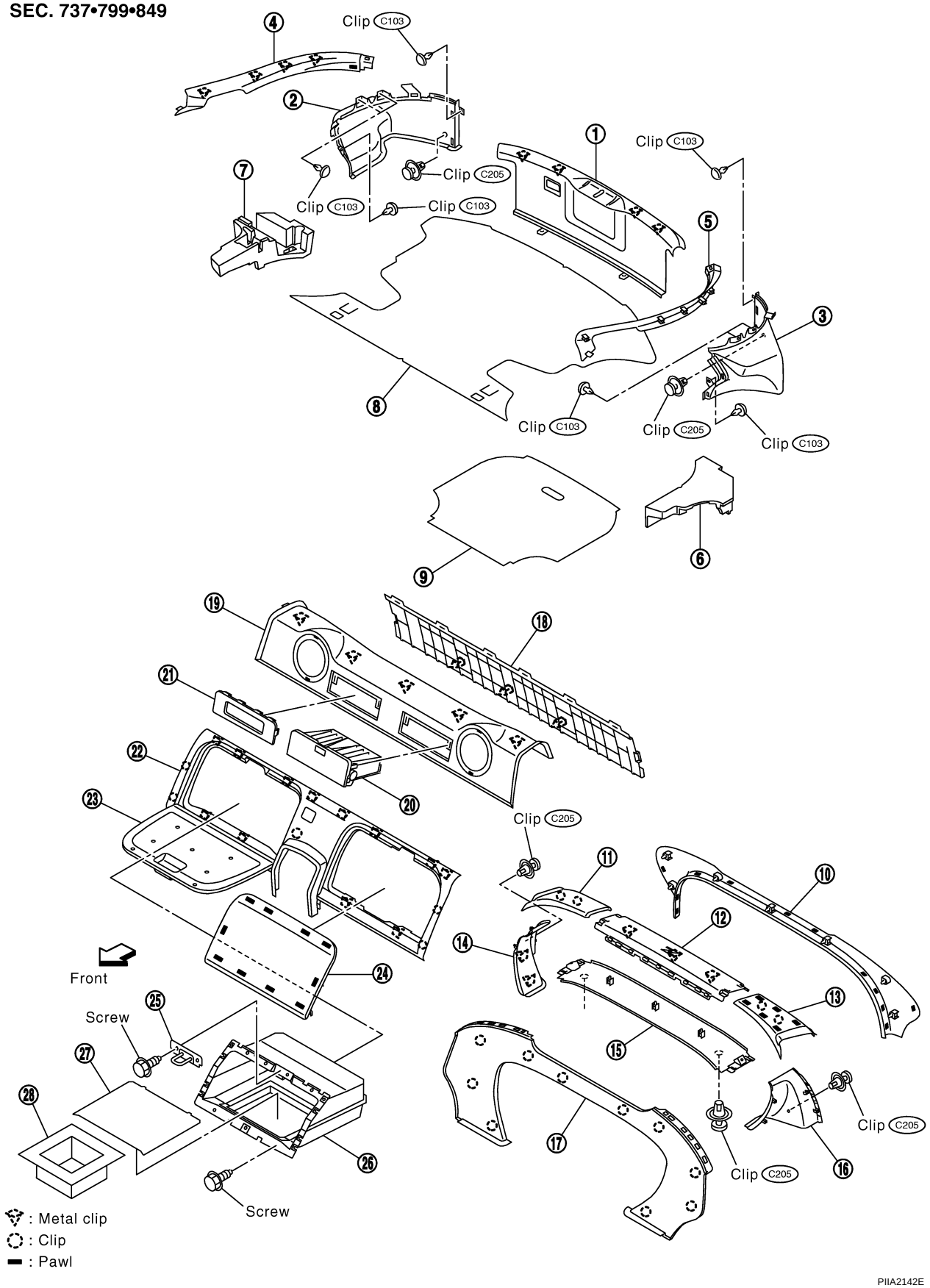
LUGGAGE FLOOR TRIM

PFP:84999

Removal and Installation (for Coupe Models)

AIS0015R

SEC. 737•799•849



PIIA2142E

1. Luggage finisher lower (center)
2. Luggage side finisher lower (RH)
3. Luggage side finisher lower (LH)
4. Luggage side finisher upper (RH)
5. Luggage side finisher upper (LH)
6. Trunk side box
7. Tool box
8. Luggage floor carpet
9. Spare tire cover
10. Strut cover rear
11. Strut cover upper (RH)
12. Strut cover upper (center)
13. Strut cover upper (LH)
14. Strut cover lower (RH)
15. Strut cover lower (center)
16. Strut cover lower (LH)
17. Strut cover front
18. Luggage floor finisher upper (rear)
19. Luggage floor finisher upper (front)
20. Rear parcel box
21. Rear parcel escutcheon
22. Luggage floor finisher lower
23. Rear floor box lid
24. Luggage floor finisher mask
25. Rear floor box striker
26. Rear floor box
27. Rear floor box mat
28. Tray

LUGGAGE FLOOR TRIM

Removal

1. Remove back door welt. Refer to EI-46, "BACK DOOR" .
2. Remove luggage floor carpet.
3. Remove spare tire cover.
4. Remove luggage finisher lower (center).
5. Remove luggage side finisher upper (RH/LH).
6. Remove strut cover upper (RH/LH).
7. Remove strut cover rear.
8. Remove clip of luggage side finisher lower and remove luggage side finisher lower.
9. Remove strut cover front.
10. Remove strut cover upper (center).
11. Remove clip of strut cover lower (RH/LH) and remove strut cover lower.
12. Remove strut cover lower (center).

Installation

Install in the reverse order of removal.

REAR FLOOR BOX

Removal

1. Remove kicking plate inner. Refer to EI-35, "BODY SIDE TRIM" .
2. Remove body side welt. Refer to EI-35, "BODY SIDE TRIM" .
3. Remove rear side finisher. Refer to EI-35, "BODY SIDE TRIM" .
4. Remove console box. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
5. Remove screw of rear floor box and remove rear floor box.
6. Remove pins of rear floor box lid and remove rear floor box lid.
7. Remove luggage floor finisher mask.
8. Remove screws of rear floor box lock and remove rear floor box lock.
9. Remove tray.

Installation

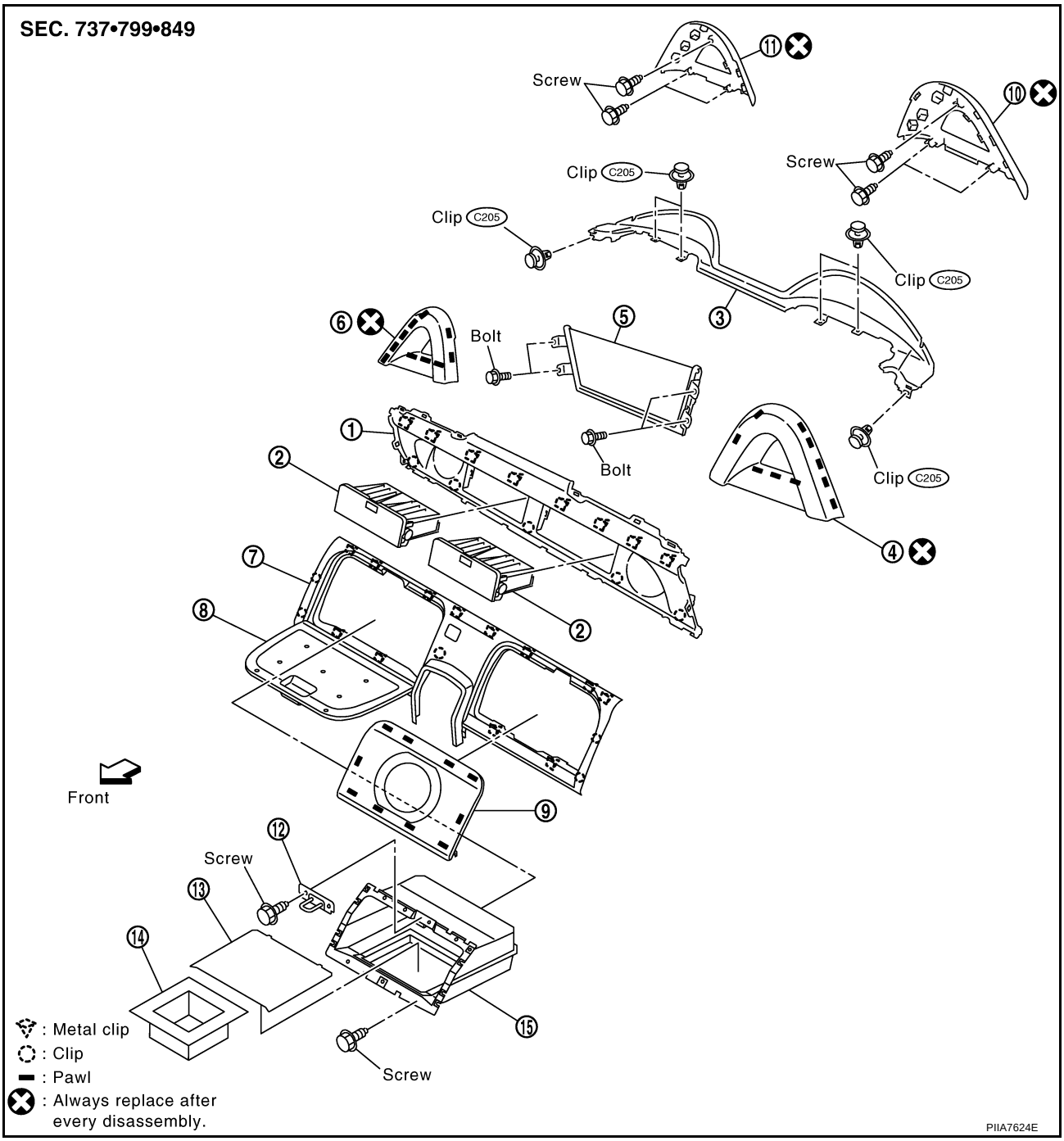
Install in the reverse order of removal.

CAUTION:

To install, check if all clips are matched over holes panel on vehicle, then push on.

Removal and Installation (for Roadster Models)

AIS003XC



1. Luggage floor finisher upper	2. Rear parcel box	3. Back panel finisher assembly
4. Guard frame protector front (LH)	5. Storage lid deflector	6. Guard frame protector front (RH)
7. Luggage floor finisher lower	8. Real floor box lid	9. Luggage floor finisher mask
10. Guard frame protector rear (LH)	11. Guard frame protector rear (RH)	12. Rear floor box striker
13. Rear floor box mat	14. Tray	15. Rear floor box

REAR FLOOR BOX

Removal

1. Remove center console finisher. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove kicking plate inner and partially remove rear of body side welt (RH/LH). Refer to EI-37, "Removal and Installation (for Roadster Models)" .
3. Remove rear side finisher. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
4. Remove luggage floor finisher lower.

5. Remove rear floor box lid and luggage floor finisher mask from luggage floor finisher lower.
6. Remove rear floor box mat and tray.
7. Remove screws, and remove rear floor box striker.
8. Loosen mounting screws and remove rear floor box.

Installation

Install in the reverse order of removal.

LUGGAGE FLOOR FINISHER UPPER

Removal

1. Remove kicking plate inner and partially remove rear of body side welt (RH/LH). Refer to EI-37, "Removal and Installation (for Roadster Models)" .
2. Remove rear side finisher. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
3. Remove luggage floor finisher lower.
4. Remove rear parcel box (RH/LH).
5. Remove luggage floor finisher upper.

Installation

Install in the reverse order of removal.

BACK PANEL FINISHER

Removal

1. Remove kicking plate inner and partially remove rear of body side welt (RH/LH). Refer to EI-37, "Removal and Installation (for Roadster Models)" .
2. Remove rear side finisher. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
3. Remove cover and shoulder anchor bolt of seat belt (RH/LH). Refer to SB-6, "Removal and Installation of Seat Belt (Roadster)" .
4. Remove front guard frame protector (RH/LH).
5. Loosen mounting bolts and remove storage lid deflector.
6. Loosen screws and remove rear guard frame protector (RH/LH).
7. Remove clips, remove back panel finisher assembly.

Installation

Install in the reverse order of removal.

CAUTION:

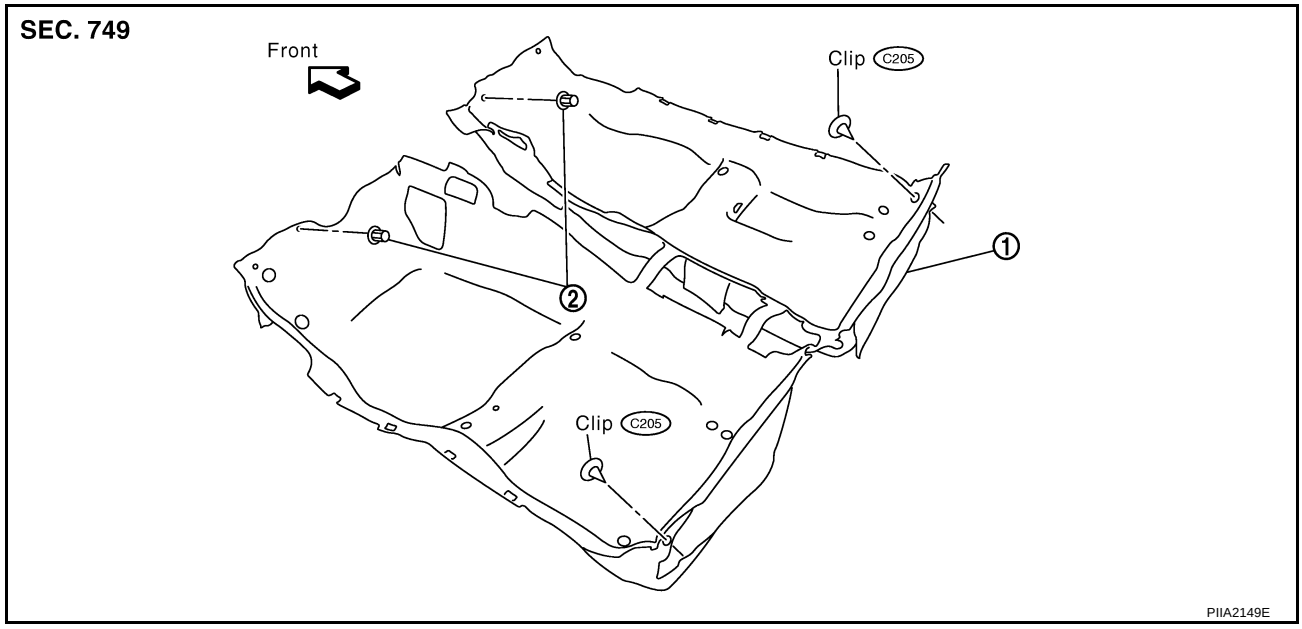
To install, check if all clips are matched over holes panele on vehicle, then push on.

FLOOR TRIM

PFP:74902

Removal and Installation

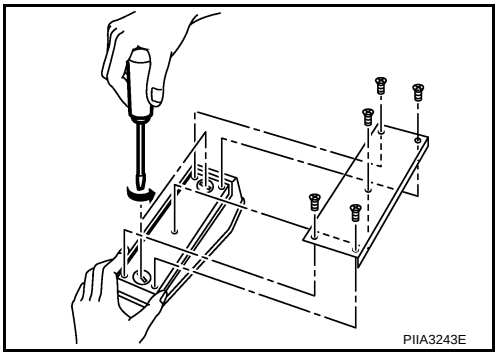
AIS000HM



1. Floor carpet assembly
2. Nut

REMOVAL

1. Remove driver seat and passenger seat. Refer to SE-65, "SEAT" .
2. Remove center console. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
3. Remove instrument side panel (left and right). Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
4. Remove body side welt. Refer to EI-35, "BODY SIDE TRIM" .
5. Remove kicking plate inner. Refer to EI-35, "BODY SIDE TRIM" .
6. Remove screw of footrest and remove plate.
7. Remove clips of footrest and remove footrest
8. Remove dash side finisher. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
9. Remove nut and clips of floor carpet.
10. Remove floor carpet assembly.



INSTALLATION

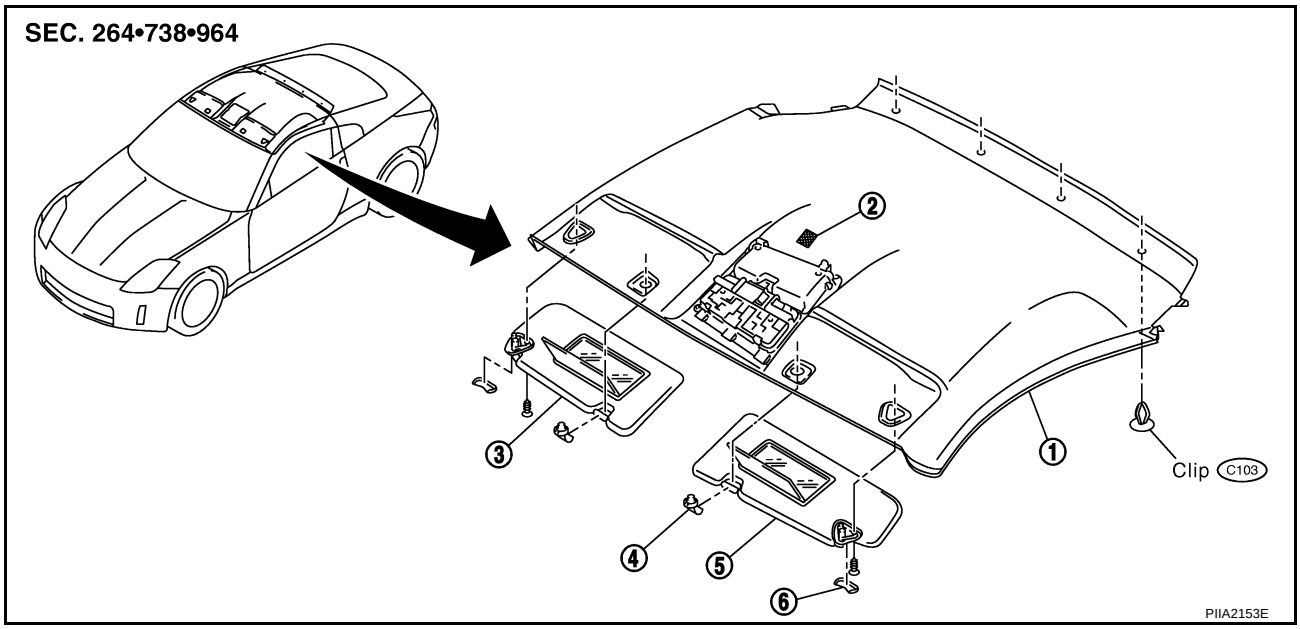
Install in the reverse order of removal.

HEADLINING

PFP:73910

Removal and Installation (for Coupe Models)

AIS000HN



1. Headlining
2. Dual lock fastener
3. Sunvisor (right)
4. Sunvisor holder
5. Sunvisor (left)
6. cap

REMOVAL

1. Remove back door welt. Refer to EI-46, "BACK DOOR" .
2. Remove luggage floor carpet. Refer to EI-39, "Removal and Installation (for Coupe Models)" .
3. Remove luggage finisher lower center. Refer to EI-39, "Removal and Installation (for Coupe Models)" .
4. Disconnect harness connector at luggage room lamp.
5. Remove luggage side finisher upper. Refer to EI-39, "Removal and Installation (for Coupe Models)" .
6. Remove kicking plate inner. Refer to EI-36, "KICKING PLATE" .
7. Remove body side welt. Refer to EI-35, "Removal and Installation (for Coupe Models)" .
8. Remove rear side finisher. Refer to EI-35, "REAR SIDE FINISHER" .
9. Remove seat belt anchor. Refer to SB-4, "Removal and Installation of Seat Belt (Coupe)" .
10. Remove rear pillar finisher. Refer to EI-35, "REAR PILLAR FINISHER" .
11. Remove front pillar garnish. Refer to EI-35, "Removal and Installation (for Coupe Models)" .
12. Disconnect harness connector at map lamp.
13. Remove sunvisor and sunvisor holder.
14. Remove dual lock fastener.
15. Remove clips of headlining rear potion.
16. Remove headlining, turn to 90 degrees and take out from back door.

CAUTION:

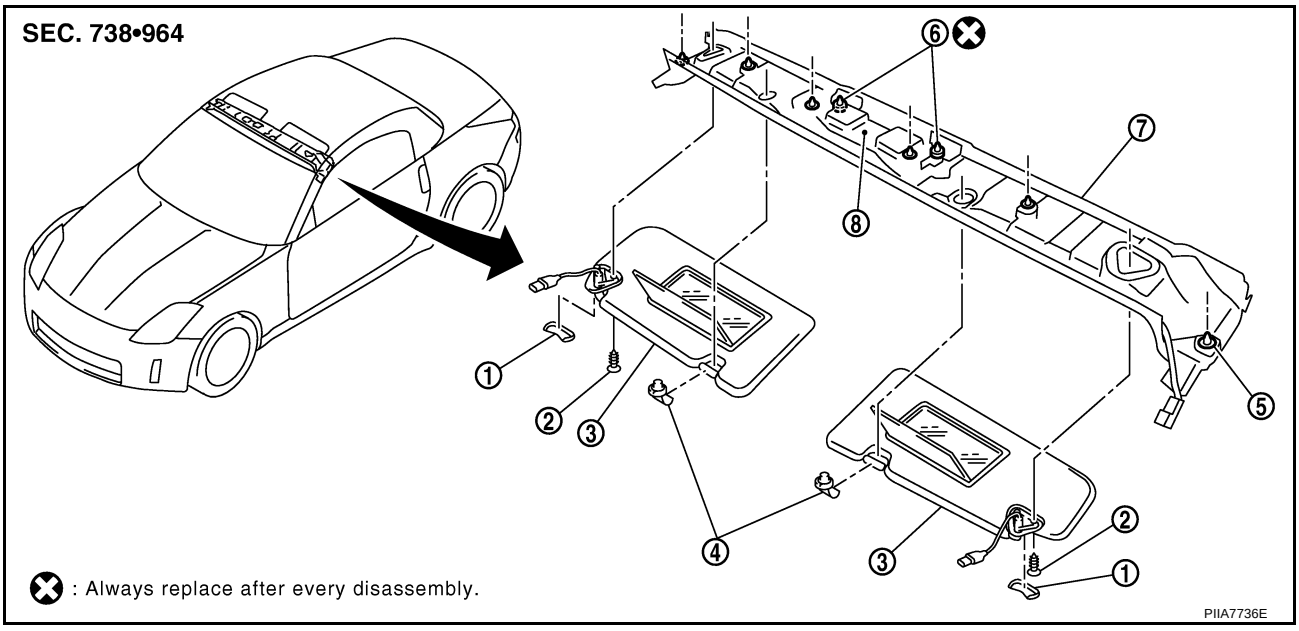
- **Always remove or install in a pair.**
- **Cover surroundings with waste to avoid scratches or damages.**
- **Do not bend headlining too hard.**

INSTALLATION

Install in the reverse order of removal.

Removal and Installation (for Roadster Models)

AIS003XK



1. Cap	2. Screw	3. Sunvisor
4. Sunvisor holder	5. Clip (C101)	6. Clip (C101)
7. Roof front finisher	8. Map lamp	

ROOF FRONT FINISHER

Removal

1. Remove cap and screws and disconnect harness connector, then remove sunvisor.
2. Rotate by 90 degrees and remove sunvisor holder.
3. Remove body side welt and front pillar garnish. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
4. Disconnect harness connector and remove roof front finisher.

Installation

Install in the reverse order of removal.

CAUTION:

To install, check if all clips are matched over holes panel on vehicle, then push on.

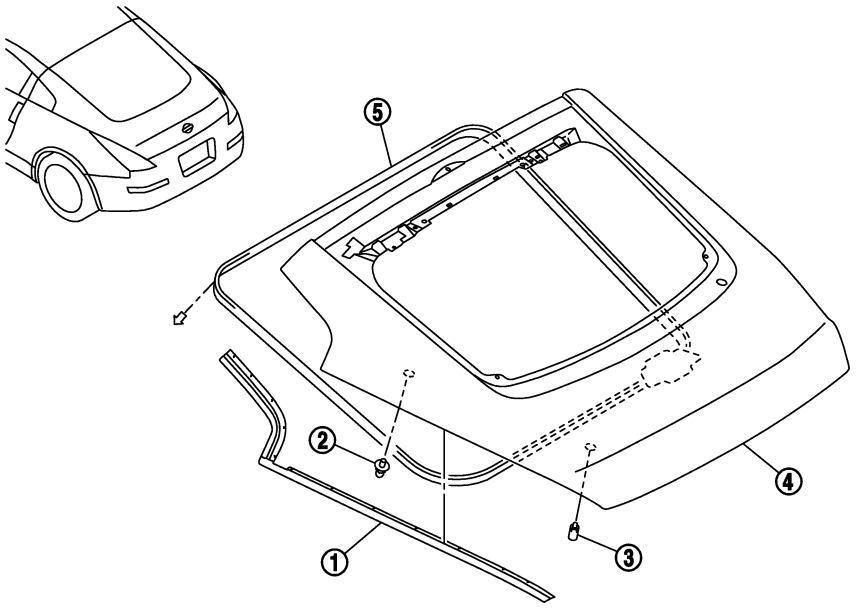
BACK DOOR

PFP:90100

Removal and Installation

AIS001QA

SEC. 909



PIIA2155E

1. Back door molding
2. Bumper rubber
3. Bumper rubber
4. Back door panel
5. Back door welt

BACK DOOR MOLDING

Removal

Remove clips of back door molding and remove back door molding.

Installation

Install in the reverse order of removal.

BACK DOOR WELT

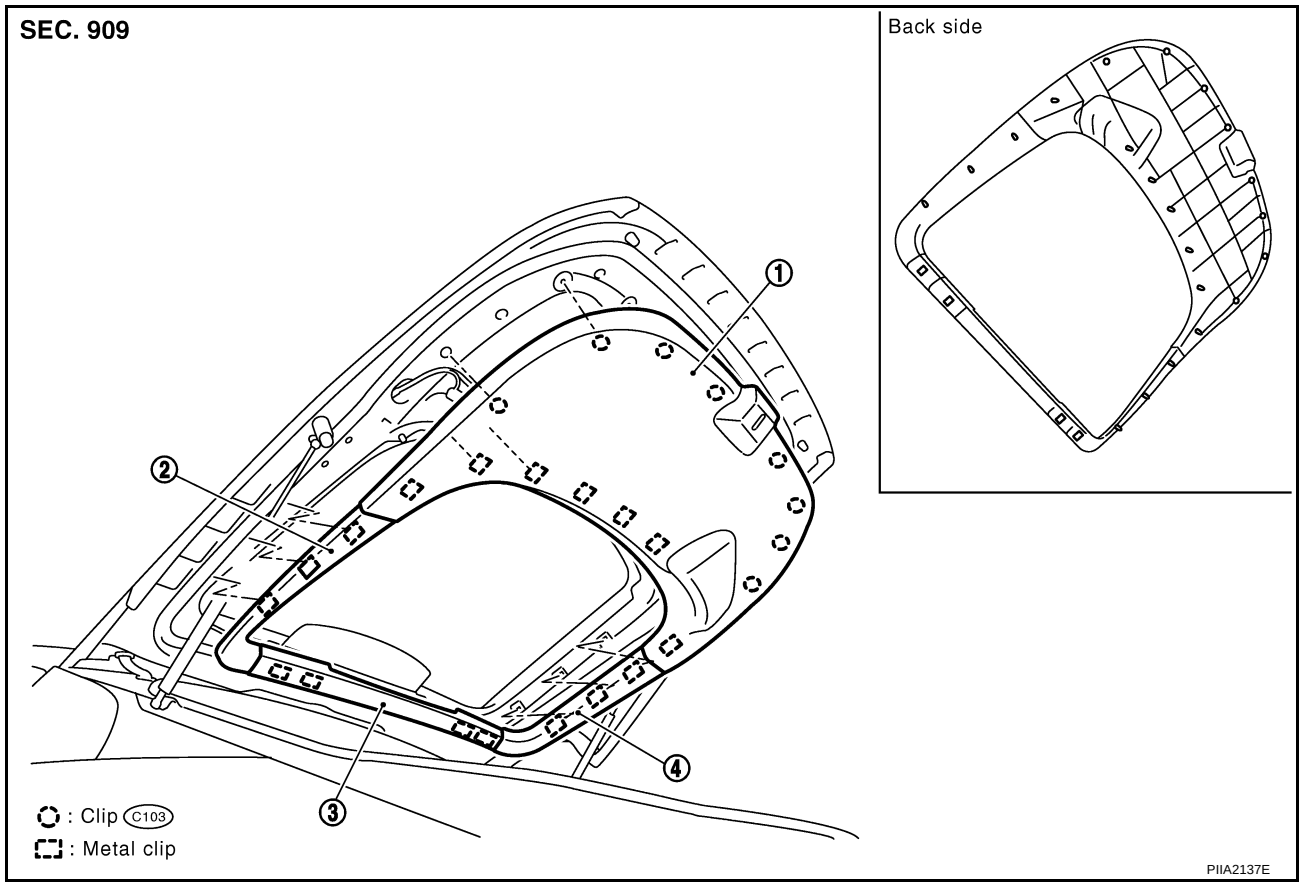
Removal

Remove back door welt.

Installation

Install in the reverse order of removal.

BACK DOOR FINISHER



1. Back door finisher lower
2. Back door finisher side (LH)
3. Back door finisher side (RH)
4. Back door finisher upper

Removal

1. Remove back door finisher lower.
2. Remove back door finisher upper.
3. Remove back door finisher side (RH/LH).

Installation

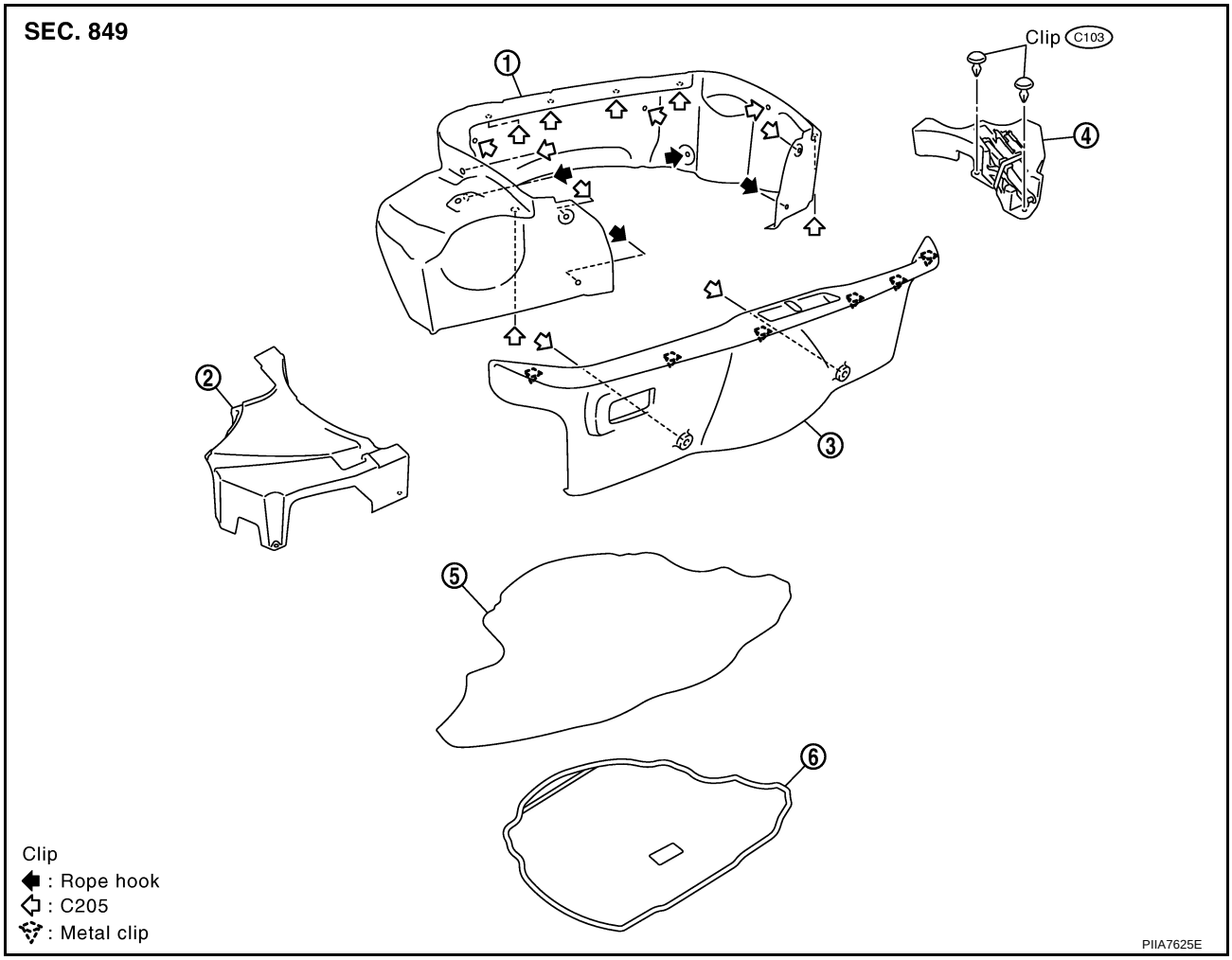
Install in the reverse order of bremoval.

TRUNK ROOM TRIM & TRUNK LID FINISHER

PFP:84920

Removal and Installation (for Roadstar Models)

AIS003X9



1. Trunk front finisher
2. Trunk side box
3. Trunk rear finisher
4. Tool box
5. Trunk floor carpet
6. Spare tire cover

TRUNK ROOM TRIM

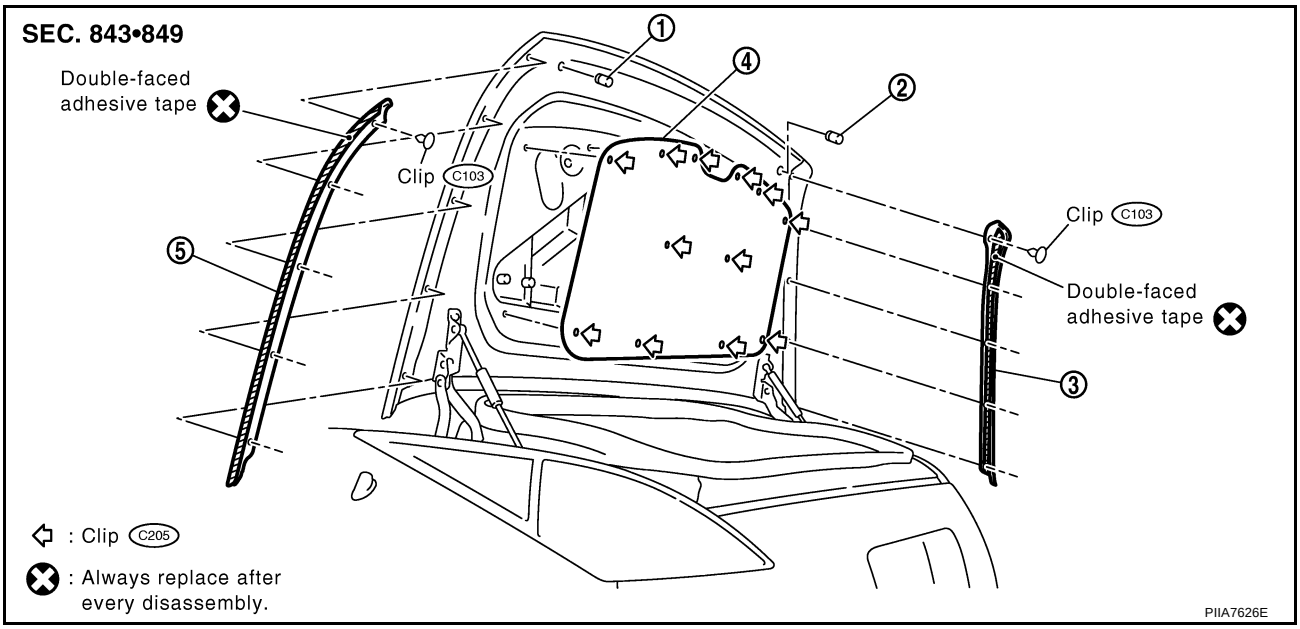
Removal

1. Remove trunk lid weatherstrip. Refer to BL-118, "Removal and Installation of Trunk Lid Weatherstrip" .
2. Remove trunk floor carpet.
3. Remove spare tire cover.
4. Remove trunk lid release lever from trunk rear finisher.
5. Remove clips and remove trunk rear finisher.
6. Remove clips of trunk front finisher and remove trunk front finisher.
7. Remove trunk side box.
8. Remove clips and remove tool box.

Installation

Install in the reverse order of removal.

TRUNK LID FINISHER



1. Bumper rubber
2. Bumper rubber
3. Trunk lid molding (RH)
4. Trunk lid finisher
5. Trunk lid molding (LH)

Removal

Remove clips of trunk lid finisher and remove trunk lid finisher.

Installation

Install in the reverse order of removal.

TRUNK LID MOLDING

Removal

1. Remove clips and double-faced adhesive tape of trunk lid molding.
2. Remove trunk lid molding (LH/RH).

Installation

Install in the reverse order of removal.

SECTION IP
INSTRUMENT PANEL

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

AIS000HQ

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

AIS001PB

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions

AIS000HR

- Disconnect both battery cables in advance.
- Disconnect air bag system line in advance.
- Never tamper with or force air bag lid open, as this may adversely affect air bag performance.
- Be careful not to scratch pad and other parts.
- When removing or disassembling any part, be careful not to damage or deform it. Protect parts, which may get in the way with cloth.
- When removing parts with a screwdriver or other tool, protect parts by wrapping them with vinyl or tape.
- Keep removed parts protected with cloth.
- If a clip is deformed or damaged, replace it.
- If an unreusable part is removed, replace it with a new one.
- Tighten bolts and nuts firmly to the specified torque.
- After re-assembly has been completed, make sure each part functions correctly.
- Remove stains in the following way.

Water-soluble stains:
Dip a soft cloth in warm water, and then squeeze it tightly. After wiping the stain, wipe with a soft dry cloth.
Oil stain:
Dissolve a synthetic detergent in warm water (density of 2 to 3% or less), dip the cloth, then clean off the stain with the cloth. Next, dip the cloth in fresh water and squeeze it tightly. Then clean off the detergent completely. Then wipe the area with a soft dry cloth.

- Do not use any organic solvent, such as thinner or benzine.

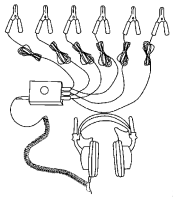
PREPARATION

PFP:00002

Special Service Tools

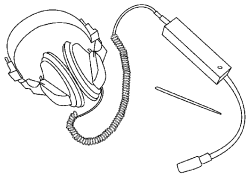
AIS000HS

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
(J39570) Chassis ear  SIIA0993E	Locating the noise
(J43980) NISSAN Squeak and Rattle Kit SIIA0994E	Repairing the cause of noise

Commercial Service Tools

AIS000HT

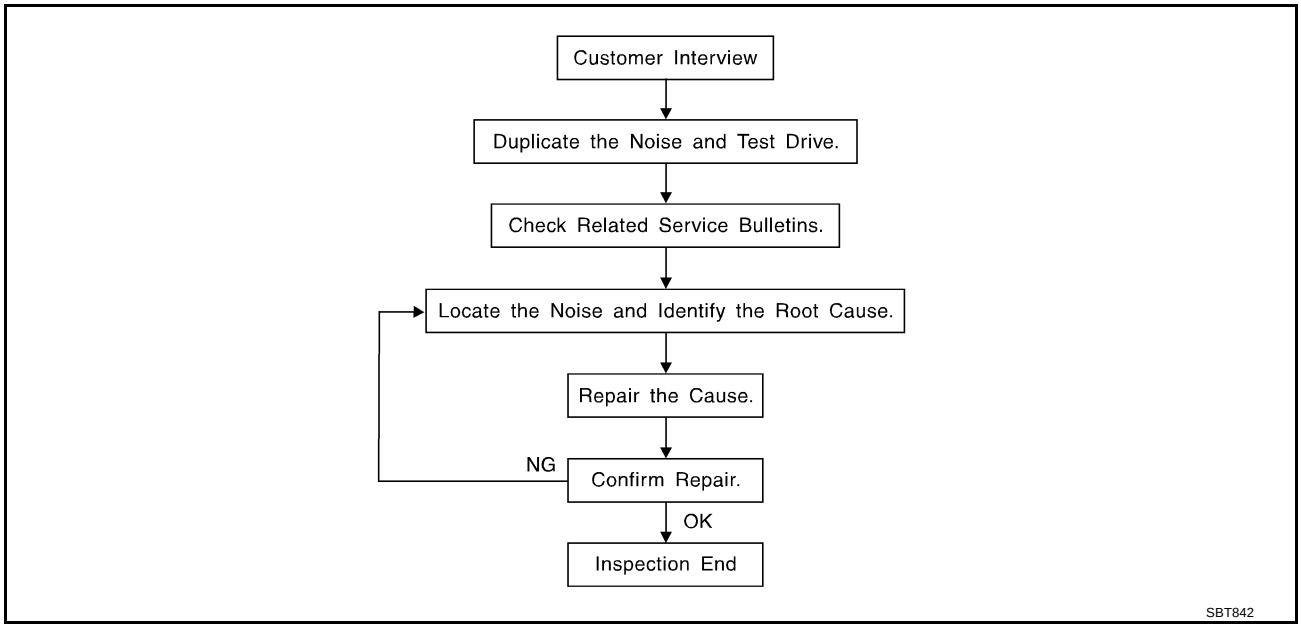
Tool name	Description
Engine ear  SIIA0995E	Locating the noise

SQUEAK AND RATTLE TROUBLE DIAGNOSES

PFP:00000

Work Flow

AIS000HU



CUSTOMER INTERVIEW

Interview the customer if possible, to determine the conditions that exist when the noise occurs. Use the Diagnostic Worksheet during the interview to document the facts and conditions when the noise occurs and any customer's comments; refer to IP-8, "Diagnostic Worksheet" . This information is necessary to duplicate the conditions that exist when the noise occurs.

- The customer may not be able to provide a detailed description or the location of the noise. Attempt to obtain all the facts and conditions that exist when the noise occurs (or does not occur).
- If there is more than one noise in the vehicle, be sure to diagnose and repair the noise that the customer is concerned about. This can be accomplished by test driving the vehicle with the customer.
- After identifying the type of noise, isolate the noise in terms of its characteristics. The noise characteristics are provided so the customer, service adviser and technician are all speaking the same language when defining the noise.
- Squeak —(Like tennis shoes on a clean floor)
  Squeak characteristics include the light contact/fast movement/brought on by road conditions/hard surfaces=higher pitch noise/softer surfaces=lower pitch noises/edge to surface=chirping
- Creak—(Like walking on an old wooden floor)
  Creak characteristics include firm contact/slow movement/twisting with a rotational movement/pitch dependent on materials/often brought on by activity.
- Rattle—(Like shaking a baby rattle)
  Rattle characteristics include the fast repeated contact/vibration or similar movement/loose parts/missing clip or fastener/incorrect clearance.
- Knock —(Like a knock on a door)
  Knock characteristics include hollow sounding/sometimes repeating/often brought on by driver action.
- Tick—(Like a clock second hand)
  Tick characteristics include gentle contacting of light materials/loose components/can be caused by driver action or road conditions.
- Thump—(Heavy, muffled knock noise)
  Thump characteristics include softer knock/dead sound often brought on by activity.
- Buzz—(Like a bumble bee)
  Buzz characteristics include high frequency rattle/firm contact.
- Often the degree of acceptable noise level will vary depending upon the person. A noise that you may judge as acceptable may be very irritating to the customer.
- Weather conditions, especially humidity and temperature, may have a great effect on noise level.

DUPLICATE THE NOISE AND TEST DRIVE

If possible, drive the vehicle with the customer until the noise is duplicated. Note any additional information on the Diagnostic Worksheet regarding the conditions or location of the noise. This information can be used to duplicate the same conditions when you confirm the repair.
If the noise can be duplicated easily during the test drive, to help identify the source of the noise, try to duplicate the noise with the vehicle stopped by doing one or all of the following:

1) Close a door.
2) Tap or push/pull around the area where the noise appears to be coming from.
3) Rev the engine.
4) Use a floor jack to recreate vehicle “twist”.
5) At idle, apply engine load (electrical load, half-clutch on M/T model, drive position on A/T model).
6) Raise the vehicle on a hoist and hit a tire with a rubber hammer.

- Drive the vehicle and attempt to duplicate the conditions the customer states exist when the noise occurs.
- If it is difficult to duplicate the noise, drive the vehicle slowly on an undulating or rough road to stress the vehicle body.

CHECK RELATED SERVICE BULLETINS

After verifying the customer concern or symptom, check ASIST for Technical Service Bulletins (TSBs) related to that concern or symptom.
If a TSB relates to the symptom, follow the procedure to repair the noise.

LOCATE THE NOISE AND IDENTIFY THE ROOT CAUSE

1. Narrow down the noise to a general area. To help pinpoint the source of the noise, use a listening tool (Chassis Ear: J39570, Engine Ear and mechanics stethoscope).
2. Narrow down the noise to a more specific area and identify the cause of the noise by:

- removing the components in the area that you suspect the noise is coming from.
  Do not use too much force when removing clips and fasteners, otherwise clips and fastener can be broken or lost during the repair, resulting in the creation of new noise.
- tapping or pushing/pulling the component that you suspect is causing the noise.
  Do not tap or push/pull the component with excessive force, otherwise the noise will be eliminated only temporarily.
- feeling for a vibration with your hand by touching the component(s) that you suspect is (are) causing the noise.
- placing a piece of paper between components that you suspect are causing the noise.
- looking for loose components and contact marks.
  Refer to IP-6, "Generic Squeak and Rattle Troubleshooting" .

REPAIR THE CAUSE

- If the cause is a loose component, tighten the component securely.
- If the cause is insufficient clearance between components:
  - separate components by repositioning or loosening and retightening the component, if possible.
  - insulate components with a suitable insulator such as urethane pads, foam blocks, felt cloth tape or urethane tape. A NISSAN Squeak and Rattle Kit (J43980) is available through your authorized NISSAN Parts Department.

CAUTION:
Do not use excessive force as many components are constructed of plastic and may be damaged.
Always check with the Parts Department for the latest parts information.
The following materials are contained in the NISSAN Squeak and Rattle Kit (J43980). Each item can be ordered separately as needed.
URETHANE PADS [1.5 mm (0.059 in) thick]
Insulates connectors, harness, etc.
76268-9E005: 100 × 135 mm (3.94 × 5.31 in)/76884-71L01: 60 × 85 mm (2.36 × 3.35 in)/76884-71L02: 15 × 25 mm (0.59 × 0.98 in)
INSULATOR (Foam blocks)
Insulates components from contact. Can be used to fill space behind a panel.
73982-9E000: 45 mm (1.77 in) thick, 50 × 50 mm (1.97 × 1.97 in)/73982-50Y00: 10 mm (0.39 in) thick, 50 × 50 mm (1.97 × 1.97 in)

INSULATOR (Light foam block)
80845-71L00: 30 mm (1.18 in) thick, 30 × 50 mm (1.18 × 1.97 in)
FELT CLOTH TAPE
Used to insulate where movement does not occur.Ideal for instrument panel applications.
68370-4B000: 15 × 25 mm (0.59 × 0.98 in) pad/68239-13E00: 5 mm (0.20 in) wide tape roll The following materials, not found in the kit, can also be used to repair squeaks and rattles.
UHMW (TEFLON) TAPE
Insulates where slight movement is present. Ideal for instrument panel applications.
SILICONE GREASE
Used in place of UHMW tape that will be visible or not fit.
Note: Will only last a few months.
SILICONE SPRAY
Use when grease cannot be applied.
DUCT TAPE
Use to eliminate movement.

CONFIRM THE REPAIR

Confirm that the cause of a noise is repaired by test driving the vehicle. Operate the vehicle under the same conditions as when the noise originally occurred. Refer to the notes on the Diagnostic Worksheet.

Generic Squeak and Rattle Troubleshooting

AIS000HV

Refer to Table of Contents for specific component removal and installation information.

INSTRUMENT PANEL

Most incidents are caused by contact and movement between:

1. The cluster lid A and instrument panel
2. Acrylic lens and combination meter housing
3. Instrument panel to front pillar garnish
4. Instrument panel to windshield
5. Instrument panel mounting pins
6. Wiring harnesses behind the combination meter
7. A/C defroster duct and duct joint

These incidents can usually be located by tapping or moving the components to duplicate the noise or by pressing on the components while driving to stop the noise. Most of these incidents can be repaired by applying felt cloth tape or silicon spray (in hard to reach areas). Urethane pads can be used to insulate wiring harness.

CAUTION:
Do not use silicone spray to isolate a squeak or rattle. If you saturate the area with silicone, you will not be able to recheck the repair.

CENTER CONSOLE

Components to pay attention to include:

1. Shifter assembly cover to finisher
2. A/C control unit and cluster lid C
3. Wiring harnesses behind audio and A/C control unit

The instrument panel repair and isolation procedures also apply to the center console.

DOORS

Pay attention to the:

1. Finisher and inner panel making a slapping noise
2. Inside handle escutcheon to door finisher
3. Wiring harnesses tapping
4. Door striker out of alignment causing a popping noise on starts and stops

Tapping or moving the components or pressing on them while driving to duplicate the conditions can isolate many of these incidents. You can usually insulate the areas with felt cloth tape or insulator foam blocks from the NISSAN Squeak and Rattle Kit (J43980) to repair the noise.

TRUNK

Trunk noises are often caused by a loose jack or loose items put into the trunk by the owner.
In addition look for:

1. Trunk lid dumpers out of adjustment
2. Trunk lid striker out of adjustment
3. The trunk lid torsion bars knocking together
4. A loose license plate or bracket

Most of these incidents can be repaired by adjusting, securing or insulating the item(s) or component(s) causing the noise.

SUNROOF/HEADLINING

Noises in the sunroof/headlining area can often be traced to one of the following:

1. Sunroof lid, rail, linkage or seals making a rattle or light knocking noise
2. Sunvisor shaft shaking in the holder
3. Front or rear windshield touching headlining and squeaking

Again, pressing on the components to stop the noise while duplicating the conditions can isolate most of these incidents. Repairs usually consist of insulating with felt cloth tape.

SEATS

When isolating seat noise it's important to note the position the seat is in and the load placed on the seat when the noise is present. These conditions should be duplicated when verifying and isolating the cause of the noise.
Cause of seat noise include:

1. Headrest rods and holder
2. A squeak between the seat pad cushion and frame
3. The rear seatback lock and bracket

These noises can be isolated by moving or pressing on the suspected components while duplicating the conditions under which the noise occurs. Most of these incidents can be repaired by repositioning the component or applying urethane tape to the contact area.

UNDERHOOD

Some interior noise may be caused by components under the hood or on the engine wall. The noise is then transmitted into the passenger compartment.
Causes of transmitted underhood noise include:

1. Any component mounted to the engine wall
2. Components that pass through the engine wall
3. Engine wall mounts and connectors
4. Loose radiator mounting pins
5. Hood bumpers out of adjustment
6. Hood striker out of adjustment

These noises can be difficult to isolate since they cannot be reached from the interior of the vehicle. The best method is to secure, move or insulate one component at a time and test drive the vehicle. Also, engine RPM or load can be changed to isolate the noise. Repairs can usually be made by moving, adjusting, securing, or insulating the component causing the noise.

Diagnostic Worksheet

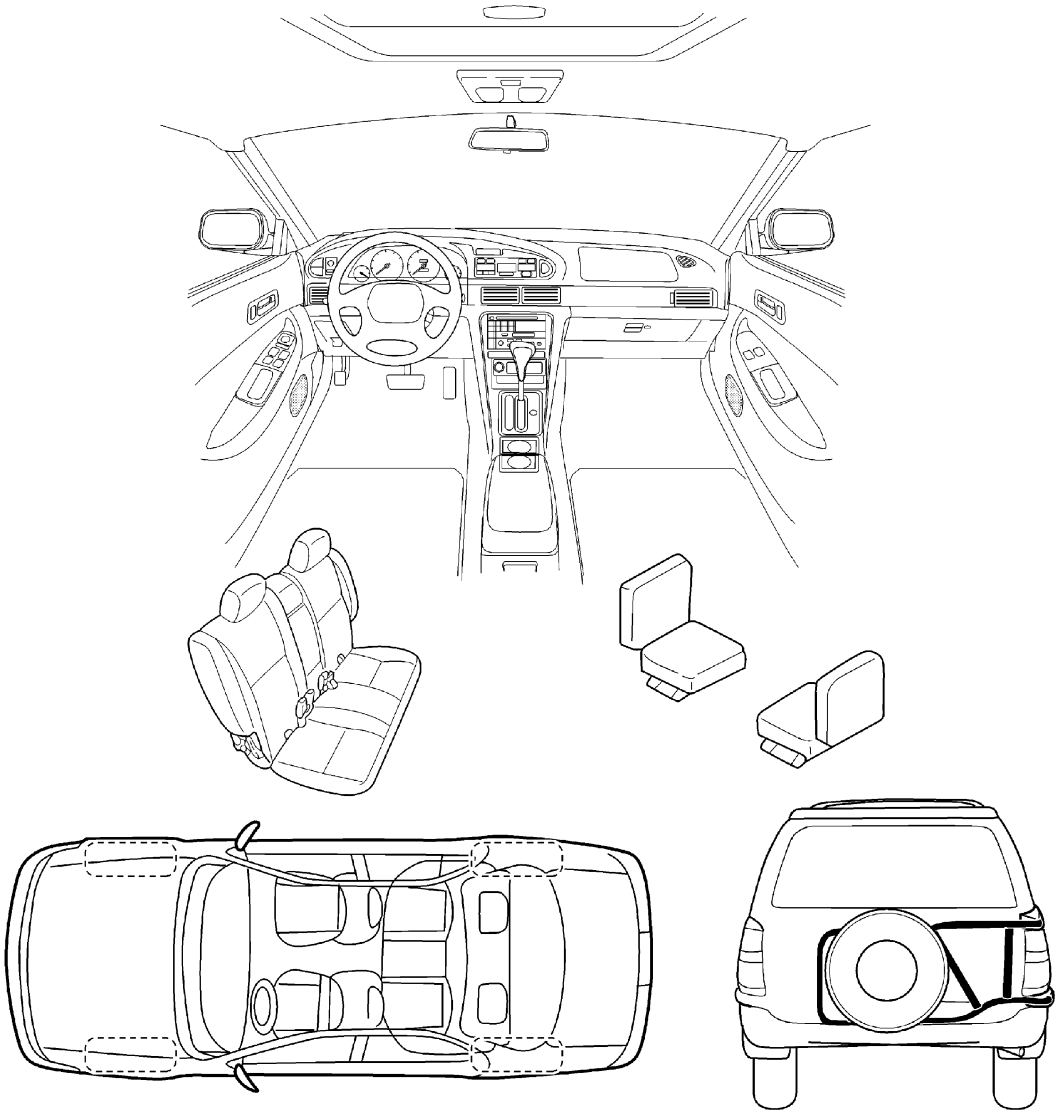
AIS000HW

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET

Dear Nissan Customer:
We are concerned about your satisfaction with your Nissan vehicle. Repairing a squeak or rattle sometimes can be very difficult. To help us fix your Nissan right the first time, please take a moment to note the area of the vehicle where the squeak or rattle occurs and under what conditions. You may be asked to take a test drive with a service advisor or technician to ensure we confirm the noise you are hearing.

I. WHERE DOES THE NOISE COME FROM? (circle the area of the vehicle)

The illustrations are for reference only, and may not reflect the actual configuration of your vehicle.



Continue to the back of the worksheet and briefly describe the location of the noise or rattle. In addition, please indicate the conditions which are present when the noise occurs.

PIIB0723E

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET- page 2

Briefly describe the location where the noise occurs:

_____

_____

II. WHEN DOES IT OCCUR? (check the boxes that apply)

❑ anytime
❑ 1st time in the morning
❑ only when it is cold outside
❑ only when it is hot outside
❑ after sitting out in the sun
❑ when it is raining or wet
❑ dry or dusty conditions
❑ other: _____

III. WHEN DRIVING:

❑ through driveways
❑ over rough roads
❑ over speed bumps
❑ only at about ____ mph
❑ on acceleration
❑ coming to a stop
❑ on turns : left, right or either (circle)
❑ with passengers or cargo
❑ other: _____
❑ after driving ____ miles or ____ minutes

IV. WHAT TYPE OF NOISE?

❑ squeak (like tennis shoes on a clean floor)
❑ creak (like walking on an old wooden floor)
❑ rattle (like shaking a baby rattle)
❑ knock (like a knock on a door)
❑ tick (like a clock second hand)
❑ thump (heavy, muffled knock noise)
❑ buzz (like a bumble bee)

TO BE COMPLETED BY DEALERSHIP PERSONNEL
Test Drive Notes:

_____

_____

	YES	NO	Initials of person performing
Vehicle test driven with customer	❑	❑	_____
- Noise verified on test drive	❑	❑	
- Noise source located and repaired	❑	❑	_____
- Follow up test drive performed to confirm repair	❑	❑	_____

VIN: _____ Customer Name: _____

W.O. #: _____ Date: _____

This form must be attached to Work Order

SBT844

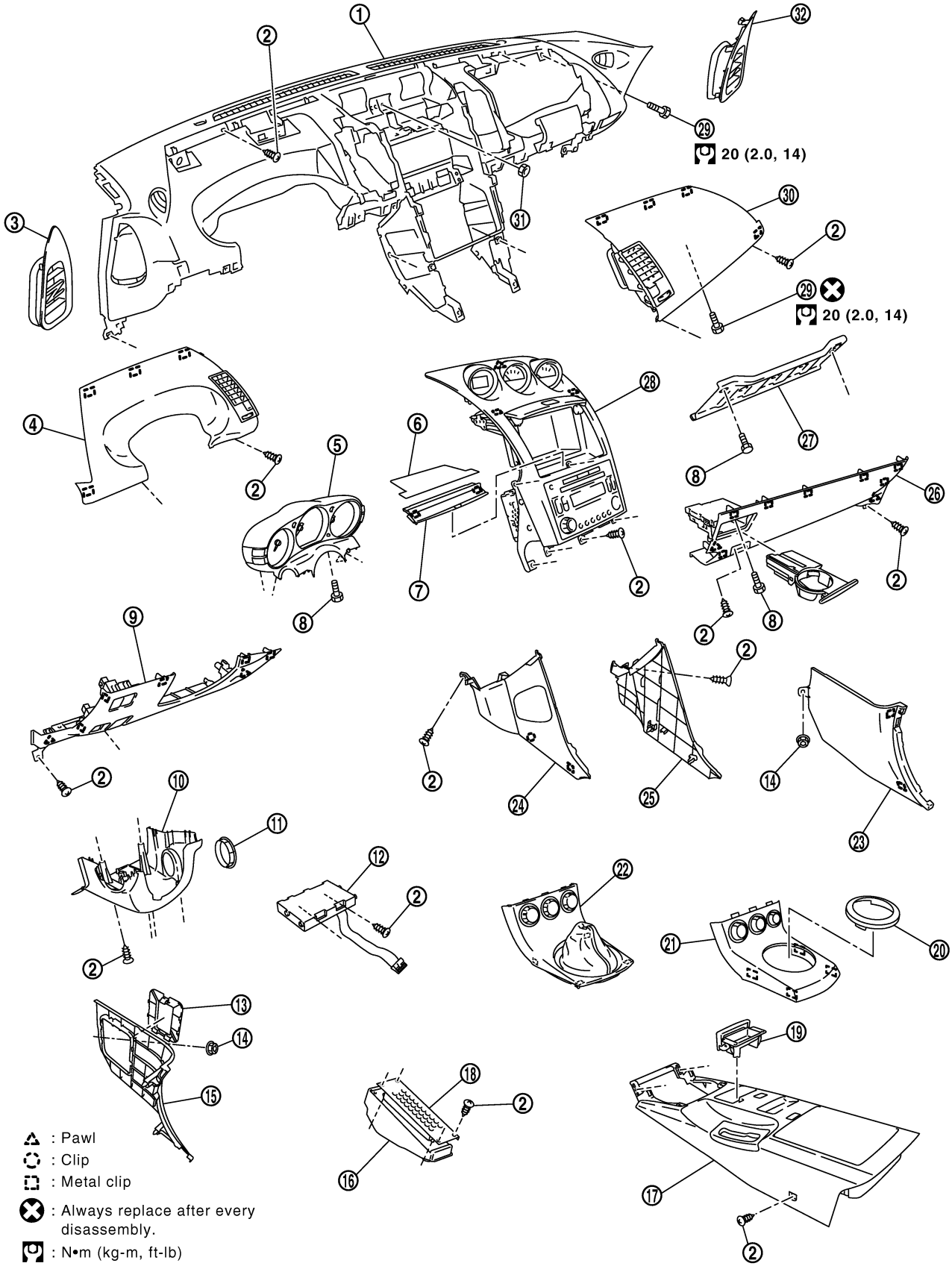
INSTRUMENT PANEL ASSEMBLY

PFP:68200

Component Parts Drawing

AIS004Y2

SEC. 248•280•487•680•969



PIIB1202E

1. Instrument panel
2. Screw
3. Instrument side finisher
4. Instrument driver panel upper
5. Combination meter
6. Pocket mat
7. Switch mask
8. Bolt
9. Instrument driver panel lower
10. Steering column cover
11. Steering lock escutcheon
12. Unified meter and A/C amp.
13. Fuse cover
14. Nut (plastics)
15. Dash side finisher (LH)
16. Foot rest
17. Center console
18. Foot rest plate
19. Coin holder / Ashtray
20. Console finisher (A/T ring)
21. Console finisher (A/T)
22. Console boot (M/T)
23. Dash side finisher (RH)
24. Instrument side panel (LH)
25. Instrument side panel (RH)
26. Instrument passenger panel lower
27. Knee protector
28. Cluster lid C
29. Bolt
30. Instrument passenger panel upper
31. Nut
32. Instrument side finisher (RH)

Removal and Installation

AIS004Y3

WORK STEP

When removing instrument panel, combination meter, audio and console assembly, take steps in the order shown by the numbers below.

CAUTION:

- **Disconnect both battery cables in advance.**
- **Disconnect air bag system line in advance.**
- **Never tamper with or force air bag lid open, as this may adversely affect air bag performance.**
- **Be careful not to scratch pad and other parts.**

Parts		Reference page	Instrument panel	Combination meter	Audio	Center console
(A)	Kicking plate (RH / LH)	EI-37	[1]	[1]		
(B)	Foot rest	EI-43	[2]	[2]		
(C)	Dash side finisher (RH / LH)	IP-12	[3]	[3]		
(D)	Instrument driver panel lower	IP-12	[4]	[4]		
(E)	Steering column lower cover	IP-12	[5]	[5]		
(F)	Combination meter	IP-12	[6]	[6]		
(G)	Spiral cable	SRS-43	[7]			
(H)	Console finisher (A/T ring) (A/T Models)	IP-13	[8]		[1]	[1]
(I)	Shift knob (M/T Models)	IP-13	[8]		[1]	[1]
(J)	Console finisher (A/T Models)	IP-13	[9]		[2]	[2]
(K)	Console boot (M/T Models)	IP-13	[9]		[2]	[2]
(L)	Center console *1	IP-13	[10]			[3]
(M)	Instrument passenger panel lower	IP-13	[11]			
(N)	Instrument side panel (RH / LH)	IP-14	[12]			
(O)	Unified meter and A/C amp.	ATC-109	[13]		[3]	
(P)	Switch mask (without NAVI models)	IP-14	[14]		[4]	
(Q)	NAVI switch (with NAVI models)	AV-115	[14]		[4]	
(R)	Cluster lid C*2	IP-14	[15]		[5]	
(S)	Display unit (with NAVI models)	AV-115	[16]			
(T)	Front pillar garnish (RH / LH)	EI-37	[17]			
(U)	Instrument driver panel upper	IP-15	[18]			
(V)	Instrument passenger panel upper	IP-15	[19]			
(W)	Instrument side finisher (RH)	IP-15	[20]			
(X)	Instrument panel	IP-15	[21]			

[ ]:number indicates step in removal procedures.

NOTE:
*1: Console rear pocket and coin holder bracket assembly. Refer to IP-16, "CENTER CONSOLE" .
*2: Audio, Instrument upper box, and triple meter assembly. Refer to IP-17, "CLUSTER LID C" .

REMOVAL

(A) Kicking Plate (RH/LH)

Remove kicking plate (RH/LH). Refer to EI-35, "BODY SIDE TRIM" .

(B) Foot Rest

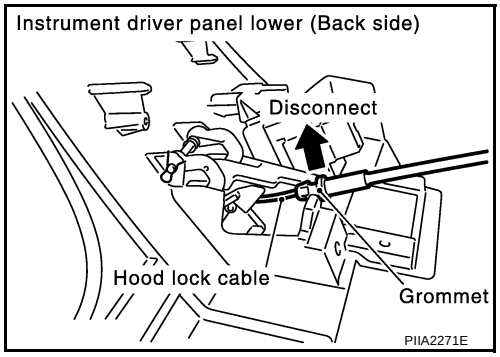
Remove foot rest. Refer to EI-43, "FLOOR TRIM" .

(C) Dash Side Finisher (RH/LH)

1. Remove plastics nut.
2. Remove dash side finisher (RH/LH).

(D) Instrument Driver Panel Lower

1. Remove screws.
2. Remove data link connector.
3. Pull to disengage metal clip by removing panel in horizontal direction.
4. Disconnect in-vehicle sensor and each electrical parts.
5. Remove the grommet, and remove hood lock cable.

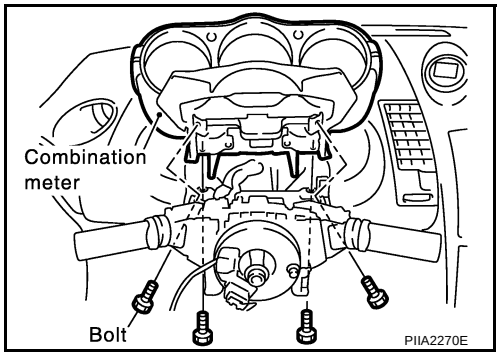


(E) Steering Column Lower Cover

1. Remove screws.
2. Disengage the tab, remove only lower side. (Upper side is integrated in combination meter.)

(F) Combination Meter

After removing bolts, remove harness connector.

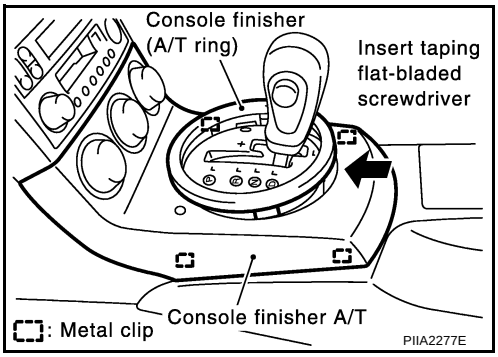


(G) Spiral cable

Remove bolts and remove spiral cable. Refer to SRS-43, "SPIRAL CABLE" .

(H) Console Finisher (A/T RING) (A/T Models)

1. Move selector lever to the drive position.



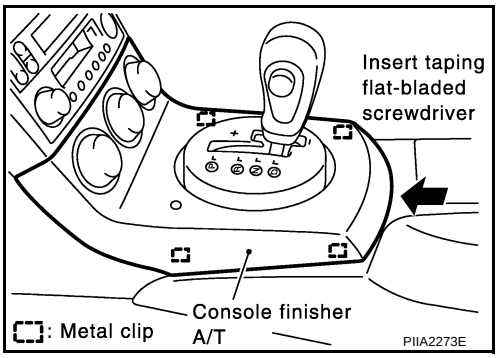
(I) Shift Knob (M/T Models)

Remove shift knob with turning counterclockwise. Refer to MT-13, "SHIFT CONTROL" .

(J) Console Finisher (A/T Models)

1. Insert a thin flat-bladed screwdriver wrapped with tape from behind console finisher, and remove metal clip on back. Then pull up and back to disengage from front metal clip.
2. Disconnect A/C harness connector, and remove console finisher.

NOTE:
A/C controller is assembled in the console finisher. Therefore, when installing and removing be careful not to use excessive force, etc.



(K) Console Boot (M/T Models)

1. Insert a thin flat-bladed screwdriver wrapped with tape from behind console boot, and remove metal clip on back. Then pull up and back to disengage from front metal clip.
2. Disconnect A/C harness connector, and remove console boot.

NOTE:
A/C controller is assembled in the console boot. Therefore, when installing and removing be careful not to use excessive force, etc.

(L) Center Console

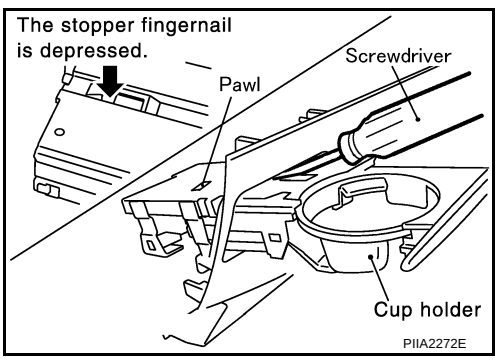
1. Remove coin holder and ashtray.
2. Remove screws.
3. Remove console sub-harness.
4. After removing, disassemble each parts. Refer to IP-16, "CENTER CONSOLE" .

NOTE:
When removing console, be careful not to pull the harness.

(M) Instrument Passenger Panel Lower

1. Remove cup holder.

   NOTE:
   Insert a screwdriver wrapped with tape into square hole that can be seen from lower side. Pull stopper tab forward while pressing to lower side.
2. Remove screws and bolt.
3. Pull panel horizontally toward you and disengage from metal clip.



(N) Instrument Side Panel (RH/LH)

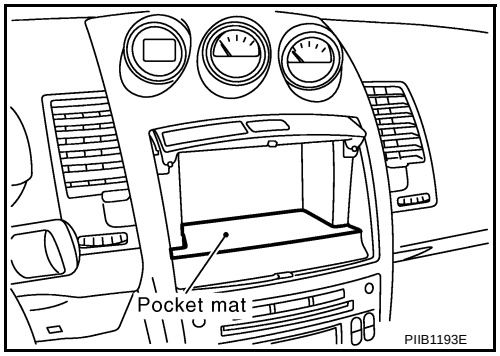
1. Remove screws.
2. Pull to the side, disconnect metal clips, and remove instrument side panel.

(O) Unified Meter And A/C Amp.

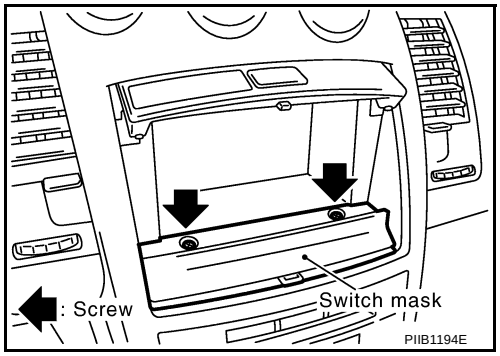
Remove screws, and disconnect harness connector, and remove unified meter and A/C amp. Refer to ATC-109, "AUTO AMP" .

(P) Switch Mask (Without NAVI Models)

1. Remove pocket mat.



2. Remove screws.



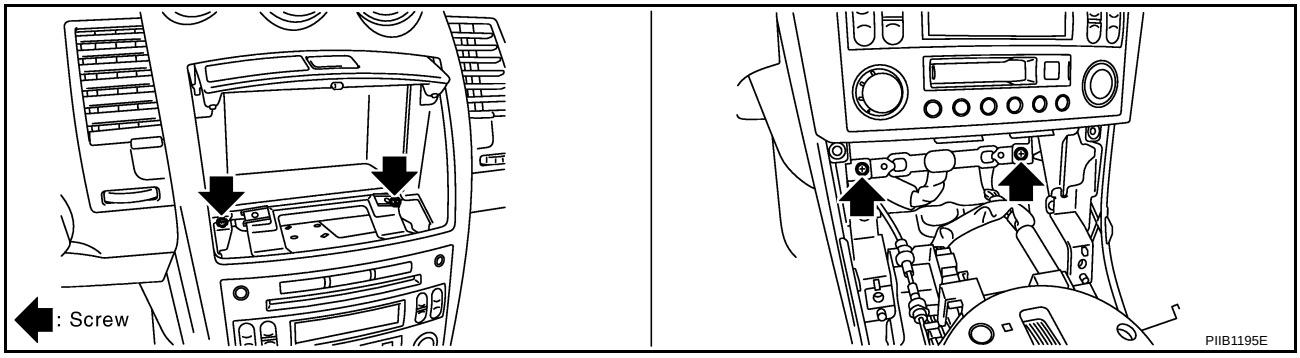
3. Insert a screwdriver wrapped with tape into center square hole for instrument upper box pawl. Bend instrument upper box backward to create a front/back gap.
4. Insert another screwdriver wrapped with tape into the gap made in Step1. Push up switch mask, and remove.

(Q) NAVI Switch (With NAVI Models)

Remove NAVI switch. Refer to AV-115, "Removal and Installation of NAVI Switch" .

(R) Cluster Lid C

1. Remove screws.



2. Disconnect upper edge central pawl and metal clip.
3. Disconnect audio harness connector and pull out toward you.

CAUTION:

Unit is heavy, so be careful not to pinch your fingers when working.

4. After remove cluster lid C and then remove triple meter, instrument upper box and audio unit. Refer to IP-17, "CLUSTER LID C" .

(S) Display Unit (With NAVI Models)

Remove display unit. Refer to AV-115, "Removal and Installation of Display Unit" .

(T) Front Pillar Garnish

Pull to inside of vehicle, disconnect metal clips and remove front pillar garnish. Refer to EI-35, "BODY SIDE TRIM" .

(U) Instrument Driver Panel Upper

1. Remove screws.
2. Disconnect metal clips, then remove instrument driver panel upper.

(V) Instrument Passenger Panel Upper

1. Remove screws.
2. Disconnect metal clips, then remove instrument passenger panel upper.

(W) Instrument Side Finisher (RH)

Using a screwdriver wrapped with tape, pry up and remove instrument side finisher.
Disconnect from metal clip and pull toward you.

(X) Instrument Panel

Remove bolts, nut and screws, and remove instrument panel from passenger door opening portion.

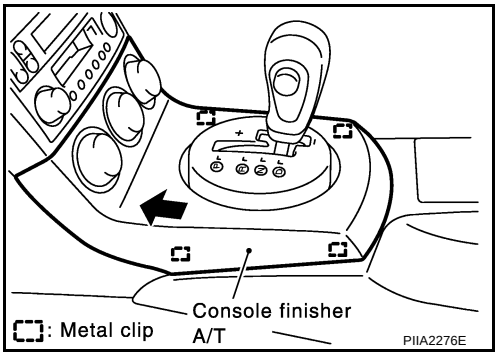
INSTALLATION

To install, reverse the removal procedure sequence.
Assemble the following three parts carefully.

(J) Console Finisher (A/T Models)

1. Move selector lever to the drive position.
2. Bring console finisher to front side and connect front section metal clip.
3. After confirming secure connection of front section metal clip, connect rear section metal clip.

NOTE:
Insert securely to make sure there is on clearance of seam between lower section of cluster lid C and front section of center console.



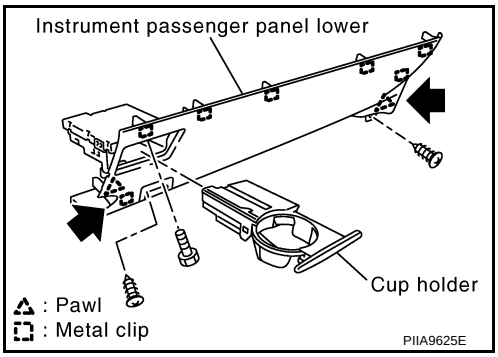
(K) Console Boot (M/T Models)

1. Bring console boot to front side and connect front section metal clip.
2. After confirming secure connection of front section metal clip, connect rear section metal clip.

NOTE:
Insert securely to make sure there is on clearance of seam between lower section of cluster lid C and front section of center console.

(D) Instrument Passenger Panel Lower

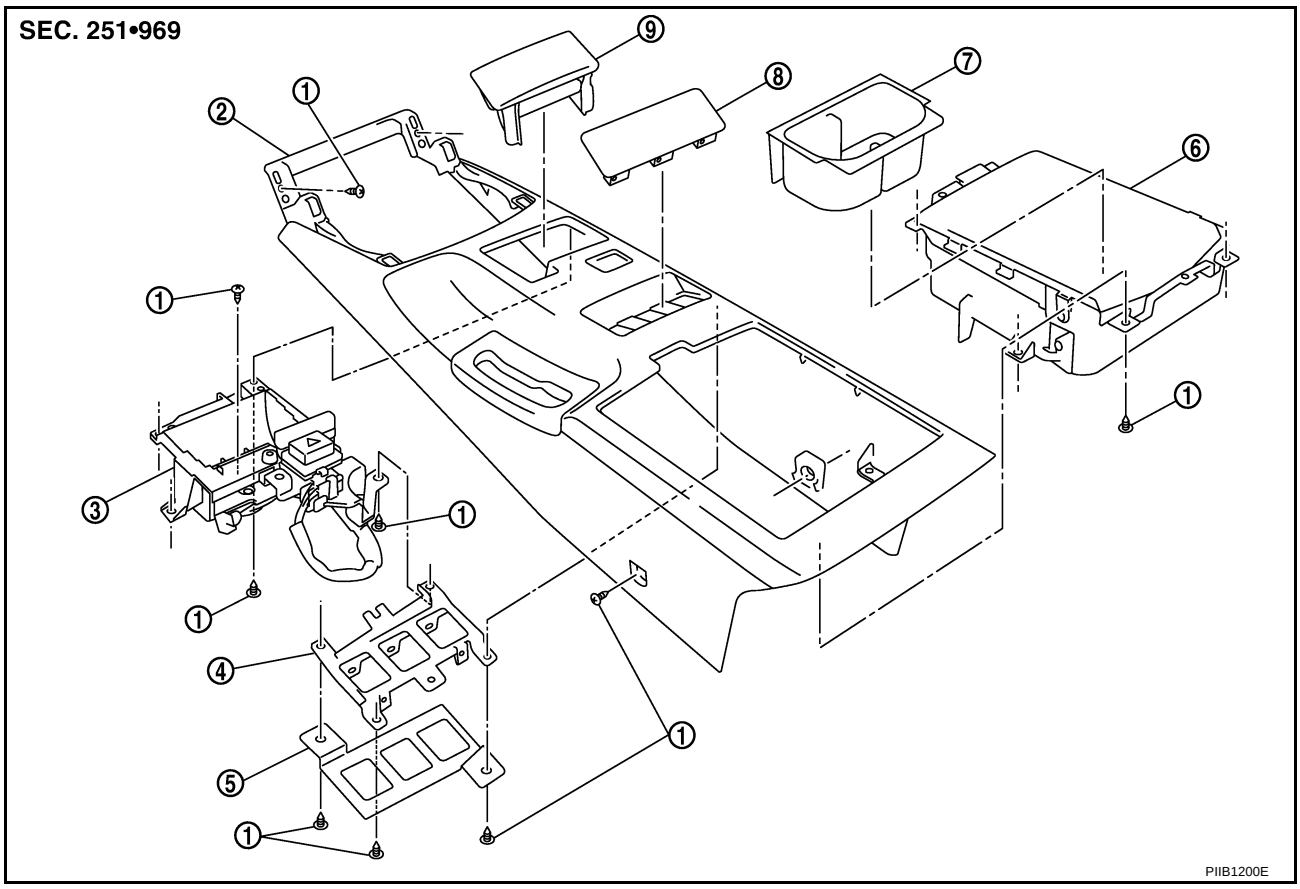
After finishing work, check the lower clip from lower angle which the clip is properly inserted.



Disassembly and Assembly

AIS004Y4

CENTER CONSOLE



1. Screw
2. Center console
3. Coin holder bracket
4. Switch bracket
5. Bracket
6. Console rear pocket
7. Console tray
8. Console cover mask
9. Coin holder / Ashtray

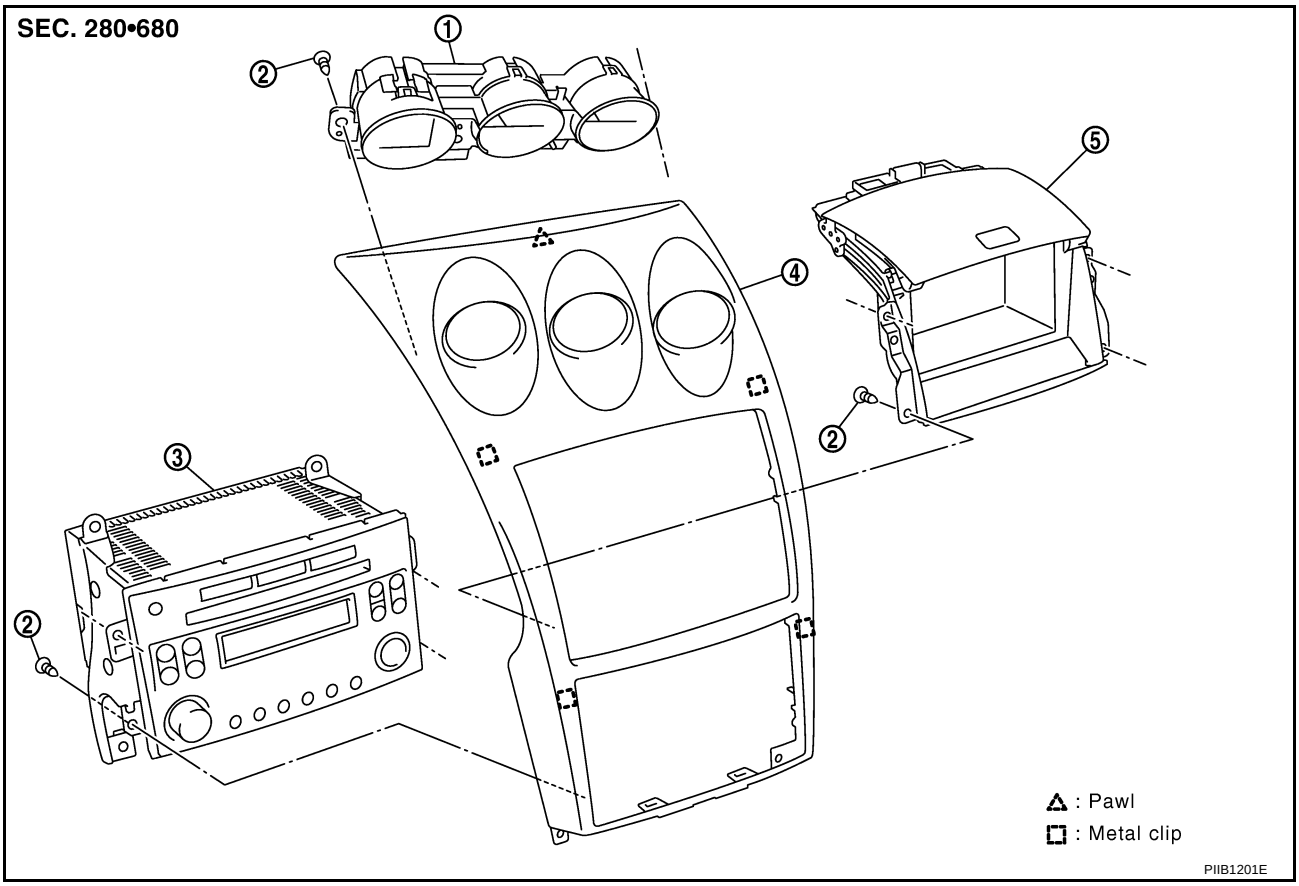
Disassembly

1. Remove screws of back side and remove coin holder bracket.
2. Remove screws of back side and remove console rear pocket.

Assembly

Assemble in the reverse order of disassembly.

CLUSTER LID C



1. Triple meter
2. Screw
3. Audio
4. Cluster lid C
5. Instrument upper box

Disassembly

1. Remove screws, and then triple meter.
2. Remove screws, and then instrument upper box. (Without NAVI models)
3. Remove screws, and then audio unit. Refer to AV-40, "Removal and Installation of Audio Unit (Base system)" ,AV-40, "Locking CD Auto Changer Mechanism (Audio unit of BOSE system)" and AV-41, "Removal and Installation of Audio Unit (BOSE system)" .

Assembly

Assemble in the reverse order of disassembly.

SECTION SE
SEAT

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

AIS000I2

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Service Notice

AIS000I1

- When removing or installing various parts, place a cloth or padding onto the vehicle body to prevent scratches.
- Handle trim, molding, instruments, grille, etc. carefully during removing or installing. Be careful not to oil or damage them.
- Apply sealing compound where necessary when installing parts.
- When applying sealing compound, be careful that the sealing compound does not protrude from parts.
- When replacing any metal parts (for example body outer panel, members, etc.), be sure to take rust prevention measures.

Precautions for Battery Service

AIS001PC

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Work

AIS000I3

- When removing or disassembling each component, be careful not to damage or deform it. If a component may be subject to interference, be sure to protect it with a shop cloth.
- When removing (disengaging) components with a screwdriver or similar tool, be sure to wrap the component with a shop cloth or vinyl tape to protect it.
- Protect the removed parts with a shop cloth and keep them.
- Replace a deformed or damaged clip.
- If a part is specified as a non-reusable part, always replace it with new one.
- Be sure to tighten bolts and nuts securely to the specified torque.
- After re-installation is completed, be sure to check that each part works normally.
- Follow the steps below to clean components.

– Water soluble foul: Dip a soft cloth into lukewarm water, and wring the water out of the cloth to wipe the fouled area.
Then rub with a soft and dry cloth.

– Oily foul: Dip a soft cloth into lukewarm water with mild detergent (concentration: within 2 to 3%), and wipe the fouled area.
Then dip a cloth into fresh water, and wring the water out of the cloth to wipe the detergent off. Then rub with a soft and dry cloth.

- Do not use organic solvent such as thinner, benzene, alcohol, and gasoline.
- For genuine leather seats, use a genuine leather seat cleaner.

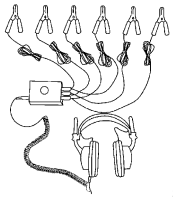
PREPARATION

PFP:00002

Special Service Tools

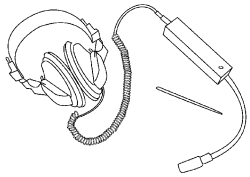
AIS000I4

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
(J39570) Chassis ear  SIIA0993E	Locating the noise
(J43980) NISSAN Squeak and Rattle Kit SIIA0994E	Repairing the cause of noise

Commercial Service Tools

AIS000I5

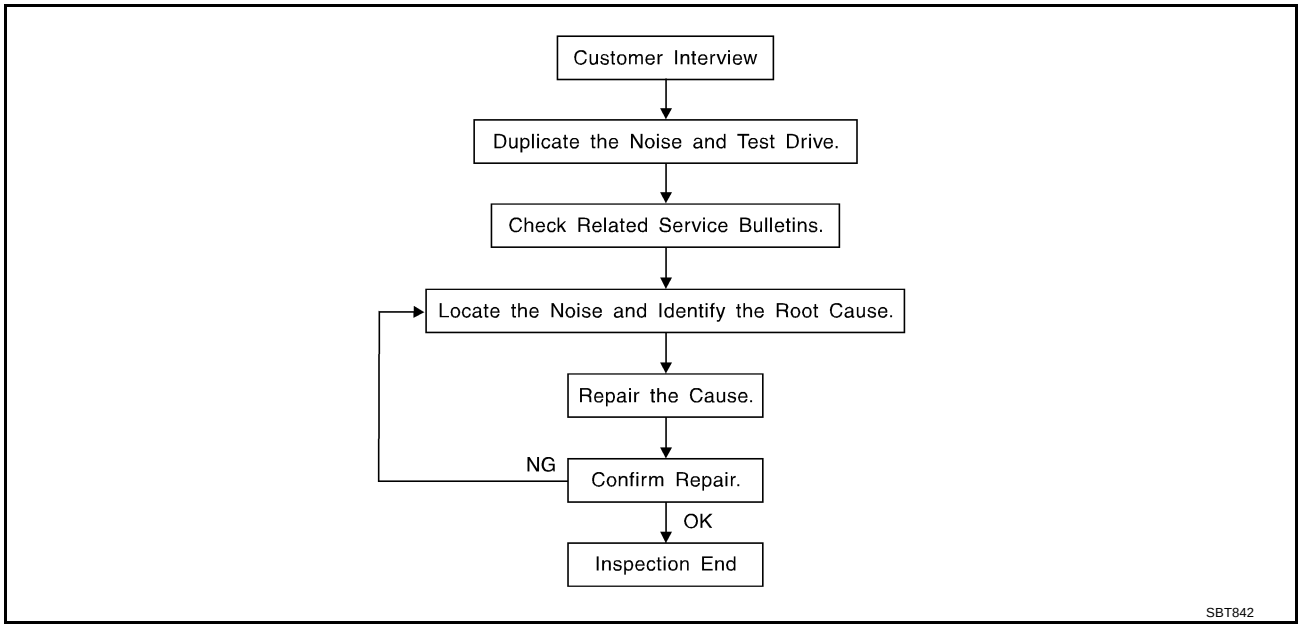
Tool name	Description
Engine ear  SIIA0995E	Locating the noise

SQUEAK AND RATTLE TROUBLE DIAGNOSES

PFP:00000

Work Flow

AIS000I6



CUSTOMER INTERVIEW

Interview the customer if possible, to determine the conditions that exist when the noise occurs. Use the Diagnostic Worksheet during the interview to document the facts and conditions when the noise occurs and any customer's comments; refer to SE-10, "Diagnostic Worksheet" . This information is necessary to duplicate the conditions that exist when the noise occurs.

- The customer may not be able to provide a detailed description or the location of the noise. Attempt to obtain all the facts and conditions that exist when the noise occurs (or does not occur).
- If there is more than one noise in the vehicle, be sure to diagnose and repair the noise that the customer is concerned about. This can be accomplished by test driving the vehicle with the customer.
- After identifying the type of noise, isolate the noise in terms of its characteristics. The noise characteristics are provided so the customer, service adviser and technician are all speaking the same language when defining the noise.
- Squeak —(Like tennis shoes on a clean floor)
  Squeak characteristics include the light contact/fast movement/brought on by road conditions/hard surfaces=higher pitch noise/softer surfaces=lower pitch noises/edge to surface=chirping
- Creak—(Like walking on an old wooden floor)
  Creak characteristics include firm contact/slow movement/twisting with a rotational movement/pitch dependent on materials/often brought on by activity.
- Rattle—(Like shaking a baby rattle)
  Rattle characteristics include the fast repeated contact/vibration or similar movement/loose parts/missing clip or fastener/incorrect clearance.
- Knock —(Like a knock on a door)
  Knock characteristics include hollow sounding/sometimes repeating/often brought on by driver action.
- Tick—(Like a clock second hand)
  Tick characteristics include gentle contacting of light materials/loose components/can be caused by driver action or road conditions.
- Thump—(Heavy, muffled knock noise)
  Thump characteristics include softer knock/dead sound often brought on by activity.
- Buzz—(Like a bumble bee)
  Buzz characteristics include high frequency rattle/firm contact.
- Often the degree of acceptable noise level will vary depending upon the person. A noise that you may judge as acceptable may be very irritating to the customer.
- Weather conditions, especially humidity and temperature, may have a great effect on noise level.

DUPLICATE THE NOISE AND TEST DRIVE

If possible, drive the vehicle with the customer until the noise is duplicated. Note any additional information on the Diagnostic Worksheet regarding the conditions or location of the noise. This information can be used to duplicate the same conditions when you confirm the repair.
If the noise can be duplicated easily during the test drive, to help identify the source of the noise, try to duplicate the noise with the vehicle stopped by doing one or all of the following:

1) Close a door.
2) Tap or push/pull around the area where the noise appears to be coming from.
3) Rev the engine.
4) Use a floor jack to recreate vehicle “twist”.
5) At idle, apply engine load (electrical load, half-clutch on M/T model, drive position on A/T model).
6) Raise the vehicle on a hoist and hit a tire with a rubber hammer.

- Drive the vehicle and attempt to duplicate the conditions the customer states exist when the noise occurs.
- If it is difficult to duplicate the noise, drive the vehicle slowly on an undulating or rough road to stress the vehicle body.

CHECK RELATED SERVICE BULLETINS

After verifying the customer concern or symptom, check ASIST for Technical Service Bulletins (TSBs) related to that concern or symptom.
If a TSB relates to the symptom, follow the procedure to repair the noise.

LOCATE THE NOISE AND IDENTIFY THE ROOT CAUSE

1. Narrow down the noise to a general area. To help pinpoint the source of the noise, use a listening tool (Chassis Ear: J39570, Engine Ear and mechanics stethoscope).
2. Narrow down the noise to a more specific area and identify the cause of the noise by:

- removing the components in the area that you suspect the noise is coming from.
  Do not use too much force when removing clips and fasteners, otherwise clips and fastener can be broken or lost during the repair, resulting in the creation of new noise.
- tapping or pushing/pulling the component that you suspect is causing the noise.
  Do not tap or push/pull the component with excessive force, otherwise the noise will be eliminated only temporarily.
- feeling for a vibration with your hand by touching the component(s) that you suspect is (are) causing the noise.
- placing a piece of paper between components that you suspect are causing the noise.
- looking for loose components and contact marks.
  Refer to SE-8, "Generic Squeak and Rattle Troubleshooting" .

REPAIR THE CAUSE

- If the cause is a loose component, tighten the component securely.
- If the cause is insufficient clearance between components:
  - separate components by repositioning or loosening and retightening the component, if possible.
  - insulate components with a suitable insulator such as urethane pads, foam blocks, felt cloth tape or urethane tape. A Nissan Squeak and Rattle Kit (J43980) is available through your authorized Nissan Parts Department.

CAUTION:
Do not use excessive force as many components are constructed of plastic and may be damaged.
Always check with the Parts Department for the latest parts information.
The following materials are contained in the Nissan Squeak and Rattle Kit (J43980). Each item can be ordered separately as needed.
URETHANE PADS [1.5 mm (0.059 in) thick]
Insulates connectors, harness, etc.
76268-9E005: 100 × 135 mm (3.94 × 5.31 in)/76884-71L01: 60 × 85 mm (2.36 × 3.35 in)/76884-71L02: 15 × 25 mm (0.59 × 0.98 in)
INSULATOR (Foam blocks)
Insulates components from contact. Can be used to fill space behind a panel.
73982-9E000: 45 mm (1.77 in) thick, 50 × 50 mm (1.97 × 1.97 in)/73982-50Y00: 10 mm (0.39 in) thick, 50 × 50 mm (1.97 × 1.97 in)

INSULATOR (Light foam block)
80845-71L00: 30 mm (1.18 in) thick, 30 × 50 mm (1.18 × 1.97 in)
FELT CLOTHTAPE
Used to insulate where movement does not occur. Ideal for instrument panel applications.
68370-4B000: 15 × 25 mm (0.59 × 0.98 in) pad/68239-13E00: 5 mm (0.20 in) wide tape roll
The following materials, not found in the kit, can also be used to repair squeaks and rattles.
UHMW (TEFLON) TAPE
Insulates where slight movement is present. Ideal for instrument panel applications.
SILICONE GREASE
Used in place of UHMW tape that will be visible or not fit.
Note: Will only last a few months.
SILICONE SPRAY
Use when grease cannot be applied.
DUCT TAPE
Use to eliminate movement.

CONFIRM THE REPAIR

Confirm that the cause of a noise is repaired by test driving the vehicle. Operate the vehicle under the same conditions as when the noise originally occurred. Refer to the notes on the Diagnostic Worksheet.

Generic Squeak and Rattle Troubleshooting

AIS000I7

Refer to Table of Contents for specific component removal and installation information.

INSTRUMENT PANEL

Most incidents are caused by contact and movement between:

1. Cluster lid A and instrument panel
2. Acrylic lens and combination meter housing
3. Instrument panel to front pillar garnish
4. Instrument panel to windshield
5. Instrument panel mounting pins
6. Wiring harnesses behind the combination meter
7. A/C defroster duct and duct joint

These incidents can usually be located by tapping or moving the components to duplicate the noise or by pressing on the components while driving to stop the noise. Most of these incidents can be repaired by applying felt cloth tape or silicon spray (in hard to reach areas). Urethane pads can be used to insulate wiring harness.

CAUTION:
Do not use silicone spray to isolate a squeak or rattle. If you saturate the area with silicone, you will not be able to recheck the repair.

CENTER CONSOLE

Components to pay attention to include:

1. Shifter assembly cover to finisher
2. A/C control unit and cluster lid C
3. Wiring harnesses behind audio and A/C control unit

The instrument panel repair and isolation procedures also apply to the center console.

DOORS

Pay attention to the:

1. Finisher and inner panel making a slapping noise
2. Inside handle escutcheon to door finisher
3. Wiring harnesses tapping
4. Door striker out of alignment causing a popping noise on starts and stops

Tapping or moving the components or pressing on them while driving to duplicate the conditions can isolate many of these incidents. You can usually insulate the areas with felt cloth tape or insulator foam blocks from the Nissan Squeak and Rattle Kit (J43980) to repair the noise.

TRUNK

Trunk noises are often caused by a loose jack or loose items put into the trunk by the owner.
In addition look for:

1. Trunk lid dumpers out of adjustment
2. Trunk lid striker out of adjustment
3. Trunk lid torsion bars knocking together
4. A loose license plate or bracket

Most of these incidents can be repaired by adjusting, securing or insulating the item(s) or component(s) causing the noise.

SUNROOF/HEADLINING

Noises in the sunroof/headlining area can often be traced to one of the following:

1. Sunroof lid, rail, linkage or seals making a rattle or light knocking noise
2. Sunvisor shaft shaking in the holder
3. Front or rear windshield touching headlining and squeaking

Again, pressing on the components to stop the noise while duplicating the conditions can isolate most of these incidents. Repairs usually consist of insulating with felt cloth tape.

SEATS

When isolating seat noise it's important to note the position the seat is in and the load placed on the seat when the noise is present. These conditions should be duplicated when verifying and isolating the cause of the noise.
Cause of seat noise include:

1. Headrest rods and holder
2. A squeak between the seat pad cushion and frame
3. Seatback lock and bracket

These noises can be isolated by moving or pressing on the suspected components while duplicating the conditions under which the noise occurs. Most of these incidents can be repaired by repositioning the component or applying urethane tape to the contact area.

UNDERHOOD

Some interior noise may be caused by components under the hood or on the engine wall. The noise is then transmitted into the passenger compartment.
Causes of transmitted underhood noise include:

1. Any component mounted to the engine wall
2. Components that pass through the engine wall
3. Engine wall mounts and connectors
4. Loose radiator mounting pins
5. Hood bumpers out of adjustment
6. Hood striker out of adjustment

These noises can be difficult to isolate since they cannot be reached from the interior of the vehicle. The best method is to secure, move or insulate one component at a time and test drive the vehicle. Also, engine RPM or load can be changed to isolate the noise. Repairs can usually be made by moving, adjusting, securing, or insulating the component causing the noise.

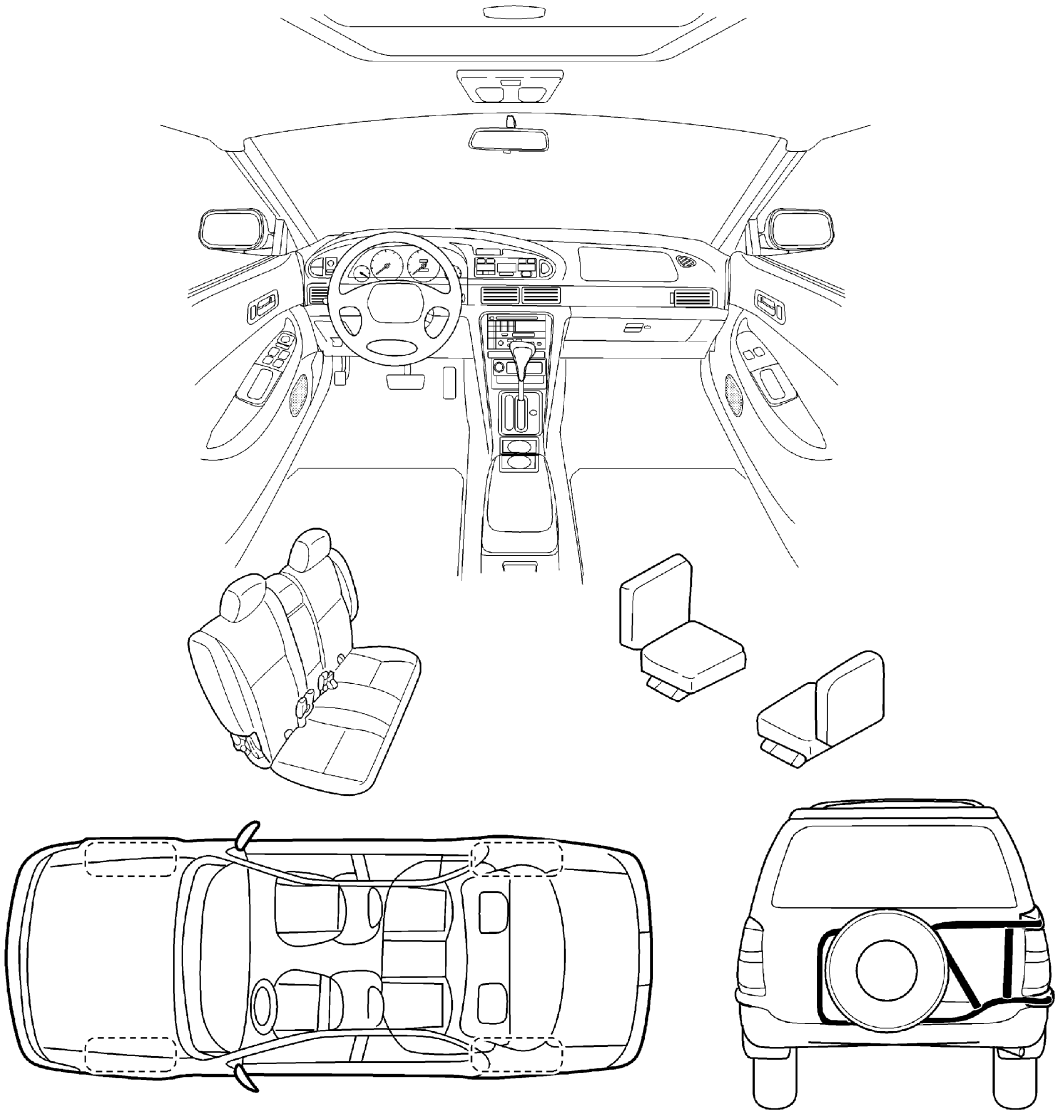
Diagnostic Worksheet

AIS000I8

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET

Dear Nissan Customer:
We are concerned about your satisfaction with your Nissan vehicle. Repairing a squeak or rattle sometimes can be very difficult. To help us fix your Nissan right the first time, please take a moment to note the area of the vehicle where the squeak or rattle occurs and under what conditions. You may be asked to take a test drive with a service advisor or technician to ensure we confirm the noise you are hearing.

I. WHERE DOES THE NOISE COME FROM? (circle the area of the vehicle)
The illustrations are for reference only, and may not reflect the actual configuration of your vehicle.



Continue to the back of the worksheet and briefly describe the location of the noise or rattle. In addition, please indicate the conditions which are present when the noise occurs.

PIIB0723E

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET- page 2

Briefly describe the location where the noise occurs:

_____

_____

II. WHEN DOES IT OCCUR? (check the boxes that apply)

❑ anytime
❑ 1st time in the morning
❑ only when it is cold outside
❑ only when it is hot outside
❑ after sitting out in the sun
❑ when it is raining or wet
❑ dry or dusty conditions
❑ other: _____

III. WHEN DRIVING:

❑ through driveways
❑ over rough roads
❑ over speed bumps
❑ only at about ____ mph
❑ on acceleration
❑ coming to a stop
❑ on turns : left, right or either (circle)
❑ with passengers or cargo
❑ other: _____
❑ after driving ____ miles or ____ minutes

IV. WHAT TYPE OF NOISE?

❑ squeak (like tennis shoes on a clean floor)
❑ creak (like walking on an old wooden floor)
❑ rattle (like shaking a baby rattle)
❑ knock (like a knock on a door)
❑ tick (like a clock second hand)
❑ thump (heavy, muffled knock noise)
❑ buzz (like a bumble bee)

TO BE COMPLETED BY DEALERSHIP PERSONNEL
Test Drive Notes:

_____

_____

	YES	NO	Initials of person performing
Vehicle test driven with customer	❑	❑	_____
- Noise verified on test drive	❑	❑	
- Noise source located and repaired	❑	❑	_____
- Follow up test drive performed to confirm repair	❑	❑	_____

VIN: _____ Customer Name: _____

W.O. #: _____ Date: _____

This form must be attached to Work Order

SBT844

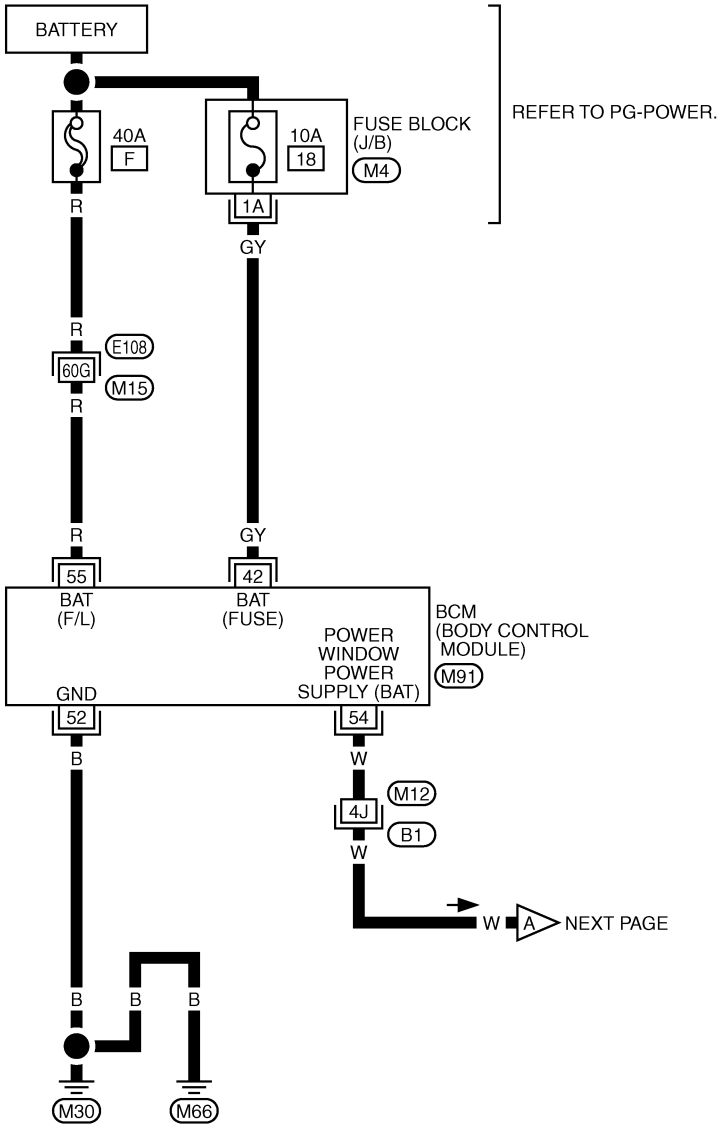
POWER SEAT/FOR COUPE

PFP:87016

Wiring Diagram–SEAT– /For Driver Seat

AIS004J0

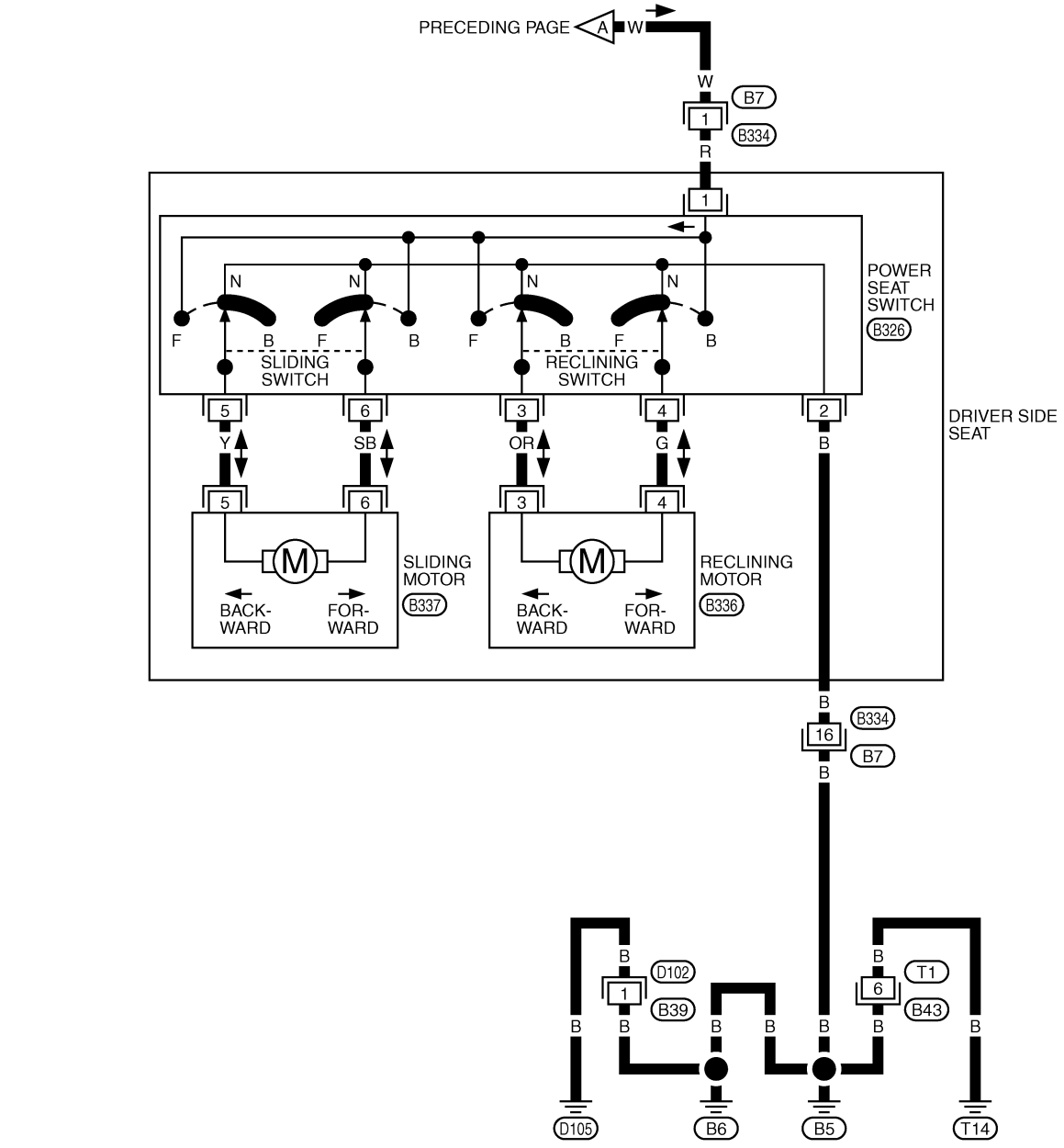
SE-SEAT-01

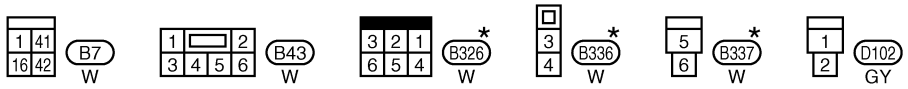


REFER TO THE FOLLOWING.
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M91 -ELECTRICAL UNITS

TIWT0826E

SE-SEAT-02





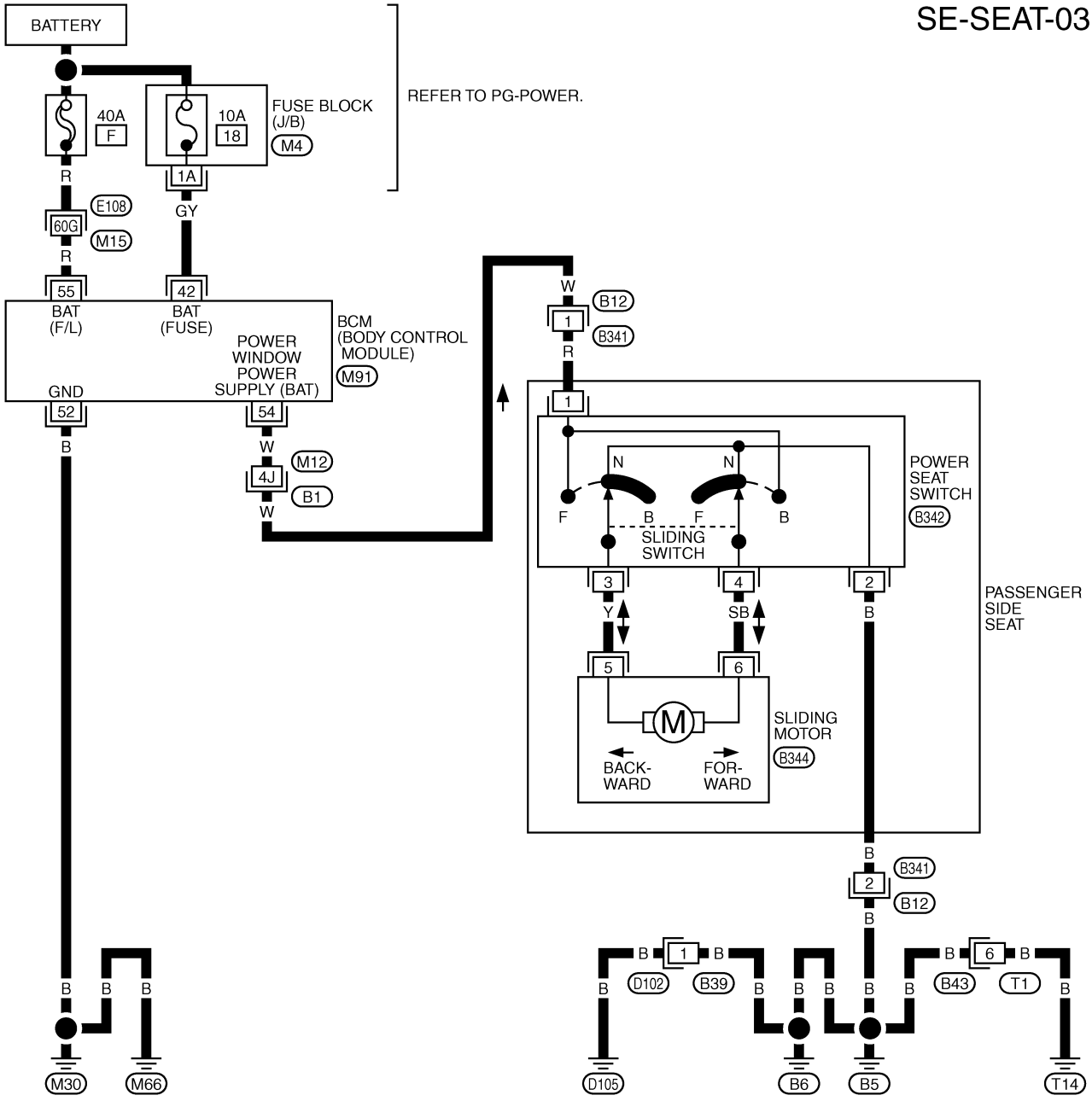
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

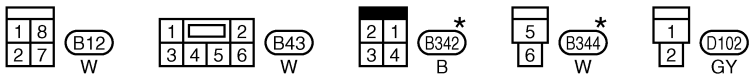
TIWT0723E

Wiring Diagram–SEAT– /For Passenger Seat

AIS004J1

SE-SEAT-03





REFER TO THE FOLLOWING.

E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

M91 -ELECTRICAL UNITS

*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

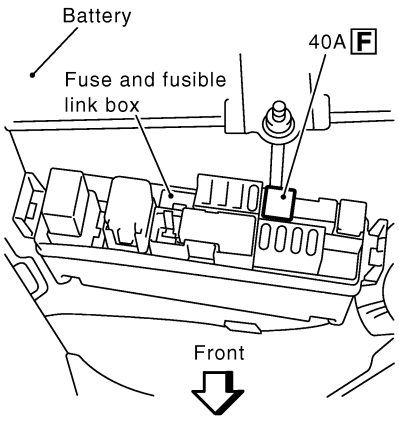
TIWT0829E

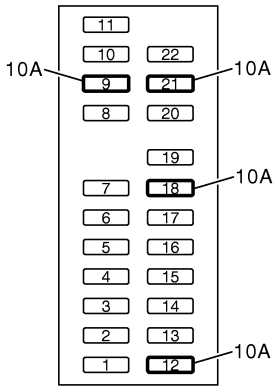
POWER SEAT/FOR ROADSTER

PFP:25565

Component Parts and Harness Connector Location

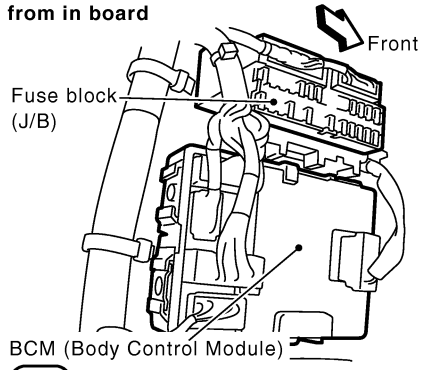
AIS004J2

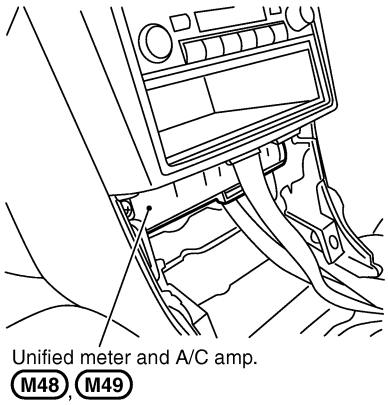


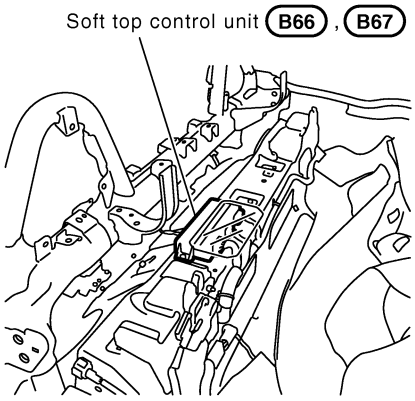


Fuse block (J/B) fuse layout

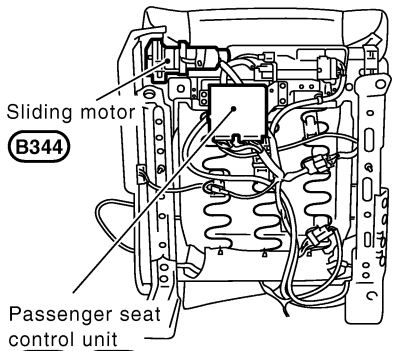
View without the LH side finisher from in board



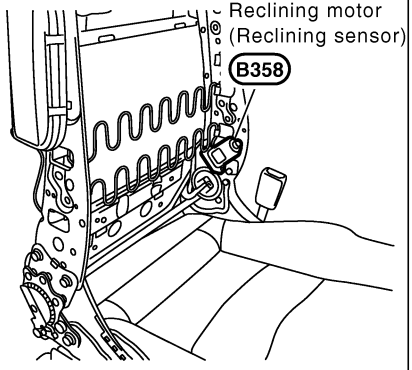


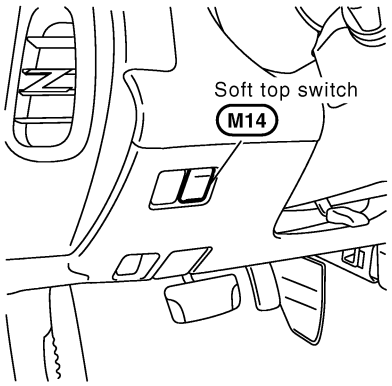


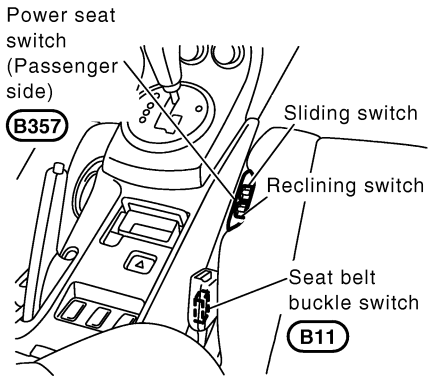
Bottom view of passenger seat



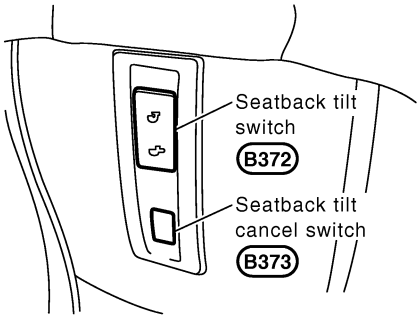
Front view of passenger side seatback without pad and trim removed



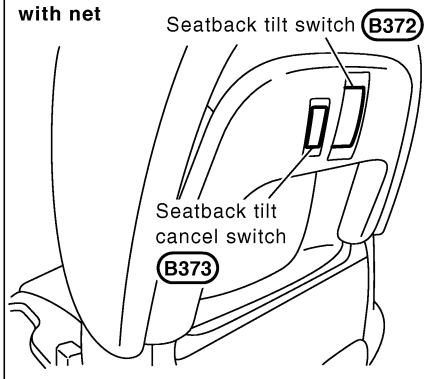


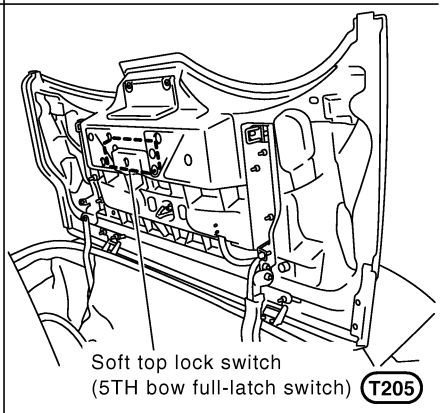


Rear view of passenger side seatback without net



Rear view of passenger side seatback with net





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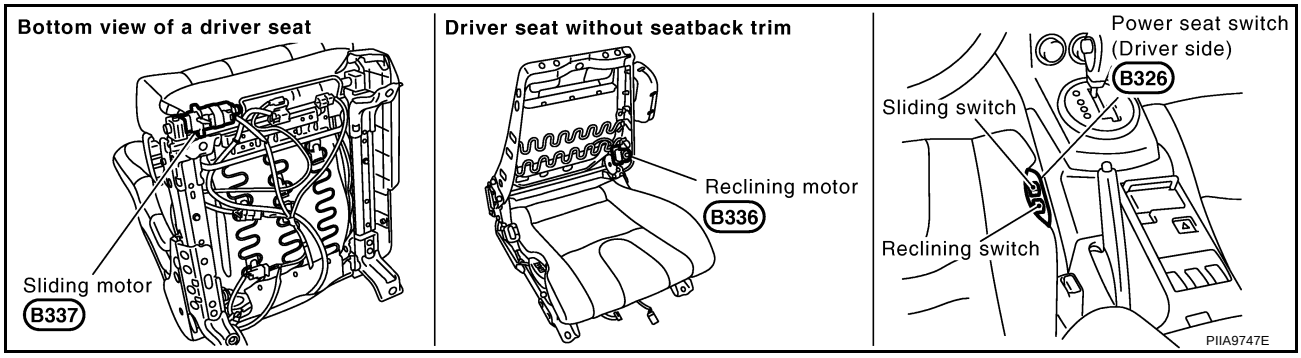


System Description

AIS004J7

Power is supplied at all times,

- through 40A fusible link (letter **F** , located in the fusible link)
- to BCM terminal 55,
- through 10A fuse [No.18, located in the fuse block (J/B)]
- to BCM terminal 42,
- through 10A fuse [No.21, located in the fuse block (J/B)]
- to passenger seat control unit terminal 34,
- through BCM terminal 54
- to driver side power seat switch terminal 1 and passenger seat control unit terminal 39.

When ignition switch in ON or START position,
power is supplied

- thought 10A fuse [No. 12, located in the fuse block (J/B)]
- to passenger seat control unit terminal 2.

When ignition switch in START position,
power is supplied

- thought 10A fuse [No. 9, located in the fuse block (J/B)]
- to passenger seat control unit terminal 1.

Ground supplied

- to BCM terminal 52
- through body grounds M30 and M60,
- to power seat switch terminal 2 and
- to passenger side seat control unit terminals 40, 48
- through body grounds B5, B6 and T14.

DRIVER SIDE SEAT OPERATION

When a driver side seat sliding switch is operated forward,
power is supplied

- through power seat switch terminal 5
- to sliding motor terminal 5.

Then ground is supplied

- to sliding motor terminal 6
- through power seat switch terminal 6
- through power seat switch terminal 2

The driver side seat moves forward.
When a driver side seat sliding switch is operated backward,
power is supplied

- through power seat switch terminal 6
- to sliding motor terminal 6.

Then ground is supplied

- to sliding motor terminal 5

- through power seat switch terminal 5
- through power seat switch terminal 2

The driver side seat moves backward.
When a driver side seat reclining switch is operated forward, power is supplied

- through power seat switch terminal 3
- to reclining motor terminal 3.

Then ground is supplied

- to reclining motor terminal 4
- through power seat switch terminal 4
- through power seat switch terminal 2

The driver side seat folds forward.
When a driver side seat reclining switch is operated backward, power is supplied

- through power seat switch terminal 4
- to reclining motor terminal 4.

Then ground is supplied

- to reclining motor terminal 3
- through power seat switch terminal 3
- through power seat switch terminal 2

The driver side seat reclines backward.

PASSENGER SIDE SEAT MANUAL OPERATION

When a passenger side seat sliding switch is operated forward, ground is supplied

- to passenger seat control unit terminal 14
- through power seat switch terminal 14
- through power seat switch terminal 40B
- through body ground B5, B6 and T14.

Then passenger seat control unit recognizes the forward signal, power is supplied simultaneously

- through passenger seat control unit terminal 45
- to sliding motor terminal 45

Then ground is supplied

- to sliding motor terminal 37
- through passenger seat control unit terminal 37

The passenger side seat moves forward.
When a passenger side seat sliding switch is operated backward, ground is supplied

- to passenger seat control unit terminal 15
- through power seat switch terminal 15
- through power seat switch terminal 40B
- through body ground B5, B6 and T14.

Then passenger seat control unit recognizes the backward signal, power is supplied simultaneously

- through passenger seat control unit terminal 37
- to sliding motor terminal 37

Then ground is supplied.

- to sliding motor terminal 45
- through passenger seat control unit terminal 45

The passenger side seat moves backward.

When a passenger side seat reclining switch is operated forward, ground is supplied

- to passenger seat control unit terminal 12
- through power seat switch terminal 12
- through power seat switch terminal 40B
- through body ground B5, B6 and T14.

Then passenger seat control unit recognizes the forward signal, power is supplied simultaneously

- through passenger seat control unit terminal 42
- to reclining motor terminal 42

Then ground is supplied

- to reclining motor terminal 35
- through passenger seat control unit terminal 35

The passenger side seat folds forward.
When a passenger side seat reclining switch is operated backward, ground is supplied

- to passenger seat control unit terminal 13
- through power seat switch terminal 13
- through power seat switch terminal 40B
- through body ground B5, B6 and T14.

Then passenger seat control unit recognizes the back ward signal, power is supplied simultaneously

- through passenger seat control unit terminal 35
- to reclining motor terminal 35

Then ground is supplied

- to reclining motor terminal 42
- through passenger seat control unit terminal 42

The passenger side seat reclines backward.

PASSENGER SEATBACK TILT FORWARD/BACKWARD OPERATION

When a passenger side seatback tilt switch is operated forward, ground is supplied

- to passenger seat control unit terminal 8
- through seatback tilt switch terminal 8
- through seatback tilt switch terminal 40
- through body ground B5, B6 and T14.

Then passenger seat control unit recognizes the forward signal, power is supplied simultaneously

- through passenger seat control unit terminal 42
- to reclining motor terminal 42

Then ground is supplied

- to reclining motor terminal 35
- through passenger seat control unit terminal 35

Then, a seat folds front most forward.
When a passenger side seatback tilt switch is operated backward, ground is supplied

- to passenger seat control unit terminal 9
- through seatback tilt switch terminal 9
- through seatback tilt switch terminal 40
- through body ground B5, B6 and T14.

Then passenger seat control unit recognizes the backward signal,

power is supplied simultaneously

- through passenger seat control unit terminal 35
- to reclining motor terminal 35

Then ground is supplied

- to reclining motor terminal 42
- through passenger seat control unit terminal 42.

The passenger side seat returns to former position.

INTERLOCKING OPERATION OF THE PASSENGER SEAT WITH THE SOFT TOP

NOTE:

Refer to RF-12, "System Description" for detailed operation.

CLOSE → OPEN

When a soft top switch is operated to OPEN,
ground is supplied

- to passenger seat control unit terminal 5
- through soft top switch terminal 3
- through soft top switch terminal 1
- through body ground M30 and M66.

Then passenger seat control unit recognizes the soft top OPEN signal,
Soft top control unit transmits power window down signal to passenger seat control unit,

- through soft top control unit terminal 36
- to passenger seat control unit terminal 16.

When passenger seat control unit receives power window down signal and soft top OPEN signal,
power is supplied simultaneously

- through passenger seat control unit terminal 42
- to reclining motor terminal 42

Then ground is supplied

- to reclining motor terminal 35
- through passenger seat control unit terminal 35

Then, a seat folds 6° forward.

When storage lid closed, soft top control unit transmits a storage lid close signal to passenger seat control unit,

- through soft top control unit terminal 13
- to passenger seat control unit terminal 33.

When passenger seat control unit receives storage lid close signal,
power is supplied simultaneously

- through passenger seat control unit terminal 35
- to reclining motor terminal 35

Then ground is supplied

- to reclining motor terminal 42
- through passenger seat control unit terminal 42.

The passenger side seat returns to former position.

OPEN → CLOSE

When a soft top switch is operated to CLOSE,
ground is supplied

- to passenger seat control unit terminal 6
- through soft top switch terminal 4
- through soft top switch terminal 1
- through body ground M30 and M66.

Then passenger seat control unit recognizes the soft top CLOSE signal,
soft top control unit transmits power window down signal to passenger seat control unit,

- through soft top control unit terminal 36

- to passenger seat control unit terminal 16.

When passenger seat control unit receives power window down signal and soft top CLOSE signal, power is supplied simultaneously

- through passenger seat control unit terminal 42
- to reclining motor terminal 42

Then ground is supplied

- to reclining motor terminal 35
- through passenger seat control unit terminal 35

Then, a seat folds 6° forward.
When soft top lock switch (5th bow full latch switch) is turned ON, soft top control unit transmits a soft top lock signal to passenger seat control unit,
ground is supplied

- to passenger seat control unit terminal 11
- through soft top lock switch (5th bow full latch swtich) terminal 3
- through soft top lock switch (5th bow full latch swtich) terminal 4
- through body ground B5, B6 and T14.

When passenger seat control unit receives soft top lock switch ON signal, power is supplied simultaneously

- through passenger seat control unit terminal 35
- to reclining motor terminal 35

Then ground is supplied

- to reclining motor terminal 42
- through passenger seat control unit terminal 42.

The passenger side seat returns to former position.

PASSENGER SIDE RECLINING MOTOR OPERATION

When a passenger side seat reclining motor is operated,
signal is transmitted

- to passenger seat control unit terminal 3
- through reclining motor terminal 3
- through reclining motor terminal 41
- through passenger seat control unit terminal 41.

Then passenger seat control unit judges seatback angle by receiving reclining sensor signal.

SEATBACK TILT CANCEL SWITCH OPERATION

When a passenger side seatback tilt cancel switch is operated to CANCEL,
ground is supplied

- to passenger seat control unit terminal 7
- through seatback tilt cancel switch terminal 7
- through seatback tilt cancel switch terminal 40C
- through body ground B5, B6 and T14.

Then passenger seat control unit recognizes the CANCEL signal.
When a “seatback tilt cancel switch” is operated to CANCEL, the automatic operation of a passenger seat is not performed.

MANUAL OPERATION

The seat positions can be adjusted by operating the sliding switch and reclining switch located on the side of both driver and passenger seat cushions.

AUTOMATIC OPERATION

Passenger Seatback Tilting Function

- When theseatback tilt switch on the rear side of the passenger seatback is operated to tilt forward, the seatback tilts forward to the front most position.
- To tilt the seatback backward or restore its position, push the seatback tilt switch on the tilt-backward direction. The seatback will be tilting backwards while the switch is operated. It can be moved backwards until it reaches to its start position.

Conditions For the Operation

When the following conditions are satisfied, the seatback tilts forward or backward by operating the seatback tilt switch.

Conditions	● Power seat switches (sliding and reclining) are OFF. ● The seat belt is not fastened. ● The vehicle speed is approximately 6 km/h or less. ● The soft top is not currently in operation.*1 ● The ignition switch is not in the START position. ● The seatback tilt cancel switch is in AUTO.

*1: The operation will be stopped only while the reclining motor is operating.

Conditions for Stopping the Operation

- Seatback tilting operation stops when any one of the conditions below is satisfied.

Conditions	● A power seat switch (sliding or reclining) is operated. ● The seat belt is fastened. ● The vehicle speed is approximately 7 km/h or more. ● The soft top is in operation. (Stops only tilt-forward operation.)*2 ● The seatback tilting switch is operated while the seatback is in operation. ● The ignition switch is turned to the START position. ● Reclining motor lock is detected.

*2: Operation will be stopped only while the reclining motor is operating.

NOTE:

If operation stops as a result of the conditions below, use the reclining switch to tilt the seat backward.

- A power seat switch (sliding or reclining) is operated.
- The seat belt is fastened.
- The seatback tilt cancel switch is turned to “CANCEL”.

Soft Top Interlocking Operation Function

- The seatback tilts forward by approximately 6° (tilt froward operation) when the soft top opens or closes.
- When open/close operation is completed, the seatback returns to the tilt start position (return operation).

Conditions for the Operation

When the soft top switch is pushed to OPEN or CLOSE, and all of the conditions below are satisfied, then the seatback operates, linked with the operation of the soft top.

Conditions	● The power seat switches (sliding and reclining) are OFF. ● The seatback tilt switch is OFF. ● The vehicle speed is 6 km/h or less. ● The ignition switch is ON. ● The seatback tilt cancel switch is turned to AUTO.

Conditions for the Pauseing/Stopping Operation

Operation is paused or stopped if any of the conditions below are satisfied during soft top operation.

Stop conditions	● A power seat switch (sliding or reclining) is operated. ● Reclining motor lock is detected (return operation only). ● The seatback tilt switch is operated while the seatback is operating. ● The seatback tilt cancel switch is turned to CANCEL.
Pause condition	● The ignition switch is turned to the START position.

Seat Status Output Signal

- Depending on the seat status, the “passenger seat control unit” sends the seat status output signal to the “soft top control unit”.
- The “soft top control unit” controls the soft top open/close operation based on whether the seat status signal is ON or OFF. For details about soft top control, refer to RF-19, "Operation Chart" .

Seat status signal OFF→ ON condition	● When a seatback tilt forward motion has been completed. (as a process during a soft top interlocking operation) ● When a seatback tilt forward motion has been completed. (during a automatic operation by using a seatback tilt switch) ● When a seatback tilt forward permission condition is satisfied for a soft top interlocking operation, and a tilt forward / backward operation is under going, and if the seatback is tilted more than 6 degree from the start position of the tilt forward / backward operation. (during a automatic operation by using a seatback tilt switch) ● When a seatback tilt forward permission condition is satisfied for a soft top interlocking operation, and a tilt forward operation was under going, but the operation was stopped under some conditions, (See below *4.) and if the seatback is tilted more than 6 degree from the start position of the tilt forward operation. (after an automatic operation by using a seatback tilt switch) ● When a seatback tilt forward permission condition is satisfied for a soft top interlocking operation, and also the seatback tilt cancel switch is in “Cancel” position. ● When the ignition switch has been turned from “START” to “ON” position. (during a soft top interlocking operation. After an engine start operation, the soft top interlocking operation is accepted.)
Seat status signal ON→ OFF condition	● When a seatback tilt backward motion has been started. (as a process during a soft top interlocking operation) ● When a seatback tilt backward permission condition is satisfied for a soft top interlocking operation, after a tilt forward operation has been finished. (during a automatic operation by using a seatback tilt switch) ● When a seatback tilt backward permission condition is satisfied for a soft top interlocking operation, and a tilt forward / backward operation is under going, and if the seatback is tilted more than 6 degree from the start position of the tilt forward / backward operation. (during a automatic operation by using a seatback tilt switch) ● When a seatback tilt backward permission condition is satisfied for a soft top interlocking operation, and a tilt forward operation was under going, but the operation was stopped under some conditions, (See below *4.) and if the seatback is still tilted more than 6 degree from the start position of the tilt forward operation. (after an automatic operation by using a seatback tilt switch.) ● When the ignition switch has been turned from “ON” to “START” position. (during a soft top interlocking operation. During an engine start operation, the soft top interlocking operation is paused.) ● When a seatback tilt forward motion has been started by the seatback tilt switch, just after the seatback tilt forward motion has been finished for a soft top interlocking operation. (for the seatback tilt switch operation during a soft top interlocking operation) ● When a seatback tilt forward motion has been started by the passenger seat reclining switch, just after the seatback tilt forward motion has been finished for a soft top interlocking operation. (for the seat reclining switch operation during a soft top interlocking operation)

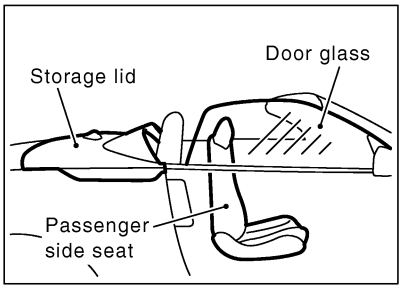
*3: After that, seat condition signal stays ON if cancel switch turns to AUTO.
The seat status signal turns ON only when power window DOWN signal input is ON.

*4: If tilt forward/backward operation stops as a result of the conditions below, the tilt start position does not change.

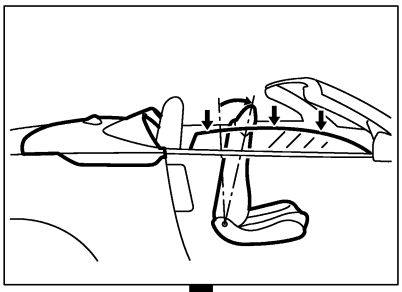
- The vehicle speed is approximately 7 km/h or more.
- The seatback tilt switch is operated while the seatback is operating.
- The ignition switch is turned to the START position.

Operation of the Passenger Seat Linked with the Soft Top

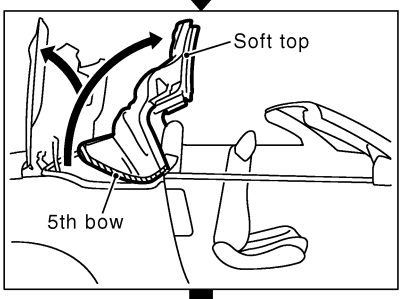
Passenger seat operation during soft top CLOSE operation



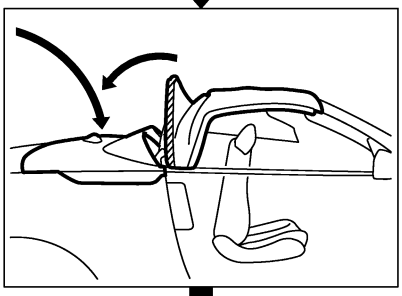
1. Passenger seatback tilts forward by approximately 6° as soon as windows go down, when soft top switch has been pushed on CLOSE.



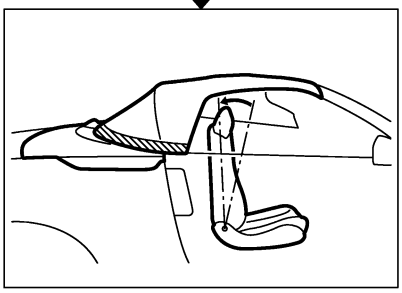
2. Soft top CLOSE operation starts as soon as the passenger seatback tilt forward operation completes.



3. Soft top continues the operation.



4. Passenger seatback goes back to the original position when 5th bow is closed.



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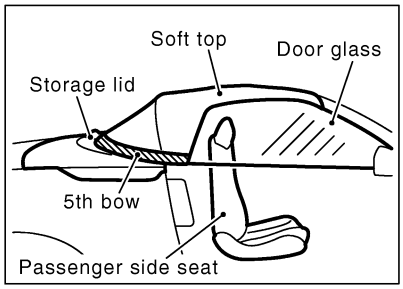
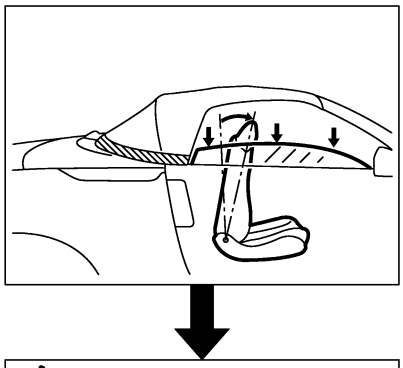
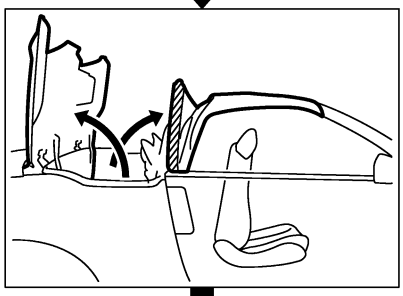
Passenger seat operation during soft top OPEN operation



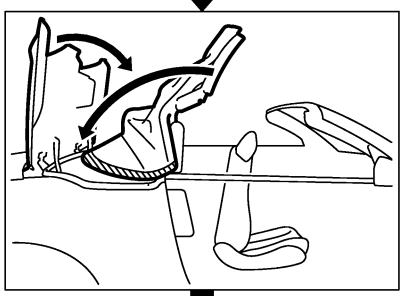
1. Passenger seatback tilts forward by approximately 6° as soon as windows go down, when soft top switch has been pushed on OPEN.



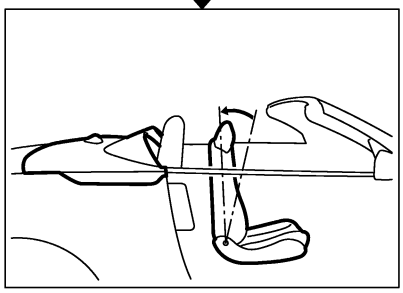
2. Soft top OPEN operation starts as soon as the passenger seatback tilt forward operation completes.



3. Soft top continues the operation.



4. Passenger seatback goes back to the original position when storage lid is closed.



PIIA9713E

CANCEL FUNCTION

The seatback tilt cancel switch can be used to set following functions ON or OFF.

- The seatback tilt forward/backward function
- The soft top interlocking operation function

CAUTION:

- **If a child seat is installed, turn the seat tilt cancel switch OFF to disable the seatback tilt forward/backward function and the soft top interlock operation function.**

FAIL-SAFE MODE

If the power seat switch is not operated, nor the seat back tilt switch is not operated, nor the soft top interlocking operation is not under operation, and if the passenger seat control unit detects a motor operation power from the soft top control unit, the passenger seat control unit stops the motor by switching the motor power line to ground.

Operation location	● Sliding motor ● Reclining motor

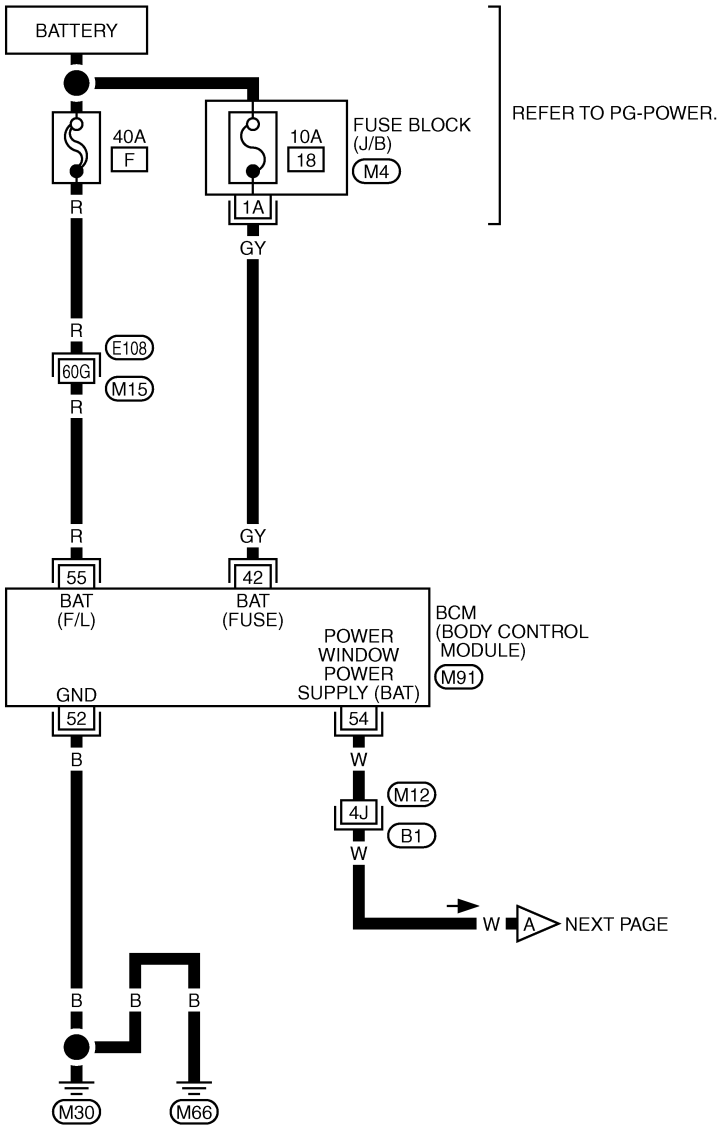
Canceling Fail-Safe Mode

- Disconnect and reconnect the battery terminal.
- Disconnect and reconnect the passenger seat control unit connector.

Wiring Diagram–SEAT– / For Driver Seat

AIS004X0

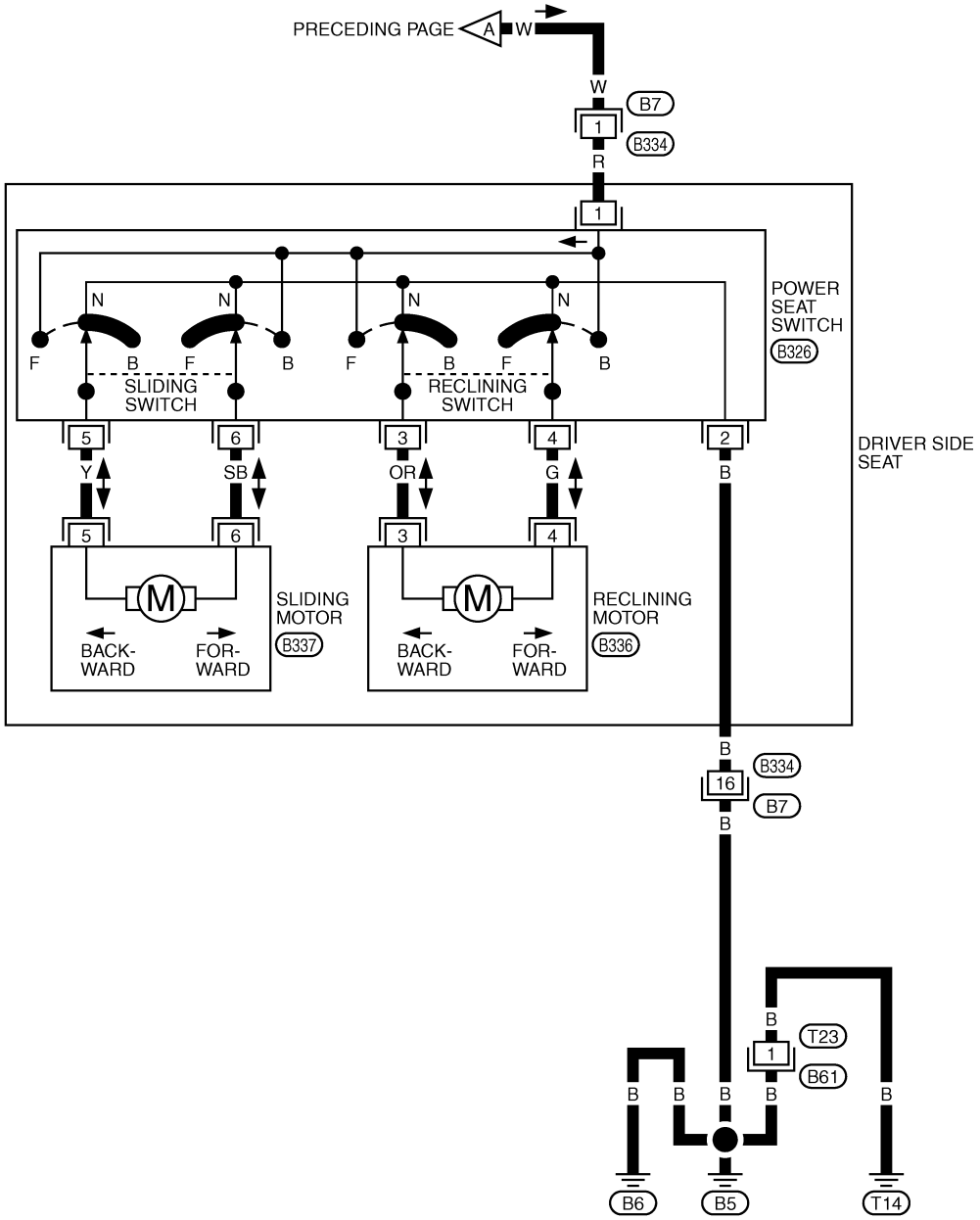
SE-SEAT-04



REFER TO THE FOLLOWING.
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M91 -ELECTRICAL UNITS

TIWT0832E

SE-SEAT-05

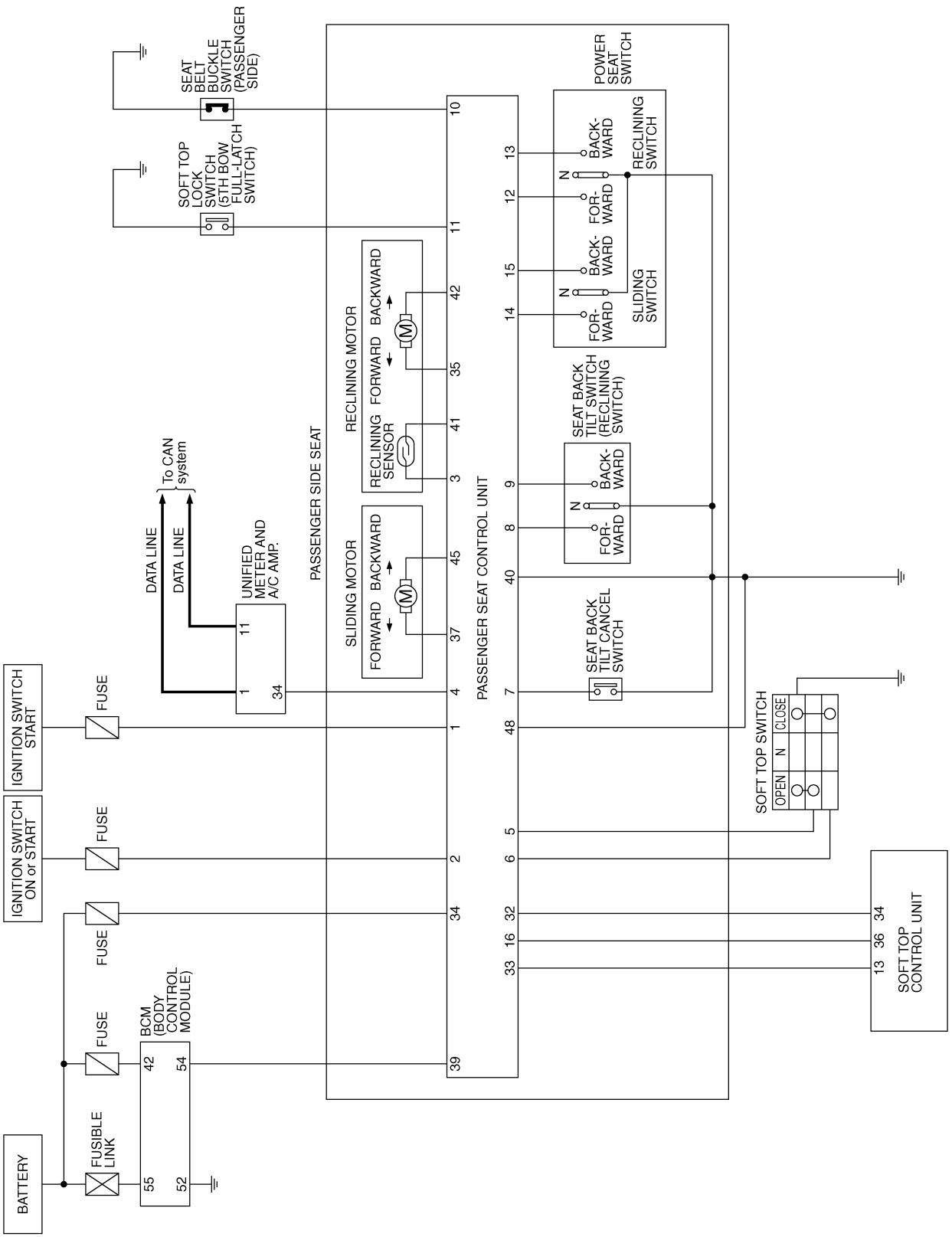


∗: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT0774E

Schematic / For Passenger Seat

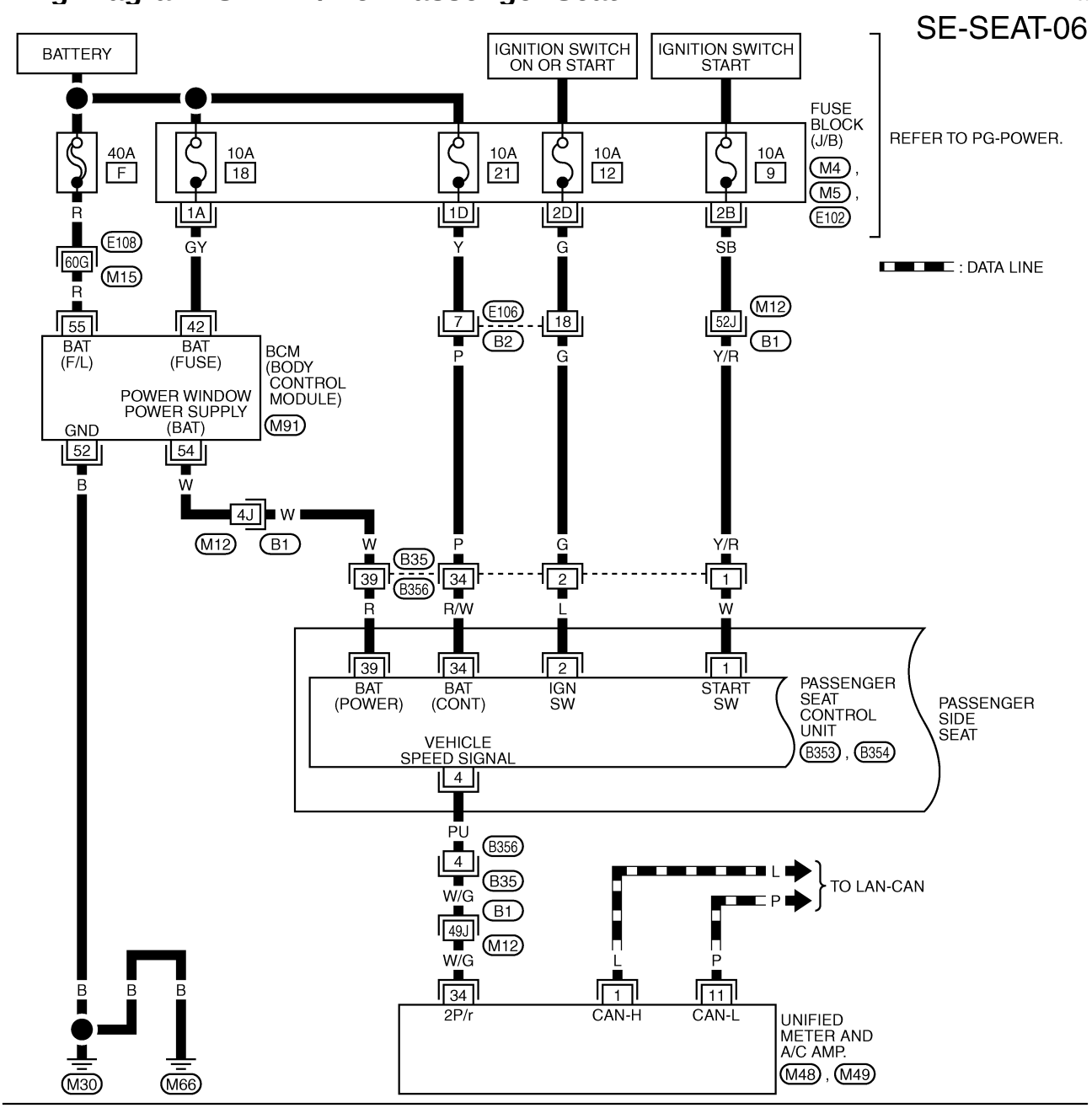
AIS004J8

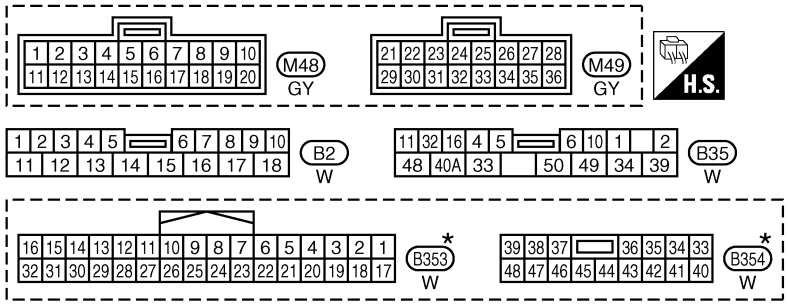


TIWT0839E

Wiring Diagram–SEAT– / For Passenger Seat

AIS004J9





★ : THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.

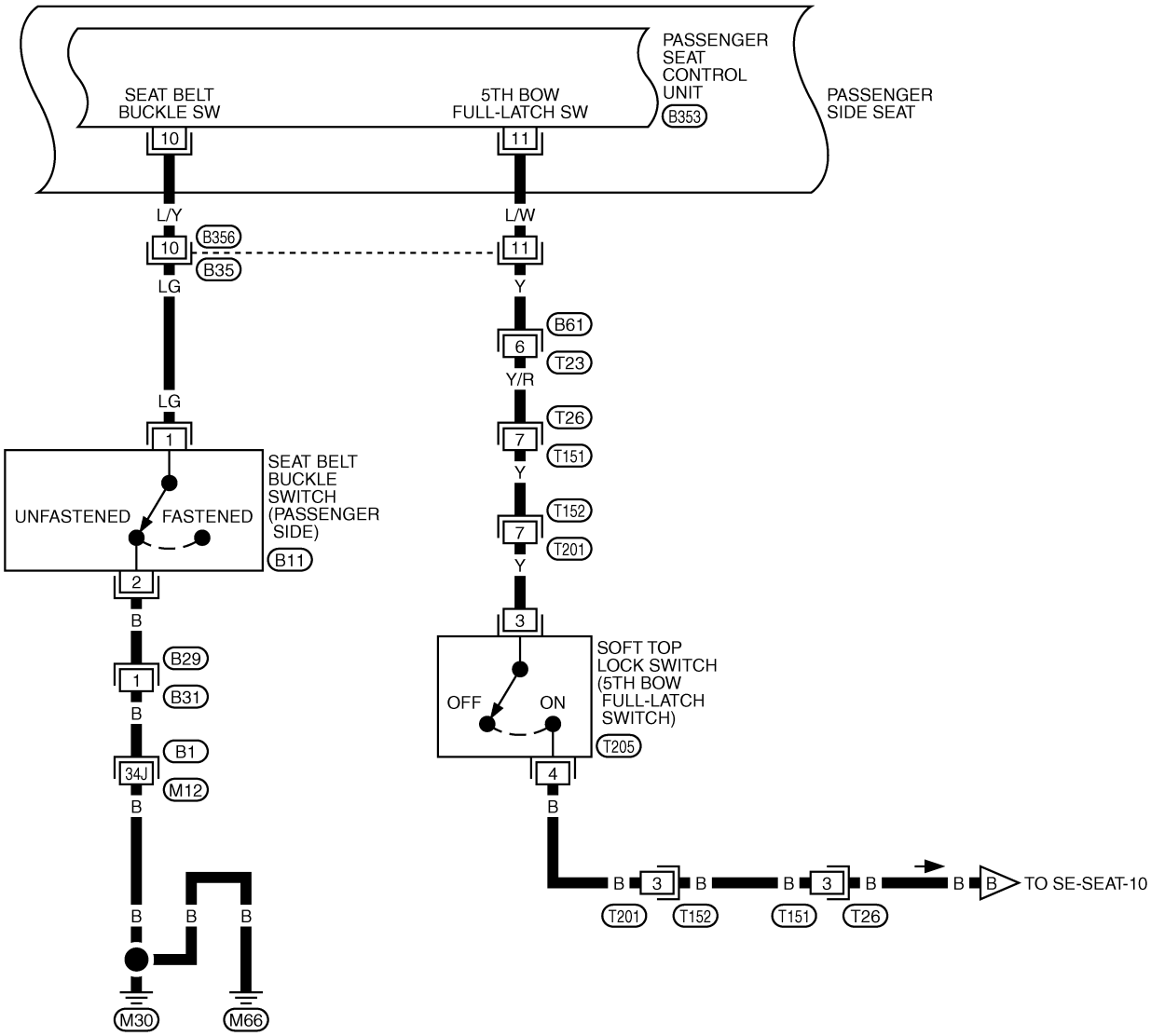
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

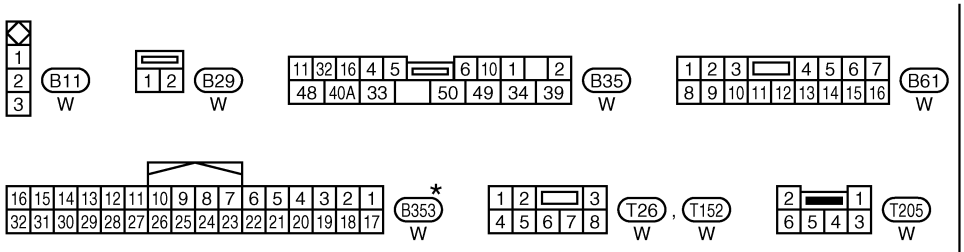
M4 , M5 , E102 -FUSE BLOCK-JUNCTION BOX (J/B)

M91 -ELECTRICAL UNITS

TIWT0840E

SE-SEAT-07



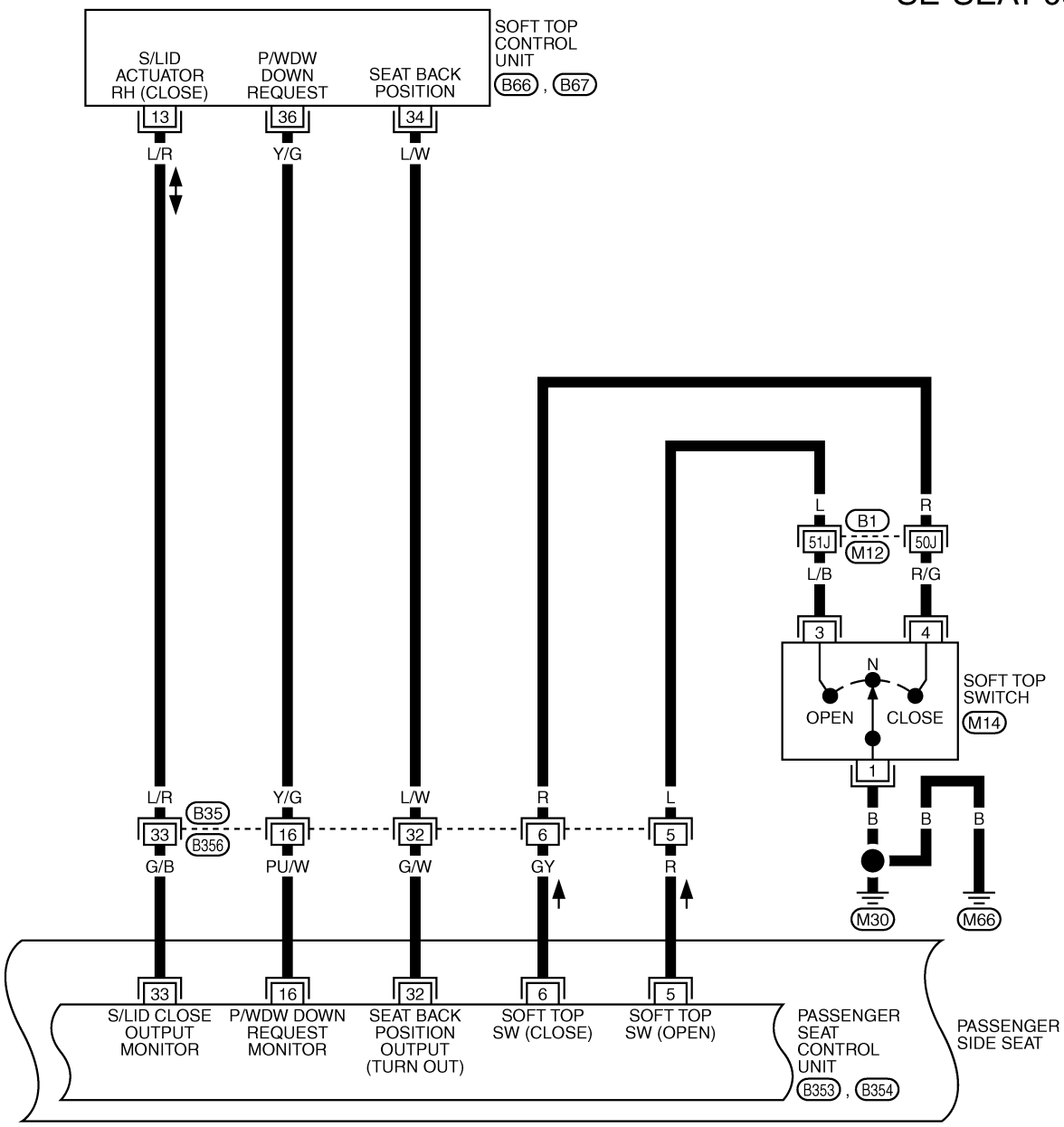


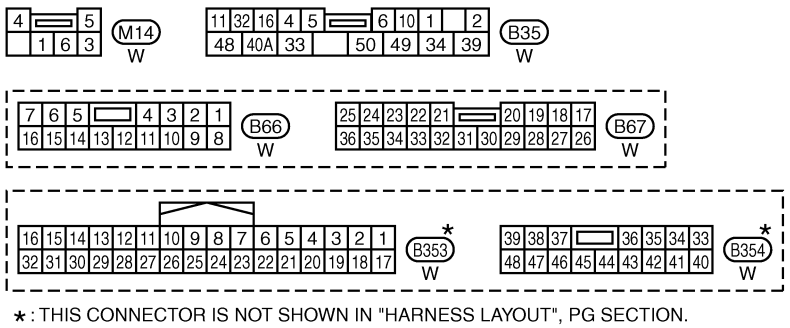
REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

★: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT0727E

SE-SEAT-08





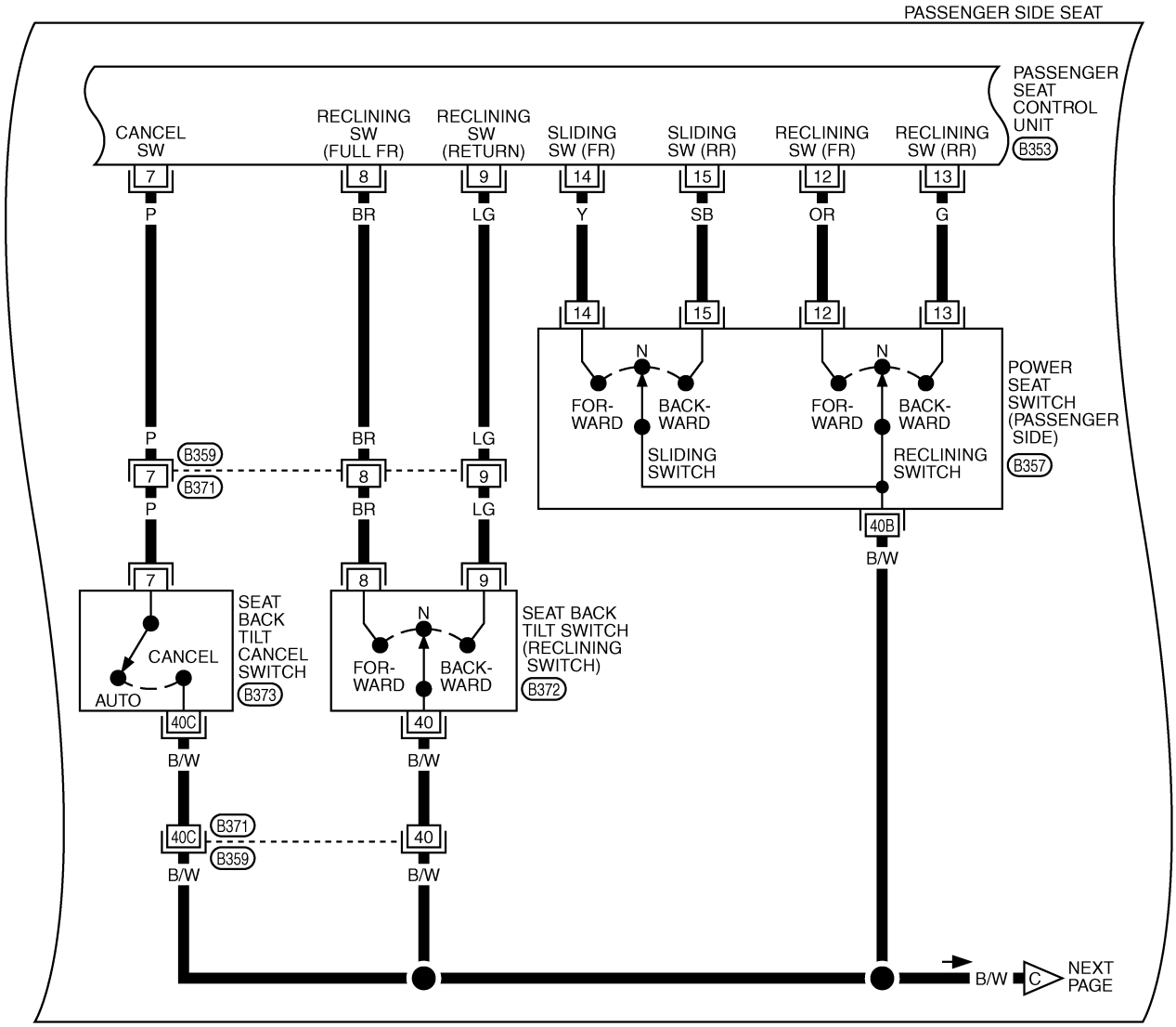
★ : THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

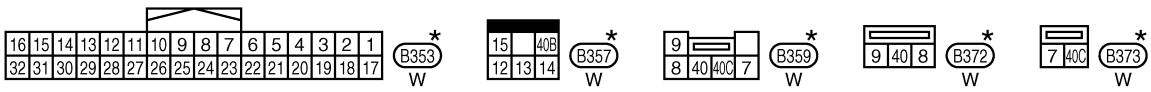
REFER TO THE FOLLOWING.

B1 -SUPER MULTIPLE JUNCTION (SMJ)

TIWT0728E

SE-SEAT-09

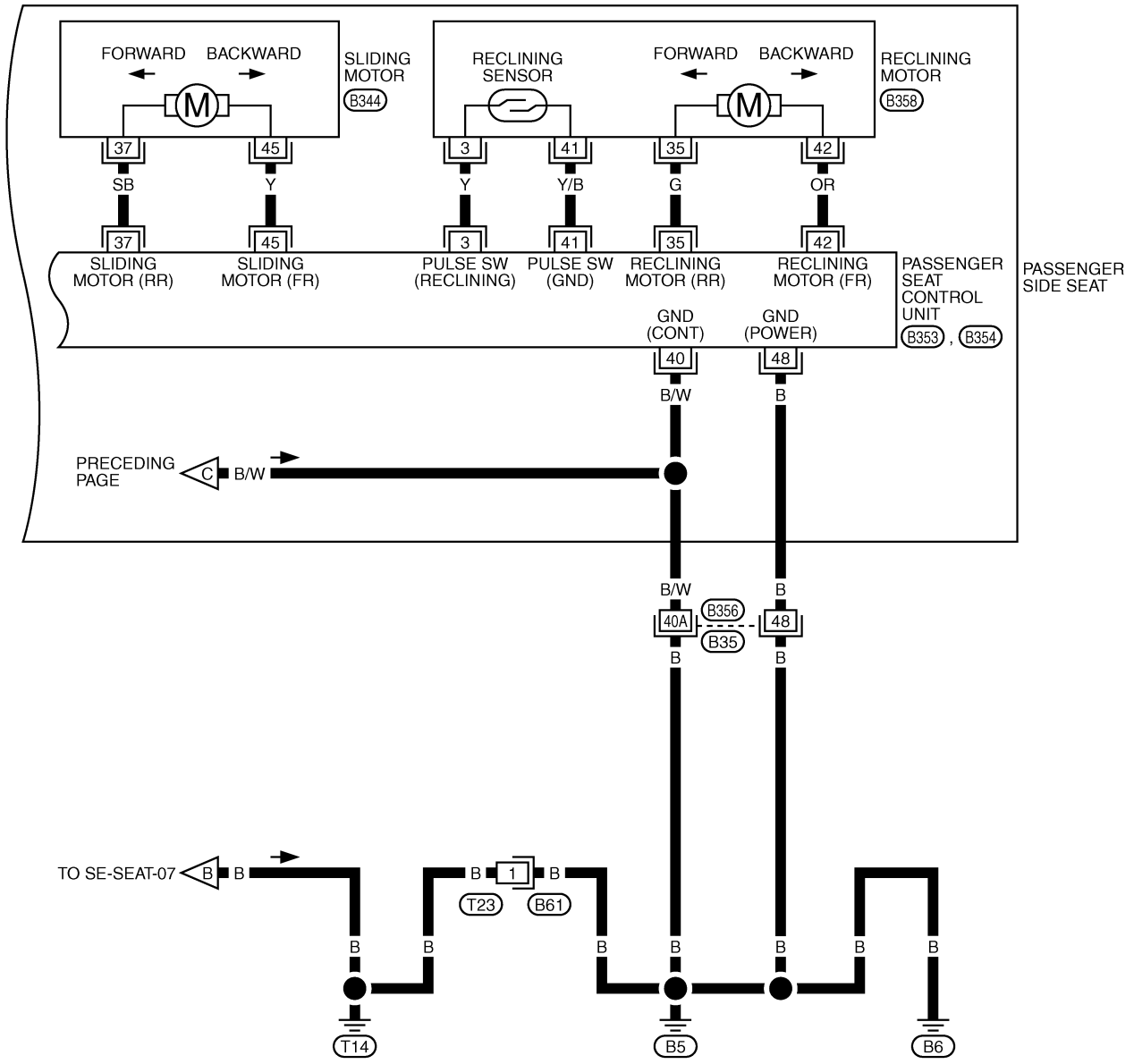


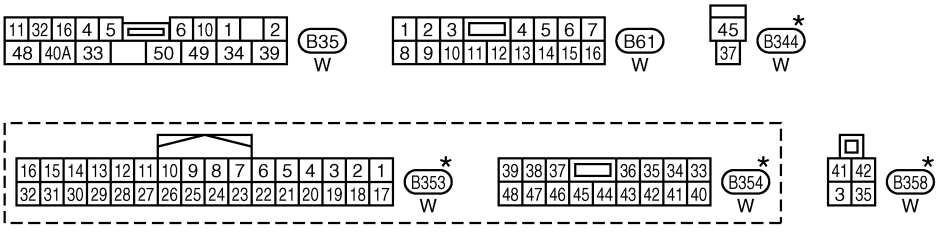


* : THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT0729E

SE-SEAT-10



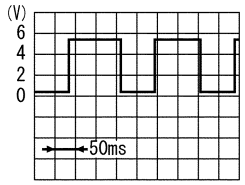
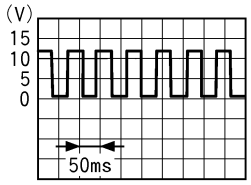


∗ : THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT0730E

Terminals and Reference Values of Passenger Seat Control Unit

AIS004JA

TERMI-NAL	WIRE COLOR	ITEM	CONDITION	VOLTAGE (V) (Approx)
1	W	Ignition switch START power supply	Ignition switch (START position)	Battery voltage
2	L	Ignition switch ON power supply	Ignition switch (ON or START position)	Battery voltage
3	Y	Reclining sensor input signal	When reclining motor is operated	 SIIA0692J
			Other than above	0 or 5
4	PU	Vehicle speed signal (2puls)	Speedometer operated [When vehicle speed is approx. 40 km/h (25 MPH)]	 PIIB0078J
5	R	Soft top switch OPEN signal	When soft top switch is turned to OPEN	0
			Other than above	Battery voltage
6	GY	Soft top switch CLOSE signal	When soft top switch is turned to CLOSE	0
			Other than above	Battery voltage
7	P	Seatback tilt cancel switch signal	When seatback tilt cancel switch is turned to AUTO	5
			When seatback tilt cancel switch is turned to CANCEL	0
8	BR	Seatback tilt switch FORWARD signal	When seatback tilt switch is turned to FORWARD	0
			Other than above	Battery voltage
9	LG	Seatback tilt switch BACKWARD signal	When seatback tilt switch is turned to BACKWARD	0
			Other than above	Battery voltage
10	L/Y	Seat belt buckle switch signal	When seat belt is fastened (OFF)	5
			When seat belt is unfastened (ON)	0
11	L/W	Soft top lock switch (5th bow full latch swtich) signal	5th bow full latch switch : ON	0
			5th bow full latch switch :OFF	5
12	OR	Reclining switch FORWARD signal	When power seat reclining switch is turned to FORWARD	0
			Other than above	Battery voltage
13	G	Reclining switch BACKWARD signal	When power seat reclining switch is turned to BACKWARD	0
			Other than above	Battery voltage
14	Y	Sliding switch FORWARD signal	When power seat sliding switch is turned to FORWARD	0
			Other than above	Battery voltage

TERMINAL	WIRE COLOR	ITEM	CONDITION	VOLTAGE (V) (Approx)
15	SB	Sliding switch BACKWARD signal	When power seat sliding switch is turned to BACKWARD	0
			Other than above	Battery voltage
16	PU/W	Power window down signal	When soft top switch is turned to ON	0
			Other than above	5
32	G/W	Seatback position signal	When the seatback is tilted by the interlocking operation with soft top	0
			Other than above	5
33	G/B	Storage lid actuator RH CLOSE signal	When storage lid actuator is in a closed operation	Battery voltage
			Other than above	0
34	R/W	Battery power supply (control unit)	—	Battery voltage
35	G	Reclining motor BACKWARD output	Reclining switch backward operation (Motor operated)	Battery voltage
			Other than above	0
37	SB	Sliding motor BACKWARD output	Sliding switch backward operation (Motor operated)	Battery voltage
			Other than above	0
39	R	Battery power supply (power)	—	Battery voltage
40	B/W	Ground (control unit)	—	0
41	Y/B	Ground (sensor)	—	0
42	OR	Reclining motor FORWARD output	Reclining switch forward operation (Motor operated)	Battery voltage
			Other than above	0
45	Y	Sliding motor FORWARD output	Sliding switch forward operation (Motor operated)	Battery voltage
			Other than above	0
48	B	Ground (power)	—	0

Terminals and Reference Values of BCM

AIS004JB

TERMINAL	WIRE COLOR	ITEM	CONDITION	VOLTAGE (V) (Approx)
42	GY	Battery power supply (Fuse)	—	Battery voltage
52	B	Ground	—	0
54	W	Power window power supply output (driver side power seat switch and passenger seat control unit power supply)	—	Battery voltage
55	R	Battery power supply (Fusible link)	—	Battery voltage

Terminals and Reference Values of Soft Top Control Unit

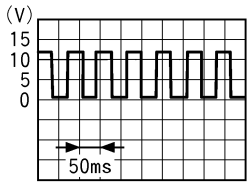
AIS004JC

TERMINAL	WIRE COLOR	ITEM	CONDITION	VOLTAGE (V) (Approx)
13	L/R	Storage lid actuator RH CLOSE signal	When storage lid actuator is in a closing operation	Battery voltage
			Other than above	0

TERMINAL	WIRE COLOR	ITEM	CONDITION	VOLTAGE (V) (Approx)
34	L/W	Seatback position signal	When the seatback is tilted by the interlocking operation with soft top	0
			Other than above	5
36	Y/G	Power window down signal	When soft top switch is turned to ON	0
			Other than above	5

Terminals and Reference Values of Unified Meter and A/c Amp.

AIS004JD

TERMINAL	WIRE COLOR	ITEM	CONDITION	VOLTAGE (V) (Approx)
1	L	CAN-H	—	—
11	P	CAN-L	—	—
34	W/G	Speed signal (2puls)	Speedometer is in operation [When vehicle speed is approx. 40 km/h (25 MPH)]	 PIIB0078J

Work Flow

AIS004JE

1. Check the symptom and customer's requests.
2. Understand the outline of system. Refer to SE-16, "System Description" .
3. According to the trouble diagnosis chart, repair or replace the cause of the malfunction. Refer to SE-36, "Trouble Diagnosis Symptom Chart" .
4. Does power seat system operate normally? If Yes, GO TO 5, If No, GO TO 3.
5. INSPECTION END.

Trouble Diagnosis Symptom Chart

AIS004JF

Always check the “WORK FLOW” before troubleshooting. Refer to SE-36, "Work Flow" .

Symptom	Diagnosis / service procedure		Refer to page
Power seat systems do not operate (Neither driver side seat nor passenger side seat operation can be performed).	BCM power supply and ground circuit check		SE-37
Functions of a driver side power seat do not operate.	Driver side power seat power supply and ground check		SE-39
A part of driver side power seat system does not operate.	1.	Driver side seat sliding motor circuit check	SE-40
	2.	Driver side seat reclining motor circuit check	SE-41
All the passenger side power seat systems do not operate.	Passenger seat control unit power supply and ground check		SE-42
A passenger seat does not a sliding operation.	Passenger side seat sliding motor circuit check		SE-44
A passenger seat does not carry out a reclining operation (Neither manual operation nor an automatic operation can be performed).	Passenger side seat reclining motor circuit check		SE-44
The automatic operation of a passenger seat can not be performed (a manual operation can be performed).	1.	Passenger side seat reclining sensor circuit check	SE-45
	2.	Seatback tilt cancel switch circuit check	SE-50
	3.	If the above systems are normal, replace passenger seat control unit.	SE-15
A passenger seat operates automatically when the vehicle is running.	Vehicle speed signal check		SE-56

Symptom	Diagnosis / service procedure		Refer to page
Passenger seatback does not return during a soft top CLOSE operation.	Soft top lock switch circuit check		SE-54
Passenger seatback does not tilt forward and return during a soft top OPEN operation.	Storage lid close signal circuit check		SE-53
Passenger seatback does not tilt forward during a soft top CLOSE operation or OPEN operation.	1.	Power window down request signal circuit check	SE-52
	2.	Soft top switch circuit check	SE-51
	3.	If the above systems are normal, replace passenger seat control unit.	SE-15
Seat does not tilt when passenger seatback tilt switch is pushed (other functions operate normally).	1.	Seatback tilt switch circuit check	SE-49
	2.	Seat belt buckle switch circuit check	SE-54
	3.	If the above systems are normal, replace passenger seat control unit	SE-15
A part of passenger seat system does not operate (only manual).	1.	Passenger side seat sliding switch circuit check	SE-46
	2.	Passenger side seat reclining switch circuit check	SE-47
Passenger seatback dose not go back to the original position during a soft top CLOSE or OPEN operation.	Passenger seat control unit ignition signal circuit check		SE-43
The manual operation of a passenger seat cannot be performed (a automatic operation can be performed).	Passenger side power seat ground circuit check		SE-48

BCM Power Supply and Ground Check

AIS004JG

1. CHECK FUSE

- Check 40A fusible link (letter **F** located in the fuse and fusible link box).
- Check 10A fuse [No.18, located in the fuse block (J/B)]

NOTE:
Refer to SE-15, "Component Parts and Harness Connector Location" .

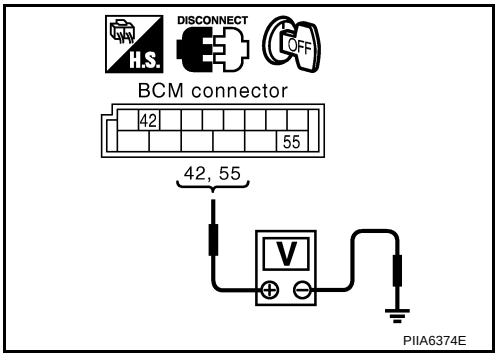
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK BCM POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM connector M91 terminal 42, 55 and ground.

42 (GY) - Ground : Battery voltage
55 (R) - Ground : Battery voltage



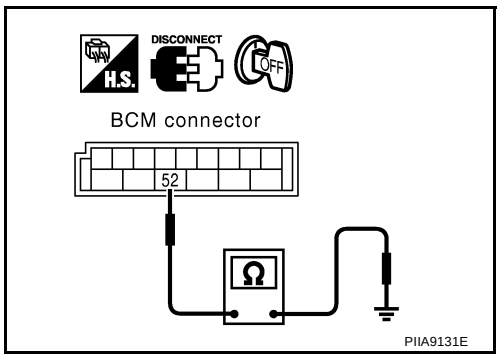
OK or NG

OK >> GO TO 3.
NG >> Repair or replace the harness between BCM and fusible link.

3. CHECK BCM GROUND CIRCUIT

Check continuity between BCM connector M91 terminal 52 and ground.

52 (B) - Ground : Continuity should exist.



OK or NG

OK >> GO TO 4.
NG >> Repair or replace the harness between BCM and ground.

4. CHECK BCM OUTPUT POWER SUPPLY CIRCUIT

1. Disconnect power seat switch and passenger seat control unit connector.
2. Check continuity between BCM connector M91 terminal 54 and power seat switch connector B326 terminal 1.

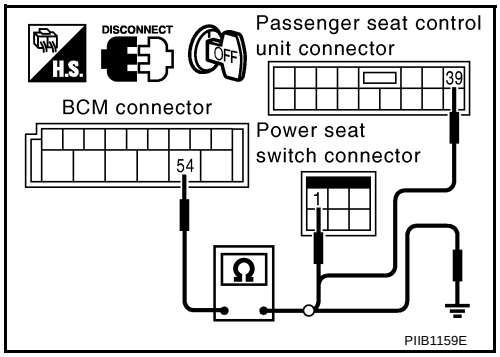
54 (W) - 1 (R) : Continuity should exist.

3. Check continuity between BCM connector M91 terminal 54 and passenger seat control unit connector B354 terminal 39.

54 (W) - 39 (R) : Continuity should exist.

4. Check continuity between BCM connector M91 terminal 54 and ground.

54 (W) - Ground : Continuity should not exist.



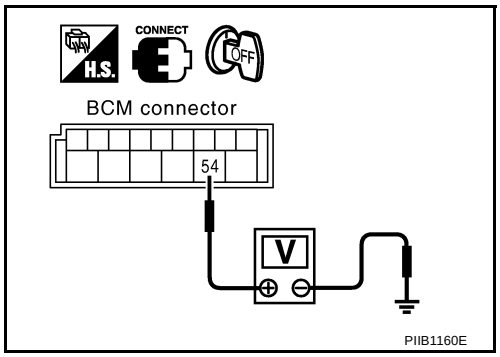
OK or NG

OK >> GO TO 5.
NG >> Replace harness between BCM and power seat switch or passenger seat control unit.

5. CHECK BCM OUTPUT POWER SUPPLY

1. Connect BCM connector.
2. Check voltage between BCM connector M91 terminal 54 and ground.

54 (W) - Ground : Battery voltage



OK or NG

OK >> Check the condition of the harness and connector.
NG >> Replace BCM.

Driver Side Seat Power Supply and Ground Check

AIS004JH

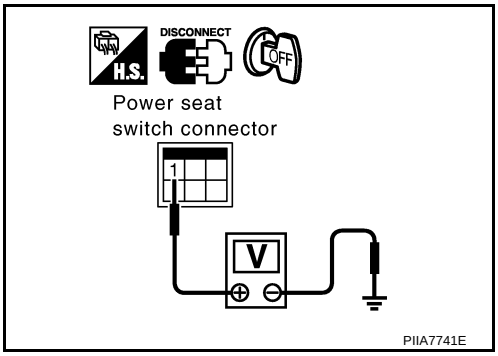
1. CHECK POWER SEAT SWITCH POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect power seat switch connector.
3. Check voltage between power seat switch connector B326 terminal 1 and ground.

1 (R) - Ground : Battery voltage

OK or NG

OK >> GO TO 3.
NG >> GO TO 2.



2. CHECK BCM OUTPUT POWER SUPPLY CIRCUIT

1. Disconnect passenger seat control unit connector.
2. Check continuity between BCM connector M91 terminal 54 and power seat switch connector B326 terminal 1.

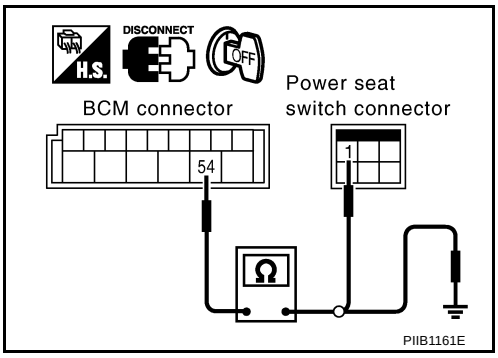
54 (W) - 1 (R) : Continuity should exist.

3. Check continuity between BCM connector M91 terminal 54 and ground.

54 (W) - Ground : Continuity should not exist.

OK or NG

OK >> Check the condition of the harness and connector.
NG >> Replace harness between BCM and power seat switch.



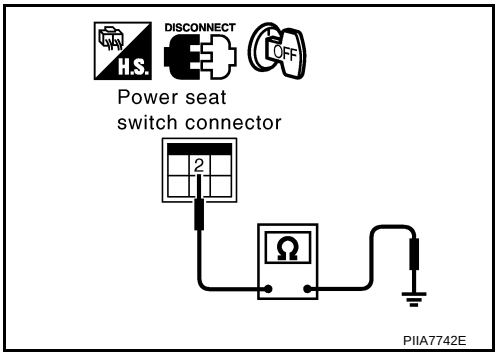
3. CHECK POWER SEAT SWITCH GROUND CIRCUIT

Check continuity between power seat switch connector B326 terminal 2 and ground.

2 (B) - Ground : Continuity should exist.

OK or NG

OK >> Check the condition of the harness and connector.
NG >> Repair or replace the harness between power seat switch and ground.



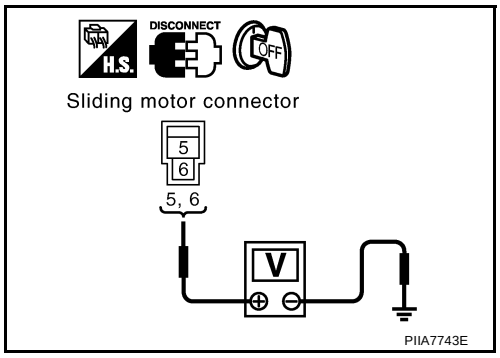
Driver Side Seat Sliding Motor Circuit Check

AIS004JI

1. CHECK SLIDING MOTOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect sliding motor connector.
3. Sliding switch operate, check voltage between sliding motor connector and ground.

Connector	Terminal (Wire color)		Sliding switch condition	Voltage (V) (Approx.)
	(+)	(-)		
B337	5 (Y)	Ground	FORWARD	Battery voltage
			Other than above	0
	6 (SB)		BACKWARD	Battery voltage
			Other than above	0



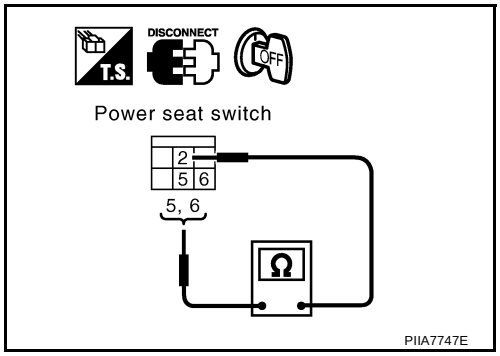
OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK POWER SEAT SWITCH 1

1. Disconnect power seat switch connector.
2. Sliding switch operate, check continuity between power seat switch terminal 5, 6 and 2.

Terminals		Sliding swtich condition	Continuity
5	2	BACKWARD	Yes
		Other than above	No
6		FORWARD	Yes
		Other than above	No



OK or NG

OK >> Replace sliding motor.
NG >> Replace power seat switch.

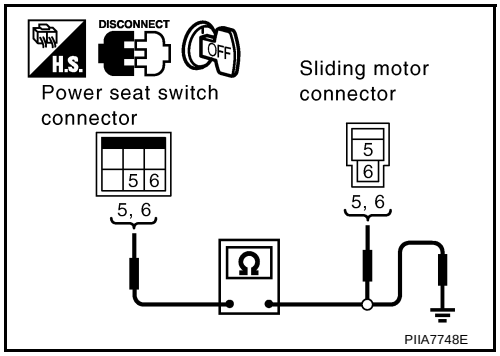
3. CHECK SLIDING MOTOR CIRCUIT HARNESS

1. Disconnect power seat switch connector.
2. Check continuity between power seat switch connector B326 terminal 5, 6 and sliding motor connector B337 terminal 5, 6.

5 (Y) - 5 (Y) : Continuity should exist.
6 (SB) - 6 (SB) : Continuity should exist.

3. Check continuity between power seat switch connector B326 terminal 5, 6 and ground.

5 (Y) - Ground : Continuity should not exist.
6 (SB) - Ground : Continuity should not exist.



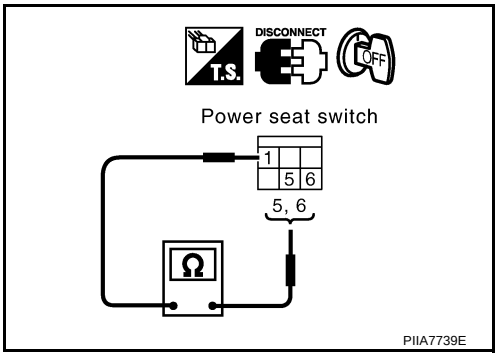
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness between power seat switch and sliding motor.

4. CHECK POWER SEAT SWITCH 2

Check continuity between power seat switch as follows.

Terminals		Sliding swtich condition	Continuity
5	1	FORWARD	Yes
		Other than above	No
6		BACKWARD	Yes
		Other than above	No



OK or NG

OK >> Check the condition of the harness and connector.
NG >> Replace power seat switch.

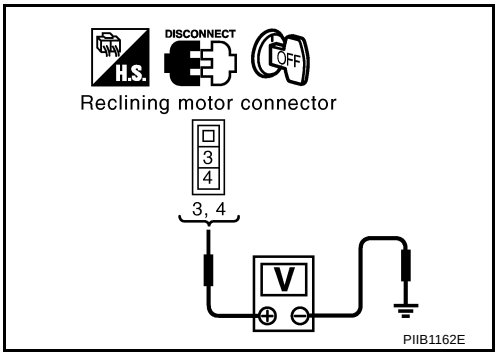
Driver Side Seat Reclining Motor Circuit Check

AIS004JJ

1. CHECK RECLINING MOTOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect reclining motor connector.
3. Reclining switch operate, check voltage between reclining motor connector and ground.

Connector	Terminal (Wire color)		Reclining swtich condition	Voltage (V) (Approx.)
	(+)	(-)		
B336	3 (OR)	Ground	FORWARD	Battery voltage
			Other than above	0
	4 (G)		BACKWARD	Battery voltage
			Other than above	0



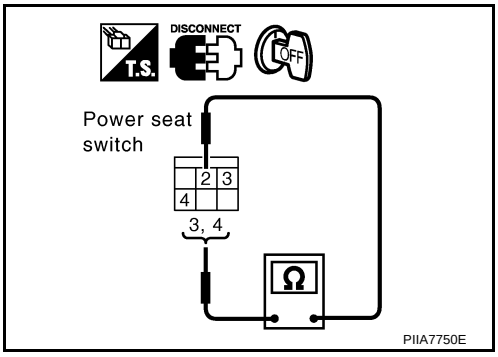
OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK POWER SEAT SWITCH 1

1. Disconnect power seat switch connector.
2. Reclining switch operate, check continuity between power seat switch terminal 3, 4 and 2.

Terminals		Reclining swtich condition	Continuity
3	2	FORWARD	Yes
		Other than above	No
4		BACKWARD	Yes
		Other than above	No



OK or NG

OK >> Replace reclining motor.
NG >> Replace power seat switch.

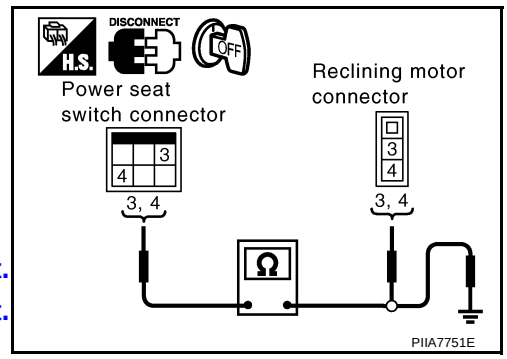
3. CHECK RECLINING MOTOR CIRCUIT HARNESS

1. Disconnect power seat switch connector.
2. Check continuity between power seat switch connector B326 terminal 3, 4 and reclining motor connector B336 terminal 3, 4.

3 (OR) - 3 (OR) : Continuity should exist.
4 (G) - 4 (G) : Continuity should exist.

3. Check continuity between power seat switch connector B326 terminal 3, 4 and ground.

3 (OR) - Ground : Continuity should not exist.
4 (G) - Ground : Continuity should not exist.



OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness between power seat switch and reclining motor.

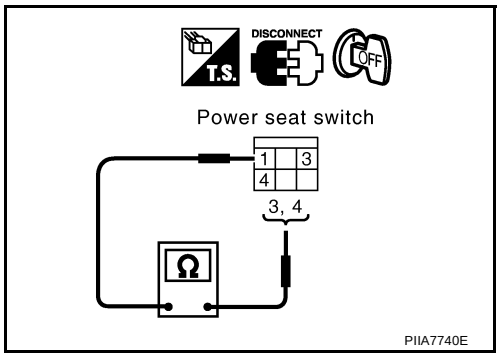
4. CHECK POWER SEAT SWITCH 2

Reclining switch operate, check continuity between power seat switch as follows.

Terminals		Reclining swtich condition	Continuity
3	1	FORWARD	Yes
		Other than above	No
4		BACKWARD	Yes
		Other than above	No

OK or NG

OK >> Check the condition of the harness and connector.
NG >> Replace power seat switch.



Passenger Seat Control Unit Power Supply and Ground Check

AIS004JK

1. CHECK FUSE

- Check 10A fuse [No.21, located in the fuse block (J/B)].

NOTE:
Refer to SE-15, "Component Parts and Harness Connector Location" .

OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

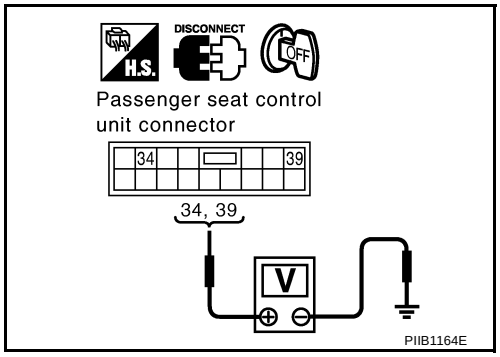
2. CHECK PASSENGER SEAT CONTROL UNIT POWER SUPPLY

Check voltage between passenger seat control unit connector B354 terminal 34, 39 and ground.

34 (R/W) - Ground : Battery voltage.
39 (R) - Ground : Battery voltage.

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.



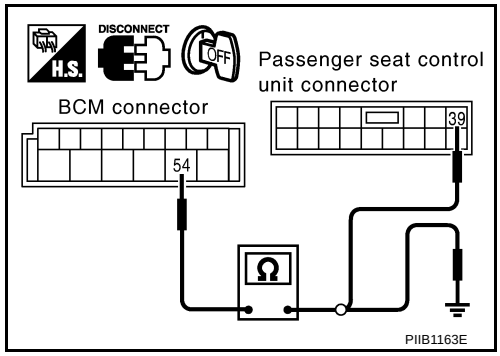
3. CHECK BCM OUTPUT POWER SUPPLY CIRCUIT

1. Turn ignition swtich OFF.
2. Disconnect BCM, power seat switch connector and passenger seat control unit connector.
3. Check continuity between BCM connector M91 terminal 54 and passenger seat control unit connector B354 terminal 39.

54 (W) - 39 (R) : Continuity should exist.

4. Check continuity between BCM connector M91 terminal 54 and ground.

54 (W) - Ground : Continuity should not exist.



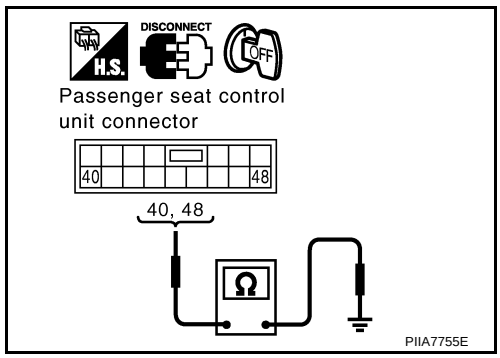
OK or NG

OK >> GO TO 4.
NG >> Repair or replace the harness between BCM and passenger seat control unit.

4. CHECK PASSENGER SEAT CONTROL UNIT GROUND CIRCUIT

Check continuity between passenger seat control unit connector B354 terminal 40, 48 and ground.

40 (B/W) - Ground : Continuity should exist.
48 (B) - Ground : Continuity should exist.



OK or NG

OK >> Passenger seat control unit power supply and ground is OK.
NG >> Repair or replace the harness between passenger seat control unit and ground.

Passenger Seat Control Unit Ignition Signal Circuit Check

AIS004JL

1. CHECK FUSE

- Check 10A fuse [No.9, located in the fuse block (J/B)].
- Check 10A fuse [No.12, located in the fuse block (J/B)].

NOTE:
Refer to SE-15, "Component Parts and Harness Connector Location" .

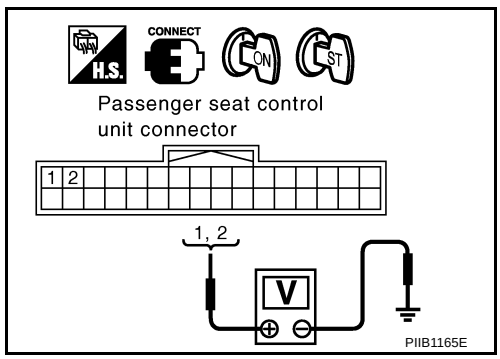
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK PASSENGER SEAT CONTROL UNIT POWER SUPPLY

Check voltage between passenger seat control unit and ground.

Connector	Terminal (Wire color)		Condition		Voltage (V) (Approx.)
	(+)	(-)			
B353	1 (W)	Ground	Ignition switch	: START	Battery voltage
	2 (L)			: ON	



OK or NG

OK >> Replace passenger seat control unit.
NG >> Repair or replace the harness between passenger seat control unit and fuse block (J/B).

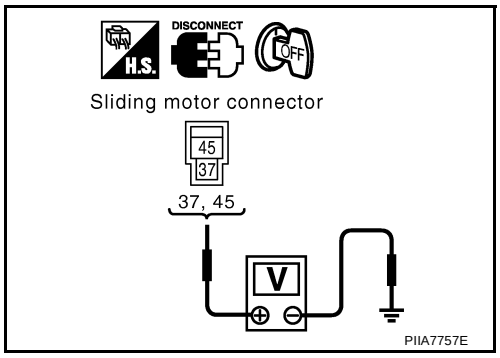
Passenger Side Seat Sliding Motor Circuit Check

AIS004JM

1. CHECK SLIDING MOTOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect sliding motor connector.
3. Slinding switch operated, check voltage between sliding motor connector and ground.

Connector	Terminal (Wire color)		Sliding switch condition	Voltage (V) (Approx.)
	(+)	(-)		
B344	37 (SB)	Ground	BACKWARD	Battery voltage
			Other than above	0
	45 (Y)		FORWARD	Battery voltage
			Other than above	0



OK or NG

OK >> Replace sliding motor.
NG >> GO TO 2.

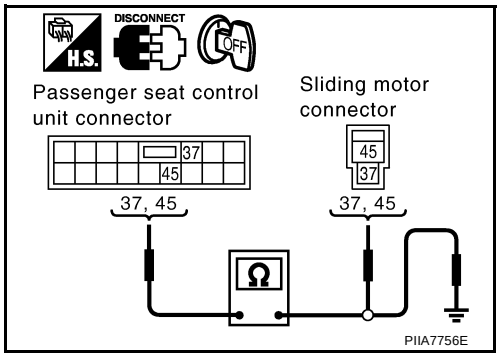
2. CHECK SLIDING MOTOR CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector.
2. Check continuity between passenger seat control unit connector B354 terminal 37, 45 and sliding motor connector B344 terminal 37, 45.

37 (SB) - 37 (SB) : Continuity should exist.
45 (Y) - 45 (Y) : Continuity should exist.

3. Check continuity between passenger seat control unit connector B354 terminal 37, 45 and ground.

37 (SB) - Ground : Continuity should not exist.
45 (Y) - Ground : Continuity should not exist.



OK or NG

OK >> Check the condition of the harness and connector.
NG >> Repair or replace harness between passenger seat control unit and sliding motor.

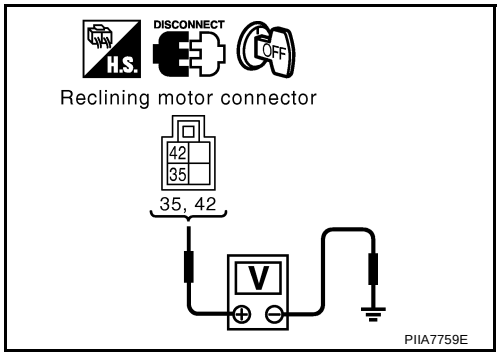
Passenger Side Seat Reclining Motor Circuit Check

AIS004JN

1. CHECK RECLINING MOTOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect reclining motor connector.
3. Reclining swtich operated, check voltage between reclining motor and ground.

Connector	Terminal (Wire color)		Reclining swtich condition	Voltage (V) (Approx.)
	(+)	(-)		
B358	35 (G)	Ground	BACKWARD	Battery voltage
			Other than above	0
	42 (OR)		FORWARD	Battery voltage
			Other than above	0



OK or NG

OK >> Replace reclining motor.
NG >> GO TO 2.

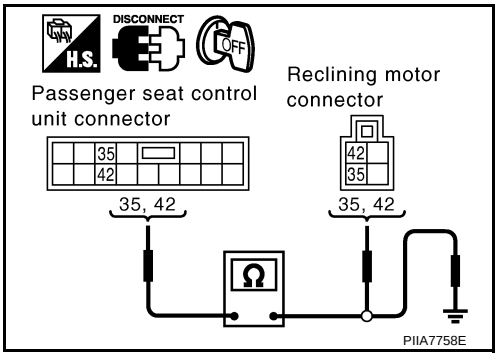
2. CHECK RECLINING MOTOR CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector.
2. Check continuity between passenger seat control unit connector B354 terminal 35, 42 and reclining motor connector B358 terminal 35, 42.

35 (G) - 35 (G) : Continuity should exist.
42 (OR) - 42 (OR) : Continuity should exist.

3. Check continuity between passenger seat control unit connector B354 terminal 35, 42 and ground.

35 (G) - Ground : Continuity should not exist.
42 (OR) - Ground : Continuity should not exist.



OK or NG

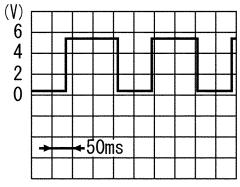
OK >> Check the condition of the harness and connector.
NG >> Repair or replace harness between passenger seat control unit and reclining motor.

Passenger Side Seat Reclining Sensor Circuit Check

AIS004JO

1. CHECK RECLINING SENSOR OUTPUT SIGNAL

1. Turn ignition switch OFF.
2. Check signal between passenger seat control unit connector and ground, with oscilloscope.

Connector	Terminal (Wire color) (+)	Terminal (Wire color) (-)	Condition	Signal (Reference value)
B353	3 (Y)	Ground	When reclining motor is operated.	

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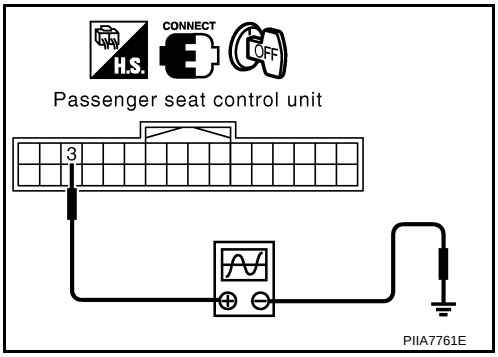


OK or NG

OK >> Passenger side seat reclining motor circuit is OK.
NG1 >> When voltage waveform dose not appear with a constant voltage (approx. 5V), GO TO 3.
NG2 >> When voltage waveform dose not appear with a constant voltage (approx. 0V), GO TO 2.

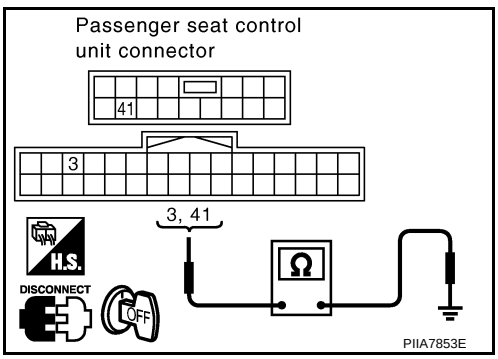
2. CHECK RECLINING SENSOR CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector.
2. Check continuity between passenger seat control unit connector B354 terminal 3, 41 and ground.

3 (Y) - Ground : Continuity should not exist.
41 (Y/B) - Ground : Continuity should not exist.

OK or NG

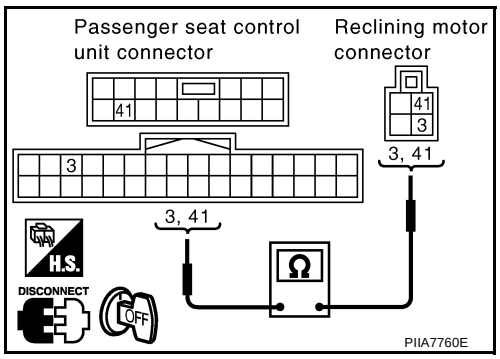
OK >> Replace passenger seat control unit.
NG >> Repair or replace harness between passenger seat control unit and reclining motor.



3. CHECK RECLINING SENSOR CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector.
2. Check continuity between passenger seat control unit connector B354 terminal 3, 41 and reclining motor connector B358 terminal 3, 41.

3 (Y) - 3 (Y) : Continuity should exist.
41 (Y/B) - 41 (Y/B) : Continuity should exist.



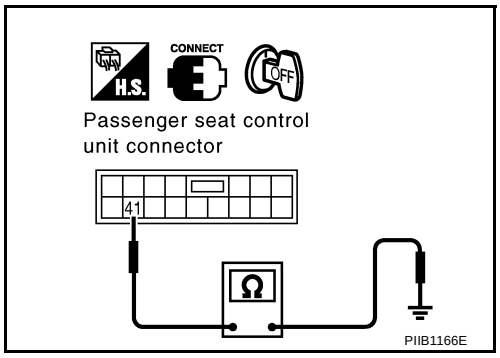
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness between passenger seat control unit and reclining motor.

4. CHECK RECLINING SENSOR GROUND CIRCUIT

1. Connect passenger seat control unit connector.
2. Check continuity between passenger seat control unit connector B354 terminal 41and ground.

41 (Y/B) - Ground : Continuity should exist.



OK or NG

OK >> Replace reclining motor.
NG >> Replace passenger seat control unit.

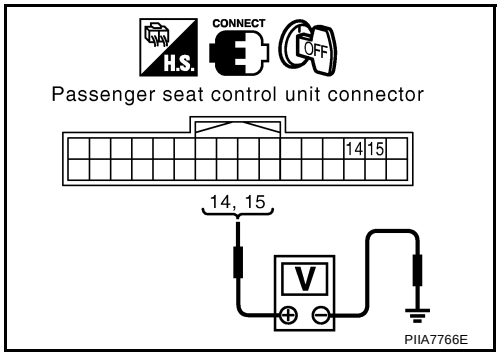
Passenger Side Seat Sliding Switch Circuit Check

AIS004JP

1. CHECK SLIDING SWITCH OUTPUT SIGNAL

1. Turn ignition switch OFF.
2. Slining switch operated, check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Sliding switch condition	Voltage (V) (Approx.)
	(+)	(-)		
B353	14 (Y)	Ground	FORWARD	0
			Other than above	Battery voltage
	15 (SB)		BACKWARD	0
			Other than above	Battery voltage



OK or NG

OK >> Replace passenger seat control unit.
NG >> GO TO 2.

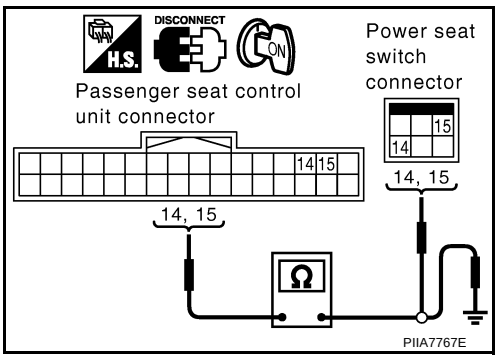
2. CHECK SLIDING SWITCH CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector and power seat switch connector.
2. Check continuity between passenger seat control unit connector B353 terminal 14, 15 and power seat switch connector B357 terminal 14, 15.

14 (Y) - 14 (Y) : Continuity should exist.
15 (SB) - 15 (SB) : Continuity should exist.

3. Check continuity between passenger seat control unit connector B353 terminal 14, 15 and ground.

14 (Y) - Ground : Continuity should not exist.
15 (SB) - Ground : Continuity should not exist.



OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness between passenger seat control unit and power seat switch.

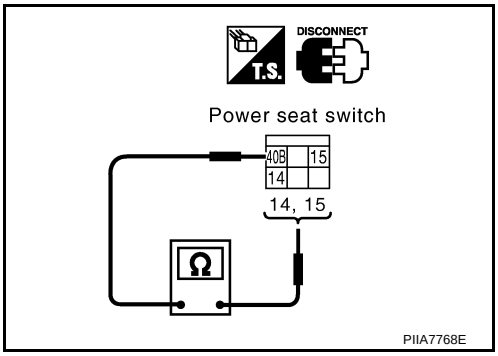
3. CHECK POWER SEAT SWITCH

Slinding swtich operated, check continuity between power seat switch terminal 14, 15 and 40B.

Terminals		Sliding swtich condition	Continuity
14	40B	FORWARD	Yes
		Other than above	No
15		BACKWARD	Yes
		Other than above	No

OK or NG

OK >> Check the condition of the harness and connector.
NG >> Replace power seat switch.



Passenger Side Seat Reclining Switch Circuit Check

AIS004JQ

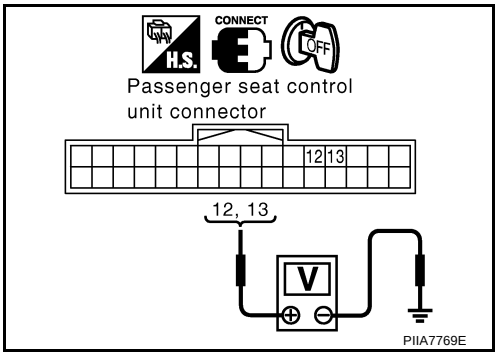
1. CHECK RECLINING SWITCH OUTPUT SIGNAL

1. Turn ignition switch OFF.
2. Reclining swtich operated, check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Reclining swtich condition	Voltage (V) (Approx.)
	(+)	(-)		
B353	12 (OR)	Ground	FORWARD	0
			Other than above	Battery voltage
	13 (G)		BACKWARD	0
			Other than above	Battery voltage

OK or NG

OK >> Passenger side seat reclining switch circuit is OK.
NG >> GO TO 2.



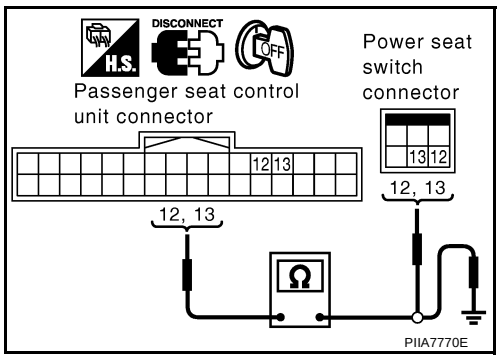
2. CHECK RECLINING SWITCH CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector and power seat switch connector.
2. Check continuity between passenger seat control unit connector B353 terminal 12, 13 and power seat switch connector B357 terminal 12, 13.

12 (OR) - 12 (OR) : Continuity should exist.
13 (G) - 13 (G) : Continuity should exist.

3. Check continuity between passenger seat control unit connector B353 terminal 12, 13 and ground.

12 (OR) - Ground : Continuity should not exist.
13 (G) - Ground : Continuity should not exist.



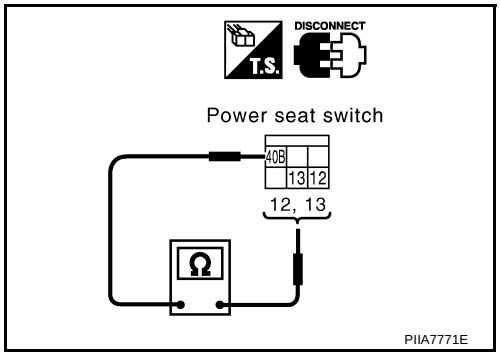
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness between passenger seat control unit and power seat switch.

3. CHECK POWER SEAT SWITCH

Rclining swtich operated, check continuity between power seat switch terminal 12, 13 and 40B.

Terminals		Reclining swtich condition	Continuity
12	40B	FORWARD	Yes
		Other than above	No
13		BACKWARD	Yes
		Other than above	No



OK or NG

OK >> Check the condition of the harness and connector.
NG >> Replace power seat switch.

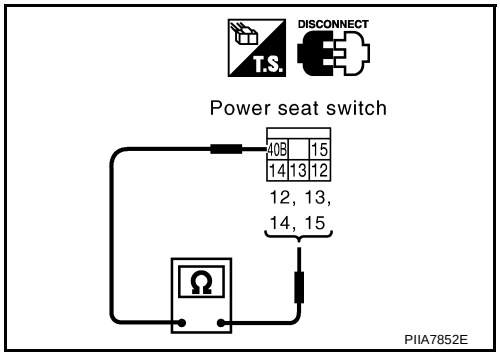
Passenger Side Power Seat Switch Ground Circuit Check

AIS004JR

1. CHECK POWER SEAT SWITCH

1. Turn ignition switch OFF.
2. Disconnect power seat switch connector.
3. Check continuity between power seat switch terminal 12, 13, 14, 15 and 40B.

Terminals		Condition	Continuity
12	40B	When reclining switch is turned to forward	Yes
		Other than above	No
13		When reclining switch is turned to backward	Yes
		Other than above	No
14		When sliding switch is turned to forward	Yes
		Other than above	No
15		When sliding switch is turned to backward	Yes
		Other than above	No



OK or NG

OK >> GO TO 2.
NG >> Replace power seat switch.

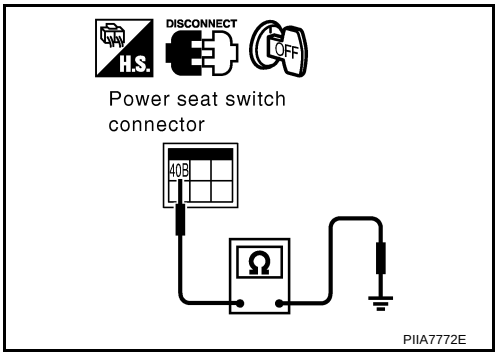
2. CHECK POWER SEAT SWITCH GROUND CIRCUIT

Check continuity between power seat switch connector B357 terminal 40B and ground.

40B (B/W) - Ground : Continuity should exist.

OK or NG

OK >> Check the condition of the harness and connector.
NG >> Repair or replace the harness between power seat switch and ground.



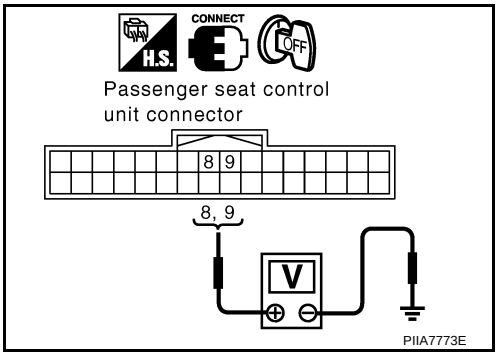
Seatback Tilt Switch Circuit Check

AIS004JS

1. CHECK SEATBACK TILT SWITCH OUTPUT SIGNAL

1. Turn ignition switch OFF.
2. Seatback tilt switch operated, check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Seatback tilt swtich condition	Voltage (V) (Approx.)
	(+)	(-)		
B353	8 (BR)	Ground	FORWARD	0
			Other than above.	Battery voltage
	9 (LG)		BACKWARD	0
			Other than above.	Battery voltage



OK or NG

OK >> Seatback tilt switch circuit is OK.
NG >> GO TO 2.

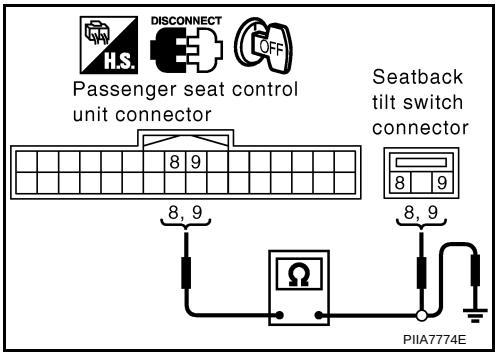
2. CHECK SEATBACK TILT SWITCH CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector and seatback tilt switch.
2. Check continuity between passenger seat control unit connector B353 terminal 8, 9 and seatback tilt switch connector B372 terminal 8, 9.

8 (BR) - 8 (BR) : Continuity should exist.
9 (LG) - 9 (LG) : Continuity should exist.

3. Check continuity between passenger seat control unit connector B353 terminal 8, 9 and ground.

8 (BR) - Ground : Continuity should not exist.
9 (LG) - Ground : Continuity should not exist.



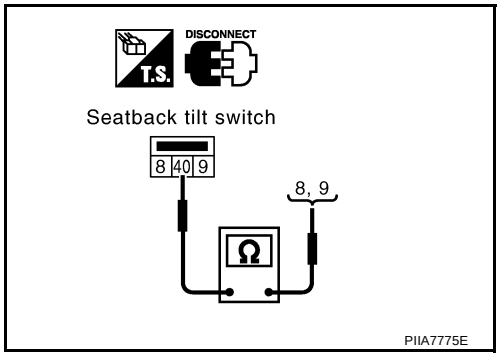
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness between passenger seat control unit and seatback tilt switch.

3. CHECK SEATBACK TILT SWITCH

Seatback switch operated, check continuity between seatback tilt switch terminal 8, 9 and 40.

Terminals		Seatback swtich condition	Continuity
8	40	FORWARD	Yes
		Other than above	No
9		BACKWARD	Yes
		Other than above	No



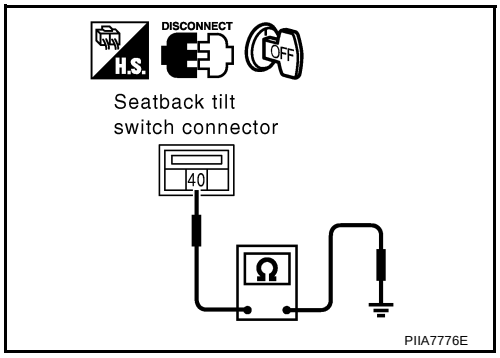
OK or NG

OK >> GO TO 4.
NG >> Replace seatback tilt switch.

4. CHECK SEATBACK TILT SWITCH GROUND CIRCUIT

Check continuity between seatback tilt switch connector B372 terminal 40 and ground.

40 (B/W) - Ground : Continuity should exist.



OK or NG

OK >> Check the condition of the harness and connector.
NG >> Repair or replace the harness between seatback tilt switch and ground.

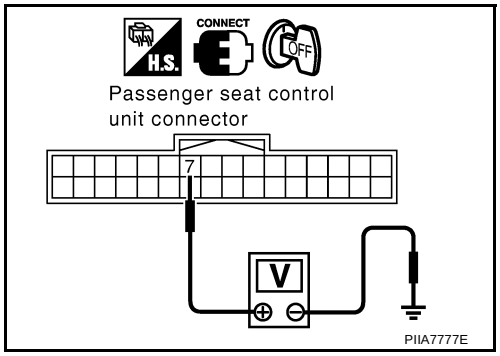
Seatback Tilt Cancel Switch Circuit Check

AIS004JT

1. CHECK SEATBACK TILT CANCEL SWITCH OUTPUT SIGNAL

1. Turn ignition switch OFF.
2. Seatback tilt cancel swtich operated, check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Seatback tilt swtich cancel swtich condition	Voltage (V) (Approx.)
	(+)	(-)		
B353	7 (P)	Ground	CANCEL	0
			AUTO	5



OK or NG

OK >> Passenger seatback tilt cancel switch circuit is OK.
NG >> GO TO 2.

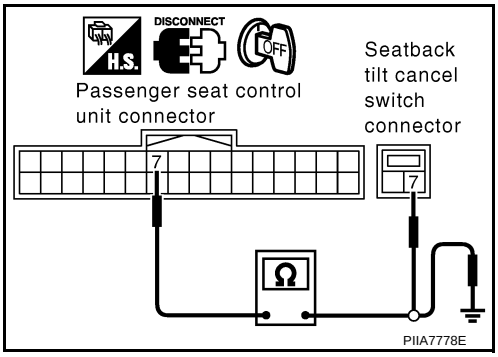
2. CHECK SEATBACK TILT CANCEL SWITCH CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector and seatback tilt cancel switch.
2. Check continuity between passenger seat control unit connector B353 terminal 7 and seatback tilt cancel switch connector B373 terminal 7.

7 (P) - 7 (P) : Continuity should exist.

3. Check continuity between passenger seat control unit connector B353 terminal 7 and ground.

7 (P) - Ground : Continuity should not exist.



OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness between passenger seat control unit and seatback tilt cancel switch.

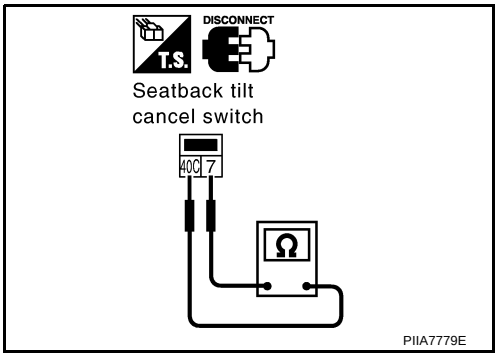
3. CHECK SEATBACK TILT CANCEL SWITCH

Seatback tilt cancel swtich operated, check continuity between seatback tilt cancel switch terminal 7 and 40C.

Terminals		Seatback tilt cancel swtich condition	Continuity
7	40C	CANCEL	Yes
		AUTO	No

OK or NG

OK >> GO TO 4.
NG >> Replace seatback tilt cancel switch.



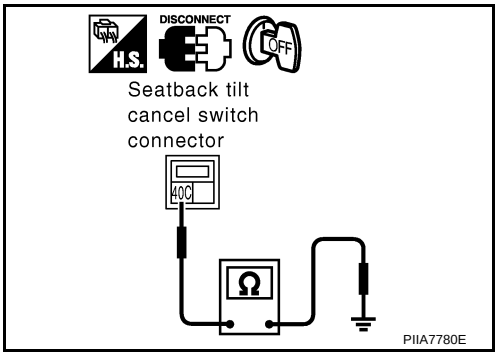
4. CHECK SEATBACK TILT CANCEL SWITCH GROUND CIRCUIT

Check continuity between seatback tilt cancel switch connector B373 terminal 40C and ground.

40C (B/W) - Ground : Continuity should exist.

OK or NG

OK >> Check the condition of the harness and connector.
NG >> Repair or replace the harness between seatback tilt cancel switch and ground.



Soft Top Switch Circuit Check

AIS004JU

1. CHECK SOFT TOP SYSTEM

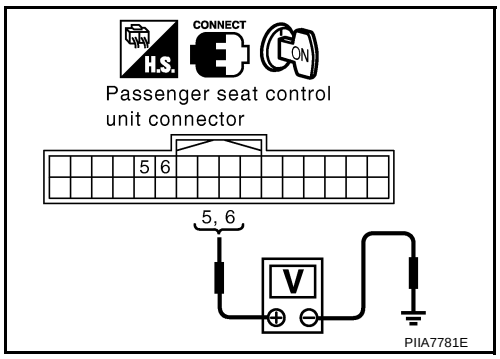
Soft top is operated.

Operate normally?

Yes >> GO TO 2.
No >> Further inspection necessary. Refer to

2. CHECK SOFT TOP SWITCH OUTPUT SIGNAL

1. Turn ignition switch ON.
2. Soft top switch operated, check voltage between passenger seat control unit connector and ground.



Connector	Terminal (Wire color)		Soft top switch condition	Voltage (V) (Approx.)
	(+)	(-)		
B353	5 (R)	Ground	OPEN*	0
			Other than above	Battery voltage
	6 (GY)		CLOSE*	0
			Other than above	Battery voltage

*: Turn ignition switch ON and depress brake pedal when soft top switch operates.

OK or NG

OK >> Soft top switch circuit is OK.
NG >> GO TO 3.

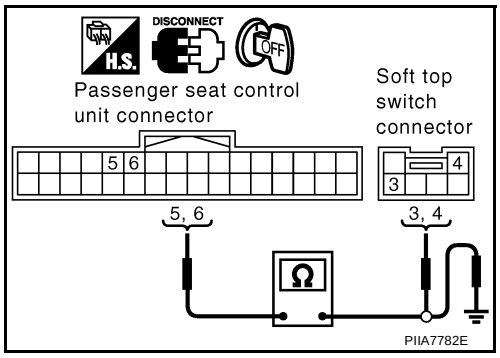
3. CHECK SOFT TOP SWITCH CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector and soft top switch.
2. Check continuity between passenger seat control unit connector B353 terminal 5, 6 and soft top switch connector M14 terminal 3, 4.

5 (R) - 3 (L/B) : Continuity should exist.
6 (GY) - 4 (R/G) : Continuity should exist.

3. Check continuity between passenger seat control unit connector B353 terminal 5, 6 and ground.

5 (R) - Ground : Continuity should not exist.
6 (GY) - Ground : Continuity should not exist.



OK or NG

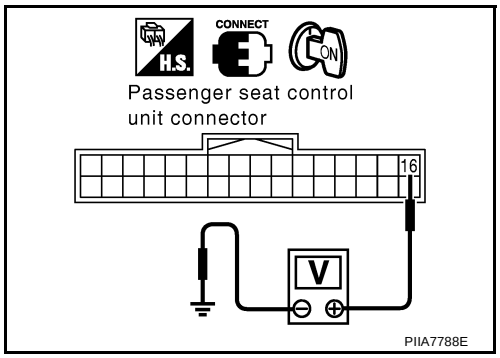
OK >> Check the condition of the harness and the connector.
NG >> Repair or replace harness between passenger seat control unit and soft top switch.

Power Window Down Request Signal Circuit Check

AIS004JV

1. CHECK POWER WINDOW DOWN REQUEST SUGNAL INPUT

1. Turn ignition switch ON.
2. Check voltage between passenger seat control unit connector and ground.



Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(-)		
B353	16 (PU/W)	Ground	When soft top switch is turned to OPEN or CLOSE.*	0
			Other than above.	5

*: Turn ignition switch ON and depress brake pedal when soft top switch operates.

OK or NG

OK >> Power window down request signal circuit is OK.
NG >> GO TO 2.

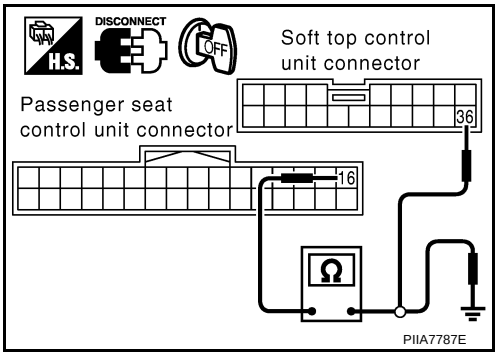
2. CHECK POWER WINDOW DOWN REQUEST SUGNAL CIRCUIT HARNESS

1. Turn ignition swtich OFF.
2. Disconnect soft top control unit and passenger seat control unit connector.
3. Check continuity between passenger seat control unit connector B353 terminal 16 and soft top control unit connector B67 terminal 36.

16 (PU/W) - 36 (Y/G) : Continuity should exist.

4. Check continuity between passenger seat control unit connector B353 terminal 16 and ground.

16 (PU/W) - Ground : Continuity should not exist.



OK or NG

OK >> Power window down request signal circuit is OK. Further inspection is necessary. Refer to RF-80, "Power Window Down Request Signal Check" .

NG >> Repair or replace harness between passenger seat control unit and soft top control unit.

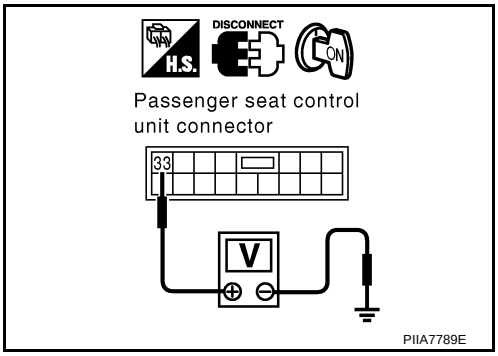
Storage Lid Close Signal Circuit Check

AIS004JW

1. CHECK STORAGE LID CLOSE SIGNAL

1. Turn ignition switch ON.
2. Soft top operates in OPEN, check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(-)		
B353	33 (G/B)	Ground	When storage lid is in a closing operation	Battery voltage
			Other than above.	0



OK or NG

OK >> Replace passenger seat control unit.

NG >> GO TO 2.

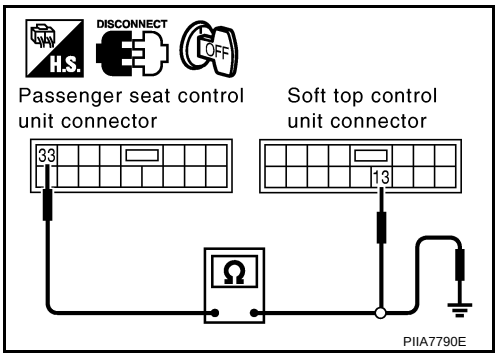
2. CHECK STORAGE LID CLOSE SIGNAL CIRCUIT HARNESS

1. Turn ignition swtich OFF.
2. Disconnect soft top control unit and storage lid actuator and passenger seat control unit connector.
3. Check continuity between passenger seat control unit connector B353 terminal 33 and soft top control unit connector B66 terminal 13.

33 (G/B) - 13 (L/R) : Continuity should exist.

4. Check continuity between passenger seat control unit connector B353 terminal 33 and ground.

33 (G/B) - Ground : Continuity should not exist.



OK or NG

OK >> Storage lid close signal circuit is OK. Further inspection is necessary. Refer to RF-61, "Storage Lid Actuator Check (Close Operate)" .

NG >> Repair or replace harness between passenger seat control unit and soft top control unit.

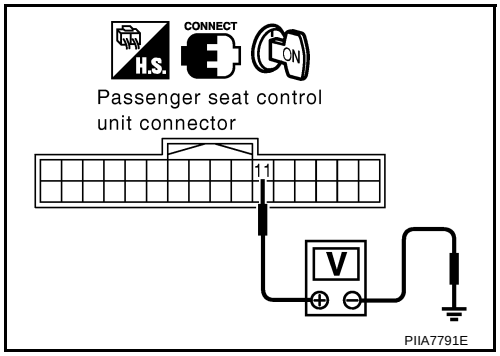
Soft Top Lock Switch Circuit Inspection

AIS004JX

1. CHECK SOFT TOP LOCK SWITCH OUTPUT SIGNAL

1. Turn ignition switch ON.
2. Soft top operates in CLOSE, check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(-)		
B353	11 (L/W)	Ground	5th bow full latch switch is turned to ON	0
			Other than above	5



OK or NG

OK >> Replace passenger seat control unit.
NG >> GO TO 2.

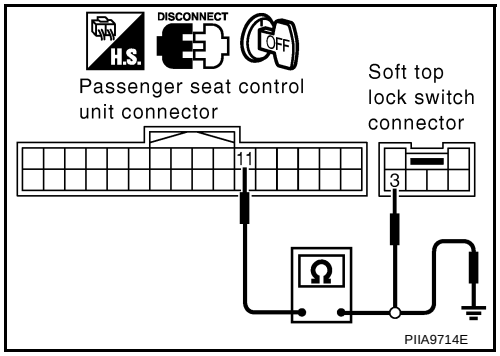
2. CHECK SOFT TOP LOCK SWITCH CIRCUIT HARNESS

1. Turn ignition swtich OFF.
2. Disconnect passenger seat control unit and soft top lock swtich connector.
3. Check continuity between passenger seat control unit connector B353 terminal 11 and soft top lock switch connector T205 terminal 3.

11 (L/W) - 3 (Y) : Continuity should exist.

4. Check continuity between passenger seat control unit connector B353 terminal 11 and ground.

11 (L/W) - Ground : Continuity should not exist.



OK or NG

OK >> Check the condition of the harness and connector.
NG >> Repair or replace harness between passenger seat control unit and soft top control unit.

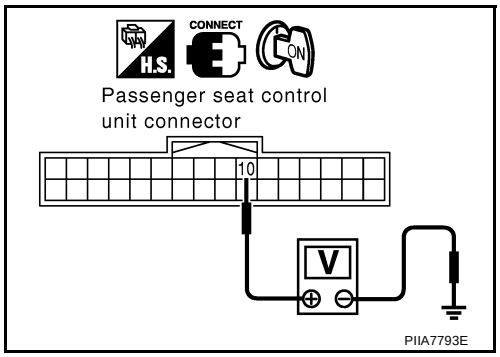
Seat Belt Buckle Switch Circuit Check

AIS004JY

1. CHECK SEAT BELT BUCKLE SWITCH OUTPUT SIGNAL

1. Turn ignition switch ON.
2. Check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Condition		Voltage (V) (Approx.)
	(+)	(-)			
B353	10 (L/Y)	Ground	Seat belt.	: Fastened	5
				: Unfastened	0



OK or NG

OK >> Seat belt buckle switch circuit is OK.
NG >> GO TO 2.

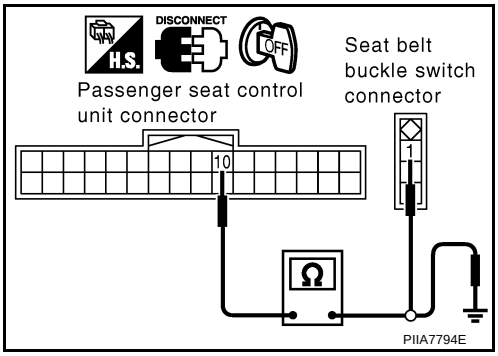
2. CHECK SEAT BELT BUCKLE SWITCH CIRCUIT HARNESS

1. Turn ignition swtich OFF.
2. Disconnect passenger seat control unit connector and seat belt buckle switch connector.
3. Check continuity between passenger seat control unit connector B353 terminal 10 and seat belt buckle switch connector B373 terminal 1.

10 (L/Y) - 1 (LG) : Continuity should exist.

4. Check continuity between passenger seat control unit connector B353 terminal 10 and ground.

10 (L/Y) - Ground : Continuity should not exist.



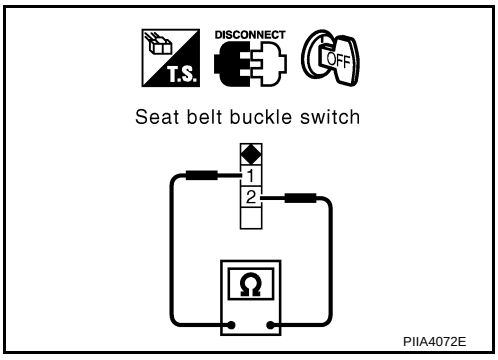
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness between passenger seat control unit and seat belt buckle switch.

3. CHECK SEAT BELT BUCKLE SWITCH

Check continuity between seat belt buckle switch terminal 1 and 2.

Terminals		Condition		Continuity
1	2	Seat belt	: Fastened	No
			: Unfastened	Yes



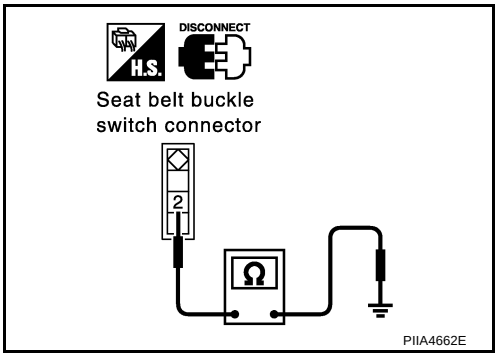
OK or NG

OK >> GO TO 4.
NG >> Replace seat belt buckle switch.

4. CHECK SEAT BELT BUCKLE SWITCH GROUND CIRCUIT

Check continuity between seat belt buckle switch connector B11 terminal 2 and ground.

2 (B) - Ground : Continuity should exist.



OK or NG

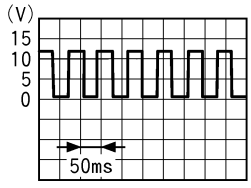
OK >> Check the condition of the harness and connector.
NG >> Repair or replace the harness between seat belt buckle switch and ground.

Vehicle Speed Signal Check

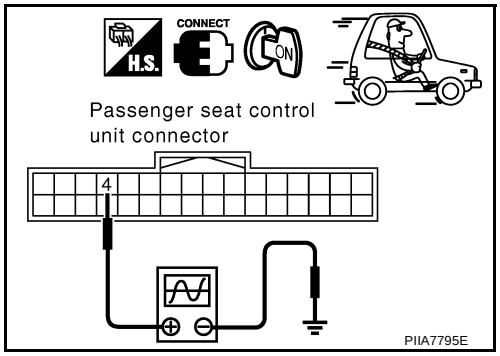
AIS004JZ

1. CHECK VEHICLE SPEED SIGNAL

1. Turn ignition switch ON.
2. Check signal between passenger seat control unit connector and body ground with oscilloscope.

Connector	Terminal (Wire color)		Condition	Signal (Reference value)
	(+)	(-)		
B353	4 (PU)	Ground	When vehicle speed is approx. 40 km/h (25 MPH)	

PIIB0078J



PIIA7795E

OK or NG

OK >> Replace passenger seat control unit.
NG >> GO TO 2.

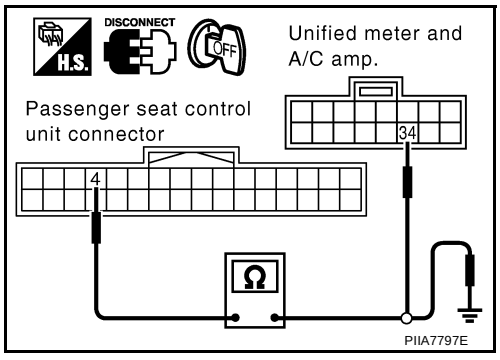
2. CHECK VEHICLE SPEED SIGNAL CIRCUIT HARNESS

1. Turn ignition swtich OFF.
2. Disconnect passenger seat control unit connector and unified meter and A/C amp.
3. Check continuity between passenger seat control unit connector B353 terminal 4 and unified meter and A/C amp. connector M49 terminal 34.

4 (PU) - 34 (W/G) : Continuity should exist.

4. Check continuity between passenger seat control unit connector B353 terminal 4 and ground.

4 (PU) - Ground : Continuity should not exist.



PIIA7797E

OK or NG

OK >> Vehicle speed signal circuit is OK. Further inspection is necessary. Refer to DI-18, "Vehicle Speed Signal Inspection" .
NG >> Repair or replace harness between passenger seat control unit and unified meter and A/C amp.

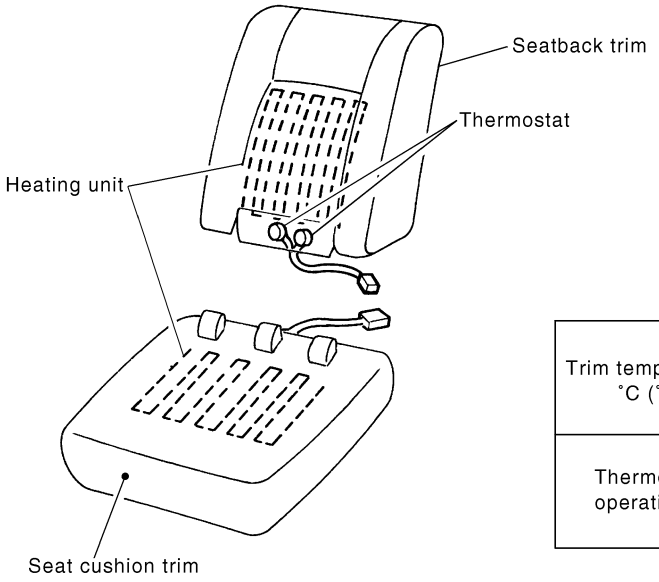
HEATED SEAT

PFP:87335

Description

AIS000IH

- When handling seat, be extremely careful not to scratch heating unit.
- To replace heating unit, seat trim and pad should be separated.
- Do not use any organic solvent, such as thinner, benzene, alcohol, etc. to clean trims.

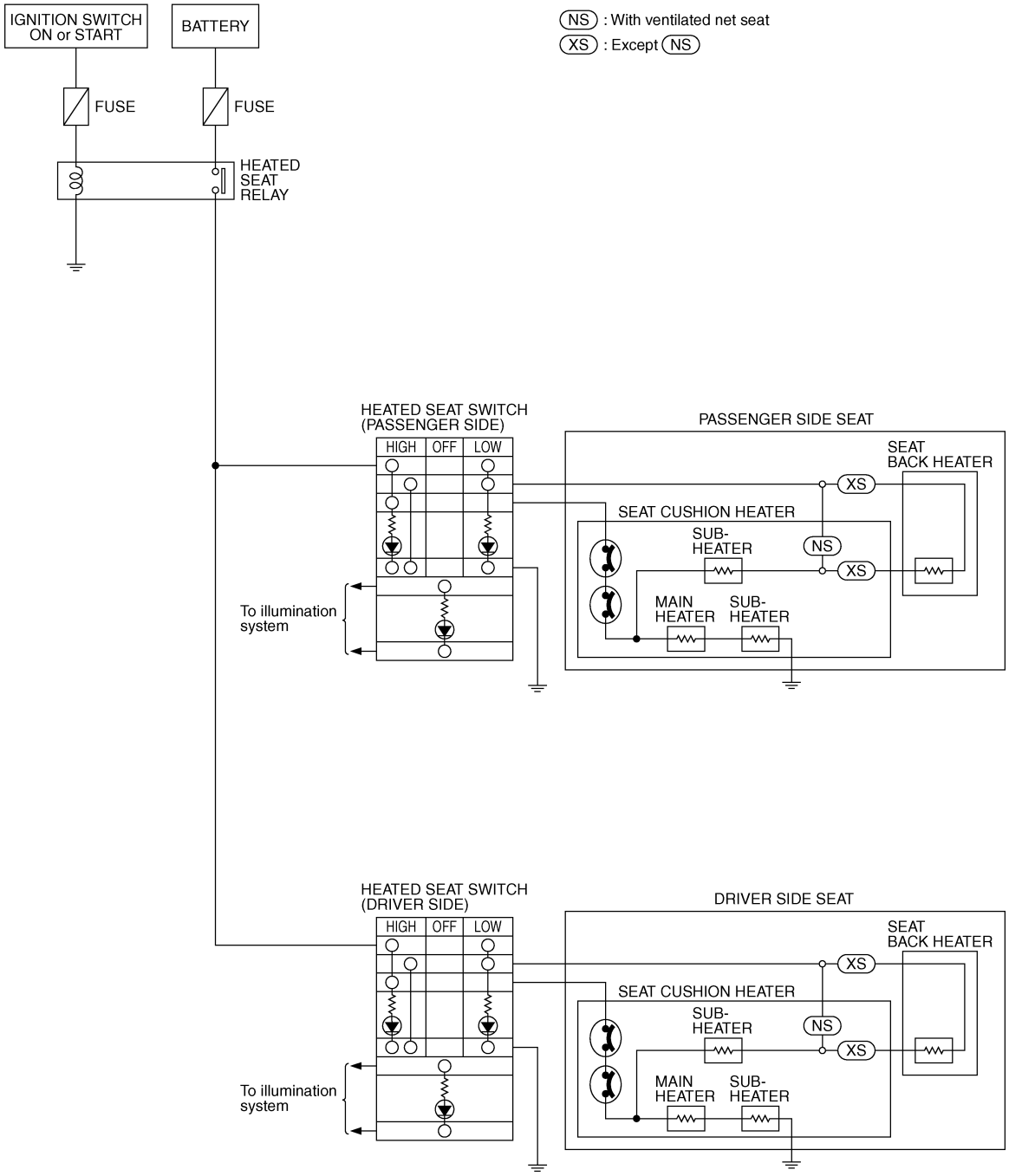


Trim temperature °C (°F)	Heating up to 35 - 45 (95 - 113)	Cooling down to 25 - 35 (77 - 95)
Thermostat operation	OFF	ON

PIIA9035E

Schematic

AIS0040X

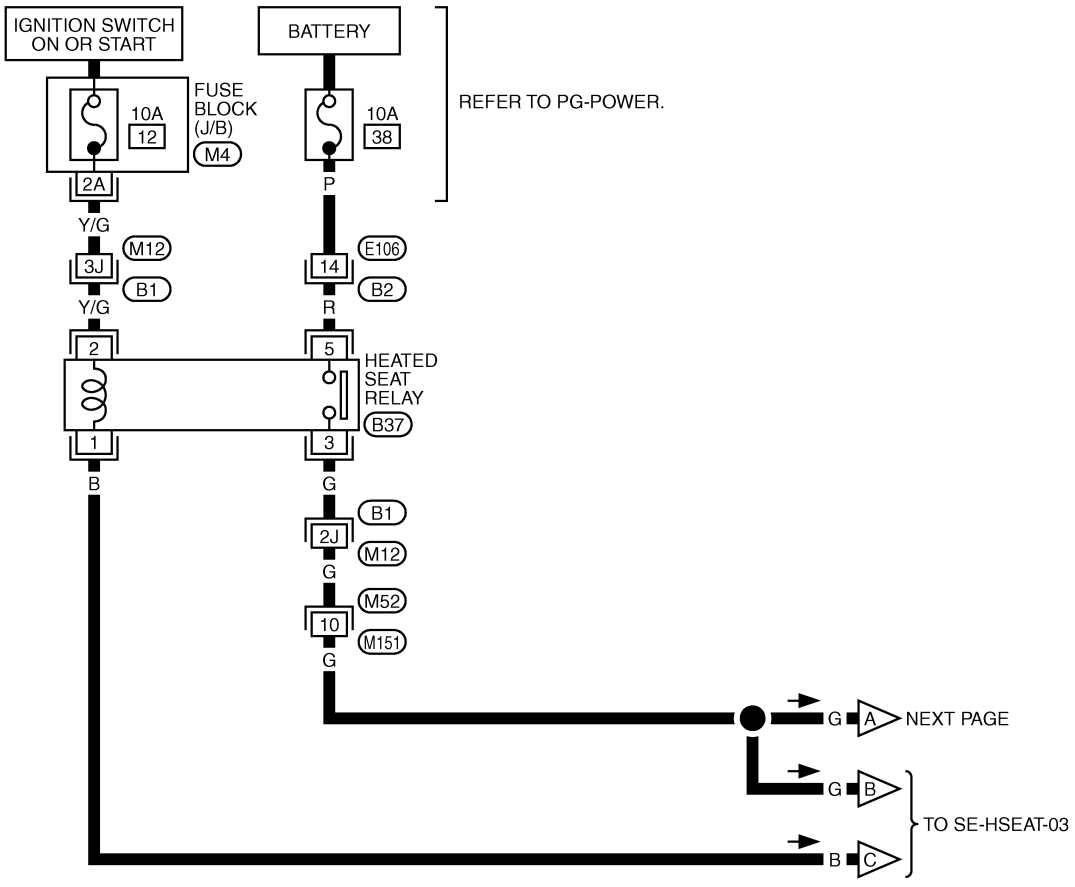


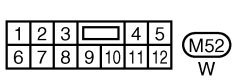
TIWT0517E

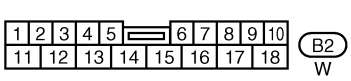
Wiring Diagram–HSEAT–/For Coupe

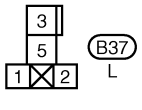
AIS004SF

SE-HSEAT-01









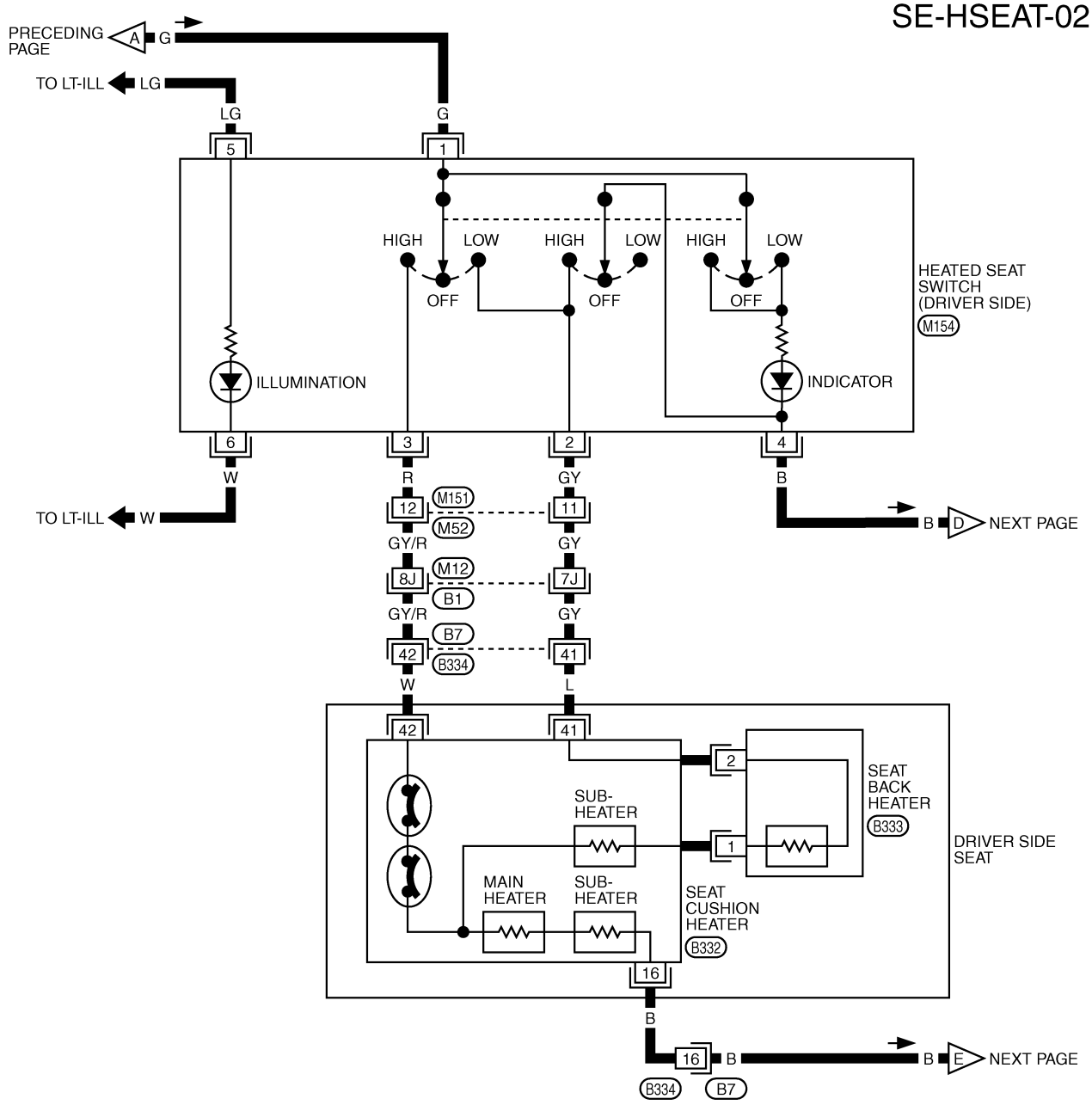
REFER TO THE FOLLOWING.

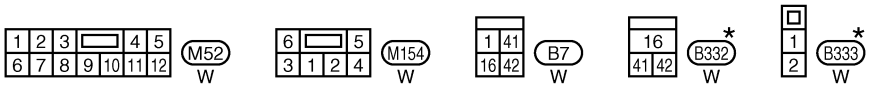
B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TIWT0445E

SE-HSEAT-02



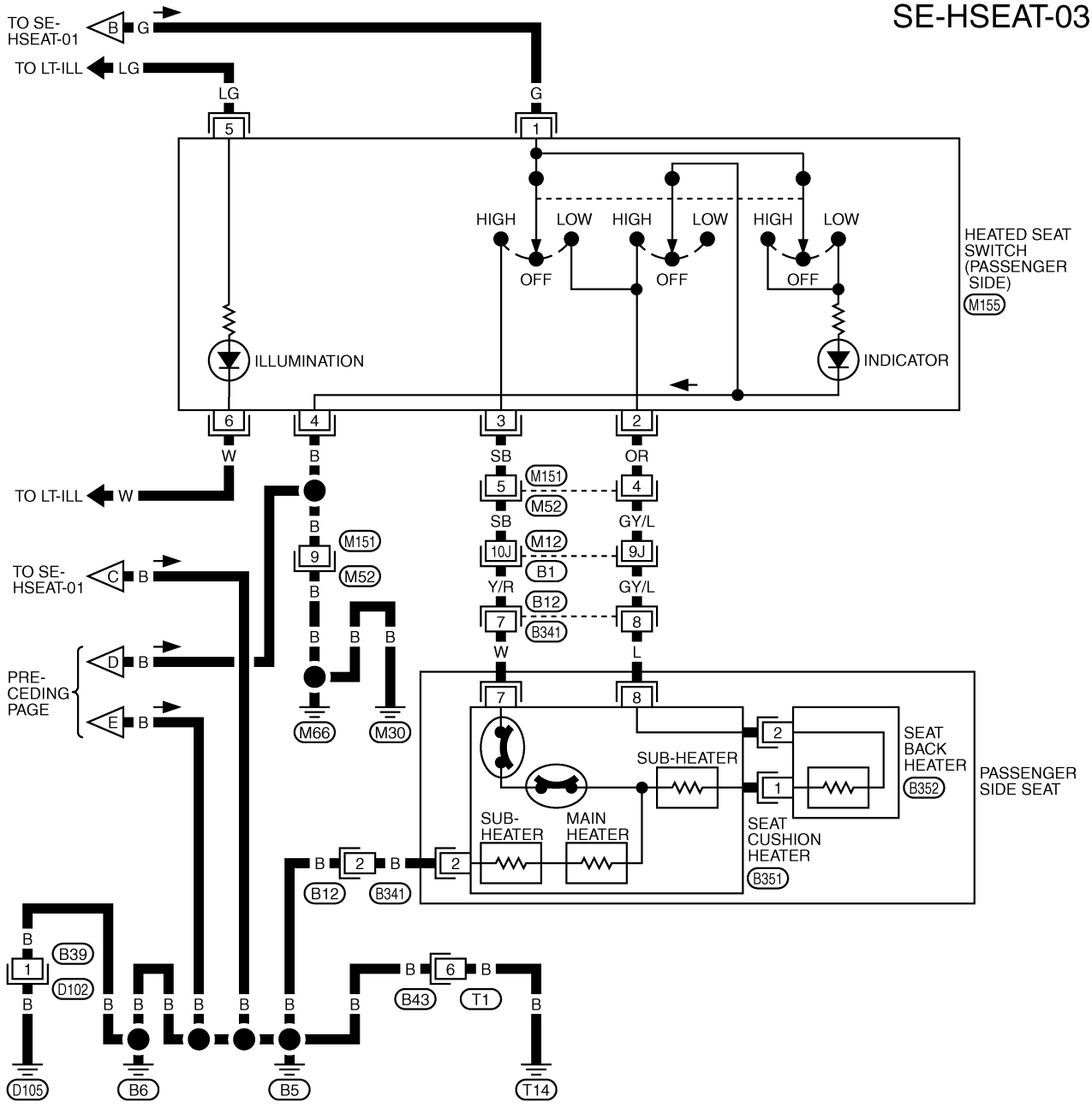


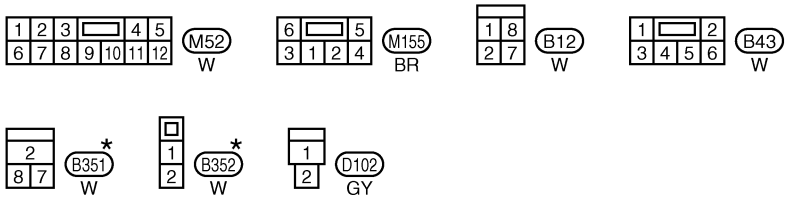
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

TIWT0446E

SE-HSEAT-03





REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

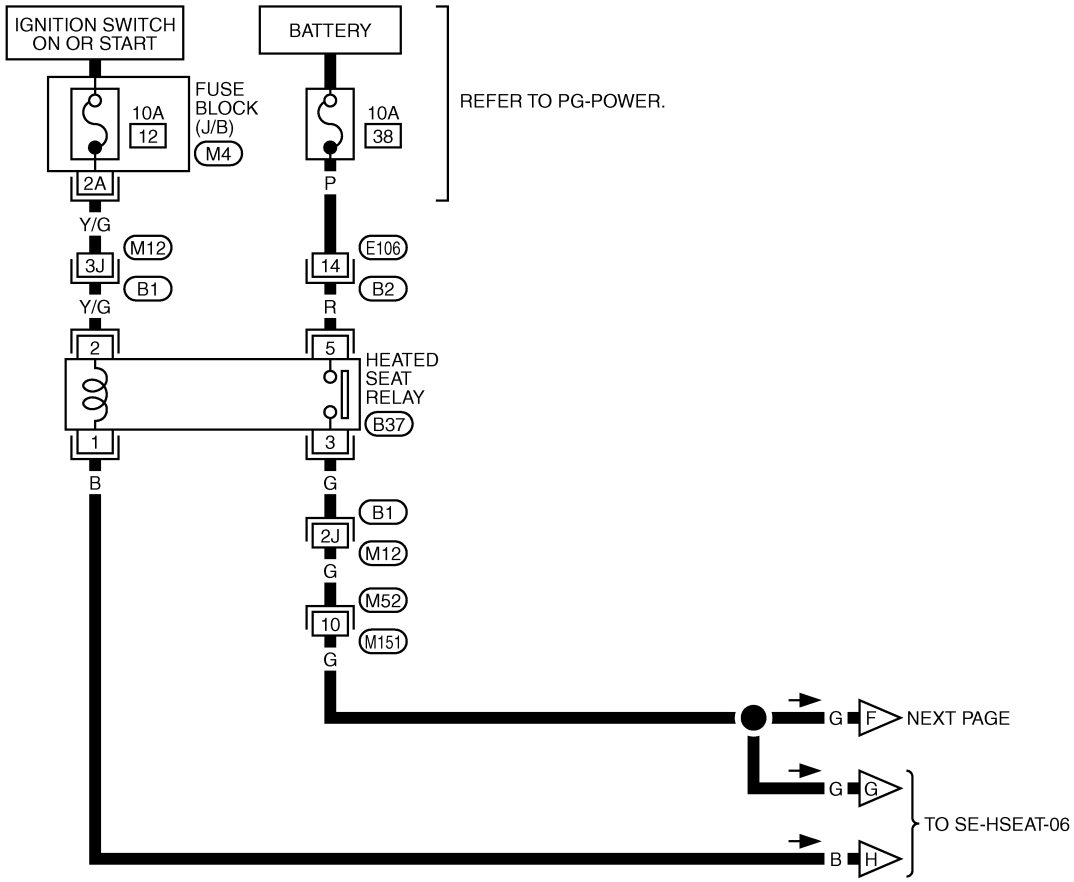
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

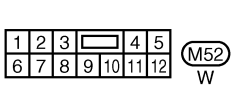
TIWT0593E

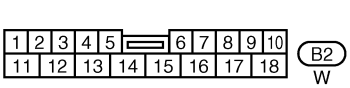
Wiring Diagram–For Roadster–

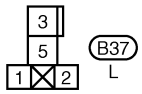
AIS0040Y

SE-HSEAT-04









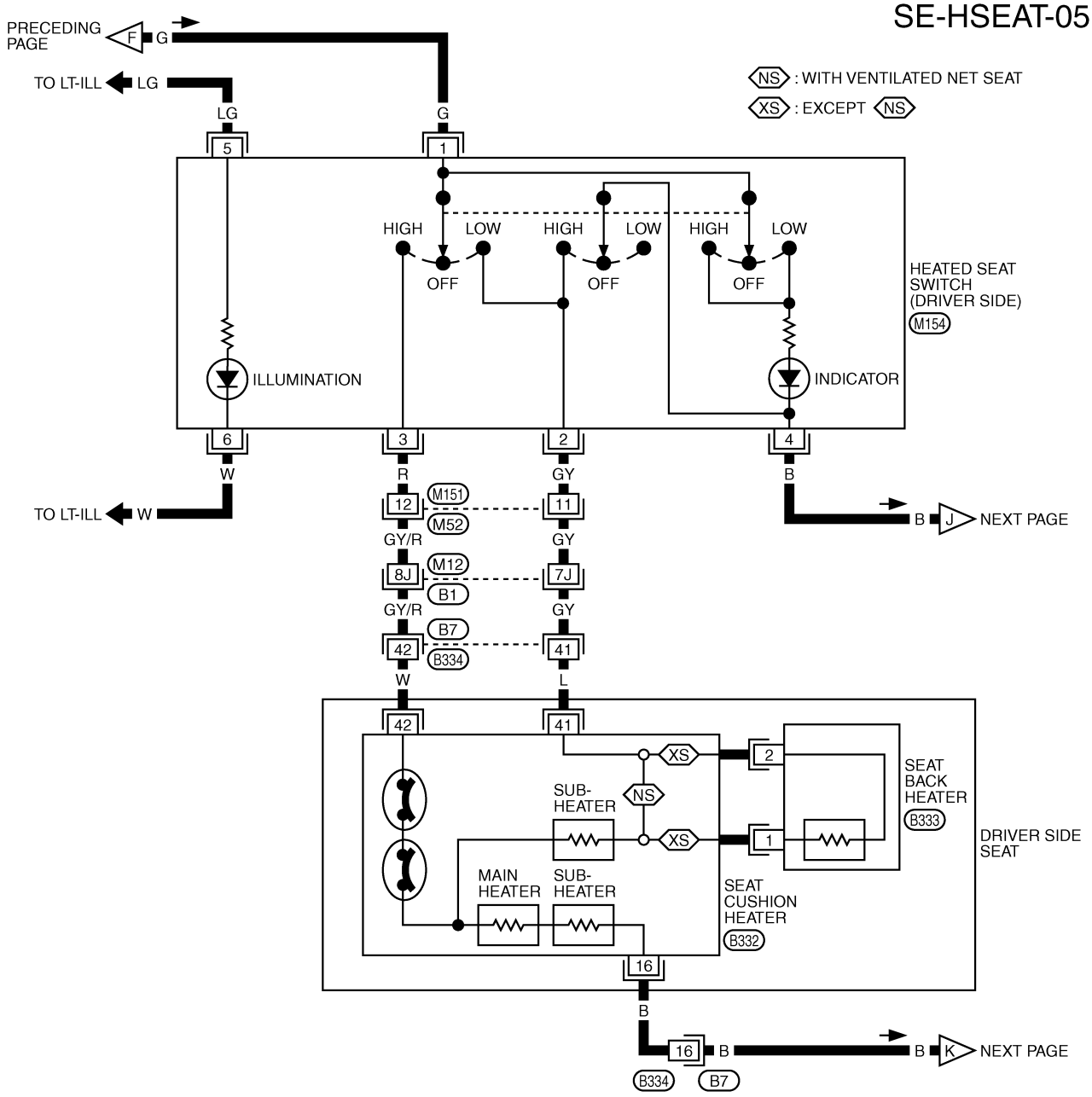
REFER TO THE FOLLOWING.

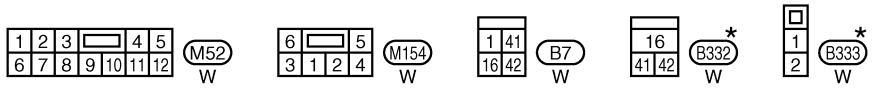
B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TIWT0731E

SE-HSEAT-05



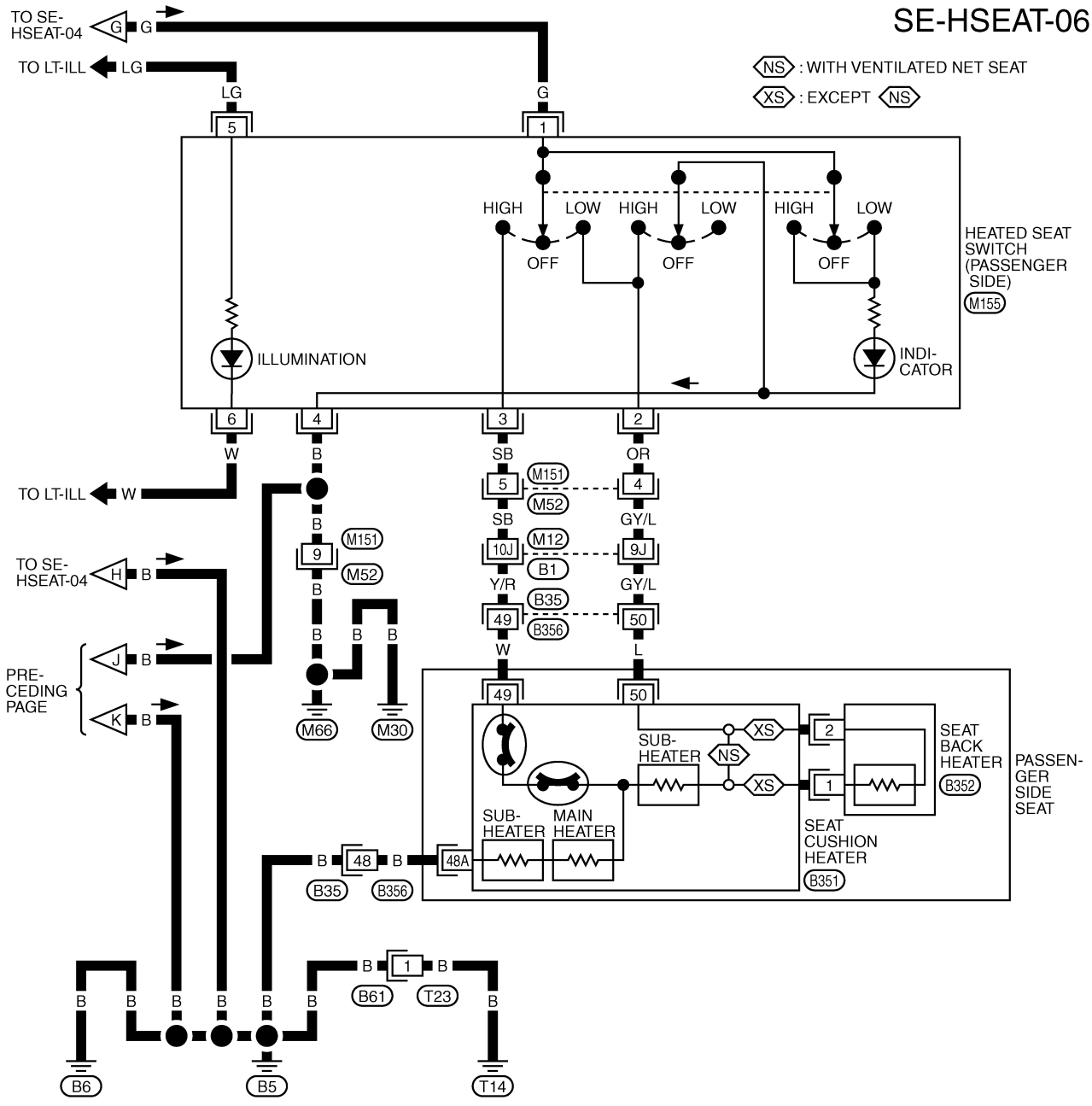


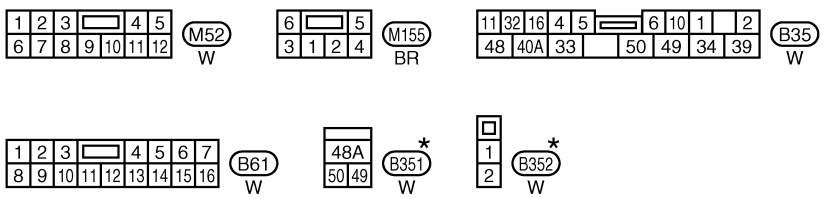
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.

B1 -SUPER MULTIPLE JUNCTION (SMJ)

TIWT0732E





REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT0733E

SEAT

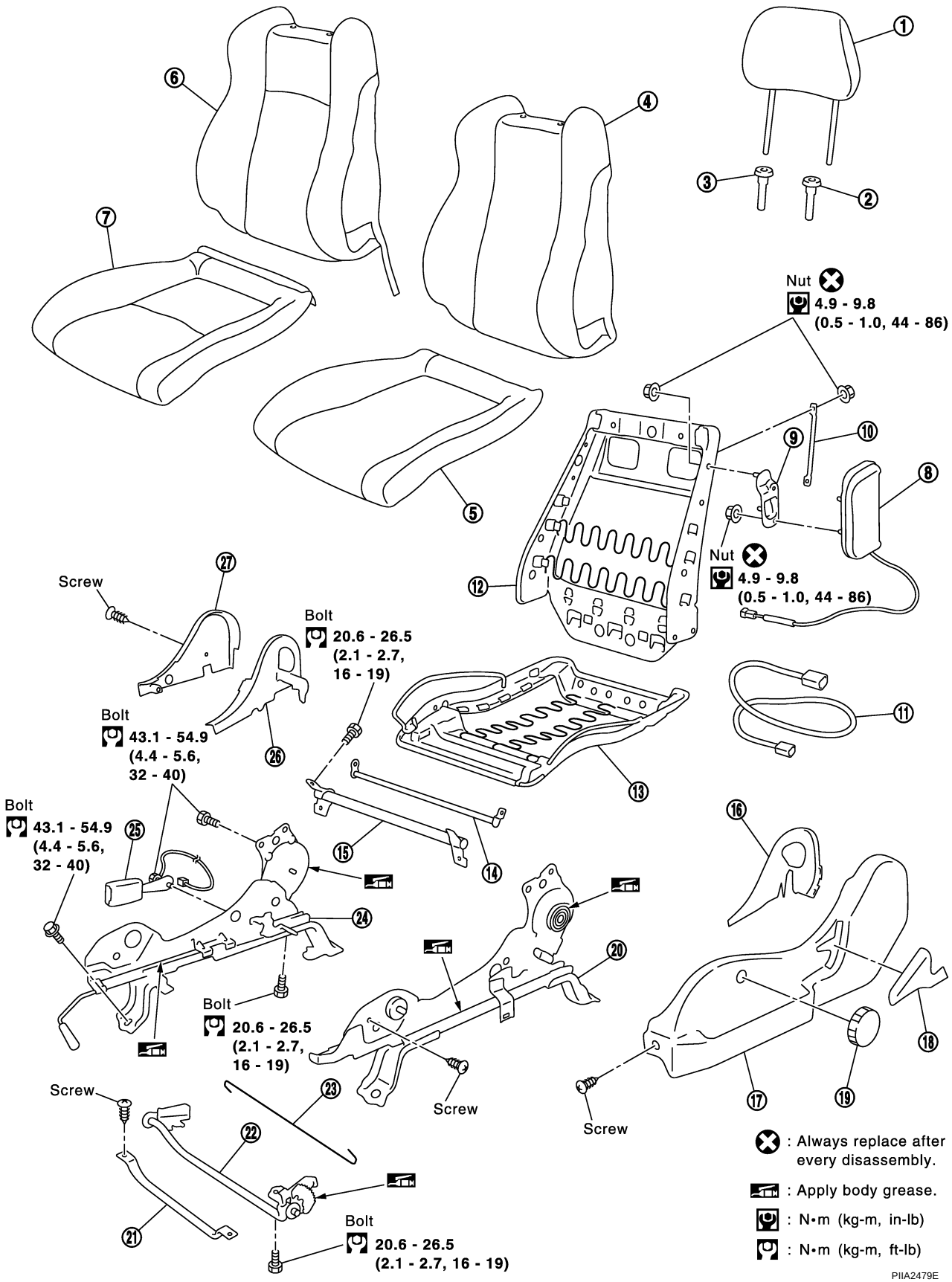
PFP:87000

Removal and Installation

AIS000IK

MANUAL SEAT (COUPE)

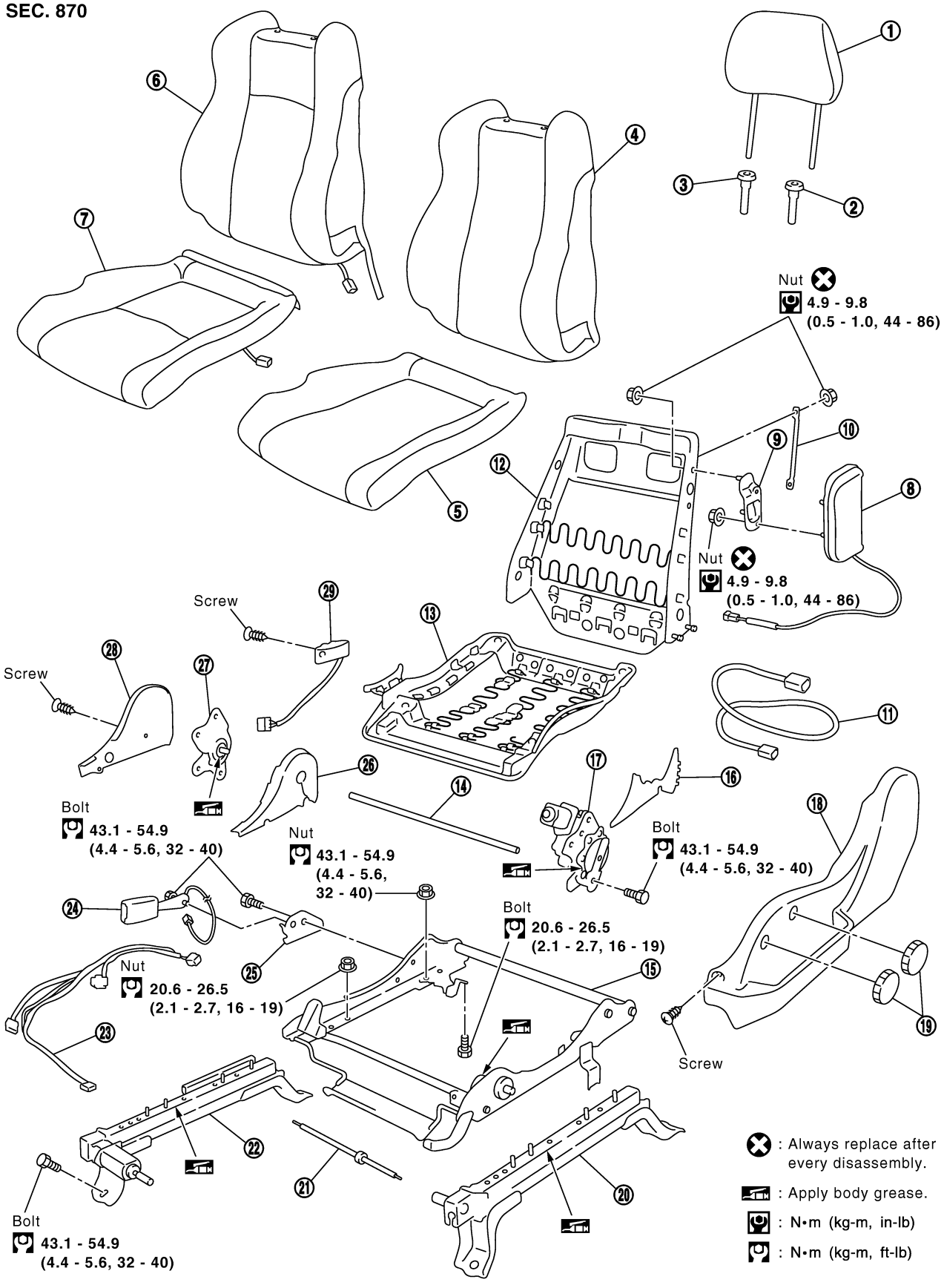
SEC. 870



1. Headrest
2. Headrest holder (locked)
3. Headrest holder (free)
4. Seatback pad
5. Seat cushion pad
6. Seatback trim
7. Seat cushion trim
8. Side air bag module
9. Side air bag module bracket
10. Inner cloth stay
11. Side air bag module harness
12. Seatback frame
13. Seat cushion frame
14. Connector rod
15. Rear gusset
16. Inner cover outer device
17. Seat cushion outer finisher
18. Reclining lever knob
19. Thigh support adjuster dial
20. Sliding and reclining device outer
21. Front gusset
22. Seat thigh support adjuster
23. Wire pull
24. Sliding and reclining device inner
25. Seat belt buckle
26. Inner cover inner device
27. Seat cushion inner finisher

POWER SEAT

SEC. 870



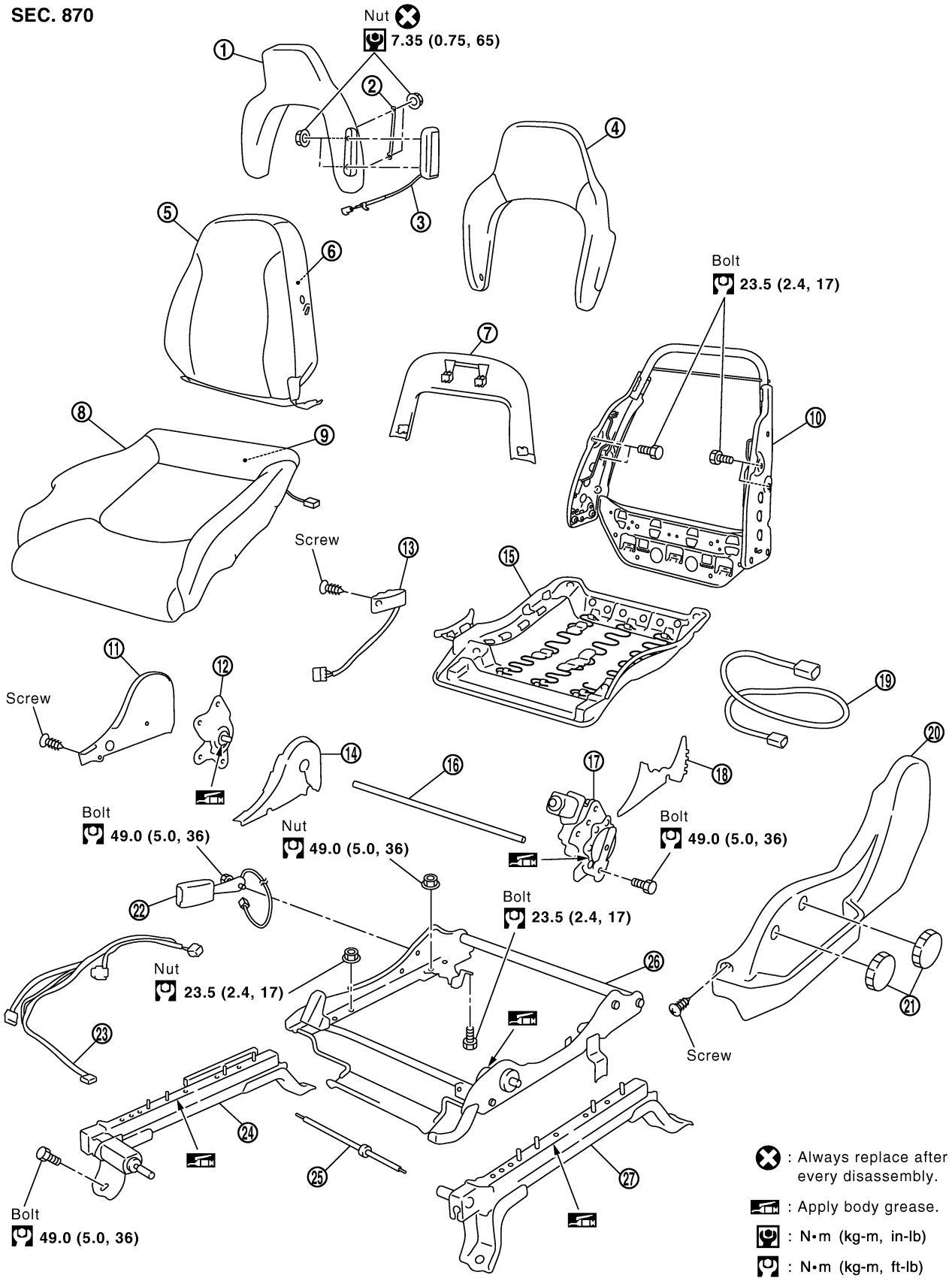
PIIA8725E

1. Headrest
2. Headrest holder (locked)
3. Headrest holder (free)
4. Seatback pad
5. Seat cushion pad
6. Seatback trim

7. Seat cushion trim
8. Side air bag module
9. Side air bag module bracket
10. Inner cloth stay
11. Side air bag module harness
12. Seatback frame
13. Seat cushion frame
14. Reclining device rod
15. Seat thigh support adjuster assembly
16. Inner cover outer device
17. Reclining device outer
18. Seat cushion outer finisher
19. Lifter dial
20. Sliding outer assembly
21. Flexible wire
22. Sliding inner assembly
23. Power seat harness
24. Seat belt buckle
25. Seat belt buckle bracket
26. Inner cover inner device
27. Reclining device inner
28. Seat cushion inner finisher
29. Power seat switch

NET SEAT (ROADSTER)

SEC. 870



PIIA8728E

1. Seatback frame and pad upper
2. Inner cloth stay
3. Side air bag module
4. Seatback trim upper
5. Seatback trim lower
6. Seatback pad lower

7. Seatback garnish
8. Seat cushion trim
9. Seat cushion pad
10. Seatback frame
11. Seat cushion inner finisher
12. Reclining inner device
13. Power seat switch
14. Inner cover inner device
15. Seat cushion frame
16. Reclining device rod
17. Reclining outer device
18. Inner cover outer device
19. Side air bag module harness
20. Seat cushion outer finisher
21. Lifter dial
22. Seat belt buckle
23. Power seat harness
24. Sliding inner assembly
25. Flexible wire
26. Seat thigh support adjuster assembly
27. Sliding outer assembly

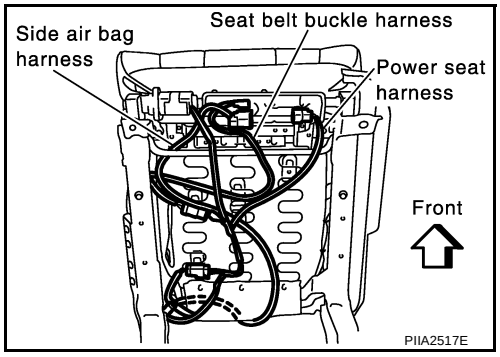
REMOVAL

When removing or installing the seat trim, carefully handle it to keep dirt out and avoid damage.

CAUTION:

- **Before removing the seat, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **When checking the power seat circuit for continuity using a circuit tester, do not confuse its connector with the side air bag module connector. Such an error may cause the air bag to deploy.**
- **Do not drop, tilt, or bump the side air bag module installing in the seat. Always handle it with care.**

1. Remove the front leg cover and rear leg cover (LH/RH).
2. Slide the seat until the body mounting bolts are visible and a tool can be inserted.
3. Remove mounting bolts from vehicle.
4. Disconnect both battery cables.
5. Disconnect harness connector from under seat cushion.
6. Remove fastening clips under seat cushion, and remove seats from vehicle.



INSTALLATION

Install in the reverse order of removal.

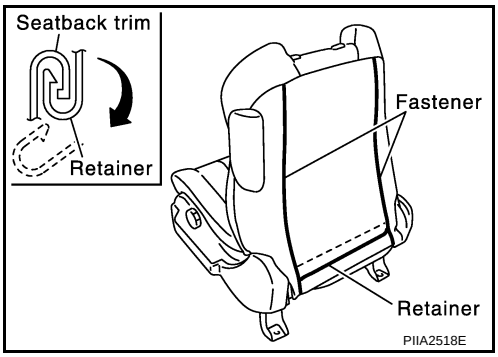
Disassembly and Assembly

AIS005DM

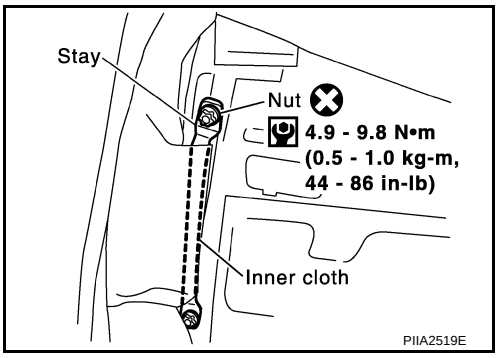
SEATBACK TRIM AND PAD (MANUAL SEAT AND POWER SEAT)

Disassembly

1. Open fastener on back of seatback, and remove retainer from seatback trim.

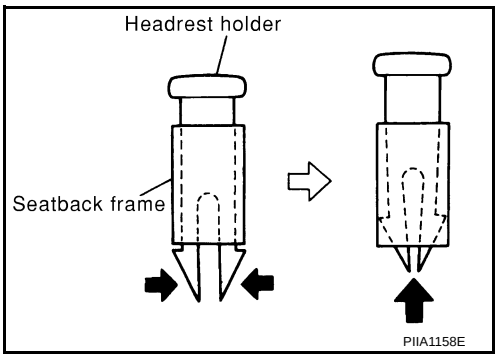


2. Remove the stay securing the inner cloth.



3. Squeeze and pull up headrest holder tabs to remove from seatback frame.

   NOTE:
   Before installing the headrest holder, check its orientation (front/rear and right/left).



4. Remove the seat heater harness connector. After removing the seatback trim and pad, remove the hog ring to separate the trim and pad.

   NOTE:
   Seatback heater unit is stitched into seatback trim. It cannot be separated (for heated seat models only).

Assembly

Assemble in the reverse order of disassembly.

REMOVAL OF SEATBACK ASSEMBLY

1. After completing the steps 1 of “SEATBACK TRIM AND PAD”, remove the harness connectors for the reclining motor (driver seat only).
2. Pull out the harness connector for the side air bag from the seat cushion.
3. Remove the reclining device mounting bolts on the seatback frame, and remove the seatback assembly.

   NOTE:
   When assembling the seatback frame, make sure that the reclining device are locked on both sides, and be sure to temporarily tighten the bolts, then tighten them finally.

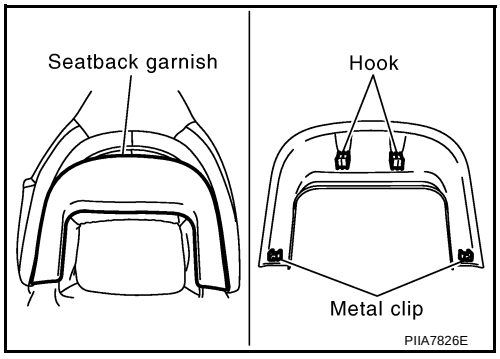
INSTALLATION OF SEATBACK ASSEMBLY

Install in the reverse order of removal.

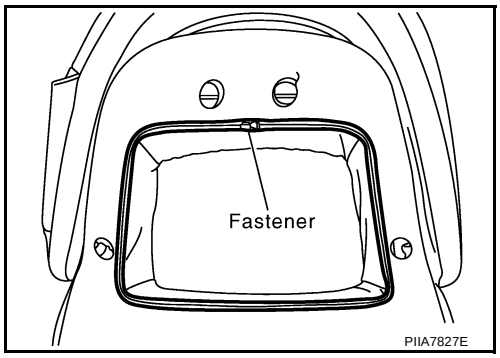
SEATBACK TRIM AND PAD (NET SEAT FOR ROADSTER)

Disassembly

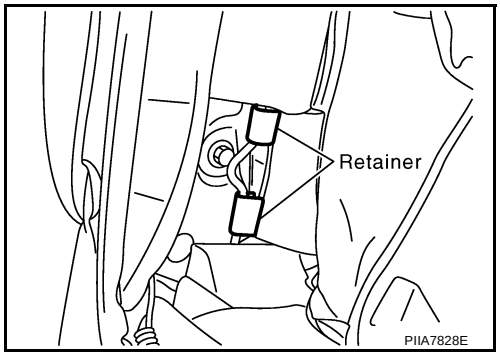
1. Remove the seatback garnish.



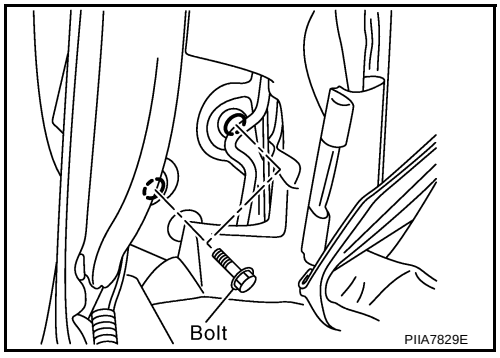
2. Open fastener on seatback lower.



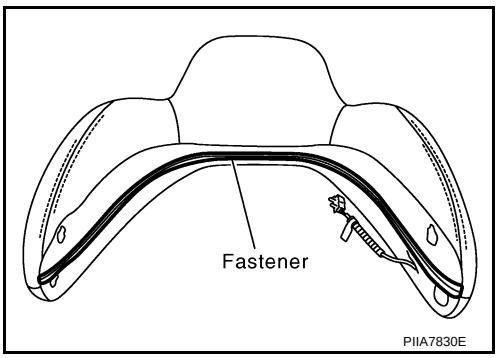
3. Remove the retainer.



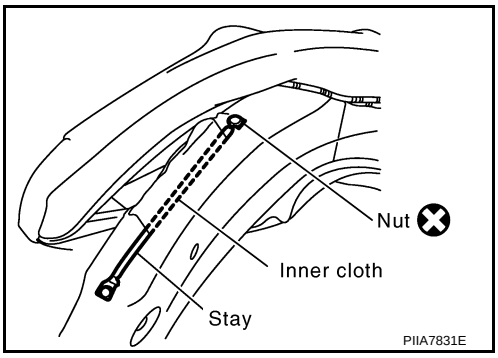
4. Disconnect side air bag connector.
5. Remove the seatback upper mounting bolts.



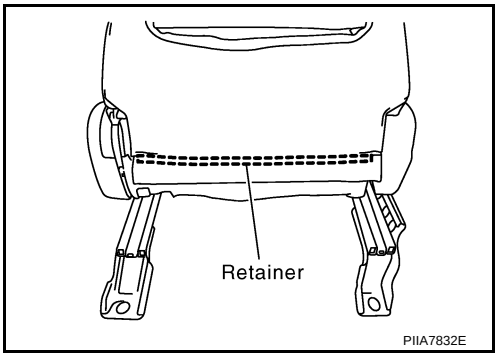
6. Open fastener on seatback upper.



7. Remove the stay securing the inner cloth.



8. Separate the seatback frame and pad upper and seatback trim upper.
9. Remove the retainer.



10. After removing the seatback trim and pad, remove the hog rings to separate the trim and pad.

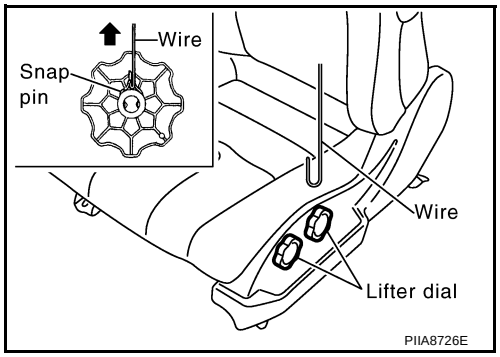
Assembly

Assemble in the reverse order of disassembly.

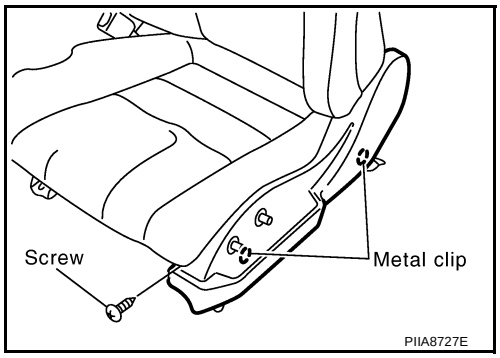
SEAT CUSHION TRIM AND PAD (POWER SEAT AND NET SEAT)

Disassembly

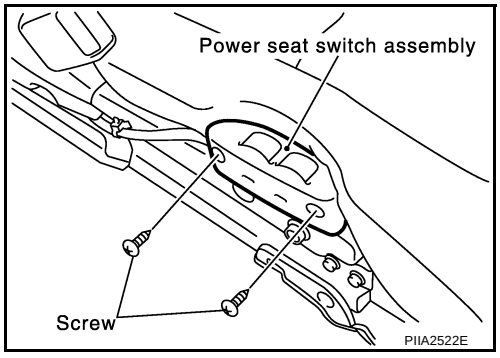
1. Hang snap ring on wire, and pull it up to remove. Remove Lifter dial.



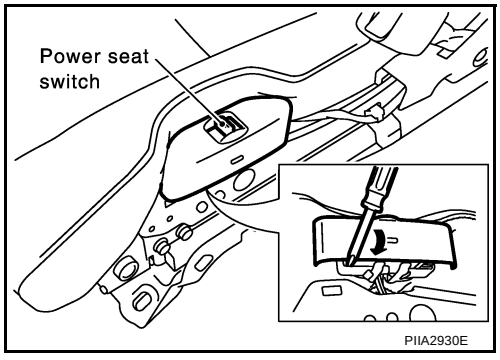
2. Unfasten the screw and metal clip and remove the seat cushion outer finisher.



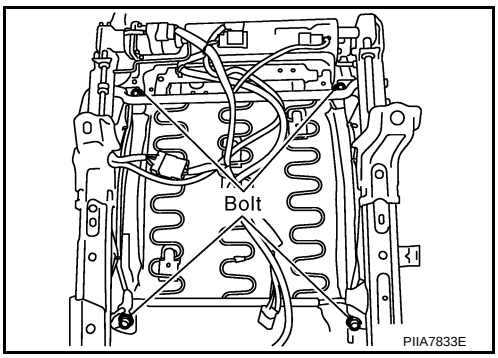
3. Unfasten screws and remove the power seat switch assembly.



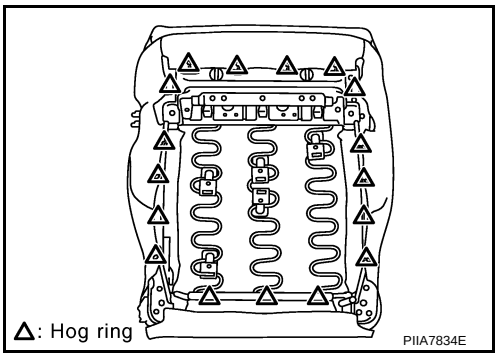
Insert a screwdriver in lower side of power seat switch and remove it (passenger seat for coupe).



4. Remove bolts on the under side of seat cushion.



5. Remove hog rings from under seat cushion frame.



6. Disconnect harness connector from seat cushion heater unit.
7. After removing the seat cushion trim and pad, remove the hog rings to separate the trim and pad.

NOTE:
Seat cushion heater unit is stitched into seat cushion trim. It cannot be separated.

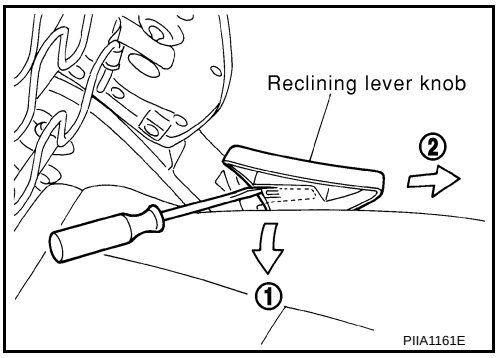
Assembly

Assemble in the reverse order of disassembly.

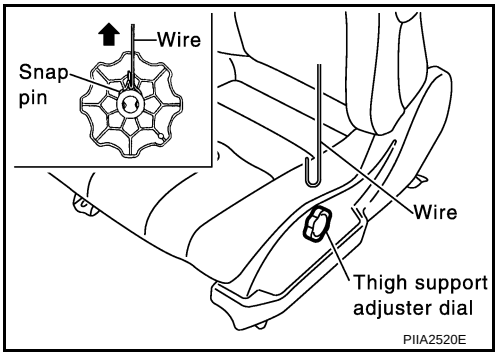
SEAT CUSHION TRIM AND PAD (MANUAL SEAT FOR COUPE)

Disassembly

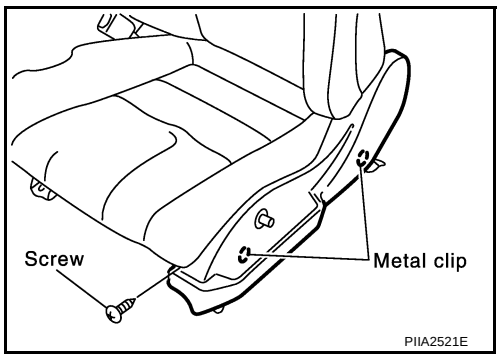
1. Pull up tabs of reclining lever from inside. Slide knob forward to remove.



2. Hang snap ring on wire, and pull it up to remove. Remove thigh support adjuster dial.



3. Unfasten the screw and metal clip and remove the seat cushion outer finisher.



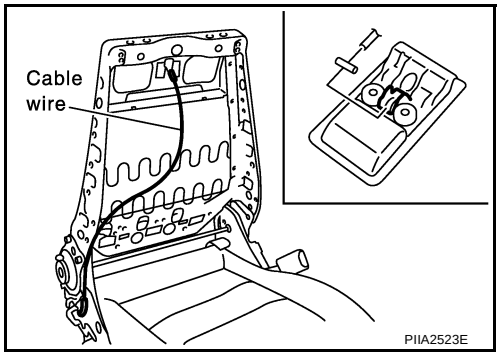
4. Remove bolts on the under side of seat cushion.
5. Remove hog rings from under seat cushion frame.
6. After removing the seat cushion trim and pad, remove the hog rings to separate the trim and pad.

Assembly

Assemble in the reverse order of disassembly.

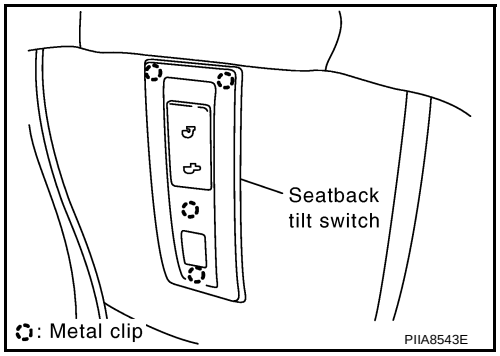
PASSENGER SIDE SEATBACK FORWARD RECLINING (COUPE)

1. Remove passenger side seatback trim and pad. Refer to SE-71, "SEATBACK TRIM AND PAD (MANUAL SEAT AND POWER SEAT)" .
2. Remove screw and fixing clip, then disconnect cable wire.



PASSENGER SIDE SEATBACK FORWARD RECLINING (ROADSTER)

1. Remove the seatback tilt switch.



2. Disconnect seatback tilt switch harness connector.
3. Remove passenger side seatback trim and pad. Refer to SE-71, "SEATBACK TRIM AND PAD (MANUAL SEAT AND POWER SEAT)" .

SECTION ATC
AUTOMATIC AIR CONDITIONER

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

AJS001FF

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

AJS000S7

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Working with HFC-134a (R-134a)

AJS0009G

WARNING:

- **CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. If the refrigerants are mixed and compressor malfunction is likely to occur, refer to "CONTAMINATED REFRIGERANT" below. To determine the purity of HFC-134a (R-134a) in the vehicle and recovery tank, use Refrigerant Recovery/Recycling Recharging equipment and Refrigerant Identifier.**
- **Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubricant other than that specified is used, compressor malfunction is likely to occur.**
- **The specified HFC-134a (R-134a) lubricant rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:**
  - **When removing refrigerant components from a vehicle, immediately cap (seal) the component to minimize the entry of moisture from the atmosphere.**
  - **When installing refrigerant components to a vehicle, do not remove the caps (unseal) until just before connecting the components. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.**
  - **Only use the specified lubricant from a sealed container. Immediately reseal containers of lubricant. Without proper sealing, lubricant will become moisture saturated and should not be used.**
  - **Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from the A/C system, using certified service equipment meeting requirements of SAE J2210 HFC-134a (R-134a) recycling equipment, or J2209 HFC-134a (R-134a) recovery equipment. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.**
  - **Do not allow lubricant (Nissan A/C System Oil Type S) to come in contact with styrofoam parts. Damage may result.**

CONTAMINATED REFRIGERANT

If a refrigerant other than pure HFC-134a (R-134a) is identified in a vehicle, your options are:

- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage your service equipment and refrigerant supply.
- Suggest the customer return the vehicle to the location of previous service where the contamination may have occurred.
- If you choose to perform the repair, recover the refrigerant using only **dedicated equipment and containers. Do not recover contaminated refrigerant into your existing service equipment.** If your facility does not have dedicated recovery equipment, you may contact a local refrigerant product retailer for available service. This refrigerant must be disposed of in accordance with all federal and local regulations. In addition, replacement of all refrigerant system components on the vehicle is recommended.
- If the vehicle is within the warranty period, the air conditioner warranty is void. Please contact Nissan Customer Affairs for further assistance.

General Refrigerant Precautions

AJS0009H

WARNING:

- **Do not release refrigerant into the air. Use approved recovery/recycling equipment to capture the refrigerant every time an air conditioning system is discharged.**
- **Always wear eye and hand protection (goggles and gloves) when working with any refrigerant or air conditioning system.**
- **Do not store or heat refrigerant containers above 52°C (125°F).**
- **Do not heat a refrigerant container with an open flame; if container warming is required, place the bottom of the container in a warm pail of water.**
- **Do not intentionally drop, puncture, or incinerate refrigerant containers.**
- **Keep refrigerant away from open flames: poisonous gas will be produced if refrigerant burns.**
- **Refrigerant will displace oxygen, therefore be certain to work in well ventilated areas to prevent suffocation.**
- **Do not pressure test or leak test HFC-134a (R-134a) service equipment and/or vehicle air conditioning systems with compressed air during repair. Some mixtures of air and HFC-134a (R-134a) have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers.**

Lubricant Precautions

AJS0009I

- Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubricant other than that specified is used, compressor malfunction is likely to occur.
- The specified HFC-134a (R-134a) lubricant rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:
  - When removing refrigerant components from a vehicle, immediately cap (seal) the component to minimize the entry of moisture from the atmosphere.
  - When installing refrigerant components to a vehicle, do not remove the caps (unseal) until just before connecting the components. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.
  - Only use the specified lubricant from a sealed container. Immediately reseal containers of lubricant. Without proper sealing, lubricant will become moisture saturated and should not be used.
- Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from the A/C system, using certified service equipment meeting requirements of SAE J2210 HFC-134a (R-134a) recycling equipment, or J2209 HFC-134a (R-134a) recovery equipment. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.
- Do not allow lubricant (Nissan A/C System Oil Type S) to come in contact with styrofoam parts. Damage may result.

Precautions for Refrigerant Connection

AJS0009J

A new type refrigerant connection has been introduced to all refrigerant lines except the following location.

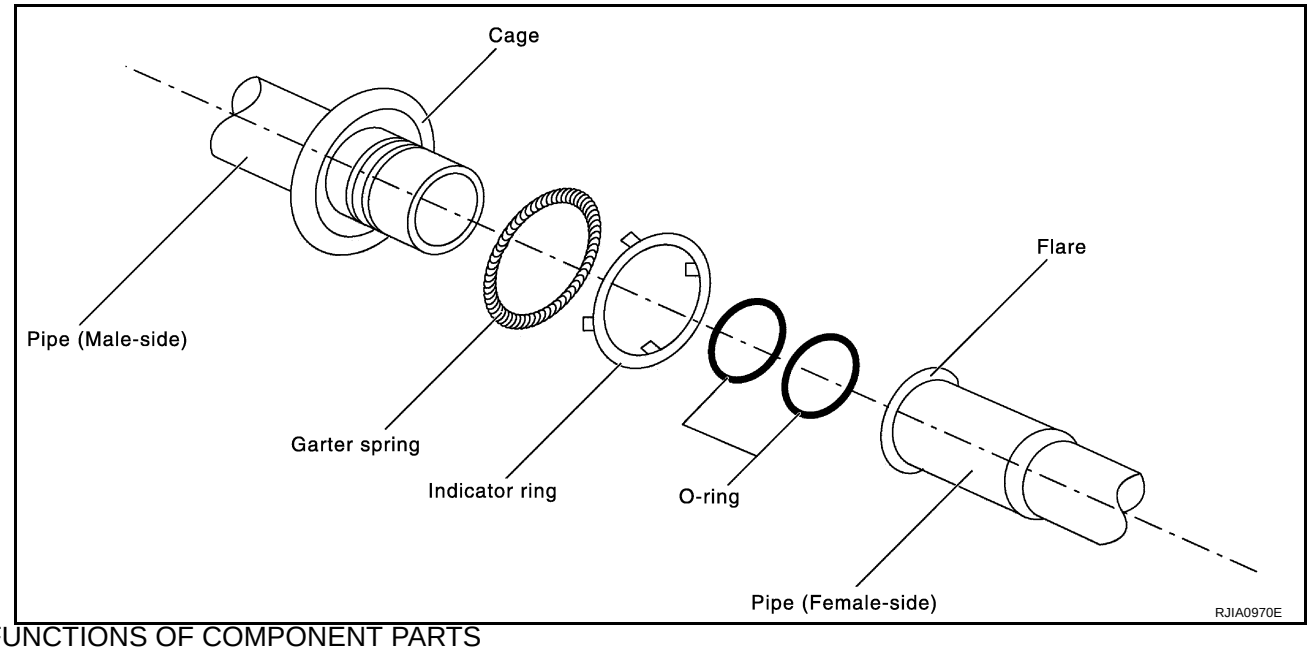
- Expansion valve to evaporator
- Refrigerant pressure sensor to liquid tank

ABOUT ONE-TOUCH JOINT

Description

- One-touch joints are pipe joints which do not require tools during piping connection.
- Unlike conventional connection methods using union nuts and flanges, controlling tightening torque at connection point is not necessary.
- When removing a pipe joint, use a disconnector.

COMPONENT PARTS



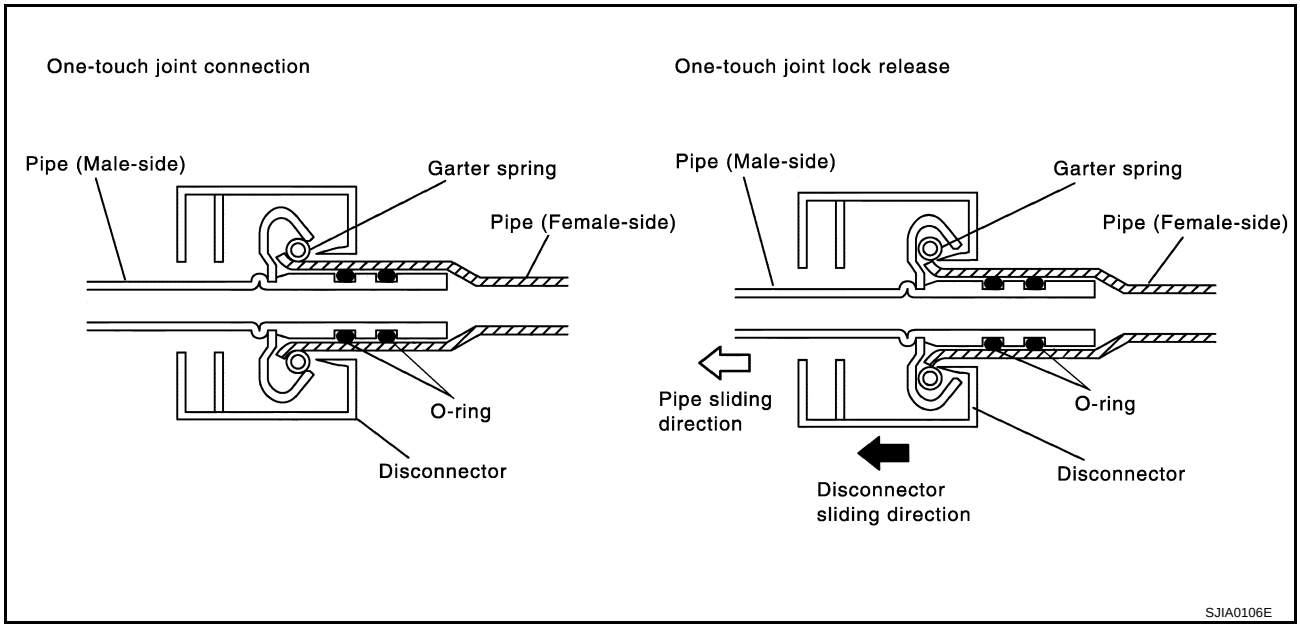
FUNCTIONS OF COMPONENT PARTS

Pipe (Male side)	● Retains O-rings. ● Retains garter spring in cage.
Garter spring	Anchors female side piping.
Indicator ring	When connection is made properly, this is ejected from male-side piping. (This part is no longer necessary after connection.)
O-ring	Seals connection point. (Not reusable)
Pipe (Female side)	● Seals connection by compressing O-rings. ● Anchors piping connection using flare and garter spring.

NOTE:

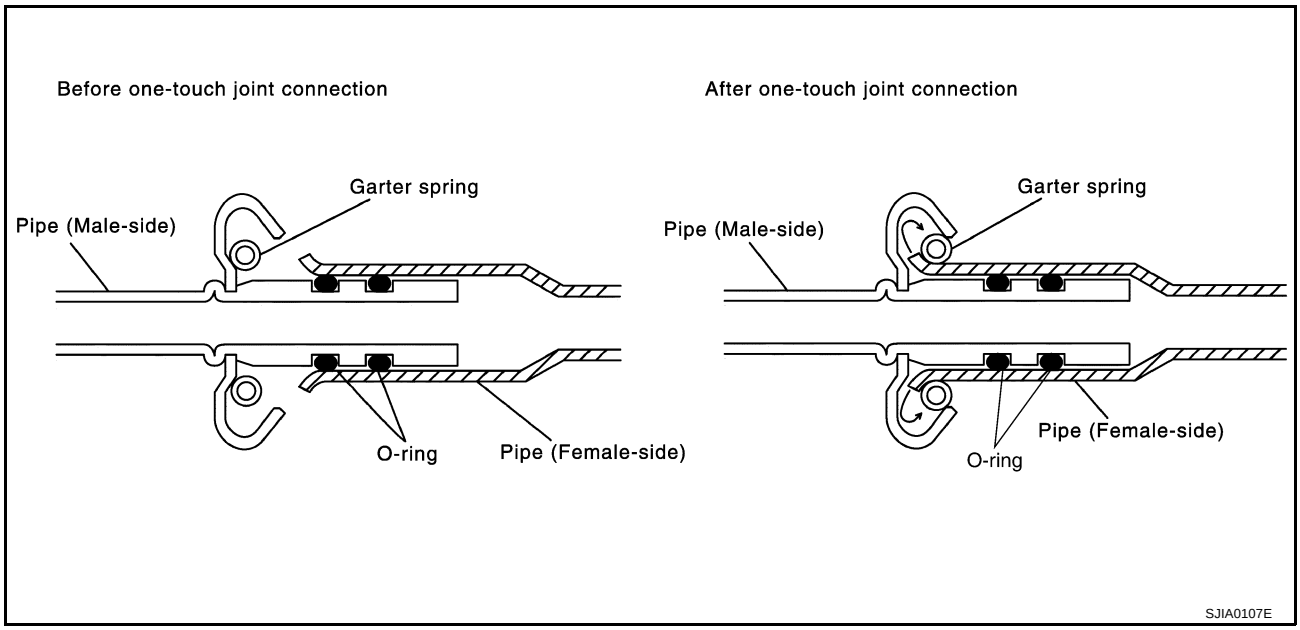
- Garter spring cannot be removed from cage of male-side piping.
- Indicator ring remains near piping connection point, however, this is not a malfunction. (This is to check piping connection during factory assembly.)

REMOVAL



1. Clean piping connection point, and set a disconnector.
2. Slide disconnector in axial direction of piping, and stretch garter spring with tapered point of disconnector.
3. Slide disconnector farther so that inside diameter of garter spring becomes larger than outside diameter of female-side piping flare. Then male-side piping can be disconnected.

INSTALLATION



1. Clean piping connection points, and insert male-side piping into female-side piping.
2. Push inserted male-side piping harder so that female-side piping flare stretches garter spring.
3. If inside diameter of garter spring becomes larger than outside diameter of female-side piping flare, garter spring seats on flare. Then, it fits in between male-side piping cage and female-side piping flare to anchor piping connection point.

   NOTICE:
   When garter spring seats on flare, and fits in between male-side piping cage and female-side piping flare, it clicks.

   CAUTION:
   - **Female-side piping connection point is thin. So, when inserting male-side piping, take care not to deform female-side piping. Slowly insert it in axial direction.**
   - **Insert piping securely until a click is heard.**

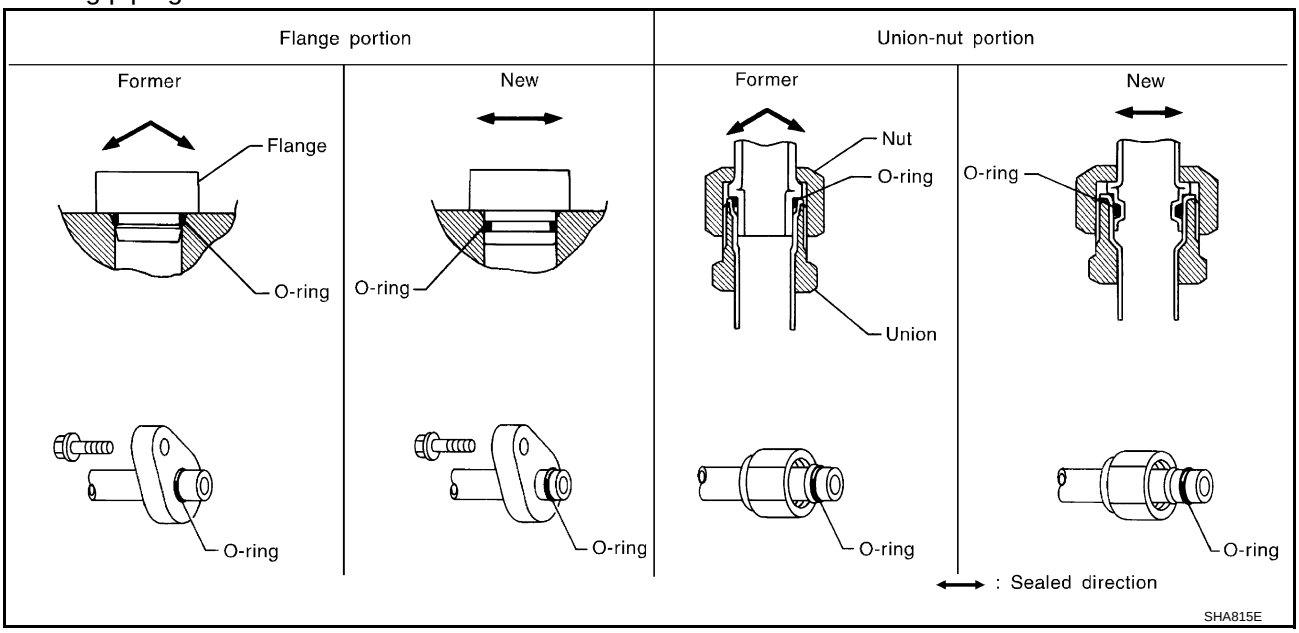
- **After piping connection is completed, pull male-side piping by hand to make sure connection does not come loose.**

NOTE:
One-touch joint connection is used in points below.

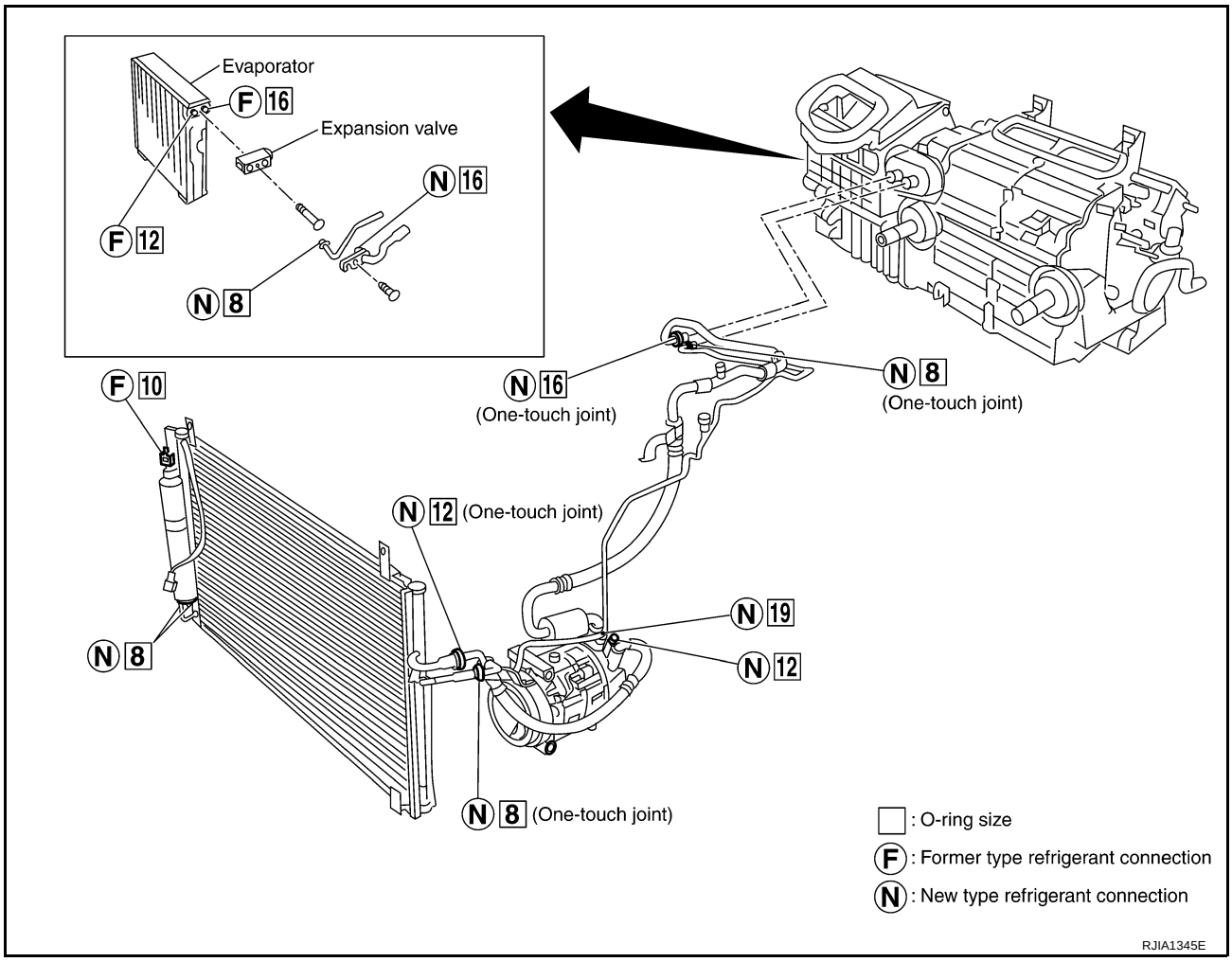
- Low-pressure flexible hose to evaporator (O-ring size: 16)
- High-pressure flexible hose to condenser (O-ring size: 12)
- High-pressure pipe 1 to evaporator (O-ring size: 8)
- High-pressure pipe 1 to condenser (O-ring size: 8)

FEATURES OF NEW TYPE REFRIGERANT CONNECTION

- The O-ring has been relocated. It has also been provided with a groove for proper installation. This eliminates the chance of the O-ring being caught in, or damaged by, the mating part. The sealing direction of the O-ring is now set vertically in relation to the contacting surface of the mating part to improve sealing characteristics.
- The reaction force of the O-ring will not occur in the direction that causes the joint to pull out, thereby facilitating piping connections.



O-RING AND REFRIGERANT CONNECTION



CAUTION:

The new and former refrigerant connections use different O-ring configurations. Do not confuse O-rings since they are not interchangeable. If a wrong O-ring is installed, refrigerant will leak at, or around, the connection.

O-Ring Part Numbers and Specifications

Connection type	Piping connection point		Part number	QTY	O-ring size
New	Low-pressure flexible hose to low-pressure pipe (One-touch joint)		92473 N8221	2	16
	High-pressure pipe 1 to high-pressure pipe 2 (One-touch joint)		92471 N8221	2	8
	Condenser to high-pressure flexible hose (One-touch joint)		92472 N8221	2	12
	Condenser to high-pressure pipe 1 (One-touch joint)		92471 N8221	2	8
	Low-pressure pipe to expansion valve		92473 N8210	1	16
	High-pressure pipe 2 to expansion valve		92471 N8210	1	8
	Compressor to low-pressure flexible hose		92474 N8210	1	19
	Compressor to high-pressure flexible hose		92472 N8210	1	12
	Liquid tank to condenser pipe	Inlet	92471 N8210	1	8
		Outlet		1	
Former	Refrigerant pressure sensor to liquid tank		J2476 89956	1	10
	Expansion valve to evaporator	Inlet	92475 71L00	1	12
		Outlet	92475 72L00	1	16

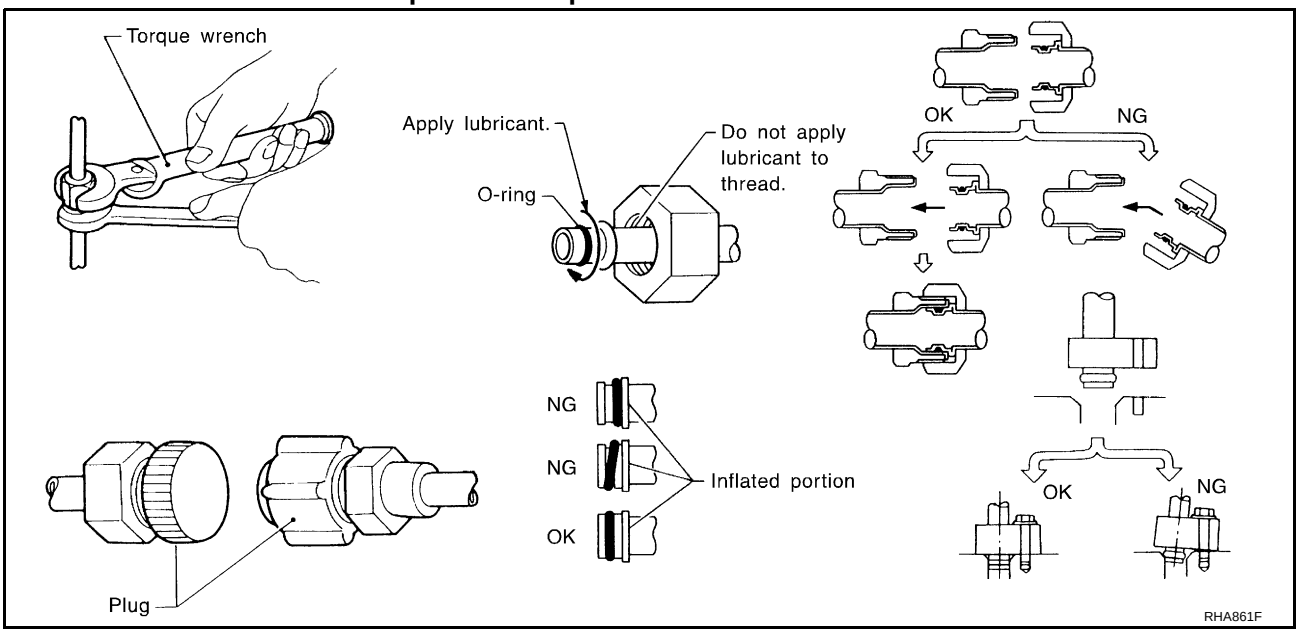
WARNING:

Make sure all refrigerant is discharged into the recycling equipment and the pressure in the system is less than atmospheric pressure. Then gradually loosen the discharge side hose fitting and remove it.

CAUTION:

When replacing or cleaning refrigerant cycle components, observe the following.

- **When the compressor is removed, store it in the same position as it is when mounted on the car. Malfunction to do so will cause lubricant to enter the low pressure chamber.**
- **When connecting tubes, always use a torque wrench and a back-up wrench.**
- **After disconnecting tubes, immediately plug all openings to prevent entry of dirt and moisture.**
- **When installing an air conditioner in the vehicle, connect the pipes as the final stage of the operation. Do not remove the seal caps of pipes and other components until just before required for connection.**
- **Allow components stored in cool areas to warm to working area temperature before removing seal caps. This prevents condensation from forming inside A/C components.**
- **Thoroughly remove moisture from the refrigeration system before charging the refrigerant.**
- **Always replace used O-rings.**
- **When connecting tube, apply lubricant to circle of the O-rings shown in illustration. Be careful not to apply lubricant to threaded portion.**
  Lubricant name: Nissan A/C System Oil Type S
  Part number: KLH00-PAGS0
- **O-ring must be closely attached to dented portion of tube.**
- **When replacing the O-ring, be careful not to damage O-ring and tube.**
- **Connect tube until you hear it click, then tighten the nut or bolt by hand until snug. Make sure that the O-ring is installed to tube correctly.**
- **After connecting line, conduct leak test and make sure that there is no leakage from connections. When the gas leaking point is found, disconnect that line and replace the O-ring. Then tighten connections of seal seat to the specified torque.**



Precautions for Servicing Compressor

AJS0009K

- **Plug all openings to prevent moisture and foreign matter from entering.**
- **When the compressor is removed, store it in the same position as it is when mounted on the car.**
- **When replacing or repairing compressor, follow “Maintenance of Lubricant Quantity in Compressor” exactly. Refer to ATC-24, "Maintenance of Lubricant Quantity in Compressor" .**
- **Keep friction surfaces between clutch and pulley clean. If the surface is contaminated, with lubricant, wipe it off by using a clean waste cloth moistened with thinner.**

- **After compressor service operation, turn the compressor shaft by hand more than five turns in both directions. This will equally distribute lubricant inside the compressor. After the compressor is installed, let the engine idle and operate the compressor for one hour.**
- **After replacing the compressor magnet clutch, apply voltage to the new one and check for usual operation.**

Precautions for Service Equipment

AJS0009L

RECOVERY/RECYCLING EQUIPMENT

Be certain to follow the manufacturer's instructions for machine operation and machine maintenance. Never introduce any refrigerant other than that specified into the machine.

ELECTRONIC LEAK DETECTOR

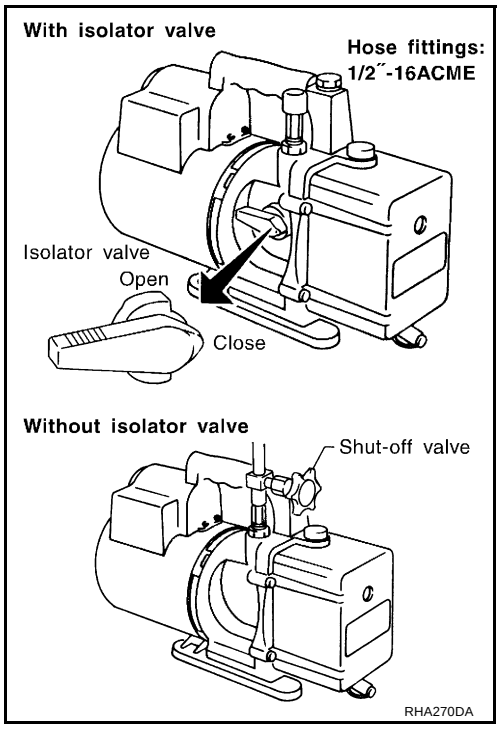
Be certain to follow the manufacturer's instructions for tester operation and tester maintenance.

VACUUM PUMP

The lubricant contained inside the vacuum pump is not compatible with the specified lubricant for HFC-134a (R-134a) A/C systems. The vent side of the vacuum pump is exposed to atmospheric pressure. So the vacuum pump lubricant may migrate out of the pump into the service hose. This is possible when the pump is switched off after evacuation (vacuuming) and hose is connected to it.
To prevent this migration, use a manual valve placed near the hose-to-pump connection, as follows.

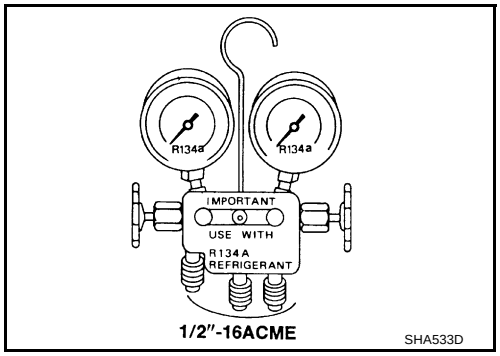
- Usually vacuum pumps have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- For pumps without an isolator, use a hose equipped with a manual shut-off valve near the pump end. Close the valve to isolate the hose from the pump.
- If the hose has an automatic shut-off valve, disconnect the hose from the pump. As long as the hose is connected, the valve is open and lubricating oil may migrate.

Some one-way valves open when vacuum is applied and close under a no vacuum condition. Such valves may restrict the pump's ability to pull a deep vacuum and are not recommended.



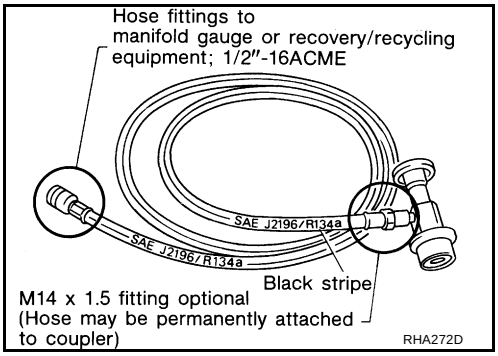
MANIFOLD GAUGE SET

Be certain that the gauge face indicates HFC-134a or R-134a. Be sure the gauge set has 1/2″-16 ACME threaded connections for service hoses. Confirm the set has been used only with refrigerant HFC-134a (R-134a) and specified lubricants.



SERVICE HOSES

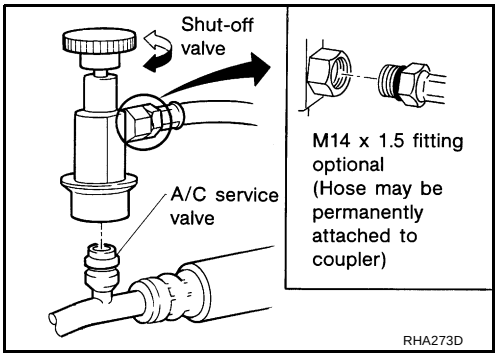
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut -off devices (either manual or automatic) near the end of the hoses opposite the manifold gauge.



SERVICE COUPLERS

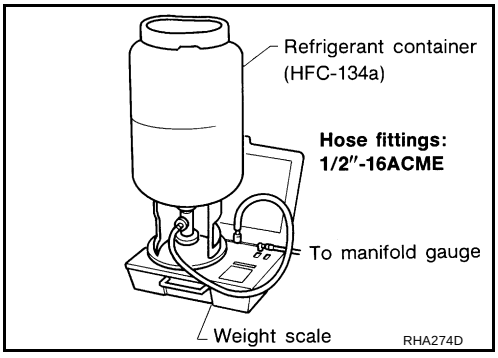
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

Shut-off valve rotation	A/C service valve
Clockwise	Open
Counterclockwise	Close



REFRIGERANT WEIGHT SCALE

Verify that no refrigerant other than HFC-134a (R-134a) and specified lubricants have been used with the scale. If the scale controls refrigerant flow electronically, the hose fitting must be 1/2″-16 ACME.



CHARGING CYLINDER

Using a charging cylinder is not recommended. Refrigerant may be vented into air from cylinder′s top valve when filling the cylinder with refrigerant. Also, the accuracy of the cylinder is generally less than that of an electronic scale or of quality recycle/recharge equipment.

Precautions for Leak Detection Dye

AJS0009M

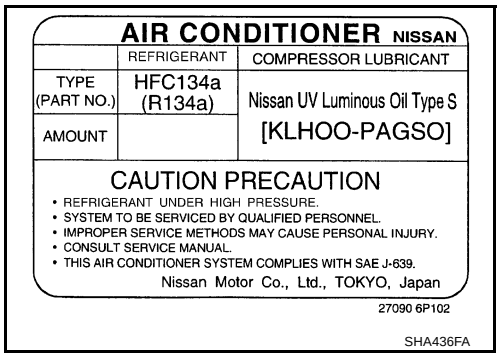
- The A/C system contains a fluorescent leak detection dye used for locating refrigerant leaks. An ultraviolet (UV) lamp is required to illuminate the dye when inspecting for leaks.
- Always wear fluorescence enhancing UV safety goggles to protect your eyes and enhance the visibility of the fluorescent dye.
- The fluorescent dye leak detector is not a replacement for an electronic refrigerant leak detector. The fluorescent dye leak detector should be used in conjunction with an electronic refrigerant leak detector to (J-41995) pin-point refrigerant leaks.
- For your safety and your customer′s satisfaction, read and follow all manufacture′s operating instructions and precautions prior to performing the work.
- A compressor shaft seal should not be repaired because of dye seepage. The compressor shaft seal should only be repaired after confirming the leak with an electronic refrigerant leak detector (J-41995).
- Always remove any remaining dye from the leak area after repairs are complete to avoid a misdiagnosis during a future service.
- Do not allow dye to come into contact with painted body panels or interior components. If dye is spilled, clean immediately with the approved dye cleaner. Fluorescent dye left on a surface for an extended period of time cannot be removed.
- Do not spray the fluorescent dye cleaning agent on hot surfaces (engine exhaust manifold, etc.).
- Do not use more than one refrigerant dye bottle (1/4 ounce /7.4 cc) per A/C system.
- Leak detection dyes for HFC-134a (R-134a) and CFC-12 (R-12) A/C systems are different. Do not use HFC-134a (R-134a) leak detection dye in CFC-12 (R-12) A/C system or CFC-12 (R-12) leak detector dye in HFC-134a (R-134a) A/C system or A/C system damage may result.
- The fluorescent properties of the dye will remain for over three (3) years unless a compressor malfunction occurs.

IDENTIFICATION

NOTE:
Vehicles with factory installed fluorescent dye have a green label.
Vehicles without factory installed fluorescent dye have a blue label.

IDENTIFICATION LABEL FOR VEHICLE

Vehicles with factory installed fluorescent dye have this identification label on the front side of hood.



Wiring Diagrams and Trouble Diagnosis

AJS0009N

When you read wiring diagrams, refer to the following:

- GI-15, "How to Read Wiring Diagrams" in GI section.
- PG-5, "Wiring Diagram — POWER —" in PG section.

When you perform trouble diagnosis, refer to the following:

- GI-11, "How to Follow Trouble Diagnoses" in GI section.
- GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident" in GI section.

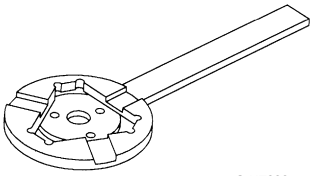
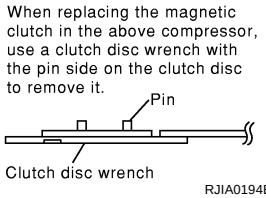
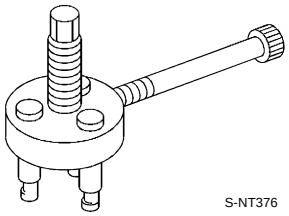
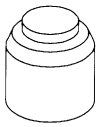
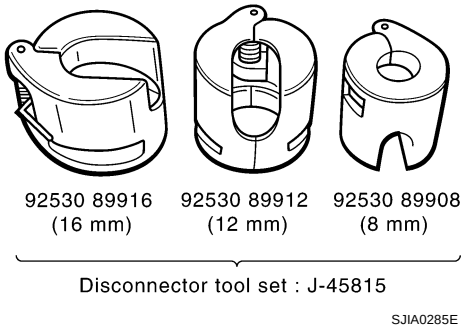
PREPARATION

PFP:00002

Special Service Tools

AJS0009O

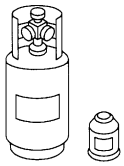
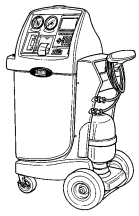
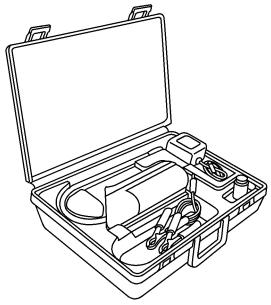
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

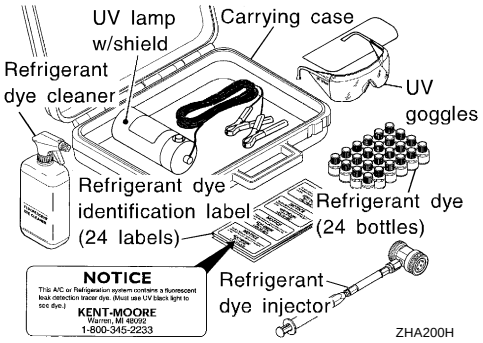
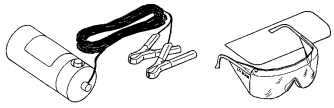
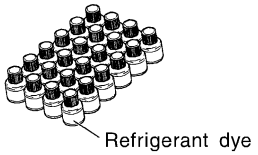
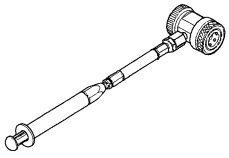
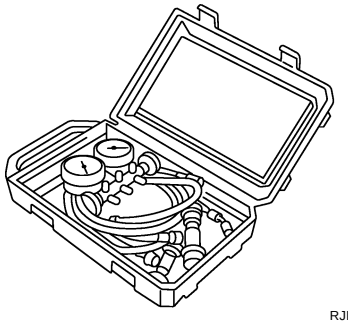
Tool number (Kent-Moore No.) Tool name	Description
KV99106100 (J-41260) Clutch disc wrench  S-NT232  RJIA0194E	Removing shaft nut and clutch disc
KV99232340 (J-38874) or KV992T0001 (-) Clutch disc puller  S-NT376	Removing clutch disc
KV99106200 (J-41261) Pulley installer  S-NT235	Installing pulley
92530 89908 (for high-pressure pipe 1) (-) 92530 89912 (for high-pressure flexible hose) (-) 92530 89916 (for low-pressure pipe 1 and low-pressure flexible hose) (-) Disconnector tool set (J-45815)  SJIA0285E	Disconnect one-touch joint connection

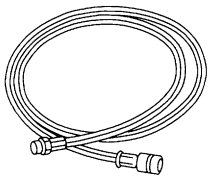
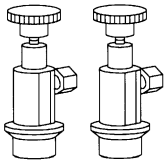
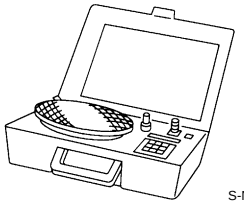
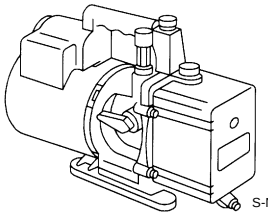
HFC-134a (R-134a) Service Tools and Equipment

AJS0009P

Never mix HFC-134a (R-134a) refrigerant and/or its specified lubricant with CFC-12 (R-12) refrigerant and/or its lubricant.
Separate and non-interchangeable service equipment must be used for handling each type of refrigerant/lubricant.
Refrigerant container fittings, service hose fittings and service equipment fittings (equipment which handles refrigerant and/or lubricant) are different between CFC-12 (R-12) and HFC-134a (R-134a). This is to avoid mixed use of the refrigerants/lubricant.
Adapters that convert one size fitting to another must never be used: refrigerant/lubricant contamination will occur and compressor malfunction will result.

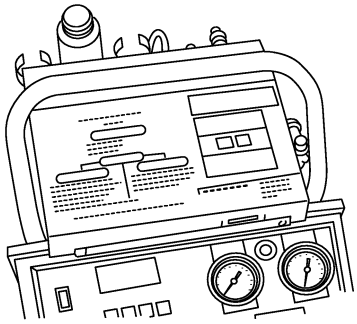
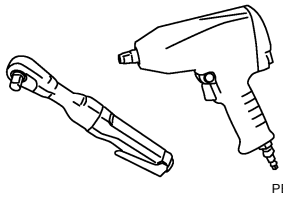
Tool number (Kent-Moore No.) Tool name		Description
HFC-134a (R-134a) refrigerant	 S-NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size ● Large container 1/2″-16 ACME
KLH00-PAGS0 (-) Nissan A/C System Oil Type S (DH-PS)	 S-NT197	Type: Poly alkylene glycol oil (PAG), type S (DH-PS) Application: HFC-134a (R-134a) wobble (swash) plate compressors (Nissan only) Lubricity: 40 m ℓ (1.4 US fl oz, 1.4 Imp fl oz)
(J-43600) Recovery/Recycling/ Recharging equipment (ACR2000)	 WJIA0293E	Function: Refrigerant recovery and recycling and recharging
(J-41995) Electrical leak detector	 AHA281A	Power supply: ● DC 12V (Cigarette lighter)

Tool number (Kent-Moore No.) Tool name		Description
(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle (J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles) (J-43872) Refrigerant dye cleaner	 ZHA200H	Power supply: DC 12V (Battery terminal)
(J-42220) UV lamp and UV safety goggles	 SHA438F	Power supply: DC 12V (Battery terminal) For checking refrigerant leak when fluorescent dye is installed in A/C system Includes: UV lamp and UV safety goggles
(J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles)	 SHA439F	Application: For HFC-134a (R-134a) PAG oil Container: 1/4 ounce (7.4 cc) bottle (Includes self-adhesive dye identification labels for affixing to vehicle after charging system with dye.)
(J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle	 SHA440F	For injecting 1/4 ounce of fluorescent leak detection dye into A/C system
(J-43872) Refrigerant dye cleaner	 SHA441F	For cleaning dye spills
(J-39183) Manifold gauge set (with hoses and couplers)	 RJIA0196E	Identification: ● The gauge face indicates HFC-134a (R-134a). Fitting size: Thread size ● 1/2″-16 ACME

Tool number (Kent-Moore No.) Tool name	Description
Service hoses ● High-pressure side hose (J-39501-72) ● Low-pressure side hose (J-39502-72) ● Utility hose (J-39476-72)  S-NT201	Hose color: ● Low hose: Blue with black stripe ● High hose: Red with black stripe ● Utility hose: Yellow with black stripe or green with black stripe Hose fitting to gauge: ● 1/2″-16 ACME
Service couplers ● High-pressure side coupler (J-39500-20) ● Low-pressure side coupler (J-39500-24)  S-NT202	Hose fitting to service hose: ● M14 x 1.5 fitting is optional or permanently attached.
(J-39650) Refrigerant weight scale  S-NT200	For measuring of refrigerant Fitting size: Thread size ● 1/2″-16 ACME
(J-39649) Vacuum pump (Including the isolator valve)  S-NT203	Capacity: ● Air displacement: 4 CFM ● Micron rating: 20 microns ● Oil capacity: 482 g (17 oz) Fitting size: Thread size ● 1/2″-16 ACME

Commercial Service Tools

AJS0009Q

Tool name	Description
Refrigerant identifier equipment  RJIA0197E	Checking for refrigerant purity and system contamination
Power tool  PBIC0190E	For loosening bolts and nuts

REFRIGERATION SYSTEM

PFP:KA990

Refrigerant Cycle

AJS0009R

REFRIGERANT FLOW

The refrigerant flows in the standard pattern, that is, through the compressor, the condenser with liquid tank, through the evaporator, and back to the compressor. The refrigerant evaporation through the evaporator coil is controlled by an externally equalized expansion valve, located inside the evaporator case.

FREEZE PROTECTION

Under normal operating conditions, when the A/C is switched on, the compressor runs continuously, and the evaporator pressure, and therefore, temperature is controlled by the V-6 variable displacement compressor to prevent freeze up.

Refrigerant System Protection

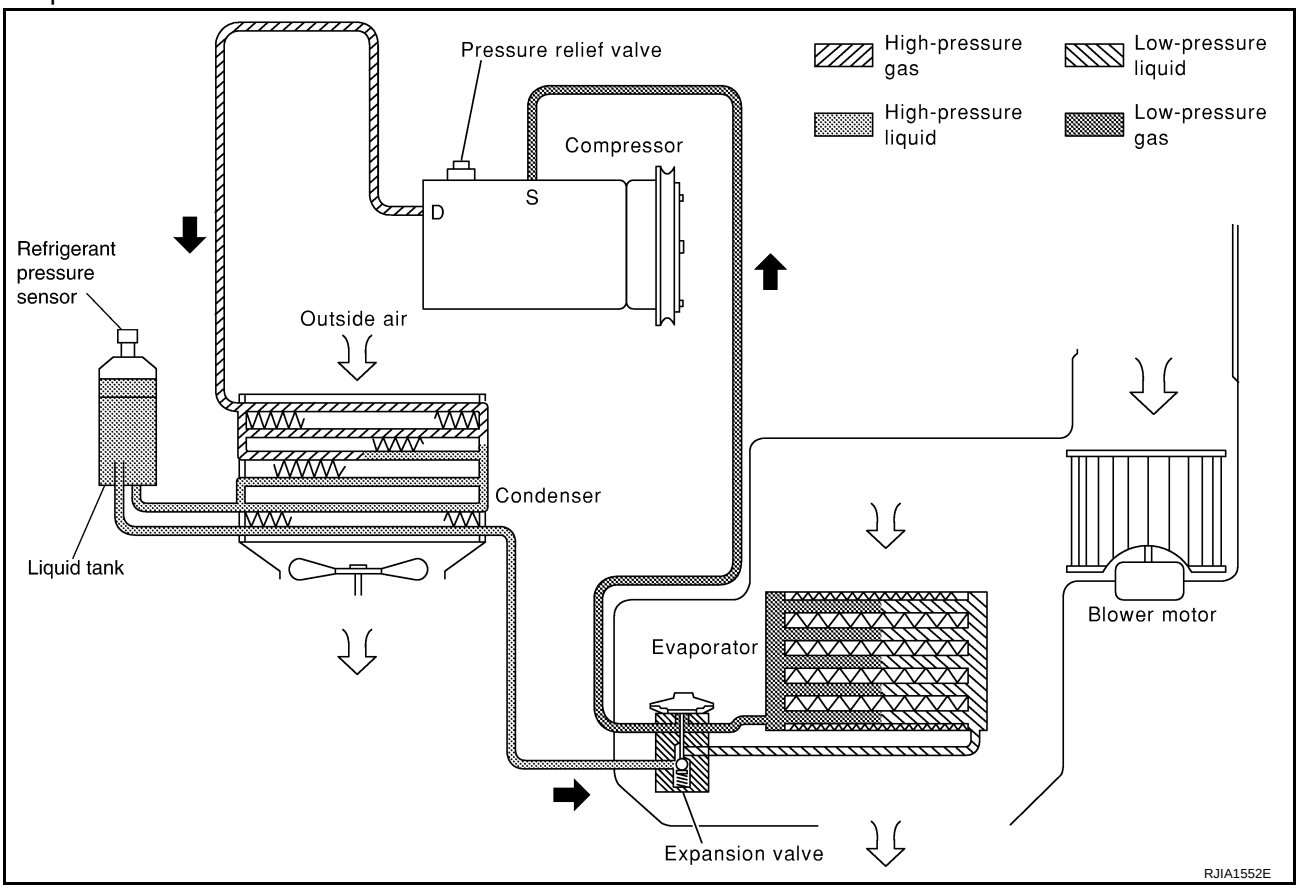
AJS000JD

REFRIGERANT PRESSURE SENSOR

The refrigerant system is protected against excessively high- or low-pressures by the refrigerant pressure sensor, located on the liquid tank. If the system pressure rises above, or falls below the specifications, the refrigerant pressure sensor detects the pressure inside the refrigerant line and sends the voltage signal to the ECM. ECM makes the A/C relay go OFF and stops the compressor when pressure on the high-pressure side detected by refrigerant pressure sensor is over about 2,746 kPa (28 kg/cm^2 , 398 psi), or below about 134 kPa (1.4 kg/cm^2 , 20 psi).

PRESSURE RELIEF VALVE

The refrigerant system is also protected by a pressure relief valve, located in the rear head of the compressor. When the pressure of refrigerant in the system increases to an unusual level [more than 3,727 kPa (38 kg/cm^2 , 540 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.



V-6 Variable Displacement Compressor

AJS000MV

GENERAL INFORMATION

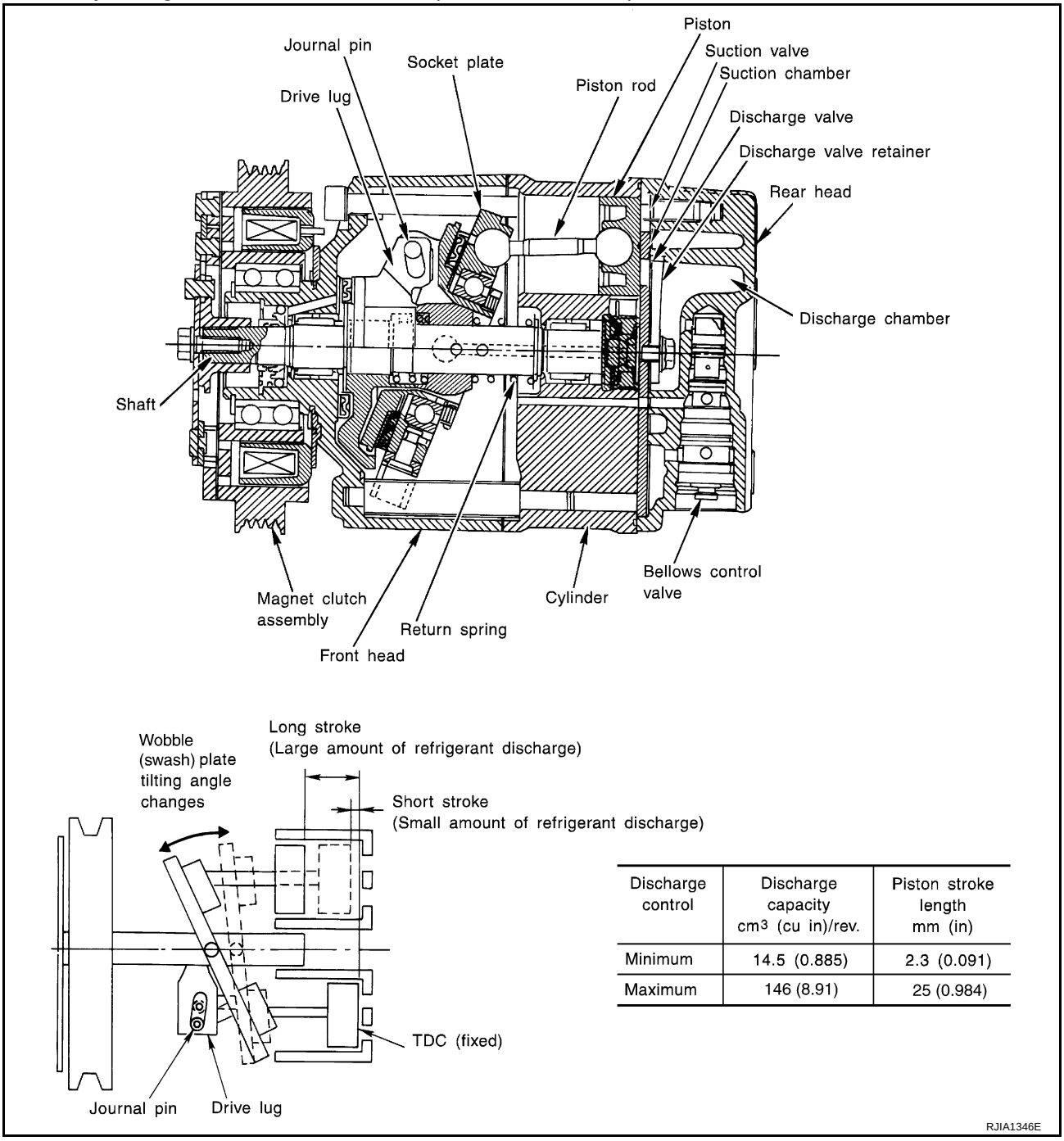
1. The V-6 variable compressor differs from previous units. The vent temperatures of the V-6 variable compressor do not drop too far below 5°C (41°F) when:
   Evaporator intake air temperature is less than 20°C (68°F).
   Engine is running at speeds less than 1,500 rpm.
   This is because the V-6 compressor provides a means of “capacity” control.
2. The V-6 variable compressor provides refrigerant control under varying conditions. During cold winters, it may not produce high refrigerant pressure discharge (compared to previous units) when used with air conditioning systems.
3. A “clanking” sound may occasionally be heard during refrigerant charge. The sound indicates that the tilt angle of the wobble (swash) plate has changed and is not a malfunction.
4. For air conditioning systems with the V-6 compressor, the clutch remains engaged unless: the system main switch, fan switch or ignition switch is turned OFF. When ambient (outside) temperatures are low or when the amount of refrigerant is insufficient, the clutch is disengaged to protect the compressor.
5. A constant range of suction pressure is maintained when engine speed is greater than a certain value. It normally ranges from 147 to 177 kPa (1.5 to 1.8 kg/cm^2 , 21 to 26 psi) under varying conditions. In previous compressors, however, suction pressure was reduced with increases in engine speed.

DESCRIPTION

General

The variable compressor is basically a swash plate type that changes piston stroke in response to the required cooling capacity.

The tilt of the wobble (swash) plate allows the piston′s stroke to change so that refrigerant discharge can be continuously changed from 14.5 to 146 cm^3 (0.885 to 8.91 cu in).

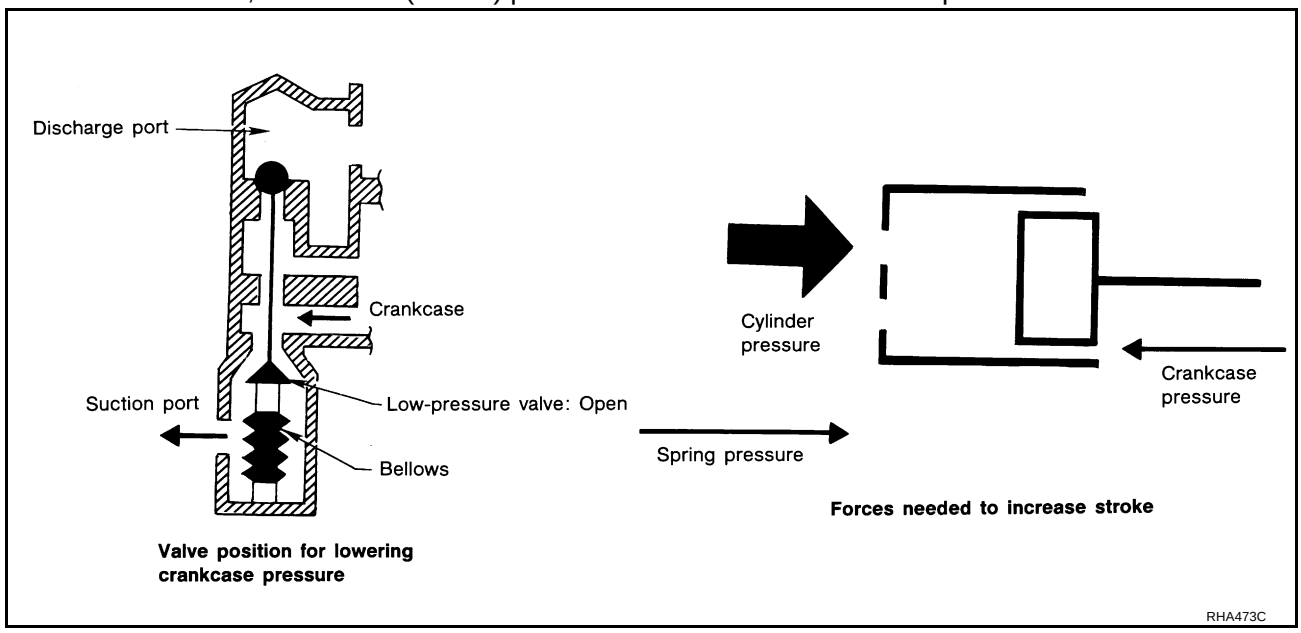


Discharge control	Discharge capacity cm^3 (cu in)/rev.	Piston stroke length mm (in)
Minimum	14.5 (0.885)	2.3 (0.091)
Maximum	146 (8.91)	25 (0.984)

Operation

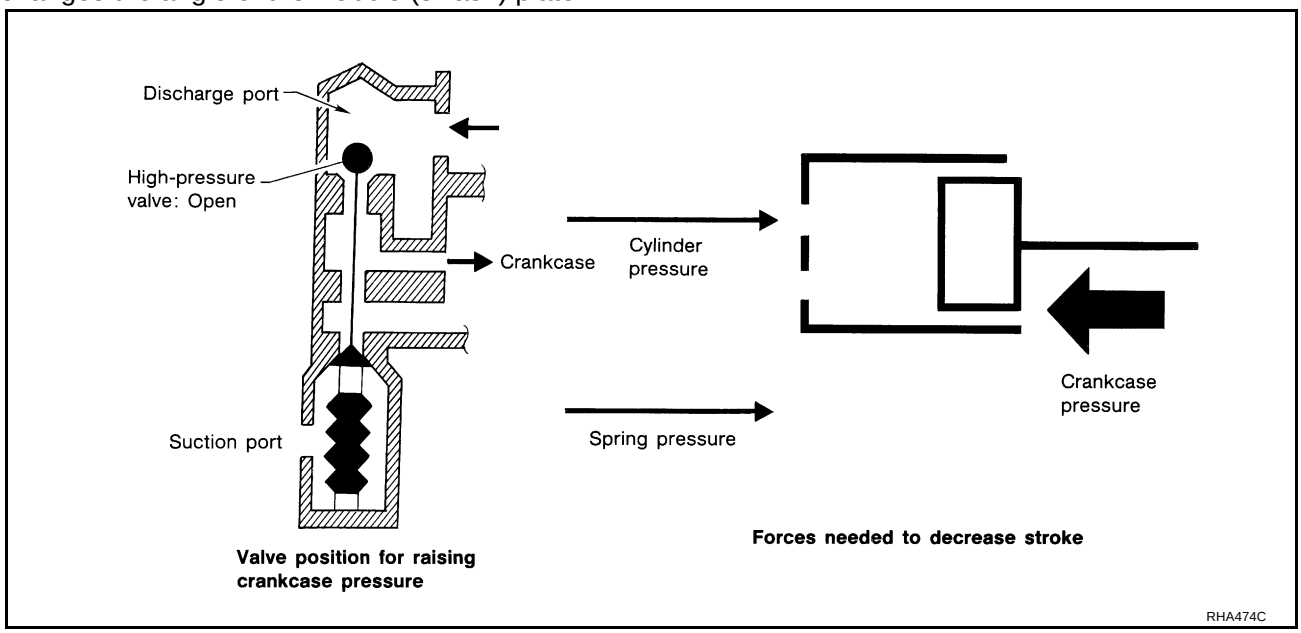
1. Operation Control Valve
   Operation control valve is located in the suction port (low-pressure) side, and opens or closes in response to changes in refrigerant suction pressure.
   Operation of the valve controls the internal pressure of the crankcase.
   The angle of the wobble (swash) plate is controlled between the crankcase′s internal pressure and the piston cylinder pressure.
2. Maximum Cooling

Refrigerant pressure on the low-pressure side increases with an increases in heat loads.
When this occurs, the control valve′s bellows compress to open the low-pressure side valve and close the high-pressure side valve.
This cases the following pressure changes:
The crankcase′s internal pressure to equal the pressure on the low-pressure side.
The cylinder′s internal pressure to be greater than the crankcase′s internal pressure.
Under this condition, the wobble (swash) plate is set to the maximum stroke position.



3. Capacity Control

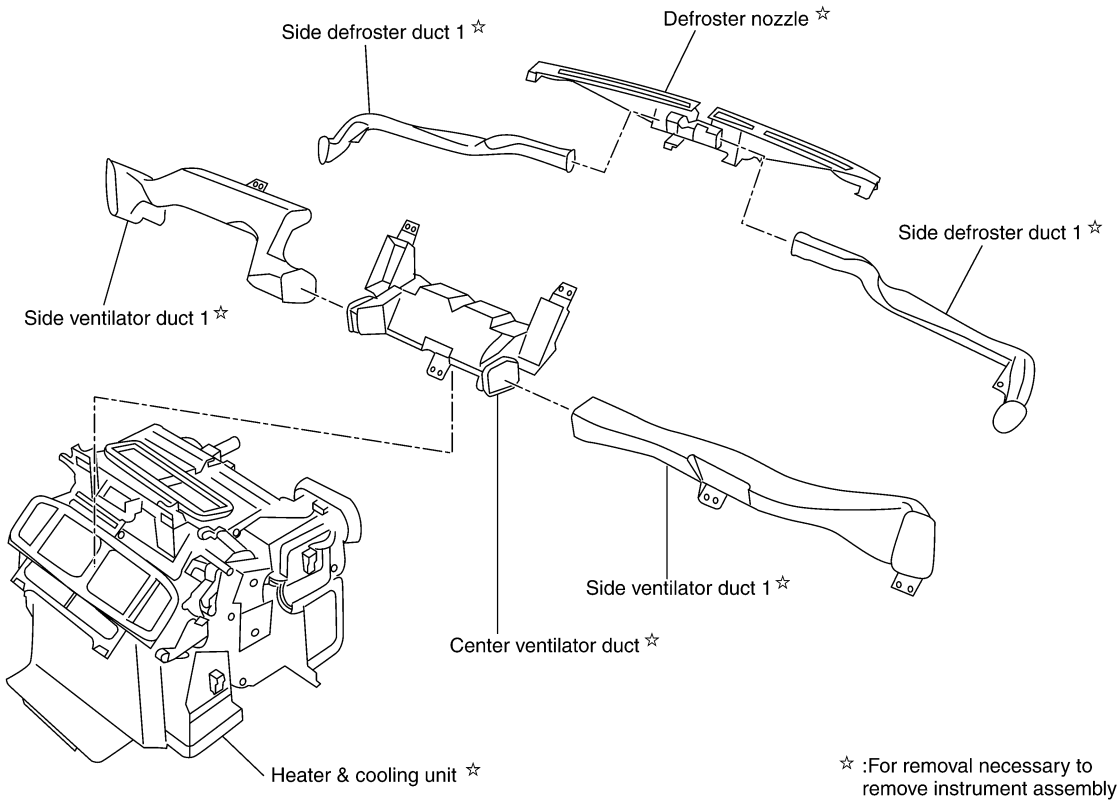
- Refrigerant pressure on suction side is low during high speed driving or when ambient or interior temperature is low.
- The bellows expands when refrigerant pressure on the suction pressure side drops below approximately 177 kPa (1.8 kg/cm^2 , 26 psi).
- The force acts around the journal pin are located where the piston generates the highest pressure. Piston pressure is between suction pressure Ps and discharge pressure Pd, which is near suction pressure Ps. If crankcase pressure Pc rises due to capacity control, the force around the journal pin makes the wobble (swash) plate angle decrease and also the piston stroke decrease. In other words, crankcase pressure increase triggers pressure difference between the piston and the crankcase. The pressure difference changes the angle of the wobble (swash) plate.



Component Layout

AJS000JF

SEC.273



LUBRICANT

PFP:KLG00

Maintenance of Lubricant Quantity in Compressor

AJS0009V

The lubricant in the compressor circulates through the system with the refrigerant. Add lubricant to compressor when replacing any component or after a large refrigerant leakage occurred. It is important to maintain the specified amount.
If lubricant quantity is not maintained properly, the following malfunctions may result:

- Lack of lubricant: May lead to a seized compressor.
- Excessive lubricant: Inadequate cooling (thermal exchange interference)

LUBRICANT

Name	**:Nissan A/C System Oil Type S**
Part number	**:KLH00-PAGS0**

LUBRICANT RETURN OPERATION

Adjust the lubricant quantity according to the test group shown below.

1. CHECK LUBRICANT RETURN OPERATION

Can lubricant return operation be performed?

- A/C system works properly.
- There is no evidence of a large amount of lubricant leakage.

CAUTION:
If excessive lubricant leakage is noted, do not perform the lubricant return operation.

OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. PERFORM LUBRICANT RETURN OPERATION, PROCEEDING AS FOLLOWS:

1. Start engine, and set the following conditions:

– Test condition
Engine speed: Idling to 1,200 rpm
A/C switch: ON
Blower speed: Max. position
Temp. control: Optional [Set so that intake air temperature is 25 to 30°C (77 to 86°F).]
Intake position: Recirculation (REC)

2. Perform lubricant return operation for about 10 minutes.
3. Stop engine.

>> GO TO 3.

3. CHECK REPLACEMENT PART

Should the compressor be replaced?

YES >> GO TO ATC-25, "LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT" .
NO >> GO TO ATC-25, "LUBRICANT ADJUSTING PROCEDURE FOR COMPONENTS REPLACEMENT EXCEPT COMPRESSOR" .

LUBRICANT ADJUSTING PROCEDURE FOR COMPONENTS REPLACEMENT EXCEPT COMPRESSOR

After replacing any of the following major components, add the correct amount of lubricant to the system.
Amount of lubricant to be added

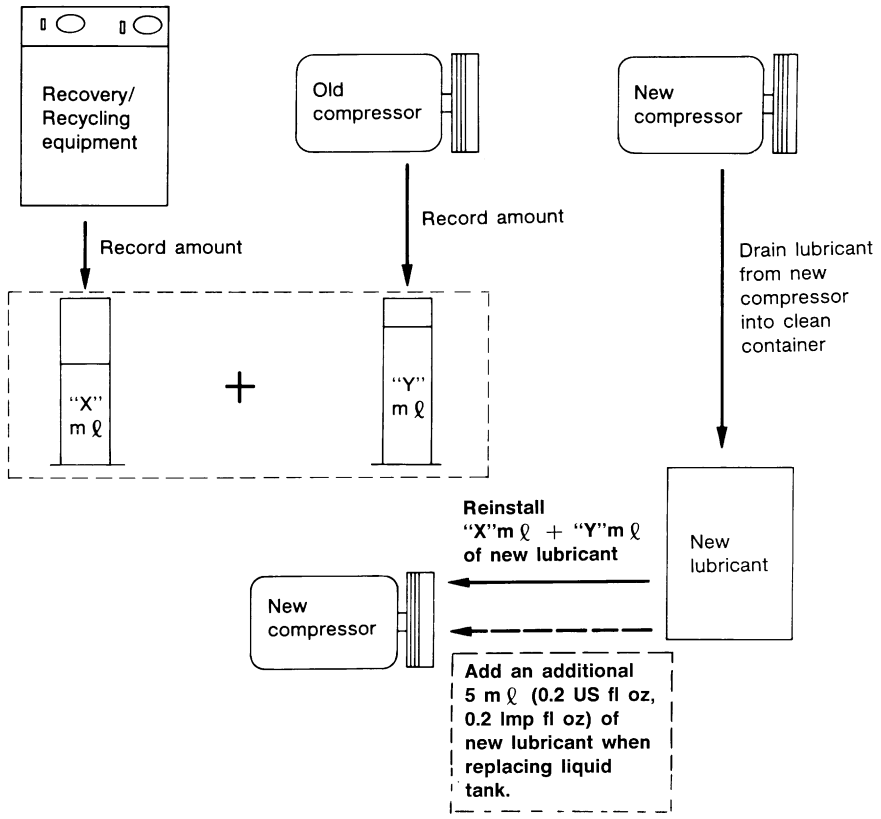
Part replaced	Lubricant to be added to system	Remarks
	Amount of lubricant m ℓ (US fl oz, Imp fl oz)	
Evaporator	75 (2.5, 2.6)	-
Condenser	35 (1.2, 1.2)	-
Liquid tank	10 (0.3, 0.4)	-
In case of refrigerant leak	30 (1.0, 1.1)	Large leak
	-	Small leak *1

*1:If refrigerant leak is small, no addition of lubricant is needed.

LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT

1. Before connecting recovery/recycling recharging equipment to vehicle, check recovery/recycling recharging equipment gauges. No refrigerant pressure should be displayed. If NG, recover refrigerant from equipment lines.
2. Connect recovery/recycling recharging equipment to vehicle. Confirm refrigerant purity in supply tank using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to ATC-5, "CONTAMINATED REFRIGERANT" .
3. Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to ATC-5, "CONTAMINATED REFRIGERANT" .
4. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
5. Drain the lubricant from the old (removed) compressor into a graduated container and recover the amount of lubricant drained.
6. Drain the lubricant from the new compressor into a separate, clean container.
7. Measure an amount of new lubricant installed equal to amount drained from old compressor. Add this lubricant to new compressor through the suction port opening.
8. Measure an amount of new lubricant equal to the amount recovered during discharging. Add this lubricant to new compressor through the suction port opening.
9. If the liquid tank also needs to be replaced, add an additional 5 m ℓ (0.2 US fl oz, 0.2 Imp fl oz) of lubricant at this time.
   Do not add this 5 m ℓ (0.2 US fl oz, 0.2 Imp fl oz) of lubricant if only replacing the compressor.

Lubricant adjusting procedure for compressor replacement



RHA065DD

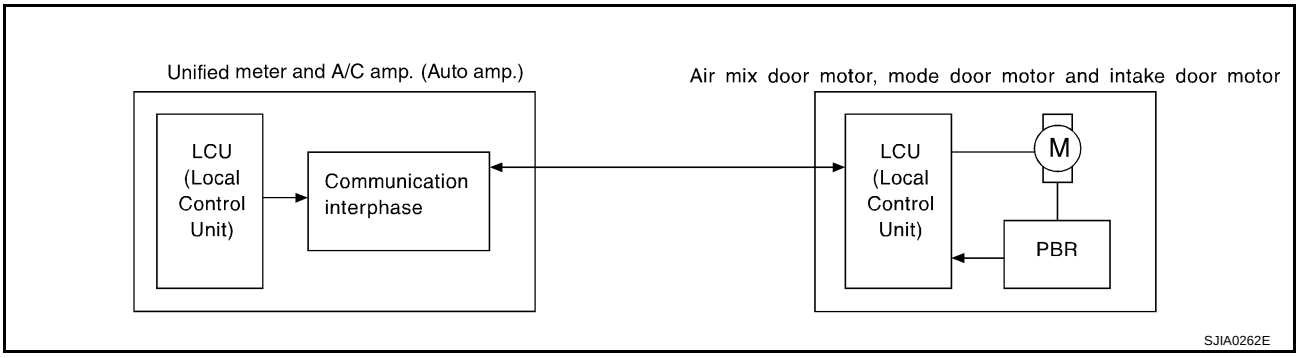
AIR CONDITIONER CONTROL

PFP:27500

Description of Air Conditioner LAN Control System

AJS0009W

The LAN (Local Area Network) system consists of unified meter and A/C amp., mode door motor, air mix door motor and intake door motor.
A configuration of these components is shown in the diagram below.

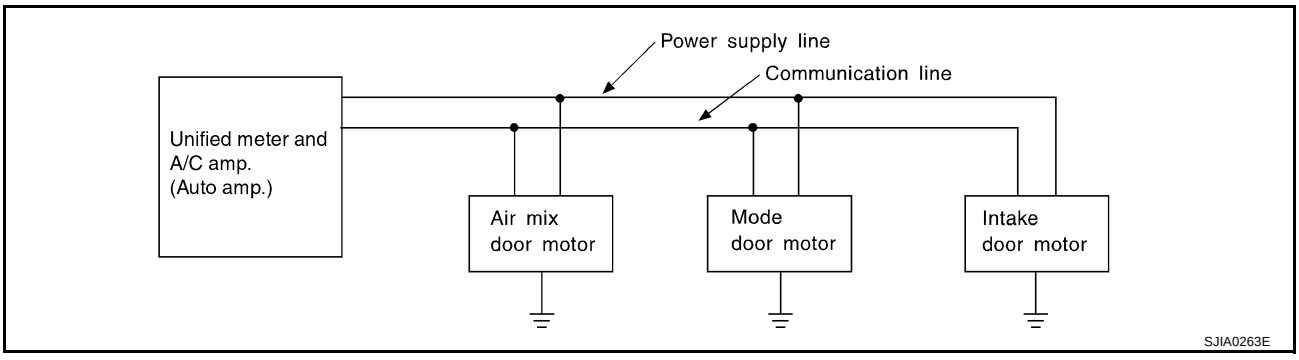


System Construction

AJS0009X

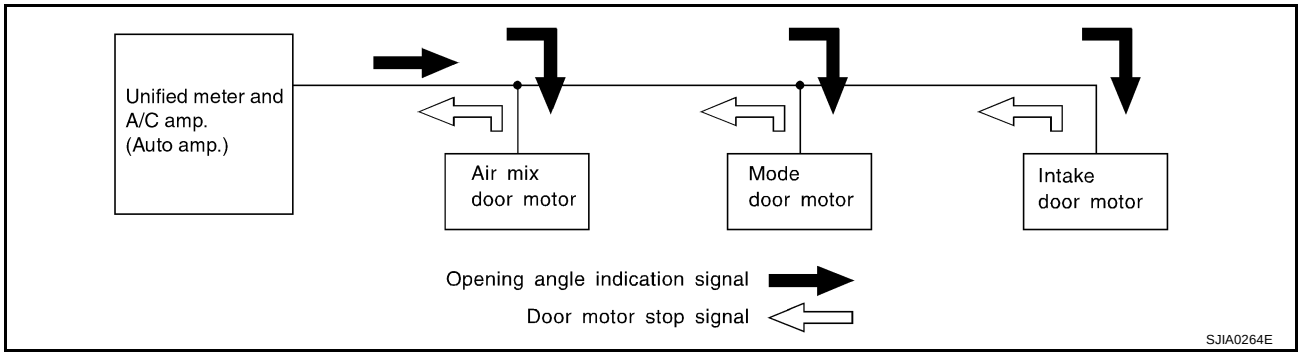
A small network is constructed between unified meter and A/C amp., air mix door motor, mode door motor and intake door motor. The unified meter and A/C amp. and motors are connected by data transmission lines and motor power supply lines. The LAN network is built through the ground circuits of each door motor.
Addresses, motor opening angle signals, motor stop signals and error checking messages are all transmitted through the data transmission lines connecting the unified meter and A/C amp. and each door motor.
The following functions are contained in LCUs built into the air mix door motor, mode door motor and intake door motor.

- Address
- Motor opening angle signals
- Data transmission
- Motor stop and drive decision
- Opening angle sensor (PBR function)
- Comparison
- Decision (Unified meter and A/C amp. indicated value and motor opening angle comparison)



OPERATION

The unified meter and A/C amp. receives data from each of the sensors. The unified meter and A/C amp. sends mode door, air mix door and intake door opening angle data to the mode door motor LCU, air mix door motor LCU and intake door motor LCU.
The mode door motor, air mix door motor and intake door motor read their respective signals according to the address signal. Opening angle indication signals received from the unified meter and A/C amp. and each of the motor position sensors is compared by the LCUs in each motor with the existing decision and opening angles. Subsequently, HOT/COLD, DEFROST/VENT or FRESH/RECIRCULATION operation is selected. The new selection data is returned to the unified meter and A/C amp.



TRANSMISSION DATA AND TRANSMISSION ORDER

Unified meter and A/C amp. data is transmitted consecutively to each of the door motors following the form shown in figure below.

Start:

Initial compulsory signal sent to each of the door motors.

Address:

Data sent from the unified meter and A/C amp. is selected according to data-based decisions made by the air mix door motor, mode door motor and intake door motor.
If the addresses are identical, the opening angle data and error check signals are received by the door motor LCUs. The LCUs then make the appropriate error decision. If the opening angle data is usual, door control begins.
If an error exists, the received data is rejected and corrected data received. Finally, door control is based upon the corrected opening angle data.

Opening Angle:

Data that shows the indicated door opening angle of each door motor.

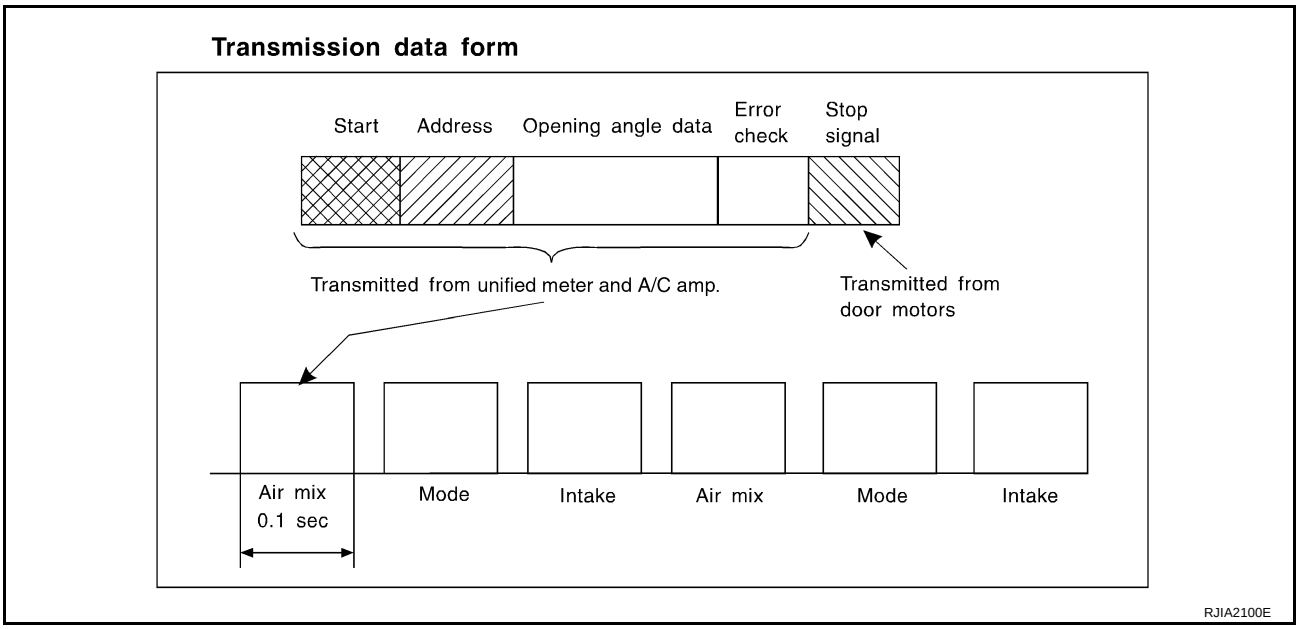
Error Check:

Procedure by which sent and received data is checked for errors. Error data is then compiled. The error check prevents corrupted data from being used by the air mix door motor, mode door motor and intake door motor. Error data can be related to the following symptoms.

- Unusual electrical frequency
- Poor electrical connections
- Signal leakage from transmission lines
- Signal level fluctuation

Stop Signal:

At the end of each transmission, a stop operation, in-operation, or internal error message is delivered to the unified meter and A/C amp. This completes one data transmission and control cycle.



AIR MIX DOOR CONTROL (AUTOMATIC TEMPERATURE CONTROL)

The air mix door is automatically controlled so that in-vehicle temperature is maintained at a predetermined value by the temperature setting, ambient temperature, in-vehicle temperature and amount of sunload.

FAN SPEED CONTROL

Blower speed is automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature, amount of sunload and air mix door position.
With FAN control dial set to AUTO, the blower motor starts to gradually increase air flow volume.
When engine coolant temperature is low, the blower motor operation is delayed to prevent cool air from flowing.

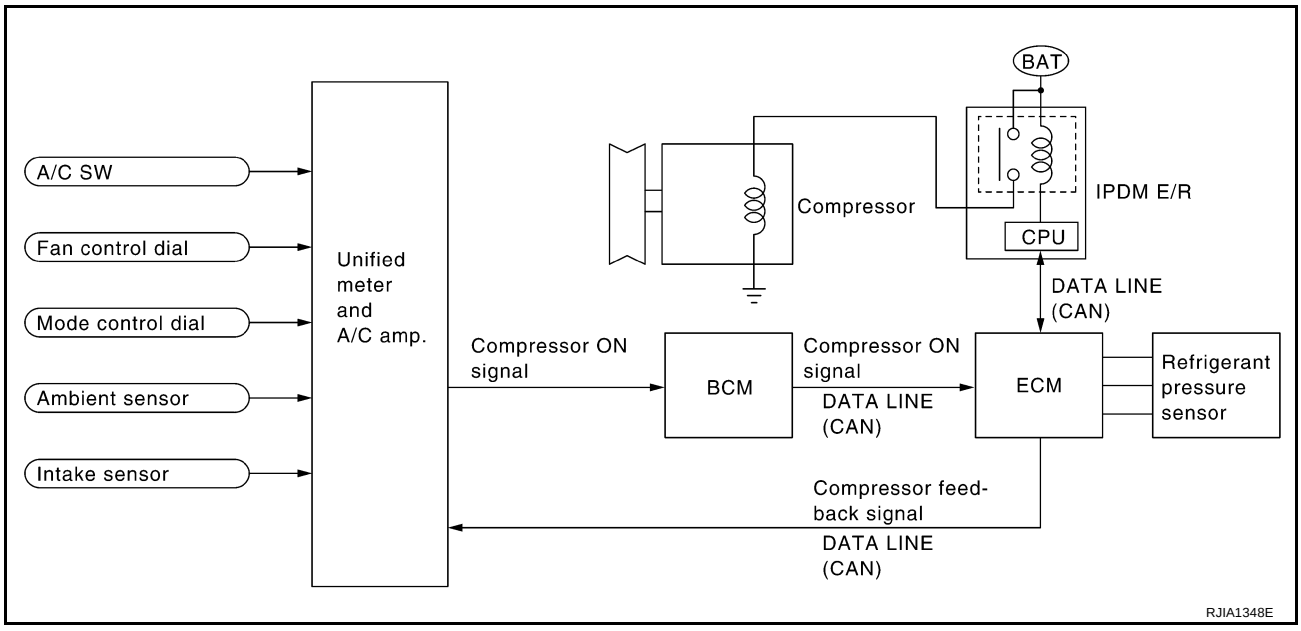
INTAKE DOOR CONTROL

The intake doors are automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature, amount of sunload and ON-OFF operation of the compressor.

OUTLET DOOR CONTROL

The outlet door is automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature and amount of sunload.

MAGNET CLUTCH CONTROL



When A/C switch is pressed, turn fan control dial to ON or set mode control dial to D/F, D/F2 or DEF position, unified meter and A/C amp. inputs compressor ON signal to BCM.
BCM sends compressor ON signal to ECM, via CAN communication line.
ECM judges whether compressor can be turned ON, based on each sensor status (refrigerant-pressure sensor signal, throttle angle, etc.). If it judges compressor can be turned ON, it sends compressor ON signal to IPDM E/R, via CAN communication line.
Upon receipt of compressor ON signal from ECM, IPDM E/R turns air conditioner relay ON to operate compressor.
When sending compressor ON signal to IPDM E/R via CAN communication line, ECM simultaneously sends compressor feedback signal to unified meter and A/C amp. via CAN communication line.
Unified meter and A/C amp., then, uses input compressor feedback signal to control air inlet.

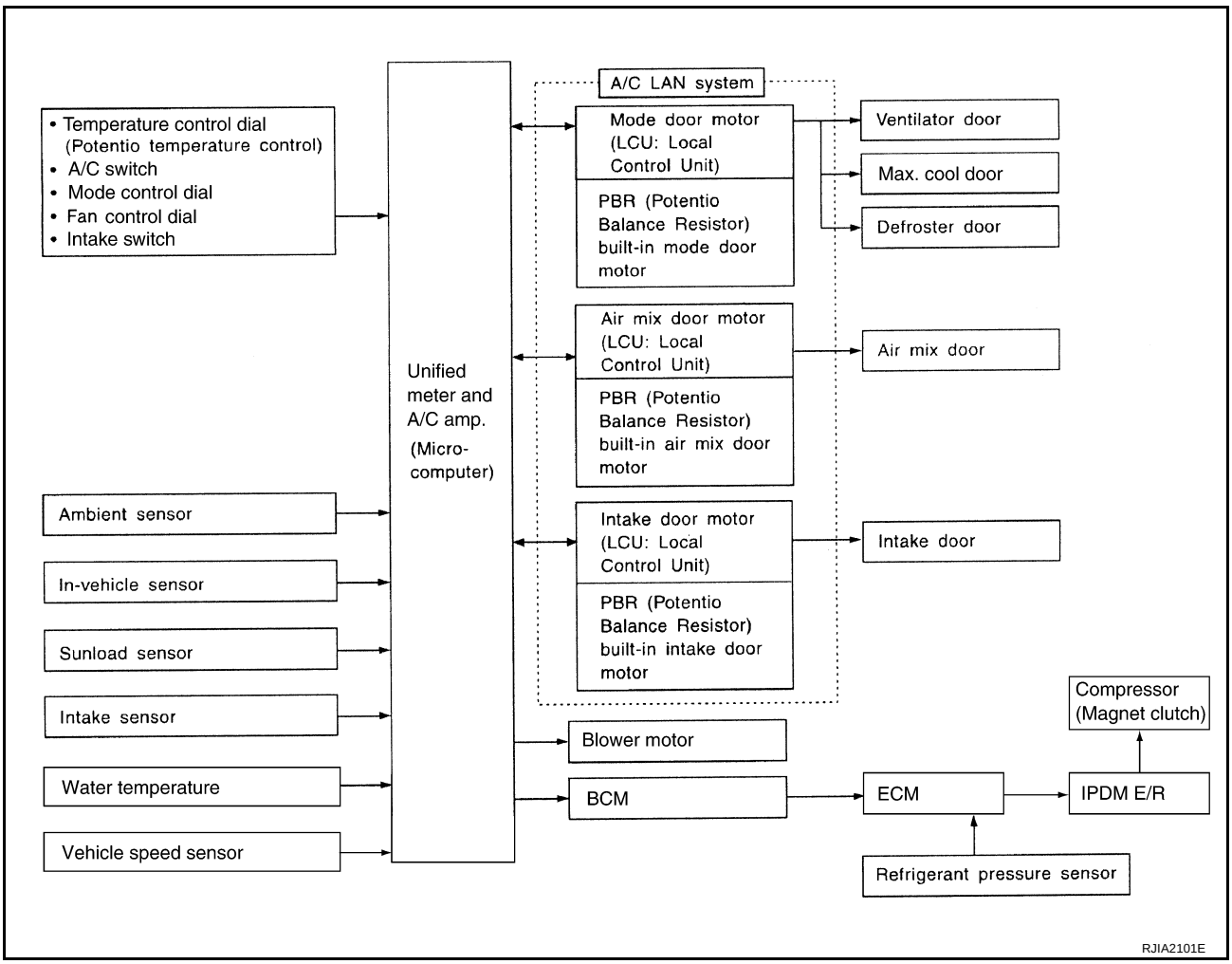
SELF-DIAGNOSTIC SYSTEM

The self-diagnostic system is built into the unified meter and A/C amp. to quickly locate the cause of symptoms.

Description of Control System

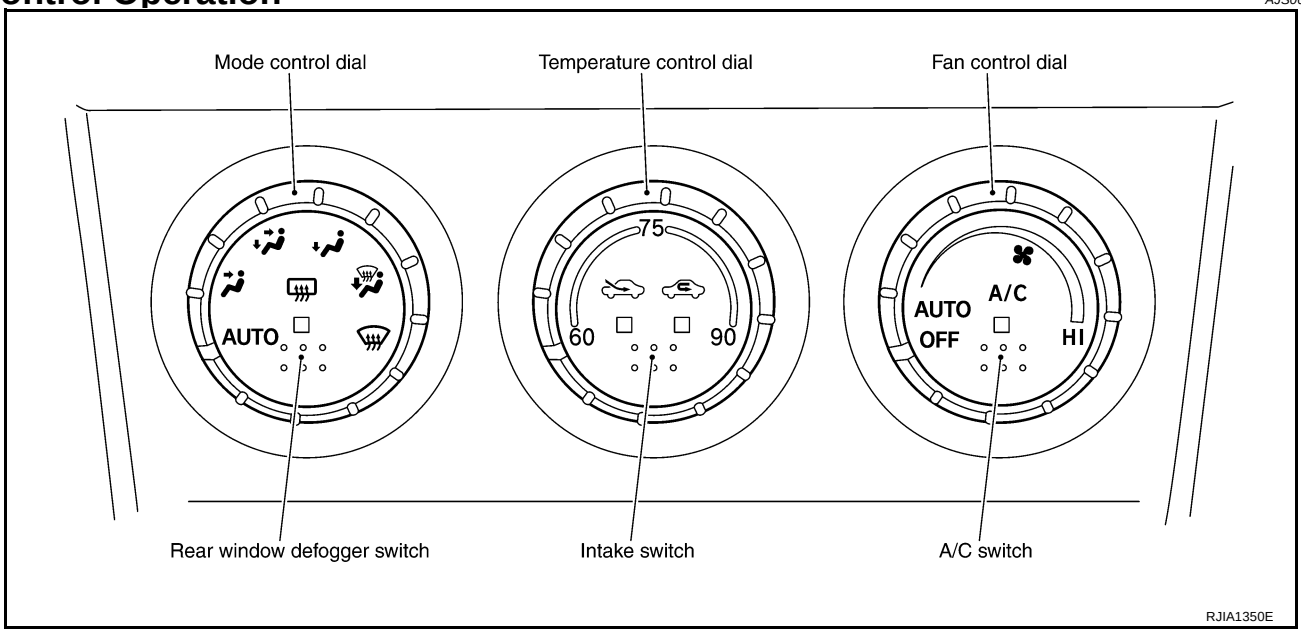
AJS0009Y

The control system consists of input sensors, switches, unified meter and A/C amp. (microcomputer) and outputs.
The relationship of these components is shown in the diagram below:



Control Operation

AJS0009Z



TEMPERATURE CONTROL DIAL (POTENTIO TEMPERATURE CONTROL)

Increases or decreases the set temperature.

INTAKE SWITCH

- When intake switch is ON, REC indicator turns ON, and air inlet is fixed to REC.
- Press intake switch again, FRE indicator turns ON, and air inlet is fixed to FRE.
- When intake switch is pressed for approximately 1.5 seconds or longer, REC and FRE indicators blink twice. Then, automatic control mode is entered. Inlet status is displayed even during automatic control.
- When FRE indicator is turned ON, shifting mode control dial to D/F or DEF, or when compressor is turned from ON to OFF, intake switch is automatically turned OFF (fixed to FRE mode). REC mode can be re-entered by pressing intake switch again. (Except D/F, D/F2 or DEF position)

REAR WINDOW DEFOGGER SWITCH

When illumination is ON, rear window is defogged.

A/C SWITCH

The compressor is ON or OFF.
(Pressing the A/C switch when the fan control dial is ON will turn off the A/C switch and compressor.)

MODE CONTROL DIAL

Controls the air discharge outlets.
Positions the air outlet doors to the defrost position. Also positions the intake doors to the outside air position.
When shifting mode control dial to D/F, D/F2 or DEF position under the following conditions, compressor is turned ON. (A/C LED ON)

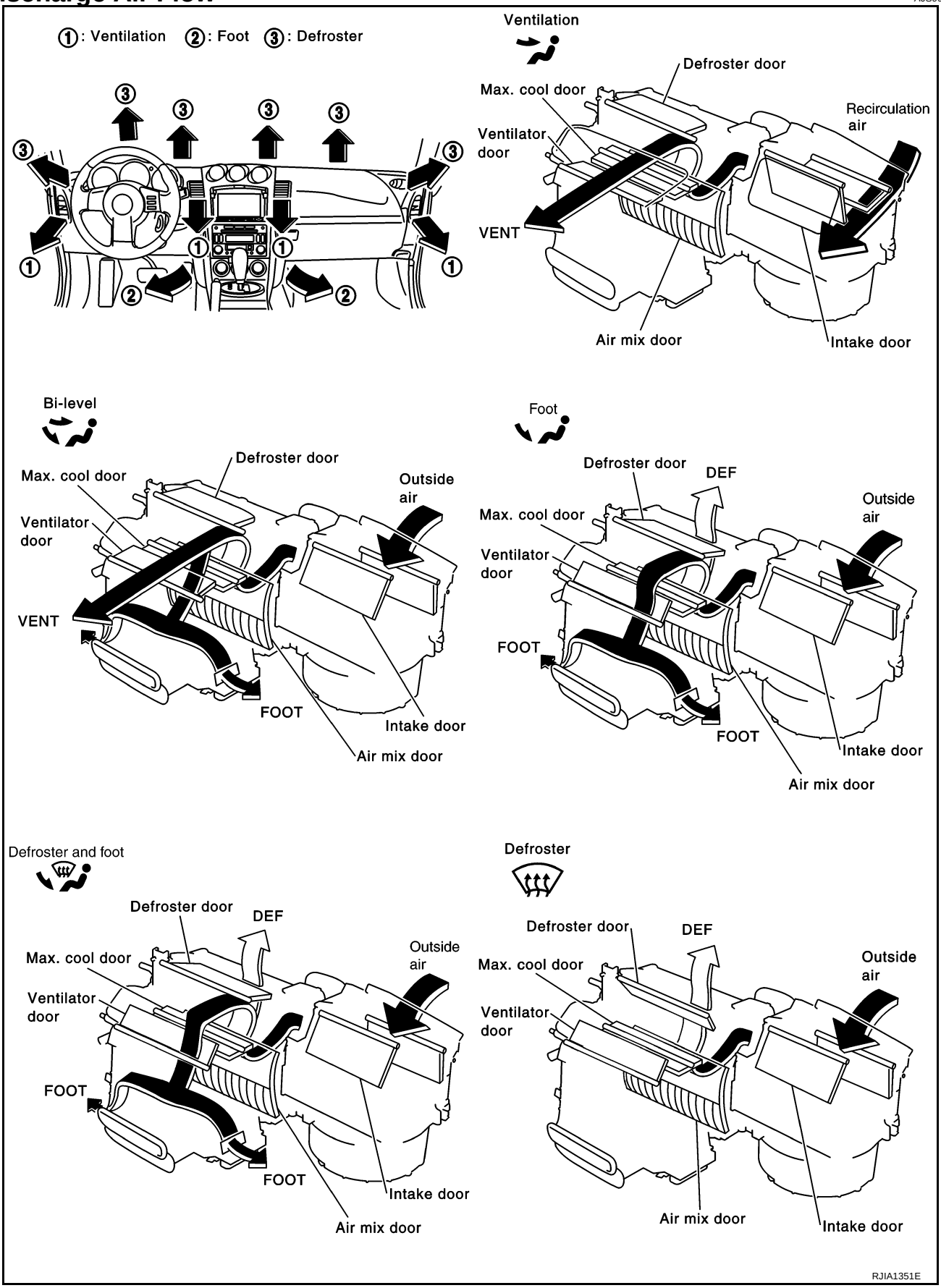
- FAN: ON
- A/C: OFF

FAN CONTROL DIAL

Automatically or manually control the blower speed. Twenty five speeds are available for manual control.
Shifting fan control dial to AUTO, compressor is turned ON automatically.

Discharge Air Flow

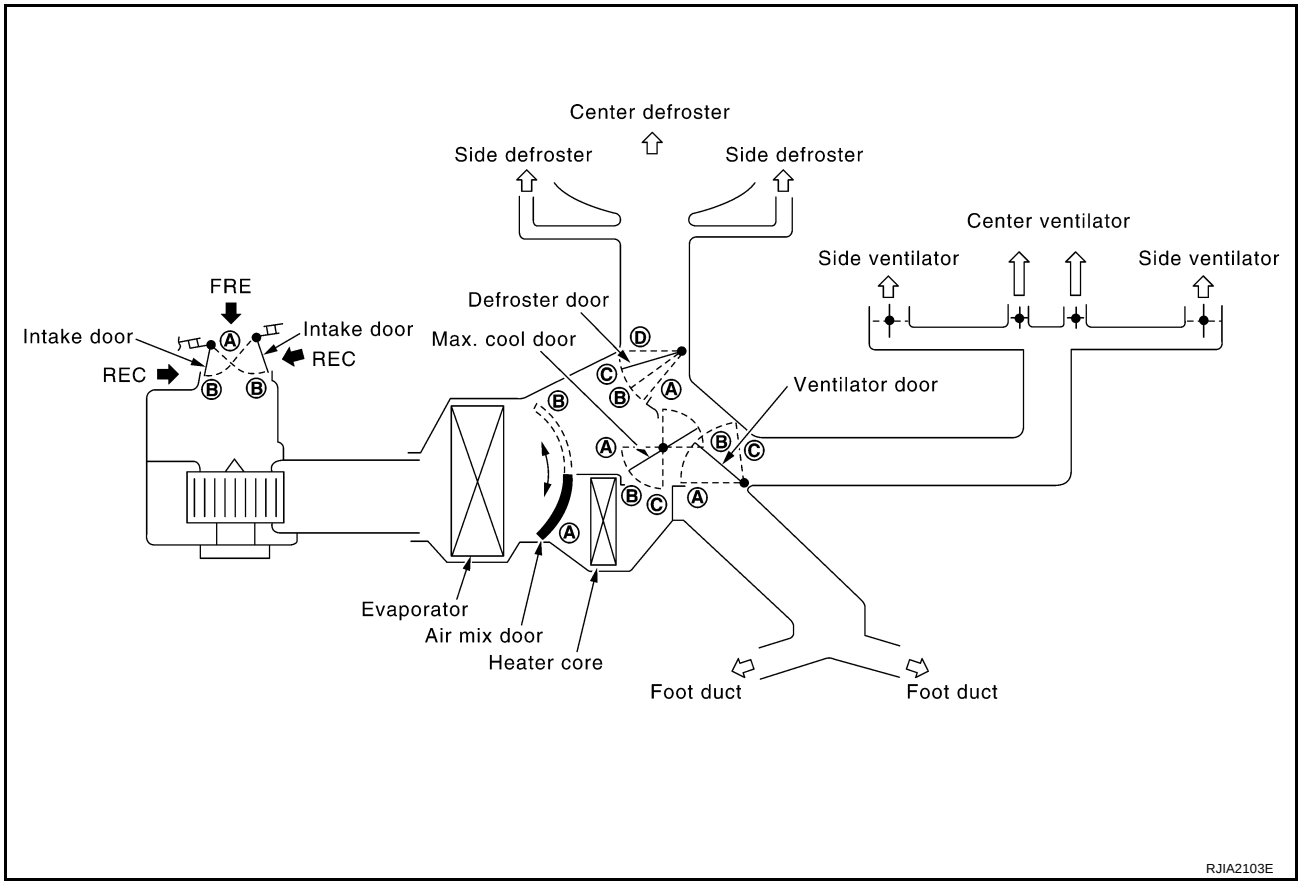
AJS000A1



System Description

AJS000R5

SWITCHES AND THEIR CONTROL FUNCTION



Door \ Position or switch	MODE control dial						Intake SW		Temperature control dial		
	VENT	B/L	FOOT	D/F	DEF	AUTO					
						—			18°C (60°F)	~	32°C (90°F)
Ventilator door	Ⓐ	Ⓑ	Ⓒ	Ⓒ	Ⓒ	AUTO	—		—		
Max. cool door	Ⓐ	Ⓑ	Ⓑ	Ⓑ	Ⓒ		—		—		
Defroster door	Ⓓ	Ⓓ	Ⓓ or Ⓒ *1	Ⓑ	Ⓐ		—		—		
Intake door	—			Ⓑ	Ⓑ	—	Ⓐ *2	Ⓑ *2	—		
Air mix door	—			—	—	—	—		Ⓐ	AUTO	Ⓑ

*1: This position is selected only when the mode door is automatically controlled.
*2: Inlet status is displayed even during automatic control.

RJIA2447E

CAN Communication System Description

AJS000R2

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. For details, refer to LAN-5, "CAN Communication Unit" .

TROUBLE DIAGNOSIS

PFP:00004

CONSULT-II

AJS001F5

CONSULT-II performs the following functions communicating with BCM.

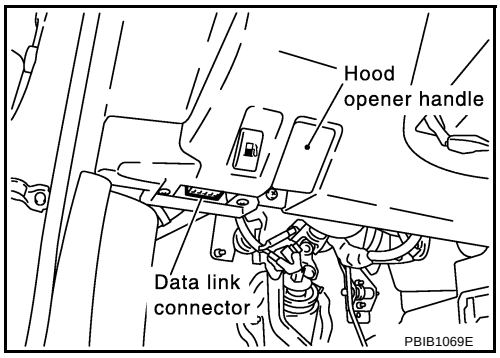
System part	Check item, diagnosis mode	Description
BCM	Data monitor	Displays BCM input data in real time.

CONSULT-II INSPECTION PROCEDURE

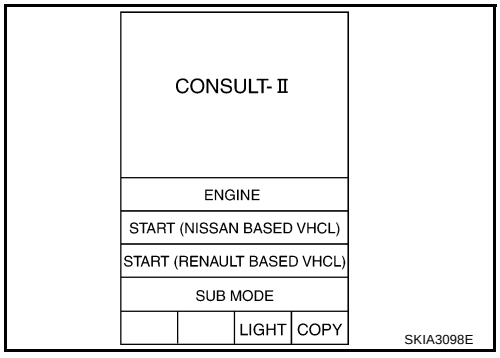
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

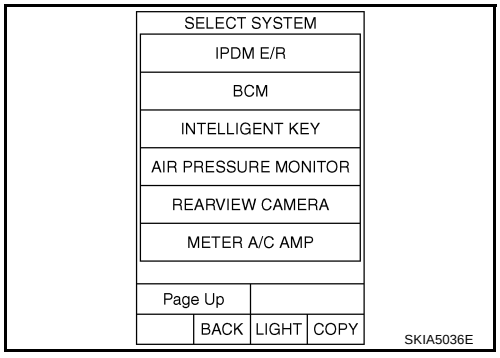
1. With the ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to the data link connector, then turn the ignition switch ON.



2. Touch “START (NISSAN BASED VHCL)”.



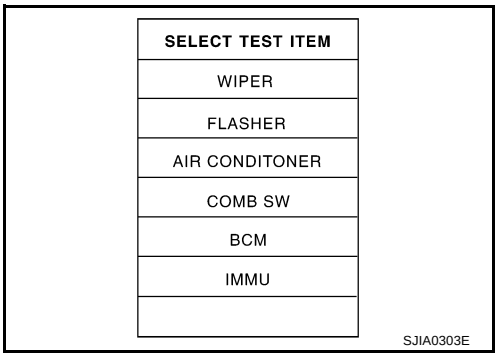
3. Touch “BCM” on “SELECT SYSTEM” screen. If “BCM” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



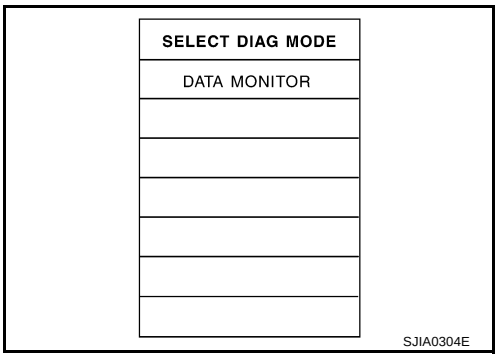
DATA MONITOR

Operation Procedure

1. Touch “AIR CONDITIONER” on “SELECT TEST ITEM” screen.



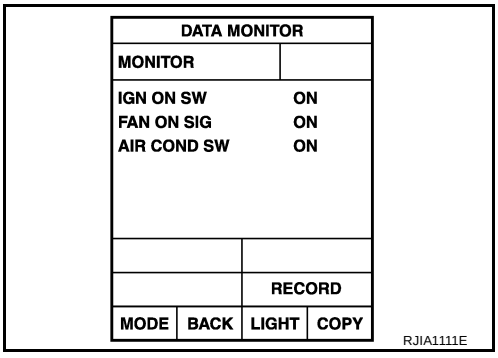
2. Touch “DATA MONITOR” on “SELECT DIAG MODE” screen.



3. Touch either “ALL SIGNALS” or “SELECTION FROM MENU” on “DATA MONITOR” screen.

All signals	Monitors all the items.
Selection from menu	Selects and monitors the individual item selected.

4. Touch “START”.
5. When “SELECTION FROM MENU” is selected, touch items to be monitored. When “ALL SIGNALS” is selected, all the items will be monitored.
6. Touch “RECORD” while monitoring, then the status of the monitored item can be recorded. To stop recording, touch “STOP”.



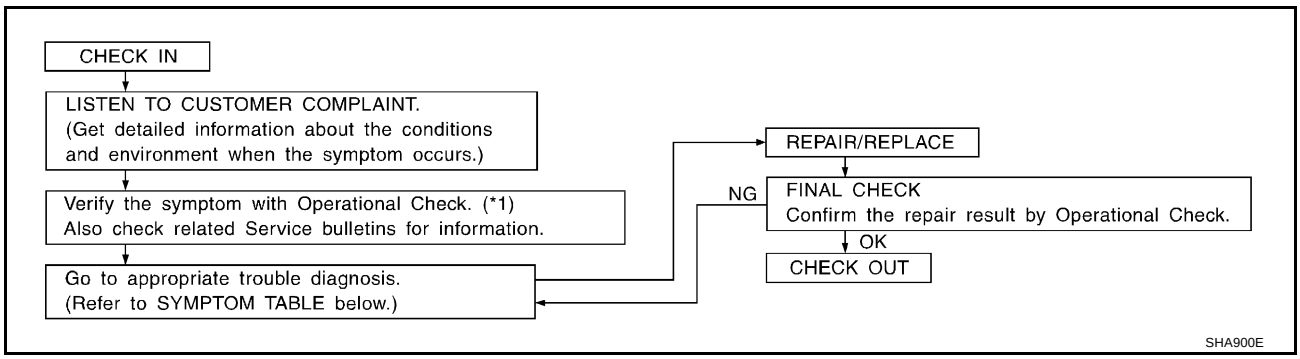
Display Item List

Monitor item name “operation or unit”		Contents
IGN ON SW	“ON/OFF”	Displays “IGN Position (ON)/OFF, ACC Position (OFF)” status as judged from ignition switch signal.
FAN ON SIG	“ON/OFF”	Displays “FAN (ON)/FAN (OFF)” status as judged from blower fan motor switch signal.
AIR COND SW	“ON/OFF”	Displays “COMP (ON)/COMP (OFF)” status as judged from air conditioner switch signal.

How to Perform Trouble Diagnoses for Quick and Accurate Repair

AJS000A3

WORK FLOW



*1 ATC-57, "Operational Check".

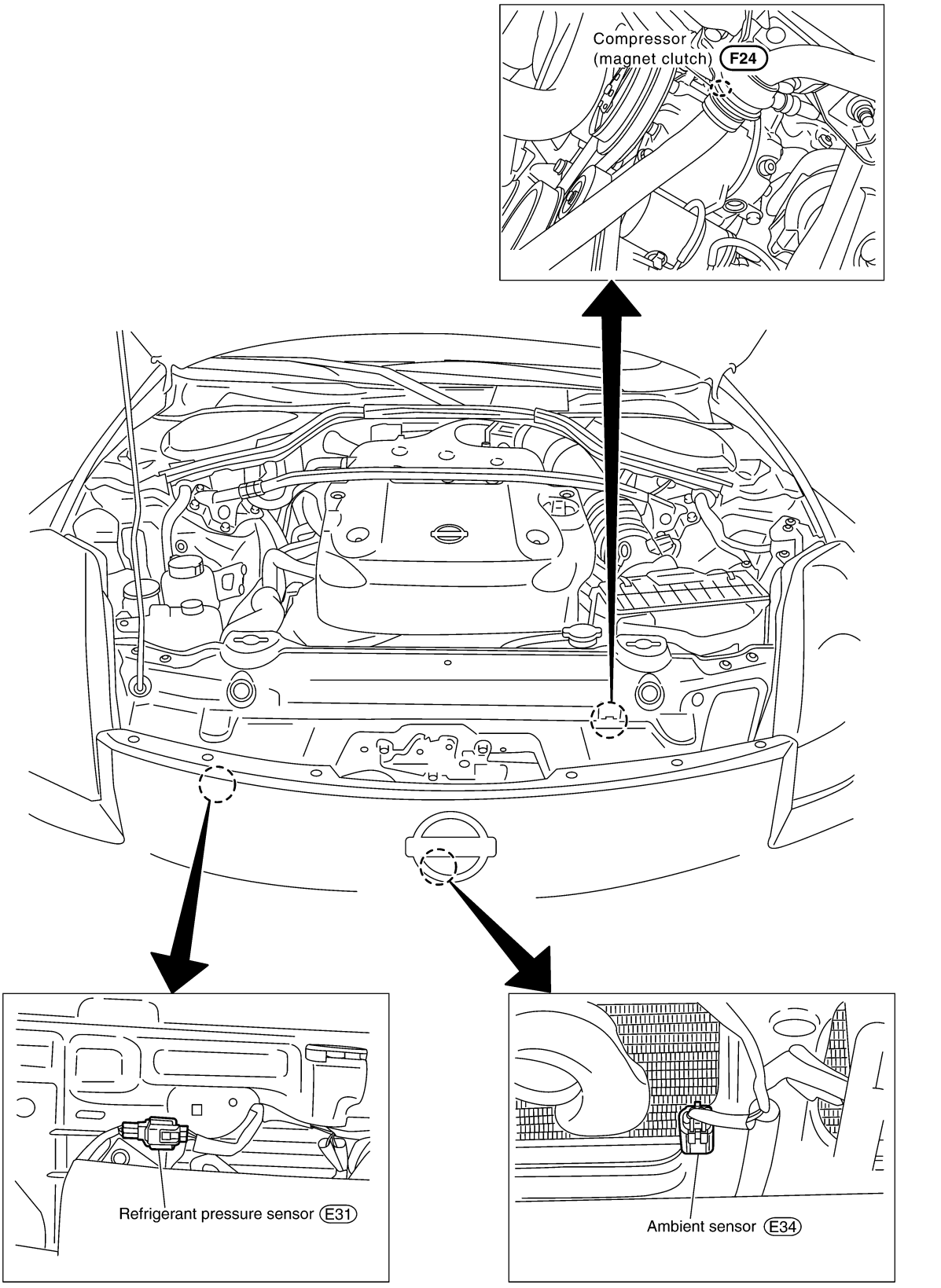
SYMPTOM TABLE

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C system.	ATC-59, "Power Supply and Ground Circuit for Auto Amp."
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor. (LAN)	ATC-65, "Mode Door Motor Circuit"
Mode door motor does not operate normally.		
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor. (LAN)	ATC-68, "Air Mix Door Motor Circuit"
Air mix door motor does not operate normally.		
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor. (LAN)	ATC-72, "Intake Door Motor Circuit"
Intake door motor does not operate normally.		
Blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Blower Motor.	ATC-75, "Blower Motor Circuit"
Blower motor operation is malfunctioning under out of starting fan speed control.		
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	ATC-80, "Magnet Clutch Circuit"
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	ATC-87, "Insufficient Cooling"
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating.	ATC-95, "Insufficient Heating"
Noise	Go to Trouble Diagnosis Procedure for Noise.	ATC-96, "Noise"
Self-diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis.	ATC-97, "Self-diagnosis"

Component Parts and Harness Connector Location

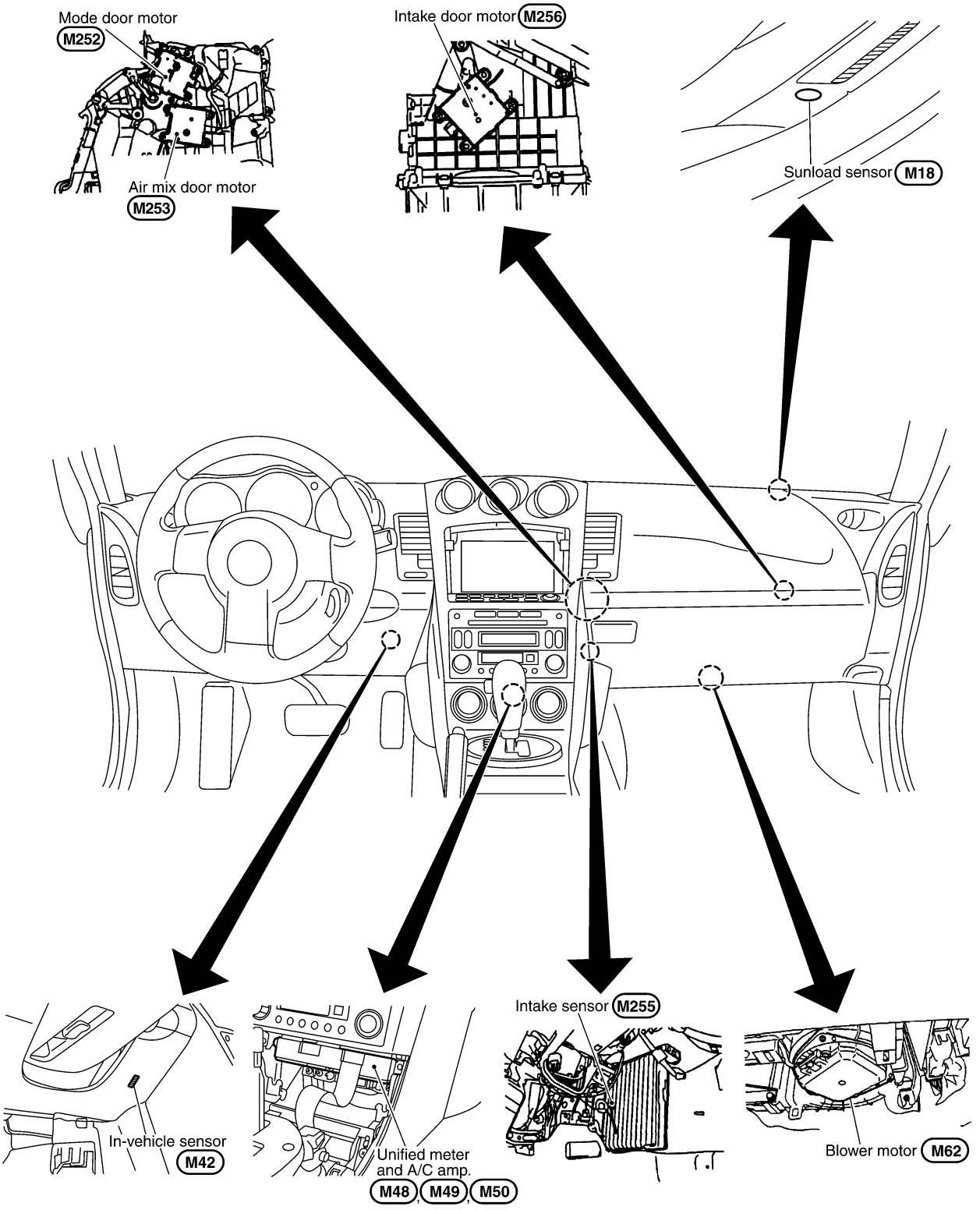
AJS000A4

ENGINE COMPARTMENT



RJIA1354E

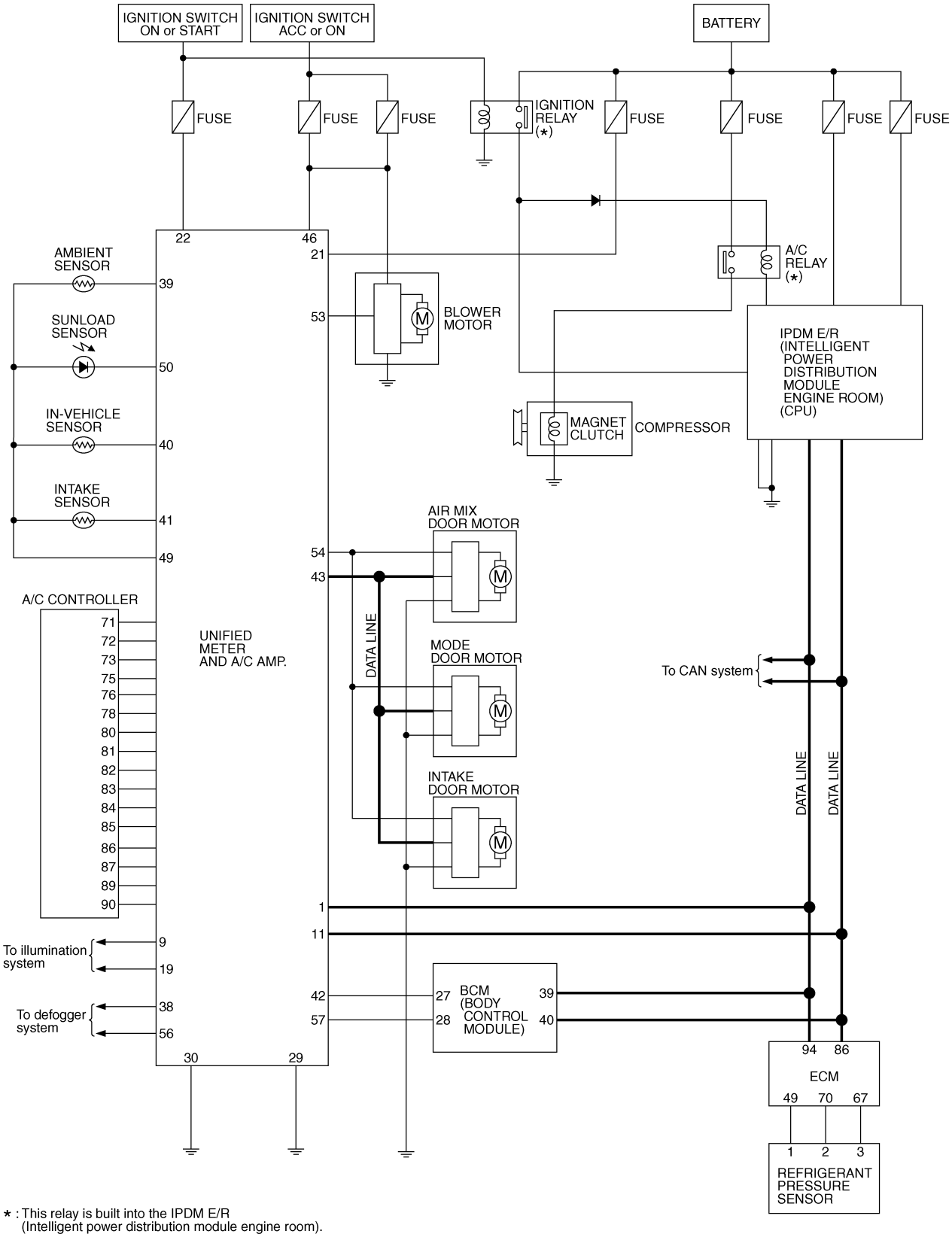
PASSENGER COMPARTMENT



RJIA1355E

Schematic

AJS000A5



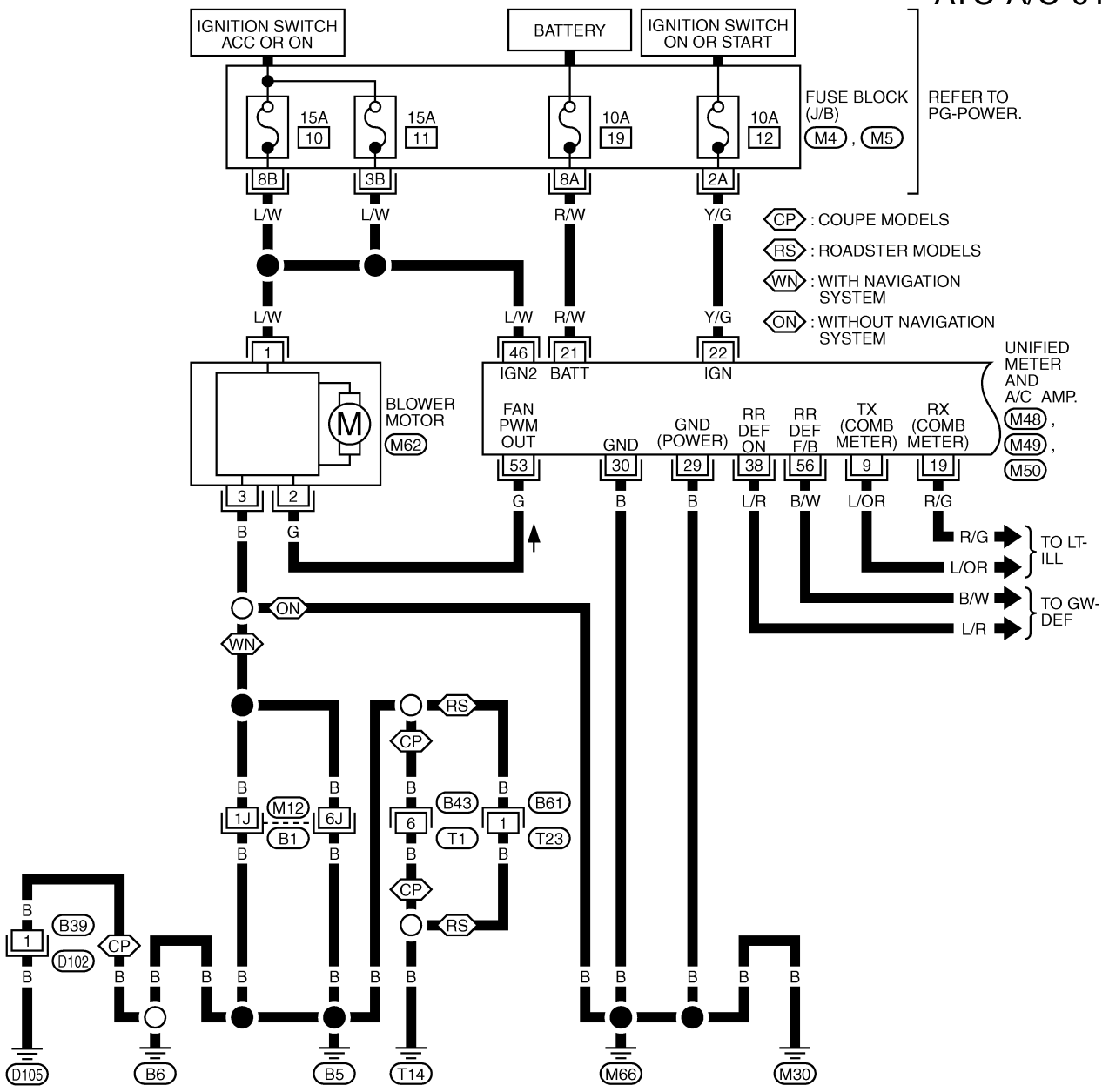
* : This relay is built into the IPDM E/R (Intelligent power distribution module engine room).

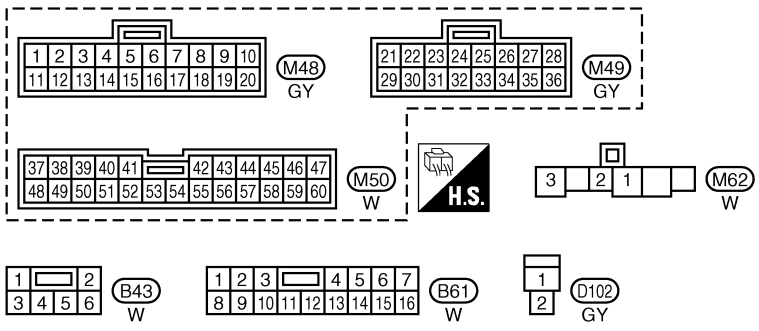
TJWT0101E

Wiring Diagram —A/C—

AJS000A6

ATC-A/C-01





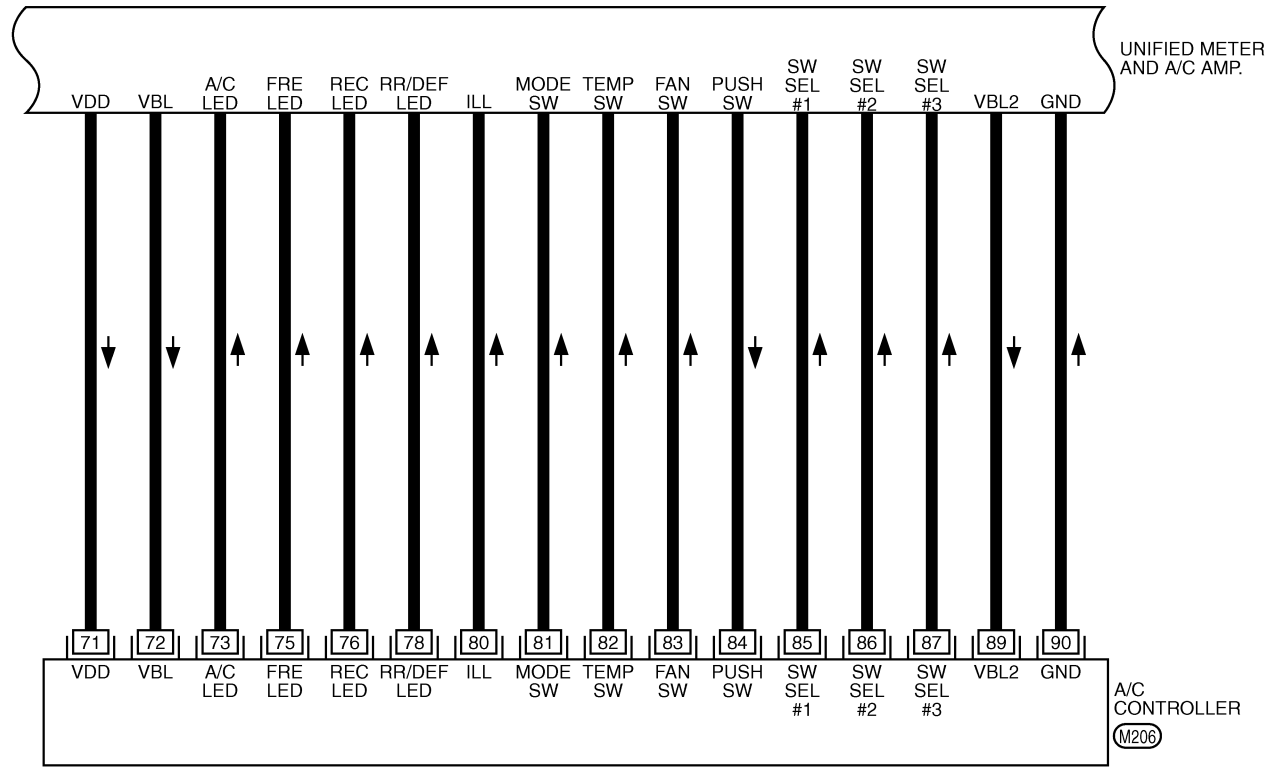
REFER TO THE FOLLOWING.

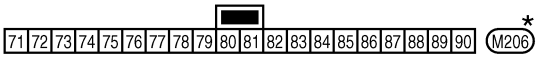
B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4, M5 -FUSE BLOCK-JUNCTION BOX (J/B)

TJWT0092E

ATC-A/C-02

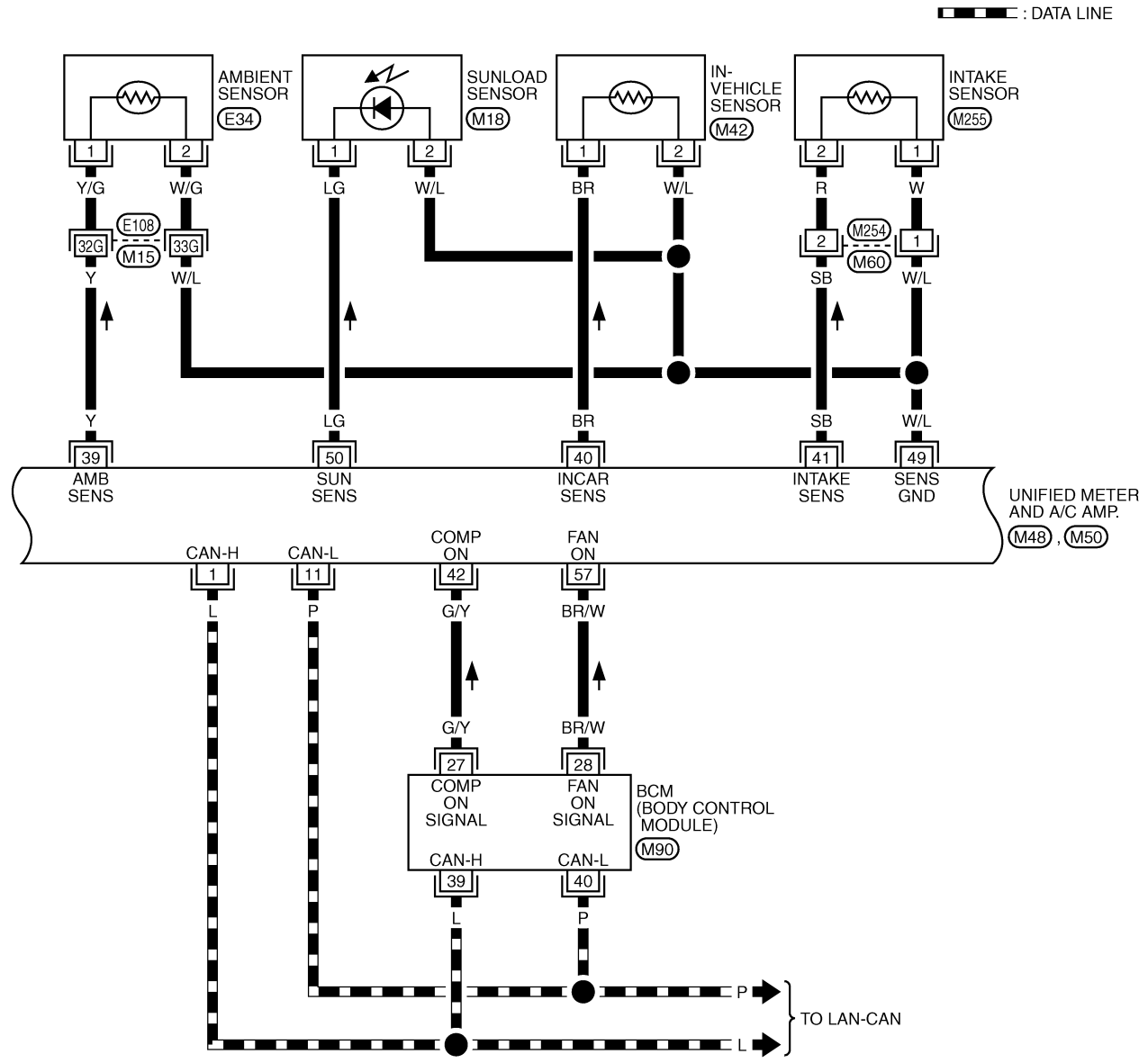


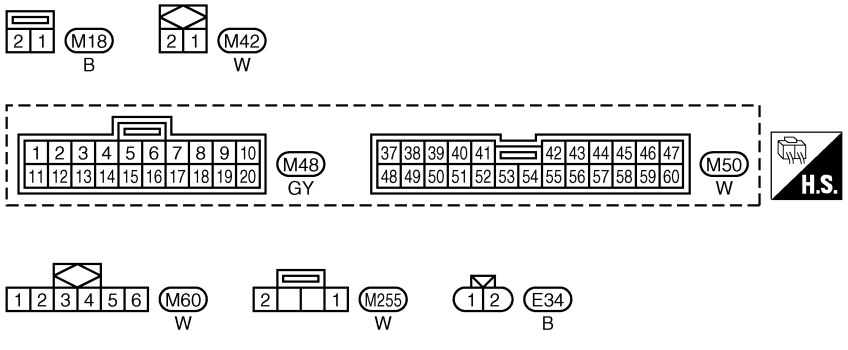


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TJWT0032E

ATC-A/C-03





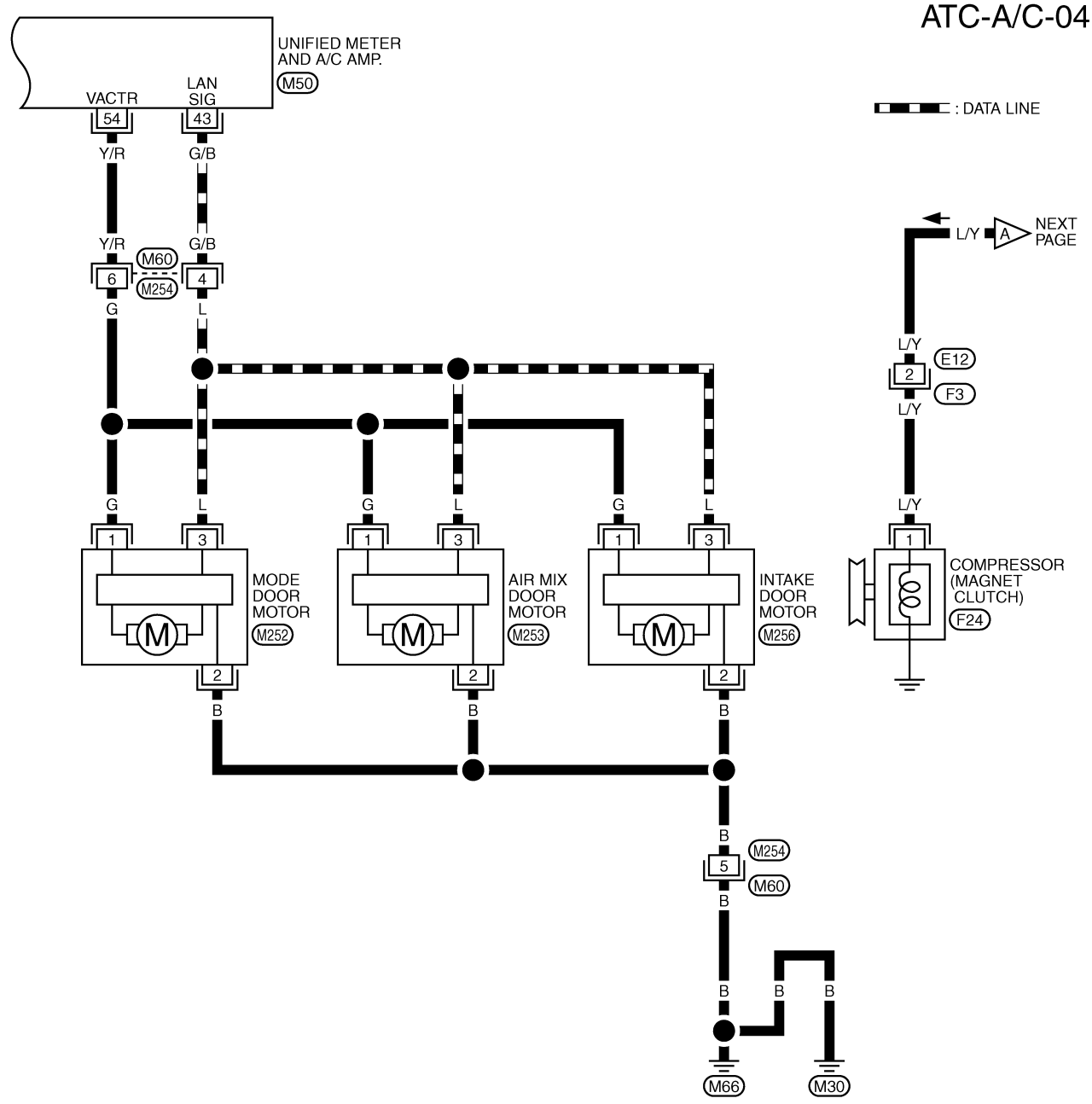
REFER TO THE FOLLOWING.

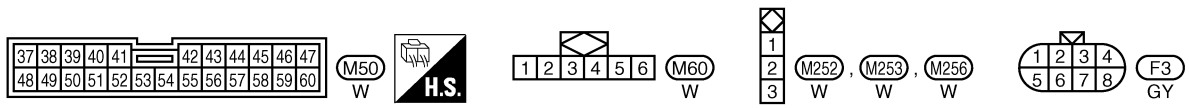
E108 -SUPER MULTIPLE JUNCTION (SMJ)

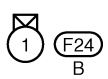
M90 -ELECTRICAL UNITS

TJWT0102E

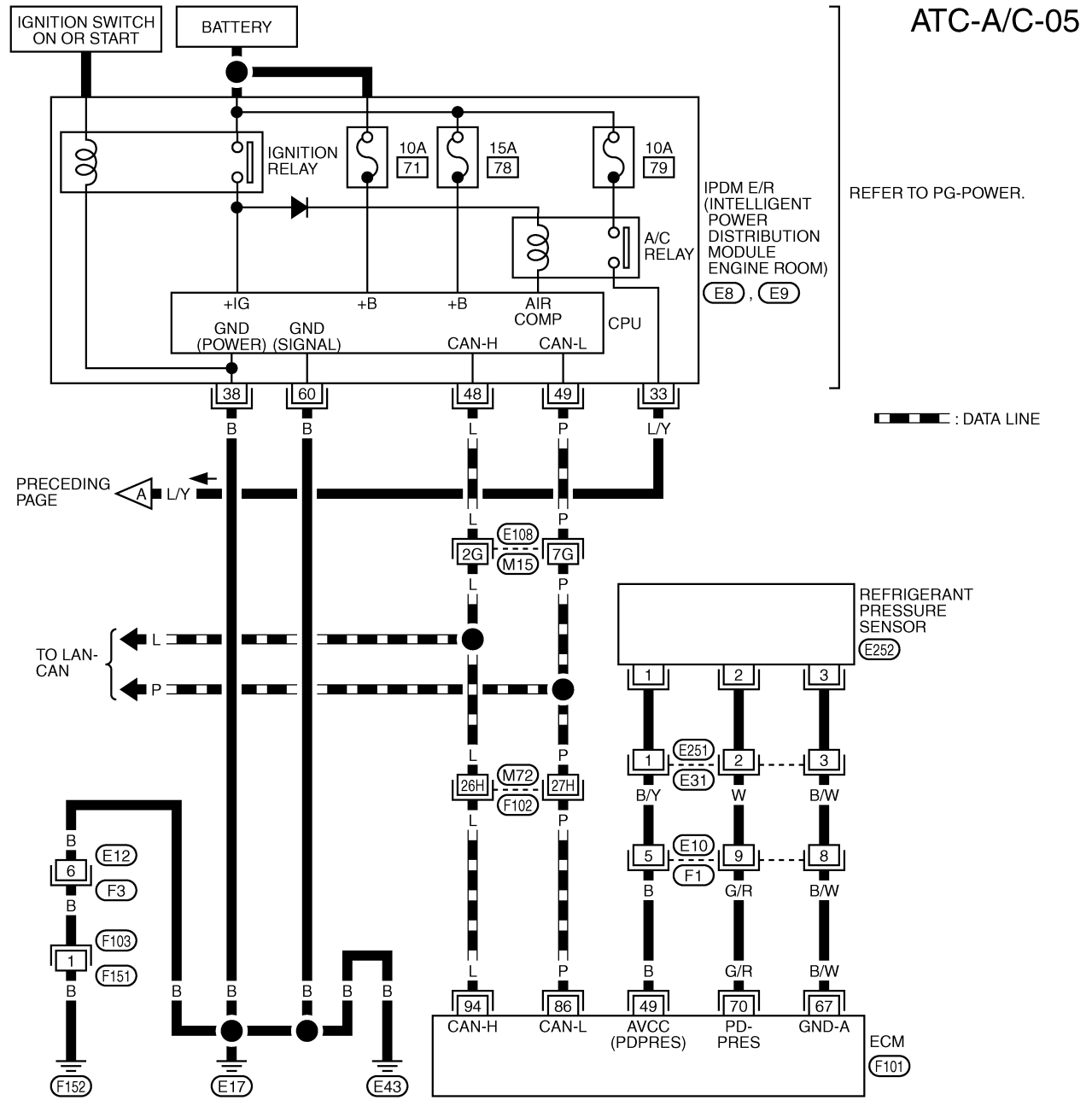
ATC-A/C-04

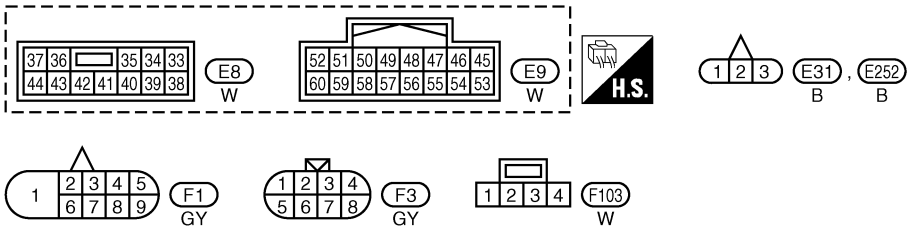






TJWT0103E





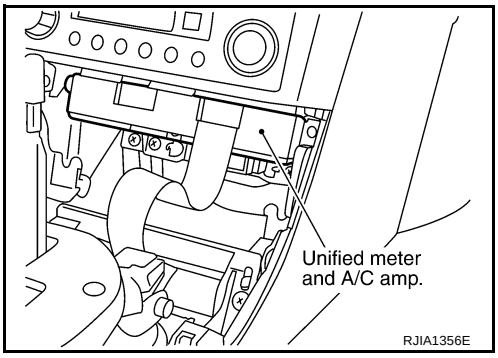
REFER TO THE FOLLOWING.
E108 , F102 -SUPER MULTIPLE JUNCTION (SMJ)
F101 -ELECTRICAL UNITS

TJWT0094E

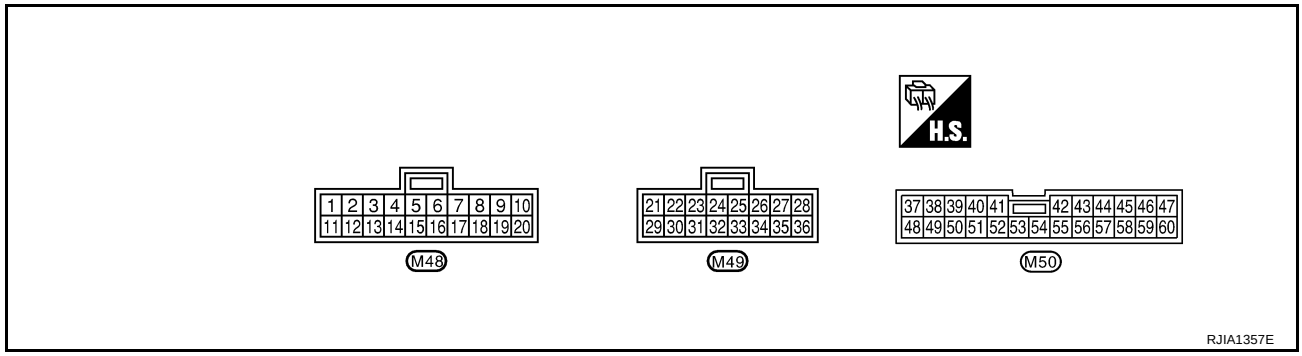
Auto Amp. Terminals and Reference Value

AJS000JI

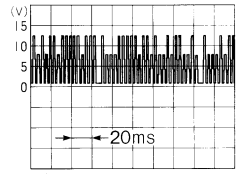
Measure voltage between each terminal and ground by following terminals and reference value for unified meter and A/C amp.



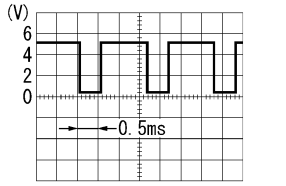
PIN CONNECTOR TERMINAL LAYOUT



TERMINALS AND REFERENCE VALUE FOR UNIFIED METER AND A/C AMP.

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V)
1	L	CAN-H	-	-	-
9	L/OR	Multiplex communication signal (Tx)	-	-	-
11	P	CAN-L	-	-	-
19	R/G	Multiplex communication signal (Rx)	-	-	-
21	R/W	Power supply for BAT	OFF	-	Battery voltage
22	Y/G	Power supply for IGN	ON	-	Battery voltage
29	B	Ground (Power)	ON	-	Approx. 0
30	B	Ground	ON	-	Approx. 0
38	L/R	Rear window defogger ON signal	ON	Rear window defogger switch: Press ON	Approx. 0
				Rear window defogger switch: OFF	Approx. 12
39	Y	Ambient sensor	-	-	-
40	BR	In-vehicle sensor	-	-	-
41	SB	Intake sensor	-	-	-
42	G/Y	Compressor ON signal	ON	Compressor: ON	Approx. 0
				Compressor: OFF	Approx. 5
43	G/B	A/C LAN signal	ON	-	

HAK0652D

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V)
46	L/W	Power supply for IGN2	ACC or ON	-	Battery voltage
49	W/L	Sensor ground	ON	-	Approx. 0
50	LG	Sunload sensor	-	-	-
53	G	Blower motor control signal	ON	Blower speed: 1st step	 SJIA0116J
54	Y/R	Power supply for each door motor	ON	-	Battery voltage
56	B/W	Rear window defogger feedback signal	ON	Rear window defogger switch: ON	Approx. 12
				Rear window defogger switch: OFF	Approx. 0
57	BR/W	Blower motor ON signal	ON	Fan control dial: ON (A/C system operates)	Approx. 0
				Fan control dial: OFF	Approx. 5

Self-diagnosis Function

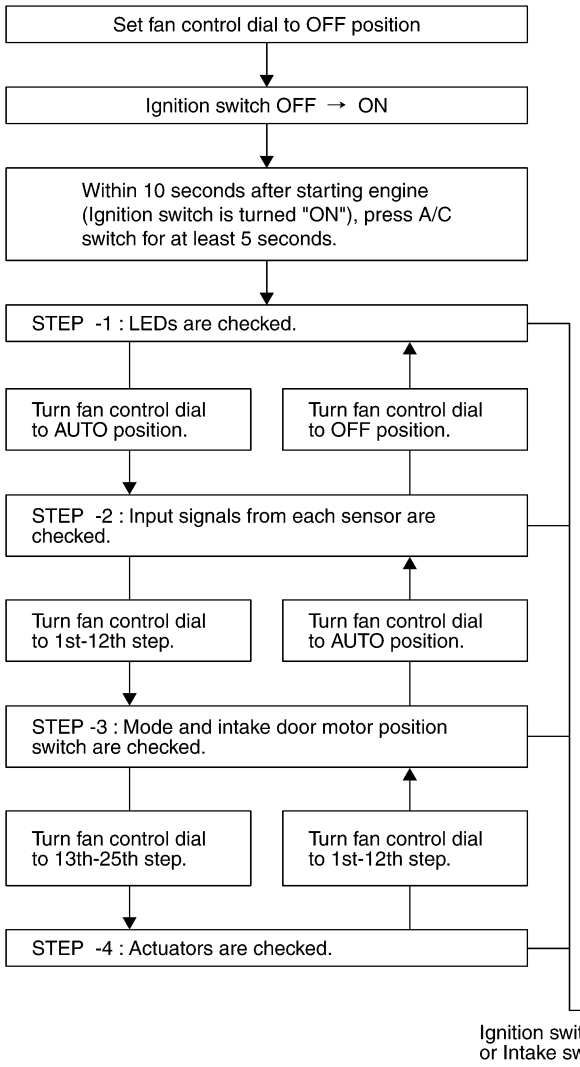
AJS000JJ

DESCRIPTION

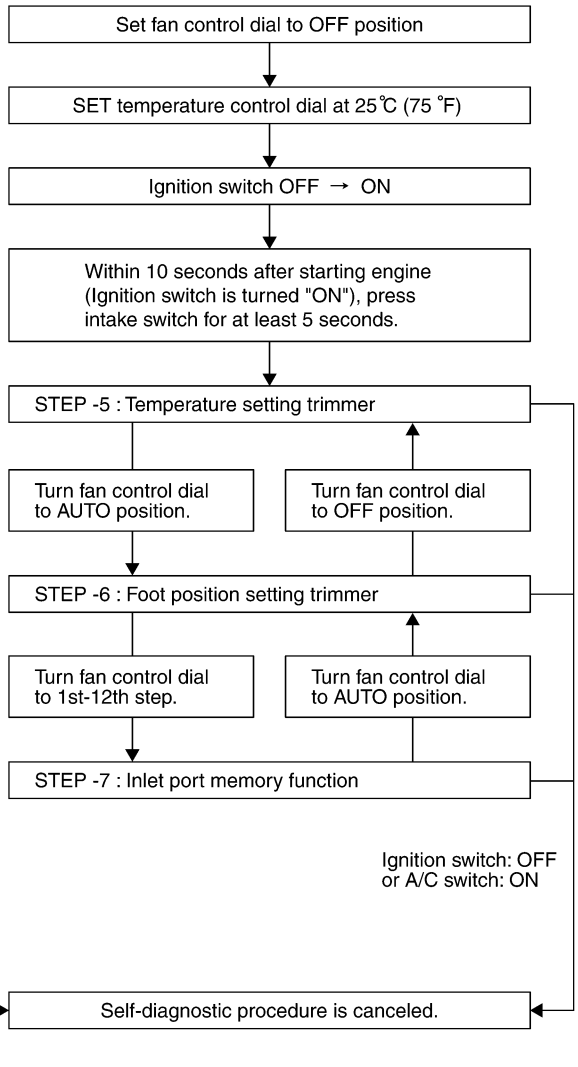
The self-diagnostic system diagnoses sensors, door motors, blower motor, etc. by system line.
Self-diagnosis is step-1 to 7. There are two ways of changing method during self-diagnosis.

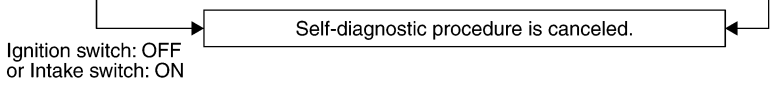
- Switching to self-diagnosis step-1 to 4.
  Shifting from usual control to the self-diagnostic system is accomplished by starting the engine (turning the ignition switch from OFF to ON) and pressing A/C switch for at least 5 seconds. The A/C switch must be pressed within 10 seconds after starting the engine (ignition switch is turned ON). This system will be canceled by either pressing intake switch or turning the ignition switch OFF. Shifting from one step to another is accomplished by means of turning fan control dial, as required.
- Switching to self diagnosis step-5 to 7 (Auxiliary mechanism).
  Shifting from usual control to the self-diagnostic system is accomplished by starting the engine (turning the ignition switch from OFF to ON) and pressing intake switch for at least 5 seconds. The intake switch must be pressed within 10 seconds after starting the engine (ignition switch is turned ON). This system will be canceled by either pressing A/C switch or turning the ignition switch OFF. Shifting from one step to another is accomplished by means of turning fan control dial, as required.

STEP 1 to 4



STEP 5 to 7 (Auxiliary mechanism)





RJIA1358E

FUNCTION CONFIRMATION PROCEDURE

1. SET IN SELF-DIAGNOSTIC MODE (STEP-1 TO 4)

1. Set the fan control dial to OFF position.
2. Turn ignition switch ON.
3. Set in self-diagnostic mode as follows. Within 10 seconds after starting engine (ignition switch is turned ON.), press A/C switch for at least 5 seconds.

CAUTION:
If battery voltage drops below 12V during diagnosis step-3, actuator speed becomes slower and as a result, the system may generate an error even when operation is usual. To avoid this, start engine before performing this diagnosis.

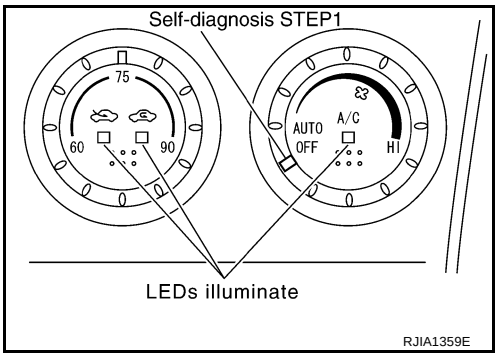
>> GO TO 2.

2. STEP-1:LEDS ARE CHECKED

Check intake and A/C switch LEDs illumination.

OK or NG

OK >> GO TO 3.
NG >> Refer to ATC-97, "Self-diagnosis" .



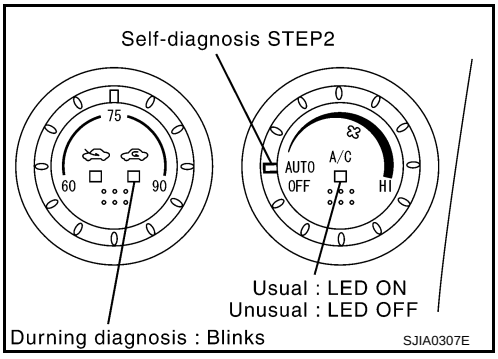
3. CHECK TO ADVANCE SELF-DIAGNOSIS STEP-2

1. Turn fan control dial to AUTO position.

   CAUTION:
   When switched to STEP-2, LED of REC position blinks for approximately 25 seconds.
2. Advance to self-diagnosis STEP-2?

Check A/C LED illumination.

YES >> GO TO 4.
NO >> Replace A/C controller. (Fan control dial malfunctioning.)



4. CHECK TO RETURN SELF-DIAGNOSIS STEP-1

Turn fan control dial to OFF position.

Return to self-diagnosis STEP-1?

YES >> GO TO 5.
NO >> Replace A/C controller. (Fan control dial malfunctioning.)

5. STEP-2: SENSOR CIRCUITS ARE CHECKED FOR OPEN OR SHORT CIRCUIT

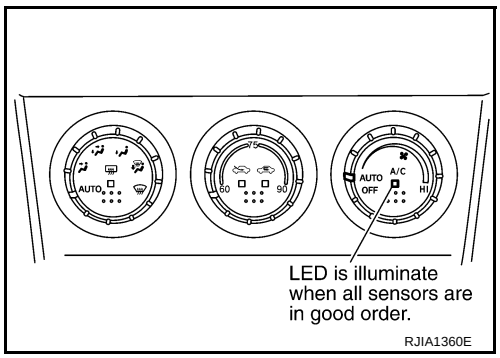
1. Turn fan control dial to AUTO position.
2. Turn mode control dial to AUTO position.

CAUTION:
When switched to STEP-2, LED of REC position blinks for approximately 25 seconds.

3. Check A/C switch LED is illuminate.

OK or NG

OK >> GO TO 6.
NG >> GO TO 9.

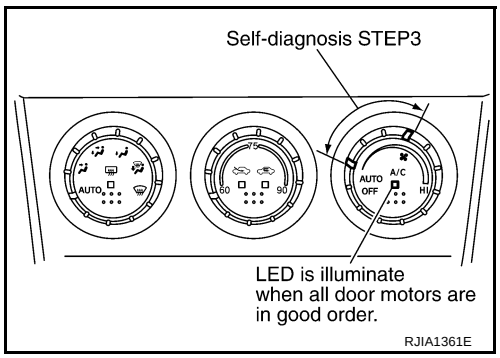


6. STEP-3: MODE DOOR AND INTAKE DOOR POSITIONS ARE CHECKED

1. Turn fan control dial to 1st–12th speed.
2. Check A/C switch LED is illuminate.

OK or NG

OK >> GO TO 7.
NG >> GO TO 10.



7. STEP-4: OPERATION OF EACH ACTUATOR IS CHECKED

1. Turn fan control dial to 13th–25th speed.
2. Change operation status of air conditioner by changing mode control dial position.

>> GO TO 8.

8. CHECK ACTUATORS

Refer to the following chart and confirm discharge air flow, air temperature, blower motor voltage and compressor operation.

Discharge air flow

Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	100%	–	–
	54%	46%	–
	–	76% (100%)	24% (–)
	–	57%	43%
	–	–	100%

( ): Manually control

RJIA2110E

	Mode control dial position					
STEP No. *1	STEP-41	STEP-42	STEP-43	STEP-44	STEP-45	STEP-46
Mode control dial position	AUTO	VENT	B/L	FOOT or FOOT2	D/F or D/F2	DEF
Mode door position	VENT	VENT2	B/L	FOOT *2	D/F	DEF
Intake door position	REC	REC	REC	FRE	FRE	FRE
Air mix door position	FULL COLD	FULL COLD	FULL COLD	FULL HOT	FULL HOT	FULL HOT
Blower motor duty ratio	25%	25%	41%	57%	75%	91%
Compressor	ON	ON	OFF	OFF	ON	OFF

Checks must be made visually, by listening to any noise, or by touching air outlets with your hand, etc. for improper operation.

*1: Step No. 41 to 46 are for differentiation and will not be displayed.

*2: FOOT position during automatic control. Refer to ATC-56, "AUXILIARY MECHANISM: FOOT POSITION SETTING TRIMMER" .

OK or NG

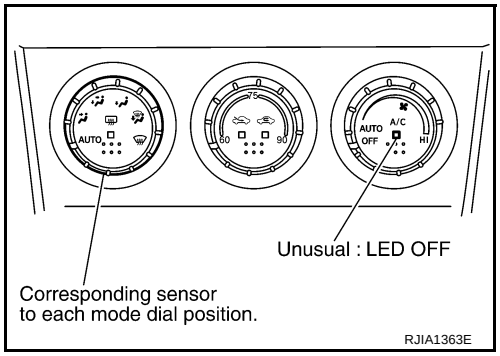
OK >> 1. Turn ignition switch OFF or intake switch ON.
2. INSPECTION END

NG >>
- Air outlet does not change.
  Go to Mode Door Motor Circuit. Refer to ATC-65, "Mode Door Motor Circuit" .
- Intake door does not change.
  Go to Intake Door Motor Circuit. Refer to ATC-72, "Intake Door Motor Circuit" .
- Blower motor operation is malfunctioning.
  Go to Blower Motor Circuit. Refer to ATC-75, "Blower Motor Circuit" .
- Magnet clutch does not engage.
  Go to Magnet Clutch Circuit. Refer to ATC-80, "Magnet Clutch Circuit" .
- Discharge air temperature does not change.
  Go to Air Mix Door Motor Circuit. Refer to ATC-68, "Air Mix Door Motor Circuit" .

9. CHECK MALFUNCTIONING SENSOR

Refer to the following chart.
*1: Conduct self-diagnosis STEP-2 under sunshine.
When conducting indoors, aim a light (more than 60W) at sunload sensor, otherwise LED of A/C switch will not indicate despite that sunload sensor is functioning properly.

CAUTION:
When switched to STEP-2, LED of REC position blinks for approximately 25 seconds.



Mode control dial position	Unusual	Malfunctioning sensor (Including circuits)	Reference page
VENT	A/C LED: OFF	Ambient sensor	*2
B/L		In-vehicle sensor	*3
FOOT or FOOT2		Sunload sensor *1	*4
D/F or D/F2		Intake sensor	*5
DEF		Air mix door motor (LCU) PBR	*6

*2: ATC-98, "DIAGNOSTIC PROCEDURE FOR AMBIENT SENSOR" .
*3: ATC-101, "DIAGNOSTIC PROCEDURE FOR IN-VEHICLE SENSOR" .
*4: ATC-103, "DIAGNOSTIC PROCEDURE FOR SUNLOAD SENSOR" .
*5: ATC-106, "DIAGNOSTIC PROCEDURE FOR INTAKE SENSOR" .
*6: ATC-61, "DIAGNOSTIC PROCEDURE FOR LAN CIRCUIT" .

>> INSPECTION END

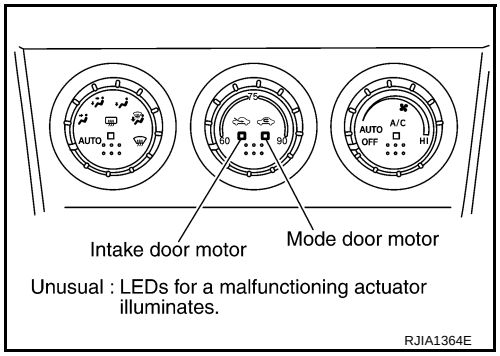
10. CHECK MALFUNCTIONING DOOR MOTOR POSITION SWITCH

Mode and/or intake door motor PBR(s) is/are malfunctioning.

CAUTION:
When switched to STEP-3, LED of REC position blinks for approximately 25 seconds.

Unusual	Mode or intake door position	Reference page
REC LED: ON	Mode door motor	*1
FRE LED: ON	Intake door motor	*2

*1:ATC-67, "DIAGNOSTIC PROCEDURE FOR MODE DOOR MOTOR" .
*2:ATC-74, "DIAGNOSTIC PROCEDURE FOR INTAKE DOOR MOTOR" .



>> INSPECTION END

AUXILIARY MECHANISM: TEMPERATURE SETTING TRIMMER

The trimmer compensates for differences in range of ±3°C (±6°F) between temperature setting (Temperature control dial position) and temperature felt by driver.

Operating procedures for this trimmer are as follows:

1. Set temperature at 25°C (75°F).
2. Set fan control dial to OFF.
3. Turn ignition switch ON.
4. Set in self-diagnostic mode as follows. Within 10 seconds after starting engine (ignition switch is turned ON.), press intake switch for at least 5 seconds.
5. Turn temperature control dial as desired. temperature will change at a rate of 1°C (2.0°F) each time a dial is turned.

Setting temperature	LED status of each switch		
	FRE	REC	A/C
-3°C (-6°F)	ON	ON	ON
-2°C (-4°F)	ON	ON	OFF
-1°C (-2°F)	ON	OFF	ON
0°C (0°F) (Initial setting)	OFF	OFF	OFF
1°C (2°F)	OFF	OFF	ON
2°C (4°F)	OFF	ON	OFF
3°C (6°F)	OFF	ON	ON

When battery cable is disconnected, trimmer operation is canceled. Temperature set becomes that of initial condition, i.e. 0°C (0°F).

AUXILIARY MECHANISM: FOOT POSITION SETTING TRIMMER

Wind distribution ratio in FOOT mode can be set.

Operating procedures for this trimmer are as follows:

1. Set temperature at 25°C (75°F).
2. Set fan control dial to AUTO.
3. Turn ignition switch ON.
4. Set in self-diagnostic mode as follows. Within 10 seconds after starting engine (ignition switch is turned ON.), press intake switch for at least 5 seconds.
5. Turn temperature control dial as desired.

Type	Discharge air flow			
	Automatically controls the mode door		Manually controls the mode door	
	FOOT	DEF	FOOT	DEF
Type-A (initial setting)	76%	24%	100%	–
Type-B	76%	24%	100%	–
Type-C	100%	–	100%	–
Type-D	100%	–	100%	–

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Type	LED status of each switch		
	FRE	REC	A/C
Type-A (Initial setting)	OFF	OFF	ON
Type-B	OFF	ON	OFF
Type-C	OFF	ON	ON
Type-D	ON	OFF	OFF

AUXILIARY MECHANISM: INLET PORT MEMORY FUNCTION

When ignition key is turned from OFF to ON, inlet port can be set to AUTO or manual.

Operating procedures for this trimmer are as follows:

1. Set fan control dial to 1st-25th speed.
2. Turn ignition switch ON.
3. Set in self-diagnostic mode as follows. Within 10 seconds after starting engine (ignition switch is turned ON.), press intake switch for at least 5 seconds.
4. Press the intake switch as desired.

LED status of FRE	LED status of REC	Setting status		Setting changeover method
		FRE	REC	
OFF	OFF	AUTO control	AUTO control	Intake SW: ON
OFF	ON	AUTO control (Initial setting)	Manual REC status is memorized. (Initial setting)	
ON	OFF	Manual FRE status is memorized.	AUTO control	
ON	ON	Manual FRE status is memorized.	Manual REC status is memorized.	

Operational Check

AJS000A9

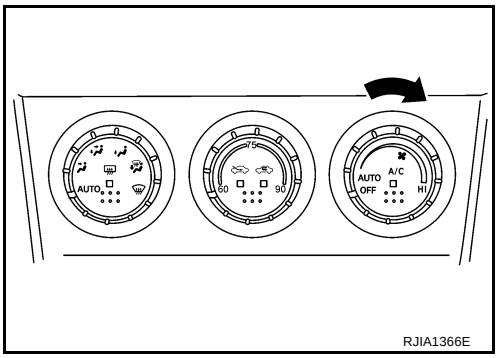
The purpose of the operational check is to confirm that the system operates properly.

Conditions : Engine running at usual operating temperature

CHECKING BLOWER

1. Turn fan control dial to 1st speed. Blower should operate on low speed.
2. Turn fan control dial to 2nd speed, and continue checking blower speed until all speeds are checked.
3. Leave blower on MAX. speed.

If NG, go to trouble diagnosis procedure for ATC-75, "Blower Motor Circuit" .
If OK, continue the check.



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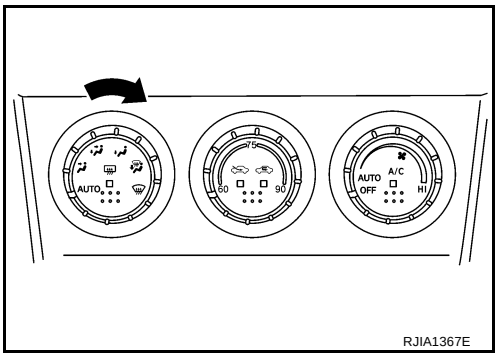
CHECKING DISCHARGE AIR

1. Turn mode control dial to each position.



RJIA1367E

2. Confirm that discharge air comes out according to the air distribution table. Refer to ATC-33, "Discharge Air Flow" .

Mode door position is checked in the next step.
If NG, go to trouble diagnosis procedure for ATC-65, "Mode Door Motor Circuit" .
If OK, continue the check.

NOTE:
Confirm that the compressor clutch is engaged (sound or visual inspection) and intake door position is at FRESH when the D/F, D/F2 or DEF position are selected.

Discharge air flow

Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	100%	–	–
	54%	46%	–
	–	76% (100%)	24% (–)
	–	57%	43%
	–	–	100%

( ): Manually control

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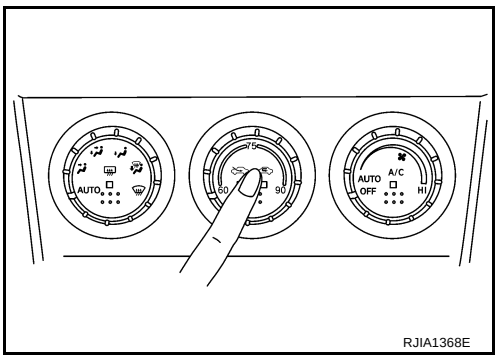
CHECKING INTAKE DOOR

1. Press intake switch. Recirculation indicator should illuminate.
2. Press intake switch again. Fresh indicator should illuminate.
3. Listen for intake door position change (you should hear blower sound change slightly).

If NG, go to trouble diagnosis procedure for ATC-72, "Intake Door Motor Circuit" .
If OK, continue the check.

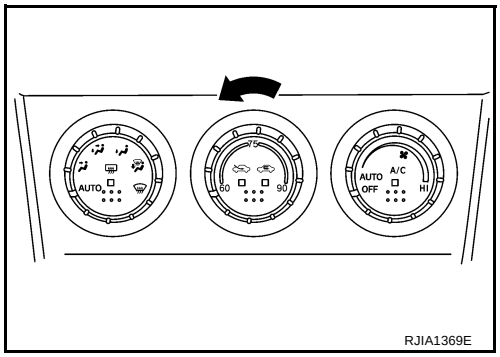


RJIA1368E

CHECKING TEMPERATURE DECREASE

1. Turn temperature control dial until 18°C (60°F).
2. Check for cold air at discharge air outlets.

If NG, go to trouble diagnosis procedure for ATC-87, "Insufficient Cooling" .
If OK, continue the check.

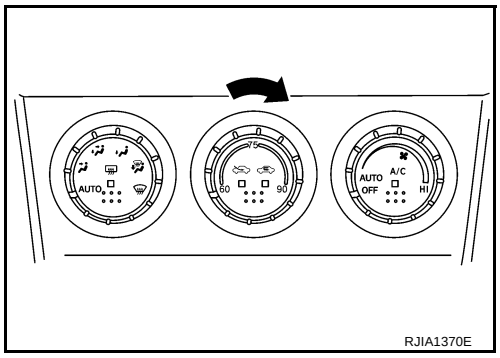


RJIA1369E

CHECKING TEMPERATURE INCREASE

1. Turn temperature control dial until 32°C (90°F).
2. Check for hot air at discharge air outlets.

If NG, go to trouble diagnosis procedure for ATC-95, "Insufficient Heating" .
If OK, continue the check.



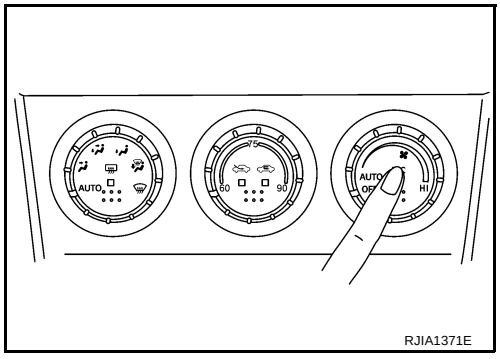
RJIA1370E

CHECKING A/C SWITCH

Turn fan control dial to AUTO position. (Compressor is turned ON automatically.)

- Confirm that the compressor clutch engages (sound or visual inspection). (Discharge air and blower speed will depend on ambient, in-vehicle, and set temperatures.)

If NG, go to trouble diagnosis procedure for ATC-59, "Power Supply and Ground Circuit for Auto Amp." , then if necessary, trouble diagnosis procedure for ATC-80, "Magnet Clutch Circuit" .
If all operational checks are OK (symptom cannot be duplicated), go to Incident Simulation Tests in GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident" and perform tests as outlined to simulate driving conditions environment. If symptom appears, refer to ATC-38, "SYMPTOM TABLE" and perform applicable trouble diagnosis procedures.



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Power Supply and Ground Circuit for Auto Amp.

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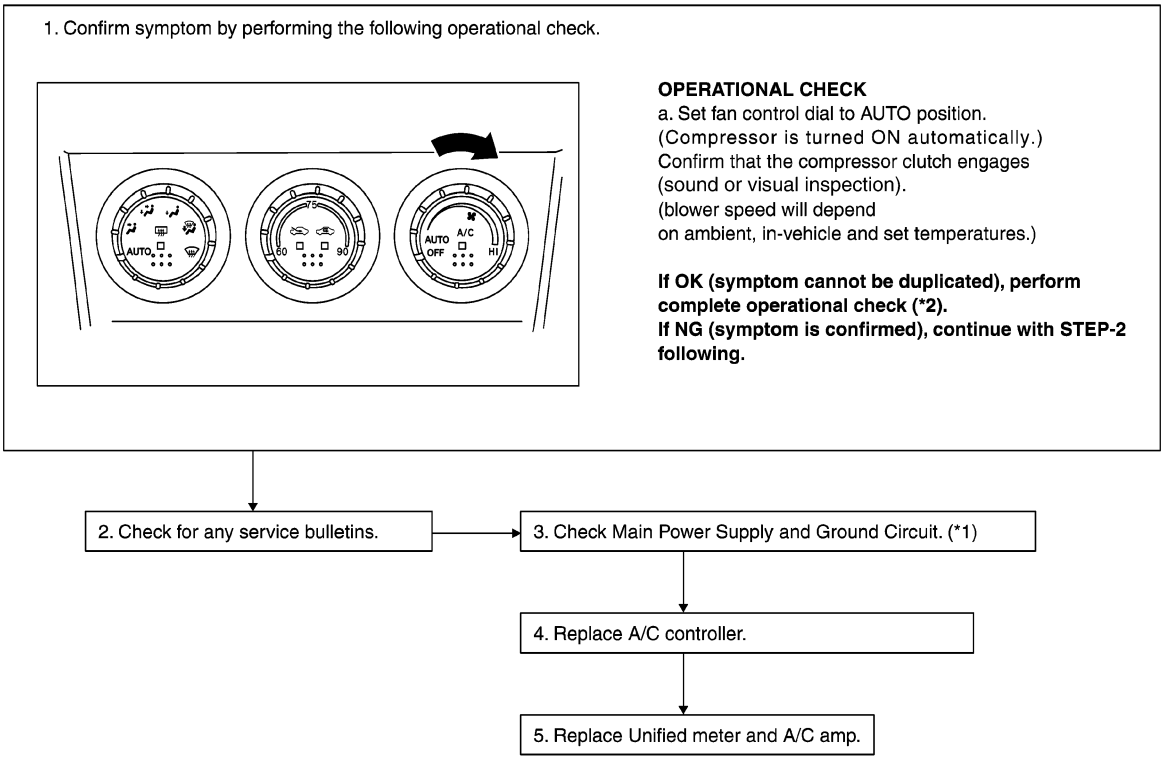
SYMPTOM: A/C system does not come on.

INSPECTION FLOW



RJIA1372E

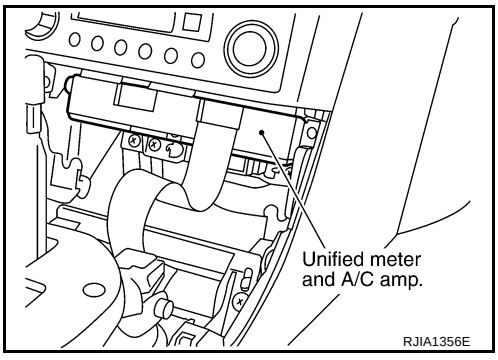
*1 ATC-60, "DIAGNOSTIC PROCEDURE FOR A/C SYSTEM".

*2 ATC-57, "Operational Check".

COMPONENT DESCRIPTION

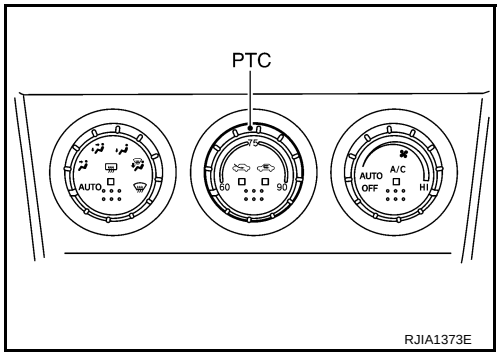
Unified meter and A/C amp. (Automatic Amplifier)

The unified meter and A/C amp. has a built-in microcomputer which processes information sent from various sensors needed for air conditioner operation. The air mix door motor, mode door motor, intake door motor, blower motor and compressor are then controlled.
The unified meter and A/C amp. is unitized with control mechanisms. When the various switches and temperature control dial are operated, data is input to the auto amp. from the A/C controller using multiplex communication.
Self-diagnostic functions are also built into unified meter and A/C amp. to provide quick check of malfunctions in the auto air conditioner system.



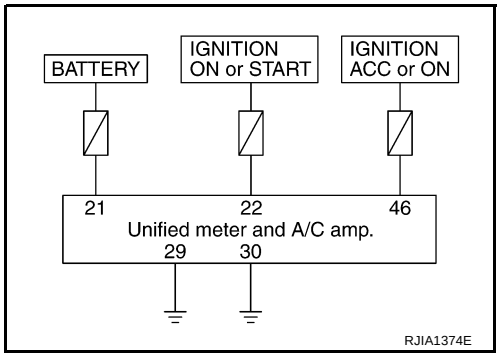
Potentio Temperature Control (PTC)

The PTC is built into the A/C controller. It can be set at an interval of 1°C (2.0°F) in the 18°C (60°F) to 32°C (90°F) temperature range by turning the temperature control dial.



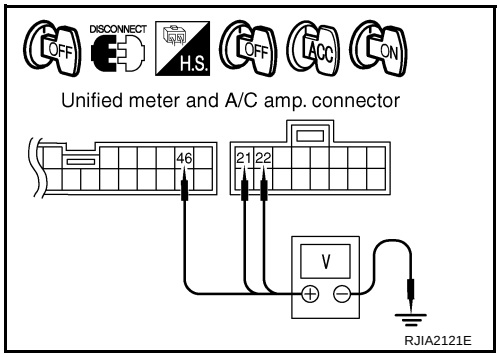
DIAGNOSTIC PROCEDURE FOR A/C SYSTEM

SYMPTOM: A/C system does not come on.



1. CHECK POWER SUPPLY CIRCUIT FOR UNIFIED METER AND A/C AMP.

1. Disconnect unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Check voltage between unified meter and A/C amp. harness connector M49 terminal 21 (R/W) and 22 (Y/G), unified meter and A/C amp. harness connector M50 terminal 46 (L/W) and ground.



Terminals			Ignition switch position		
(+)		(-)			
Unified meter and A/C amp. connector	Terminal No. (wire color)		OFF	ACC	ON
M49	21 (R/W)	Ground	Battery voltage	Battery voltage	Battery voltage
M49	22 (Y/G)		Approx. 0V	Approx. 0V	Battery voltage
M50	46 (L/W)		Approx. 0V	Battery voltage	Battery voltage

OK or NG

OK >> GO TO 2.

NG >> Check 10A and 15A fuses [Nos. 10, 11, 12 and 19, located in the fuse block (J/B)]. Refer to PG-88, "FUSE BLOCK - JUNCTION BOX (J/B)" .

- If fuses are OK, check harness for open circuit. Repair or replace if necessary.
- If fuses are NG, replace fuse and check harness for short circuit. Repair or replace if necessary.

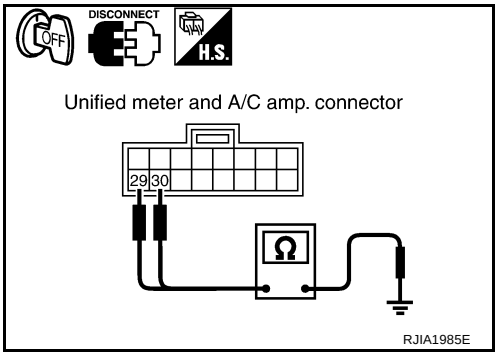
2. CHECK GROUND CIRCUIT FOR UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Check continuity between unified meter and A/C amp. harness connector M49 terminal 29 (B), 30 (B) and ground.

29, 30 – Ground : Continuity should exist.

OK or NG

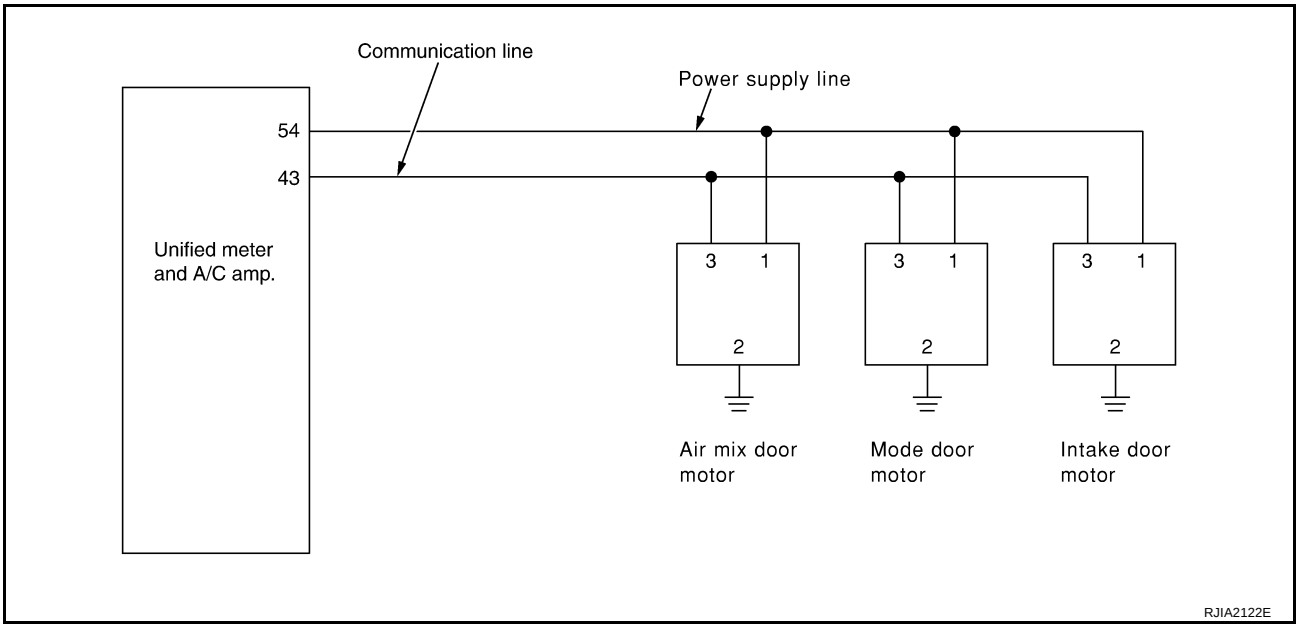
OK >> Replace unified meter and A/C amp.
NG >> Repair or replace harness.



LAN System Circuit

AJS000AB

SYMPTOM: Mode door motor, intake door motor and/or air mix door motor(s) does not operate normally.



DIAGNOSTIC PROCEDURE FOR LAN CIRCUIT

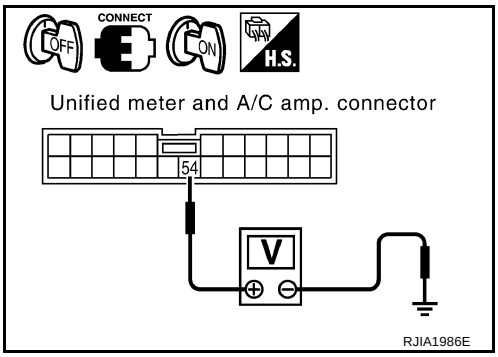
1. CHECK POWER SUPPLY FOR UNIFIED METER AND A/C AMP.

1. Turn ignition switch ON.
2. Check voltage between unified meter and A/C amp. harness connector M50 terminal 54 (Y/R) and ground.

54 – Ground : Battery voltage

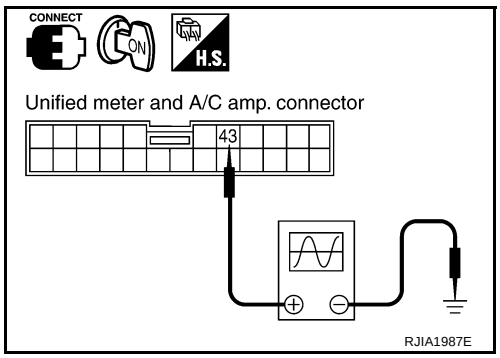
OK or NG

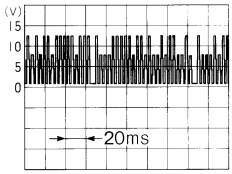
OK >> GO TO 2.
NG >> Replace unified meter and A/C amp.



2. CHECK SIGNAL FOR UNIFIED METER AND A/C AMP.

Confirm A/C LAN signal between unified meter and A/C amp. harness connector M50 terminal 43 (G/B) and ground using an oscilloscope.



Terminals			Voltage
(+)		(-)	
Unified meter and A/C amp. connector	Terminal No. (wire color)		
M50	43 (G/B)	Ground	 HAK0652D

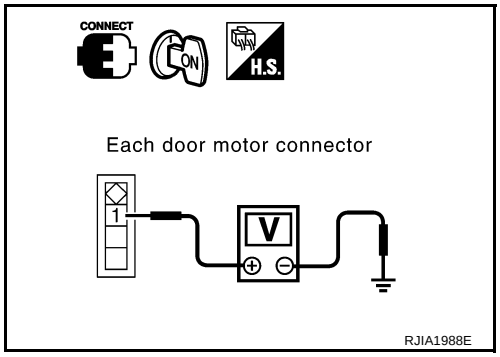
OK or NG

OK >> GO TO 3.
NG >> Replace unified meter and A/C amp.

3. CHECK POWER SUPPLY FOR MOTOR

Check voltage between mode door motor harness connector M252 terminal 1 (G), air mix door motor harness connector M253 terminal 1 (G), intake door motor connector M256 terminal 1 (G) and ground.

1 – Ground : Battery voltage

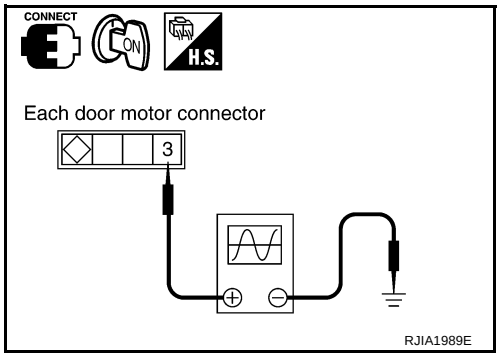


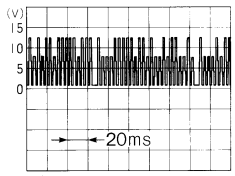
OK or NG

OK >> GO TO 4.
NG >> Replace harness or connector.

4. CHECK SIGNAL FOR MOTOR

Confirm A/C LAN signal between mode door motor harness connector M252 terminal 3 (L), air mix door motor harness connector M253 terminal 3 (L), intake door motor harness connector M256 terminal 3 (L) and ground using an oscilloscope.



Door motor	Terminals			Voltage
	(+)		(-)	
	Connector	Terminal No. (wire color)		
Mode	M252	3 (L)	Ground	 HAK0652D
Air mix	M253	3 (L)		
Intake	M256	3 (L)		

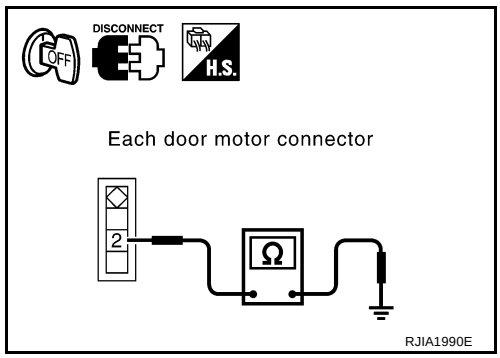
OK or NG

OK >> GO TO 5.
NG >> Replace harness or connector.

5. CHECK MOTOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect door motor connector.
3. Check continuity between mode door motor harness connector M252 terminal 2 (B), air mix door motor harness connector M253 terminal 2 (B), intake door motor harness connector M256 terminal 2 (B) and ground.

2 – Ground : Continuity should exist.



OK or NG

OK >> GO TO 6.
NG >> Replace harness or connector.

6. CHECK MOTOR OPERATION

1. Turn ignition switch OFF.
2. Disconnect each door motor connector.
3. Reconnect each door motor connector.
4. Turn ignition switch ON.
5. Confirm each door motor operation.

OK or NG

OK >> (Return to operate normally.)
- Poor contacting the motor connector

NG >> (Does not operate normally.)
- GO TO 7.

7. CHECK AIR MIX AND INTAKE DOOR MOTORS OPERATION

1. Turn ignition switch OFF.
2. Disconnect mode, air mix and intake door motor connectors.
3. Reconnect air mix and intake door motor connector.
4. Turn ignition switch ON.
5. Confirm air mix and intake door motors operation.

OK or NG

OK >> (Air mix and intake door motors operate normally.)
- Replace mode door motor.

NG >> (Air mix and intake door motors does not operate normally.)
- GO TO 8.

8. CHECK MODE AND INTAKE DOOR MOTORS OPERATION

1. Turn ignition switch OFF.
2. Disconnect air mix door motor connector.
3. Reconnect mode door motor connector.
4. Turn ignition switch ON.
5. Confirm mode and intake door motors operation.

OK or NG

OK >> (Mode and intake door motors operate normally.)
- Replace air mix door motor.

NG >> (Mode and intake door motor does not operate normally.)
- GO TO 9.

9. CHECK MODE AND AIR MIX DOOR MOTORS OPERATION

1. Turn ignition switch OFF.
2. Disconnect intake door motor connector.
3. Reconnect air mix door motor connector.
4. Turn ignition switch ON.
5. Confirm mode and air mix door motors operation.

OK or NG

OK >> (Mode and air mix door motors operate normally.)
- Replace intake door motor.

NG >> (Mode and air mix door motors does not operate normally.)
- Replace unified meter and A/C amp.

Mode Door Motor Circuit

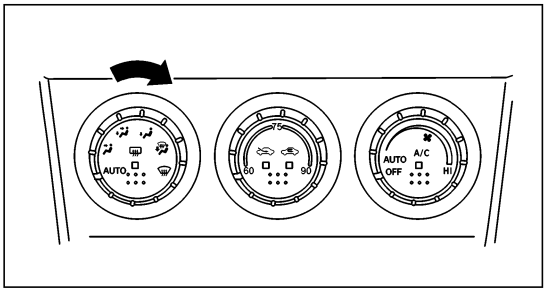
AJS000AC

SYMPTOM:

- Air outlet does not change.
- Mode door motor does not operate normally.

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Discharge air

a.Turn mode control dial to each position.

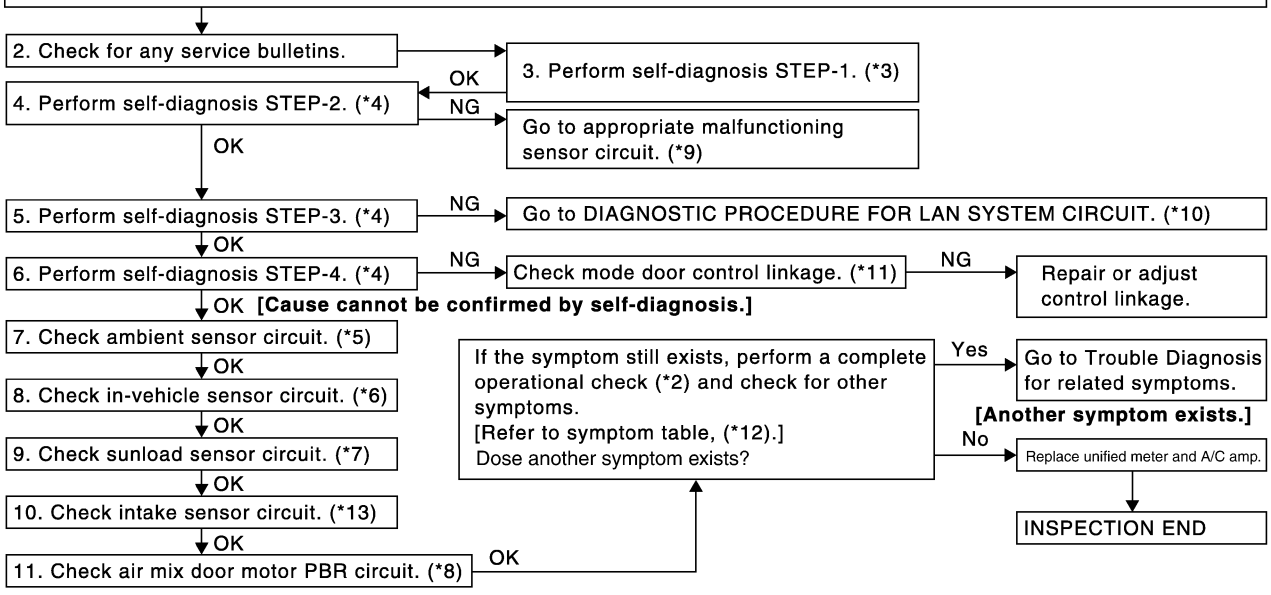
Discharge air flow

Mode door position	Air outlet/distribution		
	Face	Foot	Defroster
	100%	–	–
	54%	46%	–
	–	76%	24%
	–	57%	43%
	–	–	100%

b. Confirm that discharge air comes out according to the air distribution table at left.
Refer to “Discharge Air flow”(*1).

NOTE:

- **If OK (symptom cannot be duplicated), perform complete operational check (*2).**
  If NG (symptom is confirmed), continue with STEP-2 following.
- **Confirm that the compressor clutch is engaged (Sound or visual inspection) and intake door position is at FRESH when DEF is selected.**
  Intake door position is checked in the next step.



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*1 ATC-33, "Discharge Air Flow".
*2 ATC-57, "Operational Check".
*3 ATC-51, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.
*4 ATC-51, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.
*5 ATC-98, "Ambient Sensor Circuit".
*6 ATC-100, "In-vehicle Sensor Circuit".
*7 ATC-103, "Sunload Sensor Circuit".
*8 ATC-71, "Air Mix Door Motor PBR Circuit".
*9 ATC-51, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.

*10 ATC-61, "DIAGNOSTIC PROCEDURE FOR LAN CIRCUIT". *11 ATC-122, "MODE DOOR MOTOR". *12 ATC-38, "SYMPTOM TABLE".

*13 ATC-106, "Intake Sensor Circuit".

SYSTEM DESCRIPTION

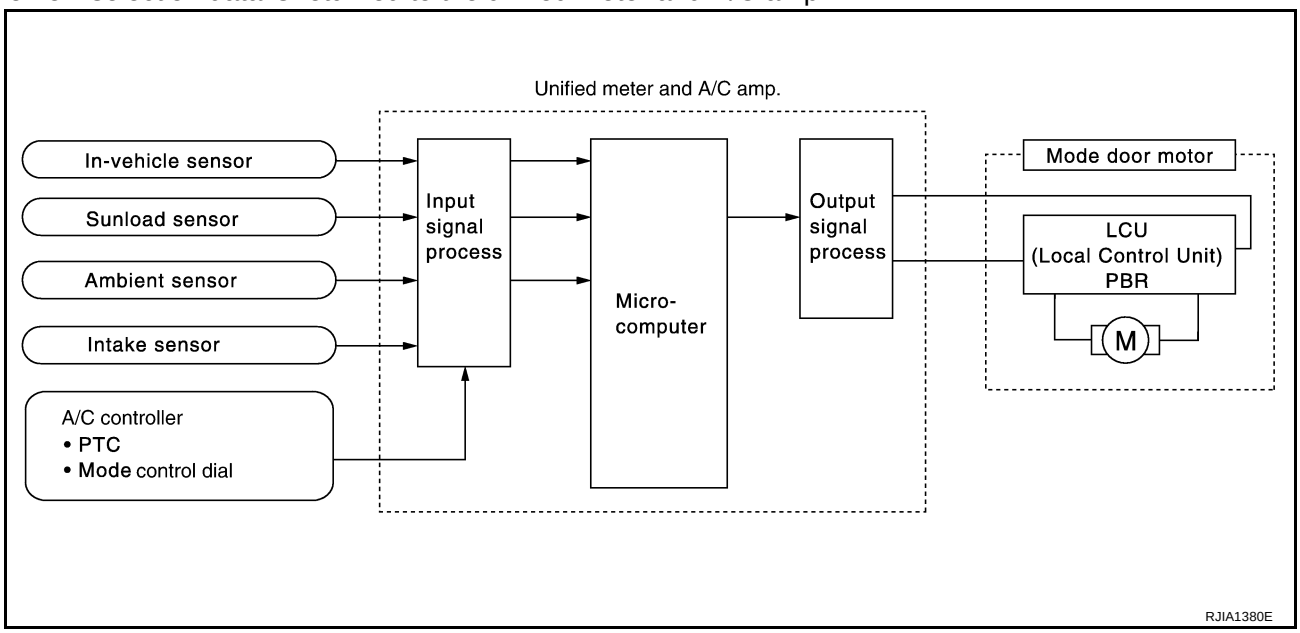
Component Parts

Mode door control system components are:

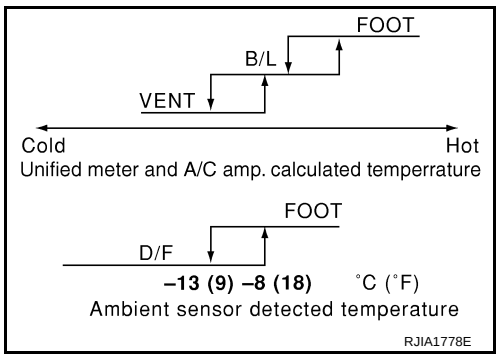
- Unified meter and A/C amp.
- Mode door motor (LCU)
- A/C LAN system (PBR built-in mode door motor, air mix door motor and intake door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

System Operation

The unified meter and A/C amp. receives data from each of the sensors. The unified meter and A/C amp. sends air mix door, mode door and intake door opening angle data to the air mix door motor LCU, mode door motor LCU and intake door motor LCU.
The air mix door motor, mode door motor and intake door motor read their respective signals according to the address signal. Opening angle indication signals received from the unified meter and A/C amp. and each of the motor position sensors are compared by the LCUs in each motor with the existing decision and opening angles. Subsequently, HOT/COLD or DEFROST/VENT or FRESH/RECIRCULATION operation is selected. The new selection data is returned to the unified meter and A/C amp.



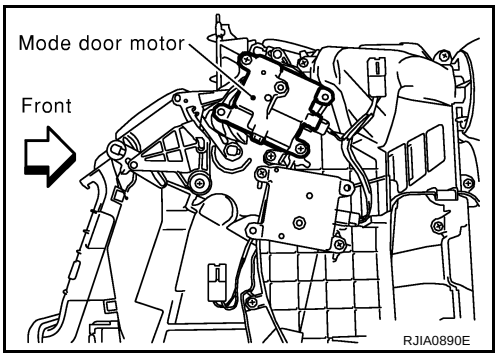
Mode Door Control Specification



COMPONENT DESCRIPTION

Mode Door Motor

The mode door motor is attached to the heater & cooling unit. It rotates so that air is discharged from the outlet set by the unified meter and A/C amp. Motor rotation is conveyed to a link which activates the mode door.



DIAGNOSTIC PROCEDURE FOR MODE DOOR MOTOR

SYMPTOM: Mode door motor does not operate normally.
Perform diagnostic procedure for ATC-61, "DIAGNOSTIC PROCEDURE FOR LAN CIRCUIT" .

Air Mix Door Motor Circuit

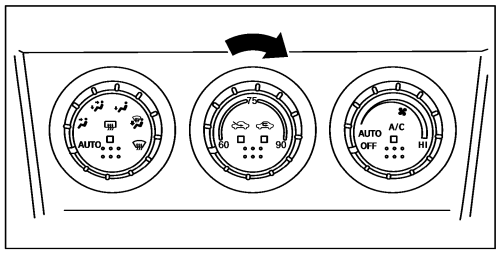
AJS000AD

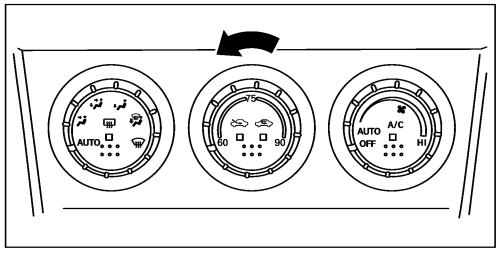
SYMPTOM:

- Discharge air temperature does not change.
- Air mix door motor does not operate.

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.





OPERATIONAL CHECK

Temperature increase

a. Turn temperature control dial clockwise until 32˚C (90˚F).
b. Check for hot air at discharge air outlets.

Temperature decrease

a. Turn temperature control dial counterclockwise until 18˚C (60˚F).
b. Check for cold air at discharge air outlets.

If OK (symptom cannot be duplicated), perform complete operational check (*10).
If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.
3. Perform self-diagnosis STEP-1. (*1)
OK
4. Perform self-diagnosis STEP-2. (*13)
NG → Go to appropriate malfunctioning sensor circuit. (*6)
OK
5. Perform self-diagnosis STEP-4. (*13)
OK **[Cause cannot be confirmed by self-diagnosis.]**
6. Check ambient sensor circuit. (*2)
OK
7. Check in-vehicle sensor circuit. (*3)
OK
8. Check sunload sensor circuit. (*4)
OK
9. Check intake sensor circuit. (*12)
OK
10. Check air mix door motor PBR circuit. (*5)
OK
If the symptom still exists, perform a complete operational check (*10) and check for other symptoms. [Refer to symptom table, (*11).] Does another symptom exists?
Yes → Go to Trouble Diagnosis for related symptom.
Another symptom exists.
No
Replace unified meter and A/C amp. → INSPECTION END

NG → Check air mix door control linkage. (*8)
OK → Go to LAN system circuit. (*7)
NG → Repair or adjust control linkage. (*9)

RJIA1381E

*1 ATC-51, "FUNCTION CONFIRMATION PROCEDURE", see No.1.
*2 ATC-98, "Ambient Sensor Circuit".
*3 ATC-100, "In-vehicle Sensor Circuit".
*4 ATC-103, "Sunload Sensor Circuit"
*5 ATC-71, "Air Mix Door Motor PBR Circuit".
*6 ATC-51, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.
*7 ATC-61, "LAN System Circuit".
*8 ATC-71, "Air Mix Door Motor".
*9 ATC-123, "AIR MIX DOOR MOTOR".

*10 ATC-57, "Operational Check".
*11 ATC-38, "SYMPTOM TABLE".
*12 ATC-106, "Intake Sensor Circuit".
*13 ATC-51, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.

SYSTEM DESCRIPTION

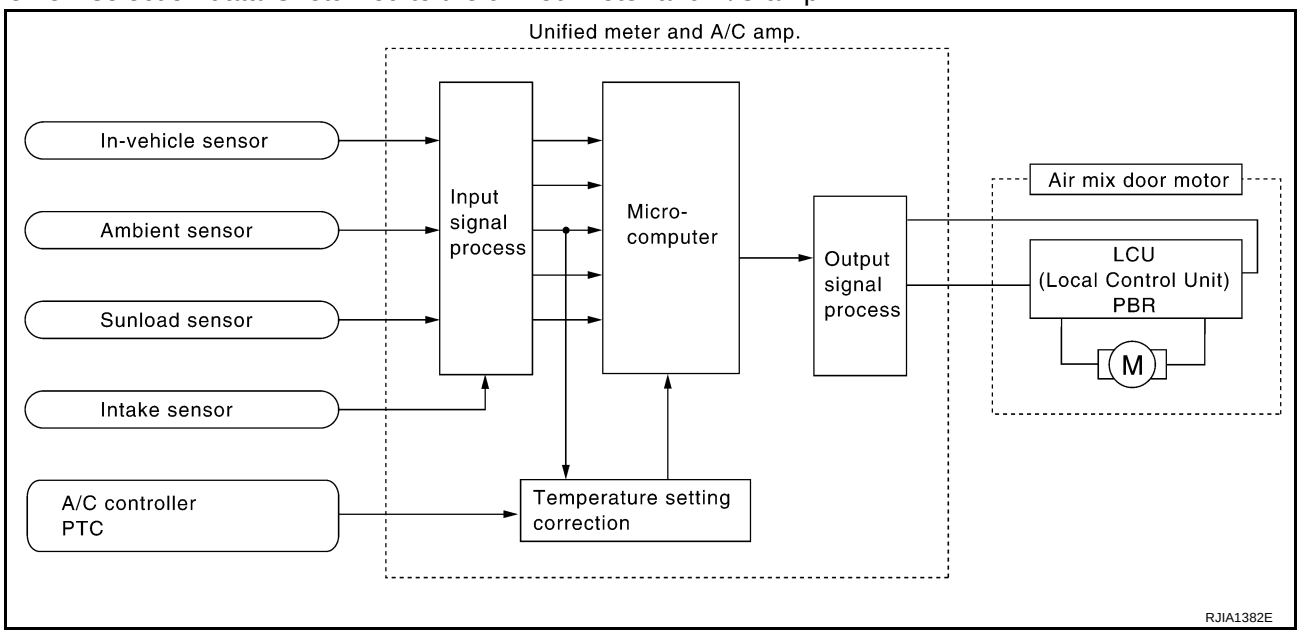
Component Parts

Air mix door control system components are:

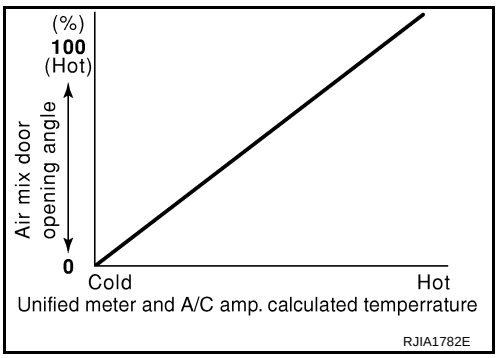
- Unified meter and A/C amp.
- Air mix door motor (LCU)
- A/C LAN system (PBR built-in mode door motor, air mix door motor and intake door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

System Operation

The unified meter and A/C amp. receives data from each of the sensors. The unified meter and A/C amp. sends air mix door, mode door and intake door opening angle data to the air mix door motor LCU, mode door motor LCU and intake door motor LCU.
The air mix door motor, mode door motor and intake door motor read their respective signals according to the address signal. Opening angle indication signals received from the unified meter and A/C amp. and each of the motor position sensors are compared by the LCUs in each motor with the existing decision and opening angles. Subsequently, HOT/COLD or DEFROST/VENT or FRESH/RECIRCULATION operation is selected. The new selection data is returned to the unified meter and A/C amp.



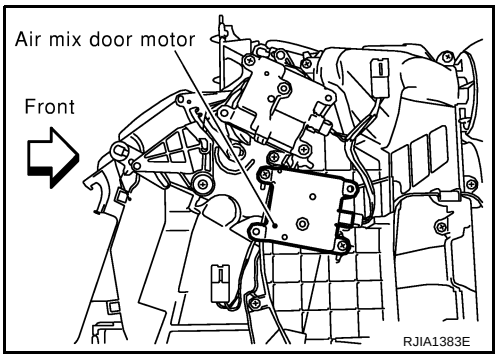
Air Mix Door Control Specification



COMPONENT DESCRIPTION

Air Mix Door Motor

The air mix door motor is attached to the heater & cooling unit. It rotates so that the air mix door is opened or closed to a position set by the unified meter and A/C amp. Motor rotation is conveyed through a shaft and the air mix door position is then fed back to the unified meter and A/C amp. by PBR built-in air mix door motor.



DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR

SYMPTOM: Discharge air temperature does not change.
Perform diagnostic procedure for ATC-61, "DIAGNOSTIC PROCEDURE FOR LAN CIRCUIT" .

Air Mix Door Motor PBR Circuit

AJS000QW

SYMPTOM:

- Discharge air temperature does not change.
- PBR circuit is open or shorted.

DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR PBR

Perform diagnostic procedure for ATC-61, "DIAGNOSTIC PROCEDURE FOR LAN CIRCUIT" .

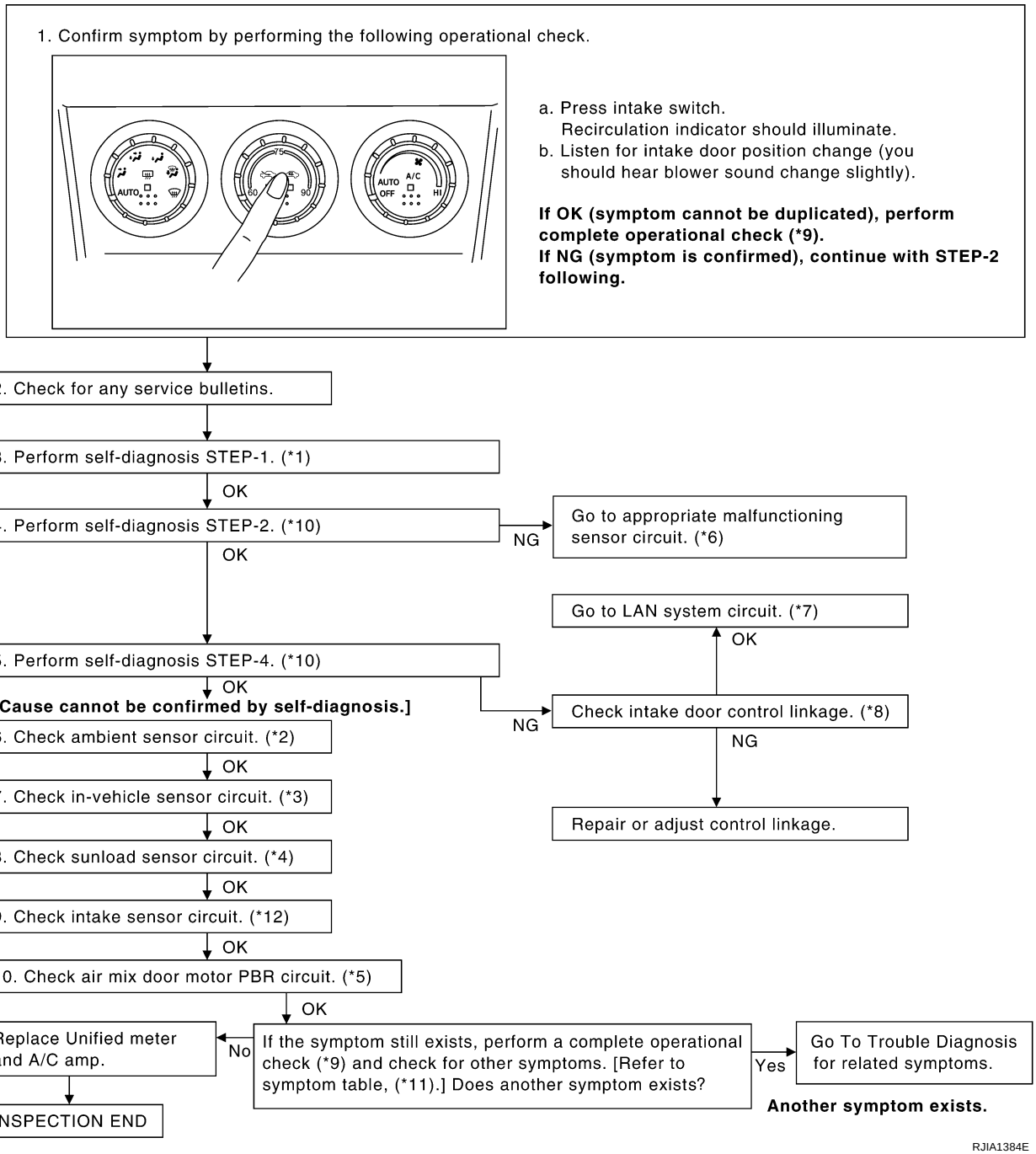
Intake Door Motor Circuit

AJS000AE

SYMPTOM:

- Intake door does not change.
- Intake door motor does not operate normally.

INSPECTION FLOW



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*1 ATC-51, "FUNCTION CONFIRMATION PROCEDURE", see No.1.
*2 ATC-98, "Ambient Sensor Circuit".
*3 ATC-100, "In-vehicle Sensor Circuit".
*4 ATC-103, "Sunload Sensor Circuit".
*5 ATC-71, "Air Mix Door Motor PBR Circuit".
*6 ATC-51, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.
*7 ATC-61, "LAN System Circuit".
*8 ATC-117, "INTAKE DOOR MOTOR".
*9 ATC-57, "Operational Check".
*10 ATC-51, "FUNCTION CONFIRMATION PROCEDURE", see No.5 to 7.
*11 ATC-38, "SYMPTOM TABLE".
*12 ATC-106, "Intake Sensor Circuit".

SYSTEM DESCRIPTION

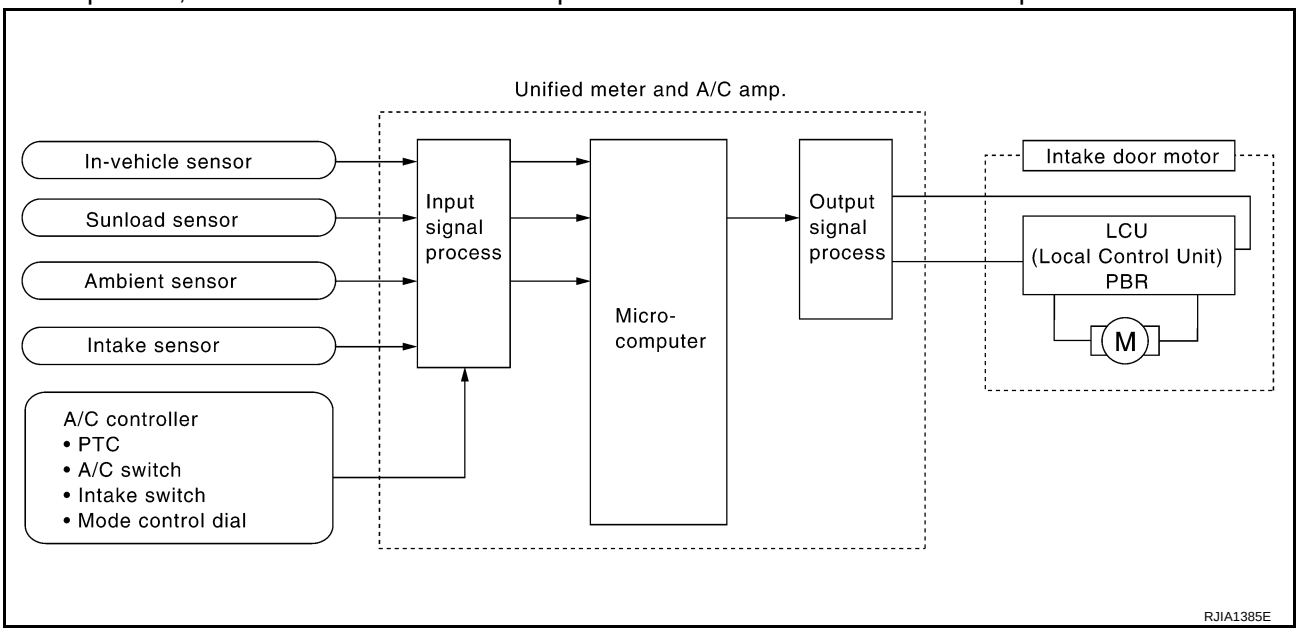
Component Parts

Intake door control system components are:

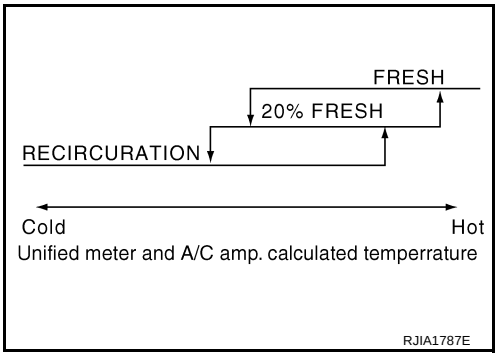
- Unified meter and A/C amp.
- Intake door motor (LCU)
- A/C LAN system (PBR built-in mode door motor, air mix door motor and intake door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

System Operation

The intake door control determines intake door position based on the ambient temperature, the intake air temperature and the in-vehicle temperature. When set mode control dial to D/F, D/F2 or DEF position, or OFF switch is pushed, the unified meter and A/C amp. sets the intake door at the FRESH position.



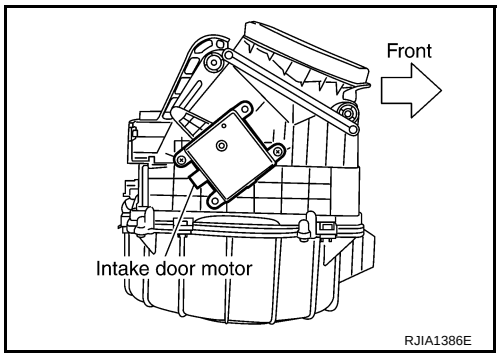
Intake Door Control Specification



COMPONENT DESCRIPTION

Intake Door Motor

The intake door motor is attached to the blower unit. It rotates so that air is drawn from inlets set by the unified meter and A/C amp. Motor rotation is conveyed to a lever which activates the intake door.



DIAGNOSTIC PROCEDURE FOR INTAKE DOOR MOTOR

SYMPTOM: Intake door motor does not operate normally.
Perform diagnostic procedure for ATC-61, "DIAGNOSTIC PROCEDURE FOR LAN CIRCUIT" .

Blower Motor Circuit

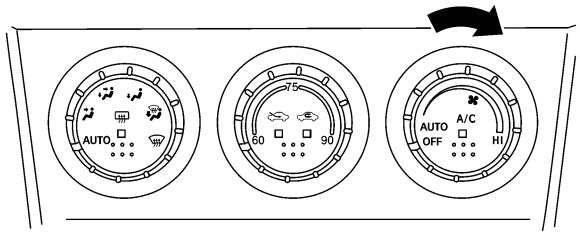
AJS000AF

SYMPTOM:

- Blower motor operation is malfunctioning.
- Blower motor operation is malfunctioning under out of starting fan speed control.

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK - Blower
Turn fan control dial clockwise,
and continue checking blower speed until all speeds are checked.
If OK (symptom cannot be duplicated), perform complete operational check (*1).
If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.

3. Perform self-diagnosis STEP-1. (*2)

OK

4. Perform self-diagnosis STEP-2. (*3)

NG → Go to appropriate malfunctioning sensor circuit. (*5)

OK

5. Perform self-diagnosis STEP-4. (*4)
Does blower motor speed change according to each code No.?

Code No.	41	42	43	44	45	46
Blower motor duty ratio	25%		41%	57%	75%	91%

No → Go to Blower Motor Circuit. (*6)

Yes

6. Is engine coolant temperature below 56˚C (133˚F)?

No → Blower motor operation is normal.

Yes

7. Is blower motor operating under starting blower speed control?

No → Go to Blower Motor Circuit. (*6)

OK → Check engine coolant temperature sensor circuit. (*12)

Yes **[Cause cannot be confirmed by self-diagnosis.]**

8. Check ambient sensor circuit. (*8)

OK

9. Check in-vehicle sensor circuit. (*9)

OK

10. Check sunload sensor circuit. (*10)

OK

11. Check intake sensor circuit. (*11)

OK

If the symptom still exists, perform a complete operational check (*1) and check for other symptoms. [Refer to symptom table, (*7).] Does another symptom exists?

Yes → Go to Trouble Diagnosis for related symptom.

Another symptom exists.

No

Replace Unified meter and A/C amp. → INSPECTION END

RJIA1387E

*1 ATC-57, "Operational Check".
*2 ATC-51, "FUNCTION CONFIRMATION PROCEDURE", see No.1.
*3 ATC-51, "FUNCTION CONFIRMATION PROCEDURE", see No.5.
*4 ATC-51, "FUNCTION CONFIRMATION PROCEDURE", see No.7.
*5 ATC-51, "FUNCTION CONFIRMATION PROCEDURE", see No.9.
*6 ATC-77, "DIAGNOSTIC PROCEDURE FOR BLOWER MOTOR".
*7 ATC-38, "SYMPTOM TABLE".
*8 ATC-98, "Ambient Sensor Circuit".
*9 ATC-100, "In-vehicle Sensor Circuit".
*10 ATC-103, "Sunload Sensor Circuit".
*11 ATC-106, "Intake Sensor Circuit".
*12 EC-176, "DTC P0117, P0118 ECT SENSOR".

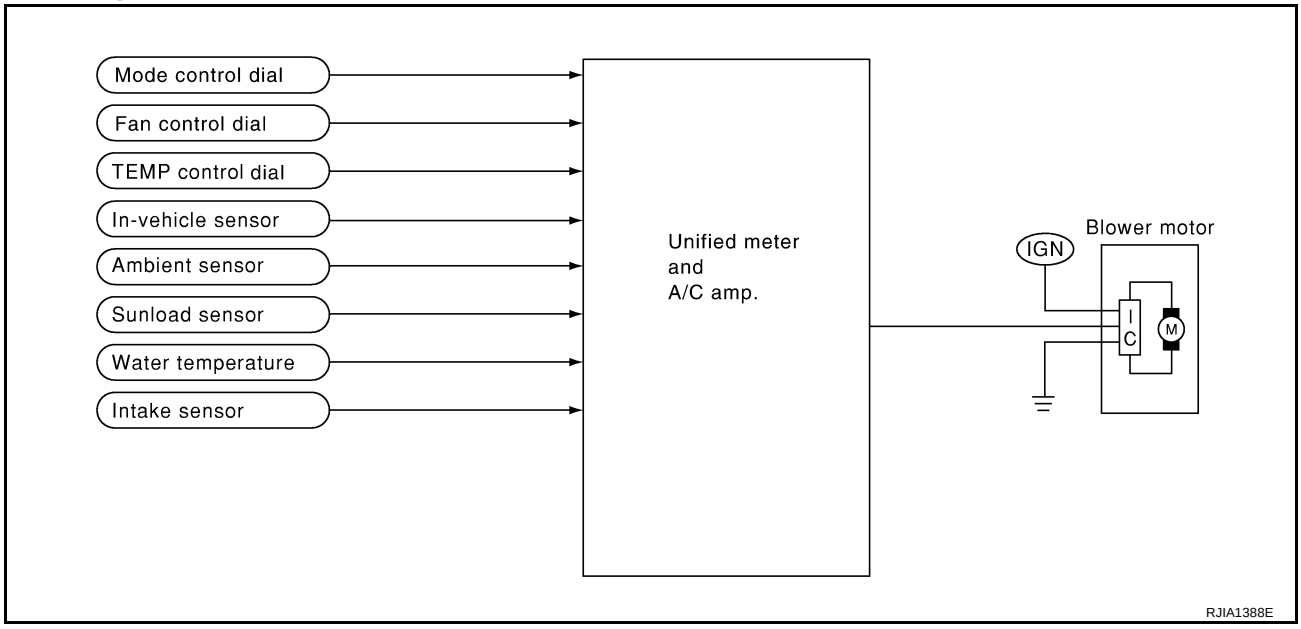
SYSTEM DESCRIPTION

Component Parts

Fan speed control system components are:

- Unified meter and A/C amp.
- A/C LAN system (PBR built-in mode door motor, air mix door motor and intake door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

System Operation



Automatic Mode

In the automatic mode, the blower motor speed is calculated by the unified meter and A/C amp. based on input from the PBR, in-vehicle sensor, sunload sensor, intake sensor and ambient sensor.
When the air flow is increased, the duty ratio of the blower fan motor′s drive signal is changed at 8%/sec. to prevent a sudden increase in air flow.
In addition to manual air flow control and the usual automatic air flow control, starting air flow control, low water temperature starting control and high passenger compartment temperature starting control are available.

Starting Fan Speed Control

Start Up from COLD SOAK Condition (Automatic mode)
In a cold start up condition where the engine coolant temperature is below 56°C (133°F), the blower will not operate for a short period of time (up to 150 seconds). The exact start delay time varies depending on the ambient and engine coolant temperature.
In the most extreme case (very low ambient) the blower starting delay will be 150 seconds as described above. After this delay, the blower will operate at low speed until the engine coolant temperature rises above 56°C (133°F), at which time the blower speed will increase to the objective speed.

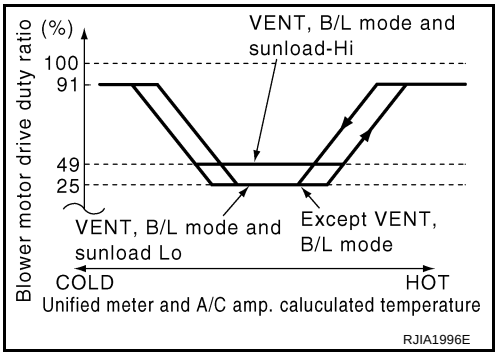
Start Up from Usual or HOT SOAK Condition (Automatic mode)
The blower will begin operation momentarily after the A/C switch is pushed. The blower speed will gradually rise to the objective speed over a time period of 3 seconds or less (actual time depends on the objective blower speed).

Blower Speed Compensation

Sunload

When the in-vehicle temperature and the set temperature are very close, the blower will be operating at low speed. The low speed will vary depending on the sunload. During conditions of low or no sunload, the blower low speed is usual low speed (duty ratio 25%). During high sunload conditions, the unified meter and A/C amp. causes the blower fan speed to increase.(duty ratio 49%).

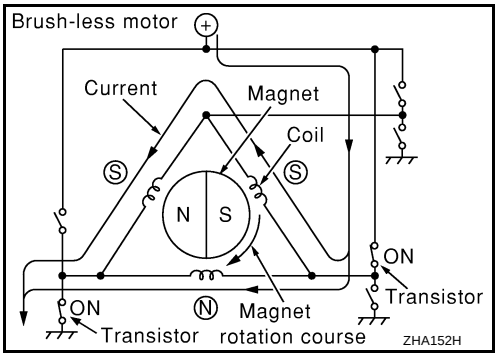
Fan Speed Control Specification



COMPONENT DESCRIPTION

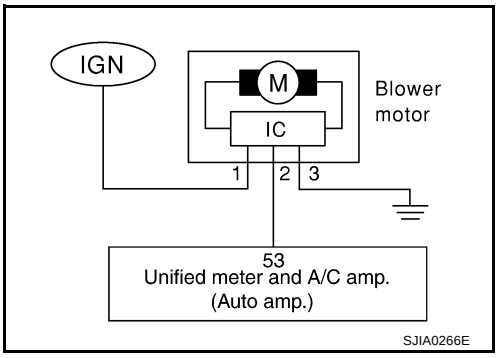
Brush-less Motor

The blower motor utilizes a brush-less motor with a rotating magnet. Quietness is improved over previous motors where the brush was the point of contact and the coil rotated.



DIAGNOSTIC PROCEDURE FOR BLOWER MOTOR

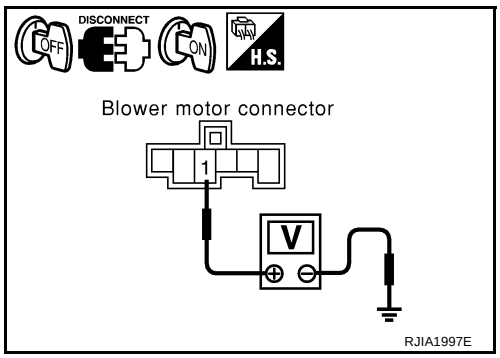
SYMPTOM: Blower motor operation is malfunctioning under starting fan speed control.



1. CHECK POWER SUPPLY FOR BLOWER MOTOR

1. Disconnect blower motor connector.
2. Turn ignition switch ON.
3. Check voltage between blower motor harness connector M62 terminal 1 (L/W) and ground.

1 – Ground : Battery voltage



OK or NG

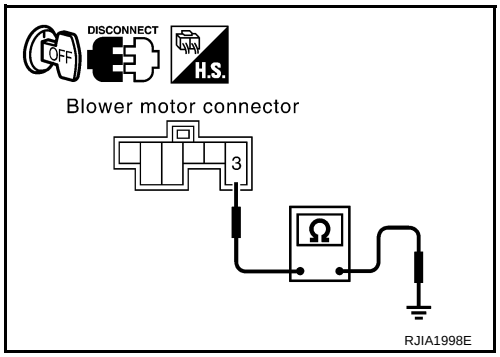
OK >> GO TO 2.
NG >> Check power supply circuit and 15A fuses [Nos. 10 and 11, located in the fuse block (J/B)]. Refer to PG-88, "FUSE BLOCK - JUNCTION BOX (J/B)" .

- If OK, check for open circuit in wiring harness. Repair or replace if necessary.
- If NG, replace fuse and check wiring harness for short circuit. Repair or replace if necessary.

2. CHECK GROUND CIRCUIT FOR BLOWER MOTOR

1. Turn ignition switch OFF.
2. Check continuity between blower motor harness connector M62 terminal 3 (B) and ground.

3 – Ground : Continuity should exist.



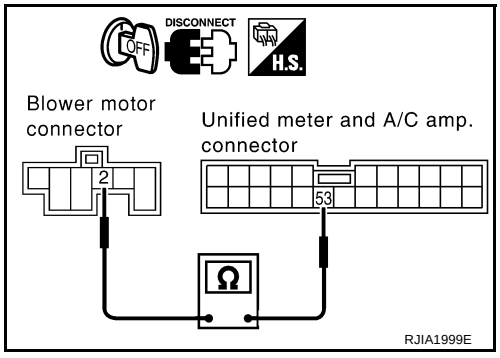
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK CIRCUIT CONTINUITY BLOWER MOTOR AND UNIFIED METER AND A/C AMP.

1. Disconnect unified meter and A/C amp. connector.
2. Check continuity between blower motor harness connector M62 terminal 2 (G) and unified meter and A/C amp. harness connector M50 terminal 53 (G).

2 – 53 : Continuity should exist.

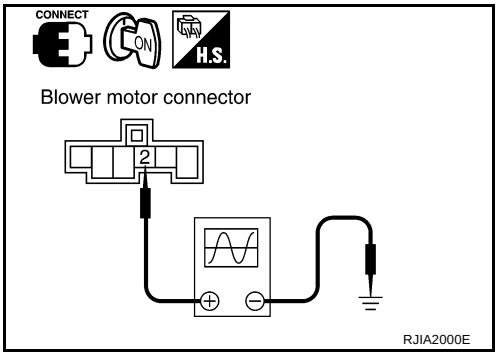


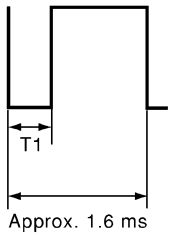
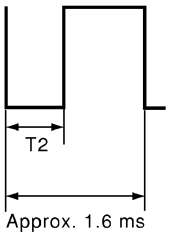
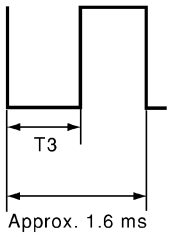
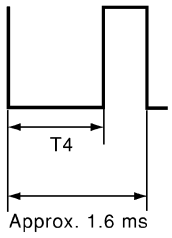
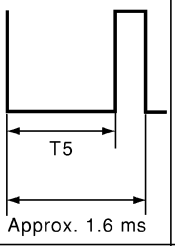
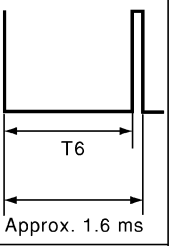
OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK FOR UNIFIED METER AND A/C AMP. OUTPUT

1. Reconnect blower motor connector and unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Vary the fan speed between Lo and Hi and confirm the blower motor connector M62 terminal 2 (G) and ground duty ratios using an oscilloscope. Usual terminal 2 (G) drive signal duty ratios are shown in the table below.



Blower fan speed	1st	5th	10th	15th	20th	25th
Blower motor connector M62 Terminal No. 2 (Oscilloscope)						
Duty ratio	Approx. 29%	Approx. 37%	Approx. 47%	Approx. 57%	Approx. 71%	Approx. 91%

NOTE: Duty ratio = $\frac{Tx}{\text{Approx. } 1.6 \text{ ms}}$ x 100 (%)

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OK or NG

OK >> GO TO 5.
NG >> Replace unified meter and A/C amp.

5. CHECK BLOWER MOTOR DRIVE SIGNAL

If the fan air flow does not change, usual terminal 2 (G) drive signal duty ratios are shown in the table above.

OK or NG

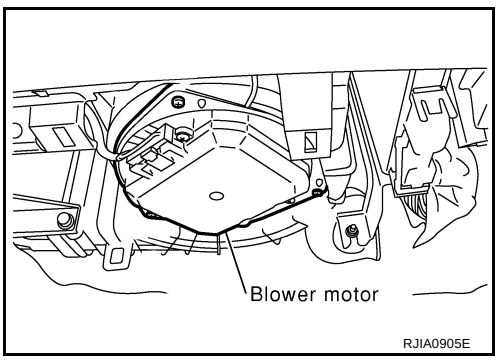
OK >> Replace blower motor.
NG >> INSPECTION END

COMPONENT INSPECTION

Blower Motor

Confirm smooth rotation of the blower motor.

- Ensure that there are no foreign particles inside the blower unit.

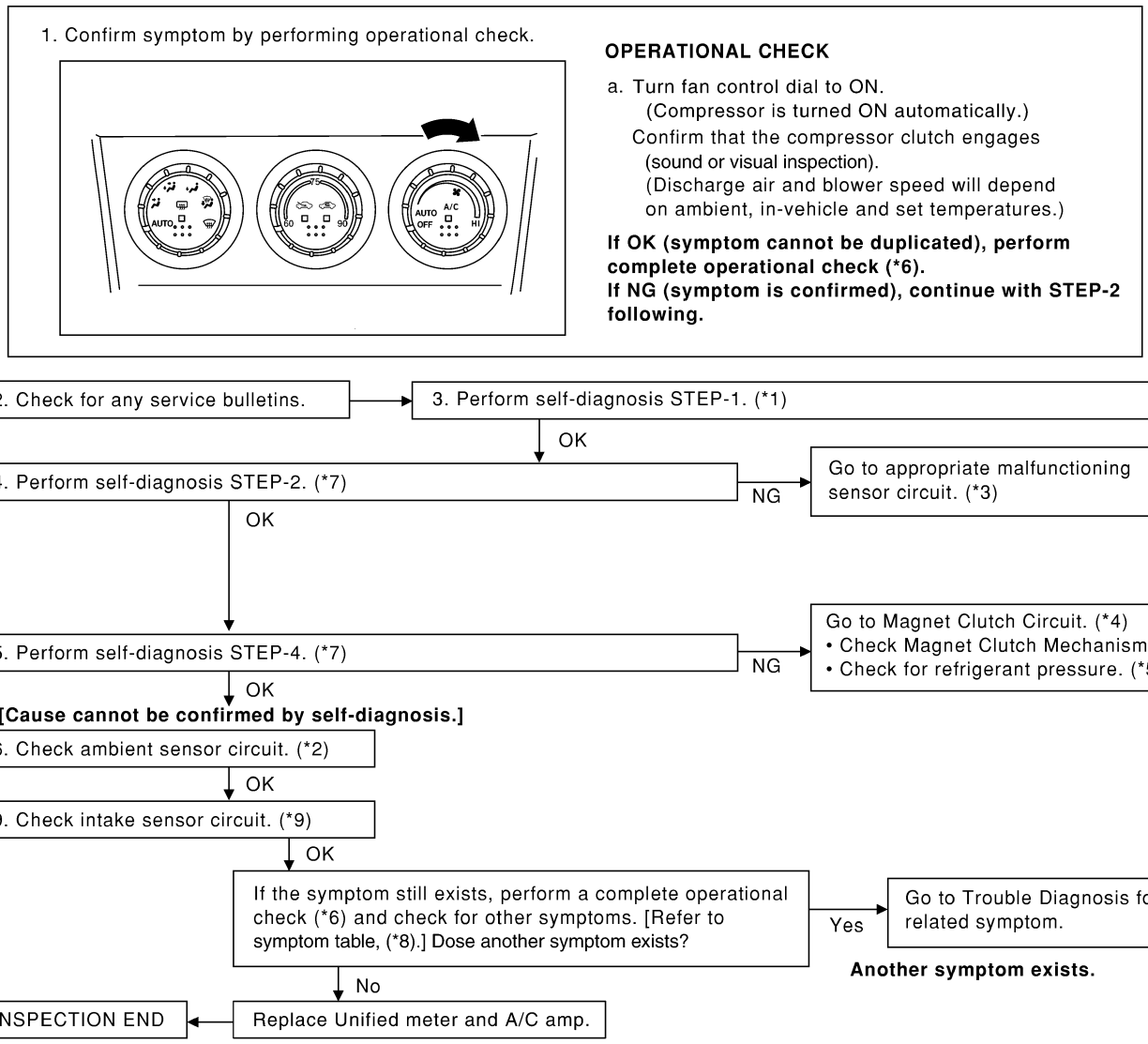


Magnet Clutch Circuit

AJS000AG

SYMPTOM: Magnet clutch does not engage.

INSPECTION FLOW



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*1 ATC-51, "FUNCTION CONFIRMATION PROCEDURE", see No.1.
*2 ATC-98, "Ambient Sensor Circuit".
*3 ATC-51, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.
*4 ATC-81, "DIAGNOSTIC PROCEDURE FOR MAGNET CLUTCH".
*5 ATC-92, "TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE".
*6 ATC-57, "Operational Check".
*7 ATC-51, "FUNCTION CONFIRMATION PROCEDURE", see No.5 to 7.
*8 ATC-38, "SYMPTOM TABLE".
*9 ATC-106, "Intake Sensor Circuit".

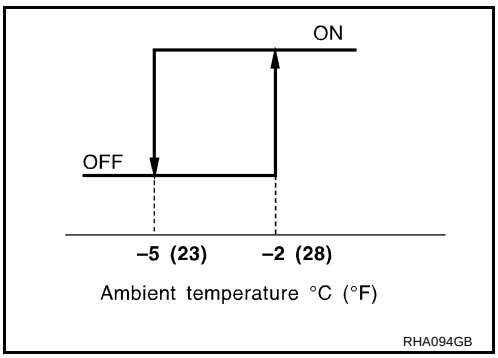
SYSTEM DESCRIPTION

Unified meter and A/C amp. controls compressor operation by ambient temperature, intake air temperature and signal from ECM.

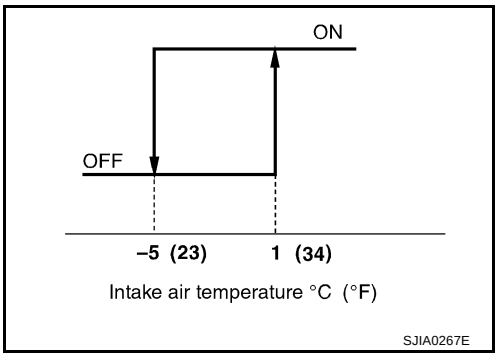
Low Temperature Protection Control

Unified meter and A/C amp. will turn compressor ON or OFF as determined by a signal detected by ambient sensor and intake sensor.

When ambient temperatures are higher than –2°C (28°F), the compressor turns ON. The compressor turns OFF when ambient temperatures are lower than –5°C (23°F).

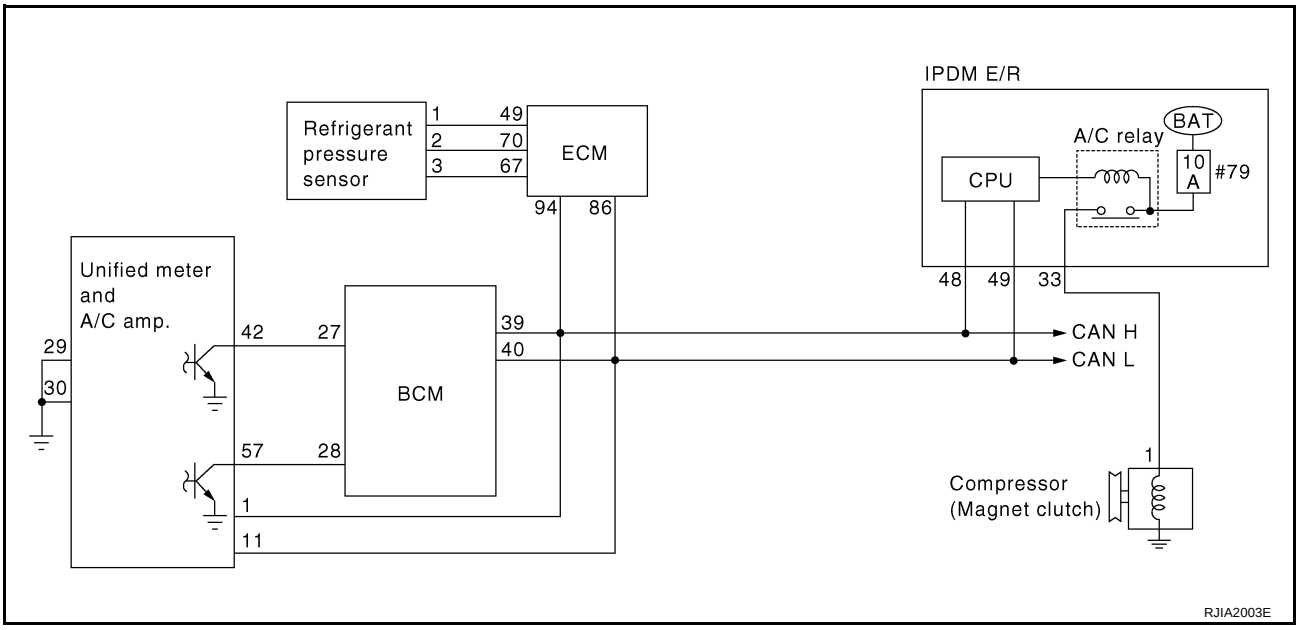


When intake air temperatures are higher than 1°C (34°F), the compressor turns ON. The compressor turns OFF when intake air temperatures are lower than –5°C (23°F).



DIAGNOSTIC PROCEDURE FOR MAGNET CLUTCH

SYMPTOM: Magnet clutch does not engage when A/C switch is ON.



1. CHECK AMBIENT SENSOR CIRCUIT AND INTAKE SENSOR CIRCUIT

Check ambient sensor and intake sensor. Refer to ATC-51, "FUNCTION CONFIRMATION PROCEDURE" , see No. 9.

OK or NG

OK >> GO TO 2.

NG >>
- Malfunctioning ambient sensor: Refer to ATC-98, "Ambient Sensor Circuit" .
- Malfunctioning intake sensor: Refer to ATC-106, "Intake Sensor Circuit" .

2. PERFORM AUTO ACTIVE TEST

Refer to PG-24, "Auto Active Test" .

Dose the magnet clutch operate?

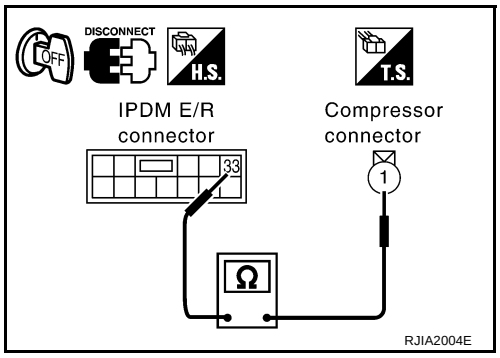
YES >>
- WITH CONSULT-II
  GO TO 5.
- WITHOUT CONSULT-II
  GO TO 6.

NO >> Check 10A fuse (No. 79, located in IPDM E/R), and GO TO 3.

3. CHECK CIRCUIT CONTINUITY BETWEEN IPDM E/R AND COMPRESSOR

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and compressor (magnet clutch) connector.
3. Check continuity between IPDM E/R harness connector E8 terminal 33 (L/Y) and compressor (magnet clutch) harness connector F24 terminal 1 (L/Y).

33 – 1 : Continuity should exist.



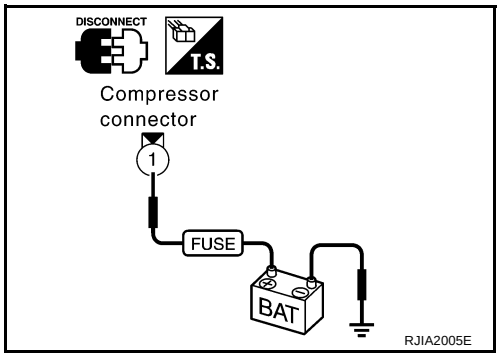
OK or NG

OK >> GO TO 4.

NG >> Repair harness or connector.

4. CHECK MAGNET CLUTCH CIRCUIT

Check operation sound when applying battery voltage direct current to terminal.



OK or NG

OK >> Replace IPDM E/R.

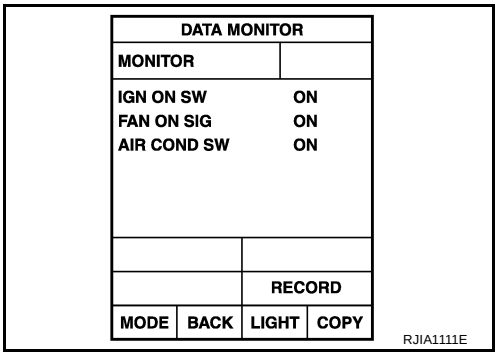
NG >> Replace magnet clutch. Refer to ATC-132, "Removal and Installation of Compressor Clutch" .

5. CHECK BCM INPUT (COMPRESSOR ON) SIGNAL

Check compressor ON/OFF signal. Refer to ATC-36, "CONSULT-II" .

A/C SW ON : AIR COND SW ON

A/C SW OFF : AIR COND SW OFF



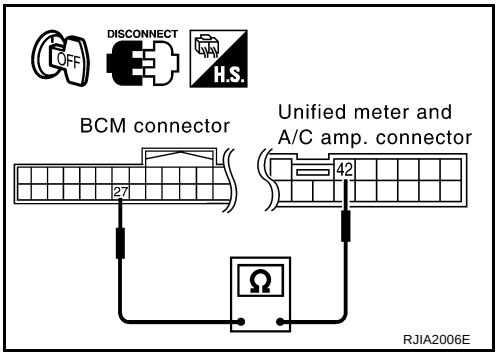
OK or NG

OK >> GO TO 8.
NG >> GO TO 6.

6. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect BCM connector and unified meter and A/C amp. connector.
3. Check continuity between BCM harness connector M90 terminal 27 (G/Y) and unified meter and A/C amp. harness connector M50 terminal 42 (G/Y).

27 – 42 : Continuity should exist.

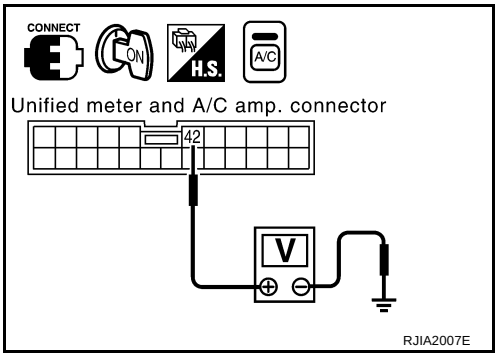


OK or NG

OK >> GO TO 7.
NG >> Repair harness or connector.

7. CHECK VOLTAGE FOR UNIFIED METER AND A/C AMP. (COMPRESSOR ON SIGNAL)

1. Reconnect BCM connector and unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Check voltage between unified meter and A/C amp. harness connector M50 terminal 42 (G/Y) and ground.



Terminals			Condition	Voltage
(+)		(-)		
Unified meter and A/C amp. connector	Terminal No. (wire color)			
M50	42 (G/Y)	Ground	A/C switch: ON	Approx. 0V
			A/C switch: OFF	Approx. 5V

OK or NG

OK >> GO TO 8.
NG-1 >> If the voltage is approx. 5V when A/C switch is ON: Replace unified meter and A/C amp.
NG-2 >> If the voltage is approx. 0V when A/C switch is OFF: Replace BCM.

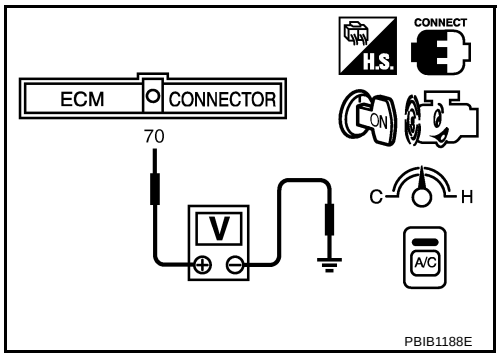
8. CHECK REFRIGERANT PRESSURE SENSOR

WITH CONSULT-II

1. Start the engine.
2. Check voltage of refrigerant pressure sensor. Refer to EC-118, "CONSULT-II Reference Value in Data Monitor" .

WITHOUT CONSULT-II

1. Start the engine.
2. Check voltage between ECM harness connector F101 terminal 70 (G/R) and ground.



Terminals			Condition	Voltage
(+)		(-)		
ECM connector	Terminal No. (wire color)			
F101	70 (G/R)	Ground	A/C switch: ON	Approx. 1 - 4V

OK or NG

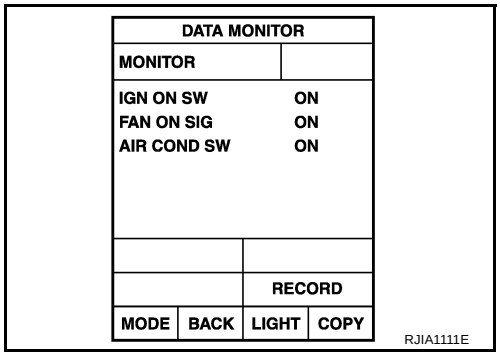
OK >> ● WITH CONSULT-II
GO TO 9.
● WITHOUT CONSULT-II
GO TO 10.

NG >> Refer to EC-645, "REFRIGERANT PRESSURE SENSOR" .

9. CHECK BCM INPUT (FAN ON) SIGNAL

Check FAN ON/OFF signal. Refer to ATC-36, "CONSULT-II" .

FAN SW ON : FAN ON SIG ON
FAN SW OFF : FAN ON SIG OFF



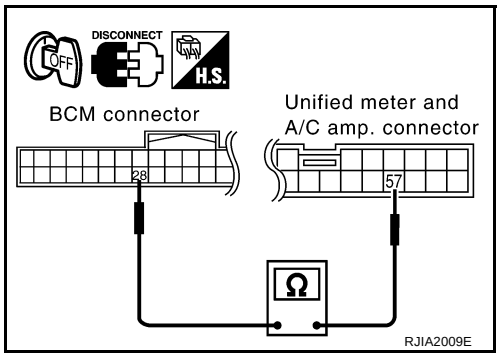
OK or NG

OK >> GO TO 12.
NG >> GO TO 10.

10. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect BCM connector and unified meter and A/C amp. connector.
3. Check continuity between BCM harness connector M60 terminal 28 (BR/W) and unified meter and A/C amp. harness connector M50 terminal 57 (BR/W).

28 – 57 : Continuity should exist.

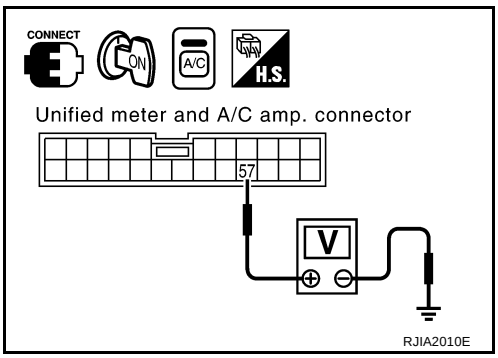


OK or NG

OK >> GO TO 11.
NG >> Repair harness or connector.

11. CHECK VOLTAGE FOR UNIFIED METER AND A/C AMP. (FAN ON SIGNAL)

1. Reconnect BCM connector and unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Check voltage between unified meter and A/C amp. harness connector M50 terminal 57 (BR/W) and ground.



Terminals			Condition	Voltage
(+)		(-)		
Unified meter and A/C amp. connector	Terminal No. (wire color)			
M50	57 (BR/W)	Ground	Fan control dial: ON (Blower motor operates.)	Approx. 0V
			Fan control dial: OFF	Approx. 5V

OK or NG

OK >> GO TO 12.
NG-1 >> If the voltage is approx. 5V when blower motor is ON: Replace unified meter and A/C amp.
NG-2 >> If the voltage is approx. 0V when blower motor is OFF: Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

12. CHECK CAN COMMUNICATION

Check CAN communication. Refer to BCS-16, "CAN Communication Inspection Using CONSULT-II (Self-Diagnosis)" .

- BCM – ECM
- ECM – IPDM E/R
- ECM – Unified meter and A/C amp.

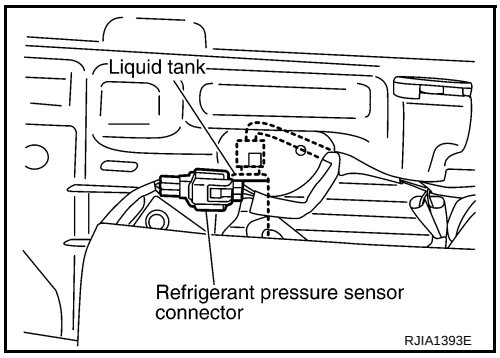
OK or NG

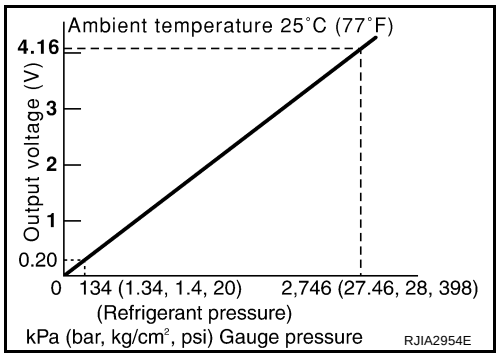
OK >> INSPECTION END
NG >> Repair or replace malfunctioning part(s).

COMPONENT INSPECTION

Refrigerant Pressure Sensor

The refrigerant pressure sensor is attached to the liquid tank.
Make sure that the A/C refrigerant pressure and the sensor output voltage are within the specified range as shown in the A/C operating condition figure. Refer to EC-645, "REFRIGERANT PRESSURE SENSOR" .





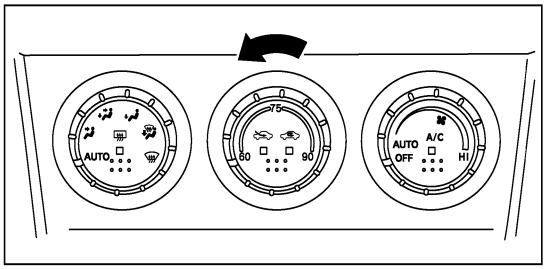
Insufficient Cooling

AJS000AH

SYMPTOM: Insufficient cooling.

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Temperature decrease

a. Turn temperature control dial counterclockwise until 18˚C (60˚F).
b. Check for cold air at discharge air outlets.

If OK (symptom cannot be duplicated), perform complete operational check (*10).
If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.

3. Perform self-diagnosis STEP-1. (*1)
   - OK → 4. Perform self-diagnosis STEP-2. (*11)
     - NG → Go to appropriate malfunctioning sensor circuit. (*5)
     - OK → 5. Perform self-diagnosis STEP-4. (*11)
       - NG → **Go to appropriate malfunctioning items.**
         - Check LAN system circuit. (*6)
         - Check blower motor circuit. (*7)
         - Check magnet clutch circuit. (*8)
       - OK → 6. Check compressor belt tension. Refer to (*13), “Checking Drive Belts”.
         - NG → Adjust or replace compressor belt.
         - OK → 7. Check air mix door operation. (*2)
           - NG → Adjust or replace air mix door control linkage.
           - OK → 8. Check cooling fan motor operation.
             - NG → Refer to (*14), “System Description”.
             - OK → 9. Before connectiong Recovery / Recycling Recharging equipment to vehicle, check Recovery / Recycling Recharging equipment gauges. No refrigerant pressure should be displayed. If NG, recover refrigerant from equipment lines.
               - OK → 10. Confirm refrigerant purity in supply tank using Recovery / Recycling Recharging equipment with refrigerant idntifier.
                 - NG → Refer to Contaminated refrigerant. (*12)
                 - OK → 11. Connect Recovery / Recycling Recharging equipment to vehicle. Confirm refrigerant purity in vehicle A/C system using Recovery / Recycling Recharging equipment with refrigerant indnetifier.
                   - NG → Refer to Contaminated refrigerant. (*12)
                   - OK → 12. Check for evaporator coil freeze up. (Does not freeze up.)
                     - NG (Freeze up.) → Perform performance test diagnoses. Refer to (*9).
                     - OK → 13. Check refrigeration cycle pressure with manifold gauge connected. Refer to (*3).
                       - NG → Perform performance test diagnoses. Refer to (*9).
                       - OK → 14. Check ducts for air leaks.
                         - NG → Replair air leaks.
                         - OK → 15. Perform temperature setting trimmer. (*4)
                           (1) Set up AUXILIARY MECHANISM mode in self-diagnosis.
                           (2) Turn temperature dial counterclockwise as desired.
                           - OK → INSPECTION END

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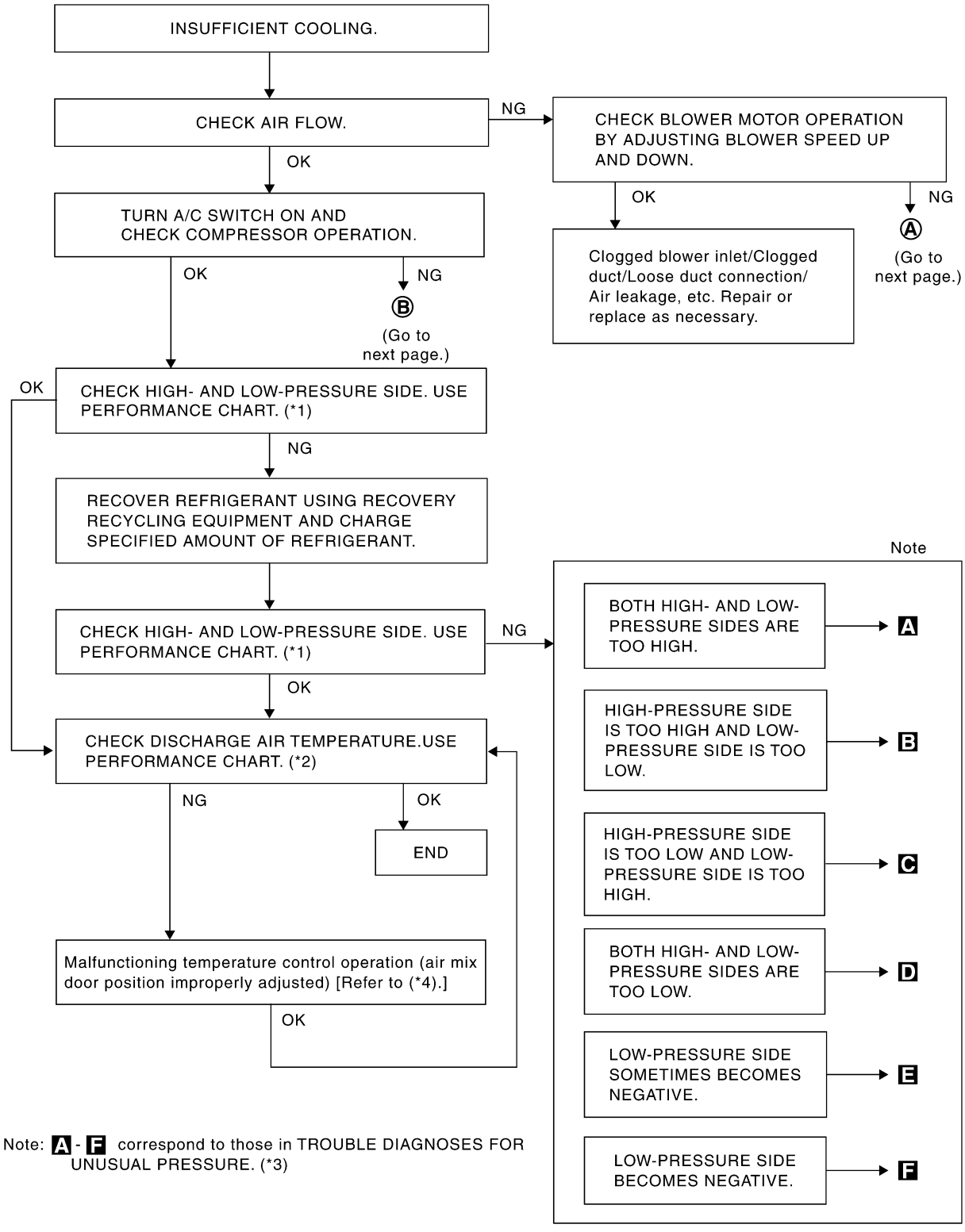
*1	ATC-51, "FUNCTION CONFIRMATION PROCEDURE", see No.1.	*2	ATC-68, "Air Mix Door Motor Circuit".	*3	ATC-91, "Test Reading".
*4	ATC-55, "AUXILIARY MECHANISM: TEMPERATURE SETTING TRIMMER".	*5	ATC-51, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.	*6	ATC-61, "LAN System Circuit".
*7	ATC-75, "Blower Motor Circuit".	*8	ATC-80, "Magnet Clutch Circuit".	*9	ATC-89, "PERFORMANCE TEST DIAGNOSIS".
*10	ATC-57, "Operational Check".	*11	ATC-51, "FUNCTION CONFIRMATION PROCEDURE", see No.5 to 7.	*12	ATC-5, "CONTAMINATED REFRIGERANT".
*13	EM-12, "Checking Drive Belts".	*14	EC-440, "SYSTEM DESCRIPTION".		

PERFORMANCE TEST DIAGNOSIS



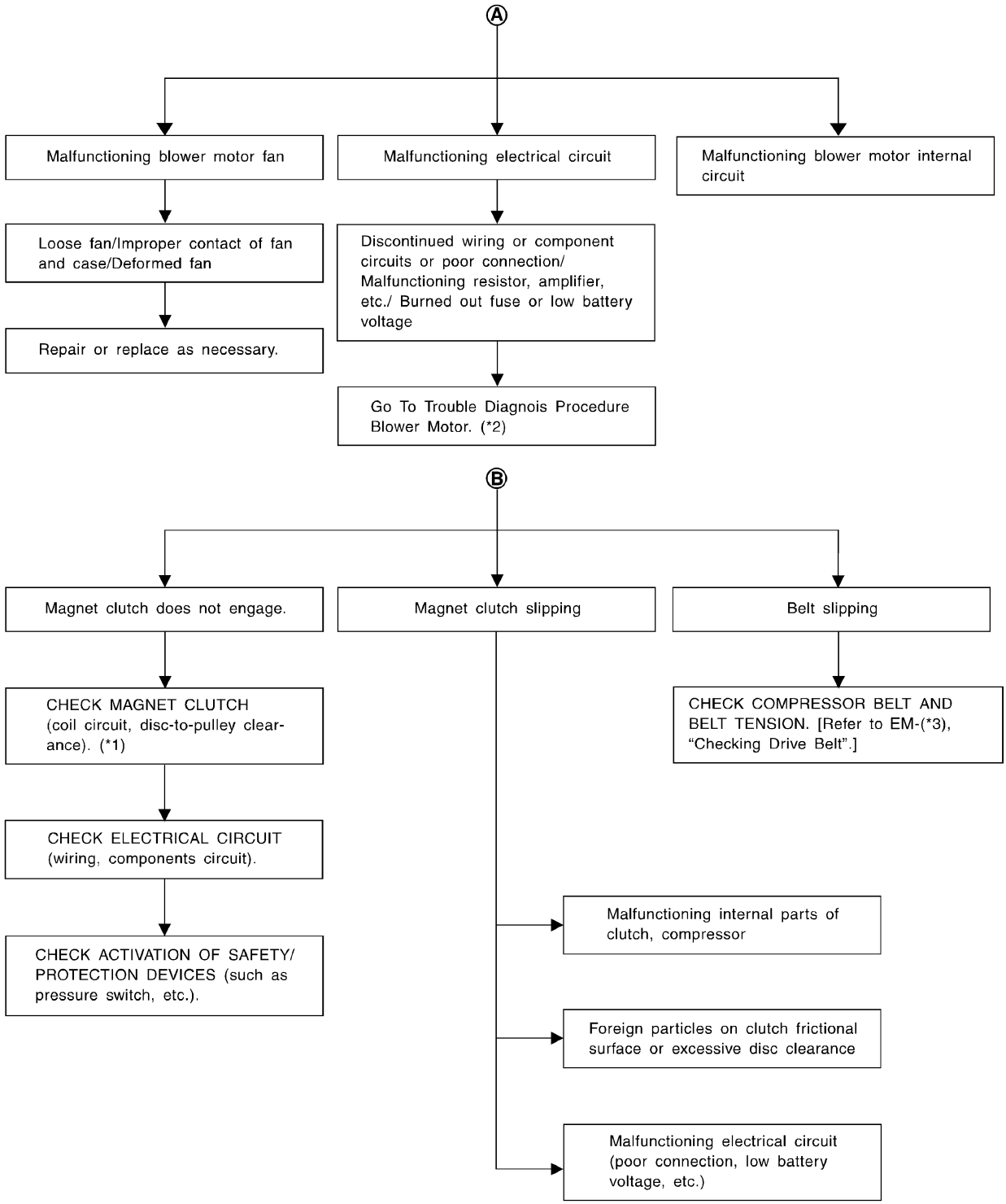
RJIA1601E

*1 ATC-91, "PERFORMANCE CHART".

*2 ATC-91, "PERFORMANCE CHART".

*3 ATC-92, "TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE".

*4 ATC-68, "Air Mix Door Motor Circuit".



RJIA1595E

*1 ATC-132, "Removal and Installation of Compressor Clutch". *2 ATC-75, "Blower Motor Circuit". *3 EM-12, "Checking Drive Belts"

PERFORMANCE CHART

Test Condition

Testing must be performed as follows:

Vehicle location	Indoors or in the shade (in a well-ventilated place)
Doors	Closed
Door window	Open
Hood	Open
TEMP.	Max. COLD
Mode control dial	(Ventilation) set
Intake switch	(Recirculation) set
Fan (blower) speed	Max. speed set
Engine speed	Idle speed
Operate the air conditioning system for 10 minutes before taking measurements.	

Test Reading

Recirculating-to-discharge Air Temperature Table

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	15 (59)	2.8 - 3.9 (37.0 - 39.0)
	20 (68)	5.3 - 7.7 (41.5 - 45.9)
	25 (77)	8.9 - 12.0 (48.0 - 53.6)
	30 (86)	13.0 - 16.7 (55.4 - 62.1)
	35 (95)	18.2 - 22.0 (64.8 - 71.6)
60 - 70	15 (59)	3.9 - 6.0 (39.0 - 42.8)
	20 (68)	7.7 - 10.0 (45.9 - 50.0)
	25 (77)	12.0 - 14.4 (53.6 - 57.9)
	30 (86)	16.7 - 19.8 (62.1 - 67.6)
	35 (95)	22.0 - 26.0 (71.6 - 78.8)

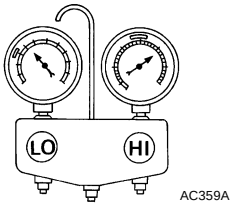
Ambient Air Temperature-to-operating Pressure Table

Ambient air		High-pressure (Discharge side) kPa (kg/cm^2 , psi)	Low-pressure (Suction side) kPa (kg/cm^2 , psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	15 (59)	600 - 770 (6.12 - 7.86, 87.0 - 111.7)	165 - 220 (1.68 - 2.24, 23.9 - 31.9)
	20 (68)	640 - 840 (6.53 - 8.57, 92.8 - 121.8)	170 - 235 (1.73 - 2.40, 24.7 - 34.1)
	25 (77)	790 - 1,030 (8.06 - 10.5, 114.6 - 149.4)	185 - 255 (1.89- 2.60, 26.8 - 37.0)
	30 (86)	1,050 - 1,340 (10.7 - 13.7, 152.3 - 194.3)	205 - 290 (2.10 - 2.96, 29.7 - 42.1)
	35 (95)	1,055 - 1,345 (10.8 - 13.7, 153.0 - 195.0)	240 - 335 (2.45 - 3.42, 34.8 - 48.6)

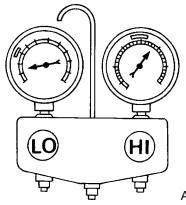
TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE

Whenever system's high and/or low side pressure(s) is/are unusual, diagnose using a manifold gauge. The marker above the gauge scale in the following tables indicates the standard (usual) pressure range. Since the standard (usual) pressure, however, differs from vehicle to vehicle, refer to above table (Ambient air temperature-to-operating pressure table).

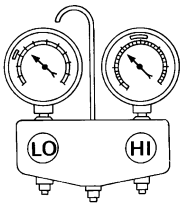
Both High- and Low-pressure Sides are Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too high.  AC359A	Pressure is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan	● Clean condenser. ● Check and repair cooling fan as necessary.
	● Low-pressure pipe is not cold. ● When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm^2 , 28 psi). It then decreases gradually thereafter.	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly.) ↓ Air in refrigeration cycle	Evacuate repeatedly and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair each engine cooling system.
	● An area of the low-pressure pipe is colder than areas near the evaporator outlet. ● Plates are sometimes covered with frost.	● Excessive liquid refrigerant on low-pressure side ● Excessive refrigerant discharge flow ● Expansion valve is open a little compared with the specification. ↓ Improper expansion valve adjustment	Replace expansion valve.

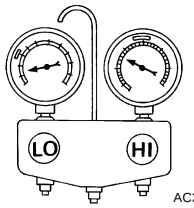
High-pressure Side is Too High and Low-pressure Side is Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too high and low-pressure side is too low.  AC360A	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts located between compressor and condenser are clogged or crushed.	● Check and repair or replace malfunctioning parts. ● Check lubricant for contamination.

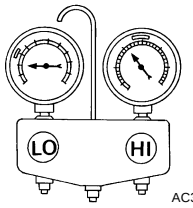
High-pressure Side is Too Low and Low-pressure Side is Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too low and low-pressure side is too high.  AC356A	High- and low-pressure sides become equal soon after compressor operation stops.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings	Replace compressor.
	No temperature difference between high- and low-pressure sides	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.

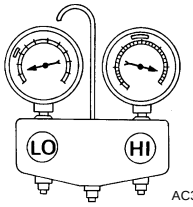
Both High- and Low-pressure Sides are Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too low.  AC353A	● There is a big temperature difference between receiver drier outlet and inlet. Outlet temperature is extremely low. ● Liquid tank inlet and expansion valve are frosted.	Liquid tank inside is slightly clogged.	● Replace liquid tank. ● Check lubricant for contamination.
	● Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank. ● Expansion valve inlet may be frosted. ● Temperature difference occurs somewhere in high-pressure side.	High-pressure pipe located between receiver drier and expansion valve is clogged.	● Check and repair malfunctioning parts. ● Check lubricant for contamination.
	Expansion valve and liquid tank are warm or only cool when touched.	Low refrigerant charge ↓ Leaking fittings or components	Check refrigerant for leaks. Refer to ATC-146, "Checking for Refrigerant Leaks" .
	There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.	Expansion valve closes a little compared with the specification. ↓ 1. Improper expansion valve adjustment. 2. Malfunctioning expansion valve. 3. Outlet and inlet may be clogged.	● Remove foreign particles by using compressed air. ● Check lubricant for contamination.
	An area of the low-pressure pipe is colder than areas near the evaporator outlet.	Low-pressure pipe is clogged or crushed.	● Check and repair malfunctioning parts. ● Check lubricant for contamination.
	Air flow volume is not enough or is too low.	Evaporator is frozen.	● Check intake sensor circuit. Refer to ATC-106, "Intake Sensor Circuit" . ● Replace compressor.

Low-pressure Side Sometimes Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side sometimes becomes negative.  AC354A	● Air conditioning system does not function and does not cyclically cool the compartment air. ● The system constantly functions for a certain period of time after compressor is stopped and restarted.	Refrigerant does not discharge cyclically. ↓ Moisture is frozen at expansion valve outlet and inlet. ↓ Water is mixed with refrigerant.	● Drain water from refrigerant or replace refrigerant. ● Replace liquid tank.

Low-pressure Side Becomes Negative

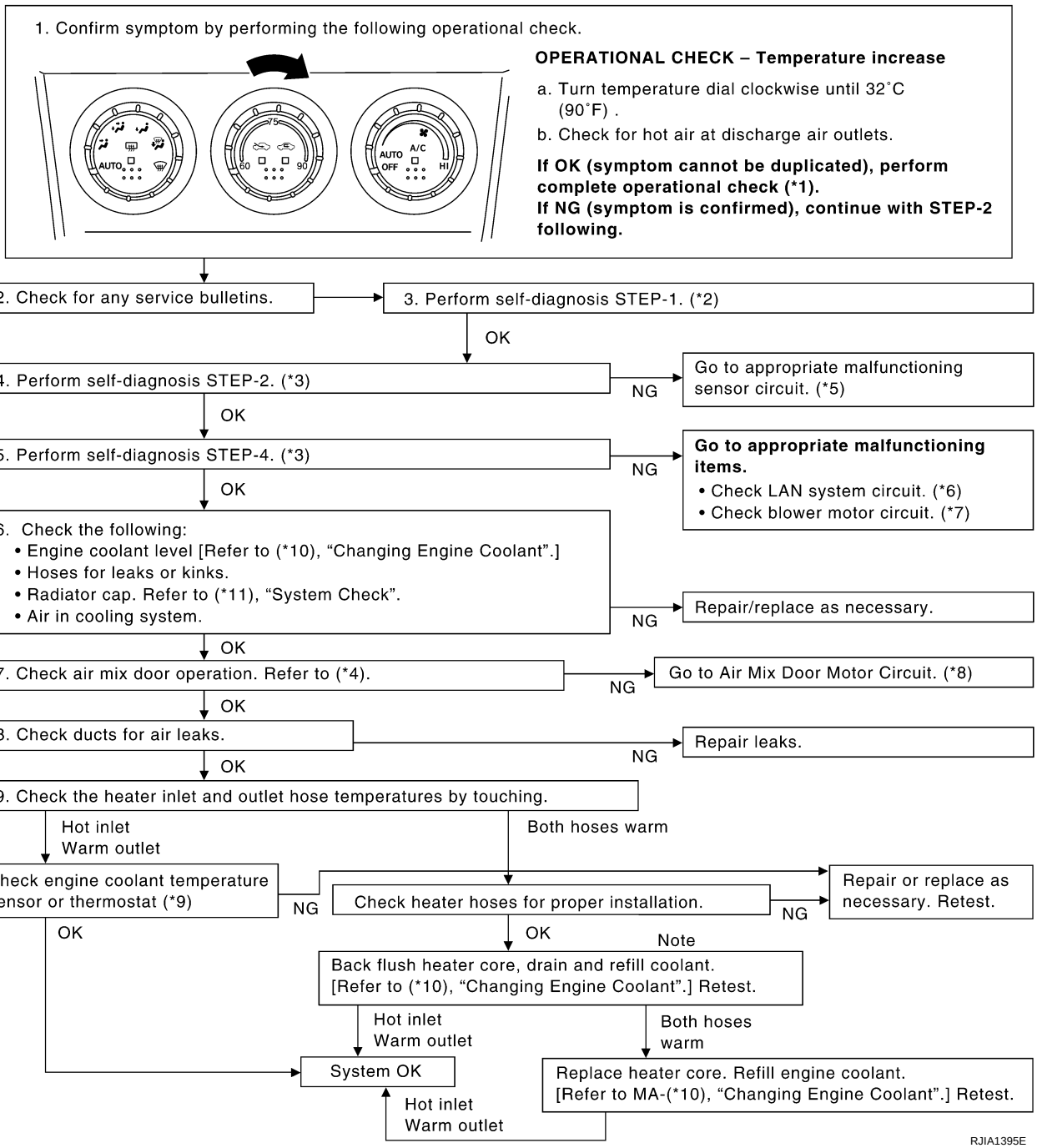
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side becomes negative.  AC362A	Liquid tank or front/rear side of expansion valve′s pipe is frosted or dewed.	High-pressure side is closed and refrigerant does not flow. ↓ Expansion valve or liquid tank is frosted.	Leave the system at rest until no frost is present. Start it again to check whether or not the problem is caused by water or foreign particles. ● If water is the cause, initially cooling is okay. Then the water freezes causing a blockage. Drain water from refrigerant or replace refrigerant. ● If due to foreign particles, remove expansion valve and remove the particles with dry and compressed air (not shop air). ● If either of the above methods cannot correct the problem, replace expansion valve. ● Replace liquid tank. ● Check lubricant for contamination.

Insufficient Heating

AJS000AI

SYMPTOM: Insufficient heating

INSPECTION FLOW



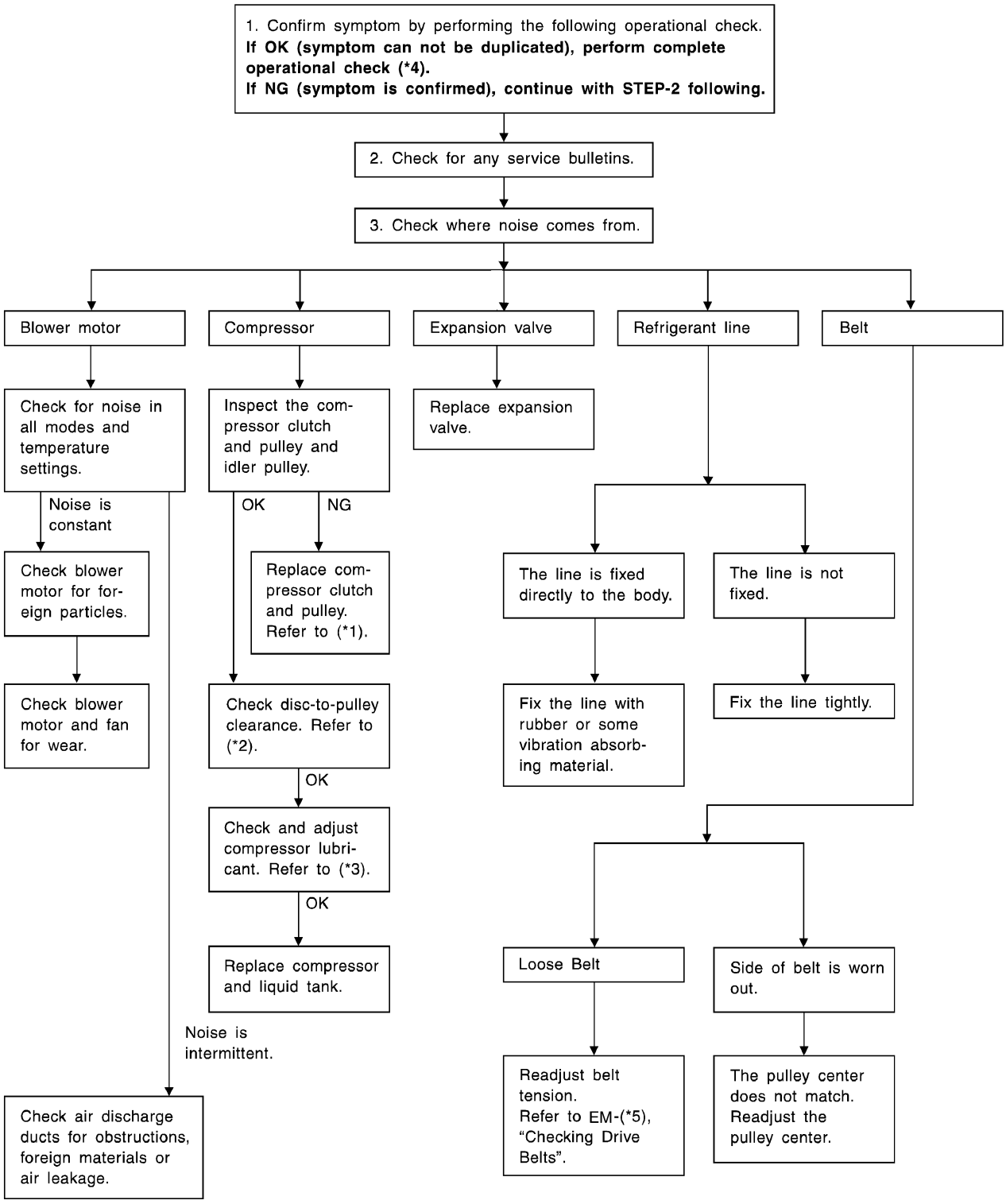
*1 ATC-57, "Operational Check".
*2 ATC-51, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.
*3 ATC-51, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.
*4 ATC-68, "Air Mix Door Motor Circuit".
*5 ATC-51, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.
*6 ATC-61, "LAN System Circuit".
*7 ATC-75, "Blower Motor Circuit".
*8 ATC-68, "Air Mix Door Motor Circuit".
*9 EC-176, "DTC P0117, P0118 ECT SENSOR".
*10 CO-9, "Changing Engine Coolant".
*11 CO-14, "Checking Radiator Cap".

Noise

AJS000AJ

SYMPTOM: Noise

INSPECTION FLOW



RJIA1596E

*1 Compressor Clutch, ATC-132, "REMOVAL" .

*2 Compressor Clutch, ATC-134, "INSTALLATION" .

*3 ATC-24, "Maintenance of Lubricant Quantity in Compressor".

*4 ATC-57, "Operational Check".

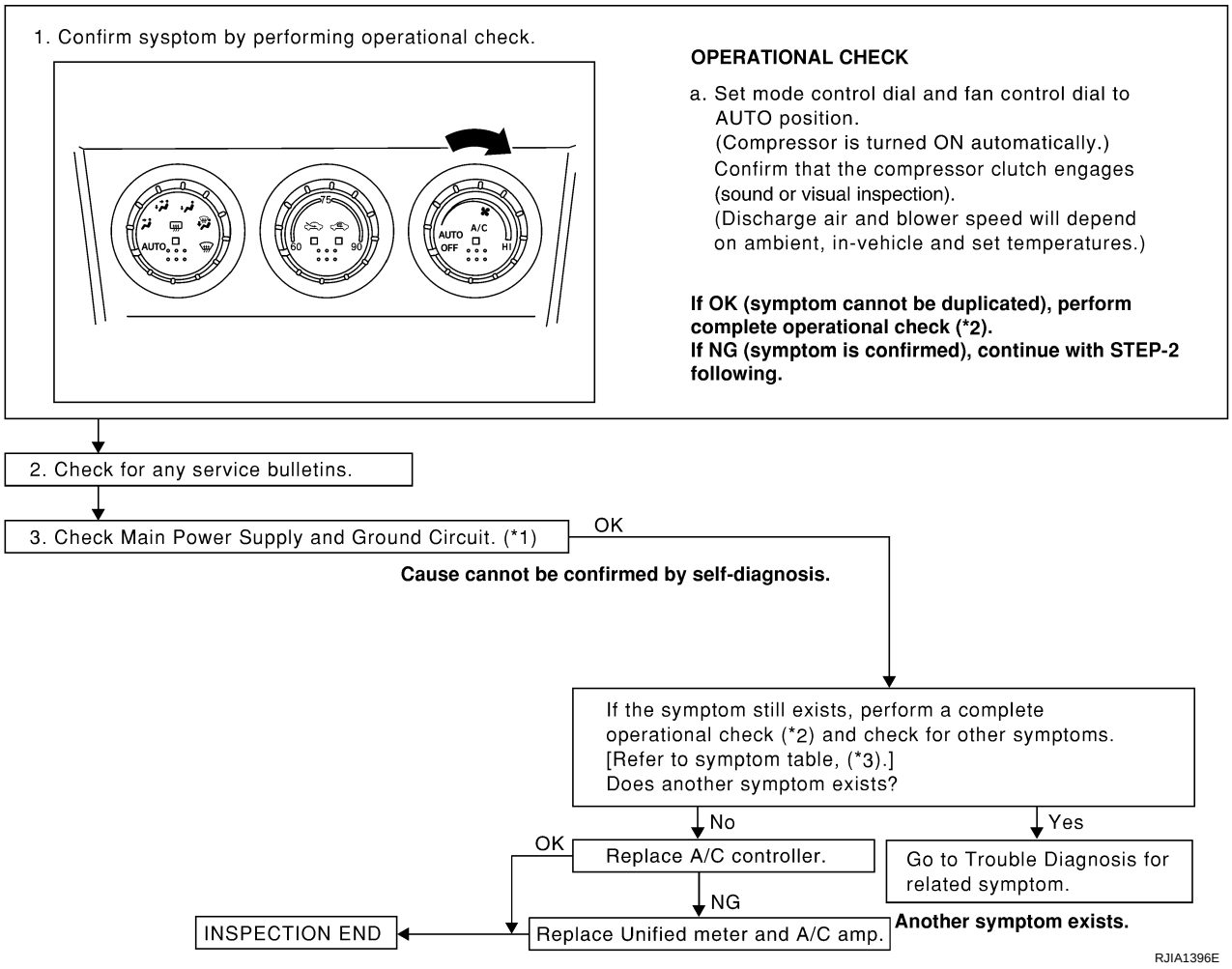
*5 EM-12, "Checking Drive Belts".

Self-diagnosis

AJS000AK

SYMPTOM: Self-diagnosis cannot be performed.

INSPECTION FLOW



*1 ATC-59, "Power Supply and Ground Circuit for Auto Amp.". *2 ATC-57, "Operational Check". *3 ATC-38, "SYMPTOM TABLE".

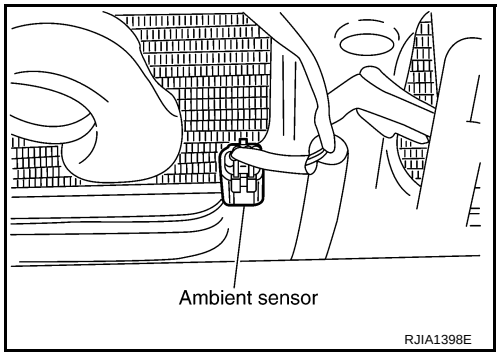
Ambient Sensor Circuit

AJS000AM

COMPONENT DESCRIPTION

Ambient Sensor

The ambient sensor is attached on the hood lock stay. It detects ambient temperature and converts it into a resistance value which is then input into the unified meter and A/C amp.

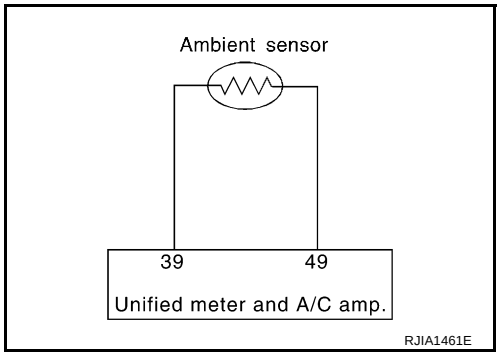


AMBIENT TEMPERATURE INPUT PROCESS

The unified meter and A/C amp. includes a processing circuit for the ambient sensor input. However, when the temperature detected by the ambient sensor increases quickly, the processing circuit retards the unified meter and A/C amp. function. It only allows the auto amp. to recognize an ambient temperature increase of 0.33°C (0.6°F) per 100 seconds.
As an example, consider stopping for a few minutes after high speed driving. Although the actual ambient temperature has not changed, the temperature detected by the ambient sensor will increase. This is because the heat from the engine compartment can radiate to the front grille area, location of the ambient sensor.

DIAGNOSTIC PROCEDURE FOR AMBIENT SENSOR

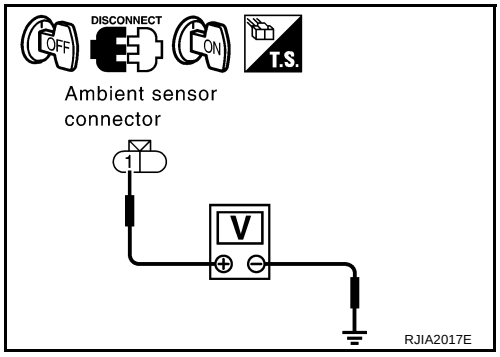
SYMPTOM: Ambient sensor circuit is open or shorted.
LED of A/C switch does not illuminate as a result of performing self-diagnosis STEP-2.



1. CHECK VOLTAGE BETWEEN AMBIENT SENSOR AND GROUND

1. Disconnect ambient sensor connector.
2. Turn ignition switch ON.
3. Check voltage between ambient sensor harness connector E34 terminal 1 (Y/G) and ground.

1 – Ground : Approx. 5V



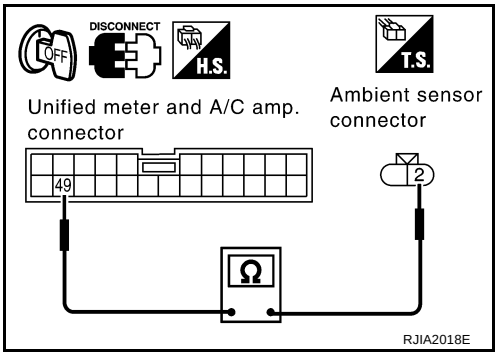
OK or NG

OK >> GO TO 2.
NG >> GO TO 4.

2. CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between ambient sensor harness connector E34 terminal 2 (W/G) and unified meter and A/C amp. harness connector M50 terminal 49 (W/L).

2 – 49 : Continuity should exist.



OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK AMBIENT SENSOR

Refer to ATC-100, "Ambient Sensor" .

OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-51, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

NG >> 1. Replace ambient sensor.
2. Go to self-diagnosis ATC-51, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

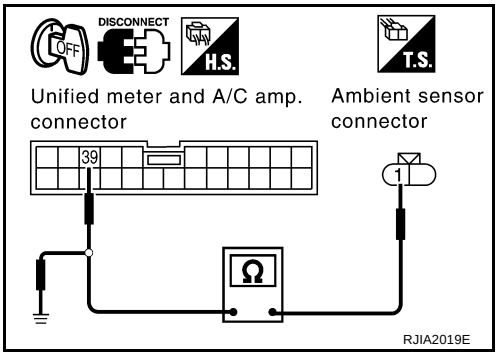
4. CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between ambient sensor harness connector E34 terminal 1 (Y/G) and unified meter and A/C amp. harness connector M50 terminal 39 (Y).

1 – 39 : Continuity should exist.

4. Check continuity between ambient sensor harness connector E34 terminal 1 (Y/G) and ground.

1 – Ground : Continuity should not exist.



OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-51, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

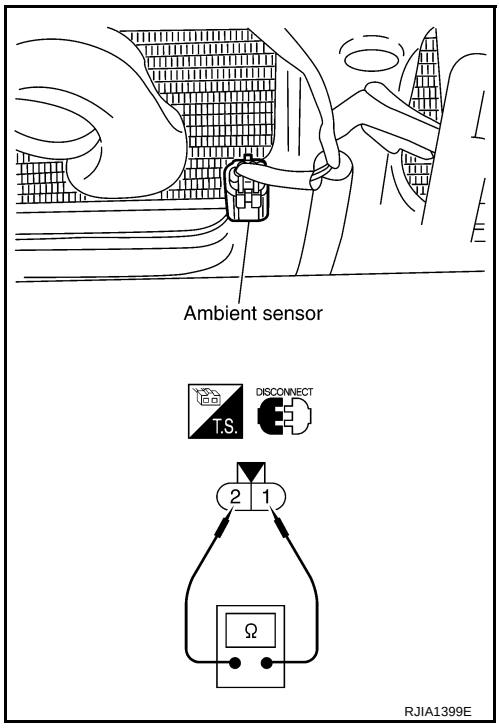
NG >> Repair harness or connector.

COMPONENT INSPECTION

Ambient Sensor

After disconnecting ambient sensor connector E34, measure resistance between terminals 2 and 1 at sensor side, using the table below.

Temperature °C (°F)	Resistance kΩ
–15 (5)	12.73
–10 (14)	9.92
–5 (23)	7.80
0 (32)	6.19
5 (41)	4.95
10 (50)	3.99
15 (59)	3.24
20 (68)	2.65
25 (77)	2.19
30 (86)	1.81
35 (95)	1.51
40 (104)	1.27
45 (113)	1.07



If NG, replace ambient sensor.

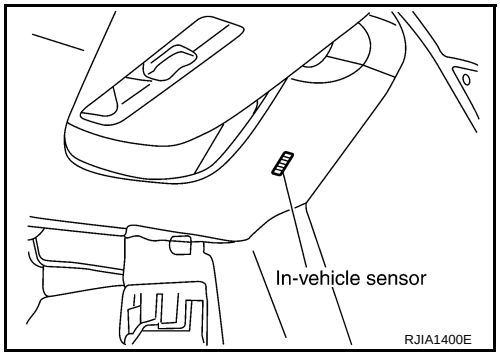
In-vehicle Sensor Circuit

AJS000AN

COMPONENT DESCRIPTION

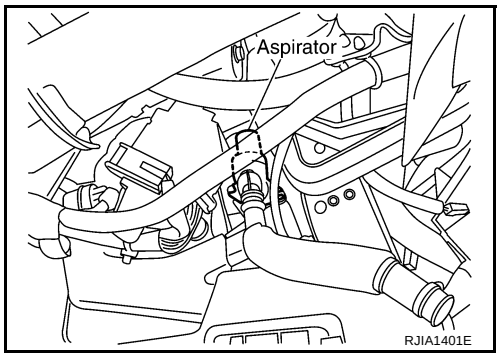
In-vehicle Sensor

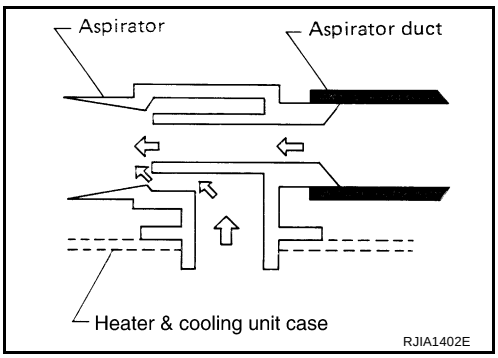
The in-vehicle sensor is located on instrument lower panel. It converts variations in temperature of compartment air drawn from the aspirator into a resistance value. It is then input into the unified meter and A/C amp.



Aspirator

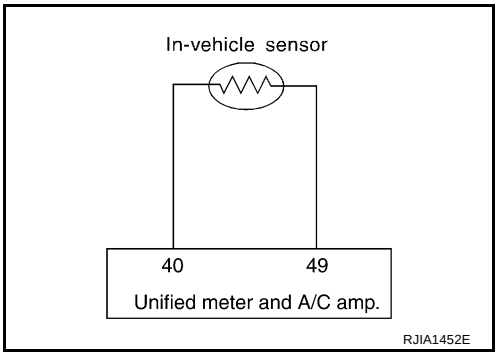
The aspirator is located on driver's side of heater & cooling unit. It produces vacuum pressure due to air discharged from the heater & cooling unit, continuously taking compartment air in the aspirator.





DIAGNOSTIC PROCEDURE FOR IN-VEHICLE SENSOR

SYMPTOM: In-vehicle sensor circuit is open or shorted.
LED of A/C switch does not illuminate as a result of performing self-diagnosis STEP-2.



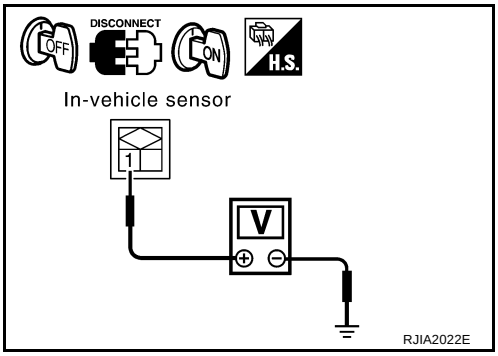
1. CHECK VOLTAGE BETWEEN IN-VEHICLE SENSOR AND GROUND

1. Disconnect in-vehicle sensor connector.
2. Turn ignition switch ON.
3. Check voltage between in-vehicle sensor harness connector M42 terminal 1 (BR) and ground.

1 – Ground : Approx. 5V

OK or NG

OK >> GO TO 2.
NG >> GO TO 4.



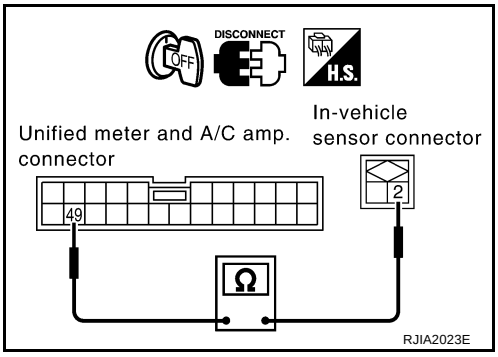
2. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between in-vehicle sensor harness connector M42 terminal 2 (W/L) and unified meter and A/C amp. harness connector M50 terminal 49 (W/L).

2 – 49 : Continuity should exist.

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.



3. CHECK IN-VEHICLE SENSOR

Refer to ATC-102, "In-vehicle Sensor" .

OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-51, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

NG >> 1. Replace in-vehicle sensor.
2. Go to self-diagnosis ATC-51, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

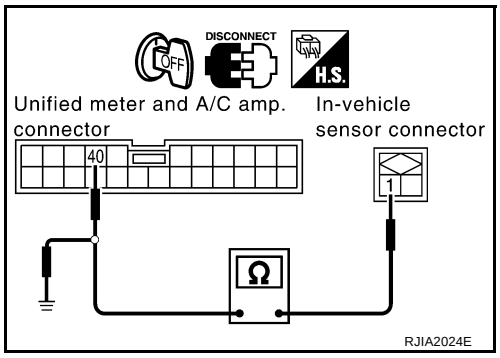
4. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between in-vehicle sensor harness connector M42 terminal 1 (BR) and unified meter and A/C amp. harness connector M50 terminal 40 (BR).

1 – 40 : Continuity should exist.

4. Check continuity between in-vehicle sensor harness connector M42 terminal 1 (BR) and ground.

1 – Ground : Continuity should not exist.



OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-51, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

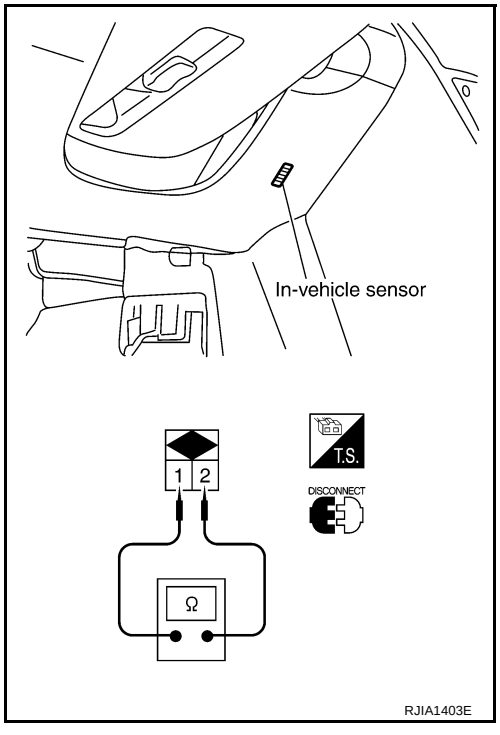
NG >> Repair harness or connector.

COMPONENT INSPECTION

In-vehicle Sensor

After disconnecting in-vehicle sensor connector M42, measure resistance between terminals 1 and 2 at sensor side, using the table below.

Temperature °C (°F)	Resistance kΩ
–15 (5)	12.73
–10 (14)	9.92
–5 (23)	7.80
0 (32)	6.19
5 (41)	4.95
10 (50)	3.99
15 (59)	3.24
20 (68)	2.65
25 (77)	2.19
30 (86)	1.81
35 (95)	1.51
40 (104)	1.27
45 (113)	1.07



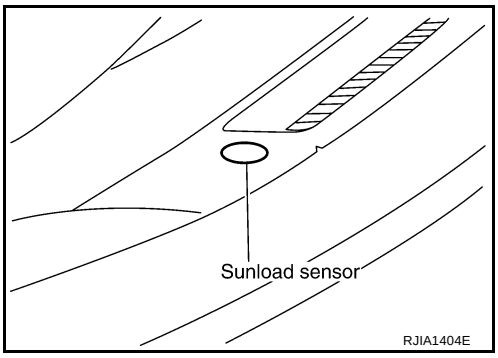
If NG, replace in-vehicle sensor.

Sunload Sensor Circuit

AJS000AO

COMPONENT DESCRIPTION

The sunload sensor is located on the passenger's side defroster grille. It detects sunload entering through windshield by means of a photo diode. The sensor converts the sunload into a current value which is then input into the unified meter and A/C amp.



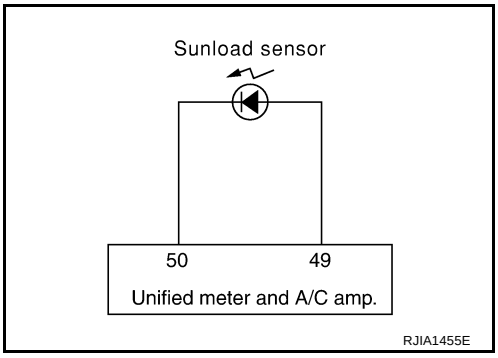
SUNLOAD INPUT PROCESS

The unified meter and A/C amp. also includes a processing circuit which averages the variations in detected sunload over a period of time. This prevents drastic swings in the ATC system operation due to small or quick variations in detected sunload.

For example, consider driving along a road bordered by an occasional group of large trees. The sunload detected by the sunload sensor will vary whenever the trees obstruct the sunlight. The processing circuit averages the detected sunload over a period of time, so that the (insignificant) effect of the trees momentarily obstructing the sunlight does not cause any change in the ATC system operation. On the other hand, shortly after entering a long tunnel, the system will recognize the change in sunload, and the system will react accordingly.

DIAGNOSTIC PROCEDURE FOR SUNLOAD SENSOR

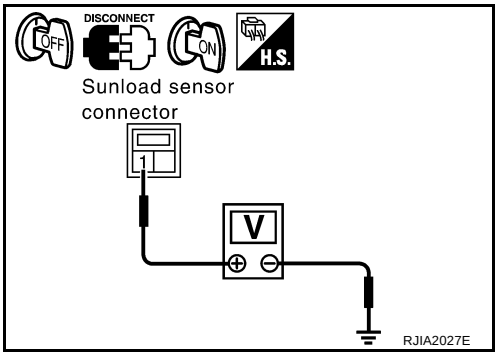
SYMPTOM: Sunload sensor circuit is open or shorted.
LED of A/C switch does not illuminate as a result of performing self-diagnosis STEP-2.



1. CHECK VOLTAGE BETWEEN SUNLOAD SENSOR AND GROUND

1. Disconnect sunload sensor connector.
2. Turn ignition switch ON.
3. Check voltage between sunload sensor harness connector M18 terminal 1 (LG) and ground.

1 – Ground : Approx. 5V



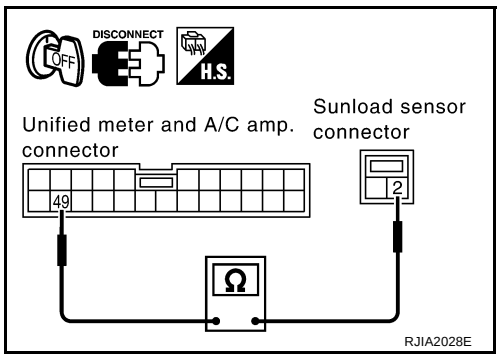
OK or NG

OK >> GO TO 2.
NG >> GO TO 4.

2. CHECK CIRCUIT CONTINUITY BETWEEN SUNLOAD SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between sunload sensor harness connector M18 terminal 2 (W/L) and unified meter and A/C amp. harness connector M50 terminal 49 (W/L).

2 – 49 : Continuity should exist.



OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK SUNLOAD SENSOR

1. Reconnect sunload sensor connector and unified meter and A/C amp. connector.
2. Refer to ATC-105, "Sunload Sensor" .

OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-51, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

NG >> 1. Replace sunload sensor.
2. Go to self-diagnosis ATC-51, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

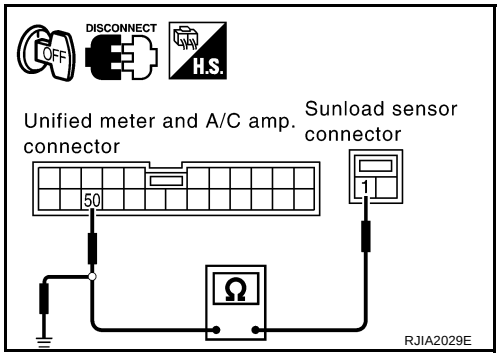
4. CHECK CIRCUIT CONTINUITY BETWEEN SUNLOAD SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between sunload sensor harness connector M18 terminal 1 (LG) and unified meter and A/C amp. harness connector M50 terminal 50 (LG).

1 – 50 : Continuity should exist.

4. Check continuity between sunload sensor harness connector M18 terminal 1 (LG) and ground.

1 – Ground : Continuity should not exist.



OK or NG

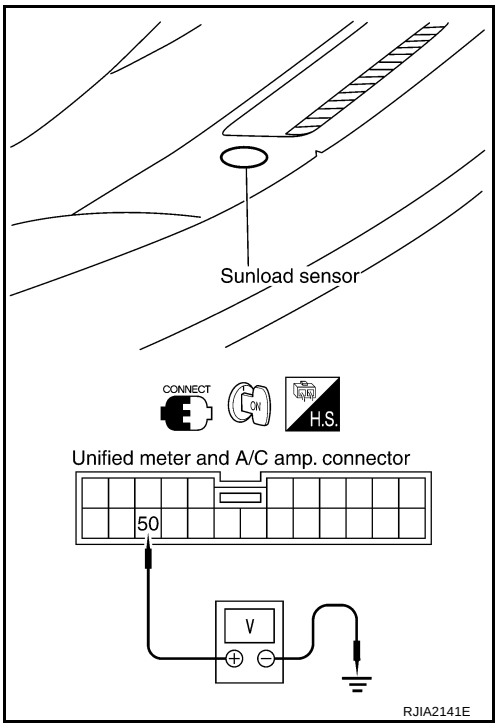
OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-51, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

NG >> Repair harness or connector.

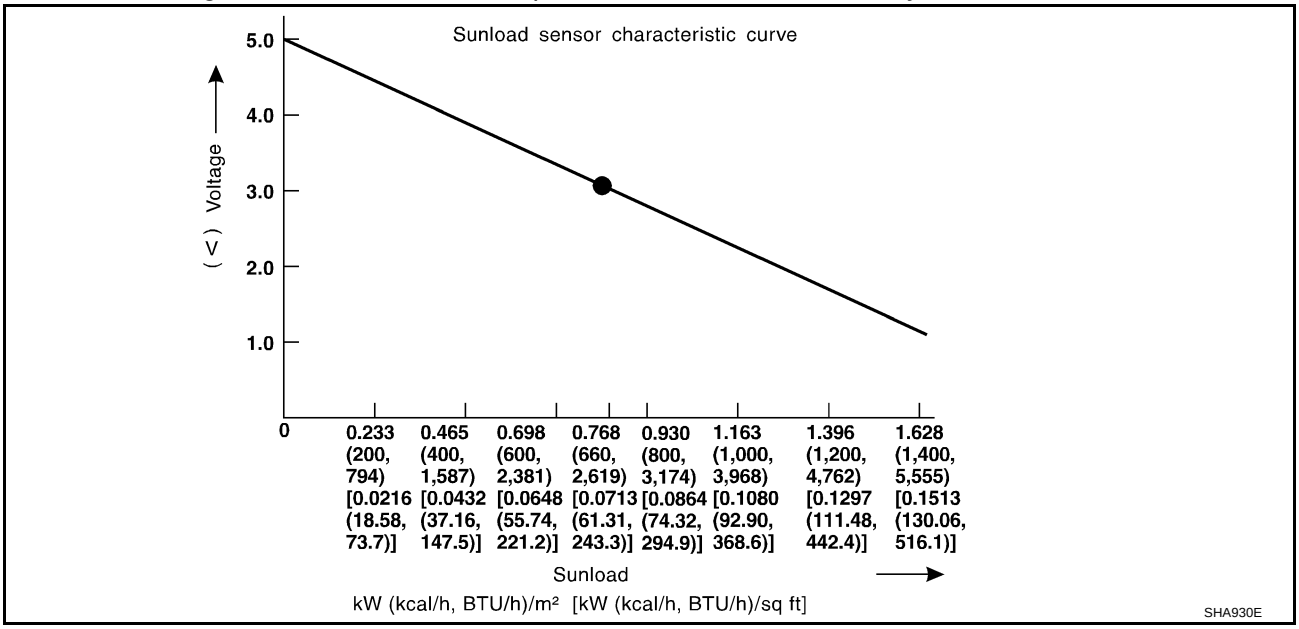
COMPONENT INSPECTION

Sunload Sensor

Measure voltage between unified meter and A/C amp. harness connector M50 terminal 50 (LG) and ground.
If NG, replace sunload sensor.



- When checking sunload sensor, select a place where sun shines directly on it.



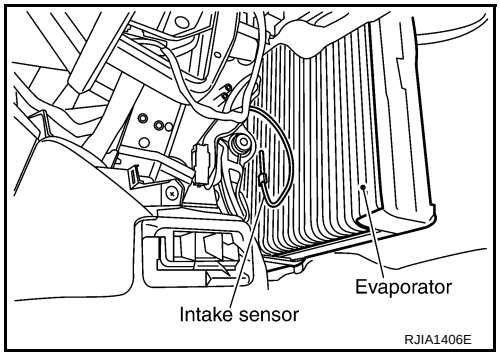
Intake Sensor Circuit

AJS000JL

COMPONENT DESCRIPTION

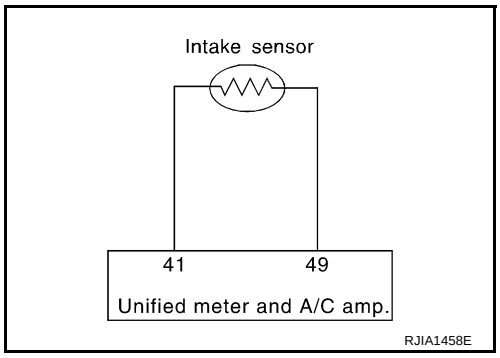
Intake Sensor

The intake sensor is located on the heater & cooling unit. It converts temperature of air after it passes through the evaporator into a resistance value which is then input to the unified meter and A/C amp.



DIAGNOSTIC PROCEDURE FOR INTAKE SENSOR

SYMPTOM: Intake sensor circuit is open or shorted.
LED of A/C switch does not illuminate as a result of performing self-diagnosis STEP-2.



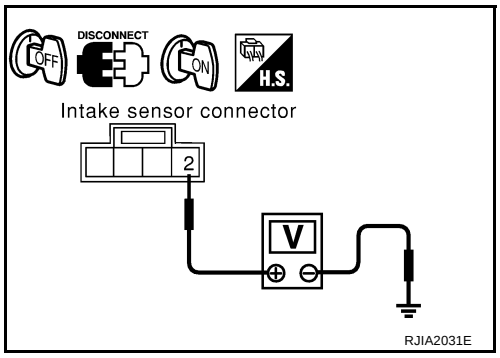
1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

1. Disconnect intake sensor connector.
2. Turn ignition switch ON.
3. Check voltage between intake sensor harness connector M255 terminal 2 (R) and ground.

2 – Ground : Approx. 5V

OK or NG

OK >> GO TO 2.
NG >> GO TO 4.



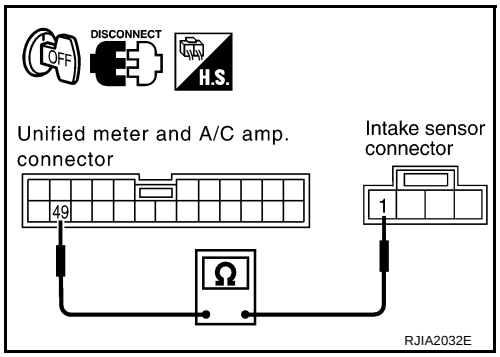
2. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between intake sensor harness connector M255 terminal 1 (W) and unified meter and A/C amp. harness connector M50 terminal 49 (W/L).

1 – 49 : Continuity should exist.

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.



3. CHECK INTAKE SENSOR

Refer to ATC-107, "Intake Sensor" .

OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-51, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

NG >> 1. Replace intake sensor.
2. Go to self-diagnosis ATC-51, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

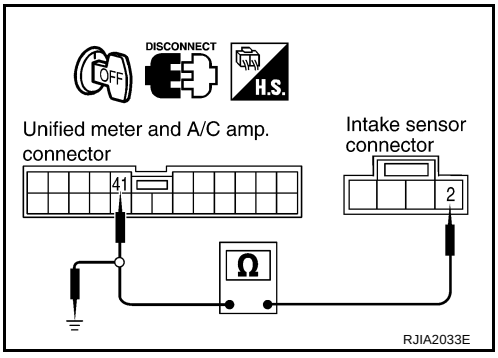
4. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between intake sensor harness connector M255 terminal 2 (R) and unified meter and A/C amp. harness connector M50 terminal 41 (SB).

2 – 41 : Continuity should exist.

4. Check continuity between intake sensor harness connector M255 terminal 2 (R) and ground.

2 – Ground : Continuity should not exist.



OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-51, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

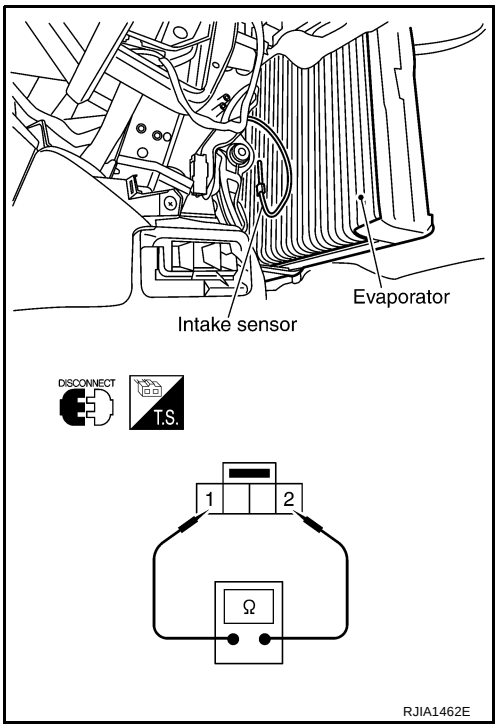
NG >> Repair harness or connector.

COMPONENT INSPECTION

Intake Sensor

After disconnecting intake sensor connector M255, measure resistance between terminals 1 and 2 at sensor side, using the table below.

Temperature °C (°F)	Resistance kΩ
–15 (5)	12.34
–10 (14)	9.62
–5 (23)	7.56
0 (32)	6.00
5 (41)	4.80
10 (50)	3.87
15 (59)	3.15
20 (68)	2.57
25 (77)	2.12
30 (86)	1.76
35 (95)	1.47
40 (104)	1.23
45 (113)	1.04



If NG, replace intake sensor.

A/C CONTROLLER

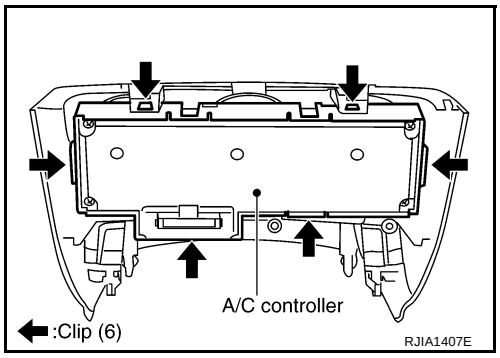
PFP:27500

Removal and Installation

AJS000JG

REMOVAL

1. Remove console finisher (A/T) or console boot (M/T). Refer to IP-11, "Removal and Installation" .
2. Remove A/C controller from console finisher (A/T) or console boot (M/T).



INSTALLATION

Installation is basically the reverse order of removal.

AUTO AMP

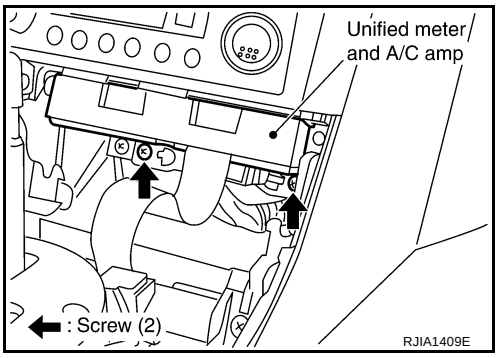
PFP:27760

Removal and Installation of Unified Meter and A/C Amp.

AJS000AT

REMOVAL

1. Remove the console finisher (A/T) or console boot (M/T). Refer to IP-11, "Removal and Installation" .
2. Remove the fixing screws, and then remove the unified meter and A/C amp.



INSTALLATION

Installation is basically the reverse order of removal.

AMBIENT SENSOR

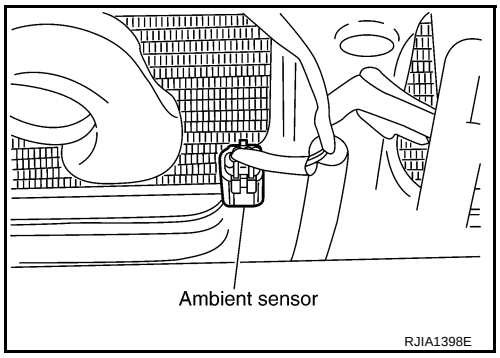
PFP:27722

Removal and Installation

AJS000AV

REMOVAL

1. Remove the engine under cover, using power tools.
2. Disconnect ambient sensor connector.
3. Remove ambient sensor.



INSTALLATION

Installation is basically the reverse order of removal.

IN-VEHICLE SENSOR

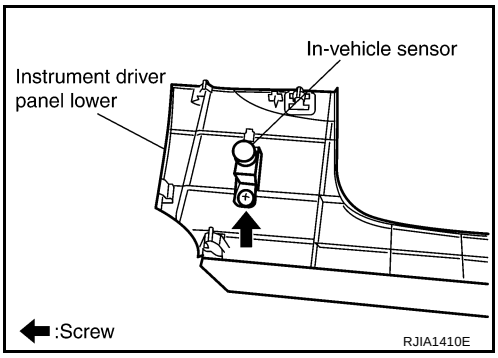
PFP:27720

Removal and Installation

AJS000AW

REMOVAL

1. Remove instrument driver panel lower. Refer to IP-11, "Removal and Installation" .
2. Remove mounting screw, and then remove in-vehicle sensor.



INSTALLATION

Installation is basically the reverse order of removal.

SUNLOAD SENSOR

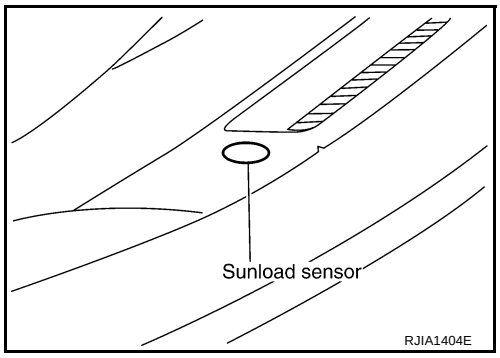
PFP:27721

Removal and Installation

AJS000AX

REMOVAL

1. Pull out sunload sensor from instrument panel.
2. Disconnect sunload sensor connector, and then remove sunload sensor.



INSTALLATION

Installation is basically the reverse order of removal.

INTAKE SENSOR

PFP:27723

Removal and Installation

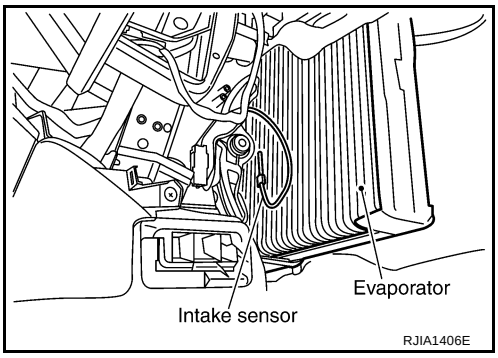
AJS001C5

REMOVAL

1. Set the temperature control dial at 18°C (60°F).
2. Open the driver and front passenger window, and then disconnect the battery negative cable.

   CAUTION:
   After the battery cables are disconnected, do not open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.
3. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
4. Remove low-pressure pipe and high-pressure pipe 2. Refer to ATC-139, "Removal and Installation of Low-pressure Pipe and High-pressure Pipe 2" .

   CAUTION:
   Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.
5. Slide the evaporator to passenger side, and then remove the intake sensor.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings for A/C piping with new ones. Before installing, apply compressor oil to them.**
- **Connection point for female-side piping is thin. So, when inserting male-side piping, take care not to deform female-side piping. Slowly insert in axial direction.**
- **Insert one-touch joint connection point securely until it clicks.**
- **After piping has been connected, pull male-side piping by hand to make sure piping does not come off.**
- **When recharging refrigerant, check for leaks.**

BLOWER UNIT

PFP:27200

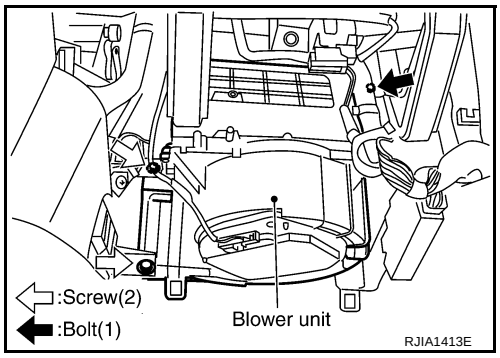
Removal and Installation

AJS000B0

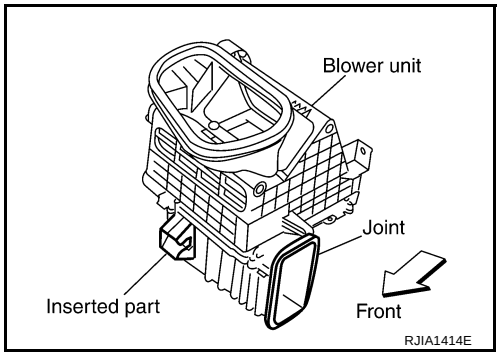
REMOVAL

1. Remove instrument passenger panel lower. Refer to IP-11, "Removal and Installation" .
2. Remove ECM with bracket attached.
3. Disconnect intake door motor connector and blower fan motor connector.
4. Remove fixing bolt (1) and screws (2), and then remove blower unit.

   CAUTION:
   Move blower unit rightward, and remove locating pin (1) and joint. Then remove blower unit downward.



5. Remove blower unit.



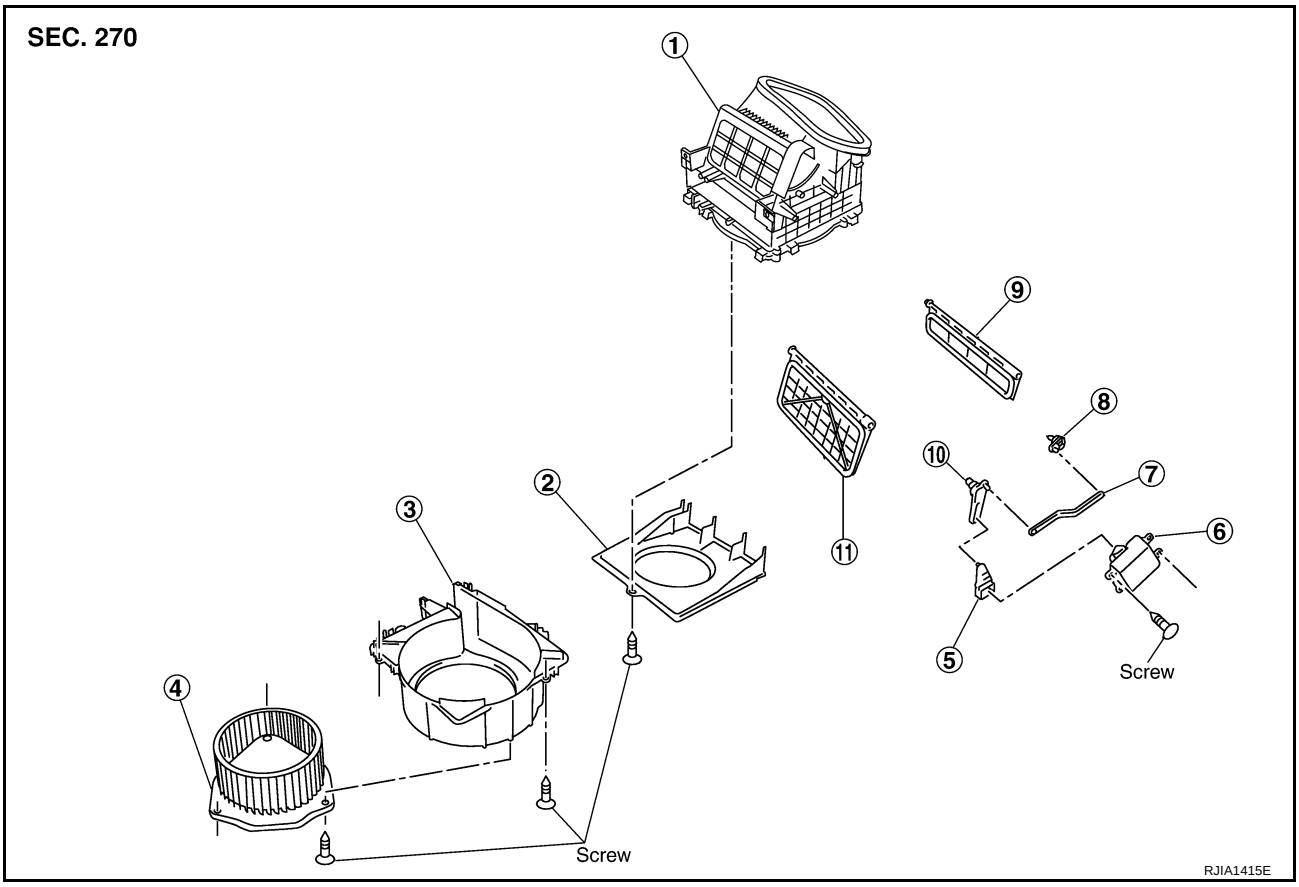
INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:
Make sure locating pin (1) and joint are securely inserted.

Disassembly and Assembly

AJS000B1



1.	Intake upper case	2.	Intake bell mouth	3.	Intake lower case
4.	Blower motor assembly	5.	Intake door lever 2	6.	Intake door motor
7.	Intake door link	8.	Intake door lever 3	9.	Intake door 2
10.	Intake door lever 1	11.	Intake door 1		

BLOWER MOTOR

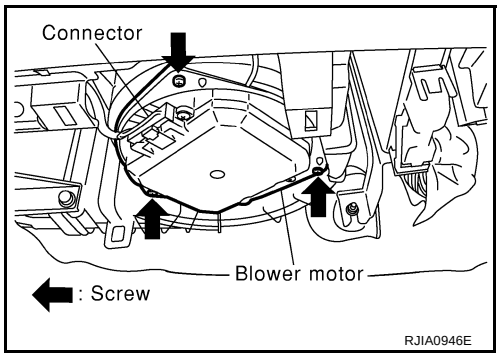
PFP:27226

Removal and Installation

AJS000B2

REMOVAL

1. Disconnect blower motor connector.
2. Remove screws from blower motor, and then remove it.



INSTALLATION

Installation is basically the reverse order of removal.

INTAKE DOOR MOTOR

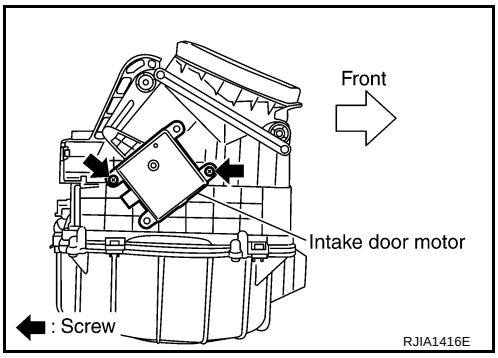
PFP:27730

Removal and Installation

AJS000B3

REMOVAL

1. Remove blower unit. Refer to ATC-114, "BLOWER UNIT" .
2. Remove intake door motor from the blower unit.



INSTALLATION

Installation is basically the reverse order of removal.

HEATER & COOLING UNIT ASSEMBLY

PFP:27110

Removal and Installation

AJS000B5

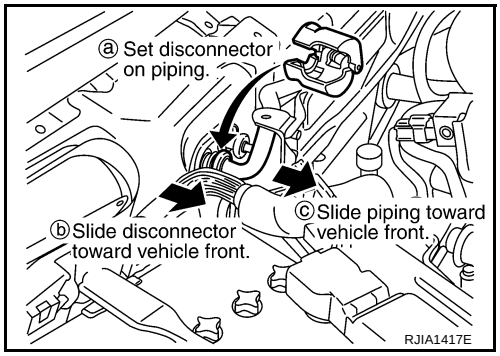
REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge refrigerant.
2. Drain coolant from cooling system. Refer to CO-9, "Changing Engine Coolant" .
3. Remove cowl top cover. Refer to EI-20, "COWL TOP" .
4. Disconnect low-pressure flexible hose and high-pressure pipe 1 from evaporator.

a. Set a disconnector (low-pressure side: 92530-89916, high-pressure side: 92530-89908) on A/C piping.

b. Slide a disconnector toward vehicle front until it clicks.

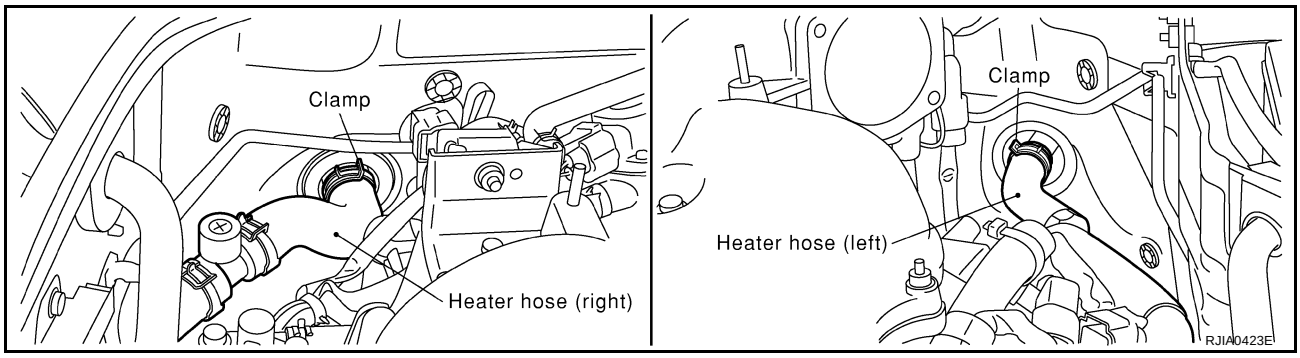
c. Slide A/C piping toward vehicle front and disconnect it.



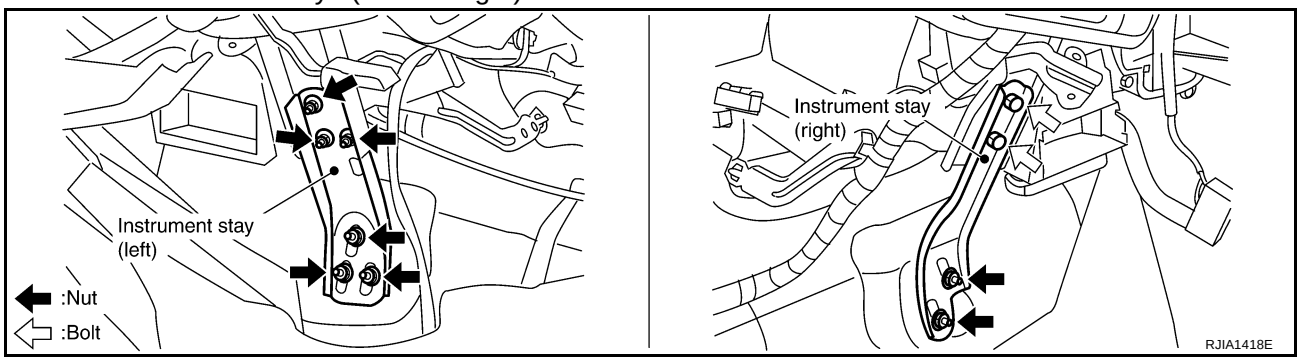
CAUTION:

Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.

5. Remove air hose and electronic control throttle assembly. Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .
6. Disconnect two heater hoses from heater core.

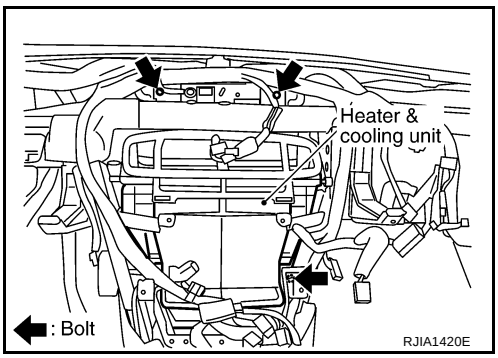


7. Remove instrument panel assembly. Refer to IP-11, "Removal and Installation" .
8. Remove blower unit. Refer to ATC-114, "BLOWER UNIT" .
9. Remove clips of vehicle harness from steering member.
10. Remove instrument stays (left and right).

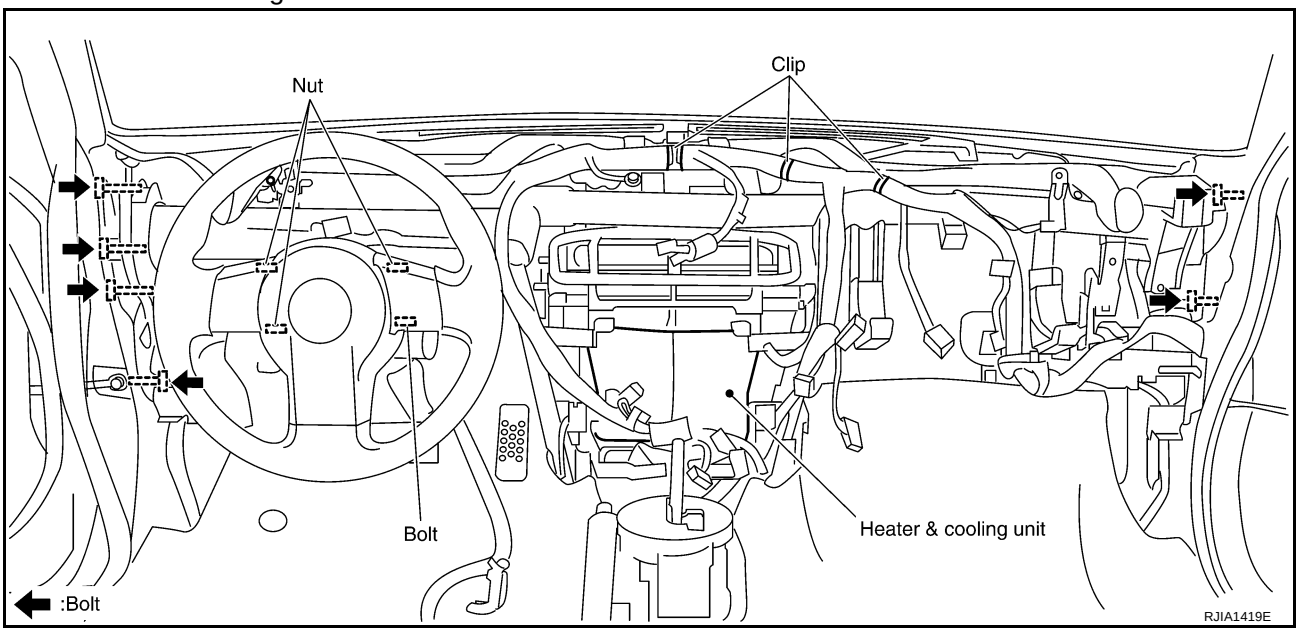


11. Remove defroster nozzle and ventilator ducts.

12. Remove mounting bolts from heater & cooling unit.



13. Remove the steering member.



14. Remove heater & cooling unit.

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings for A/C piping with new one, then apply compressor oil to it when installing it.**
- **Connection point for female-side piping is thin. So, when inserting male-side piping, take care not to deform female-side piping. Slowly insert in axial direction.**
- **Insert one-touch joint connection point securely until it clicks.**
- **After piping has been connected, pull male-side piping by hand to make sure piping does not come off.**
- **When recharging refrigerant, check for leaks.**

NOTE:

- When filling radiator with coolant, refer to CO-9, "Changing Engine Coolant" .
- Recharge the refrigerant.

Heater & cooling unit mounting bolt

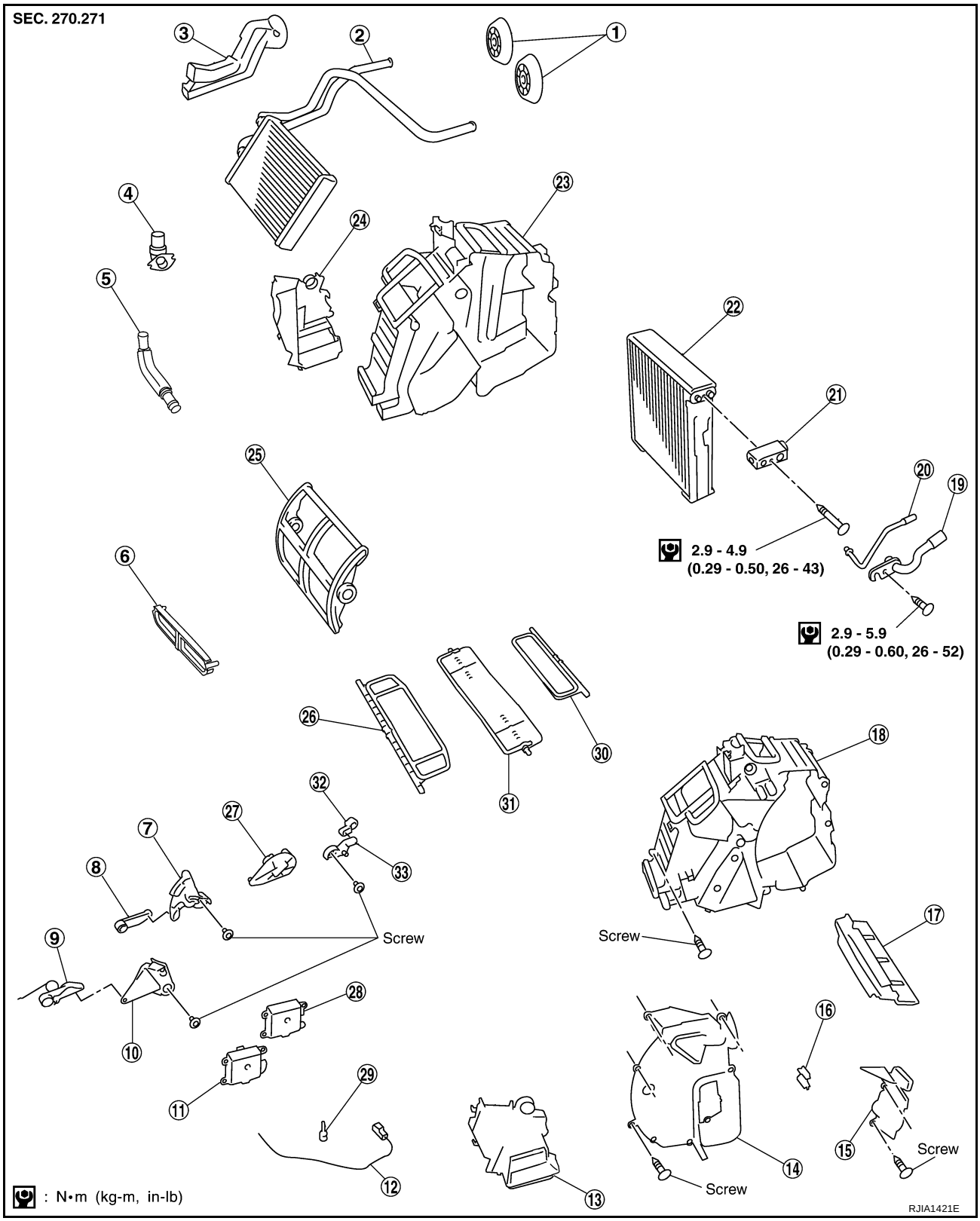
Tightening torque : 6.9 N·m (0.7 kg-m, 61 in-lb)

Steering member mounting nut and bolt

Tightening torque : 12 N·m (1.25 kg-m, 9 ft-lb)

Disassembly and Assembly

AJS000B6



1. Heater pipe grommet
2. Heater core
3. Heater pipe cover
4. Aspirator
5. Aspirator duct
6. Rear foot cover
7. Max. cool door link
8. Max. cool door lever
9. Ventilator door lever
10. Ventilator door link
11. Air mix door motor
12. Intake sensor
13. Foot duct (right)
14. Evaporator cover
15. Evaporator cover adapter
16. Heater pipe bracket
17. Insulator
18. Heater case (right)

19. Low-pressure pipe
20. High-pressure pipe 2
21. Expansion valve
22. Evaporator
23. Heater case (left)
24. Foot duct (left)
25. Air mix door (slide door)
26. Ventilator door
27. Side link
28. Mode door motor
29. Intake sensor bracket
30. Defroster door
31. Max. cool door
32. Defroster door lever
33. Defroster door link

MODE DOOR MOTOR

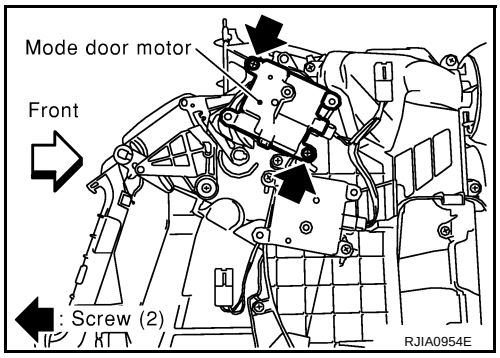
PFP:27731

Removal and Installation

AJS000B7

REMOVAL

1. Remove blower unit. Refer to ATC-114, "BLOWER UNIT" .
2. Remove mounting screws from mode door motor.
3. Disconnect mode door connector.
4. Remove mode door motor.



INSTALLATION

Installation is basically the reverse order of removal.

AIR MIX DOOR MOTOR

PFP:27732

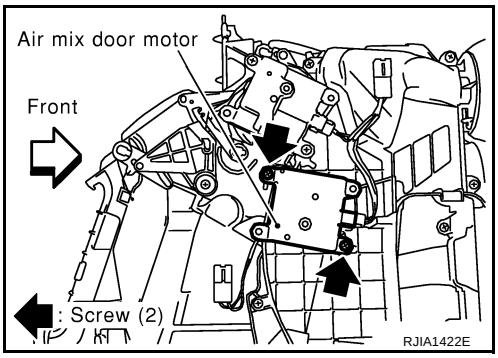
Removal and Installation

AJS000JM

REMOVAL

1. Set the temperature control dial at 18°C (60°F).
2. Open the driver and front passenger window, and then disconnect the battery negative cable.

   CAUTION:
   After the battery cables are disconnected, do not open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.
3. Remove blower unit. Refer to ATC-114, "BLOWER UNIT" .
4. Disconnect air mix door motor connector.
5. Remove air mix door motor.



INSTALLATION

Installation is basically the reverse order of removal.

HEATER CORE

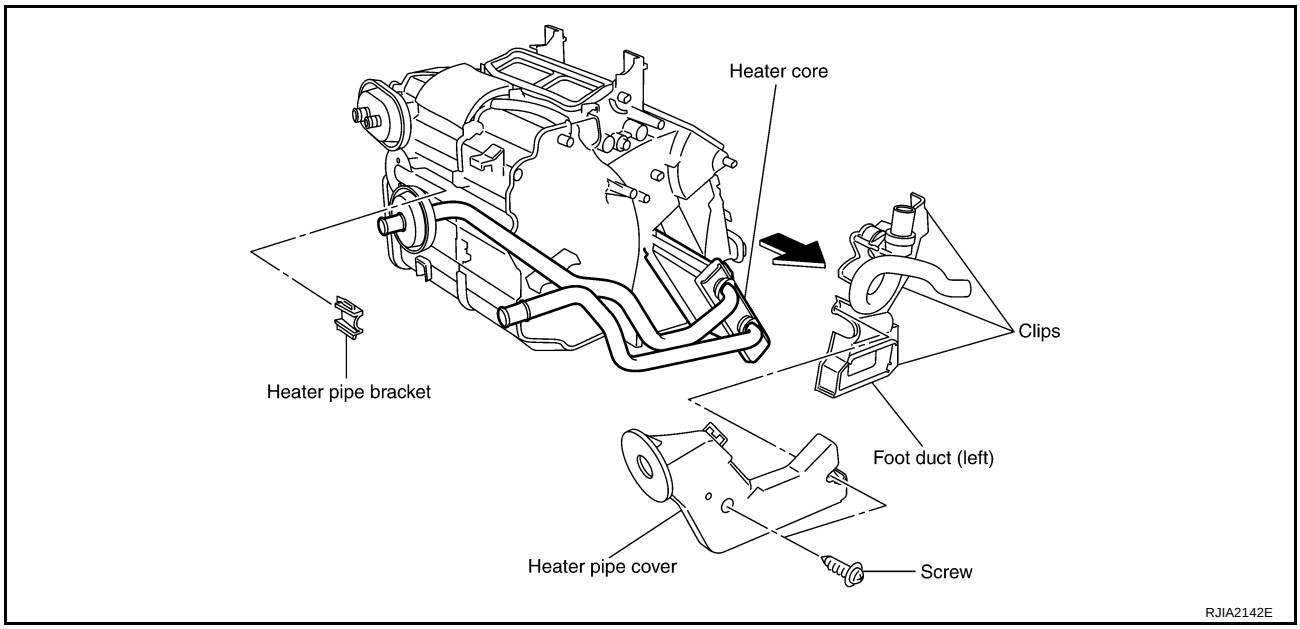
PFP:27140

Removal and Installation

AJS001C7

REMOVAL

1. Remove heater & cooling unit. Refer to ATC-118, "HEATER & COOLING UNIT ASSEMBLY" .
2. Remove foot duct (left). Refer to ATC-128, "Removal of Foot Ducts" .



3. Remove heater pipe cover.
4. Remove heater pipe support and heater pipe grommet.
5. Slide heater core to driver side.

INSTALLATION

Installation is basically the reverse order of removal.

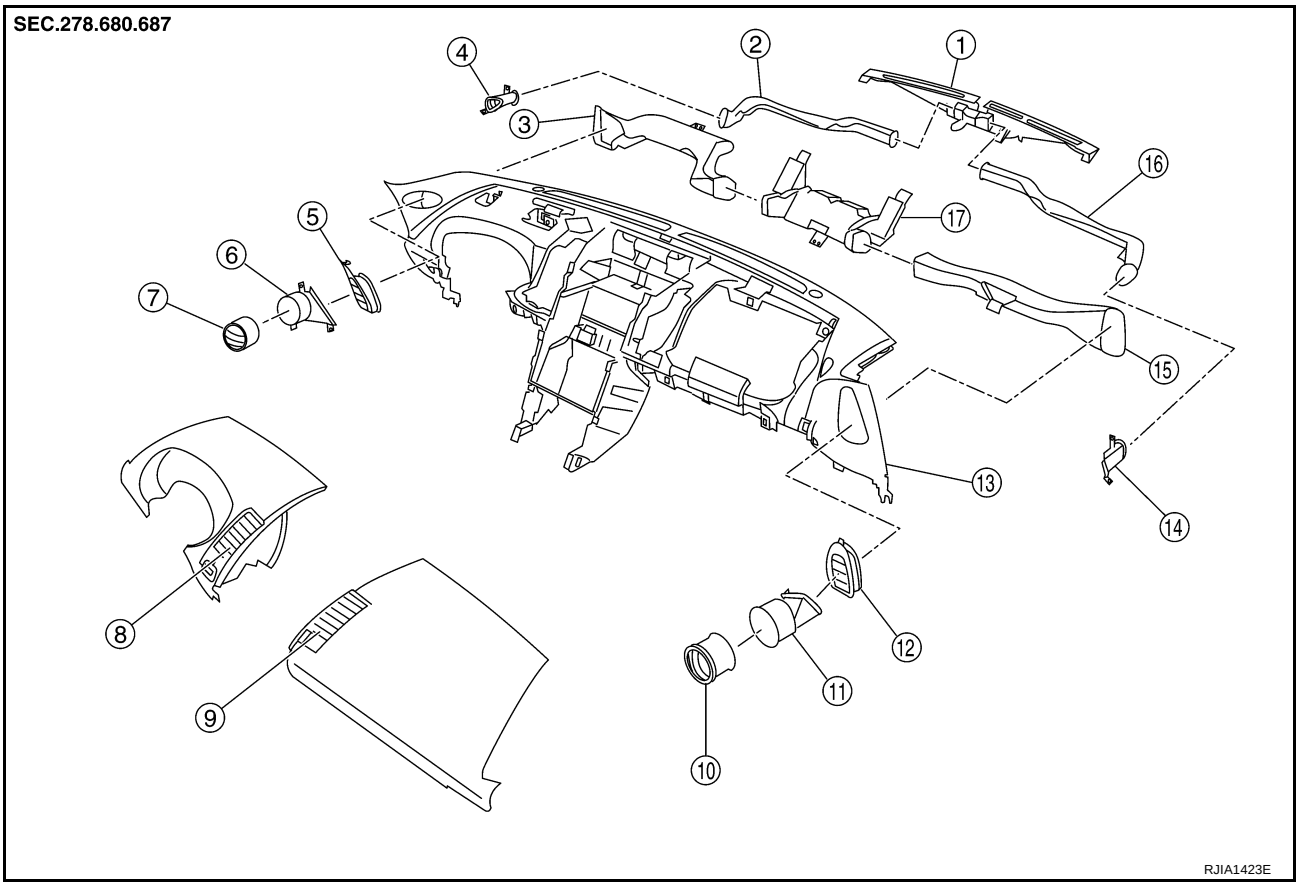
DUCTS AND GRILLES

PFP:27860

Removal and Installation

AJS000B9

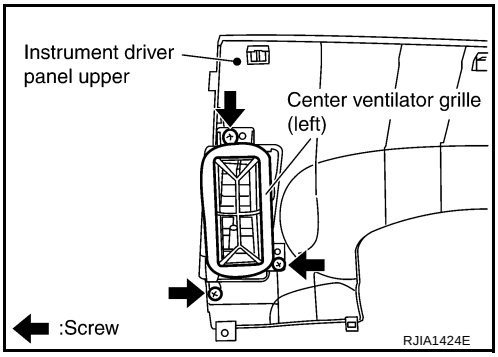
REMOVAL



1. Defroster nozzle
2. Side defroster duct 1 (left)
3. Side ventilator duct 1 (left)
4. Side defroster duct 2
5. Instrument side finisher (left)
6. Side ventilator duct 2 (left)
7. Side ventilator grille (left)
8. Center ventilator grille (left)
9. Side ventilator grille (right)
10. Side ventilator grille (right)
11. Side ventilator duct 2 (right)
12. Instrument side finisher (right)
13. Instrument panel
14. Side defroster duct 2 (right)
15. Side ventilator duct 1 (right)
16. Side defroster duct 1 (right)
17. Center ventilator duct

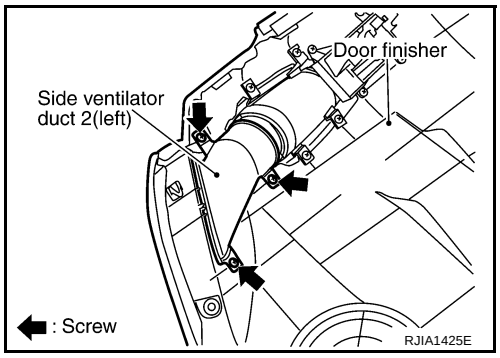
Removal of Center Ventilator Grille

1. Remove instrument driver and passenger panel upper. Refer to IP-11, "Removal and Installation" .
2. Remove mounting screws, and then remove center ventilator grille.

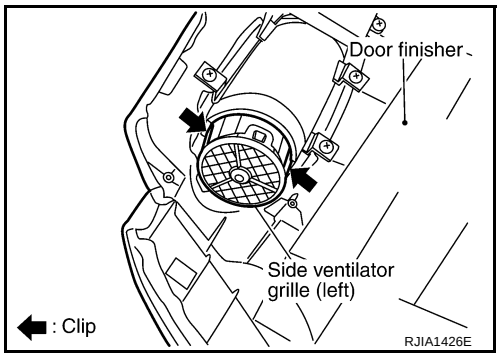


Removal of Side Ventilator Duct 2 and Grille

1. Remove door finisher. Refer to EI-33, "DOOR FINISHER" .
2. Remove mounting screws, and then remove side ventilator duct 2.

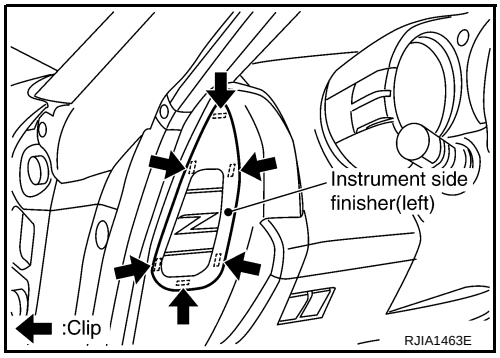


3. Remove mounting clips, and then remove side ventilator grille.



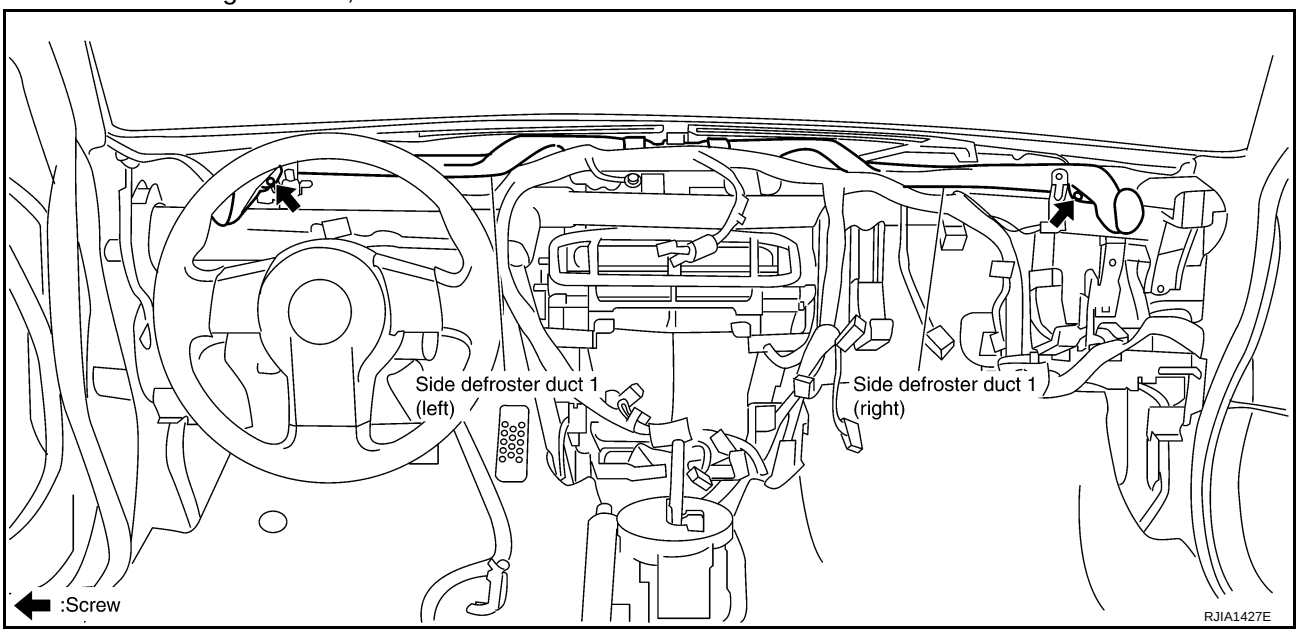
Removal of Instrument Side Finisher

Remove mounting clips, and then remove instrument side finisher.

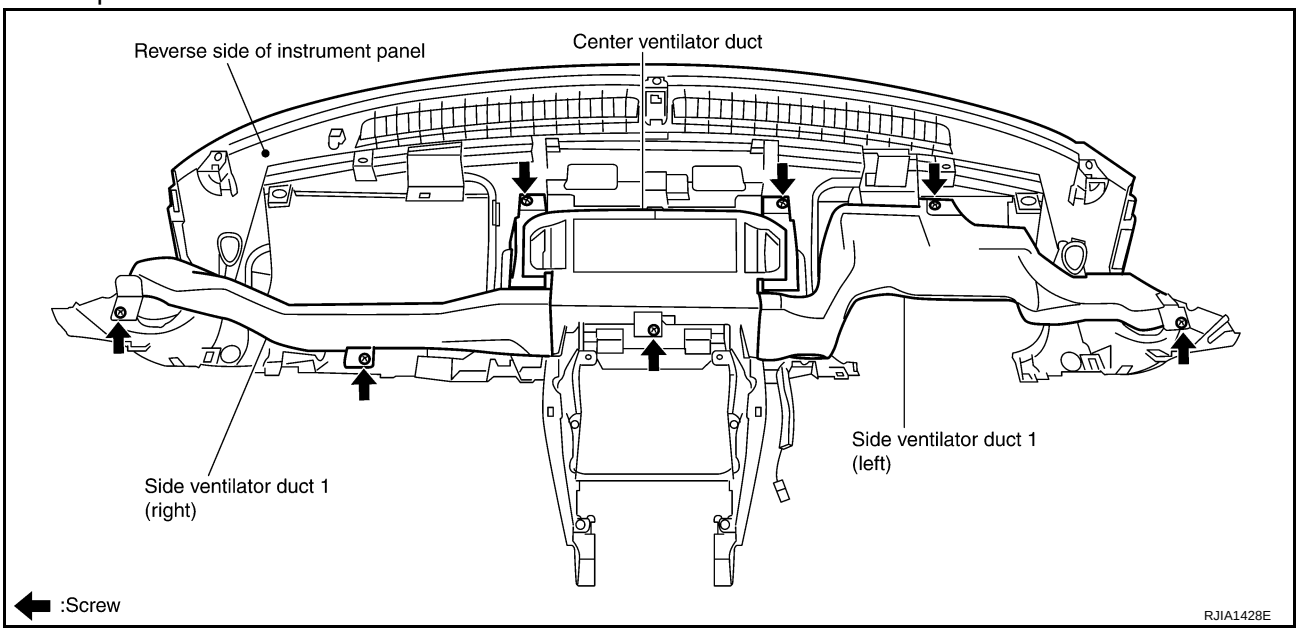


Removal of Defroster Nozzle, Ducts and Ventilator Ducts

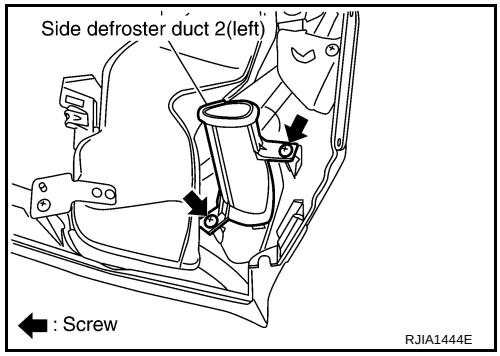
1. Remove instrument panel. Refer to IP-11, "Removal and Installation" .
2. Remove mounting screws, and then remove side defroster duct 1.
3. Remove steering member, and then remove defroster nozzle.



4. Remove mounting screws, and then remove side ventilator duct 1 and center ventilator duct from instrument panel.

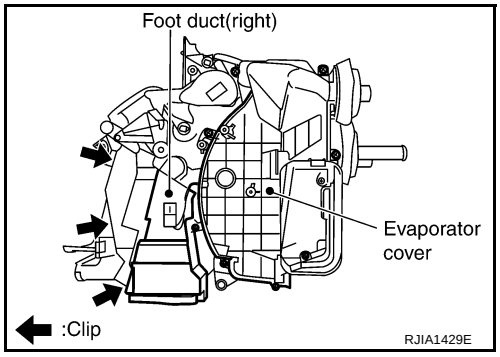


5. Remove mounting screws, and then remove side defroster duct 2.



Removal of Foot Ducts

1. Remove heater & cooling unit. Refer to ATC-118, "HEATER & COOLING UNIT ASSEMBLY" .
2. Remove evaporator cover, and then remove the foot duct (right).
3. Remove aspirator and heater pipe cover.
4. Remove foot duct (left).



INSTALLATION

Installation is basically the reverse order of removal.

REFRIGERANT LINES

PFP:92600

HFC-134a (R-134a) Service Procedure

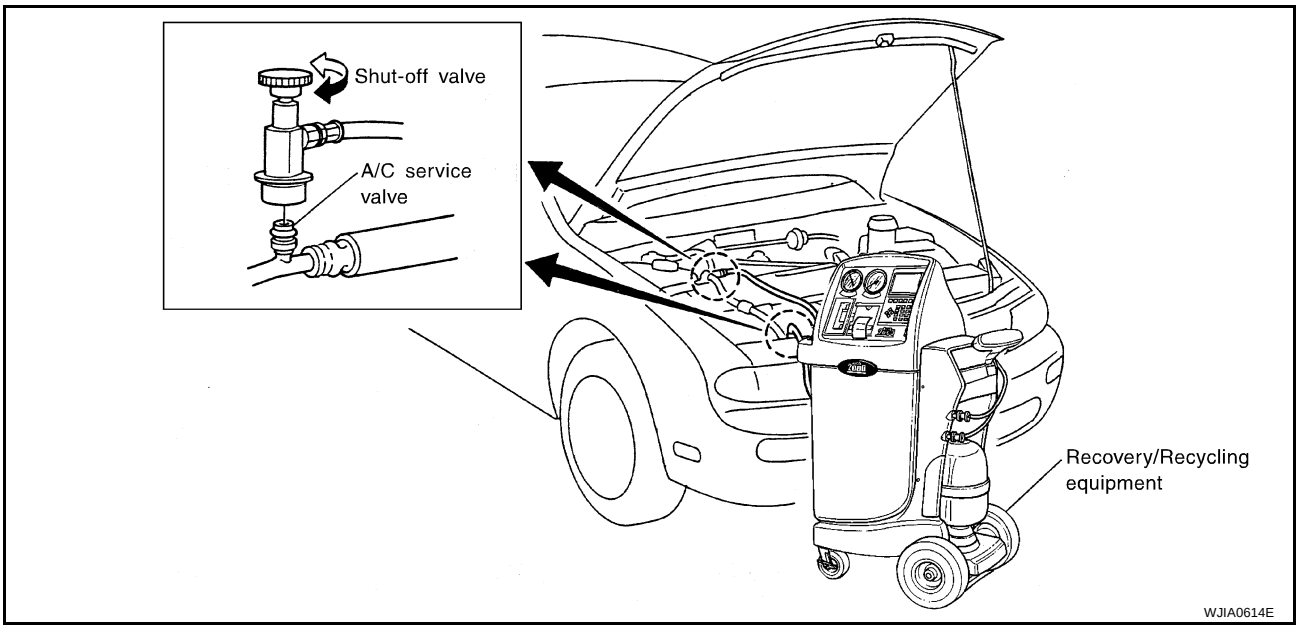
AJS000BA

SETTING OF SERVICE TOOLS AND EQUIPMENT

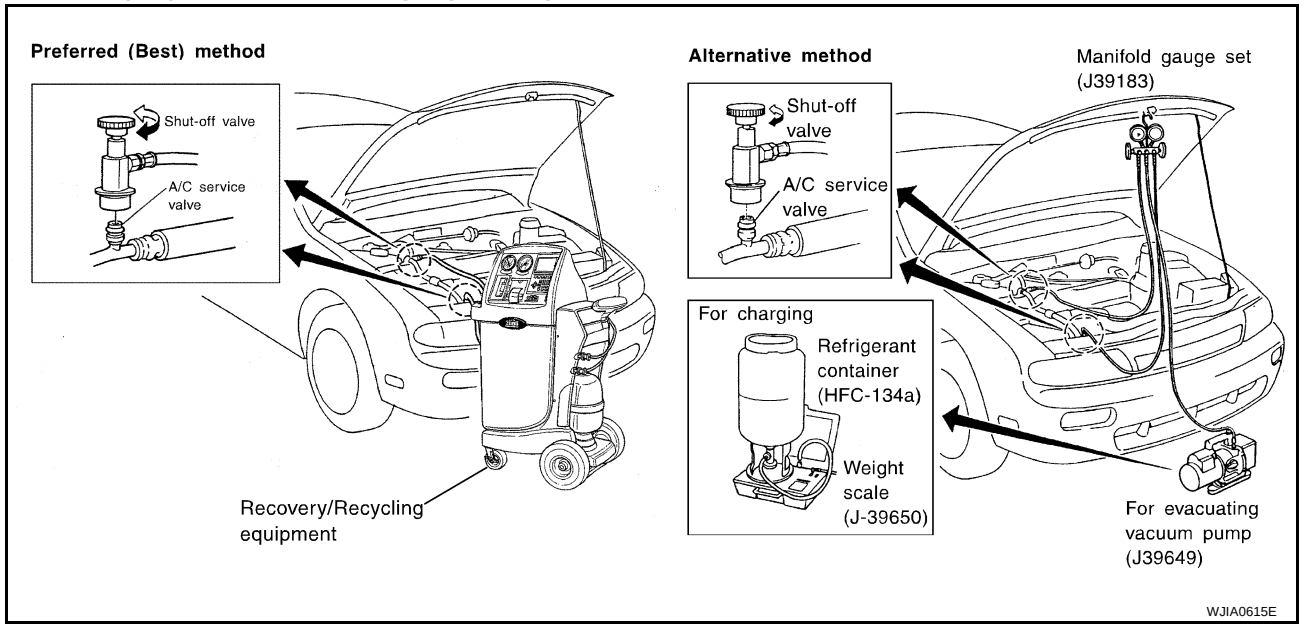
Discharging Refrigerant

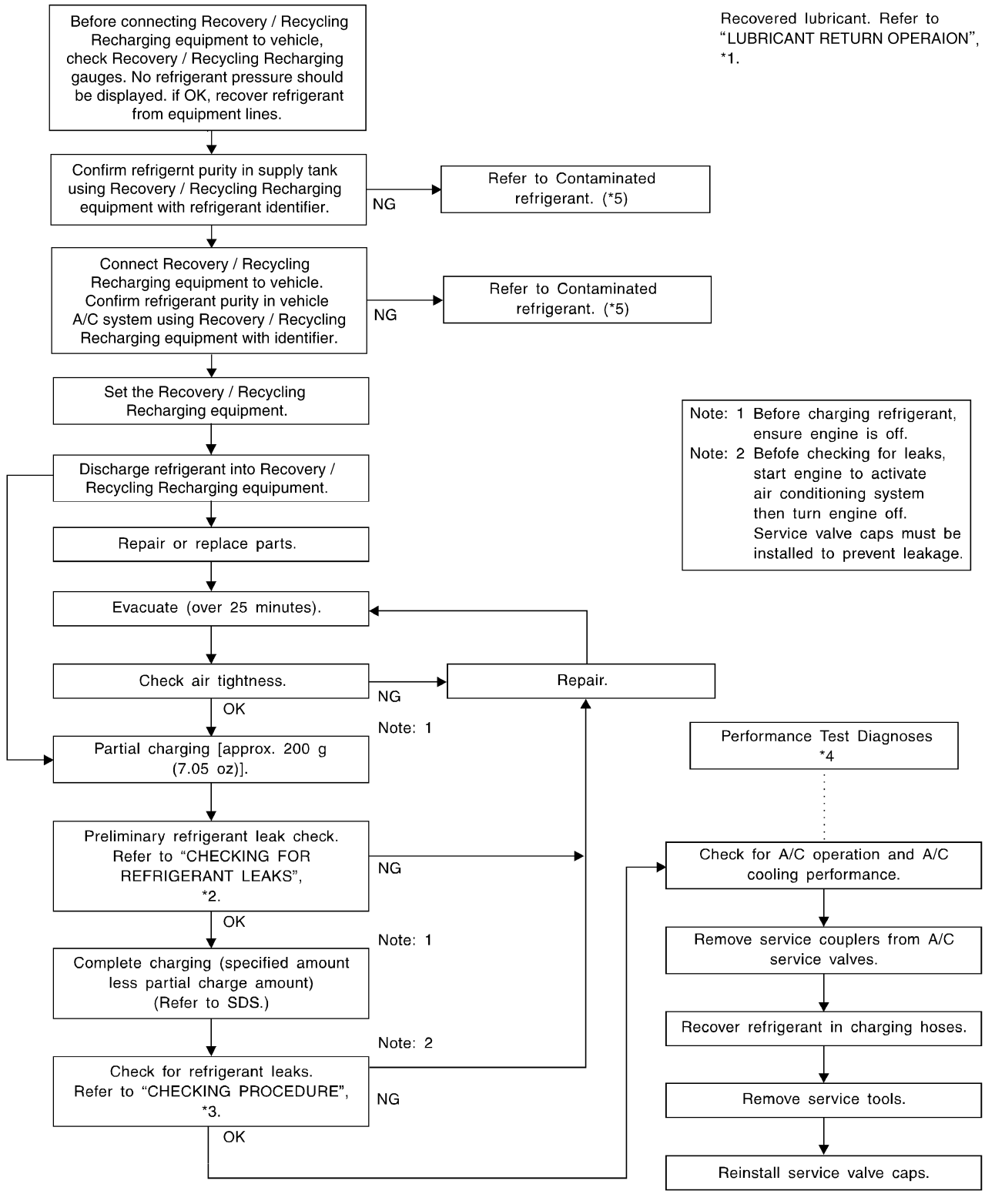
WARNING:

Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from A/C system using certified service equipment meeting requirements of SAE J2210 HFC-134a (R-134a) recycling equipment or J2201 HFC-134a (R-134a) recovery equipment. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.



Evacuating System and Charging Refrigerant





*1 ATC-24, "LUBRICANT RETURN OPERATION".

*2 ATC-146, "Checking for Refrigerant Leaks".

*3 ATC-148, "CHECKING PROCEDURE".

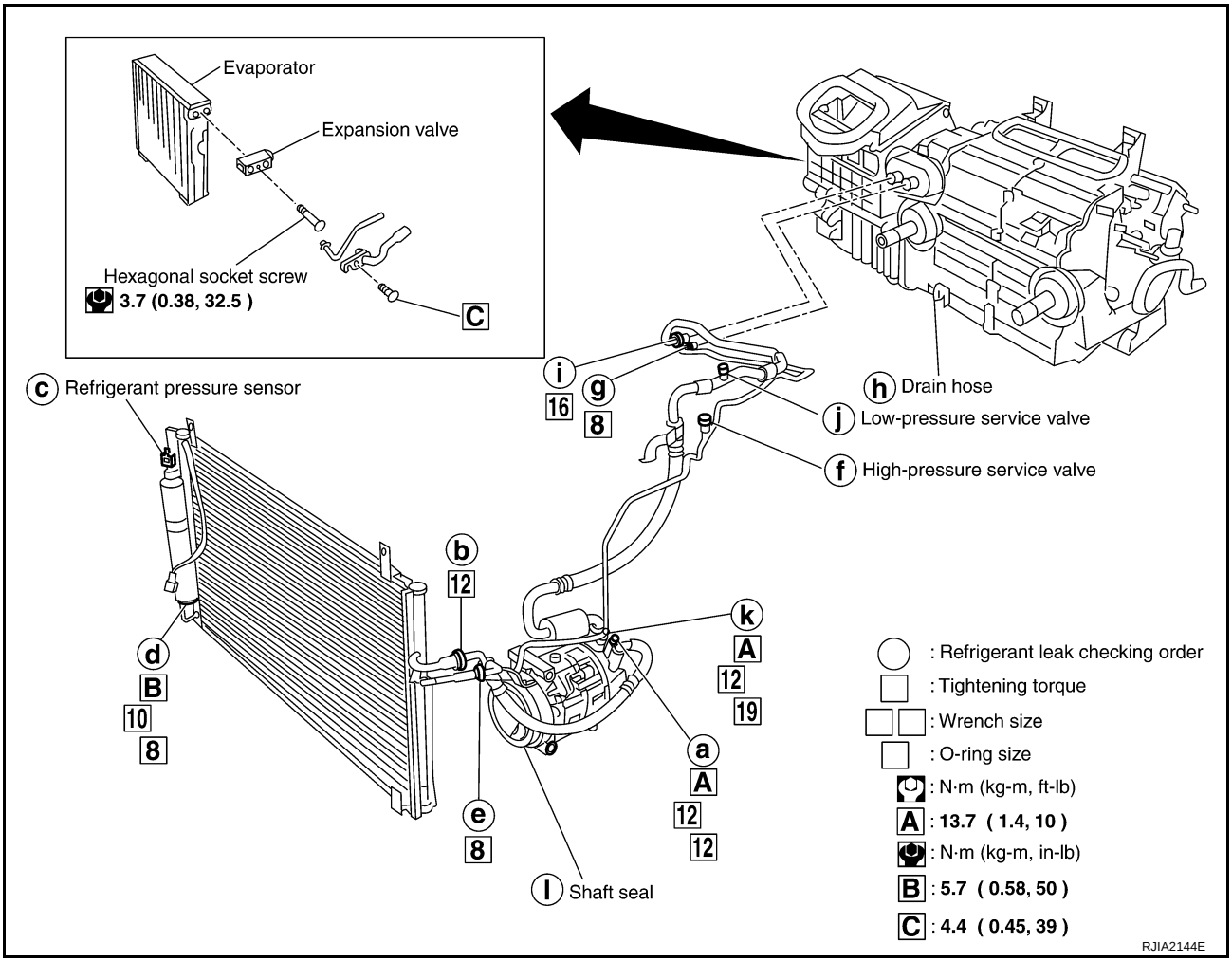
*4 ATC-89, "PERFORMANCE TEST DIAGNOSIS".

*5 ATC-5, "CONTAMINATED REFRIGERANT".

Components

AJS000BB

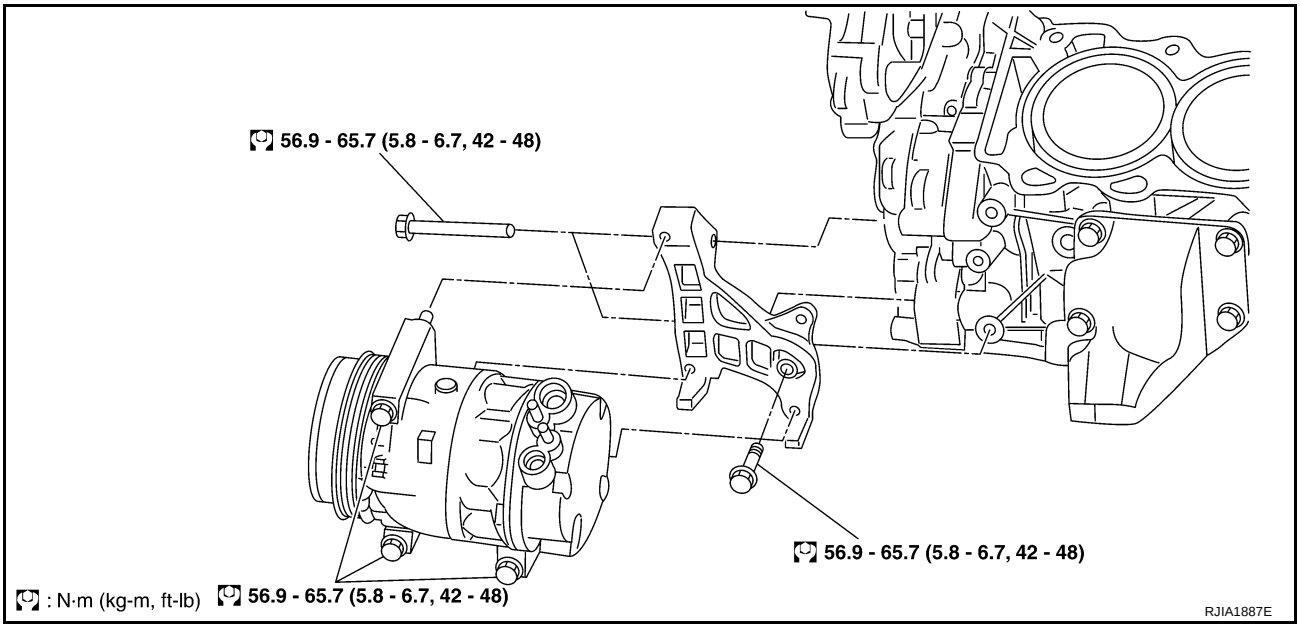
Refer to ATC-6, "Precautions for Refrigerant Connection" .



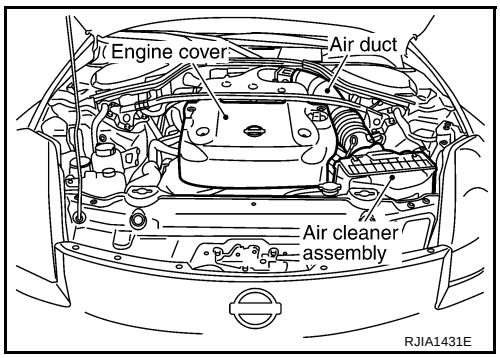
Removal and Installation of Compressor

AJS000BC

REMOVAL



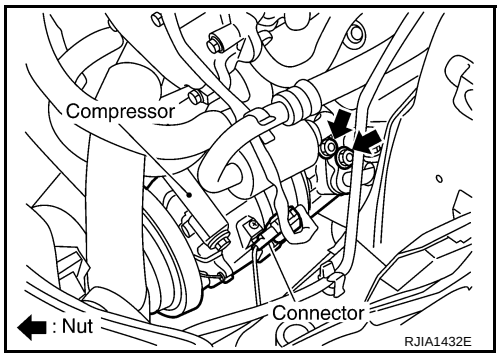
1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove air cleaner assembly and air duct. Refer to EM-14, "AIR CLEANER AND AIR DUCT" .
3. Remove engine under cover, using power tools.



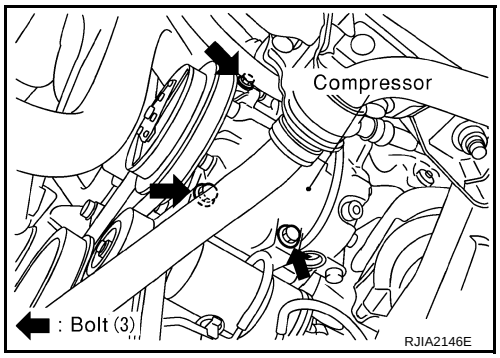
4. Remove mounting nuts from low-pressure and high-pressure flexible hose.

   CAUTION:

   Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.
5. Disconnect compressor connector.
6. Remove the A/C compressor belt. Refer to EM-12, "DRIVE BELTS" .



7. Remove mounting bolts from compressor, using power tools.
8. Remove compressor from the lower side of the vehicle.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace the O-ring of the low-pressure flexible hose and high-pressure flexible hose with a new one, then apply compressor oil to it when installing it.**
- **When recharging refrigerant, check for leaks.**

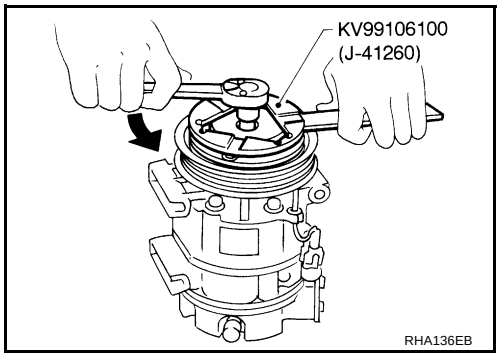
Removal and Installation of Compressor Clutch

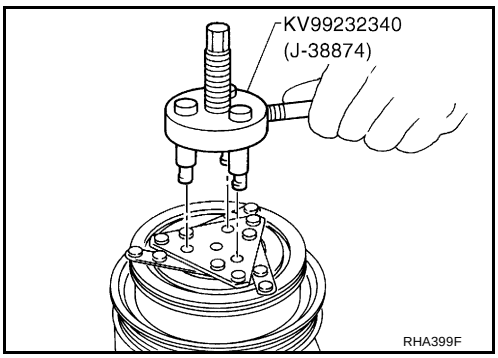
AJS000BD

REMOVAL

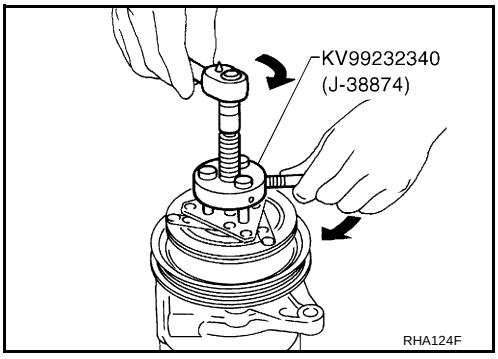
Overhaul

1. When removing center bolt, hold clutch disc with wrench.

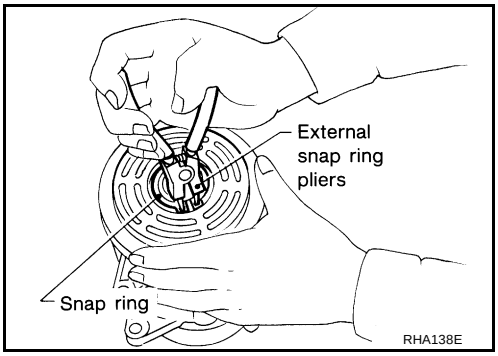




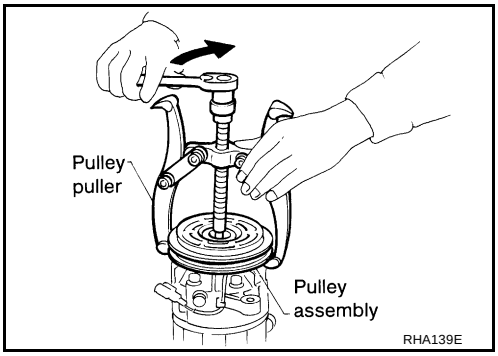
2. Remove the clutch disc using the clutch disc puller.



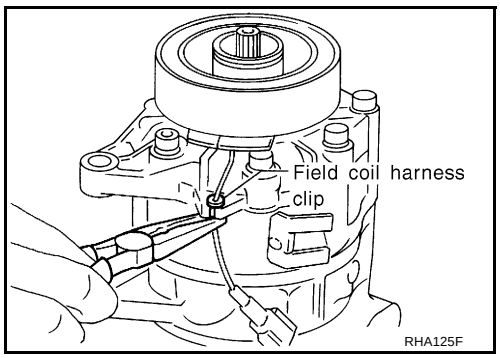
3. Remove the snap ring using external snap ring pliers.



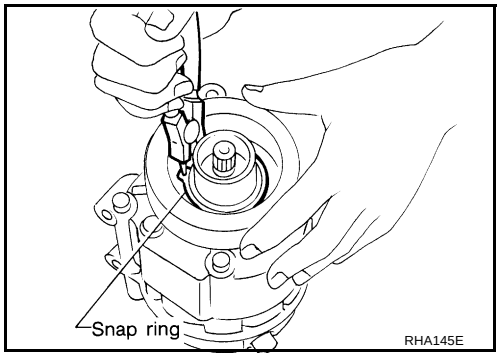
4. Position the center pulley puller on the end of the drive shaft, and remove the pulley assembly using any commercially available pulley puller.
   To prevent the pulley groove from being deformed, the puller claws should be positioned into the edge of the pulley assembly.



5. Remove the field coil harness clip using a pair of pliers.



6. Remove the snap ring using external snap ring pliers.

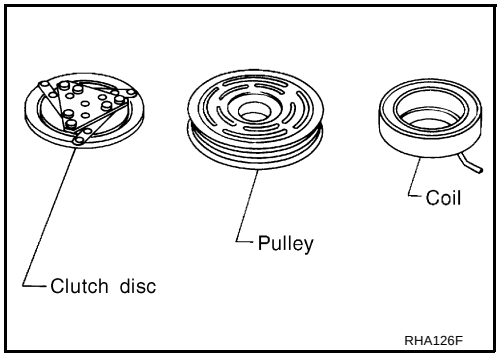


Inspection

Clutch disc
If the contact surface shows signs of damage due to excessive heat, replace clutch disc and pulley.

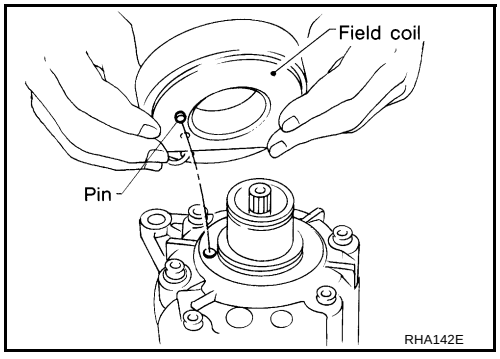
Pulley
Check the appearance of the pulley assembly. If the contact surface of pulley shows signs of excessive grooving, replace clutch disc and pulley. The contact surfaces of the pulley assembly should be cleaned with a suitable solvent before reinstallation.

Coil
Check coil for loose connection or cracked insulation.

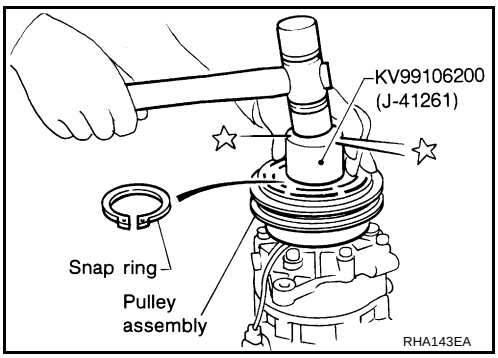


INSTALLATION

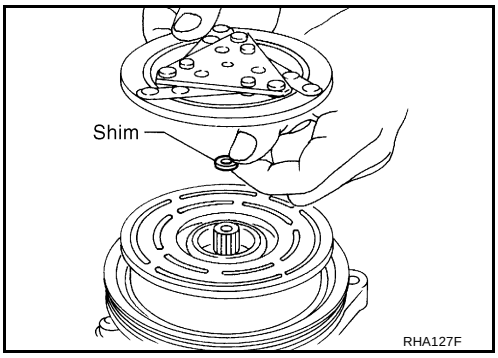
1. Install the field coil.
   Be sure to align the coil's pin with the hole in the compressor′s front head.
2. Install the field coil harness clip using a screwdriver.



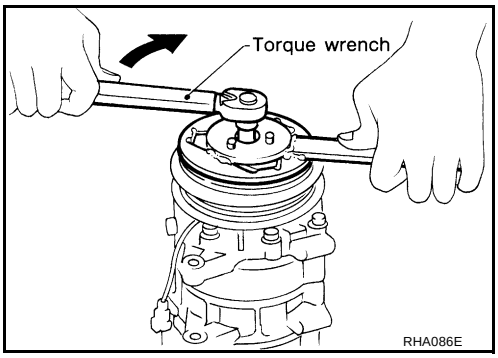
3. Install the pulley assembly using the installer and a hand press, and then install the snap ring using snap ring pliers.



4. Install the clutch disc on the drive shaft, together with the original shim(s). Press the clutch disc down by hand.



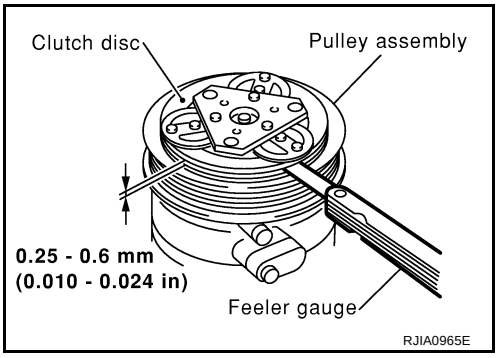
5. Using the holder to prevent clutch disc rotation, tighten the bolt to 14 N·m (1.4 kg-m, 10 ft-lb) torque.
After tightening the bolt, make sure the pulley rotates smoothly.



6. Check clearance around the entire periphery of clutch disc.

Disc to pulley clearance **: 0.25 - 0.60 mm (0.010 - 0.024 in)**

If the specified clearance is not obtained, replace adjusting spacer and readjust.



Break-in Operation

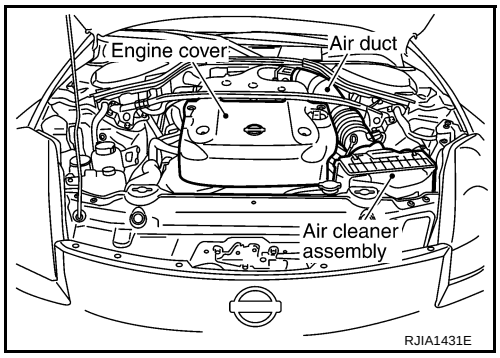
When replacing compressor clutch assembly, always carry out the break-in operation. This is done by engaging and disengaging the clutch about thirty times. Break-in operation raises the level of transmitted torque.

Removal and Installation of Low-pressure Flexible Hose

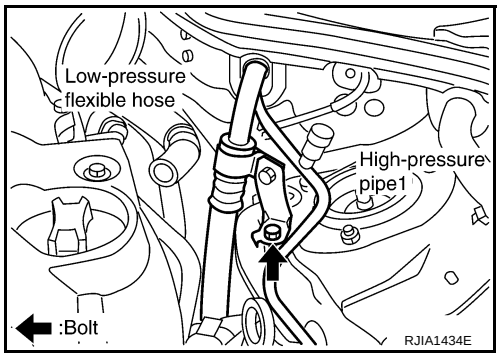
AJS000BE

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove cowl top cover. Refer to EI-20, "COWL TOP" .
3. Remove air cleaner assembly and air duct. Refer to EM-14, "AIR CLEANER AND AIR DUCT" .

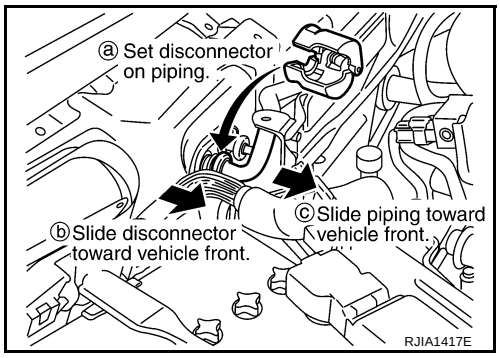


4. Remove mounting bolt for low-pressure flexible hose bracket.
5. Remove clip from high-pressure pipe 1.



6. Disconnect one-touch joint between low-pressure flexible hose and low-pressure pipe.

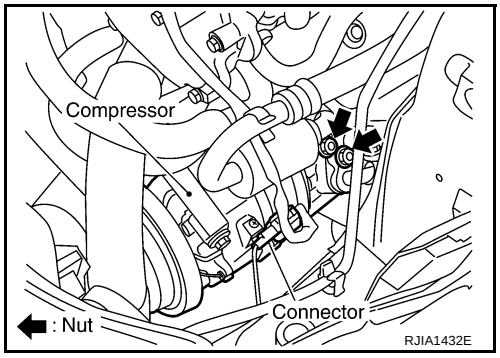
a. Set a disconnector (92530-89916) on A/C piping.
b. Slide a disconnector toward vehicle front until it clicks.
c. Slide A/C piping toward vehicle front and disconnect it.



7. Remove mounting nut from low-pressure flexible hose. (Compressor side)

CAUTION:
Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.

8. Remove low-pressure flexible hose.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings for A/C piping with new one, then apply compressor oil to it when installing it.**
- **Connection point for female-side piping is thin. So, when inserting male-side piping, take care not to deform female-side piping. Slowly insert in axial direction.**
- **Insert one-touch joint connection point securely until it clicks.**
- **After piping has been connected, pull male-side piping by hand to make sure piping does not come off.**
- **When recharging refrigerant, check for leaks.**

Bolt mounting the low-pressure flexible hose bracket

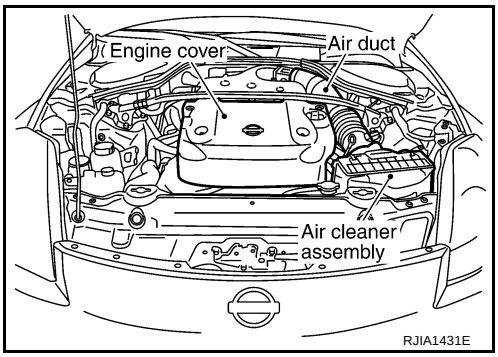
Tightening torque : 4.2 N·m (0.43 kg-m, 37 in-lb)

Removal and Installation of High-pressure Flexible Hose

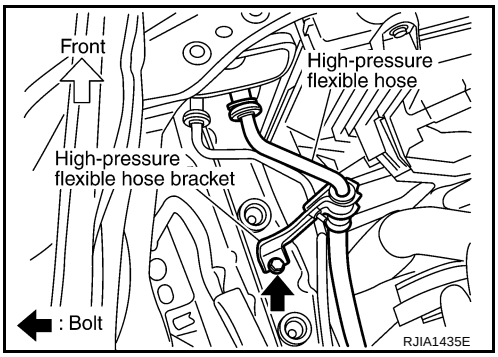
AJS000BF

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove air cleaner assembly and air duct. Refer to EM-14, "AIR CLEANER AND AIR DUCT" .



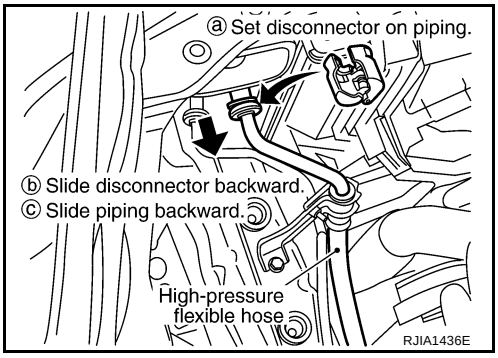
3. Remove mounting bolt for high-pressure flexible hose bracket.



4. Disconnect the one-touch joint between high-pressure flexible hose and condenser.

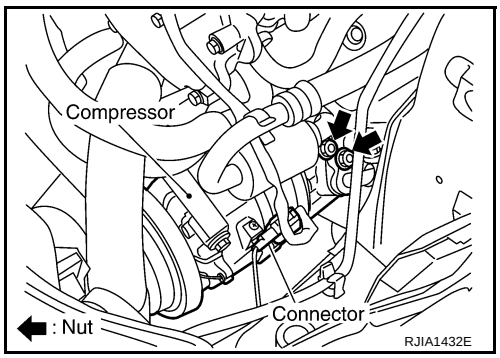
a. Set a disconnector (92530-89912) on A/C piping.
b. Slide a disconnector backward until it clicks.
c. Slide A/C piping backward and disconnect it.

CAUTION:
Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.



5. Remove the mounting nut for high-pressure flexible hose, and then remove the high-pressure flexible hose.

CAUTION:
Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace the O-ring of the high-pressure flexible hose with a new one, then apply compressor oil to it when installing it.**
- **Connection point for female-side piping is thin. So, when inserting male-side piping, take care not to deform female-side piping. Slowly insert in axial direction.**
- **Insert one-touch joint connection point securely until it clicks.**
- **After piping has been connected, pull male-side piping by hand to make sure piping does not come off.**
- **When recharging refrigerant, check for leaks.**

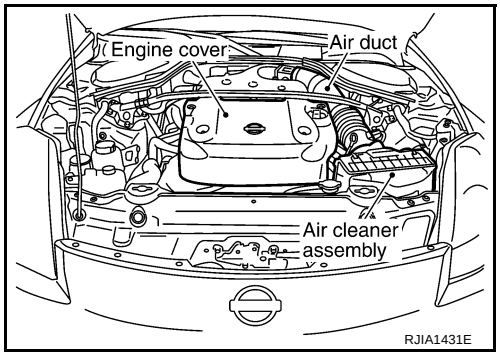
Bolt mounting high-pressure flexible hose bracket
Tightening torque : 4.2 N·m (0.43 kg-m, 37 in-lb)

Removal and Installation of High-pressure Pipe 1 (Engine Compartment)

AJS000BH

REMOVAL

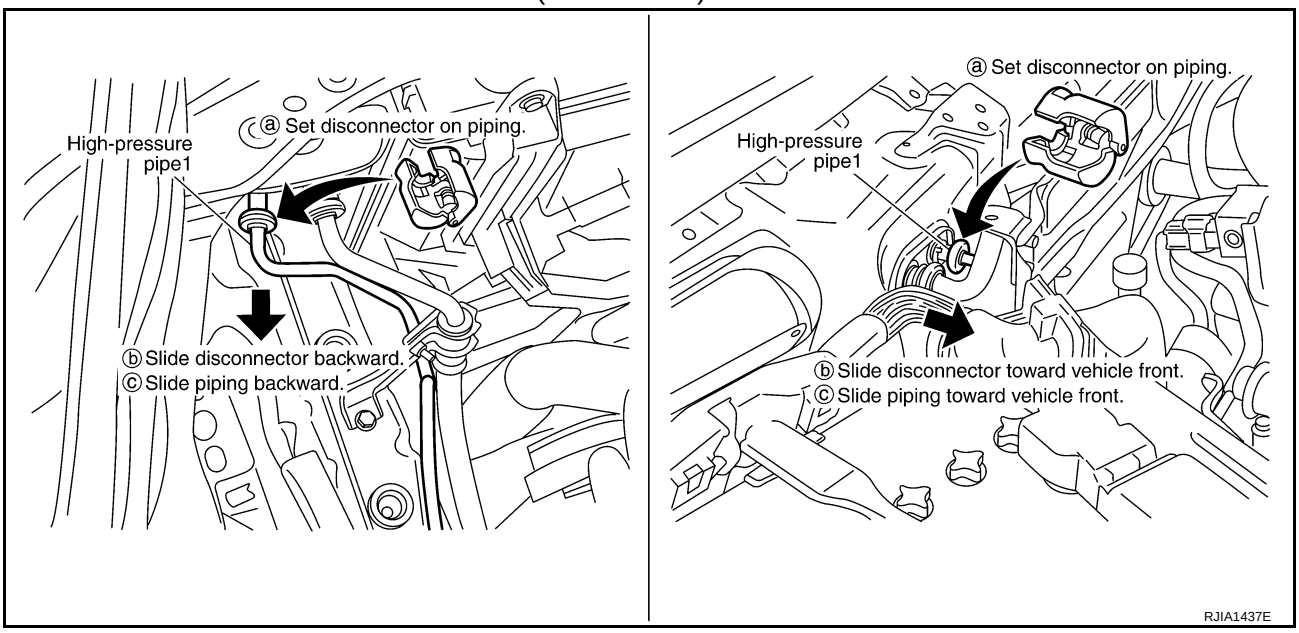
1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove cowl top cover. Refer to EI-20, "COWL TOP" .
3. Remove air cleaner assembly and air duct. Refer to EM-14, "AIR CLEANER AND AIR DUCT" .
4. Remove tower bar. Refer to FSU-20, "TOWER BAR" .
5. Remove low-pressure flexible hose. Refer to ATC-136, "Removal and Installation of Low-pressure Flexible Hose" .
6. Remove high-pressure flexible hose bracket. Refer to ATC-137, "Removal and Installation of High-pressure Flexible Hose" .



7. Remove the high-pressure flexible hose from vehicle clips.
8. Disconnect the one-touch joints of high-pressure pipe.

a. Set a disconnector (92530-89908) on A/C piping.

b. Slide a disconnector toward vehicle front (or backward) until it clicks.



c. Slide A/C piping toward vehicle front (or backward) and disconnect it.

CAUTION:

Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.

9. Remove the high-pressure pipe 1.

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace the O-ring of the high-pressure pipe with a new one, then apply compressor oil to it when installing it.**
- **Connection point for female-side piping is thin. So, when inserting male-side piping, take care not to deform female-side piping. Slowly insert in axial direction.**
- **Insert one-touch joint connection point securely until it clicks.**
- **After piping has been connected, pull male-side piping by hand to make sure piping does not come off.**
- **When recharging refrigerant, check for leaks.**

Removal and Installation of Low-pressure Pipe and High-pressure Pipe 2

AJS000BI

REMOVAL

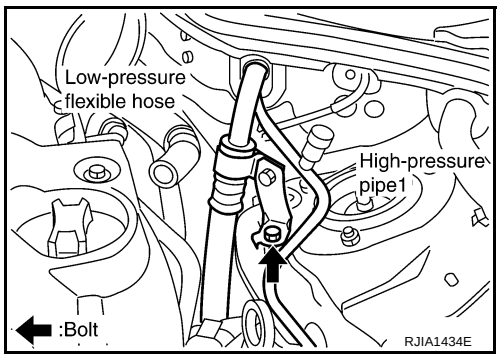
1. Set the temperature control dial at 18°C (60°F).
2. Open the driver and front passenger window, and then disconnect the battery negative cable.

CAUTION:

After the battery cables are disconnected, do not open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.

3. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
4. Remove cowl top cover. Refer to EI-20, "COWL TOP" .

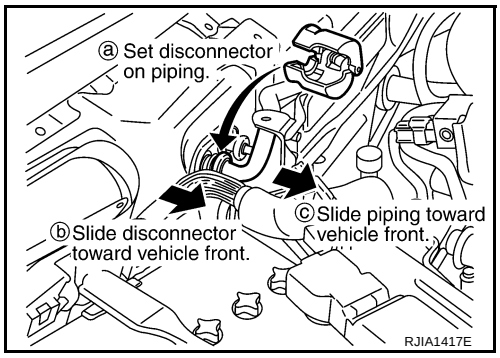
5. Remove mounting bolt for low-pressure flexible hose bracket.
6. Remove high-pressure pipe 1 from vehicle clips.



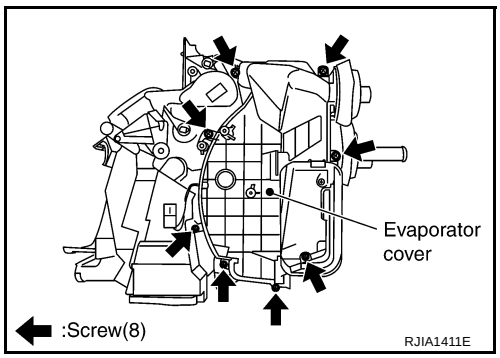
7. Disconnect one-touch joints.

a. Set a disconnector (high-pressure side: 92530-89908, low-pressure side: 92530-89916) on A/C piping.
b. Slide a disconnector toward vehicle front until it clicks.
c. Slide A/C piping toward vehicle front and disconnect it.

CAUTION:
Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.

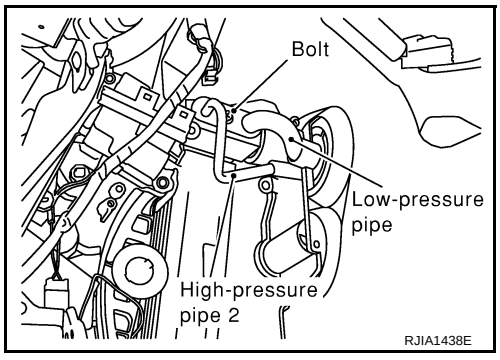


8. Remove instrument passenger panel lower. Refer to IP-11, "Removal and Installation" .
9. Remove blower unit. Refer to ATC-114, "BLOWER UNIT" .
10. Remove air mix door motor and mode door motor.
11. Remove evaporator cover.



12. Remove mounting bolt, and then remove low-pressure pipe and high-pressure pipe 2.

CAUTION:
Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings for A/C piping with new ones, then apply compressor oil to it when installing it.**
- **Connection point for female-side piping is thin. So, when inserting male-side piping, take care not to deform female-side piping. Slowly insert in axial direction.**
- **Insert one-touch joint connection point securely until it clicks.**
- **After piping has been connected, pull male-side piping by hand to make sure piping does not come off.**

- **When recharging refrigerant, check for leaks.**

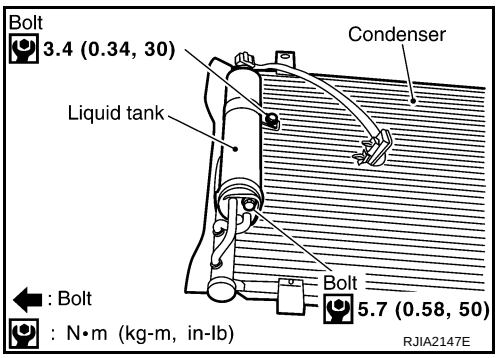
Bolt mounting low-pressure flexible hose bracket
Tightening torque : 4.2 N·m (0.43 kg-m, 37 in-lb)

Removal and Installation of Liquid Tank

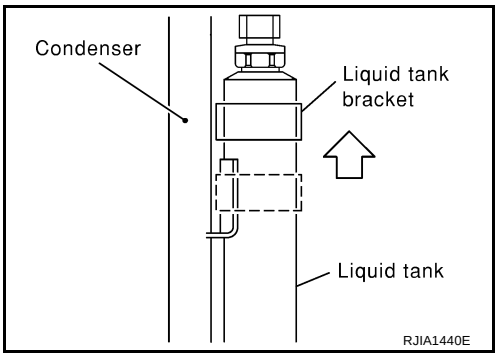
AJS000BJ

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove the condenser. Refer to ATC-142, "Removal and Installation of Condenser" .
3. Clean liquid tank and its surrounding area, and remove dirt and rust from liquid tank.
   CAUTION:
   Be sure to clean carefully.
4. Remove mounting bolt for liquid tank.



5. Lift liquid tank upwards. Remove bracket from protruding part of condenser.
6. Slide liquid tank upward, and then remove liquid tank.



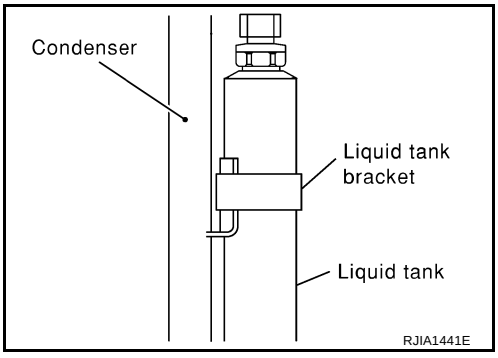
INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Make sure liquid tank bracket is securely installed at protrusion of condenser. (Make sure liquid tank bracket does not move to a position below center of liquid tank.)**
- **Replace O-rings for A/C piping with new ones, then apply compressor oil to it when installing it.**
- **When recharging refrigerant, check for leaks.**

Bolt mounting liquid tank bracket (upper side)
Tightening torque : 3.4 N·m (0.34 kg-m, 30 in-lb)
Bolt mounting liquid tank bracket (lower side)
Tightening torque : 5.7 N·m (0.58 kg-m, 50 in-lb)

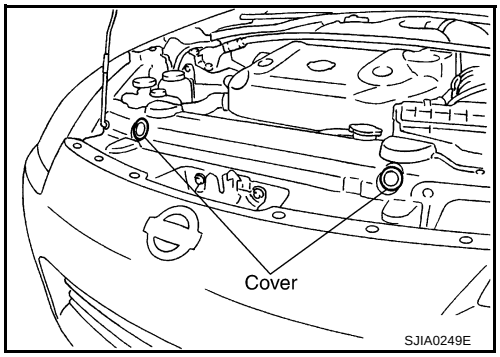


Removal and Installation of Condenser

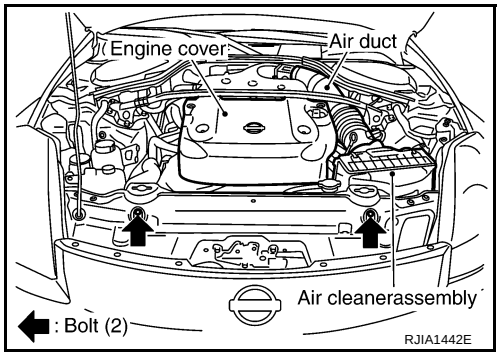
AJS000BK

REMOVAL

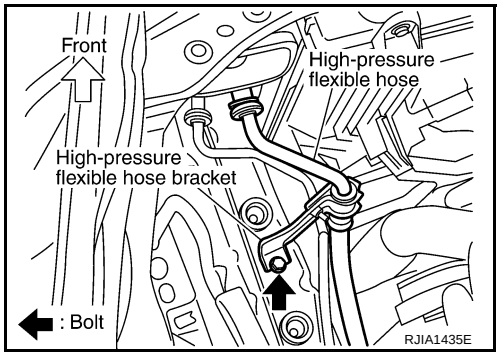
1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine under cover, using power tools.
3. Drain engine coolant. Refer to CO-9, "Changing Engine Coolant" .
4. Remove cover for condenser mounting bolt.



5. Remove engine cover, air cleaner assembly and air duct. Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" and EM-14, "AIR CLEANER AND AIR DUCT" .
6. Remove radiator fan shroud after removing radiator upper hose.



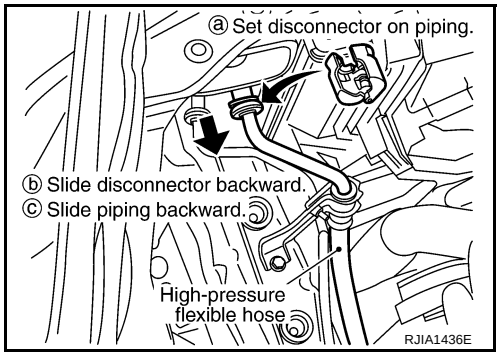
7. Remove mounting bolt for high-pressure flexible hose bracket.



8. Disconnect high-pressure flexible hose and high-pressure pipe 1 from condenser.

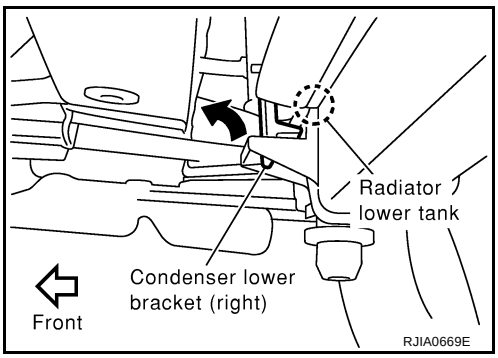
a. Set a disconnector (condenser outlet: 92530-89908, condenser inlet: 92530-89912) on A/C piping.
b. Slide a disconnector backward until it clicks.
c. Slide A/C piping backward and disconnect it.

CAUTION:
Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.



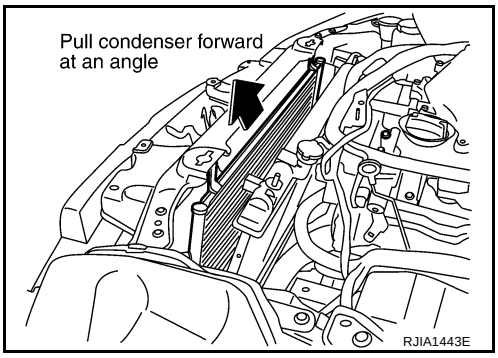
9. Remove mounting bolt for condenser.
10. Remove radiator upper mount, move radiator and condenser to the engine side.
11. Disconnect refrigerant pressure sensor connector.

12. Lift condenser up slightly and tilt it toward front of vehicle. (This is because condenser lower bracket is on bottom of radiator tank.)



13. Pull condenser forward at an angle. Remove condenser from radiator.

CAUTION:
Be careful not to damage the core surface of the condenser and the radiator.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings for A/C piping with new ones, then apply compressor oil to it when installing it.**
- **Connection point for female-side piping is thin. So, when inserting male-side piping, take care not to deform female-side piping. Slowly insert in axial direction.**
- **Insert one-touch joint connection point securely until it clicks.**
- **After piping has been connected, pull male-side piping by hand to make sure piping does not come off.**
- **When recharging refrigerant, check for leaks.**

Bolt mounting the condenser

Tightening torque : 6.1 N·m (0.62 kg-m, 54 in-lb)

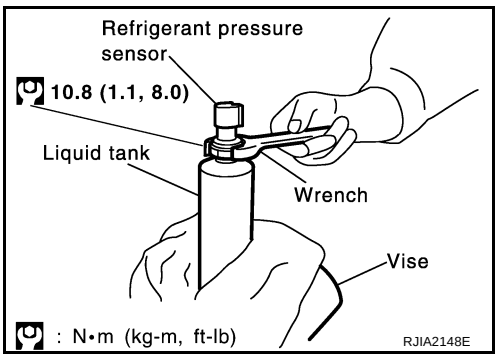
Removal and Installation of Refrigerant Pressure Sensor

AJS000BL

REMOVAL

1. Remove the liquid tank. Refer to ATC-141, "Removal and Installation of Liquid Tank" .
2. Using a vise, secure liquid tank, and remove refrigerant pressure sensor.

CAUTION:
When working, be careful not to damage the condenser fins.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

Apply compressor oil to the O-ring of the refrigerant pressure sensor when installing it.

Removal and Installation of Evaporator

AJS000BM

REMOVAL

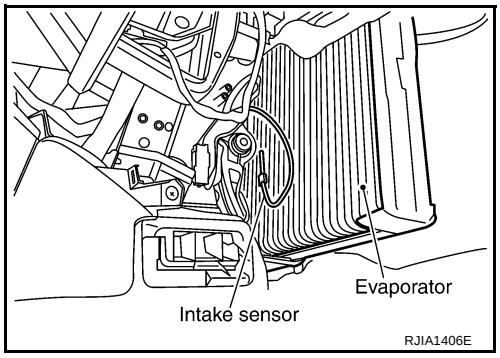
1. Set the temperature control dial at 18°C (60°F).
2. Open the driver and front passenger window, and then disconnect the battery negative cable.

   CAUTION:

   After the battery cables are disconnected, do not open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.
3. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
4. Remove the low-pressure pipe and high-pressure pipe 2. Refer to ATC-139, "Removal and Installation of Low-pressure Pipe and High-pressure Pipe 2" .

   CAUTION:

   Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.
5. Slide evaporator, and then remove it from heater & cooling unit.
6. Remove intake sensor from evaporator, and then remove evaporator.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings for A/C piping with new ones, then apply compressor oil to it when installing it.**
- **Connection point for female-side piping is thin. So, when inserting male-side piping, take care not to deform female-side piping. Slowly insert in axial direction.**
- **Insert one-touch joint connection point securely until it clicks.**
- **After piping has been connected, pull male-side piping by hand to make sure piping does not come off.**
- **The O-rings are different from low-pressure flexible hose (high-pressure pipe 1) and low-pressure pipe (high-pressure pipe 2).**
- **Mark the mounting position of the intake sensor bracket.**
- **When recharging refrigerant, check for leaks.**

Bolt mounting low-pressure flexible hose bracket

Tightening torque : 4.2 N·m (0.43 kg-m, 37 in-lb)

Removal and Installation of Expansion Valve

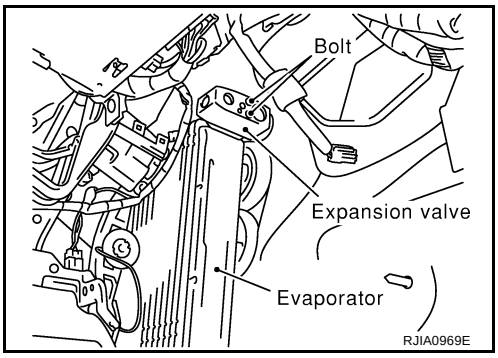
AJS000BN

REMOVAL

1. Set the temperature control dial at 18°C (60°F).
2. Open the driver and front passenger window, and then disconnect the battery negative cable.

   CAUTION:
   After the battery cables are disconnected, do not open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.
3. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
4. Remove the low-pressure pipe and high-pressure pipe 2. Refer to ATC-139, "Removal and Installation of Low-pressure Pipe and High-pressure Pipe 2" .

   CAUTION:
   Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.
5. Remove moounting bolts, and then remove expansion valve.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings with new ones, then apply compressor oil to them when installing them.**
- **The O-rings are different from low-pressure flexible hose (high-pressure pipe 1) and low-pressure pipe (high-pressure pipe 2).**
- **When recharging refrigerant, check for leaks.**

Bolts mounting expansion valve

Tightening torque : 3.9 N·m (0.40 kg-m, 35 in-lb)

Checking for Refrigerant Leaks

AJS000BO

Perform a visual inspection of all refrigeration parts, fittings, hoses and components for signs of A/C lubricant leakage, damage and corrosion. A/C lubricant leakage may indicate an area of refrigerant leakage. Allow extra inspection time in these areas when using either an electronic refrigerant leak detector or fluorescent dye leak detector.
If dye is observed, confirm the leak with an electronic refrigerant leak detector. It is possible a prior leak was repaired and not properly cleaned.
When searching for leaks, do not stop when one leak is found but continue to check for additional leaks at all system components and connections.
When searching for refrigerant leaks using an electronic leak detector, move the probe along the suspected leak area at 1 to 2 inches per second and no further than 1/4 inch from the component.

CAUTION:
Moving the electronic leak detector probe slower and closer to the suspected leak area will improve the chances of finding a leak.

Checking System for Leaks Using the Fluorescent Leak Detector

AJS000BP

1. Check A/C system for leaks using the UV lamp and safety goggles (J-42220) in a low sunlight area (area without windows preferable). Illuminate all components, fittings and lines. The dye will appear as a bright green/yellow area at the point of leakage. Fluorescent dye observed at the evaporator drain opening indicates an evaporator core assembly (tubes, core or expansion valve) leak.
2. If the suspected area is difficult to see, use an adjustable mirror or wipe the area with a clean shop rag or cloth, with the UV lamp for dye residue.
3. After the leak is repaired, remove any residual dye using dye cleaner (J-43872) to prevent future misdiagnosis.
4. Perform a system performance check and verify the leak repair with an approved electronic refrigerant leak detector.

NOTE:
Other gases in the work area or substances on the A/C components, for example, anti-freeze, windshield washer fluid, solvents and lubricants, may falsely trigger the leak detector. Make sure the surfaces to be checked are clean.
Clean with a dry cloth or blow off with shop air.
Do not allow the sensor tip of the detector to contact with any substance. This can also cause false readings and may damage the detector.

Dye Injection

AJS000BQ

(This procedure is only necessary when recharging the system or when the compressor has seized and was replaced.)

1. Check A/C system static (at rest) pressure. Pressure must be at least 345 kPa (3.52kg/cm^2 , 50 psi).
2. Pour one bottle (1/4 ounce / 7.4 cc) of the A/C refrigerant dye into the injector tool (J-41459).
3. Connect the injector tool to the A/C LOW PRESSURE side service fitting.
4. Start engine and switch A/C ON.
5. When the A/C operating (compressor running), inject one bottle (1/4 ounce / 7.4 cc) of fluorescent dye through the low-pressure service valve using dye injector tool J-41459 (refer to the manufacture′s operating instructions).
6. With the engine still running, disconnect the injector tool from the service fitting.

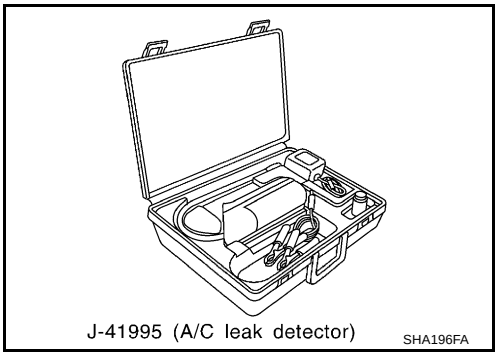
   CAUTION:
   Be careful the A/C system or replacing a component, pour the dye directly into the open system connection and proceed with the service procedures.
7. Operate the A/C system for a minimum of 20 minutes to mix the dye with the system oil. Depending on the leak size, operating conditions and location of the leak, it may take from minutes to days for the dye to penetrate a leak and become visible.

Electronic Refrigerant Leak Detector

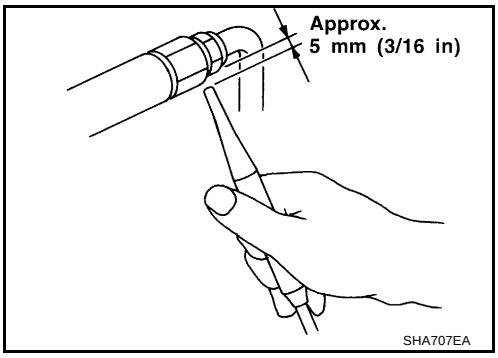
AJS000BR

PRECAUTIONS FOR HANDLING LEAK DETECTOR

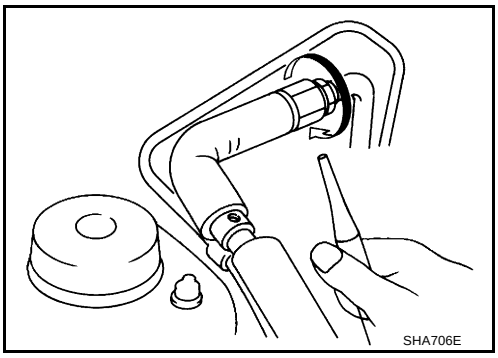
When performing a refrigerant leak check, use a J-41995 A/C leak detector or equivalent. Ensure that the instrument is calibrated and set properly per the operating instructions.
The leak detector is a delicate device. In order to use the leak detector properly, read the operating instructions and perform any specified maintenance.



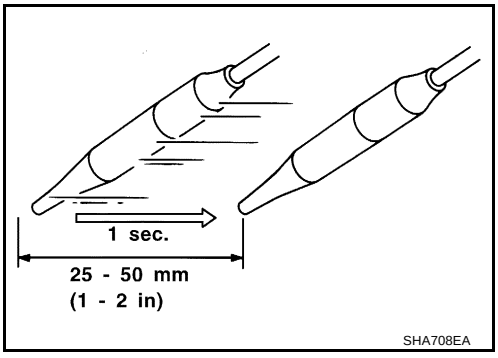
1. Position probe approximately 5 mm (3/16 in) away from point to be checked.



2. When testing, circle each fitting completely with probe.



3. Move probe along component approximately 25 to 50 mm (1 to 2 in)/sec.



CHECKING PROCEDURE

To prevent inaccurate or false readings, make sure there is no refrigerant vapor, shop chemicals, or cigarette smoke in the vicinity of the vehicle. Perform the leak test in calm area (low air/wind movement) so that the leaking refrigerant is not dispersed.

1. Turn engine OFF.
2. Connect a suitable A/C manifold gauge set to the A/C service ports.
3. Check if the A/C refrigerant pressure is at least 345 kPa (3.52 kg/cm^2 , 50 psi) above 16°C (61°F). If less than specification, recover/evacuate and recharge the system with the specified amount of refrigerant.

   NOTE:
   At temperatures below 16°C (61°F), leaks may not be detected since the system may not reach 345 kPa (3.52 kg/cm^2 , 50 psi).
4. Perform the leak test from the high-pressure side (compressor discharge a to evaporator inlet g) to the low-pressure side (evaporator drain hose h to shaft seal l). Refer to ATC-131, "Components" . Perform a leak check for the following areas carefully. Clean the component to be checked and move the leak detected probe completely around the connection/component.
   Compressor
   Check the fitting of high- and low-pressure hoses, relief valve and shaft seal.
   Liquid tank
   Check the refrigerant pressure sensor.
   Service valves
   Check all around the service valves. Ensure service valve caps are secured on the service valves (to prevent leaks).

   NOTE:
   After removing A/C manifold gauge set from service valves, wipe any residue from valves to prevent any false readings by leak detector.
   Cooling unit (Evaporator)
   With engine OFF, turn blower fan on “High” for at least 15 seconds to dissipate any refrigerant trace in the cooling unit. Wait a minimum of 10 minutes accumulation time (refer to the manufacturer′s recommended procedure for actual wait time) before inserting the leak detector probe into the drain hose.
   Keep the probe inserted for at least 10 seconds. Use caution not to contaminate the probe tip with water or dirt that may be in the drain hose.
5. If a leak detector detects a leak, verify at least once by blowing compressed air into area of suspected leak, then repeat check as outlined above.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components.
   If no leaks are found, perform steps 7 - 10.
7. Start engine.
8. Set the heater A/C control as follows;

a. A/C switch: ON

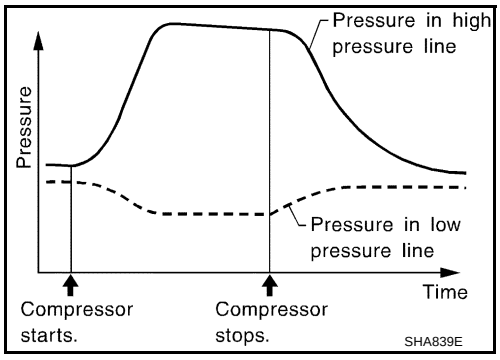
b. Air outlet: Ventilation (VENT)

c. Intake position: Recirculation

d. Max cold temperature

e. Fan speed: High

9. Run engine at 1,500 rpm for at least 2 minutes.
10. Turn engine off and perform leak check again following steps 4 through 6 above.
    Refrigerant leaks should be checked immediately after stopping the engine. Begin with the leak detector at the compressor. The pressure on the high-pressure side will gradually drop after refrigerant circulation stops and pressure on the low-pressure side will gradually rise, as shown in the graph. Some leaks are more easily detected when pressure is high.



11. Before connecting recovery/recycling recharging equipment to vehicle, check recovery/recycling recharging equipment gauges. No refrigerant pressure should be displayed. If pressure is displayed, recover refrigerant from equipment lines and then check refrigerant purity.
12. Confirm refrigerant purity in supply tank using recovery/recycling recharging equipment and refrigerant identifier.
13. Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier.
14. Discharge A/C system using approved refrigerant recovery equipment. Repair the leaking fitting or component if necessary.
15. Evacuate and recharge A/C system and perform the leak test to confirm no refrigerant leaks.
16. Perform A/C performance test to ensure system works properly.

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Compressor

AJS000BS

Model		Calsonic Kansei make CWV-615M
Type		V-6 variable displacement
Displacement cm^3 (cu in)/rev	Max.	146 (8.91)
	Min.	14.5 (0.885)
Cylinder bore × stroke mm (in)		35.2 (1.386) × [2.3 - 25 (0.091 - 0.98)]
Direction of rotation		Clockwise (viewed from drive end)
Drive belt		Poly V

Lubricant

AJS000BT

Model		Calsonic Kansei make CWV-615M
Name		Nissan A/C System Oil Type S (DH-PS)
Part number		KLH00-PAGS0
Capacity m ℓ (US fl oz, Imp fl oz)	Total in system	180 (6.0, 6.3)
	Compressor (Service part) charging amount	180 (6.0, 6.3)

Refrigerant

AJS000BU

Type	HFC-134a (R-134a)
Capacity kg (lb)	0.55 (1.21)

Engine Idling Speed

AJS000BV

Refer to EC-30, "Idle Speed and Ignition Timing Check" .

Belt Tension

AJS000BW

Refer to EM-12, "DRIVE BELTS" .

SECTION SC
STARTING & CHARGING SYSTEM

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

AKS0098J

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

AKS00AV8

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Wiring Diagrams and Trouble Diagnosis

AKS0098L

When you read wiring diagrams, refer to the following:

- Refer to GI-15, "How to Read Wiring Diagrams" in GI section.
- Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" for power distribution circuit in PG section.

When you perform trouble diagnosis, refer to the followings:

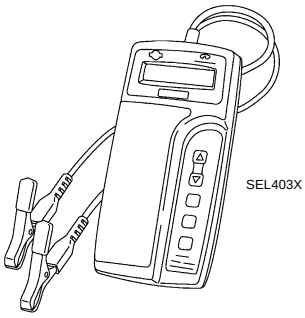
- Refer to GI-11, "HOW TO FOLLOW TEST GROUPS IN TROUBLE DIAGNOSES" in GI section.
- Refer to GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident" in GI section.

PREPARATION

PFP:00002

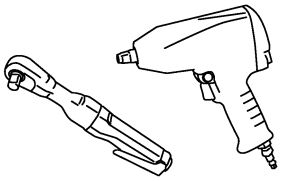
Special Service Tools

AKS0098M

Tool number Tool name	Description
J-44373 Model 620 Battery/Starting/Charging system tester  SEL403X	

Commercial Service Tools

AKS0098N

Tool number Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts

BATTERY

PFP:AYBGL

How to Handle Battery

AKS0098O

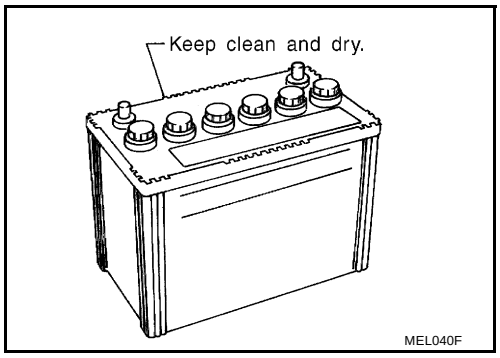
CAUTION:

- **If it becomes necessary to start the engine with a booster battery and jumper cables, use a 12-volt booster battery.**
- **After connecting battery cables, ensure that they are tightly clamped to battery terminals for good contact.**

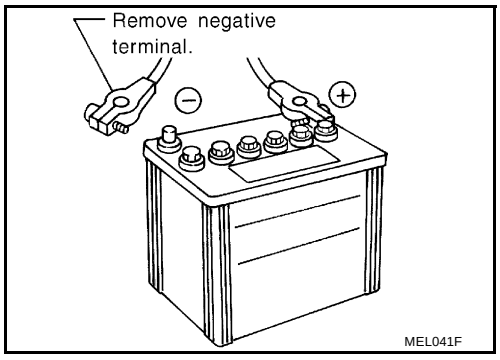
METHODS OF PREVENTING OVER-DISCHARGE

The following precautions must be taken to prevent over-discharging a battery.

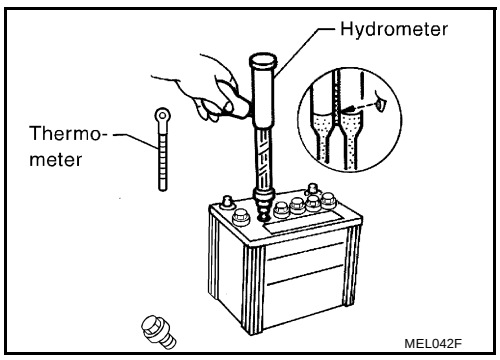
- The battery surface (particularly its top) should always be kept clean and dry.
- The terminal connections should be clean and tight.
- At every routine maintenance, check the electrolyte level.
  This also applies to batteries designated as “low maintenance” and “maintenance-free”.



- When the vehicle is not going to be used over a long period of time, disconnect the negative battery terminal.



- Check the charge condition of the battery.
  Periodically check the specific gravity of the electrolyte. Keep a close check on charge condition to prevent over-discharge.

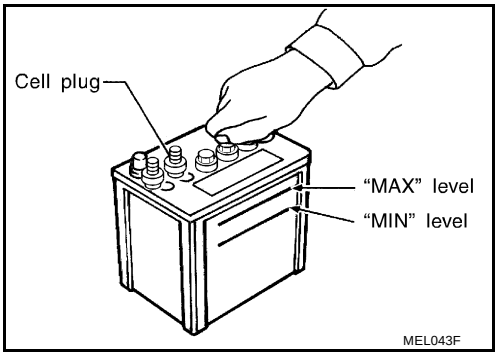


CHECKING ELECTROLYTE LEVEL

WARNING:

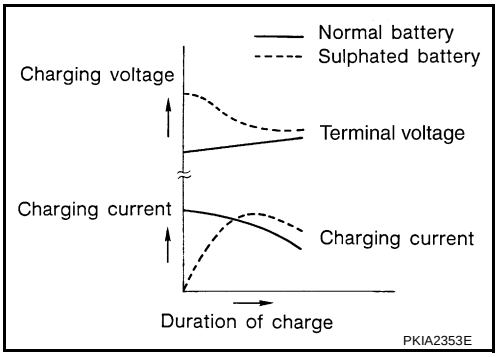
Do not allow battery fluid to come in contact with skin, eyes, fabrics, or painted surfaces. After touching a battery, do not touch or rub your eyes until you have thoroughly washed your hands. If acid contacts eyes, skin or clothing, immediately flush with water for 15 minutes and seek medical attention.

- Remove the cell plug using a suitable tool.
- Add distilled water up to the MAX level.



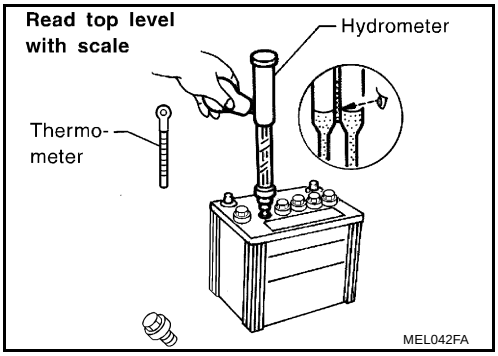
Sulphation

A battery will be completely discharged if it is left unattended for a long time and the specific gravity will become less than 1.100. This may result in sulphation on the cell plates.
To determine if a battery has been "sulphated", note its voltage and current when charging it. As shown in the figure, less current and higher voltage are observed in the initial stage of charging sulphated batteries.
A sulphated battery may sometimes be brought back into service by means of a long, slow charge, 12 hours or more, followed by a battery capacity test.



SPECIFIC GRAVITY CHECK

1. Read hydrometer and thermometer indications at eye level.
2. Use the chart below to correct your hydrometer reading according to electrolyte temperature.



Hydrometer Temperature Correction

Battery electrolyte temperature °C (°F)	Add to specific gravity reading
71 (160)	0.032
66 (150)	0.028
60 (140)	0.024
54 (130)	0.020
49 (120)	0.016
43 (110)	0.012
38 (100)	0.008
32 (90)	0.004
27 (80)	0
21 (70)	–0.004

Battery electrolyte temperature °C (°F)	Add to specific gravity reading
16 (60)	–0.008
10 (50)	–0.012
4 (40)	–0.016
–1 (30)	–0.020
–7 (20)	–0.024
–12 (10)	–0.028
–18 (0)	–0.032

Corrected specific gravity	Approximate charge condition
1.260 - 1.280	Fully charged
1.230 - 1.250	3/4 charged
1.200 - 1.220	1/2 charged
1.170 - 1.190	1/4 charged
1.140 - 1.160	Almost discharged
1.110 - 1.130	Completely discharged

CHARGING THE BATTERY

CAUTION:

- **Do not “quick charge” a fully discharged battery.**
- **Keep the battery away from open flame while it is being charged.**
- **When connecting the charger, connect the leads first, then turn on the charger. Do not turn on the charger first, as this may cause a spark.**
- **If battery electrolyte temperature rises above 55°C (131°F), stop charging. Always charge battery at a temperature below 55°C (131°F).**

Charging Rates

Amps	Time
50	1 hour
25	2 hours
10	5 hours
5	10 hours

Do not charge at more than 50 ampere rate.

NOTE:

The ammeter reading on your battery charger will automatically decrease as the battery charges. This indicates that the voltage of the battery is increasing normally as the state of charge improves. The charging amps indicated above refer to initial charge rate.

- If, after charging, the specific gravity of any two cells varies more than 0.050, the battery should be replaced.

Trouble Diagnoses with Battery/Starting/Charging System Tester

AKS0098P

CAUTION:

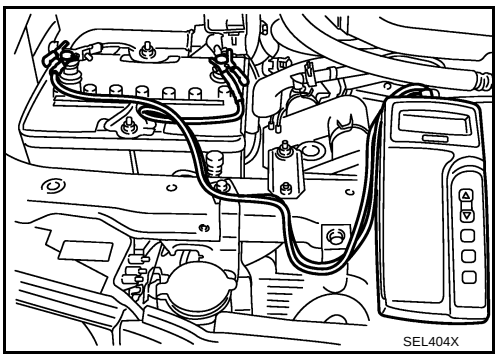
When working with batteries, always wear appropriate eye protection.

NOTE:

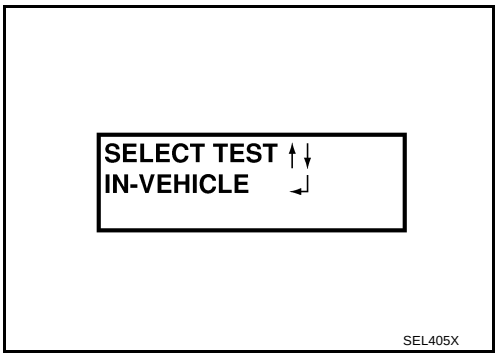
- To ensure a complete and thorough diagnosis, the battery, starter and generator test segments must be done as a set from start to finish.
- If battery surface charge is detected while testing, the tester will prompt you to turn on the headlamps to remove the surface charge.
- If necessary, the tester will prompt you to determine if the battery temperature is above or below 0°C (32°F). Choose the appropriate selection by pressing the up or down arrow button, then press “ENTER” to make the selection.

1. Turn off all loads on the vehicle electrical system. Clean or repair as necessary.
2. Visually inspect the battery, battery terminals and cable ends with ignition switch in “OFF” position.

   NOTE:
   The contact surface between the battery terminals, cable ends and tester leads must be clean for a valid test. A poor connection will prevent testing and a “CHECK CONNECTION” message will appear during the test procedures. If this occurs, clean the battery post and terminals, reconnect them and restart the test.


SEL404X

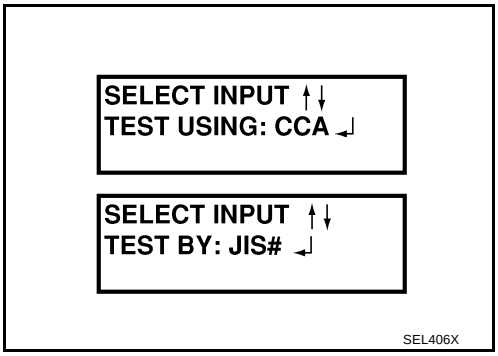
3. Connect the red tester lead clamp to the positive battery terminal, and the black to the negative terminal.
4. The tester will turn on automatically. Using the arrow keys, select “IN-VEHICLE” on the tester and then press the “ENTER” key.



SEL405X

5. Locate the battery type and rating stamped or written on the top case of the battery to be tested.

   NOTE:
   The battery type and rating will have either of the following.
   CCA: Cold Cranking Amps (490 CCA, 550 CCA, etc.)
   JIS: Japanese Industrial Standard.
   Battery is stamped with a number such as:
   80D26L: 80 (rank of output), D (physical size-depth), 26 (width in cm). The last character L (post configuration) is not input into the tester.
   The tester requires the rating for the battery be entered exactly as it is written or stamped on the battery. Do not attempt a CCA conversion for JIS stamped batteries. JIS must be input directly.

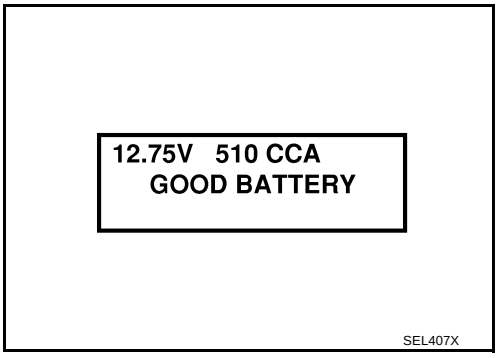


SEL406X

6. Using the arrow and “ENTER” keys alternately, select the battery type and rating.

   NOTE:
   The tester lists five choices; CCA, JIS, IEC, DIN, and EN. Only use CCA or JIS.

7. Press “ENTER” to begin the test. Diagnosis results are displayed on the tester. Refer to SC-8, "DIAGNOSTIC RESULT ITEM CHART" .

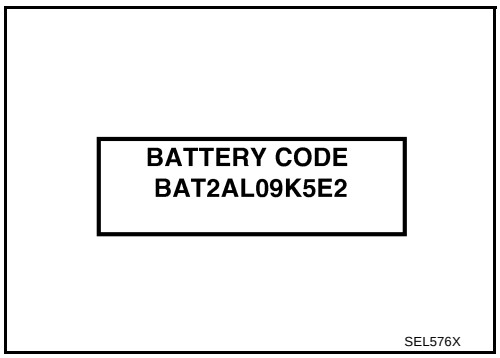


SEL407X

8. Press “ENTER”, then test output code is displayed. Record the test output code on the repair order.
9. Toggle back to the “DIAGNOSTIC SCREEN” for test results.

NOTE:

- If necessary, the tester will ask the user to determine if the battery has just been charged. Choose the appropriate selection by pressing the up or down arrow button and then press the “ENTER” button to make the selection.
- When testing a battery installed in a vehicle that has recently been driven, select “BEFORE CHARGE”.
- If the battery has just been slow charged due to a “CHARGE & RETEST” decision by the tester, and the tester asks the user “BEFORE CHARGE/AFTER CHARGE”, select “AFTER CHARGE”.



DIAGNOSTIC RESULT ITEM CHART

Diagnostic item	Service procedure
GOOD BATTERY	Battery is OK, go to “Trouble Diagnoses”, “STARTING SYSTEM”. Refer to SC-15, "Trouble Diagnoses with Battery/Starting/Charging System Tester" .
REPLACE BATTERY	Replace battery. Before replacing battery, clean the battery cable clamps and battery posts. Perform battery test again with Battery/Starting/Charging system tester. If second test result is “Replace Battery”, then do so. Perform battery test again to confirm repair.
BAD CELL-REPLACE	Replace the battery. Perform battery test again with Battery/Starting/Charging system tester to confirm repair.
GOOD-RECHARGE	Perform the slow battery charging procedure. (Initial rate of charge is 10A for 12 hours.)
CHARGE & RETEST	Perform the slow battery charging. (Initial rate of charge is 10A for 12 hours.) Perform battery test again with Battery/Starting/Charging system tester to confirm repair. **NOTE:** **If the tester asks the user “BEFORE CHARGE/AFTER CHARGE”, select “AFTER CHARGE”.**

Removal and Installation

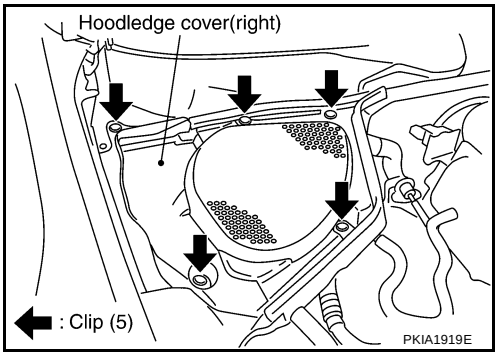
AKS0098Q

REMOVAL

CAUTION:

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

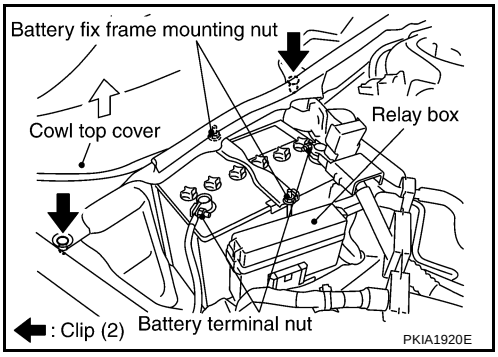
1. Remove hoodledge cover (right).



2. Disconnect negative battery cable and positive battery cable.

   CAUTION:

   When disconnect, disconnect negative battery cable first.
3. Remove clips of cowl top cover (right) and it raises to the up side.
4. Remove battery fix frame mounting nuts and battery fix frame.
5. Remove relay box from bracket.
6. Remove battery.



INSTALLATION

Install in the reverse order of removal.

CAUTION:

When connecting, connect positive battery cable first.

Battery fix frame mounting nut

: 3.9 N·m (0.4 kg-m, 35 in-lb)

Battery terminal nut

: 5.4 N·m (0.55 kg-m, 48 in-lb)

STARTING SYSTEM

PFP:23300

System Description

AKS0098R

M/T MODEL

Power is supplied at all times:

- through 40A fusible link (letter M, located in the fuse and fusible link block)
- to ignition switch terminal 1
- through 10A fuse (No.71, located in the IPDM E/R)
- to CPU of IPDM E/R
- through 15A fuse (No. 78, located in the IPDM E/R)
- to CPU of IPDM E/R.

With the ignition switch in the ON or START position, power is supplied:

- to CPU of IPDM E/R
- through 10A fuse (No. 89, located in the IPDM E/R) and IPDM E/R terminal 25
- to clutch interlock switch terminal 1.

When the clutch pedal is depressed, power is supplied:

- through clutch interlock switch terminal 2
- to IPDM E/R terminal 53.

Ground is supplied:

- to IPDM E/ R terminals 38, 50 and 60
- from body grounds E17, E43 and F152.

Then starter relay is turn ON.
With the ignition switch in the START position, IPDM E/R is energized and power is supplied:

- from ignition switch terminal 5
- to IPDM E/R terminal 4 and
- through IPDM E/R terminal 3
- to starter motor terminal 1.

The starter motor plunger closes and provides a closed circuit between the battery and starter motor. The starter motor is grounded to the engine block. With power and ground supplied, cranking occurs and the engine starts.

A/T MODEL

Power is supplied at all times:

- through 40A fusible link (letter M, located in the fuse and fusible link block)
- to ignition switch terminal 1
- through 10A fuse (No.71, located in the IPDM E/R)
- to CPU of IPDM E/R
- through 15A fuse (No. 78, located in the IPDM E/R)
- to CPU of IPDM E/R.

With the ignition switch in the ON or START position, power is supplied:

- to CPU of IPDM E/R

When the selector lever in the P or N position, power is supplied:

- from A/T assembly (TCM) terminal 9
- to IPDM E/R terminal 53.

Ground is supplied:

- to IPDM E/R terminals 38, 50 and 60
- from body grounds E17, E43 and F152.

Then starter relay is turn ON.
With the ignition switch in the START position, IPDM E/R is energized and power is supplied:

- from ignition switch terminal 5
- to IPDM E/R terminal 4 and
- through IPDM E/R terminal 3
- to starter motor terminal 1.

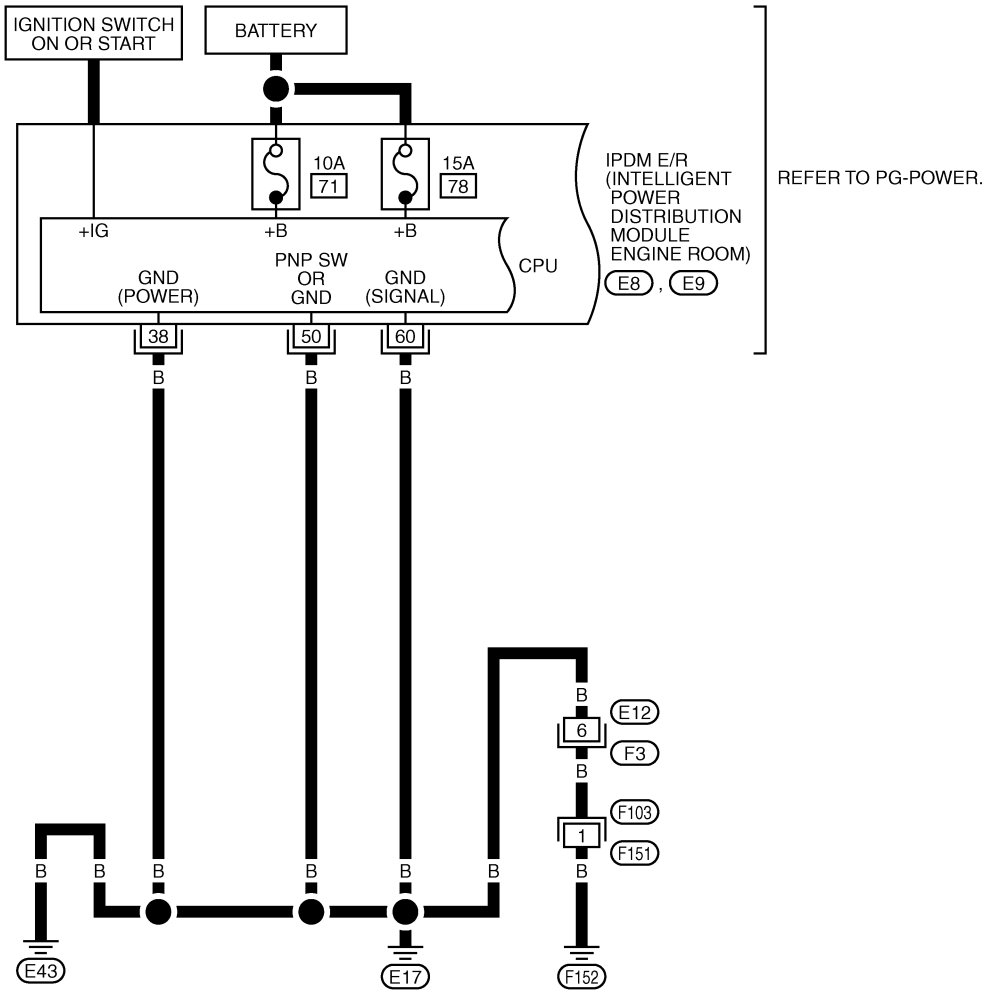
The starter motor plunger closes and provides a closed circuit between the battery and starter motor. The starter motor is grounded to the engine block. With power and ground supplied, cranking occurs and the engine starts.

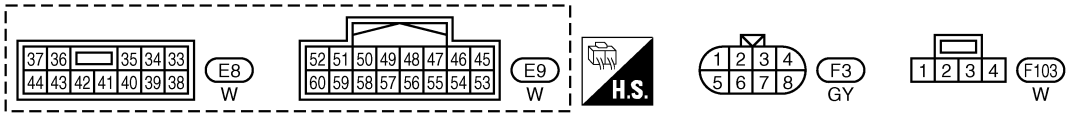
Wiring Diagram — START —

AKS0098S

M/T MODEL

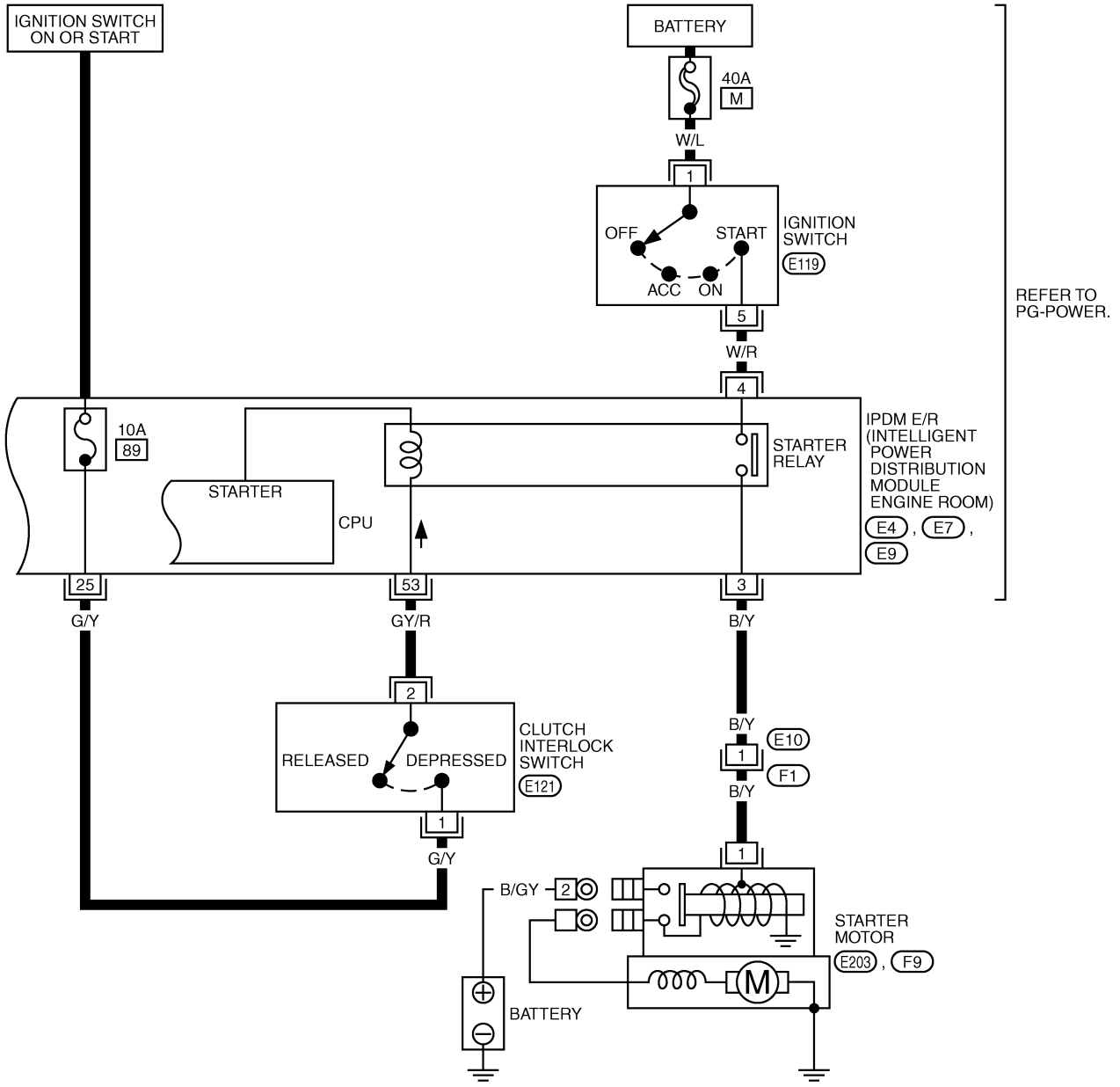
SC-START-01

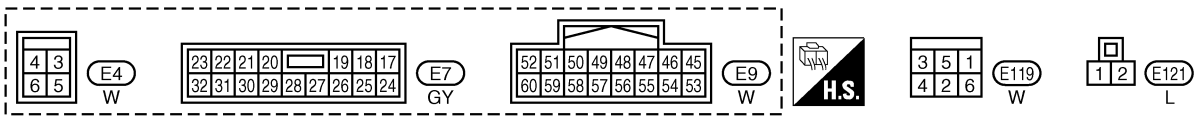


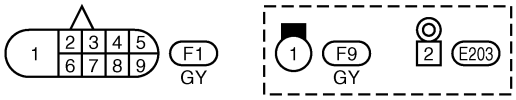


TKWT1297E

SC-START-02

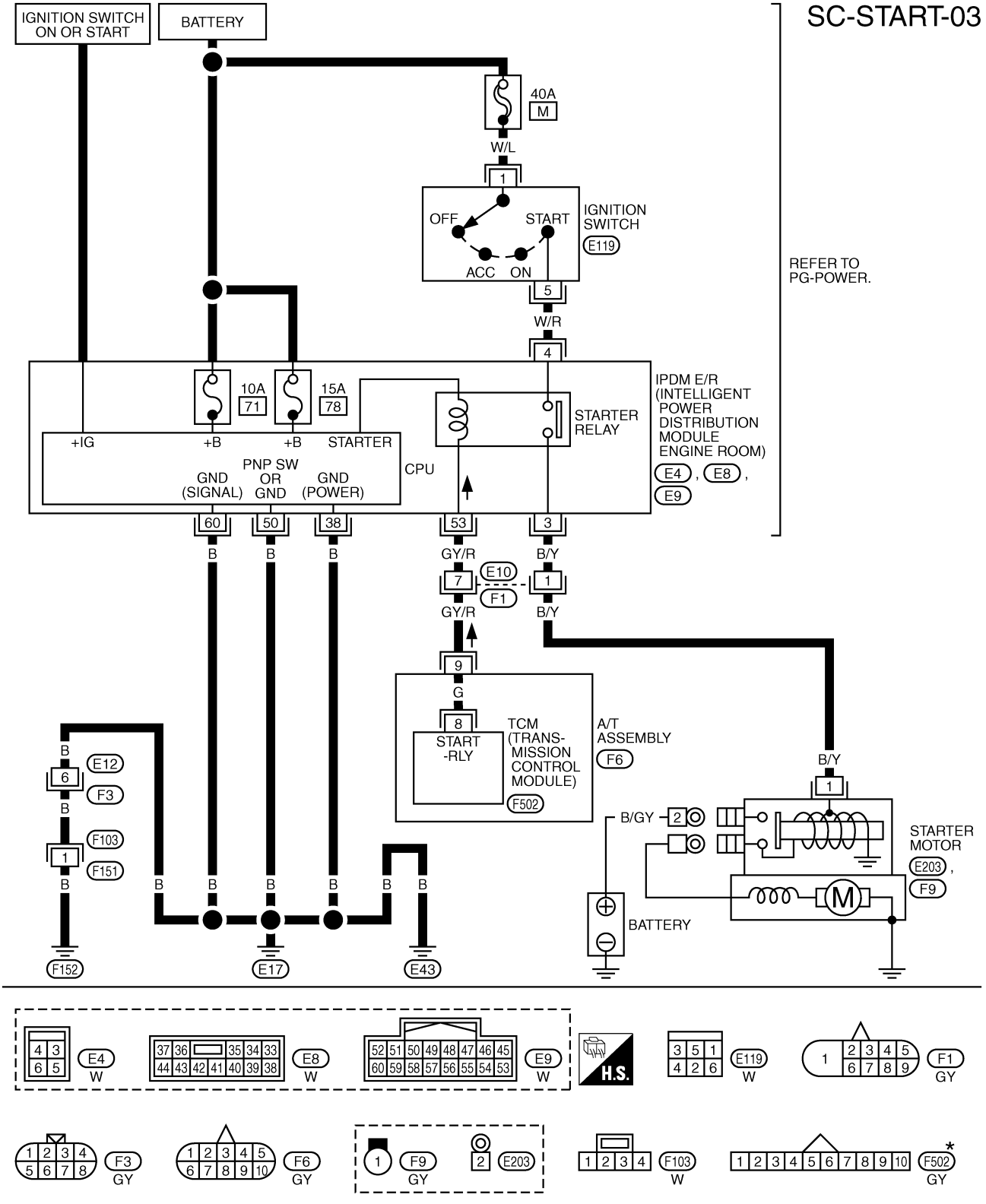






TKWT1298E

A/T MODEL



*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

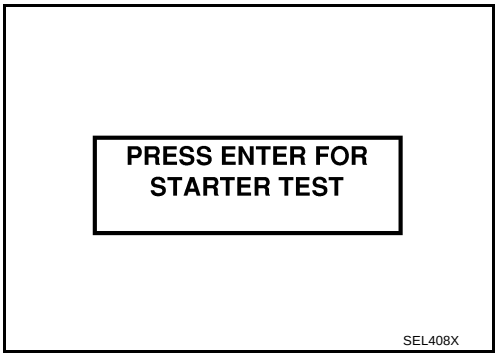
TKWM1314E

Trouble Diagnoses with Battery/Starting/Charging System Tester

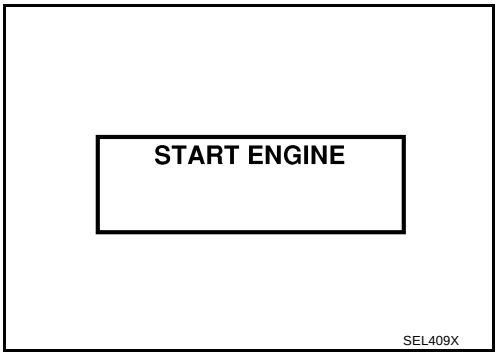
AKS0098T

NOTE:
To ensure a complete and thorough diagnosis, the battery, starter and generator test segments must be done as a set from start to finish.

1. Turn off all loads on the vehicle electrical system.
2. Perform battery test with Battery/Starting/Charging system tester. Refer to SC-6, "Trouble Diagnoses with Battery/Starting/Charging System Tester" .
3. Press “ENTER” to begin the starting system test.

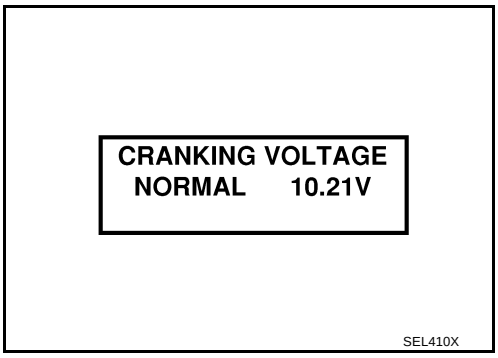


4. Start the engine.



5. Diagnosis result is displayed on the tester. Refer to SC-15, "DIAGNOSTIC RESULT ITEM CHART" .

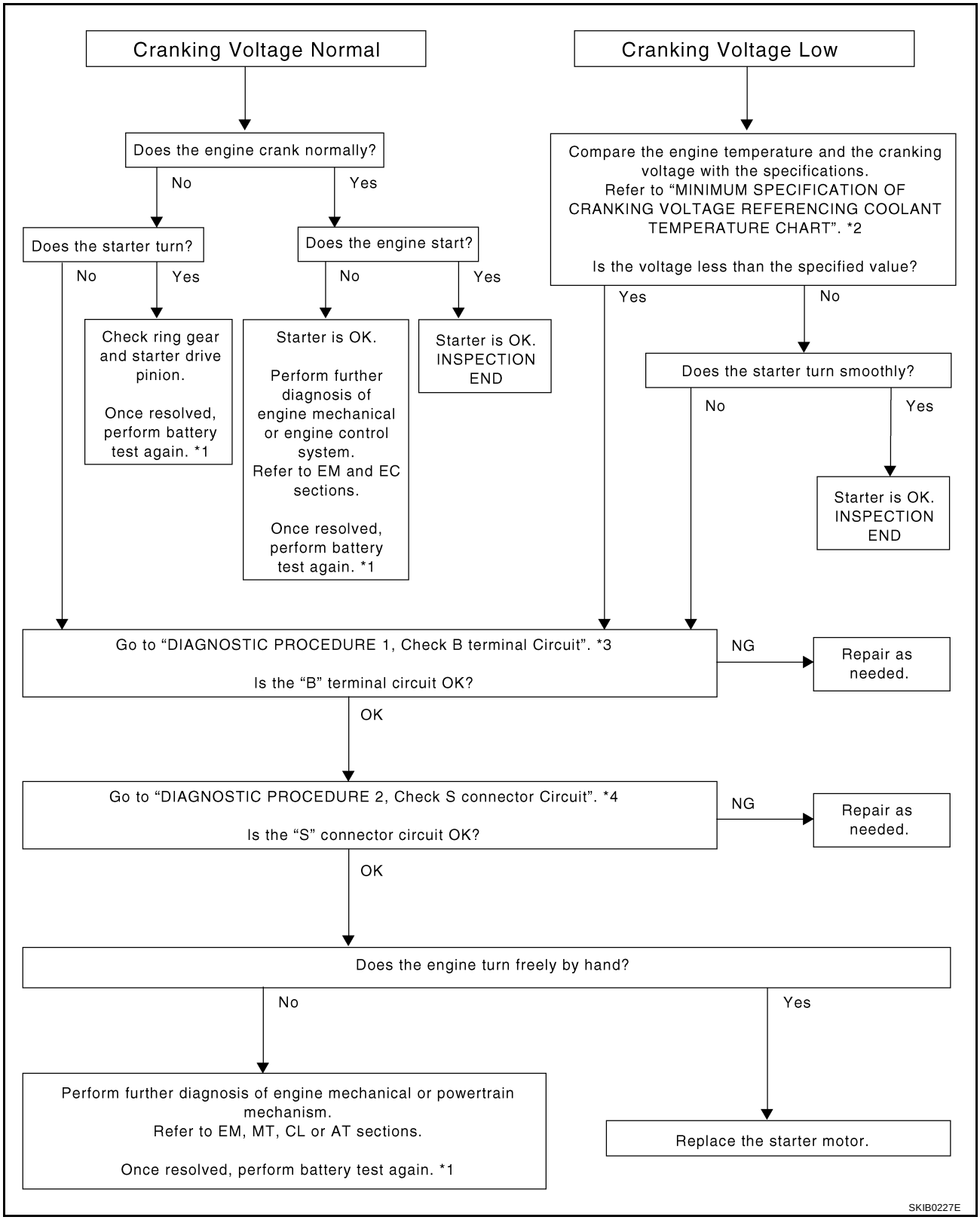
   NOTE:
   - If the starter performs normally but the engine does not start, perform engine diagnosis.
   - For intermittent “NO CRANK” or “NO STARTER OPERATION” incidents, refer to SC-18, "DIAGNOSTIC PROCEDURE 2" .



DIAGNOSTIC RESULT ITEM CHART

Diagnostic item	Service procedure
CRANKING VOLTAGE NORMAL	Go to “WORK FLOW”, SC-16, "WORK FLOW" .
CRANKING VOLTAGE LOW	Go to “WORK FLOW”, SC-16, "WORK FLOW" .
CHARGE BATTERY	Perform the slow battery charging procedure. (Initial rate of charge is 10A for 12 hours.) Perform battery test again with Battery/Starting/Charging system tester. Refer to SC-6, "Trouble Diagnoses with Battery/Starting/Charging System Tester" .
REPLACE BATTERY	Before replacing battery, clean the battery cable clamps and battery posts. Perform battery test again with Battery/Starting/Charging system tester. Refer to SC-6, "Trouble Diagnoses with Battery/Starting/Charging System Tester" . If second test result is “REPLACE BATTERY”, then do so. Perform battery test again to confirm repair.

WORK FLOW



*1 SC-15, "Trouble Diagnoses with Battery/Starting/Charging System Tester"

*2 SC-18, "MINIMUM SPECIFICATION OF CRANKING VOLTAGE REFERENCING COOLANT TEMPERATURE"

*3 SC-17, "DIAGNOSTIC PROCEDURE 1"

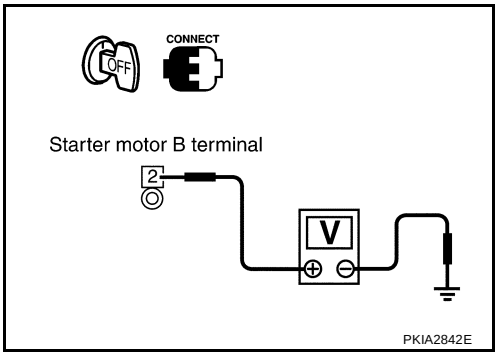
*4 SC-18, "DIAGNOSTIC PROCEDURE 2"

DIAGNOSTIC PROCEDURE 1
Check “B” Terminal Circuit

1. CHECK POWER SUPPLY FOR STARTER MOTOR “B” TERMINAL

1. Remove the fuel pump fuse.
2. Crank or start the engine (where possible) until the fuel pressure is released.
3. Turn ignition switch OFF.
4. Make sure that the starter motor B terminal E203 terminal 2 (B/GY) connection is clean and tight.
5. Check voltage between starter motor B terminal E203 terminal 2 (B/GY) and ground using a digital circuit tester.

Battery voltage should exist.



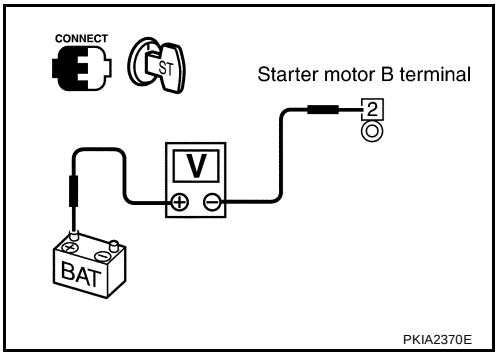
OK or NG

OK >> GO TO 2.
NG >> Check harness between the battery and the starter motor for open circuit.

2. CHECK BATTERY CABLE CONNECTION (VOLTAGE DROP TEST)

Check voltage between starter motor B terminal E203 terminal 2 (B/GY) and battery positive terminal using a digital circuit tester.

When the ignition switch is in START position,
Voltage: Less than 0.5V



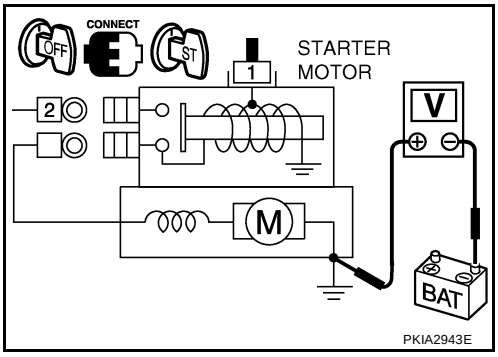
OK or NG

OK >> GO TO 3.
NG >> Check harness between the battery and the starter motor for poor continuity.

3. CHECK STARTER MOTOR GROUND CIRCUIT (VOLTAGE DROP TEST)

1. Turn ignition switch OFF.
2. Check voltage between starter motor case and battery negative terminal using a digital circuit tester.

When the ignition switch is in START position,
Voltage: Less than 0.2V



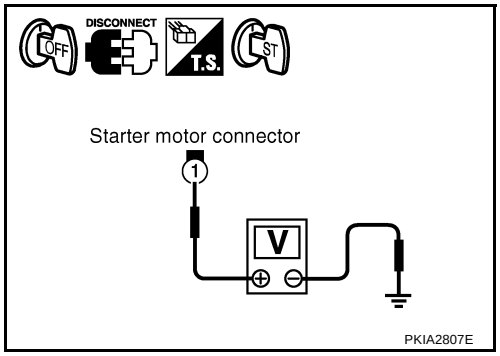
OK or NG

OK >> Starter motor “B” terminal circuit is OK. Further inspection necessary. Refer to SC-16, "WORK FLOW" .
NG >> Check the starter motor case and ground for poor continuity.

DIAGNOSTIC PROCEDURE 2
Check “S” Connector Circuit

1. CHECK POWER SUPPLY FOR STARTER MOTOR “S” TERMINAL

1. Remove the fuel pump fuse.
2. Crank or start the engine (where possible) until the fuel pressure is released.
3. Turn ignition switch OFF.
4. Disconnect starter motors connector.
5. Check voltage between starter motor harness connector F9 terminal 1 (B/Y) and ground using a digital circuit tester.



When the ignition switch is in START position,
Battery voltage should exist.

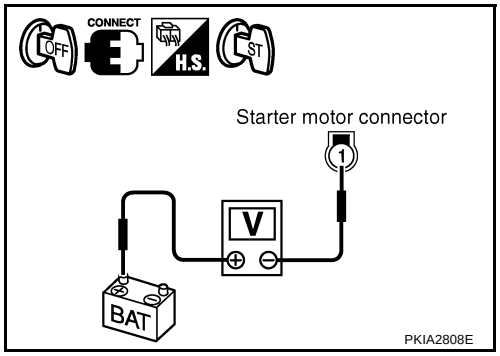
OK or NG

OK >> GO TO 2.
NG >> Check the following.

- 40A fusible link (letter M , located in fuse and fusible link block)
- Ignition switch
- Starter relay [within the IPDM E/R (intelligent power distribution module engine room)]
- Harness for open or short

2. CHECK “S” TERMINAL CONNECTION (VOLTAGE DROP TEST)

1. Turn ignition switch OFF.
2. Connect starter motors connector.
3. Check voltage between starter motor harness connector F9 terminal 1 (B/Y) and battery positive terminal using a digital circuit tester.



When the ignition switch is in START position,
Voltage: Less than 1V

OK or NG

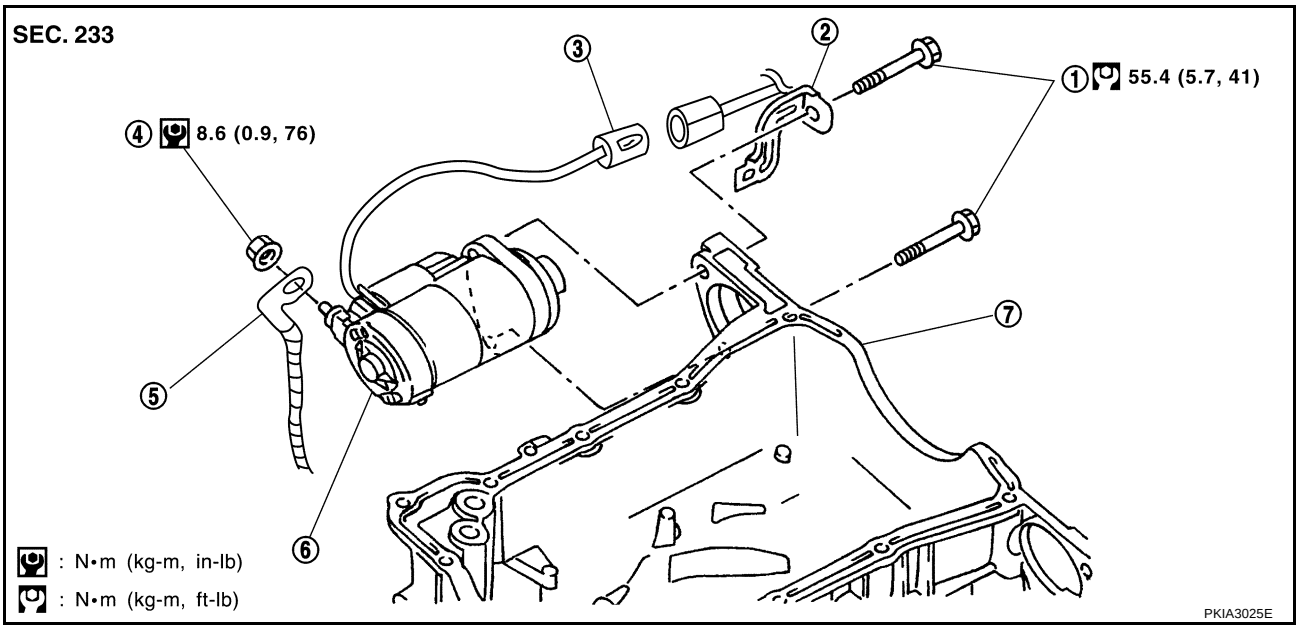
OK >> Starter motor “S” connector circuit is OK. Further inspection necessary. Refer to SC-16, "WORK FLOW" .
NG >> Check harness between the battery and the starter motor “S” connector for poor continuity.

MINIMUM SPECIFICATION OF CRANKING VOLTAGE REFERENCING COOLANT TEMPERATURE

Engine coolant temperature	Voltage V
–30°C to –20°C (–22°F to –4°F)	8.4
–19°C to –10°C (–2°F to 14°F)	8.9
–9°C to 0°C (16°F to 32°F)	9.3
More than 1°C (More than 34°F)	9.7

Removal and Installation

AKS0098U



1. Starter motor mounting bolt
2. Harness clip bracket
3. S connector
4. B terminal nut
5. B terminal harness
6. Starter motor
7. Oil pan

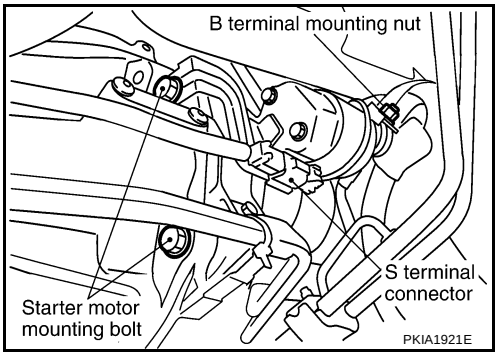
REMOVAL

1. Open the driver and front passenger window, and then disconnect the battery negative cable.

   CAUTION:

   Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

2. Remove engine undercover, using power tools.
3. Disconnect S connector.
4. Remove B terminal nut.
5. Remove starter motor mounting bolts and harness connector clip bracket, using power tools.
6. Remove starter motor to the direction of under side the vehicle.



INSTALLATION

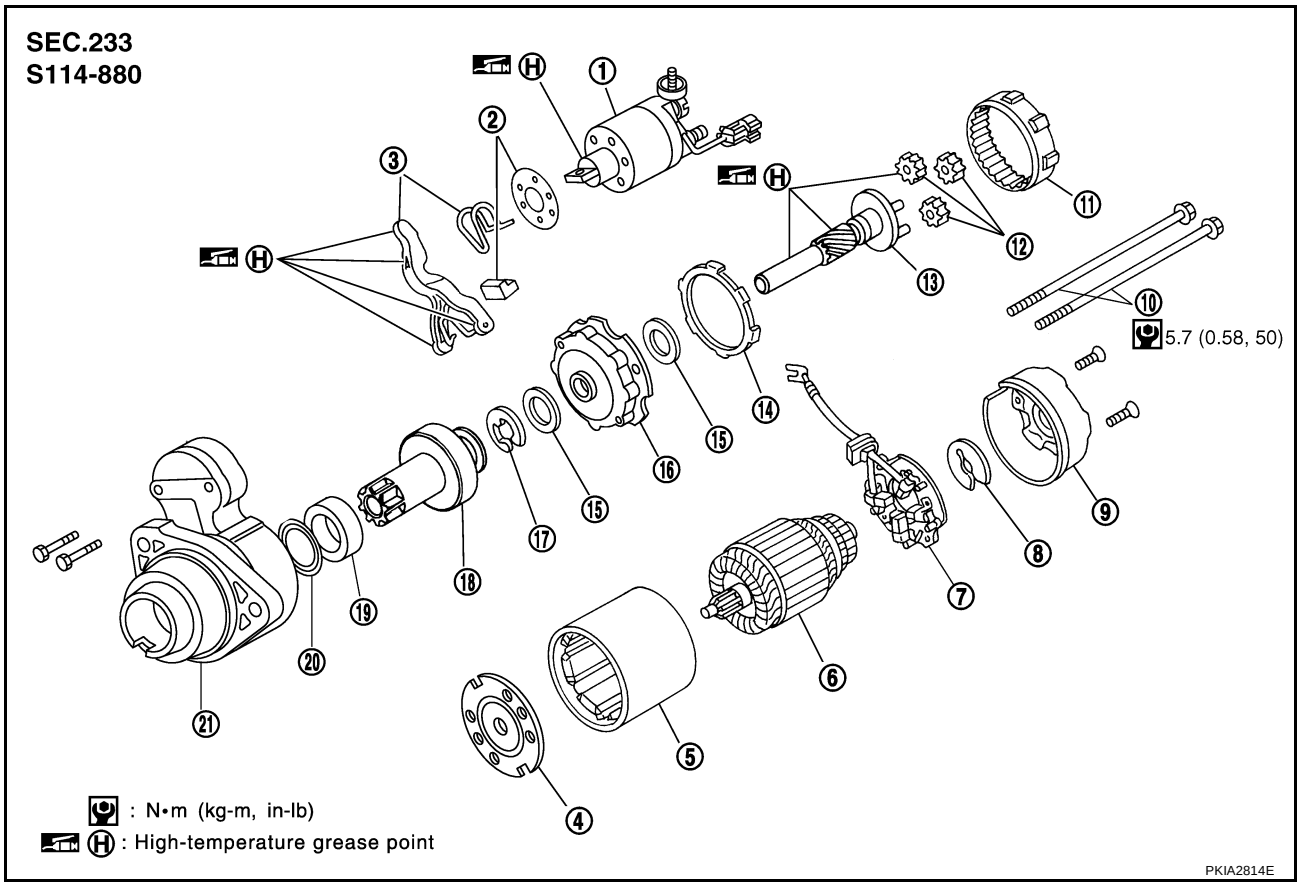
Install in the reverse order of removal.

CAUTION:

Be sure to tighten B terminal nut carefully.

Disassembly and Assembly

AKS0098V



1. Magnetic switch assembly	2. Dust cover kit	3. Shift lever set
4. Center bracket (A)	5. Yoke assembly	6. Armature assembly
7. Brush holder assembly	8. Thrust washer	9. Rear cover assembly
10. Through-bolt	11. Internal gear	12. Planetary gear
13. Pinion shaft	14. Packing	15. Thrust washer
16. Center bracket (P)	17. E-ring	18. Pinion assembly
19. Ball bearing	20. Caul	21. Gear case assembly

INSPECTION AFTER DISASSEMBLY

Pinion/Clutch Check

1. Inspect pinion teeth.
   - Replace pinion if teeth are worn or damaged. (Also check condition of ring gear teeth.)
2. Inspect reduction gear teeth.
   - Replace reduction gear if teeth are worn or damaged. (Also check condition of armature shaft gear teeth.)
3. Check to see if pinion locks in one direction and rotates smoothly in the opposite direction.
   - If it locks or rotates in both directions, or unusual resistance is evident, replace.

CHARGING SYSTEM

PFP:23100

System Description

AKS0098X

The alternator provides DC voltage to operate the vehicle's electrical system and to keep the battery charged. The voltage output is controlled by the IC regulator.
Power is supplied at all times to alternator terminal 4(S) through:

- 10A fuse (No. 36, located in the fuse and fusible link block).

Terminal B supplies power to charge the battery and operate the vehicle's electrical system. Output voltage is controlled by the IC regulator at terminal 4(S) detecting the input voltage.
The alternator is grounded to the engine block.
With the ignition switch in the ON or START position, power is supplied:

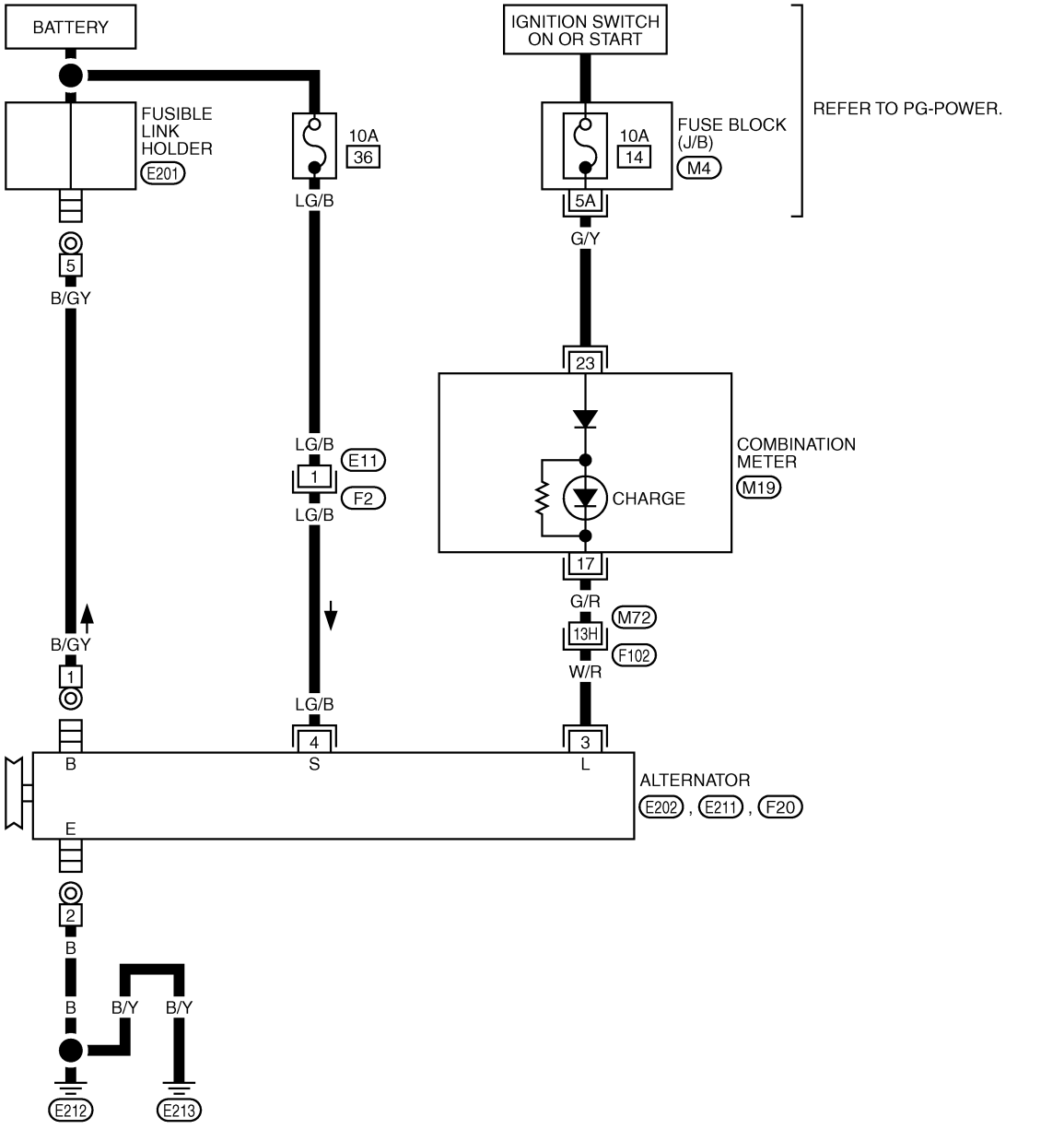
- through 10A fuse [No. 14, located in the fuse block (J/B)]
- to combination meter terminal 23 for the charge warning lamp.

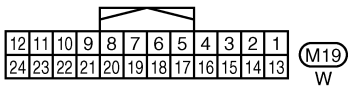
Ground is supplied to combination meter terminal 17 through alternator terminal 3 (L). With power and ground supplied, the charge warning lamp will illuminate. When the alternator is providing sufficient voltage with the engine running, the ground is opened and the charge warning lamp will go off.
If the charge warning lamp illuminates with the engine running, a malfunction is indicated.

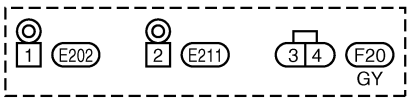
Wiring Diagram — CHARGE —

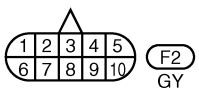
AKS0098Y

SC-CHARGE-01









REFER TO THE FOLLOWING.

F102 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

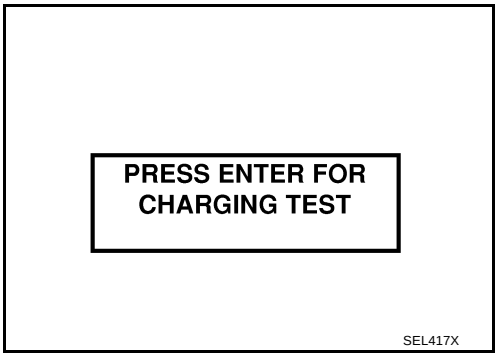
TKWT0985E

Trouble Diagnoses with Battery/Starting/Charging System Tester

AKS0098Z

NOTE:
To ensure a complete and thorough diagnosis, the battery, starter and alternator test segments must be done as a set from start to finish.

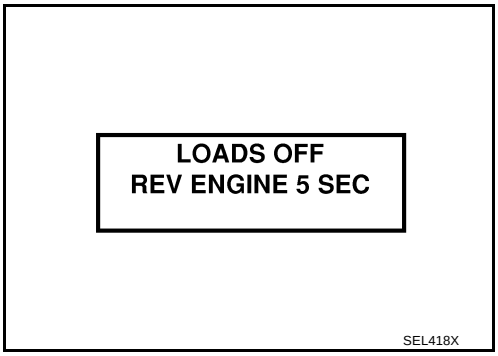
1. Turn off all loads on the vehicle electrical system.
2. Perform battery and starting system test with Battery/Starting/Charging system tester.
3. Press “ENTER” to begin the charging system test.
4. Start engine.



SEL417X

5. Press “ENTER” until “LOADS OFF REV ENGINE 5 SEC” is displayed.
6. Raise and hold the engine speed at 1,500 to 2,000 rpm for about 5 seconds, then return the engine to idle.
   Once the increase in engine rpm is detected, press “ENTER” to continue.

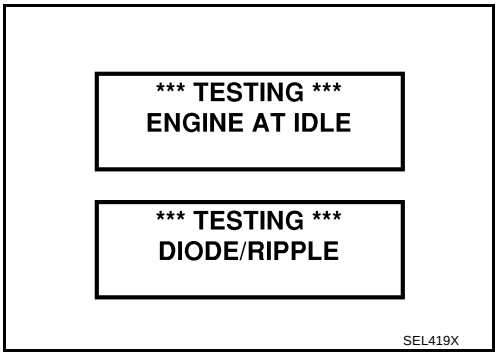
   NOTE:
   - If after 30 seconds an increase in engine idle speed is not detected, “RPM NOT DETECTED” will display.
   - Some engines may have a higher idle initially after starting, particularly when the engine is cold. The tester may detect this without any other action being taken. If this occurs, continue on with the testing process. The final results will not be affected.



SEL418X

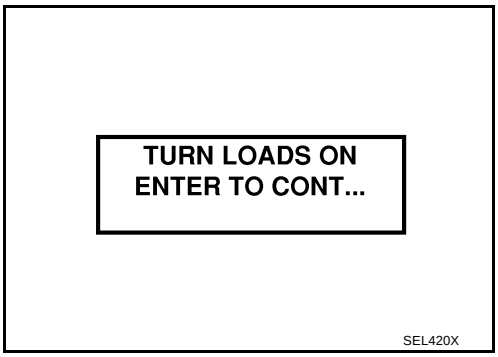
7. The tester now checks the engine at idle and performs the DIODE/RIPPLE check.
8. When complete, the tester will prompt you to turn on the following electrical loads.
   - Heater fan set to highest speed. Do not run the A/C or windshield defroster.
   - Headlamp high beam
   - Rear window defogger

   NOTE:
   Do not run the windshield wipers or any other cyclical loads.



SEL419X

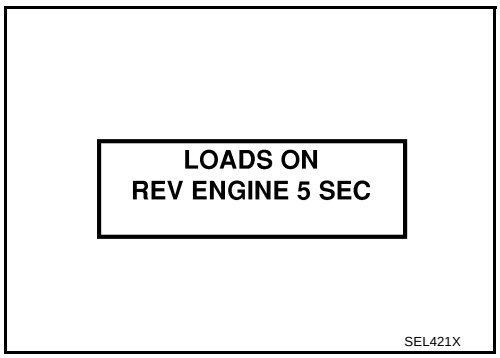
9. Press “ENTER” to continue.



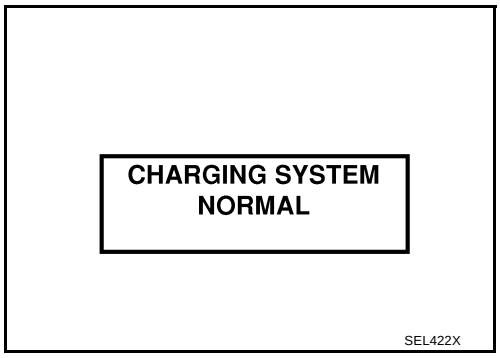
SEL420X

10. Raise and hold the engine speed at 1,500 to 2,000 rpm for about 5 seconds, then return the engine to idle. Once the increase in engine rpm is detected, press “ENTER” to continue.

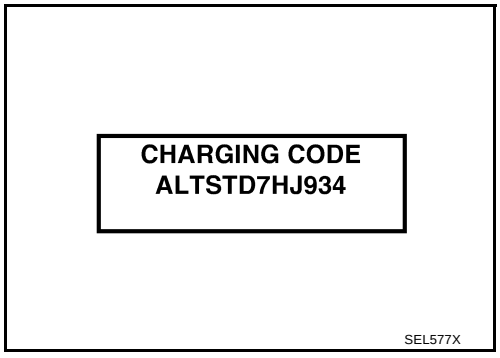
    NOTE:
    If after 30 seconds an increase in engine idle speed is not detected, “RPM NOT DETECTED” will be displayed. Press “ENTER” to restart the test.



11. Diagnostic result is displayed on the tester. Refer to SC-24, "DIAGNOSTIC RESULT ITEM CHART" .



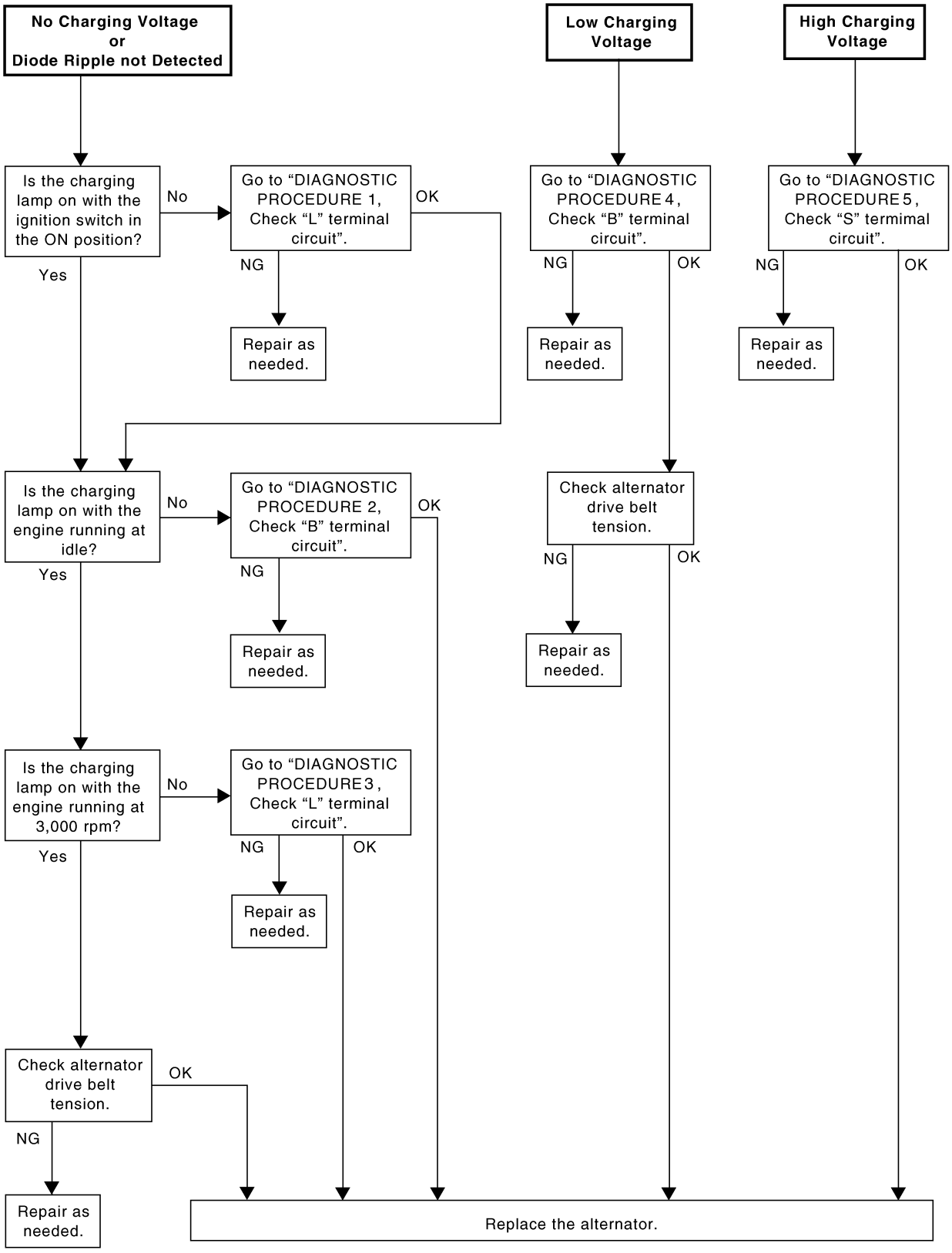
12. Press “ENTER” then test output code is displayed. Record the test output code on the repair order.
13. Toggle back to the “DIAGNOSTIC SCREEN” for test results.



DIAGNOSTIC RESULT ITEM CHART

Diagnostic item	Service procedure
CHARGING SYSTEM NORMAL	Charging system is normal and will also show DIODE RIPPLE test result.
NO CHARGING VOLTAGE	Go to SC-25, "WORK FLOW" .
LOW CHARGING VOLTAGE	Go to SC-25, "WORK FLOW" .
HIGH CHARGING VOLTAGE	Go to SC-25, "WORK FLOW" .
DIODE RIPPLE NORMAL	Diode ripple is OK and will also show CHARGING VOLTAGE test result.
EXCESS RIPPLE DETECTED	Replace the alternator. Perform “DIODE RIPPLE” test again using Battery/Starting/Charging system tester to confirm repair.
DIODE RIPPLE NOT DETECTED	Go to SC-25, "WORK FLOW" .

WORK FLOW



PKIA2226E

DIAGNOSTIC PROCEDURE 1
Check “L” Terminal Circuit

1. CHECK “L” TERMINAL CONNECTION

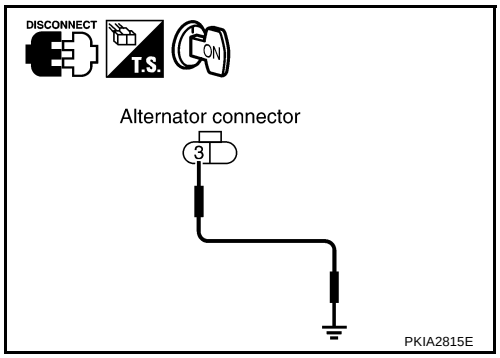
1. Turn ignition switch OFF.
2. Check to see if “L” terminal is clean and tight.

OK or NG

OK >> GO TO 2.
NG >> Repair “L” terminal connection. Confirm repair by performing complete Battery/Starting/Charging system test.

2. CHECK “L” TERMINAL CIRCUIT

1. Disconnect alternator connector.
2. Apply ground to alternator harness connector F20 terminal 3 (W/R) with the ignition switch in the ON position.



CHARGE lamp should light up.

OK or NG

OK >> Go to SC-25, "WORK FLOW" .
NG >> Check the following.

- 10A fuse [No. 14, located in fuse block (J/B)]
- CHARGE lamp
- Harness for open or short between combination meter and fuse
- Harness for open or short between combination meter and alternator

DIAGNOSTIC PROCEDURE 2
Check “B” Terminal Circuit

1. CHECK “B” TERMINAL CONNECTION

1. Turn ignition switch OFF.
2. Check to see if “B” terminal is clean and tight.

OK or NG

OK >> GO TO 2. Confirm repair by performing complete Battery/Starting/Charging system test.
NG >> Repair “B” terminal connection.

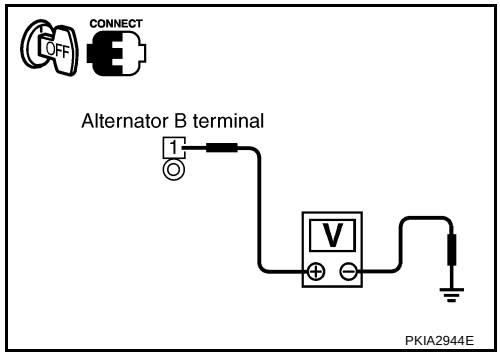
2. CHECK ALTERNATOR “B” TERMINAL CIRCUIT

Check voltage between alternator B terminal E202 terminal 1 (B/GY) and ground using a digital circuit tester.

Battery voltage should exist.

OK or NG

OK >> GO TO 3.
NG >> Check harness for open or short between alternator and battery.



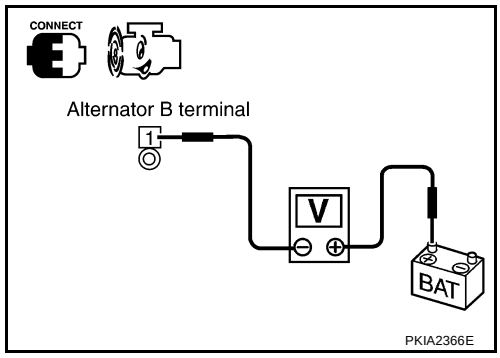
3. CHECK “B” TERMINAL CONNECTION (VOLTAGE DROP TEST)

1. Start the engine.
2. When the engine running at idle and warm, check voltage between alternator B terminal E202 terminal 1 (B/GY) and battery positive terminal using a digital circuit tester.

Voltage: Less than 0.2V

OK or NG

OK >> Replace the alternator. Confirm repair by performing complete Battery/Starting/Charging system test.
NG >> Check harness between the battery and the alternator for poor continuity.



DIAGNOSTIC PROCEDURE 3
Check “L” Terminal Circuit

1. CHECK “L” TERMINAL CONNECTION

1. Turn ignition switch OFF.
2. Check to see if “L” terminal is clean and tight.

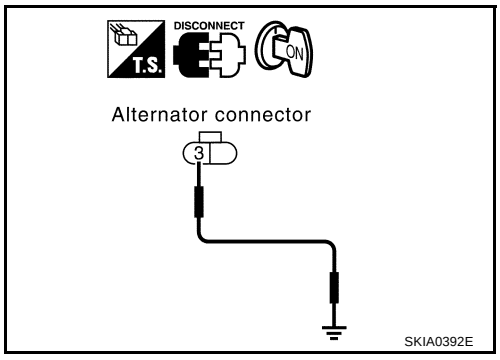
OK or NG

OK >> GO TO 2.
NG >> Repair “L” terminal connection. Confirm repair by performing complete Battery/Starting/Charging system test.

2. CHECK “L” TERMINAL CIRCUIT

1. Disconnect alternator connector.
2. Apply ground to alternator harness connector F20 terminal 3 (W/R) with the ignition switch in the ON position.

CHARGE lamp should light up.



OK or NG

OK >> Replace the alternator. Confirm repair by performing complete Battery/Starting/Charging system test.
NG >> Check the following.

- 10A fuse [No. 14, located in fuse block (J/B)]
- CHARGE lamp
- Harness for open or short between combination meter and fuse
- Harness for open or short between combination meter and alternator

DIAGNOSTIC PROCEDURE 4
Check “B” Terminal Circuit

1. CHECK “B” TERMINAL CONNECTION

1. Turn ignition switch OFF.
2. Check to see if “B” terminal is clean and tight.

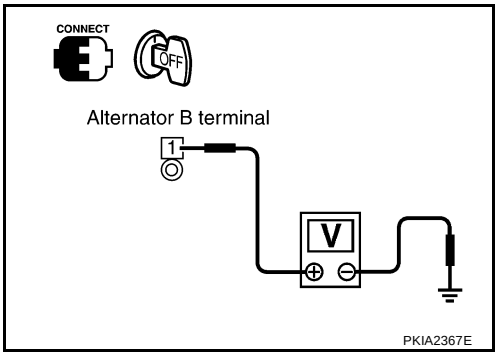
OK or NG

OK >> GO TO 2. Confirm repair by performing complete Battery/Starting/Charging system test.
NG >> Repair “B” terminal connection.

2. CHECK ALTERNATOR “B” TERMINAL CIRCUIT

Check voltage between alternator B terminal E202 terminal 1 (B/GY) and ground using a digital circuit tester.

Battery voltage should exist.



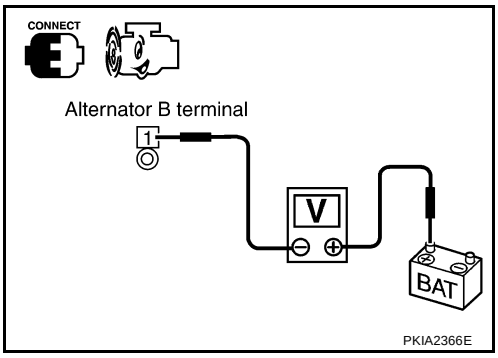
OK or NG

OK >> GO TO 3.
NG >> Check harness for open or short between alternator and battery.

3. CHECK “B” TERMINAL CONNECTION (VOLTAGE DROP TEST)

1. Start the engine.
2. When the engine running at idle and warm, check voltage between alternator terminal E202 terminal 1 (B/GY) and battery positive terminal using a digital circuit tester.

Voltage: Less than 0.2V



OK or NG

OK >> GO TO 4.
NG >> Check harness between the battery and the alternator for poor continuity.

4. CHECK ALTERNATOR DRIVE BELT TENSION

1. Turn ignition switch OFF.
2. Check alternator drive belt tension. Refer to EM-12, "Checking Drive Belts" in “ENGINE MECHANICAL (EM)” section.

Does drive belt tension normal?

YES or NO

YES >> Replace the alternator. Confirm repair by performing complete Battery/Starting/Charging system test.
NO >> Readjust drive belt tension. Refer to EM-12, "Tension Adjustment" in “ENGINE MECHANICAL (EM)” section.

DIAGNOSTIC PROCEDURE 5
Check “S” Terminal Circuit

1. CHECK “S” TERMINAL CONNECTION

1. Turn ignition switch OFF.
2. Check to see if “S” terminal is clean and tight.

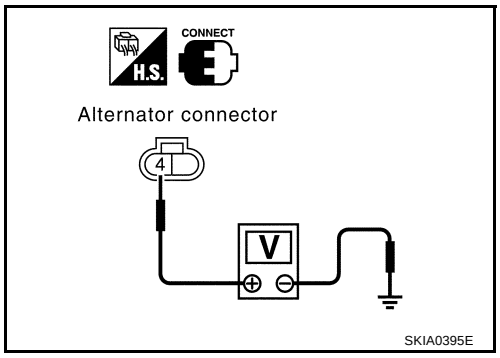
OK or NG

OK >> GO TO 2.
NG >> Repair “S” terminal connection. Confirm repair by performing complete Battery/Starting/Charging system test.

2. CHECK ALTERNATOR “S” TERMINAL CIRCUIT

Check voltage between alternator harness connector F20 terminal 4 (LG/B) and ground using a digital circuit tester.

Battery voltage should exist.



OK or NG

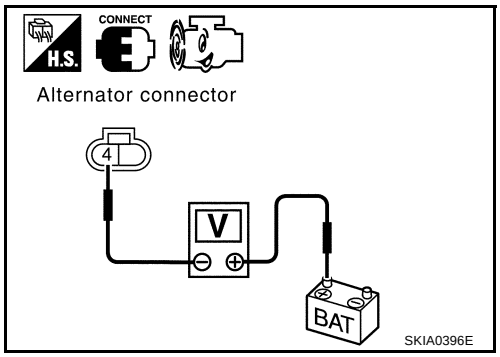
OK >> GO TO 3.
NG >> Check the following.

- 10A fuse (No. 36, located in fuse and fusible link block)
- Harness for open or short between alternator and fuse

3. CHECK “S” TERMINAL CONNECTION (VOLTAGE DROP TEST)

1. Start the engine.
2. When the engine running at idle and warm, check voltage between alternator connector F20 terminal 4 (LG/B) and battery positive terminal using a digital circuit tester.

Voltage: Less than 0.2V



OK or NG

OK >> Replace the alternator. Confirm repair by performing complete Battery/Starting/Charging system test.
NG >> Check harness between the battery and the alternator for poor continuity.

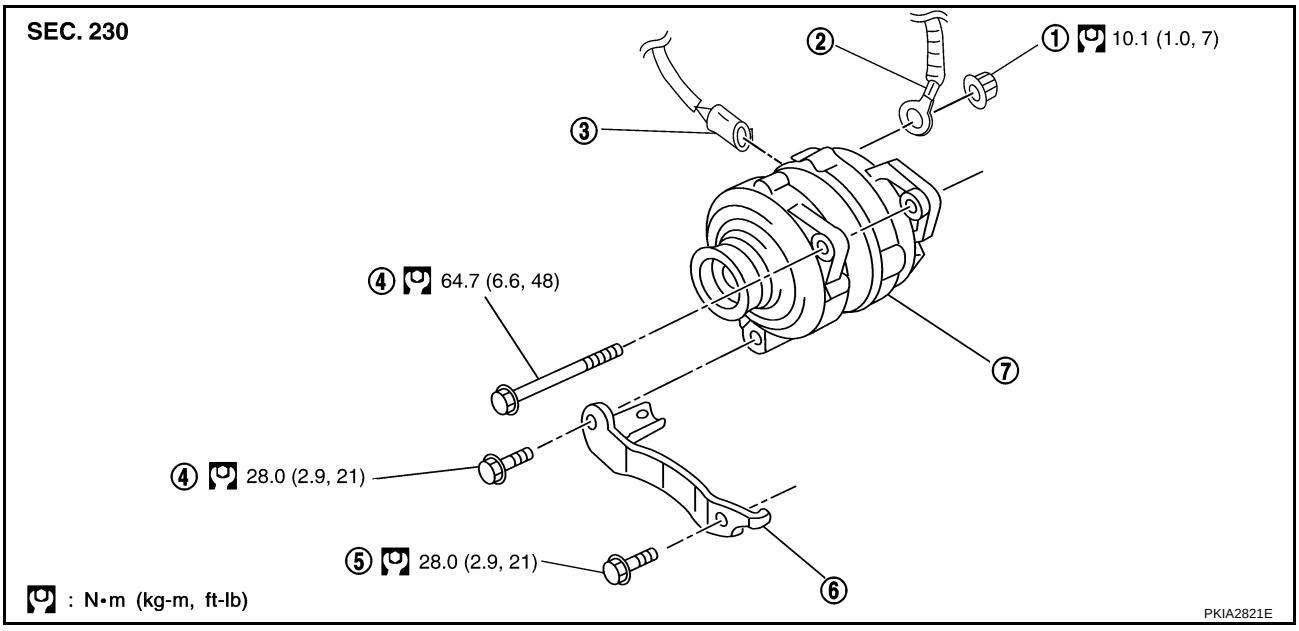
MALFUNCTION INDICATOR

The IC regulator warning function activates to illuminate “CHARGE” warning lamp, if any of the following symptoms occur while alternator is operating:

- Excessive voltage is produced.
- No voltage is produced.

Removal and Installation

AKS00990



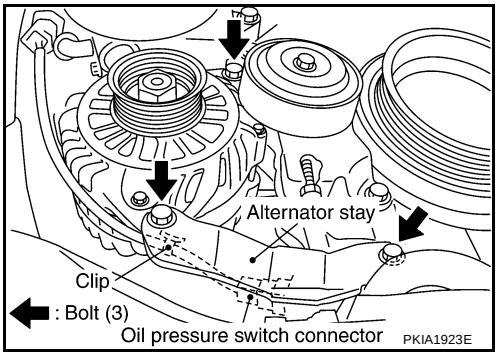
1. B terminal nut
2. Alternator B terminal harness
3. Alternator connector
4. Alternator mounting bolt
5. Alternator stay mounting bolt
6. Alternator stay
7. Alternator

REMOVAL

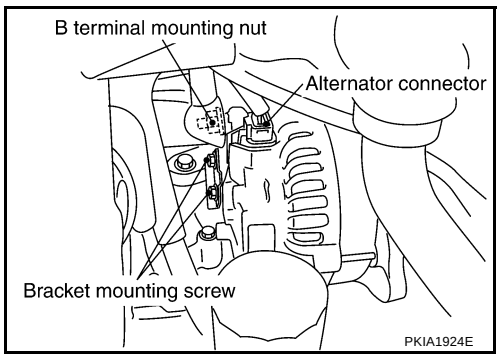
1. Open the driver and front passenger window, and then disconnect the battery negative cable.

   CAUTION:

   Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.
2. Remove engine undercover, using power tools.
3. Remove radiator fan assembly. Refer to CO-12, "RADIATOR" in “ENGINE COOLING SYSTEM (CO)” section.
4. Remove alternator and power steering belt. Refer to EM-13, "Removal and Installation" in “ENGINE MECHANICAL (EM)” section.
5. Remove oil pressure harness clip from alternator stay.
6. Disconnect oil pressure switch connector.
7. Remove alternator stay mounting bolts and alternator stay, using power tools.
8. Remove alternator mounting bolt, using power tools.



9. Disconnect alternator connector.
10. Remove B terminal mounting nut.
11. Remove harness clip and water hose bracket from alternator.
12. Remove alternator assembly to the direction under side the vehicle.



INSTALLATION

Note the following, and install in the reverse order of removal.

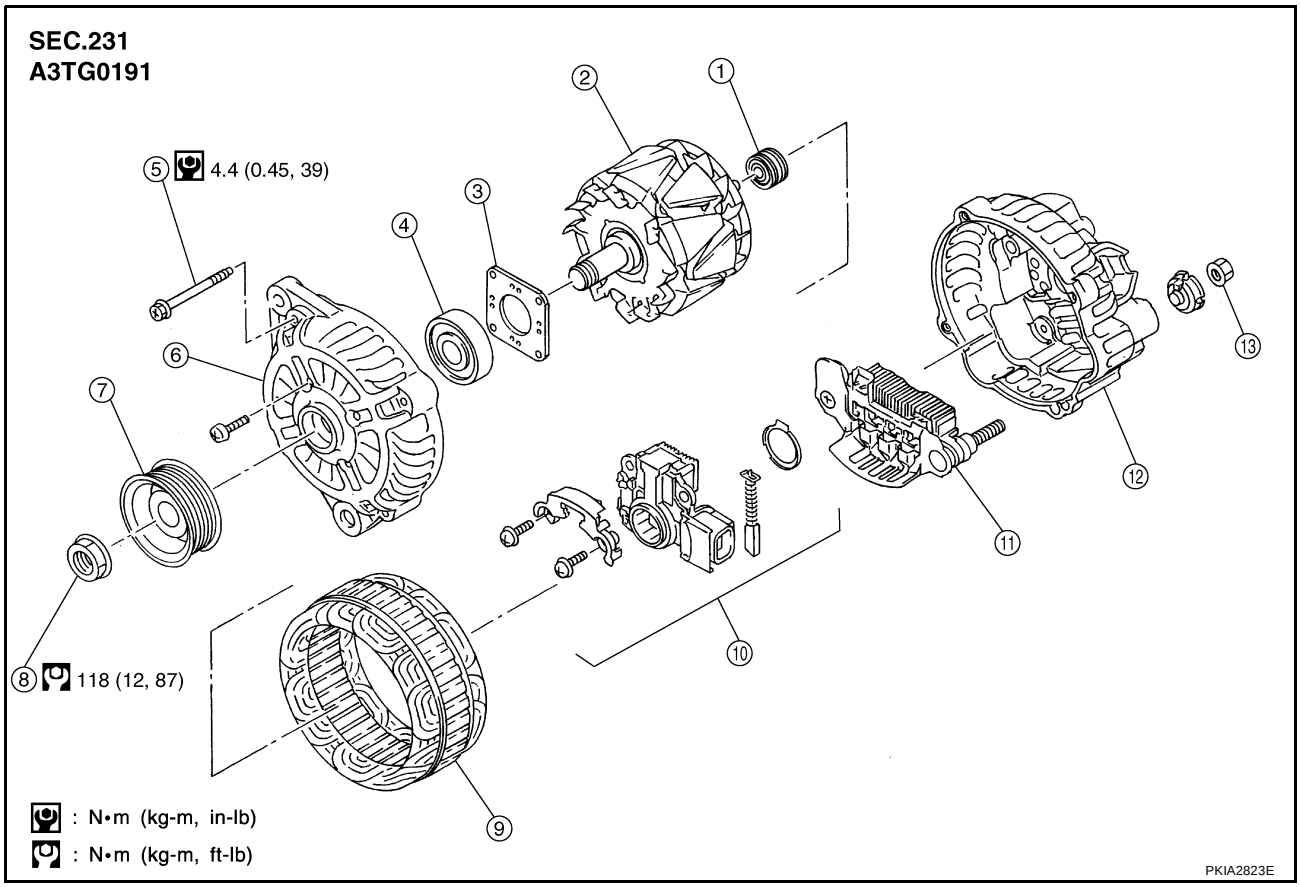
- Install alternator, and check tension of belt. Refer to EM-12, "Checking Drive Belts" in “ENGINE MECHANICAL (EM)” section.

CAUTION:

Be sure to tighten B terminal mounting nut carefully.

Disassembly and Assembly

AKS00991



1. Rear bearing
2. Rotor assembly
3. Retainer
4. Front bearing
5. Through-bolt
6. Front bracket assembly
7. Pulley
8. Pulley nut
9. Stator assembly
10. IC voltage regulator assembly
11. Diode assembly
12. Rear bracket assembly
13. B terminal nut

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Battery

AKS00992

Type	80D23L
Capacity	12V - 52AH
Cold cranking current (For reference value)	582A

Starter

AKS00993

Type		S114-880
		HITACHI make
		Reduction gear type
System voltage		12V
No-load	Terminal voltage	11V
	Current	Less than 90A
	Revolution	More than 2,880 rpm
Minimum diameter of commutator		28.0 mm (1.102 in)
Minimum length of brush		10.5mm (0.413 in)
Brush spring tension		16.2 N (1.65 kg, 3.6 lb)
Clearance between bearing metal and armature shaft		Less than 0.2 mm (0.008 in)
Movement " ℓ " in height of pinion assembly		0.3 - 2.5 mm (0.012 - 0.098 in)

Alternator

AKS00994

Type	A3TG0191
	MITSUBISHI make
Nominal rating	12V - 110A
Ground polarity	Negative
Minimum revolution under no-load (When 13.5V is applied)	Less than 1,000 rpm
Hot output current (When 13.5V is applied)	More than 37A/1,300 rpm More than 92A/2,500 rpm More than 103A/5,000 rpm
Regulated output voltage	14.1 - 14.7V
Minimum length of brush	More than 5.00 mm (0.197 in)
Brush spring pressure	4.9 - 6.1 N (499 - 622 g, 17.62 - 21.94 oz)
Slip ring minimum outer diameter	More than 22.1 mm (0.870 in)
Rotor (Field coil) resistance	1.7 - 2.1Ω

SECTION LT
LIGHTING SYSTEM

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PRECAUTIONS

PFP:00011

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

AKS00AC4

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

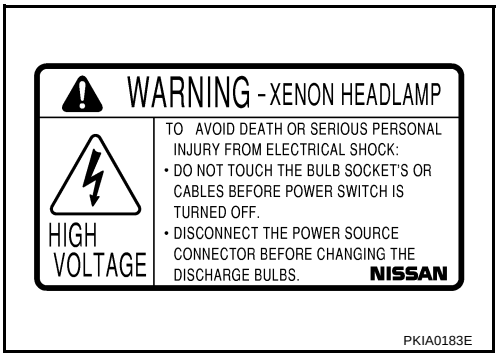
AKS003RF

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

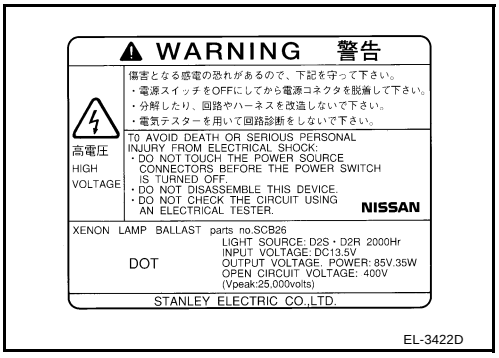
General Precautions for Service Operations

AKS000SE

- Never work with wet hands.
- Xenon headlamp includes high voltage generating part. Be sure to disconnect battery negative cable (negative terminal) or power fuse before removing, installing, or touching the xenon headlamp (including lamp bulb).
- Turn the lighting switch OFF before disconnecting and connecting the connector.
- When turning the xenon headlamp on and while it is illuminated, never touch the harness, bulb, and socket of the headlamp.
- When checking the headlamp on/off operation, check it on vehicle and with the power connected to the vehicle-side connector.



- Do not touch the headlamp bulb glass surface with bare hands or allow oil or grease to get on it. Do not touch the headlamp bulb just after the headlamp is turned off, because it is very hot.
- Install the xenon headlamp bulb socket correctly. If it is installed improperly, high-voltage leak or corona discharge may occur that can melt the bulb, connector, and housing. Do not illuminate the xenon headlamp bulb out of the headlamp housing. Doing so can cause fire and harm your eyes.
- When the bulb has burned out, wrap it in a thick vinyl bag and discard. Do not break the bulb.
- Leaving the bulb removed from the headlamp housing for a long period of time can deteriorate the performance of the lens and reflector (dirt, clouding). Always prepare a new bulb and have it on hand when replacing the bulb.



- When adjusting the headlamp aiming, turn the aiming adjustment screw only in the tightening direction. (If it is necessary to loosen the screw, first fully loosen the screw, and then turn it in the tightening direction.)
- Do not use organic solvent (paint thinner or gasoline) to clean lamps and to remove old sealant.

Wiring Diagrams and Trouble Diagnosis

AKS000SF

When you read wiring diagrams, refer to the following:

- Refer to GI-15, "How to Read Wiring Diagrams" in GI section.
- Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" for power distribution in PG section.

When you perform trouble diagnosis, refer to the following:

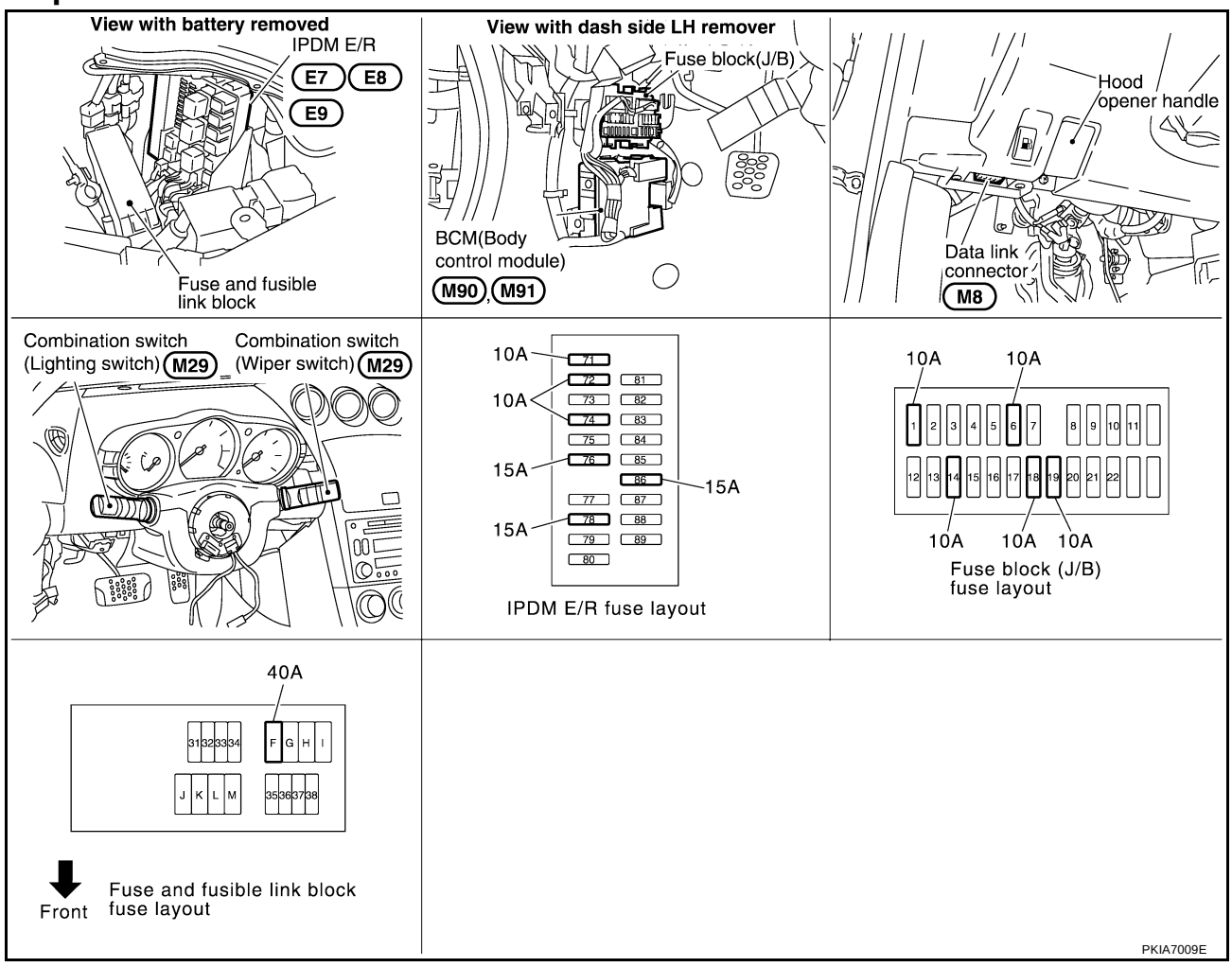
- Refer to GI-11, "HOW TO FOLLOW TEST GROUPS IN TROUBLE DIAGNOSES" in GI section.
- Refer to GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident" in GI section.

HEADLAMP (FOR USA) - XENON TYPE -

PFP:26010

Component Parts and Harness Connector Location

AKS009NQ



System Description

AKS009NR

Control of headlamp system operation is dependent upon position of combination switch (lighting switch). When lighting switch is placed in the 2ND position, BCM receives input signal requesting headlamps (and tail lamps) illuminate. This input signal is communicated to IPDM E/R (intelligent power distribution module engine room) across CAN communication lines. CPU (central processing unit) of IPDM E/R (intelligent power distribution module) controls headlamp high and headlamp low relay coils. These relays, when energized, direct power to respective headlamps, which then illuminate.

OUTLINE

Power is supplied at all times

- to headlamp high relay [located in IPDM E/R (intelligent power distribution module engine room)] and
- to headlamp low relay [located in IPDM E/R (intelligent power distribution module engine room)]
- through 40A fusible link (letter F, located in fuse and fusible link block)
- to BCM (body control module) terminal 55
- through 10A fuse [No.18, located in fuse block (J/B)]
- to BCM (body control module) terminal 42
- through 15A fuse [No.78 located in IPDM E/R (intelligent power distribution module engine room)]
- to CPU (central processing unit) [located in IPDM E/R (intelligent power distribution module engine room)]
- through 10A fuse [No.71,located in IPDM E/R (intelligent power distribution module engine room)]
- to CPU (central processing unit) [located in IPDM E/R (intelligent power distribution module engine room)].

With ignition switch in the ON or START position, power is supplied

- to CPU (central processing unit) [located in IPDM E/R (intelligent power distribution module engine room)]
- through 10A fuse [No. 1, located in fuse block (J/B)]
- to BCM (body control module) terminal 38.

With ignition switch in ACC or ON position, power is supplied

- through 10A fuse [No. 6, located in fuse block (J/B)]
- to BCM (body control module) terminal 11.

Ground is supplied

- to BCM (body control module) terminal 52
- through grounds M30 and M66
- to IPDM E/R (Intelligent power distribution module engine room) terminals 38 and 60
- through grounds E17, E43 and F152.

Low Beam Operation

With lighting switch in 2ND position, BCM receives input signal from combination switch reading function. (Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION") BCM communicates Low beam request signal to IPDM E/R across CAN communication lines. CPU in IPDM E/R controls headlamp low relay coil, which when energized, power is supplied

- through 15A fuse [No. 76, located in IPDM E/R]
- through IPDM E/R terminal 20
- to front combination lamp RH terminal 7, and
- through 15A fuse [No. 86, located in IPDM E/R]
- through IPDM E/R terminal 30
- to front combination lamp LH terminal 7.

Ground is supplied

- to front combination lamp RH terminal 8
- through grounds E17, E43 and F152
- to front combination lamp LH terminal 8
- through grounds E17, E43 and F152.

With power and ground supplied, low beam headlamps illuminate.

High Beam Operation/Flash-to-Pass Operation

With lighting switch in 2ND position and placed in HIGH or PASS position, BCM receives input signal requesting headlamp high beams to illuminate. High beam request signal is communicated to IPDM E/R across CAN communication lines. CPU in IPDM E/R controls headlamp high relay coil, which when energized directs power

- through 15A fuse [No. 76, located in IPDM E/R]
- through IPDM E/R terminal 20
- to front combination lamp RH terminal 7, and
- through 15A fuse [No. 86, located in IPDM E/R]
- through IPDM E/R terminal 30
- to front combination lamp LH terminal 7
- to 10A fuse [No. 72, located in IPDM E/R]
- through IPDM E/R terminal 27
- to front combination lamp RH terminal 3
- to 10A fuse [No. 74, located in IPDM E/R]
- through IPDM E/R terminal 28
- to front combination lamp LH terminal 3.

Ground is supplied

- to front combination lamp RH terminal 4
- through grounds E17,E43 and F152, and

- to front combination lamp LH terminal 4
- through grounds E17,E43 and F152.

With power and ground supplied, high beam headlamps illuminate.
Unified meter and A/C amp. receives signal from BCM across CAN communication lines, and then combination meter indicator illuminates high beam.

COMBINATION SWITCH READING FUNCTION

Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION" .

EXTERIOR LAMP BATTERY SAVER CONTROL

When combination switch (lighting switch) is in the 2ND position (ON), and ignition switch is turned from ON or ACC to OFF, battery saver control function is activated.
Under this condition, headlamps remain illuminated for 5 minutes, then headlamps are turned off.
Exterior lamp battery saver control mode can be changed by function setting of CONSULT-II.

VEHICLE SECURITY SYSTEM

The vehicle security system will flash high beams if the system is triggered. Refer to BL-129, "VEHICLE SECURITY (THEFT WARNING) SYSTEM" .

XENON HEADLAMP

Xenon type headlamp is adopted to low beam headlamps. Xenon bulbs do not use a filament. Instead, they produce light when a high voltage current is passed between two tungsten electrodes through a mixture of xenon (an inert gas) and certain other metal halides. In addition to added lighting power, electronic control of the power supply gives headlamps stable quality and tone color.
Following are some of the many advantages of xenon type headlamp.

- The light produced by headlamps is a white color comparable to sunlight that is easy on the eyes.
- Light output is nearly double that of halogen headlamps, affording increased area of illumination.
- The light features a high relative spectral distribution at wavelengths to which the human eye is most sensitive. This means that even in the rain, more light is reflected back from the road surface toward the vehicle, for added visibility.
- Power consumption is approximately 25 percent less than halogen headlamps, reducing battery load.

CAN Communication System Description

AKS009NS

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

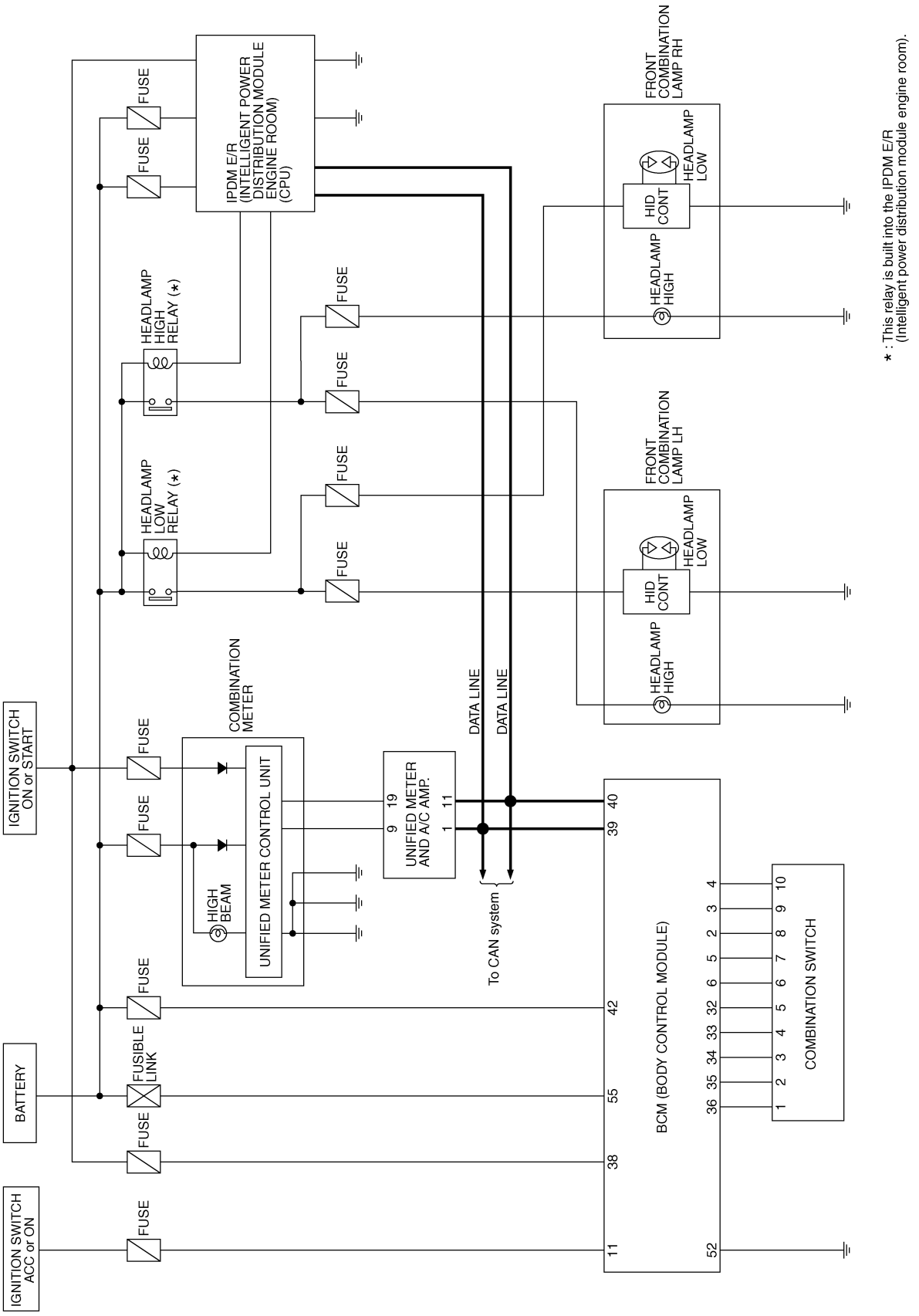
CAN Communication Unit

AKS009NT

Refer to LAN-5, "CAN Communication Unit" .

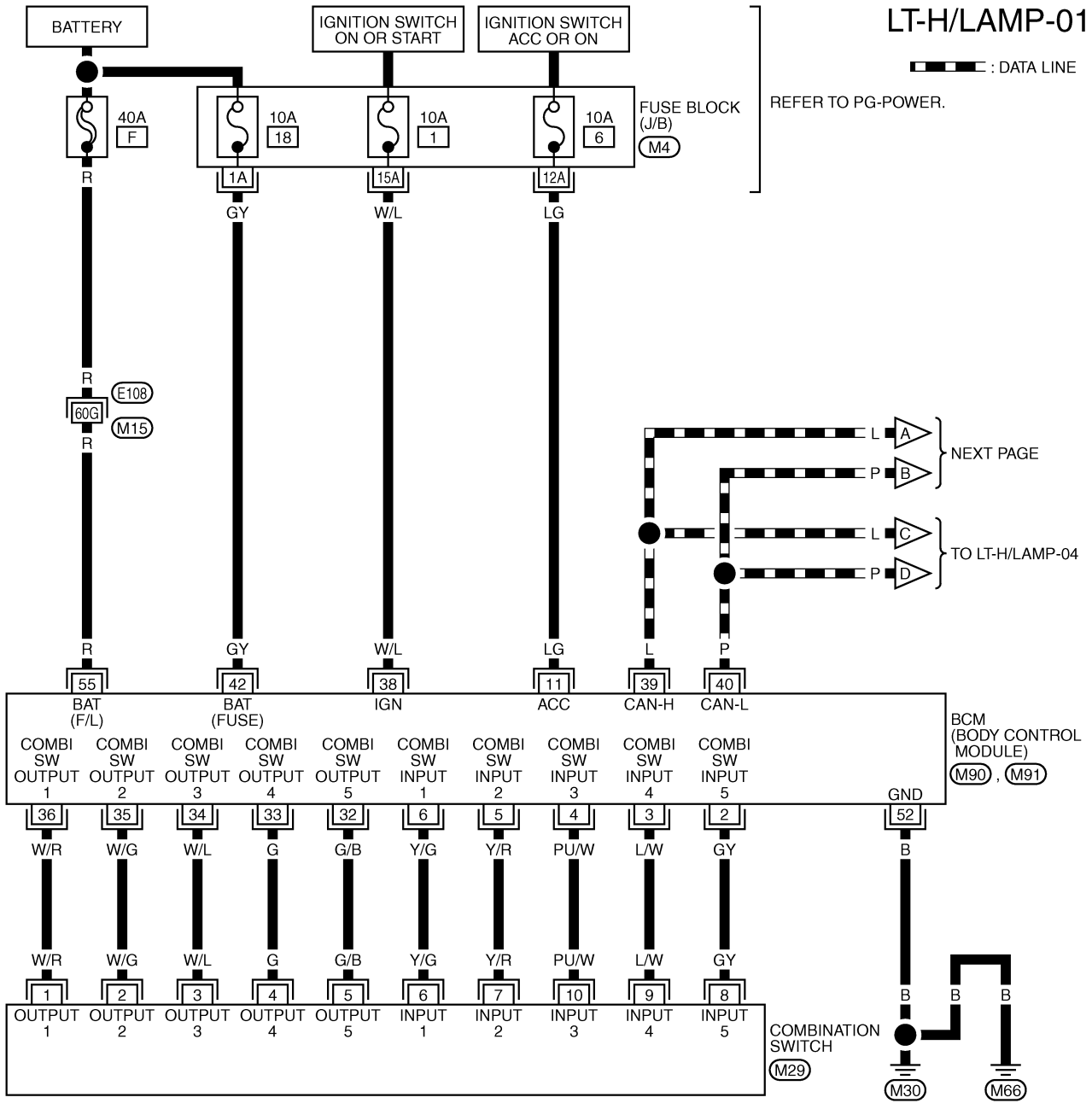
Schematic

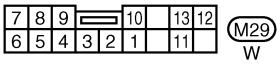
AKS009NU



Wiring Diagram — H/LAMP —

AKS009NV





REFER TO THE FOLLOWING.

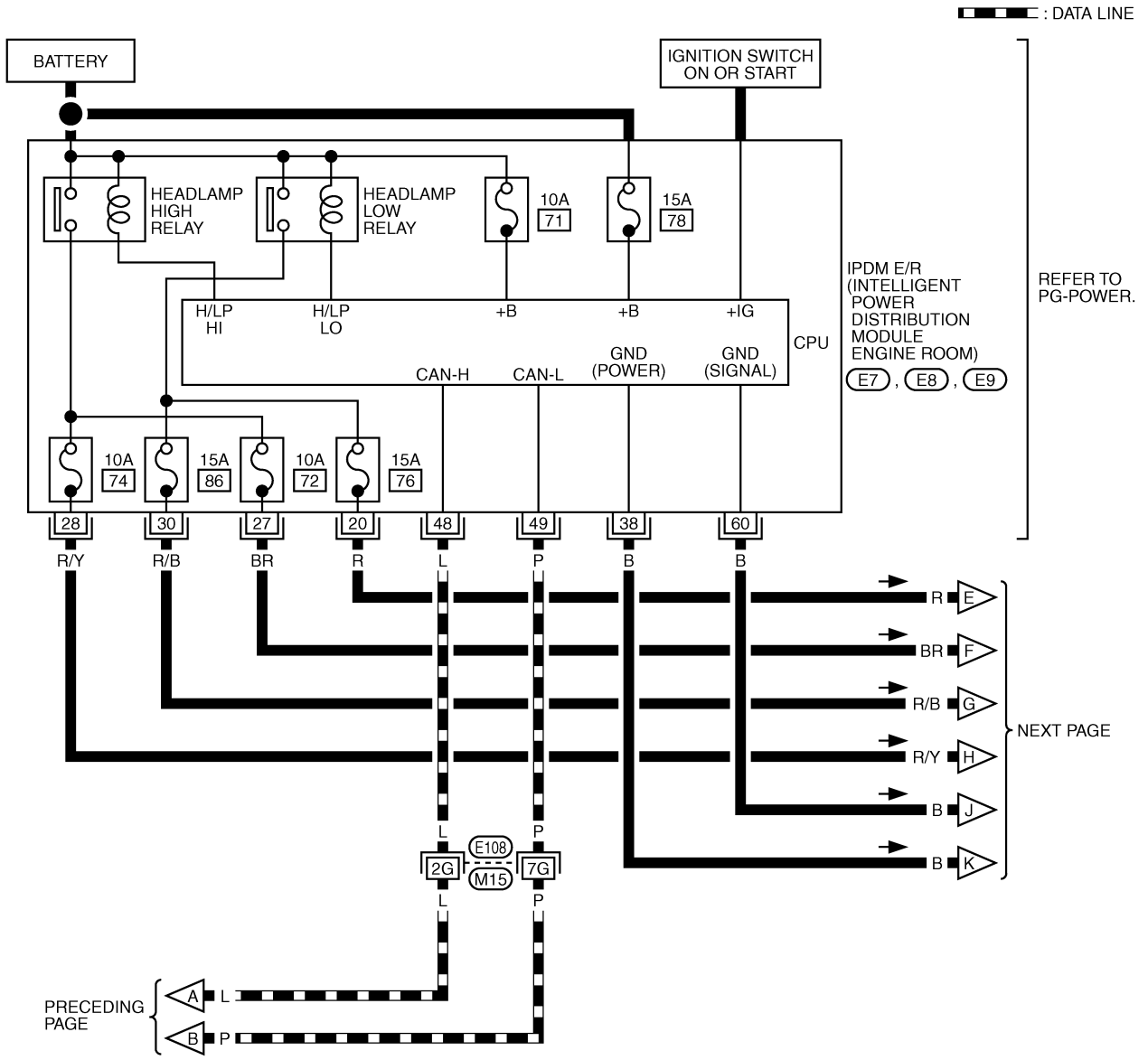
E108 -SUPER MULTIPLE JUNCTION (SMJ)

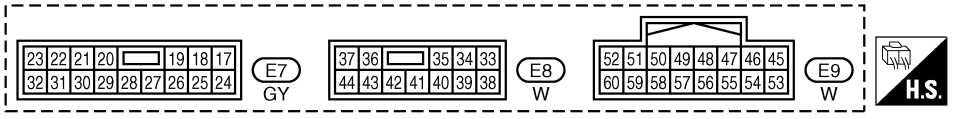
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

M90, M91 -ELECTRICAL UNITS

TKWT1767E

LT-H/LAMP-02

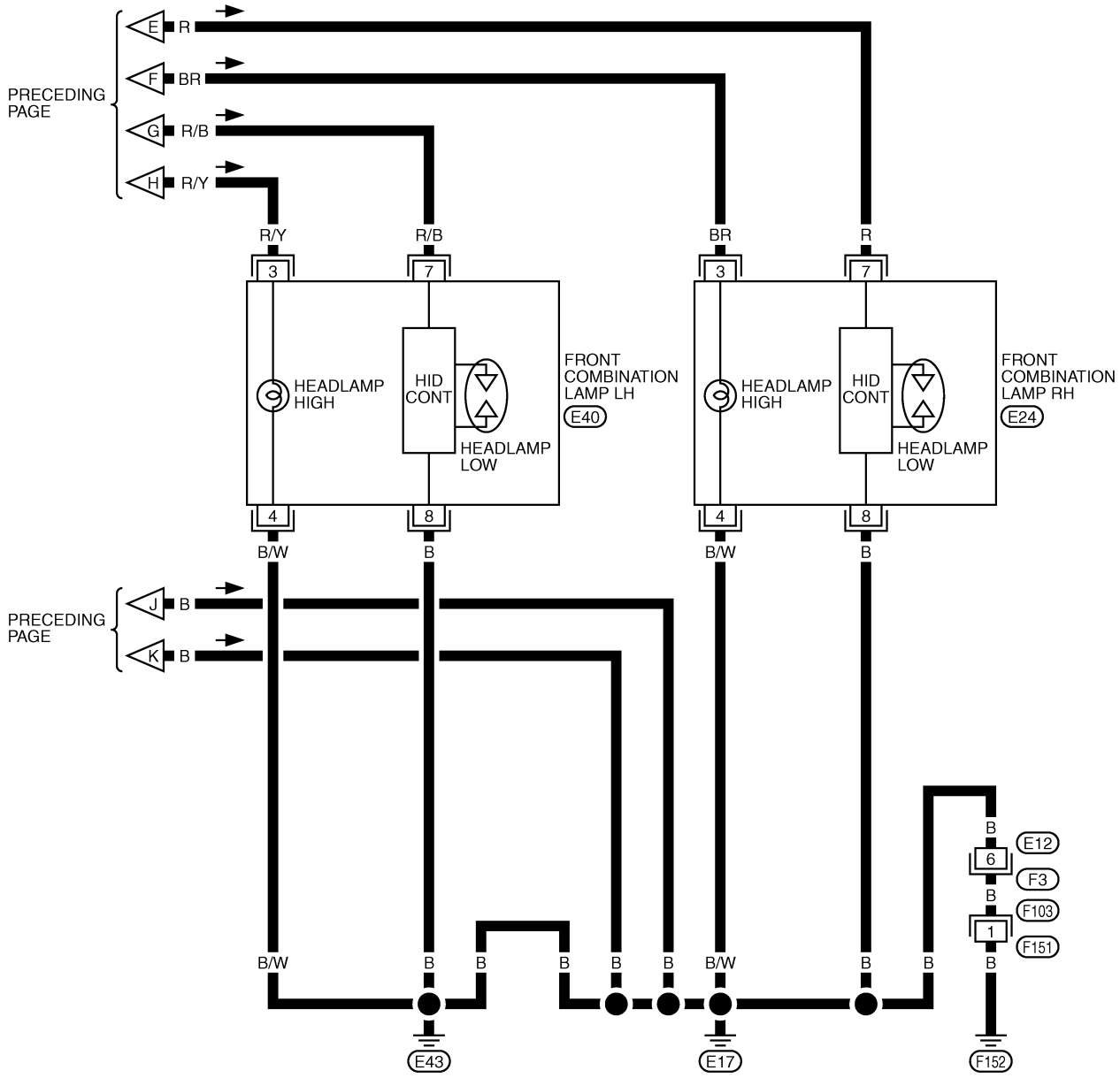


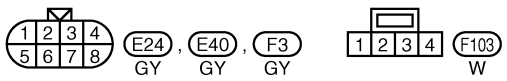


REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT1768E

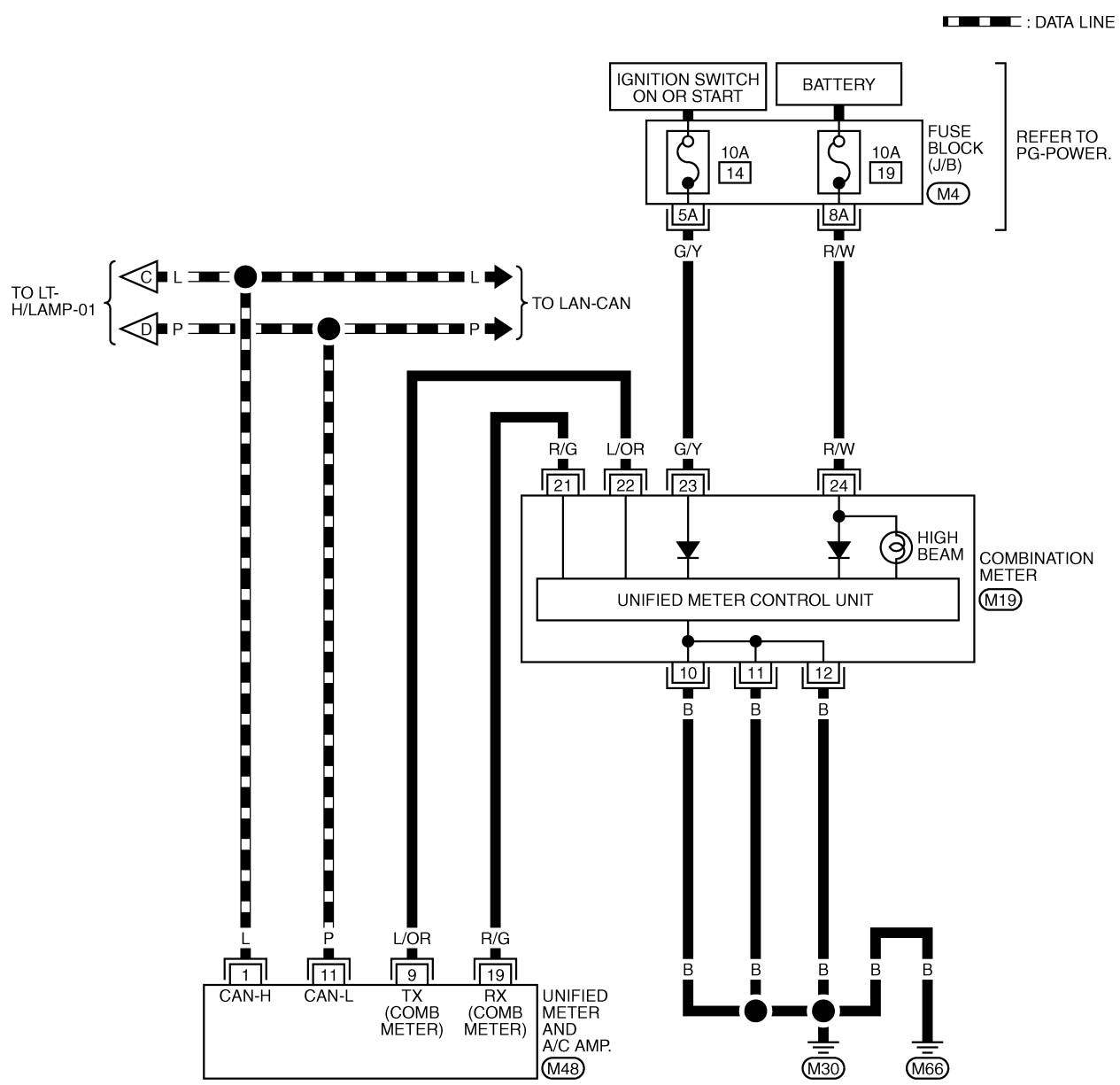
LT-H/LAMP-03

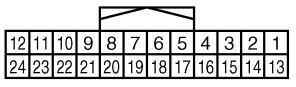




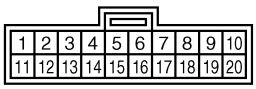
TKWT1769E

LT-H/LAMP-04





M19
W



M48
GY

H.S.

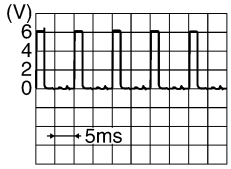
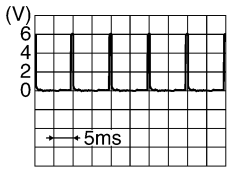
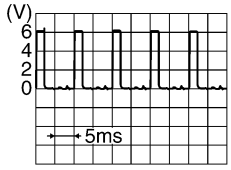
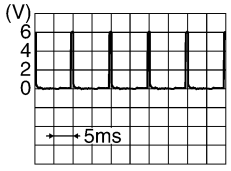
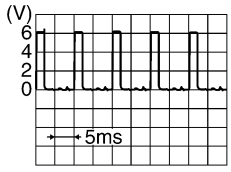
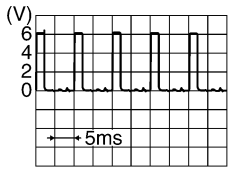
REFER TO THE FOLLOWING.

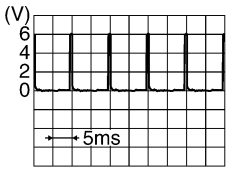
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT1728E

Terminals and Reference Values for BCM

AKS00AOK

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
2	GY	Combination switch input 5	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E
3	L/W	Combination switch input 4	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
4	PU/W	Combination switch input 3	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E
5	Y/R	Combination switch input 2	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
6	Y/G	Combination switch input 1			
11	LG	Ignition switch (ACC)	ACC	—	Battery voltage
32	G/B	Combination switch output 5	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E
33	G	Combination switch output 4	ON	Lighting, turn, wiper OFF Wiper dial position 4	SKIA5292E
34	W/L	Combination switch output 3	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
35	W/G	Combination switch output 2	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
36	W/R	Combination switch output 1			
38	W/L	Ignition switch (ON)	ON	—	Battery voltage
39	L	CAN– H	—	—	—
40	P	CAN– L	—	—	—
42	GY	Battery power supply	OFF	—	Battery voltage
52	B	Ground	ON	—	Approx. 0V
55	R	Battery power supply	OFF	—	Battery voltage

Terminals and Reference Values for IPDM E/R

AKS009QM

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
20	R	Headlamp low (RH)	ON	Lighting switch 2ND position	OFF	Approx. 0V
					ON	Battery voltage
27	BR	Headlamp high (RH)	ON	Lighting switch HIGH or PASS position	OFF	Approx. 0V
					ON	Battery voltage
28	R/Y	Headlamp high (LH)	ON	Lighting switch HIGH or PASS position	OFF	Approx. 0V
					ON	Battery voltage
30	R/B	Headlamp low (LH)	ON	Lighting switch 2ND position	OFF	Approx. 0V
					ON	Battery voltage
38	B	Ground	ON	—		Approx. 0V
48	L	CAN– H	—	—		—
49	P	CAN– L	—	—		—
60	B	Ground	ON	—		Approx. 0V

How to Proceed With Trouble Diagnosis

AKS009QN

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-7, "System Description" .
3. Perform the preliminary check. Refer to LT-17, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Does headlamp operate normally? If YES: GO TO 6. If NO: GO TO 4.
6. INSPECTION END

Preliminary Check

AKS009QO

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES

- Check fuses for blown-out.

Unit	Power source	Fuse and fusible link No.
BCM	Battery	F
	Ignition switch ON or START position	1
	Ignition switch ACC or ON position	6
IPDM E/R	Battery	72
		74
		76
		86
Combination meter	Battery	19
	Ignition switch ON or START position	14

Refer to LT-11, "Wiring Diagram — H/LAMP —" .

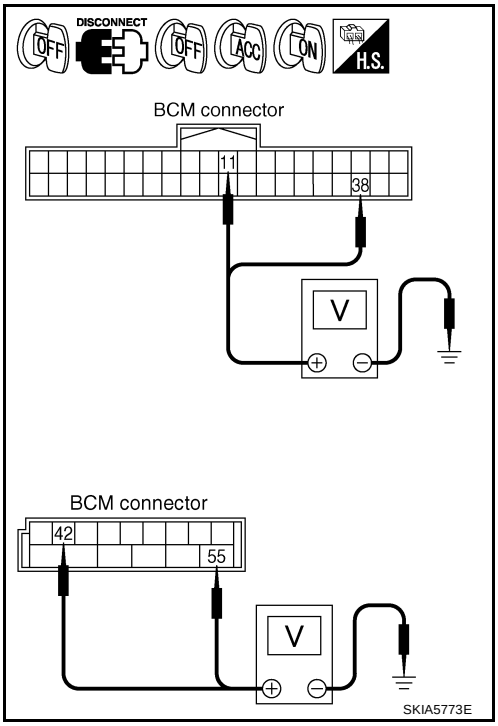
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM harness connector and ground.

Terminals			Ignition switch position		
(+)		(-)	OFF	ACC	ON
Connector	Terminal (Wire color)				
M90	11 (LG)	Ground	0V	Battery voltage	Battery voltage
	38 (W/L)		0V	0V	Battery voltage
M91	42 (GY)		Battery voltage	Battery voltage	Battery voltage
	55 (R)		Battery voltage	Battery voltage	Battery voltage



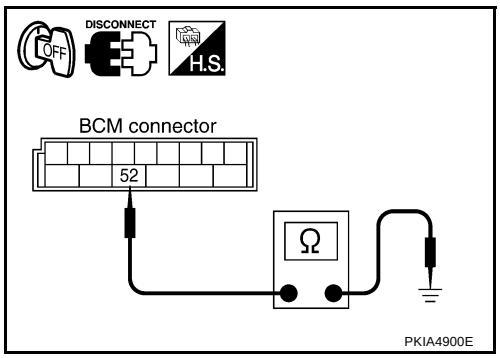
OK or NG

OK >> GO TO 3.
NG >> Check harness for open or short between BCM and fuse.

3. CHECK GROUND CIRCUIT

Check continuity between BCM harness connector and ground.

Terminals			Continuity
Connector	Terminal (Wire color)		
M91	52 (B)	Ground	Yes



OK or NG

OK >> INSPECTION END
NG >> Check ground circuit harness.

CONSULT-II Functions (BCM)

AKS009NZ

CONSULT-ll performs the following functions communicating with BCM.

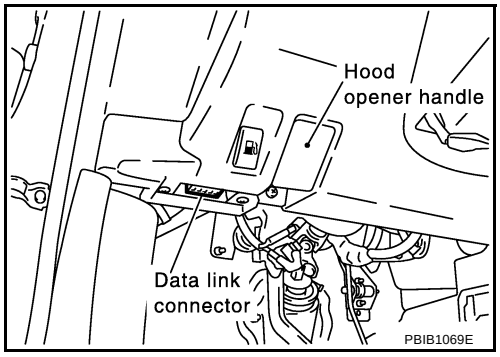
BCM diagnosis part	Check item, diagnosis mode	Description
HEADLAMP	WORK SUPPORT	Changes the setting for each function.
	DATA MONITOR	Displays BCM input data in real time.
	ACTIVE TEST	Operation of electrical loads can be checked by sending drive signal to them.
BCM	CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.

CONSULT-II BASIC OPERATION

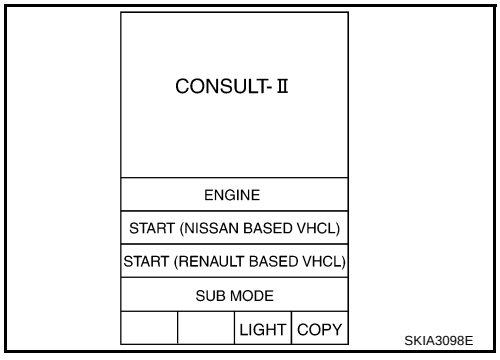
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

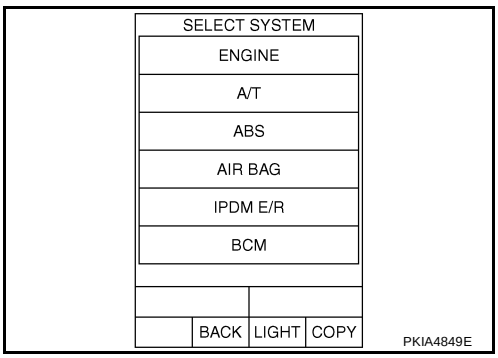
1. With ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to data link connector, then turn ignition switch ON.



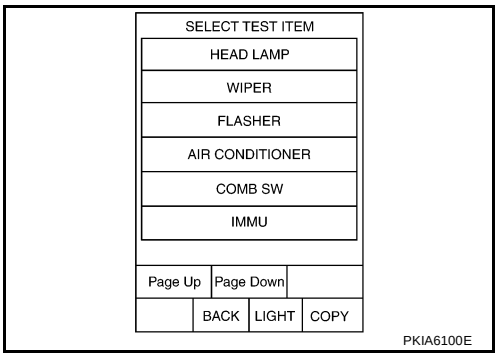
2. Touch “START (NISSAN BASED VHCL)”.



3. Touch “BCM” on “SELECT SYSTEM” screen.
If “BCM” is not indicated, refer to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



4. Touch “HEAD LAMP” on “SELECT TEST ITEM” screen.



WORK SUPPORT

Operation Procedure

1. Touch “HEAD LAMP” on “SELECT TEST ITEM” screen.
2. Touch “WORK SUPPORT” on “SELECT DIAG MODE” screen.
3. Touch “BATTERY SAVER SET” on “SELECT WORK ITEM” screen.
4. Touch “START”.
5. Touch “CHANGE SET”.
6. The setting will be changed and “CUSTOMIZING COMPLETED” will be displayed.
7. Touch “END”.

Display Item List

Item	Description	CONSULT-II	Factory setting
BATTERY SAVER SET	Exterior lamp battery saver control mode can be changed in this mode. Selects exterior lamp battery saver control mode between two ON/OFF.	ON	×
		OFF	—

DATA MONITOR

Operation Procedure

1. Touch “HEAD LAMP” on “SELECT TEST ITEM” screen.
2. Touch “DATA MONITOR” on “SELECT DIAG MODE” screen.
3. Touch either“ALL SIGNALS” or “SELECTION FROM MENU” on “DATA MONITOR” screen.

ALL SIGNALS	Monitors all the signals.
SELECTION FROM MENU	Selects and monitors individual signal.

4. Touch “START”.
5. When “SELECTION FROM MENU” is selected, touch individual items to be monitored. When “ALL SIGNALS” is selected, all the items will be monitored.
6. Touch “RECORD” while monitoring, then the status of the monitored item can be recorded. To stop recording, touch “STOP”.

Display Item List

Monitor item		Contents
IGN ON SW	“ON/OFF”	Displays “IGN position (ON)/OFF, ACC position (OFF)” judged from the ignition switch signal.
ACC ON SW	“ON/OFF”	Displays “ACC (ON)/OFF, Ignition OFF (OFF)” status judged from ignition switch signal.
HI BEAM SW	“ON/OFF”	Displays status (high beam switch: ON/Others: OFF) of high beam switch judged from lighting switch signal.
HEAD LAMP SW 1	“ON/OFF”	Displays status (headlamp switch 1: ON/Others: OFF) of headlamp switch 2 judged from lighting switch signal.
HEAD LAMP SW 2	“ON/OFF”	Displays status (headlamp switch 2: ON/Others: OFF) of headlamp switch 2 judged from lighting switch signal.
LIGH SW 1 ST	“ON/OFF”	Displays status (lighting switch 1st position: ON/Others: OFF) of lighting switch judged from lighting switch signal.
AUTO LIGHT SW	“ON/OFF”	—
PASSING SW	“ON/OFF”	Displays status (flash-to-pass switch: ON/Others: OFF) of flash-to-pass switch judged from lighting switch signal.
FR FOG SW[NOTE]	“ON/OFF”	—
DOOR SW - DR	“ON/OFF”	Displays status of driver door as judged from driver door switch signal. (Door is open: ON/Door is closed: OFF)
DOOR SW - AS	“ON/OFF”	Displays status of passenger door as judged from passenger door switch signal. (Door is open: ON/Door is closed: OFF)
DOOR SW - RR[NOTE]	“OFF”	—
DOOR SW - RL[NOTE]	“OFF”	—
BACK DOOR SW	“ON/OFF”	● Displays status of back door as judged from back door switch signal. (Coupe models) ● Displays status of rear trunk hood as judged from trunk lamp switch signal. (Roadster models)
TURN SIGNAL R	“ON/OFF”	Displays status (Turn right: ON/Others: OFF) as judged from lighting switch signal.
TURN SIGNAL L	“ON/OFF”	Displays status (Turn left: ON/Others: OFF) as judged from lighting switch signal.
CARGO LAMP SW[NOTE]	“OFF”	—

NOTE:
This item is displayed, but cannot monitor it.

ACTIVE TEST

Operation Procedure

1. Touch “HEAD LAMP” on “SELECT TEST ITEM” screen.
2. Touch “ACTIVE TEST” on “SELECT DIAG MODE” screen.
3. Touch item to be tested and check operation of the selected item.
4. During the operation check, touching “BACK” deactivates the operation.

Display Item List

Test item	Description
TAIL LAMP	Allows tail lamp relay to operate by switching ON–OFF.
HEAD LAMP	Allows headlamp relay to operate by switching ON–OFF.
FR FOG LAMP[NOTE]	—
CORNERING LAMP[NOTE]	—

NOTE:
This item is displayed, but cannot test it.

CONSULT-II Functions (IPDM E/R)

AKS009QP

CONSULT-II performs the following functions communicating with IPDM E/R.

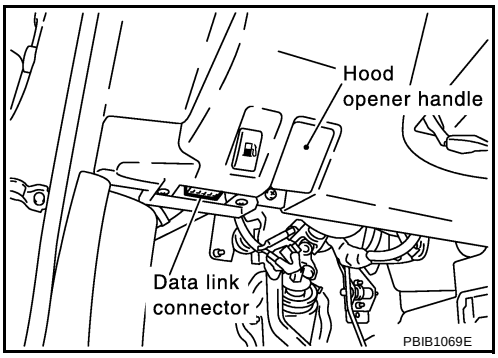
Check Item, Diagnosis Mode	Description
SELF-DIAGNOSTIC RESULTS	IPDM E/R performs self-diagnosis of CAN communication.
DATA MONITOR	The input/output data of IPDM E/R is displayed in real time.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
ACTIVE TEST	IPDM E/R sends a drive signal to electronic components to check their operation.

CONSULT-II BASIC OPERATION

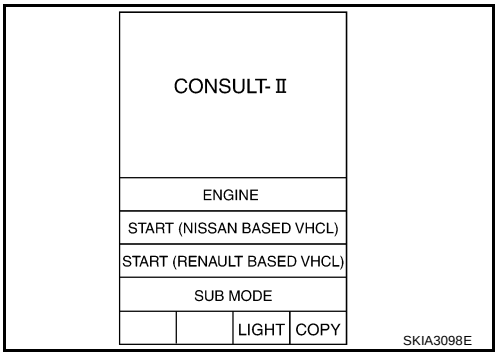
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

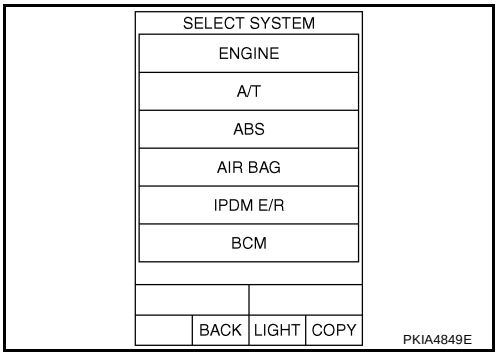
1. With ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to data link connector, then turn ignition switch ON.



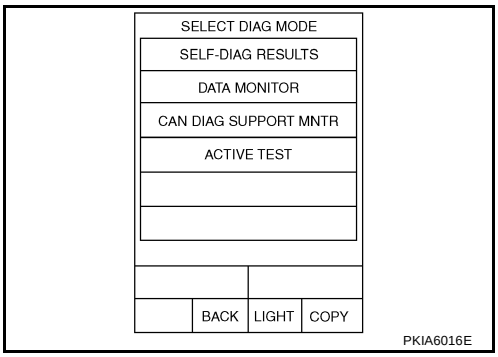
2. Touch “START (NISSAN BASED VHCL)”.



3. Touch “IPDM E/R” on “SELECT SYSTEM” screen.
If “IPDM E/R” is not displayed, print “SELECT SYSTEM” screen, then refer to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



4. Select the desired part to be diagnosed on the “SELECT DIAG MODE” screen.



DATA MONITOR

Operation Procedure

1. Touch “DATA MONITOR” on “SELECT DIAG MODE ” screen.
2. Touch “ALL SIGNALS”, “MAIN SIGNALS” or “SELECTION FROM MENU” on “DATA MONITOR” screen.

ALL SIGNALS	All items will be monitored.
MAIN SIGNALS	Monitor the predetermined item.
SELECTION FROM MENU	Select any item for monitoring.

3. Touch “START”.
4. Touch the required monitoring item on “SELECTION FROM MENU”. In “ALL SIGNALS”, all items are monitored. In “MAIN SIGNALS”, predetermined items are monitored.
5. Touch “RECORD” while monitoring to record the status of the item being monitored. To stop recording, touch “STOP”.

All Signals, Main Signals, Selection From Menu

Item name	CONSULT-II screen display	Display or unit	Monitor item selection			Description
			ALL SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
Position lights request	TAIL & CLR REQ	ON/OFF	×	×	×	Signal status input from BCM
Headlamp low beam request	HL LO REQ	ON/OFF	×	×	×	Signal status input from BCM
Headlamp high beam request	HL HI REQ	ON/OFF	×	×	×	Signal status input from BCM

NOTE:
Perform monitoring of IPDM E/R data with ignition switch ON. When ignition switch is at ACC, the display may not be correct.

ACTIVE TEST

Operation Procedure

1. Touch “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Touch item to be tested, and check operation.
3. Touch “START”.
4. Touch “STOP” while testing to stop the operation.

Test item	CONSULT-II screen display	Description
Tail lamp relay output	TAIL LAMP	Allows tail lamp relay to operate by switching operation ON-OFF at your option.
Headlamp relay (HI, LO) output	LAMPS	Allows headlamp relay (HI, LO) to operate by switching operation (OFF, HI ON, LO ON) at your option (Headlamp high beam repeats ON– OFF every 1 second).

SELF-DIAGNOSTIC RESULTS

Refer to PG-21, "SELF-DIAG RESULTS" .

Headlamp High Beam Does Not Illuminate (Both Sides)

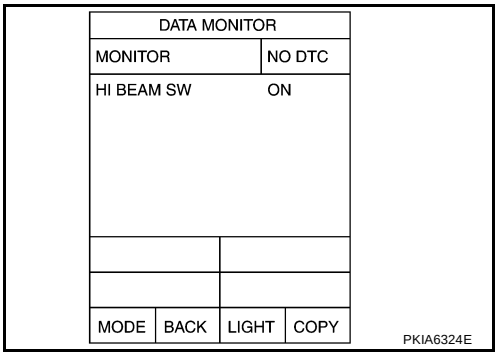
AKS00AOL

1. CHECK COMBINATION SWITCH INPUT SIGNAL

With CONSULT-II

Select “BCM” on CONSULT-II. With “HEAD LAMP” data monitor, make sure “HI BEAM SW” turns ON-OFF linked with operation of lighting switch.

When lighting switch is HIGH BEAM position : HI BEAM SW ON



Without CONSULT-II

Refer to LT-170, "Combination Switch Inspection" .

OK or NG

OK >> GO TO 2.

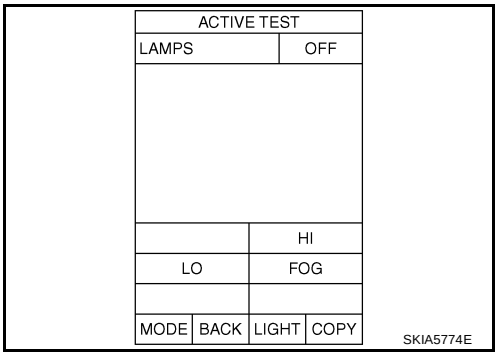
NG >> Check lighting switch. Refer to LT-170, "Combination Switch Inspection" .

2. HEADLAMP ACTIVE TEST

With CONSULT-II

1. Select “IPDM E/R” on CONSULT-II, and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Select “LAMPS” on “SELECT TEST ITEM” screen.
3. Touch “HI” screen.
4. Make sure headlamp high beam operation.

Headlamp high beam should operate.
(Headlamp high beam repeats ON-OFF every 1 second).



Without CONSULT-II

1. Start auto active test. Refer to PG-24, "Auto Active Test" .
2. Make sure headlamp high beam operation.

Headlamp high beam should operate.

OK or NG

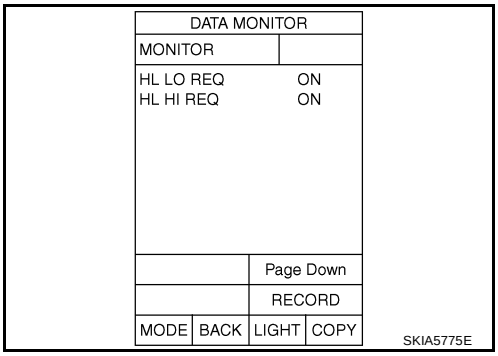
OK >> GO TO 3.

NG >> GO TO 4.

3. CHECK IPDM E/R

1. Select “IPDM E/R” on CONSULT-II, and select “DATA MONITOR” on “SELECT DIAG MODE” screen.
2. Make sure “HL LO REQ” and “HL HI REQ” turns ON when lighting switch is in HI position.

When lighting switch is HIGH BEAM position : HL LO REQ ON
: HL HI REQ ON



OK or NG

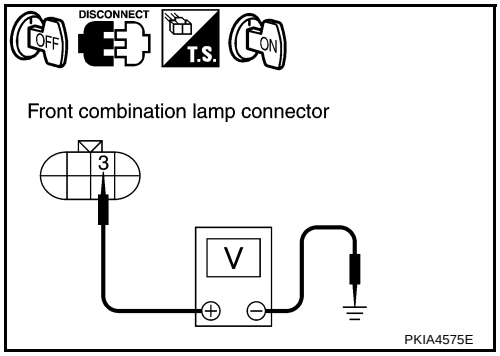
OK >> Replace IPDM E/R.

NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

4. CHECK HEADLAMP INPUT SIGNAL

With CONSULT-II

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Select “IPDM E/R” on CONSULT-II. and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
4. Select “LAMPS” on “SELECT TEST ITEM” screen.
5. Touch “HI” screen.
6. When headlamp high beam is operating, check voltage between front combination lamp RH and LH harness connector and ground (Headlamp high beam repeats ON–OFF every 1 second).



Terminals				Voltage
(+)			(-)	
Connector		Terminal (Wire color)		
RH	E24	3 (BR)	Ground	Battery voltage
LH	E40	3 (R/Y)		

Without CONSULT-II

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Start auto active test. Refer to PG-24, "Auto Active Test" .
4. When headlamp high beam is operating, check voltage between front combination lamp RH and LH harness connector and ground.

Terminals				Voltage
(+)			(-)	
Connector		Terminal (Wire color)		
RH	E24	3 (BR)	Ground	Battery voltage
LH	E40	3 (R/Y)		

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

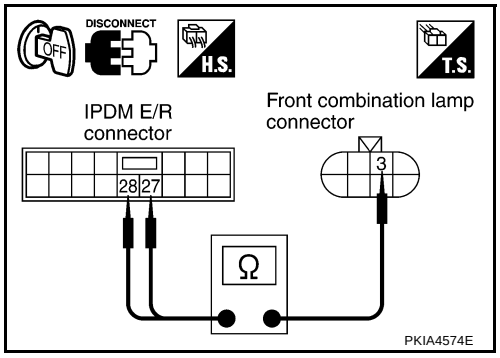
5. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector E7 terminal 27 (BR) and front combination lamp RH harness connector E24 terminal 3 (BR).

27 (BR) – 3 (BR) : Continuity should exist.

4. Check continuity between IPDM E/R harness connector E7 terminal 28 (R/Y) and front combination lamp LH harness connector E40 terminal 3 (R/Y).

28 (R/Y) – 3 (R/Y) : Continuity should exist.



OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.

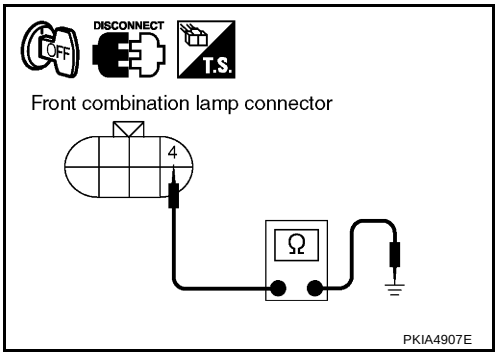
6. CHECK HEADLAMP GROUND

1. Check continuity between front combination lamp RH harness connector E24 terminal 4 (B/W) and ground.

   4 (B/W) – Ground : Continuity should exist.

2. Check continuity between front combination lamp LH harness connector E40 terminal 4 (B/W) and ground.

   4 (B/W) – Ground : Continuity should exist.



OK or NG

OK >> Check headlamp bulb.
NG >> Repair harness or connector.

Headlamp High Beam Does Not Illuminate (One Side)

AKS00AOM

1. CHECK BULB

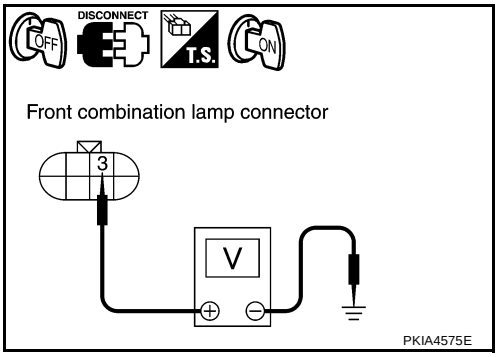
Check halogen bulb of lamp which does not illuminate.

OK or NG

OK >> GO TO 2.
NG >> Replace headlamp bulb.

2. CHECK HEADLAMP INPUT SIGNAL

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH or LH connector.
3. Turn ignition switch ON.
4. Lighting switch is turned HIGH BEAM position.
5. Check voltage between front combination lamp RH or LH harness connector and ground.



Terminals				Voltage
(+)			(-)	
Connector		Terminal (Wire color)		
RH	E24	3 (BR)	Ground	Battery voltage
LH	E40	3 (R/Y)		

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

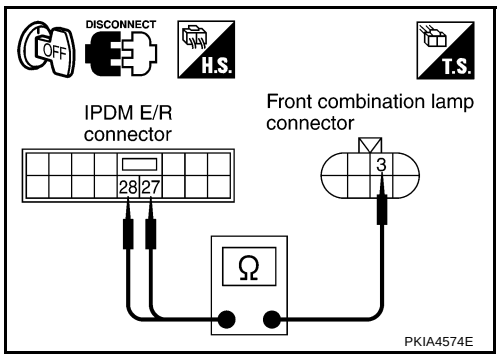
3. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector E7 terminal 27 (BR) and front combination lamp RH harness connector E24 terminal 3 (BR).

27 (BR) – 3 (BR) : Continuity should exist.

4. Check continuity between IPDM E/R harness connector E7 terminal 28 (R/Y) and front combination lamp LH harness connector E40 terminal 3 (R/Y).

28 (R/Y) – 3 (R/Y) : Continuity should exist.



OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.

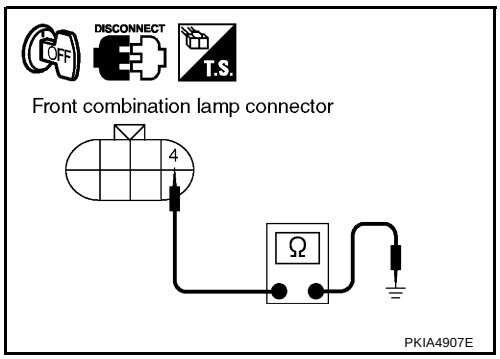
4. CHECK HEADLAMP GROUND

1. Check continuity between front combination lamp RH harness connector E24 terminal 4 (B/W) and ground.

4 (B/W) – Ground : Continuity should exist.

2. Check continuity between front combination lamp LH harness connector E40 terminal 4 (B/W) and ground.

4 (B/W) – Ground : Continuity should exist.



OK or NG

OK >> Check headlamp harness and connector.
NG >> Repair harness or connector.

High Beam Indicator Lamp Does Not Illuminate

AKS00AON

1. CHECK BULB

Check bulb of high beam indicator lamp.

OK or NG

OK >> Replace combination meter.
NG >> Replace indicator bulb.

Headlamp Low Beam Does Not Illuminate (Both Sides)

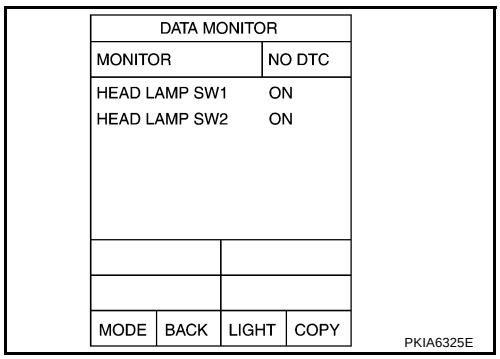
AKS00AOO

1. CHECK COMBINATION SWITCH INPUT SIGNAL

With CONSULT-II

Select “BCM” on CONSULT-II. With “HEAD LAMP” data monitor, make sure “HEAD LAMP SW 1” and “HEAD LAMP SW 2” turns ON-OFF linked with operation of lighting switch.

When lighting switch is 2ND position : HEAD LAMP SW 1 ON
: HEAD LAMP SW 2 ON



Without CONSULT-II

Refer to LT-170, "Combination Switch Inspection" .

OK or NG

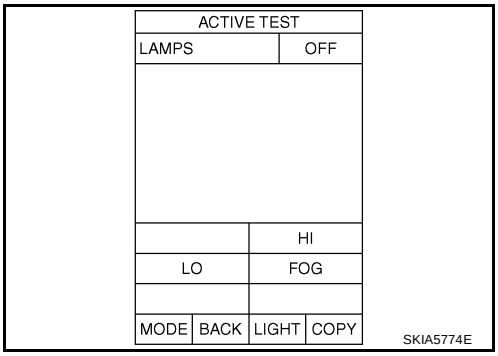
OK >> GO TO 2.
NG >> Check lighting switch. Refer to LT-170, "Combination Switch Inspection" .

2. HEADLAMP ACTIVE TEST

With CONSULT-II

1. Select “IPDM E/R” on CONSULT-II, and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Select “LAMPS” on “SELECT TEST” ITEM screen.
3. Touch “LO” screen.
4. Make sure headlamp low beam operation.

Headlamp low beam should operate.



Without CONSULT-II

1. Start auto active test. Refer to PG-24, "Auto Active Test" .
2. Make sure headlamp low beam operation.

Headlamp low beam should operate.

OK or NG

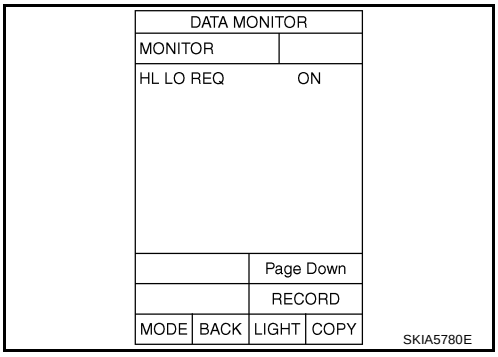
OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK IPDM E/R

With CONSULT-II

1. Select “IPDM E/R” on CONSULT-II, and select “DATA MONITOR” on “SELECT DIAG MODE” screen.
2. Make sure “HL LO REQ” turns ON when lighting switch is in 2ND position.

When lighting switch is 2ND position : HL LO REQ ON



Without CONSULT-II

1. Start auto active test. Refer to PG-24, "Auto Active Test" .
2. Make sure headlamp low beam operation.

When lighting switch is 2ND position : HL LO REQ ON

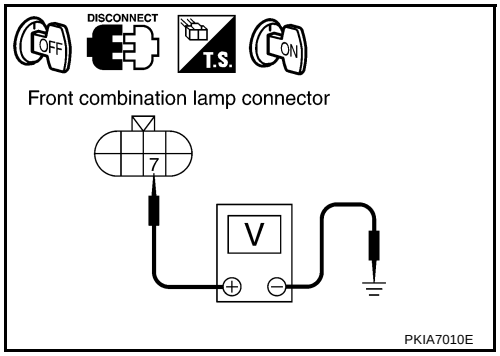
OK or NG

OK >> Replace IPDM E/R.
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

4. CHECK HEADLAMP INPUT SIGNAL

With CONSULT-II

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Select “IPDM E/R” on CONSULT-II, and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
4. Select “LAMPS” on “SELECT TEST ITEM” screen.
5. Touch “LO” screen.
6. When headlamp low beam is operating, check voltage between front combination lamp RH and LH harness connector and ground.



Terminals				Voltage
(+)			(-)	
Connector		Terminal (Wire color)		
RH	E24	7 (R)	Ground	Battery voltage
LH	E40	7 (R/B)		

Without CONSULT-II

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Start auto active test. Refer to PG-24, "Auto Active Test" .
4. When headlamp low beam is operating, check voltage between front combination lamp RH and LH harness connector and ground.

Terminals				Voltage
(+)			(-)	
Connector		Terminal (Wire color)		
RH	E24	7 (R)	Ground	Battery voltage
LH	E40	7 (R/B)		

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

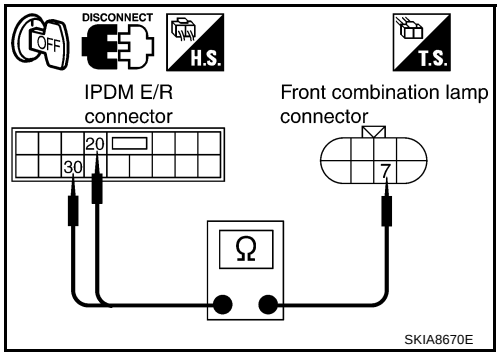
5. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector E7 terminal 20 (R) and front combination lamp RH harness connector E24 terminal 7 (R).

20 (R) – 7 (R) : Continuity should exist.

4. Check continuity between IPDM E/R harness connector E7 terminal 30 (R/B) and front combination lamp LH harness connector E40 terminal 7 (R/B).

30 (R/B) – 7 (R/B) : Continuity should exist.



OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.

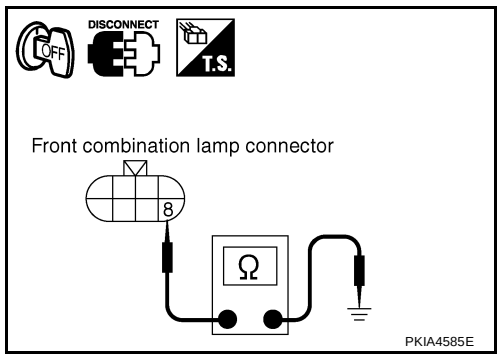
6. CHECK HEADLAMP GROUND

1. Turn ignition switch OFF.
2. Check continuity between front combination lamp RH harness connector E24 terminal 8 (B) and ground.

8 (B) – Ground : Continuity should exist.

3. Check continuity between front combination lamp LH harness connector E40 terminal 8 (B) and ground.

8 (B) – Ground : Continuity should exist.



OK or NG

OK >> Check headlamp harness and connectors, ballasts (HID control unit), and xenon bulbs. Refer to LT-32, "Xenon Headlamp Trouble Diagnosis" .

NG >> Repair harness or connector.

Headlamp Low Beam Does Not Illuminate (One Side)

AKS00AOP

1. CHECK BULB

Check ballasts (HID control unit) and xenon bulb of lamp which does not illuminate. Refer to LT-32, "Xenon Headlamp Trouble Diagnosis" .

OK or NG

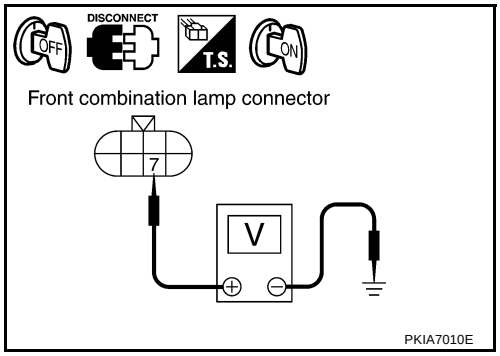
OK >> GO TO 2.

NG >> Repair malfunctioning part.

2. CHECK HEADLAMP INPUT SIGNAL

With CONSULT-II

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Select “IPDM E/R” on CONSULT-II, and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
4. Select “LAMPS” on “SELECT TEST ITEM” screen.
5. Touch “LO” screen.
6. When headlamp low beam is operating, check voltage between front combination lamp RH and LH harness connector and ground.



Terminals				Voltage
(+)			(-)	
Connector		Terminal (Wire color)		
RH	E24	7 (R)	Ground	Battery voltage
LH	E40	7 (R/B)		

Without CONSULT-II

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Start auto active test. Refer to PG-24, "Auto Active Test" .
4. When headlamp low beam is operating, check voltage between front combination lamp RH and LH harness connector and ground.

Terminals				Voltage
(+)			(-)	
Connector		Terminal (Wire color)		
RH	E24	7 (R)	Ground	Battery voltage
LH	E40	7 (R/B)		

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

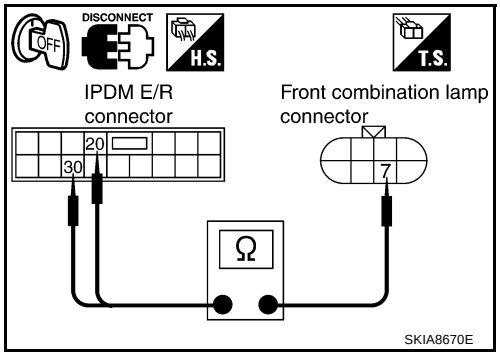
3. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front combination lamp RH or LH connector.
3. Check continuity between IPDM E/R harness connector E7 terminal 20 (R) and front combination lamp RH harness connector E24 terminal 7 (R).

20 (R) – 7 (R) : Continuity should exist.

4. Check continuity between IPDM E/R harness connector E7 terminal 30 (R/B) and front combination lamp LH harness connector E40 terminal 7 (R/B).

30 (R/B) – 7 (R/B) : Continuity should exist.



OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.

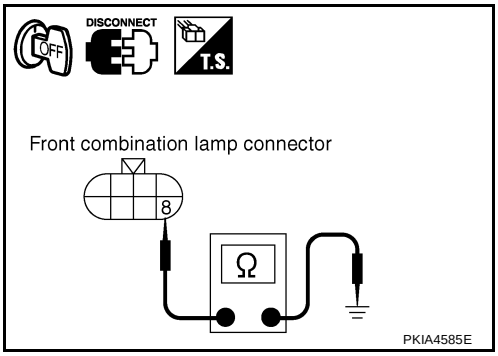
4. CHECK HEADLAMP GROUND

1. Check continuity between front combination lamp RH harness connector E24 terminal 8 (B) and ground.

   8 (B) – Ground : Continuity should exist.

2. Check continuity between front combination lamp LH harness connector E40 terminal 8 (B) and ground.

   8 (B) – Ground : Continuity should exist.



OK or NG

OK >> Check headlamp harness and connector.
NG >> Repair harness or connector.

Headlamps Does Not Turn OFF

AKS00AOQ

1. CHECK HEADLAMP TURN OFF

Make sure that lighting switch is OFF. And make sure is headlamp turns off when ignition switch is turned OFF.

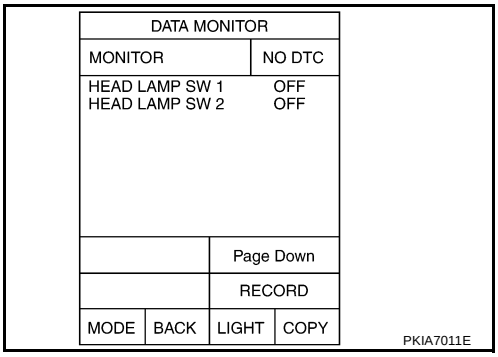
OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. CHECK COMBINATION SWITCH INPUT SIGNAL

Select “BCM” on CONSULT-II. With “HEAD LAMP” data monitor, make sure “HEAD LAMP SW 1” and “HEAD LAMP SW 2” turns ON-OFF linked with operation of lighting switch.

When lighting switch is OFF position : HEAD LAMP SW 1 OFF
: HEAD LAMP SW 2 OFF



OK or NG

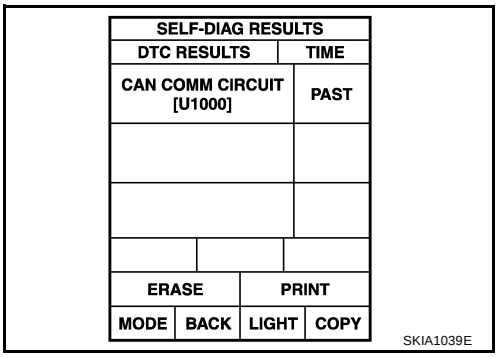
OK >> Replace IPDM E/R.
NG >> Check lighting switch. Refer to LT-170, "Combination Switch Inspection" .

3. CHECKING CAN COMMUNICATIONS BETWEEN BCM AND IPDM E/R

Select “BCM” by CONSULT-II, and perform self-diagnosis for “BCM”.

Display of self-diagnosis results

NO DTC>> Replace IPDM E/R.
CAN COMM CIRCUIT>> Refer to BCS-16, "CAN Communication Inspection Using CONSULT-II (Self-Diagnosis)" .



CAUTION:

AKS009RK

- Installation or removal of connector must be done with lighting switch OFF.
- When lamp is illuminated (when lighting switch is ON), do not touch harness, HID control unit, inside of lamp, or lamp metal parts.
- To check illumination, temporarily install lamp in the vehicle. Be sure to connect power at the vehicle-side connector.
- If the error can be traced directly to the electrical system, first check for items such as burned-out fuses and fusible links, broken wires or loose connectors, pulled-out terminals, and improper connections.
- Do not work with wet hands.
- Using a tester for HID control unit circuit trouble diagnosis is prohibited.
- Disassembling the HID control unit or harnesses (bulb socket harness, ECM harness) is prohibited.
- Immediately after illumination, the light intensity and color will fluctuate, but there is nothing wrong.
- When the bulb has reached the end of its lifetime, the brightness may drop significantly, it may flash repeatedly, or the light may turn a reddish color.

Xenon Headlamp Trouble Diagnosis

AKS009RL

1. CHECK 1: XENON HEADLAMP LIGHTING

Install normal xenon bulb to corresponding xenon bulb headlamp, and check if lamp lights up.

OK or NG

OK >> Replace xenon bulb.
NG >> GO TO 2.

2. CHECK 2: XENON HEADLAMP LIGHTING

Install normal HID control unit to corresponding xenon headlamp, and check if lamp lights up.

OK or NG

OK >> Replace HID control unit.
NG >> GO TO 3.

3. CHECK 3: XENON HEADLAMP LIGHTING

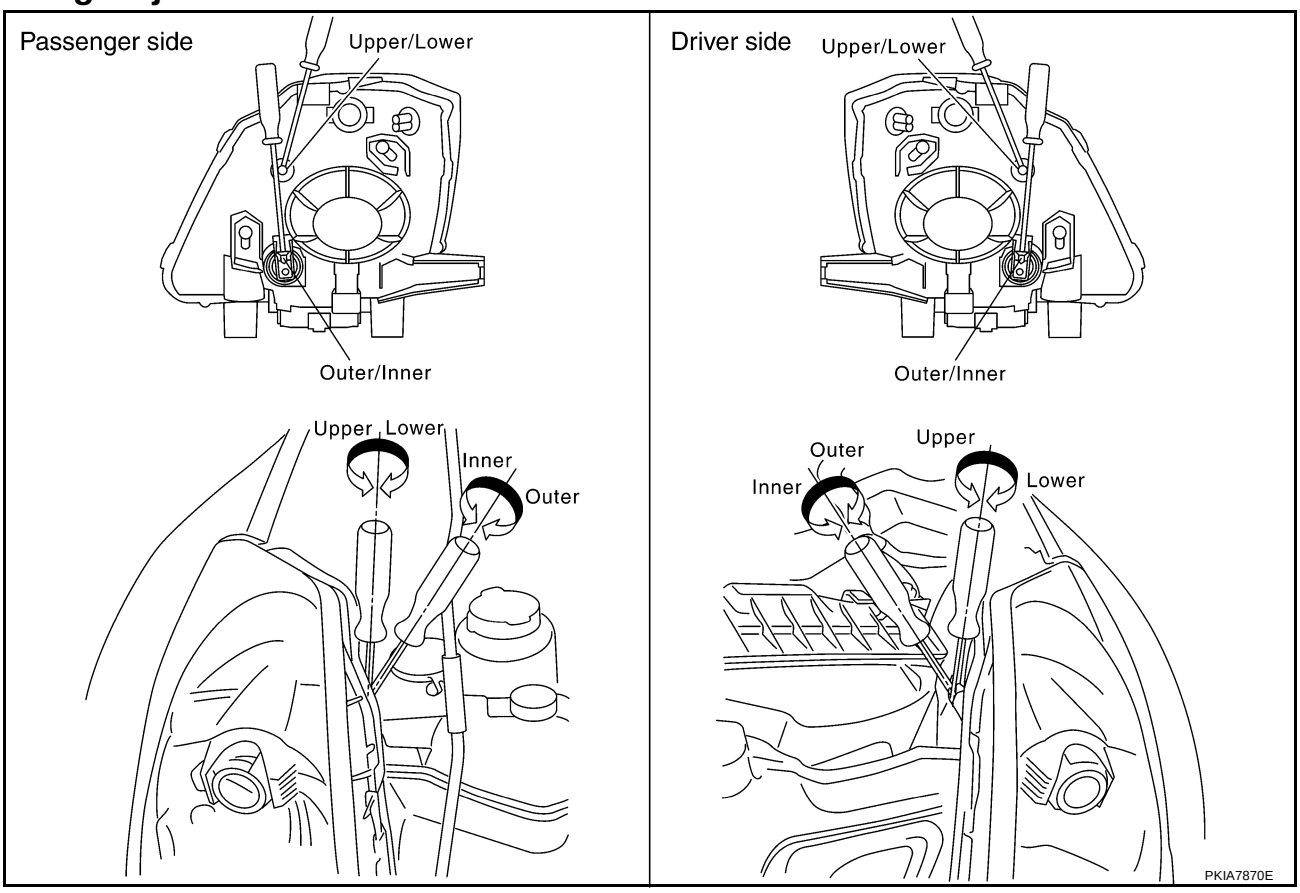
Install normal xenon lamp housing assembly to corresponding xenon headlamp, and check if lamp lights up.

OK or NG

OK >> Malfunction in starter (boosting circuit) in xenon headlamp housing. (Replace xenon headlamp housing assembly)
NG >> INSPECTION END

Aiming Adjustment

AKS009O6



PREPARATION BEFORE ADJUSTING

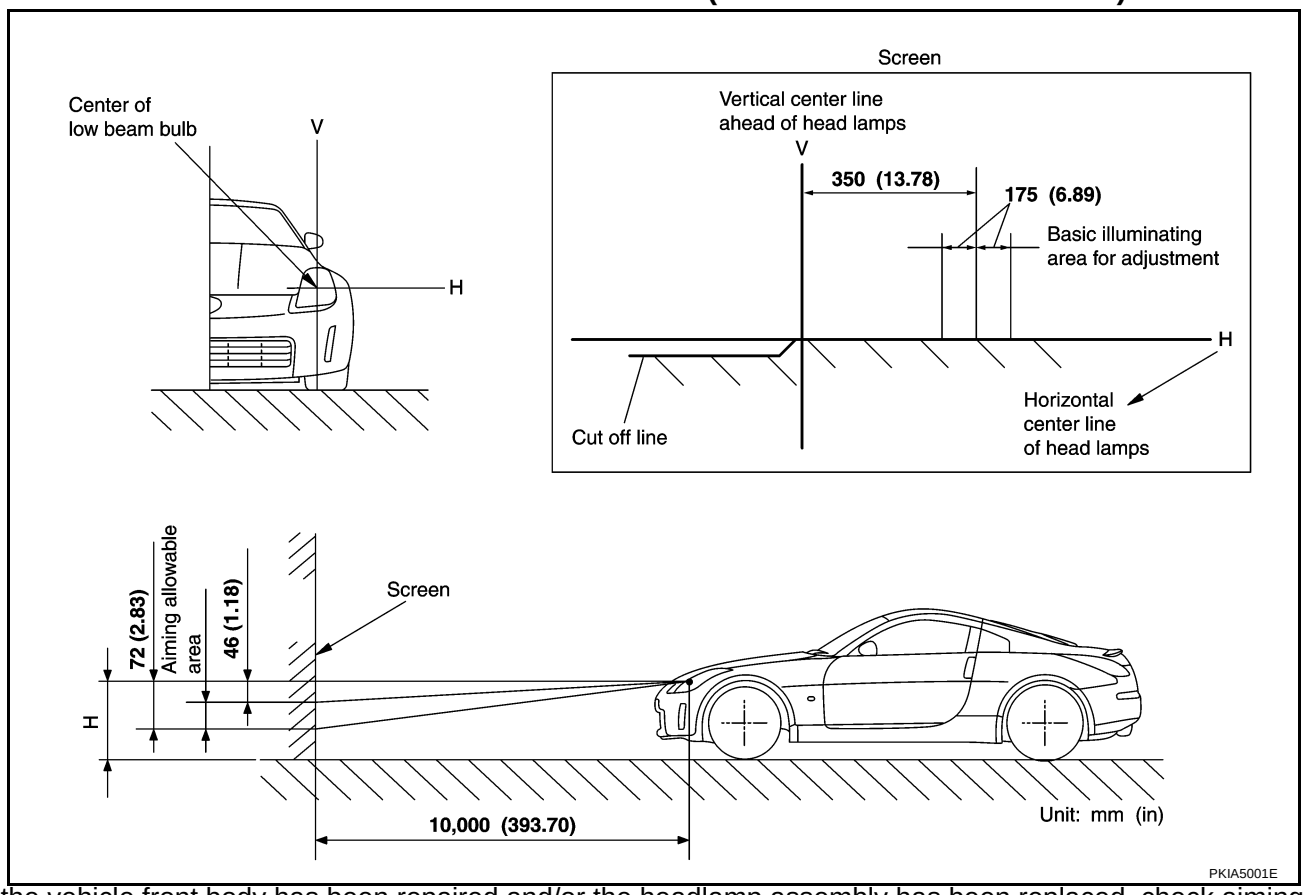
For details, refer to the regulations in your own country.
Before performing aiming adjustment, check the following.

1. Keep all tires inflated to correct pressures.
2. Place vehicle on flat surface.
3. Set that there is no-load in vehicle other than the driver (or equivalent weight placed in driver's position). Coolant, engine oil filled up to correct level and full fuel tank.

LOW BEAM AND HIGH BEAM

1. Turn headlamp low beam on.
2. Use adjusting screws to perform aiming adjustment.

ADJUSTMENT USING AN ADJUSTMENT SCREEN (LIGHT/DARK BORDERLINE)



If the vehicle front body has been repaired and/or the headlamp assembly has been replaced, check aiming. Use the aiming chart shown in the figure.

- Basic illumination area for adjustment should be within the range shown on the aiming chart. Adjust headlamp accordingly.

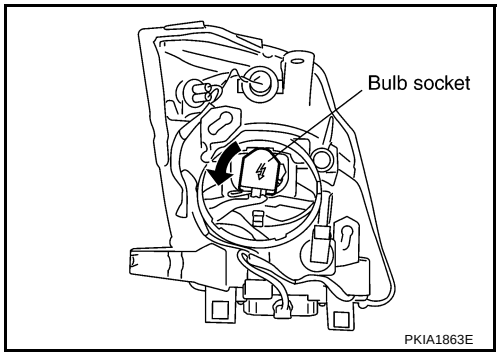
Bulb Replacement

AKS009O7

HEADLAMP (UPPER) LOW BEAM

1. Turn lighting switch OFF.
2. Remove headlamp. Refer to LT-36, "Removal and Installation" .
3. Turn plastic cap counterclockwise and unlock it.
4. Turn bulb socket counterclockwise and unlock it.
5. Unlock retaining spring and remove bulb from headlamp.
6. Install in reverse order of removal.

NOTE:
After installation, perform aiming adjustment. Refer to LT-33, "Aiming Adjustment" .



Headlamp (upper) low beam (Xenon) : 12V - 35W (D2R)

HEADLAMP (LOWER) HIGH BEAM

1. Turn lighting switch OFF.
2. Open the driver and front passenger window, and then disconnect the battery negative cable.

CAUTION:
After the battery cables are disconnected, do not open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.

3. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" in “EI” section.
4. Turn plastic cap counterclockwise and unlock it.
5. Disconnect bulb socket.
6. Unlock retaining spring and remove bulb from headlamp.
7. Install in reverse order of removal.

Headlamp (lower) high beam : 12V - 55W (H7)

PARKING LAMP (CLEARANCE LAMP)

1. Turn lighting switch OFF.
2. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" in “EI” section.
3. Turn bulb socket counterclockwise and unlock it.
4. Remove bulb from its socket.
5. Install in reverse order of removal.

Parking lamp (Clearance lamp) : 12V - 5W

FRONT TURN SIGNAL LAMP

1. Turn lighting switch OFF.
2. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" in “EI” section.
3. Turn bulb socket counterclockwise and unlock it.
4. Remove bulb from its socket.
5. Install in reverse order of removal.

Front turn signal lamp : 12V - 21W

FRONT SIDE MARKER LAMP

1. Turn lighting switch OFF.
2. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" in "EI" section.
3. Turn bulb socket counterclockwise and unlock it.
4. Remove bulb from its socket.
5. Install in reverse order of removal.

Front side marker lamp : 12V - 5W

CAUTION:
After installing bulb, be sure to install plastic cap and bulb socket securely to insure watertightness.

Removal and Installation

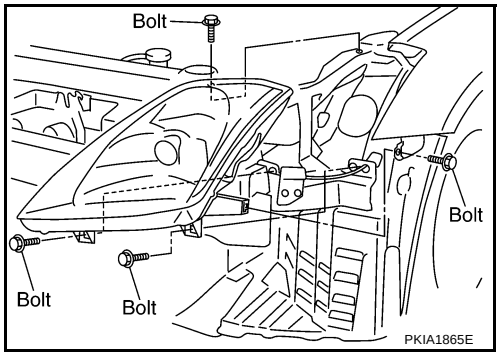
AKS009O8

REMOVAL

1. Open driver and front passenger window, and then disconnect battery negative cable.

   CAUTION:
   After battery cables are disconnected, do not open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.

2. Remove front bumper. Refer to EI-14, "FRONT BUMPER" in "EI" section.
3. Remove headlamp mounting bolts.
4. Pull head lamp toward vehicle front, disconnect connector, and remove headlamp.



INSTALLATION

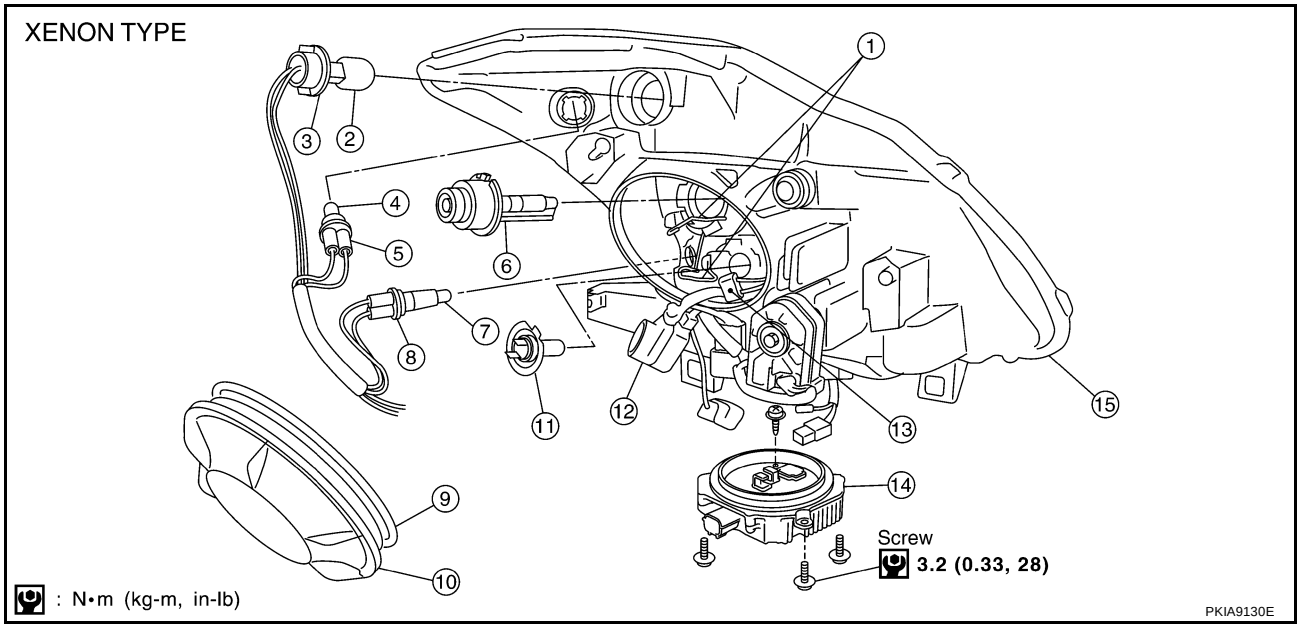
Installation in the reverse order if removal. Be careful of the following.

Headlamp mounting bolt : 6.1 N·m (0.62 kg-m, 54 in-lb)

NOTE:
After installation, aiming adjustment. Refer to LT-33, "Aiming Adjustment" .

Disassembly and Assembly

AKS009O9



1. Retaining spring	2. Front turn signal lamp bulb	3. Front turn signal lamp bulb socket
4. Side marker lamp bulb	5. Side marker lamp bulb socket	6. Xenon bulb
7. Parking lamp (Clearance lamp) bulb	8. Parking lamp (Clearance lamp) bulb socket	9. Seal rubber
10. Plastic cap	11. Halogen bulb (high)	12. Xenon bulb socket
13. Halogen bulb socket	14. HID C/U	15. Headlamp housing assembly

DISASSEMBLY

1. Turn plastic cap counterclockwise and unlock it.
2. Turn xenon bulb socket counterclockwise, and unlock it.
3. Unlock retaining spring, and remove xenon bulb (low).
4. Disconnect HID control unit connector, and remove HID control unit screws.
5. Disconnect the socket connected to halogen bulb (high).
6. Unlock retaining spring, and remove halogen bulb (high).
7. Turn parking lamp bulb socket counterclockwise and unlock it.
8. Remove parking lamp bulb from its socket.
9. Turn front turn signal lamp bulb socket counterclockwise and unlock it.
10. Remove front turn signal lamp bulb from its socket.
11. Turn front side marker lamp bulb socket counterclockwise and unlock it.
12. Remove front side marker lamp bulb from its socket.

ASSEMBLY

Assemble in reverse order of disassembly. Be careful of the following:

HID control unit mounting screw : 3.1 N·m (0.32 kg-m, 27 in-lb)

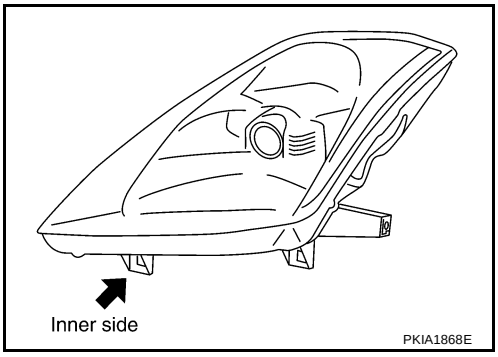
CAUTION:

- **When HID control unit is removed, reinstall it securely and avoid any looseness.**
- **After installing bulb, be sure to install plastic cap and bulb socket securely to insure watertightness**

Servicing to Replace Headlamps When Damaged

AKS009OA

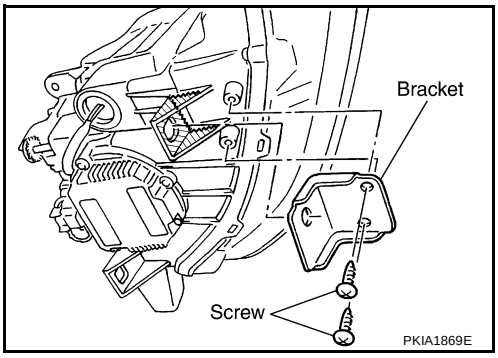
If only installation part as shown in the figure is damaged, and headlamp housing itself is not damaged, repair can be completed easily by installing correction brackets.



INSTALLATION OF HEADLAMP BRACKET

1. Remove headlamps. Refer to LT-36, "Removal and Installation" .
2. Cut damaged section of installation part, then shape with sandpaper.
3. Attach each correction bracket to headlamp housing boss with 2 screws.

RH headlamp	**Inner side**	**26040 CD000**
LH headlamp	**Inner side**	**26090 CD000**

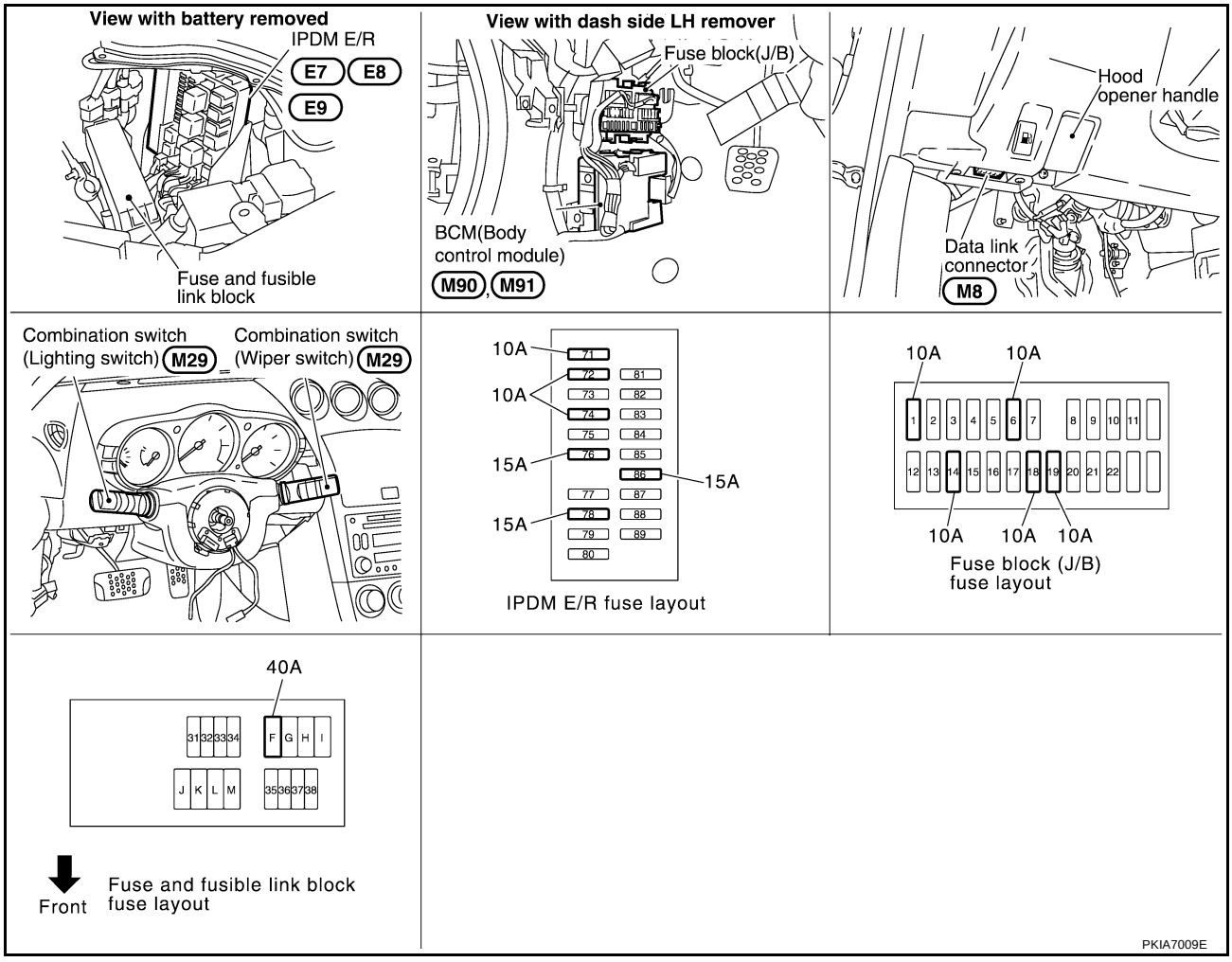


HEADLAMP (FOR USA) - CONVENTIONAL TYPE -

PFP:26010

Component Parts and Harness Connector Location

AKS009P1



System Description

AKS009P2

Control of headlamp system operation is dependent upon position of combination switch (lighting switch). When lighting switch is placed in the 2ND position, BCM receives input signal requesting headlamps (and tail lamps) illuminate. This input signal is communicated to IPDM E/R (intelligent power distribution module engine room) across CAN communication lines. CPU (central processing unit) of IPDM E/R (intelligent power distribution module) controls headlamp high and headlamp low relay coils. These relays, when energized, direct power to respective headlamps, which then illuminate.

OUTLINE

Power is supplied at all times

- to headlamp high relay [located in IPDM E/R (intelligent power distribution module engine room)]
- to headlamp low relay [located in IPDM E/R (intelligent power distribution module engine room)]
- through 40A fusible link (letter F, located in fuse and fusible link block.)
- to BCM (body control module) terminal 55
- through 10A fuse [No.18, located in fuse block (J/B)]
- to BCM (body control module) terminal 42
- through 10A fuse [No.71, located in IPDM E/R (intelligent power distribution module engine room)]
- to CPU (central processing unit) [located in IPDM E/R (intelligent power distribution module engine room)]
- through 15A fuse [No.78, located in IPDM E/R (intelligent power distribution module engine room)]
- to CPU (central processing unit) [located in IPDM E/R (intelligent power distribution module engine room)].

With ignition switch in ON or START position, power is supplied

- to CPU (central processing unit) [located in IPDM E/R (intelligent power distribution module engine room)]
- to BCM (body control module) terminal 38
- through 10A fuse [No.1, located in fuse block (J/B)].

With ignition switch in ACC or ON position, power is supplied

- to BCM (body control module) terminal 11
- through 10A fuse [No.6, located in fuse block (J/B)].

Ground is supplied

- to BCM (body control module) terminal 52
- through grounds M30 and M66
- to IPDM E/R (intelligent power distribution module engine room) terminal 38 and 60
- through grounds E17, E43 and F152.

Low Beam Operation

With lighting switch in 2ND position, BCM receives input signal requesting by combination switch reading function (Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION") headlamps to illuminate. This input signal is communicated to IPDM E/R across CAN communication lines. CPU in IPDM E/R controls headlamp low relay coil, which when energized, power is supplied.

- through 15A fuse [No.76, located in IPDM E/R]
- through IPDM E/R terminal 20
- to front combination lamp RH terminal 6
- through 15A fuse [No.86, located in IPDM E/R]
- through IPDM E/R terminal 30
- to front combination lamp LT terminal 6.

Ground is supplied

- to front combination lamp RH terminal 3
- through grounds E17, E43 and F152
- to front combination lamp LH terminal 3
- through grounds E17, E43 and F152.

High Beam Operation/Flash-to-Pass Operation

With lighting switch in 2ND position and placed in HIGH or PASS position, BCM receives input signal requesting headlamp high beams to illuminate. This input signal is communicated to IPDM E/R across CAN communication lines. CPU in IPDM E/R controls headlamp high relay coil, which when energized, directs power

- to 10A fuse [No.72, located in IPDM E/R]
- through IPDM E/R terminal 27
- to front combination lamp RH terminal 2
- to 10A fuse [No.74, located in IPDM E/R]
- through IPDM E/R terminal 28
- to front combination lamp LH terminal 2.

Ground is supplied

- to front combination lamp RH terminal 3
- through grounds E17, E43 and F152
- to front combination lamp LH terminal 3
- through grounds E17, E43 and F152.

With power and ground supplied, high beam headlamps illuminate.
Unified meter and A/C amp. receives signal from BCM across CAN communication lines, and then combination meter indicator illuminates high beam.

COMBINATION SWITCH READING FUNCTION

Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION" .

EXTERIOR LAMP BATTERY SAVER CONTROL

When combination switch (lighting switch) is in the 2ND position (ON), and ignition switch is turned from ON or ACC to OFF, battery saver control function is activated.
Under this condition, headlamps remain illuminated for 5 minutes, then headlamps are turned off.
Exterior lamp battery saver control mode can be changed by function setting of CONSULT-II.

VEHICLE SECURITY SYSTEM

The vehicle security system will flash high beams if the system is triggered. Refer to BL-129, "VEHICLE SECURITY (THEFT WARNING) SYSTEM" .

CAN Communication System Description

AKS009P3

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

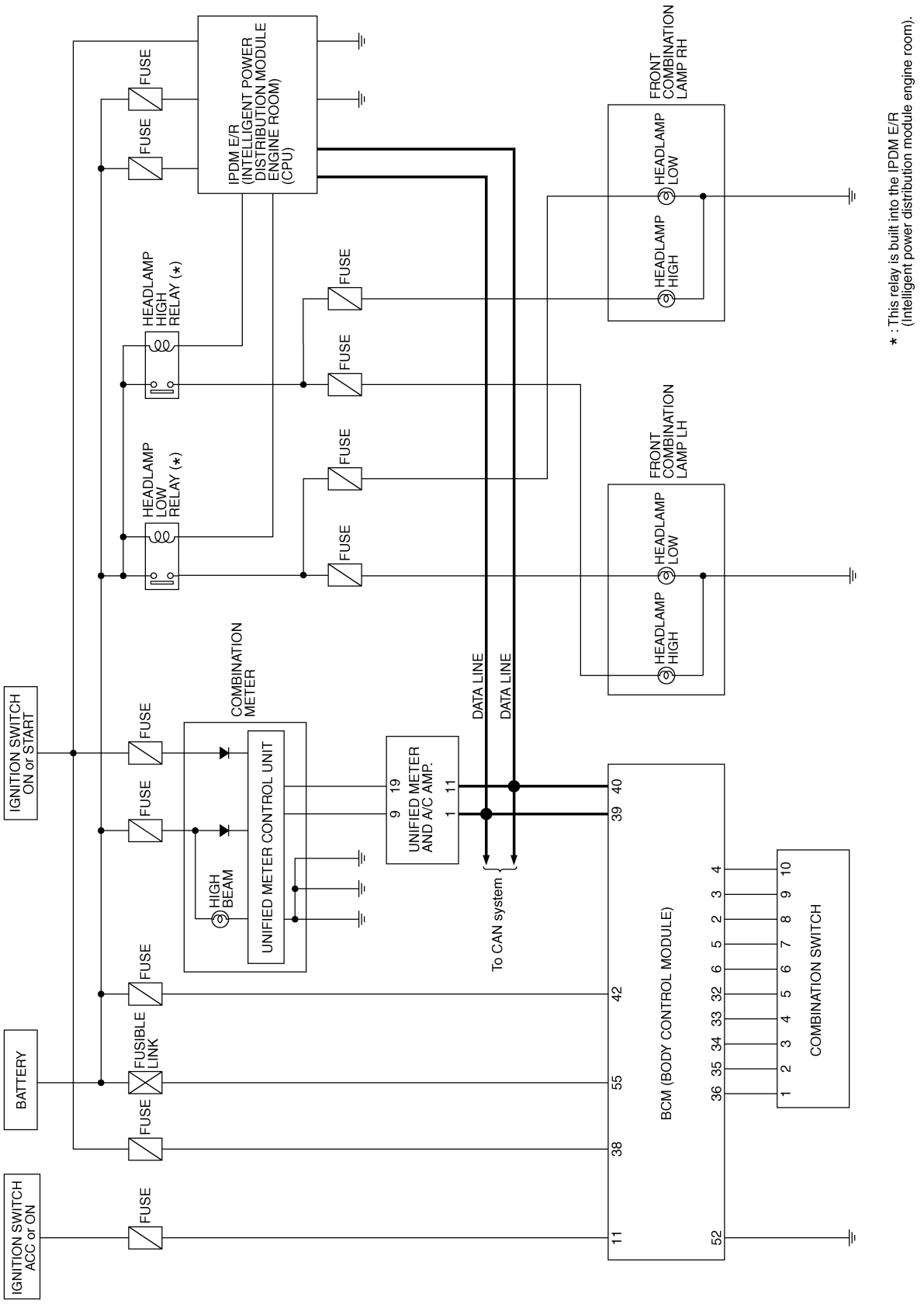
CAN Communication Unit

AKS009P4

Refer to LAN-5, "CAN Communication Unit" .

Schematic

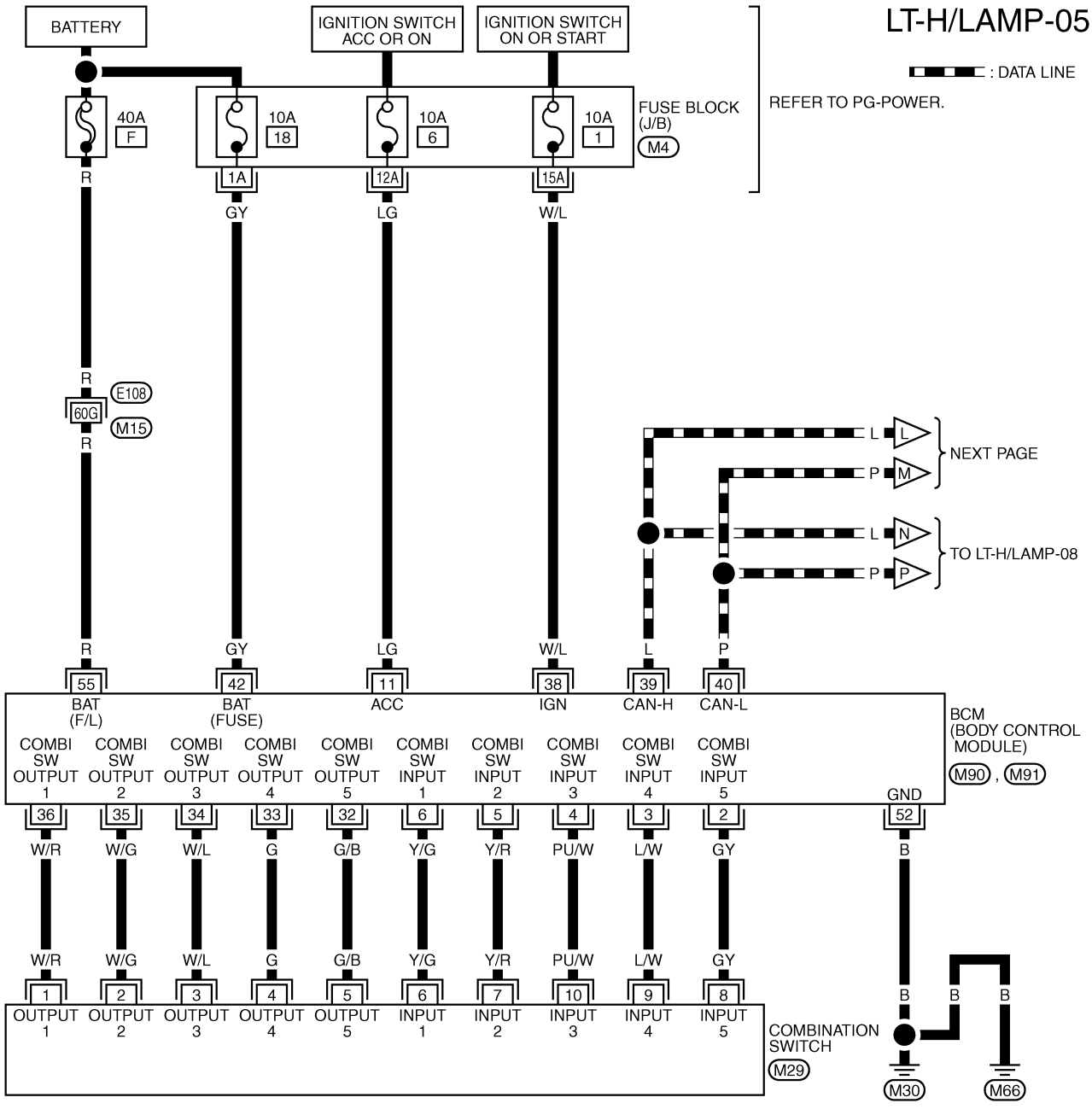
AKS009P5

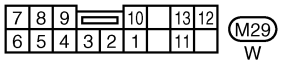


TKWT1775E

Wiring Diagram — H/LAMP —

AKS009P6





REFER TO THE FOLLOWING.

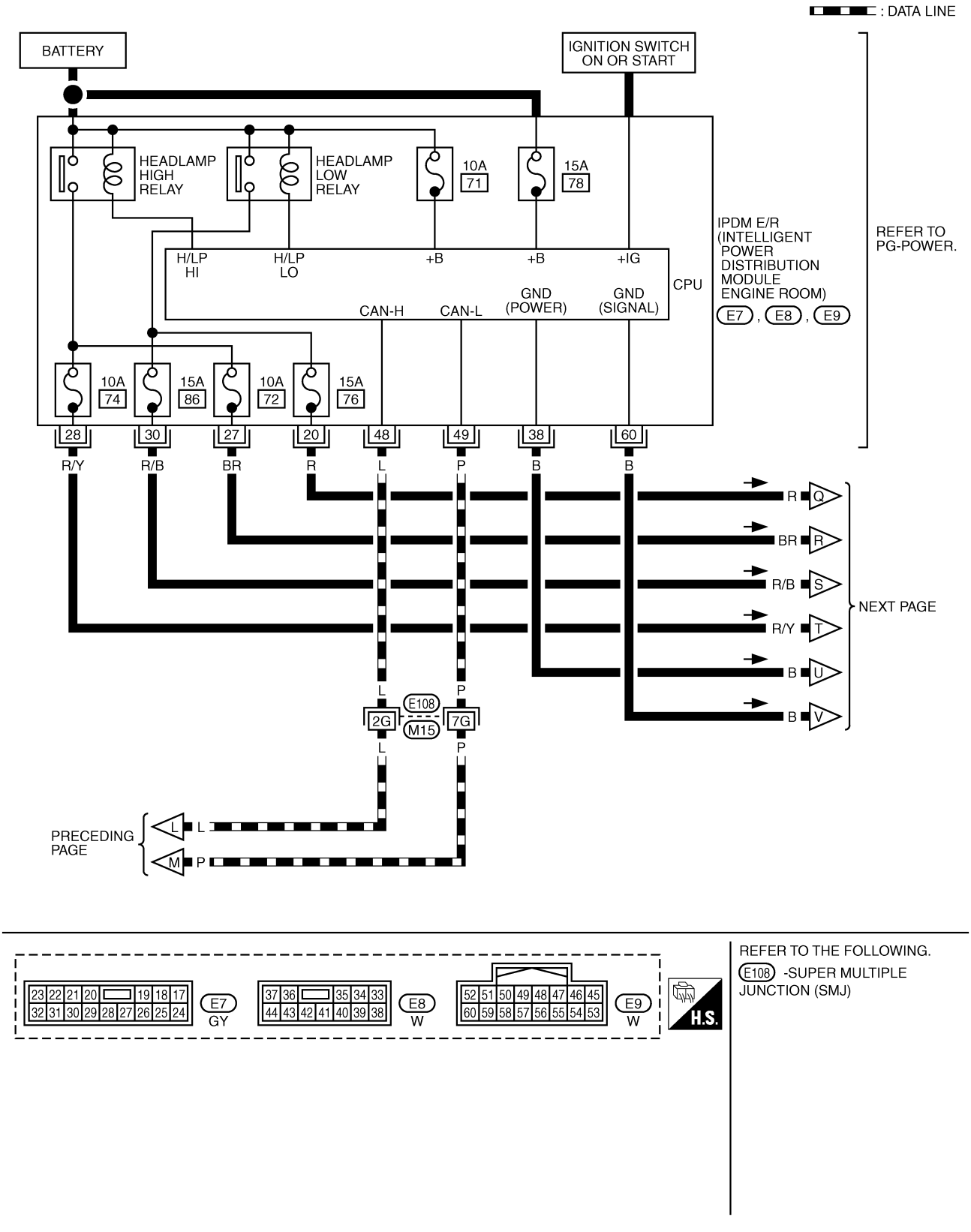
E108 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

M90 , M91 -ELECTRICAL UNITS

TKWT1776E

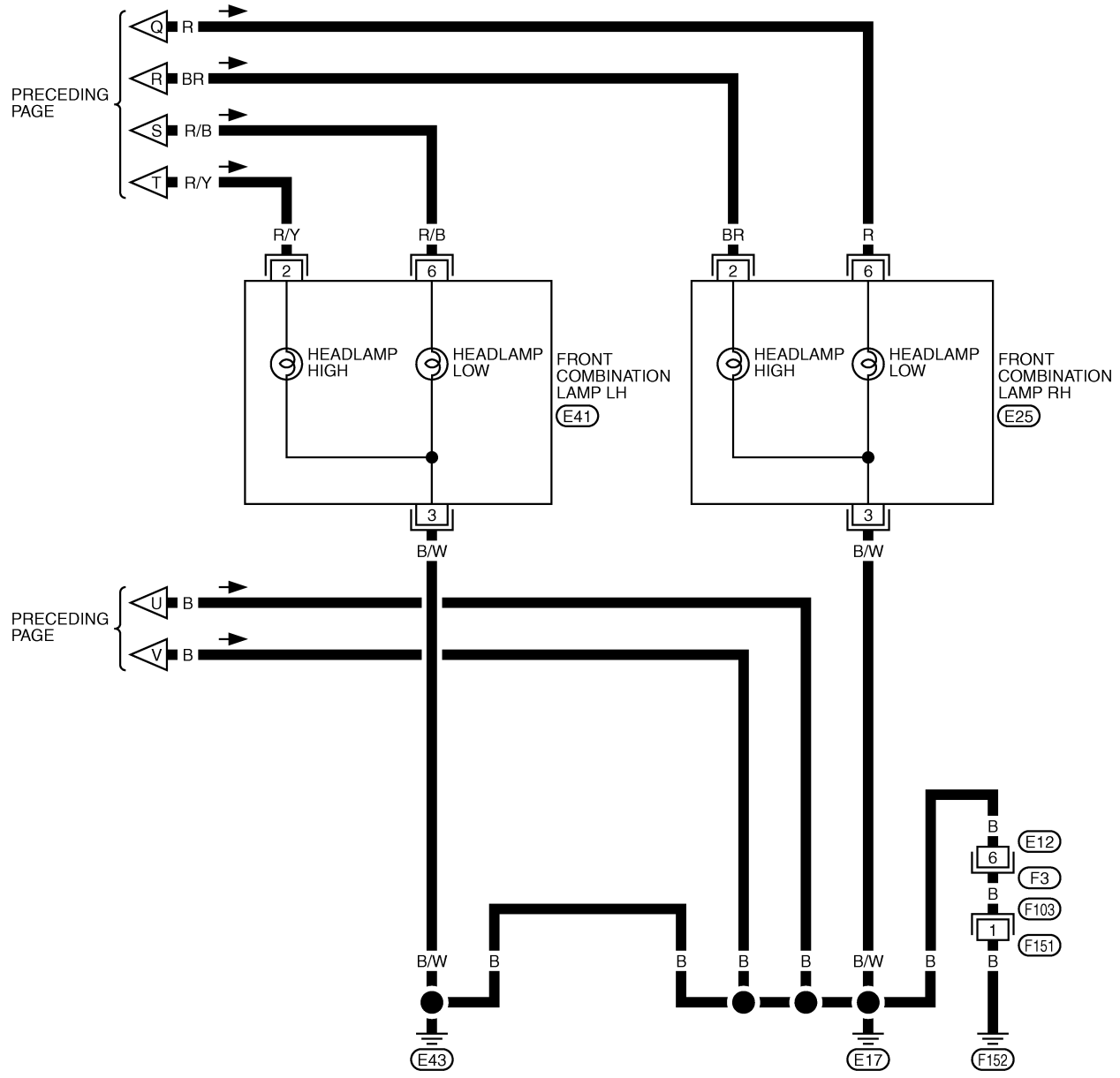
LT-H/LAMP-06

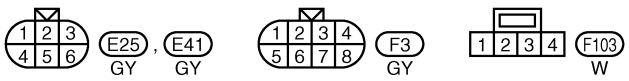


REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT1777E

LT-H/LAMP-07

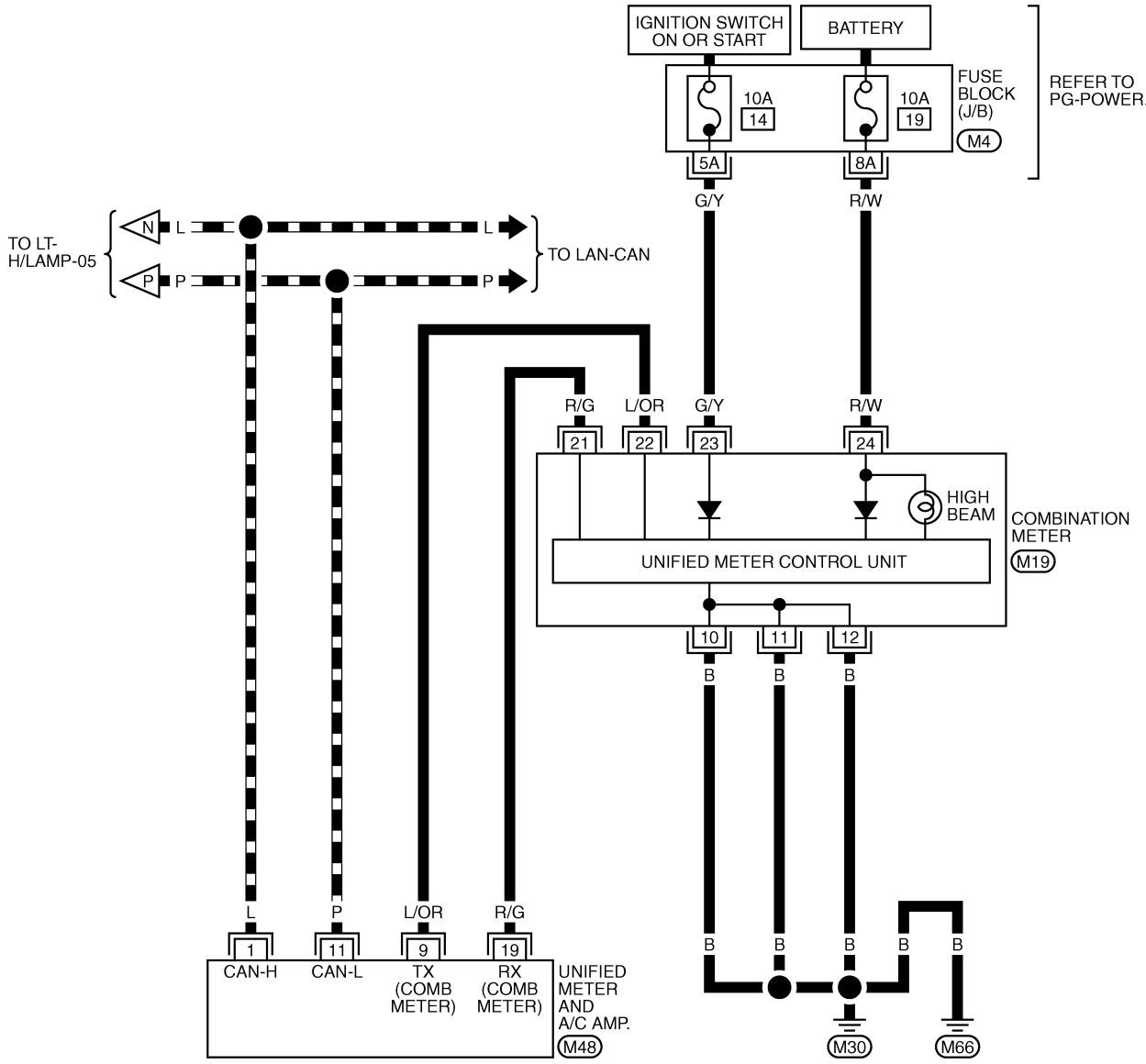


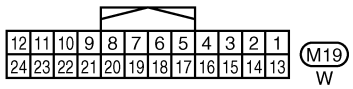


TKWT1778E

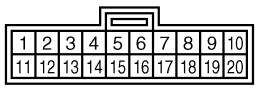
LT-H/LAMP-08

: DATA LINE





M19
W



M48
GY

H.S.

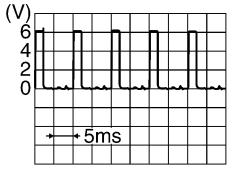
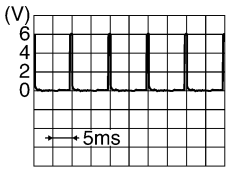
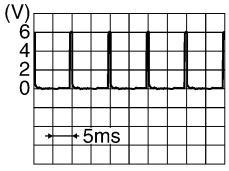
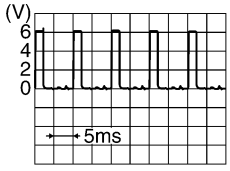
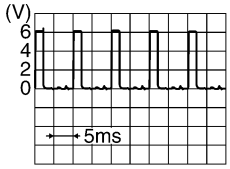
REFER TO THE FOLLOWING.

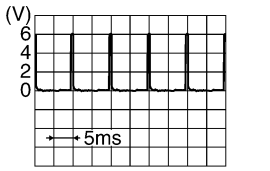
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT1779E

Terminals and Reference Values for BCM

AKS00AOR

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
2	GY	Combination switch input 5	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E
3	L/W	Combination switch input 4	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
4	PU/W	Combination switch input 3	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E
5	Y/R	Combination switch input 2	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
6	Y/G	Combination switch input 1			
11	LG	Ignition switch (ACC)	ACC	—	Battery voltage
32	G/B	Combination switch output 5	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E
33	G	Combination switch output 4	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
34	W/L	Combination switch output 3	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
35	W/G	Combination switch output 2	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
36	W/R	Combination switch output 1			
38	W/L	Ignition switch (ON)	ON	—	Battery voltage
39	L	CAN– H	—	—	—
40	P	CAN– L	—	—	—
42	GY	Battery power supply	OFF	—	Battery voltage
52	B	Ground	ON	—	Approx. 0V
55	R	Battery power supply	OFF	—	Battery voltage

Terminals and Reference Values for IPDM E/R

AKS009R9

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
20	R	Headlamp low (RH)	ON	Lighting switch 2ND position	OFF	Approx. 0V
					ON	Battery voltage
27	BR	Headlamp high (RH)	ON	Lighting switch HIGH or PASS position	OFF	Approx. 0V
					ON	Battery voltage
28	R/Y	Headlamp high (LH)	ON	Lighting switch HIGH or PASS position	OFF	Approx. 0V
					ON	Battery voltage
30	R/B	Headlamp low (LH)	ON	Lighting switch 2ND position	OFF	Approx. 0V
					ON	Battery voltage
38	B	Ground	ON	—		Approx. 0V
48	L	CAN– H	—	—		—
49	P	CAN– L	—	—		—
60	B	Ground	ON	—		Approx. 0V

How to Proceed With Trouble Diagnosis

AKS009RA

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-38, "System Description" .
3. Perform the preliminary check. Refer to LT-48, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Does the headlamp operate normally? If YES: GO TO 6. If NO: GO TO 4.
6. INSPECTION END

Preliminary Check

AKS009P9

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES

- Check for blown fuses.

UNIT	POWER SOURCE	Fuse and fusible link No.
BCM	Battery	F
	Ignition switch ON or START position	1
	Ignition switch ACC or ON position	6
IPDM E/R	Battery	72
		74
		76
		86

Refer to LT-42, "Wiring Diagram — H/LAMP —" .

OK or NG

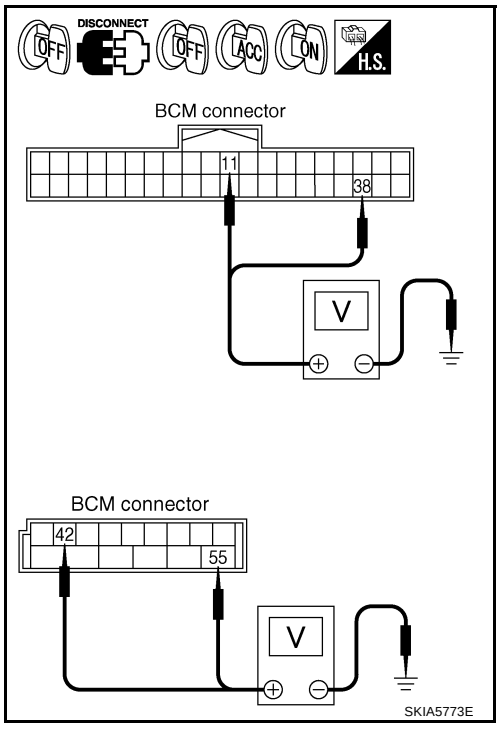
OK >> GO TO 2.

NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM harness connector and ground.

Terminals			Ignition switch position		
(+)		(–)	OFF	ACC	ON
Connector	Terminal (Wire color)				
M90	11 (LG)	Ground	0V	Battery voltage	Battery voltage
	38 (W/L)		0V	0V	Battery voltage
M91	42 (GY)		Battery voltage	Battery voltage	Battery voltage
	55 (R)		Battery voltage	Battery voltage	Battery voltage



OK or NG

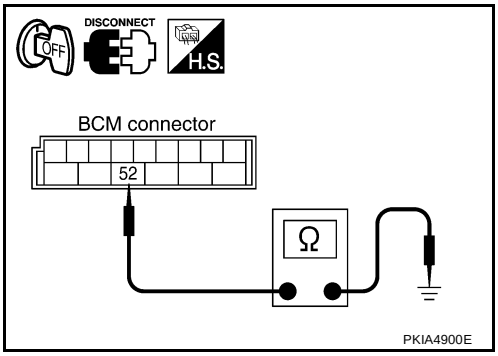
OK >> GO TO 3.

NG >> Check harness for open or short between BCM and fuse.

3. CHECK GROUND CIRCUIT

Check continuity between BCM harness connector and ground.

Terminals			Continuity
Connector	Terminal (Wire color)	Ground	
M91	52 (B)		Yes



OK or NG

OK >> INSPECTION END
NG >> Check ground circuit harness.

CONSULT-II Functions (BCM)

AKS009PA

CONSULT-II performs the following functions communicating with BCM.

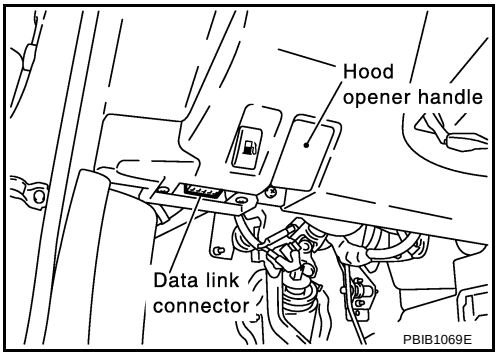
BCM diagnosis part	Check item, diagnosis mode	Description
HEADLAMP	WORK SUPPORT	Changes the setting for each function.
	DATA MONITOR	Displays BCM input data in real time.
	ACTIVE TEST	Operation of electrical loads can be checked by sending drive signal to them.
BCM	CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.

CONSULT-II BASIC OPERATION

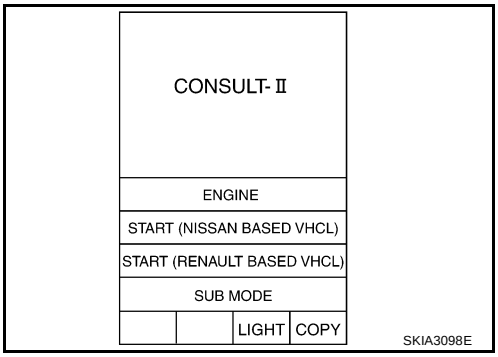
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

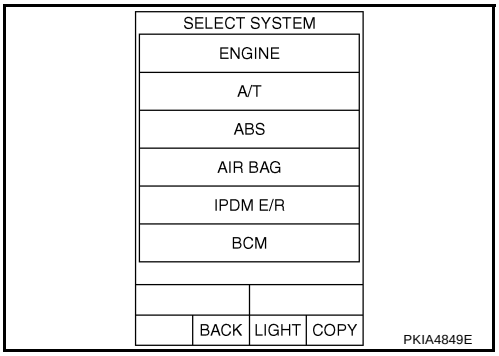
1. With ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to data link connector, then turn ignition switch ON.



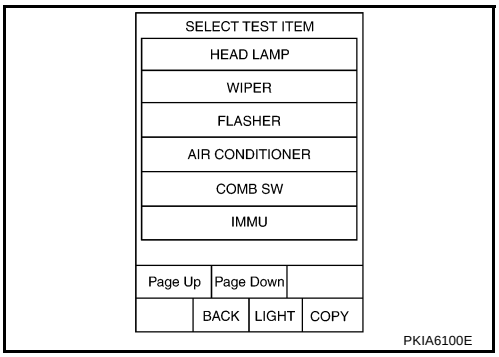
2. Touch “START (NISSAN BASED VHCL)”.



3. Touch “BCM” on “SELECT SYSTEM” screen.
If “BCM” is not indicated, refer to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



4. Touch “HEAD LAMP” on “SELECT TEST ITEM” screen.



WORK SUPPORT

Operation Procedure

1. Touch “HEAD LAMP” on “SELECT TEST ITEM” screen.
2. Touch “WORK SUPPORT” on “SELECT DIAG MODE” screen.
3. Touch “BATTERY SAVER SET” on “SELECT WORK ITEM” screen.
4. Touch “START”.
5. Touch “CHANGE SET”.
6. The setting will be changed and “CUSTOMIZING COMPLETED” will be displayed.
7. Touch “END”.

Display Item List

Item	Description	CONSULT-II	Factory setting
BATTERY SAVER SET	Exterior lamp battery saver control mode can be changed in this mode. Selects exterior lamp battery saver control mode between two ON/OFF.	ON	×
		OFF	—

DATA MONITOR

Operation Procedure

1. Touch “HEAD LAMP” on “SELECT TEST ITEM” screen.
2. Touch “DATA MONITOR” on “SELECT DIAG MODE” screen.
3. Touch either “ALL SIGNALS” or “SELECTION FROM MENU” on “DATA MONITOR” screen.

ALL SIGNALS	Monitors all the signals.
SELECTION FROM MENU	Selects and monitors individual signal.

4. Touch “START”.
5. When “SELECTION FROM MENU” is selected, touch individual items to be monitored. When “ALL SIGNALS” is selected, all the items will be monitored.
6. Touch “RECORD” while monitoring, then the status of the monitored item can be recorded. To stop recording, touch “STOP”.

Display Item List

Monitor item		Contents
IGN ON SW	“ON/OFF”	Displays “IGN position (ON)/OFF, ACC position (OFF)” judged from the ignition switch signal.
ACC ON SW	“ON/OFF”	Displays “ACC (ON)/OFF, Ignition OFF (OFF)” status judged from ignition switch signal.
HI BEAM SW	“ON/OFF”	Displays status (high beam switch: ON/Others: OFF) of high beam switch judged from lighting switch signal.
HEAD LAMP SW 1	“ON/OFF”	Displays status (headlamp switch 1: ON/Others: OFF) of headlamp switch 2 judged from lighting switch signal.
HEAD LAMP SW 2	“ON/OFF”	Displays status (headlamp switch 2: ON/Others: OFF) of headlamp switch 2 judged from lighting switch signal.
LIGHT SW 1 ST	“ON/OFF”	Displays status (lighting switch 1st position: ON/Others: OFF) of lighting switch judged from lighting switch signal.
AUTO LIGHT SW[NOTE]	“ON/OFF”	—
PASSING SW	“ON/OFF”	Displays status (flash-to-pass switch: ON/Others: OFF) of flash-to-pass switch judged from lighting switch signal.
FR FOG SW[NOTE]	“ON/OFF”	—
DOOR SW - DR	“ON/OFF”	Displays status of driver door as judged from driver door switch signal. (Door is open: ON/ Door is closed: OFF)
DOOR SW - AS	“ON/OFF”	Displays status of passenger door as judged from passenger door switch signal. (Door is open: ON/Door is closed: OFF)
DOOR SW - RR[NOTE]	“OFF”	—
DOOR SW - RL[NOTE]	“OFF”	—
BACK DOOR SW	“ON/OFF”	● Displays status of back door as judged from back door switch signal. (Coupe models) ● Displays status of rear trunk hood as judged from trunk lamp switch signal. (Roadster models)
TURN SIGNAL R	“ON/OFF”	Displays status (Turn right: ON/Others: OFF) as judged from lighting switch signal.
TURN SIGNAL L	“ON/OFF”	Displays status (Turn left: ON/Others: OFF) as judged from lighting switch signal.
CARGO LAMP SW[NOTE]	“OFF”	—

NOTE:
This item is displayed, but cannot monitor it.

ACTIVE TEST

Operation Procedure

1. Touch “HEAD LAMP” on “SELECT TEST ITEM” screen.
2. Touch “ACTIVE TEST” on “SELECT DIAG MODE” screen.
3. Touch item to be tested and check operation of the selected item.
4. During the operation check, touching “BACK” deactivates the operation.

Display Item List

Test item	Description
TAIL LAMP	Allows tail lamp relay to operate by switching ON–OFF.
HEAD LAMP	Allows headlamp relay to operate by switching ON–OFF.
FR FOG LAMP[NOTE]	—
CORNERING LAMP[NOTE]	—

NOTE:
This item is displayed, but cannot test it.

CONSULT-II Functions (IPDM E/R)

AKS009RB

CONSULT-II performs the following functions communicating with IPDM E/R.

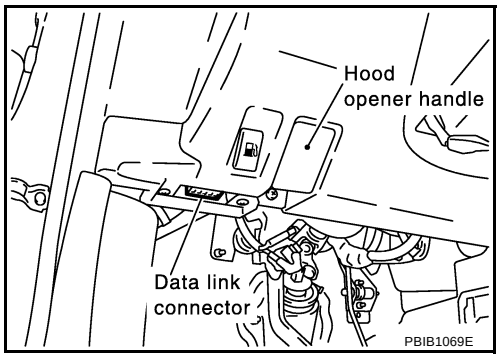
Inspection Item, Diagnosis Mode	Description
SELF-DIAGNOSTIC RESULTS	IPDM E/R performs self-diagnosis of CAN communication.
DATA MONITOR	The input/output data of IPDM E/R is displayed in real time.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
ACTIVE TEST	IPDM E/R sends a drive signal to electronic components to check their operation.

CONSULT-II OPERATION

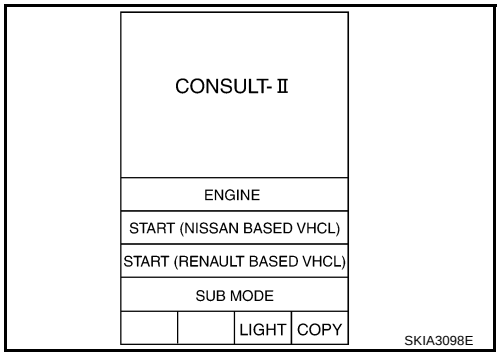
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

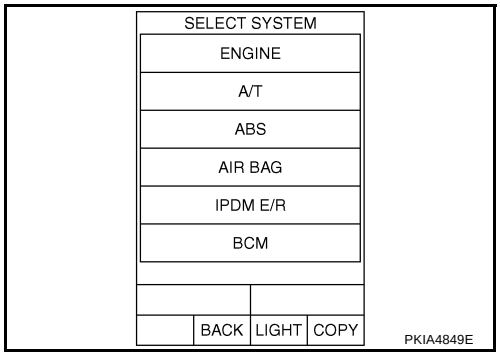
1. With ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to data link connector, then turn ignition switch ON.



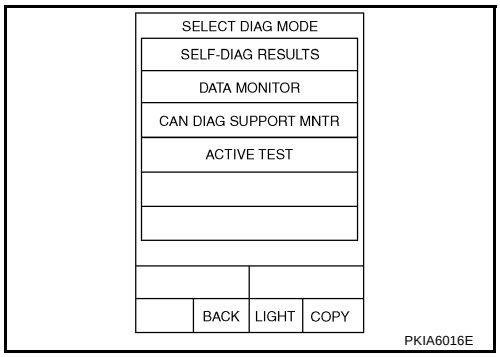
2. Touch “START (NISSAN BASED VHCL)”.



3. Touch “IPDM E/R” on “SELECT SYSTEM” screen.
If “IPDM E/R” is not displayed, print “SELECT SYSTEM” screen, then refer to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



4. Select the desired part to be diagnosed on “SELECT DIAG MODE” screen.



DATA MONITOR

Operation Procedure

1. Touch “DATA MONITOR” on “SELECT DIAG MODE ” screen.
2. Touch “ALL SIGNALS”, “MAIN SIGNALS” or “SELECTION FROM MENU” on “DATA MONITOR” screen.

ALL SIGNALS	All items will be monitored.
MAIN SIGNALS	Monitor the predetermined item.
SELECTION FROM MENU	Select any item for monitoring.

3. Touch “START”.
4. Touch the required monitoring item on “SELECTION FROM MENU”. In “ALL SIGNALS”, all items are monitored. In “MAIN SIGNALS”, predetermined items are monitored.
5. Touch “RECORD” while monitoring to record the status of the item being monitored. To stop recording, touch “STOP”.

All Signals, Main Signals, Selection From Menu

Item name	CONSULT-II screen display	Display or unit	Monitor item selection			Description
			ALL SIGNALS	MAIN SIGNALS	SELECT FROM MENU	
Position lights request	TAIL&CLR REQ	ON/OFF	×	×	×	Signal status input from BCM
Headlamp low beam request	HL LO REQ	ON/OFF	×	×	×	Signal status input from BCM
Headlamp high beam request	HL HI REQ	ON/OFF	×	×	×	Signal status input from BCM

NOTE:
Perform monitoring of IPDM E/R data with ignition switch ON. When ignition switch is at ACC, the display may not be correct.

ACTIVE TEST

Operation Procedure

1. Touch “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Touch item to be tested, and check operation.
3. Touch “START”.
4. Touch “STOP” while testing to stop the operation.

Test item	CONSULT-II screen display	Description
Tail lamp relay output	TAIL LAMP	Allows tail lamp relay to operate by switching operation ON-OFF at your option.
Headlamp relay (HI, LO) output	LAMPS	Allows headlamp relay (HI, LO) to operate by switching operation (OFF, HI ON, LO ON) at your option (Headlamp high beam repeats ON– OFF every 1 second).

SELF-DIAGNOSTIC RESULTS

Refer to PG-21, "SELF-DIAG RESULTS" .

Headlamp High Beam Does Not Illuminate (Both Sides)

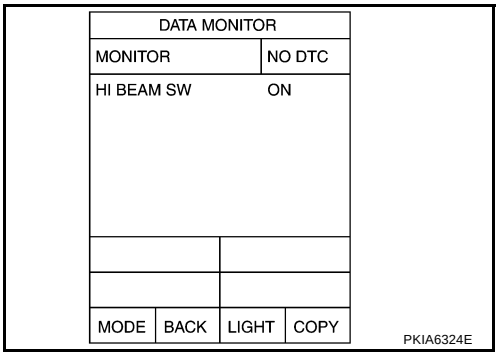
AKS00AOS

1. CHECK COMBINATION SWITCH INPUT SIGNAL

With CONSULT-II

Select “BCM” on CONSULT-II. With “HEAD LAMP” data monitor, make sure “HI BEAM SW” turns ON-OFF linked with operation of lighting switch.

When lighting switch is HIGH BEAM position : HI BEAM SW ON



Without CONSULT-II

Refer to LT-170, "Combination Switch Inspection" .

OK or NG

OK >> GO TO 2.

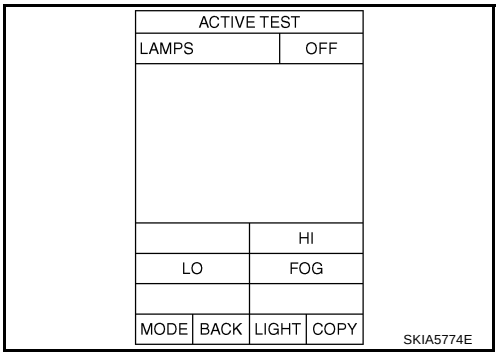
NG >> Check lighting switch. Refer to LT-170, "Combination Switch Inspection" .

2. HEADLAMP ACTIVE TEST

With CONSULT-II

1. Select “IPDM E/R” on CONSULT-II, and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Select “LAMPS” on “SELECT TEST ITEM” screen.
3. Touch “HI” screen.
4. Make sure headlamp high beam operation.

Headlamp high beam should operate.
(Headlamp high beam repeats ON-OFF every 1 second).



Without CONSULT-II

1. Start auto active test. Refer to PG-24, "Auto Active Test" .
2. Make sure headlamp high beam operation.

Headlamp high beam should operate.

OK or NG

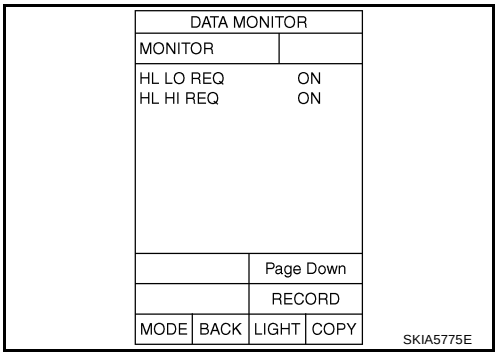
OK >> GO TO 3.

NG >> GO TO 4.

3. CHECK IPDM E/R

1. Select “IPDM E/R” on CONSULT-II, and select “DATA MONITOR” on “SELECT DIAG MODE” screen.
2. Make sure “HL LO REQ” and “HL HI REQ” turns ON when lighting switch is in HI position.

When lighting switch is HIGH BEAM position : HL LO REQ ON : HL HI REQ ON



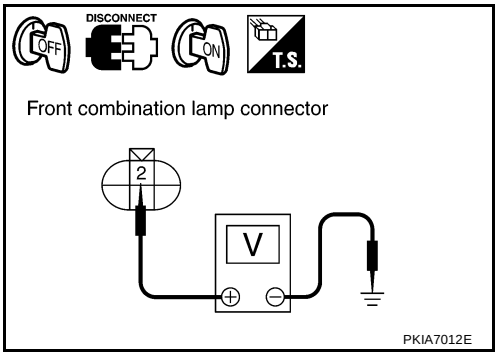
OK or NG

OK >> Replace IPDM E/R.
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

4. CHECK HEADLAMP INPUT SIGNAL

With CONSULT-II

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Select “IPDM E/R” on CONSULT-II. and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
4. Select “LAMPS” on “SELECT TEST ITEM” screen.
5. Touch “HI” screen.
6. When headlamp high beam is operating, check voltage between front combination lamp RH and LH harness connector and ground (Headlamp high beam repeats ON–OFF every 1 second).



Terminals				Voltage
(+)			(-)	
Connector		Terminal (Wire color)		
RH	E25	2 (BR)	Ground	Battery voltage
LH	E41	2 (R/Y)		

Without CONSULT-II

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Start auto active test. Refer to PG-24, "Auto Active Test" .
4. When headlamp high beam is operating, check voltage between front combination lamp RH and LH harness connector and ground.

Terminals				Voltage
(+)			(-)	
Connector		Terminal (Wire color)		
RH	E25	2 (BR)	Ground	Battery voltage
LH	E41	2 (R/Y)		

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

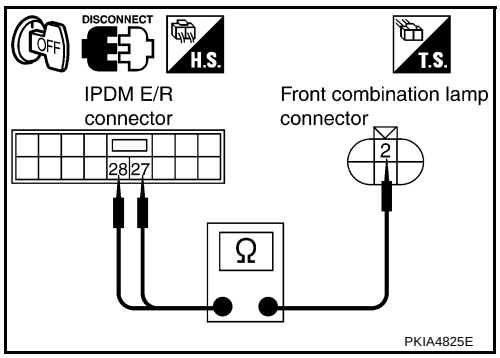
5. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector E7 terminal 27 (BR) and front combination lamp RH harness connector E25 terminal 2 (BR).

27 (BR) – 2 (BR) : Continuity should exist.

4. Check continuity between IPDM E/R harness connector E7 terminal 28 (R/Y) and front combination lamp LH harness connector E41 terminal 2 (R/Y).

28 (R/Y) – 2 (R/Y) : Continuity should exist.



OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.

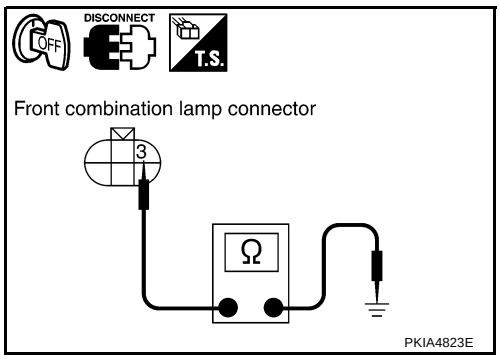
6. CHECK HEADLAMP GROUND

1. Check continuity between front combination lamp RH harness connector E25 terminal 3 (B/W) and ground.

3 (B/W) – Ground : Continuity should exist.

2. Check continuity between front combination lamp LH harness connector E41 terminal 3 (B/W) and ground.

3 (B/W) – Ground : Continuity should exist.



OK or NG

OK >> Check headlamp bulb.
NG >> Repair harness or connector.

Headlamp High Beam Does Not Illuminate (One Side)

AKS00AOT

1. CHECK BULB

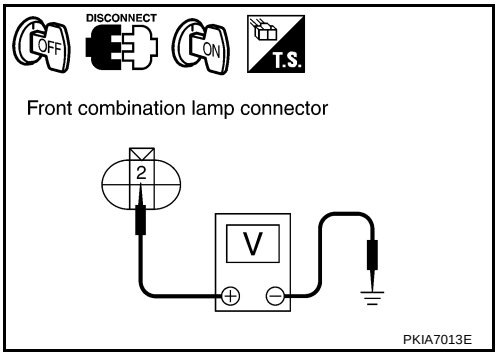
Check bulb of lamp which does not illuminate.

OK or NG

OK >> GO TO 2.
NG >> Replace headlamp bulb.

2. CHECK HEADLAMP INPUT SIGNAL

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH or LH connector.
3. Turn ignition switch ON.
4. Lighting switch is turned HIGH BEAM position.
5. Check voltage between front combination lamp RH or LH harness connector and ground.



Terminals				Voltage
(+)			(-)	
Connector		Terminal (Wire color)		
RH	E25	2 (BR)	Ground	Battery voltage
LH	E41	2 (R/Y)		

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

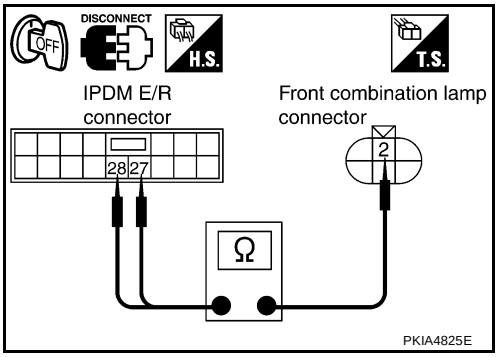
3. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector E7 terminal 27 (BR) and front combination lamp RH harness connector E25 terminal 2 (BR).

27 (BR) – 2 (BR) : Continuity should exist.

4. Check continuity between IPDM E/R harness connector E7 terminal 28 (R/Y) and front combination lamp LH harness connector E41 terminal 2 (R/Y).

28 (R/Y) – 2 (R/Y) : Continuity should exist.



OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.

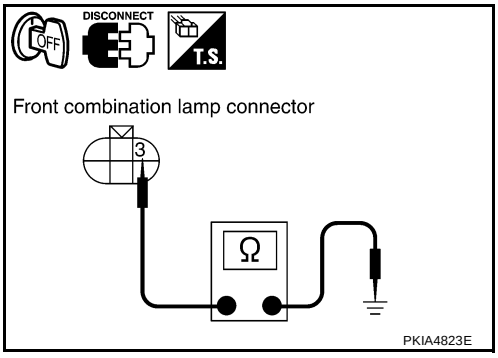
4. CHECK HEADLAMP GROUND

1. Check continuity between front combination lamp RH harness connector E25 terminal 3 (B/W) and ground.

3 (B/W) – Ground : Continuity should exist.

2. Check continuity between front combination lamp LH harness connector E41 terminal 3 (B/W) and ground.

3 (B/W) – Ground : Continuity should exist.



OK or NG

OK >> Check headlamp harness and connector.
NG >> Repair harness or connector.

High Beam Indicator Lamp Does Not Illuminate

AKS00AOU

1. CHECK BULB

Check bulb of high beam indicator lamp.

OK or NG

OK >> Replace combination meter.
NG >> Replace indicator bulb.

Headlamp Low Beam Does Not Illuminate (Both Sides)

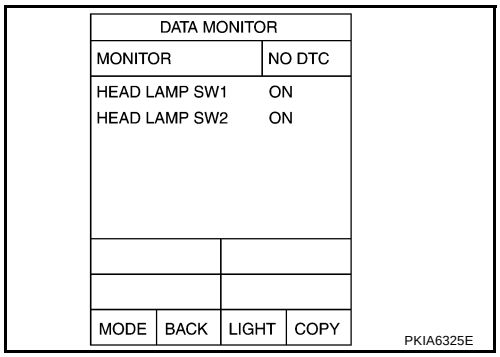
AKS00AOV

1. CHECK COMBINATION SWITCH INPUT SIGNAL

With CONSULT-II

Select “BCM” on CONSULT-II. With “HEAD LAMP” data monitor, make sure “HEAD LAMP SW 1” and “HEAD LAMP SW 2” turns ON-OFF linked with operation of lighting switch.

When lighting switch is 2ND position : HEAD LAMP SW 1 ON
: HEAD LAMP SW 2 ON



Without CONSULT-II

Refer to LT-170, "Combination Switch Inspection" .

OK or NG

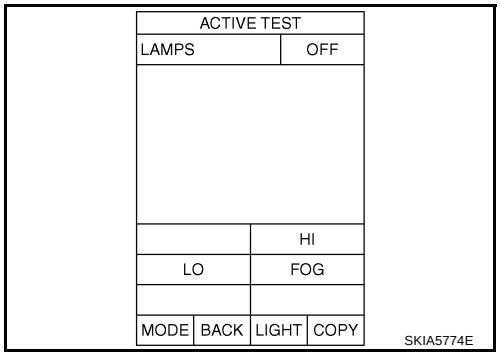
OK >> GO TO 2.
NG >> Check lighting switch. Refer to LT-170, "Combination Switch Inspection" .

2. HEADLAMP ACTIVE TEST

With CONSULT-II

1. Select “IPDM E/R” on CONSULT-II, and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Select “LAMPS” on “SELECT TEST” ITEM screen.
3. Touch “LO” screen.
4. Make sure headlamp low beam operation.

Headlamp low beam should operate.



Without CONSULT-II

1. Start auto active test. Refer to PG-24, "Auto Active Test" .
2. Make sure headlamp low beam operation.

Headlamp low beam should operate.

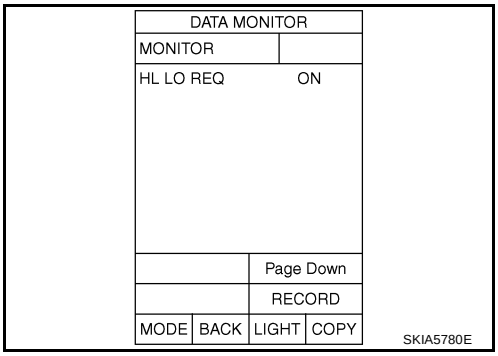
OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK IPDM E/R

1. Select “IPDM E/R” on CONSULT-II, and select “DATA MONITOR” on “SELECT DIAG MODE” screen.
2. Make sure “HL LO REQ” turns ON when lighting switch is in 2ND position.

When lighting switch is 2ND position : HL LO REQ ON



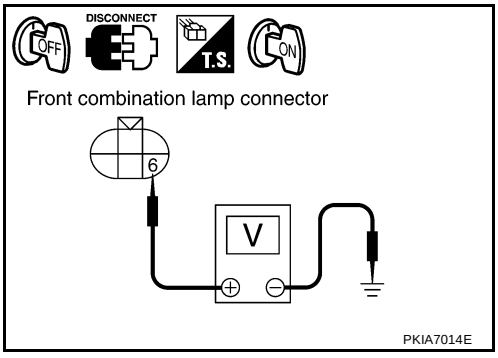
OK or NG

OK >> Replace IPDM E/R.
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

4. CHECK HEADLAMP INPUT SIGNAL

With CONSULT-II

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Select “IPDM E/R” on CONSULT-II, and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
4. Select “LAMPS” on “SELECT TEST ITEM” screen.
5. Touch “LO” screen.
6. When headlamp low beam is operating, check voltage between front combination lamp RH and LH harness connector and ground.



Terminals				Voltage
(+)			(-)	
Connector		Terminal (Wire color)		
RH	E25	6 (R)	Ground	Battery voltage
LH	E41	6 (R/B)		

Without CONSULT-II

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Start auto active test. Refer to PG-24, "Auto Active Test" .
4. When headlamp low beam is operating, check voltage between front combination lamp RH and LH harness connector and ground.

Terminals				Voltage
(+)			(-)	
Connector		Terminal (Wire color)		
RH	E25	6 (R)	Ground	Battery voltage
LH	E41	6 (R/B)		

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

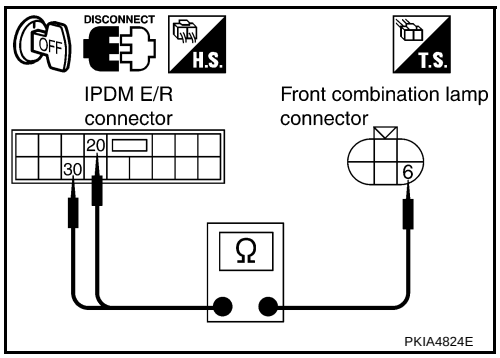
5. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector E7 terminal 20 (R) and front combination lamp RH harness connector E25 terminal 6 (R).

20 (R) – 6 (R) : Continuity should exist.

4. Check continuity between IPDM E/R harness connector E7 terminal 30 (R/B) and front combination lamp LH harness connector E41 terminal 6 (R/B).

30 (R/B) – 6 (R/B) : Continuity should exist.



OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.

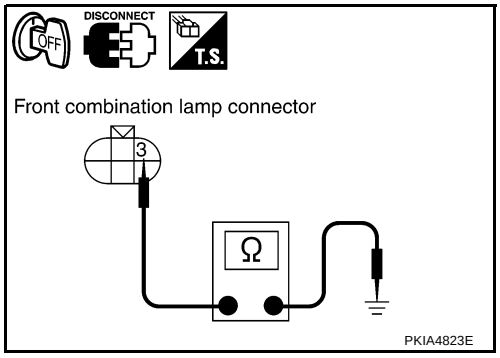
6. CHECK HEADLAMP GROUND

1. Turn ignition switch OFF.
2. Check continuity between front combination lamp RH harness connector E25 terminal 3 (B/W) and ground.

3 (B/W) – Ground : Continuity should exist.

3. Check continuity between front combination lamp LH harness connector E41 terminal 3 (B/W) and ground.

3 (B/W) – Ground : Continuity should exist.



OK or NG

OK >> Check headlamp harness and connectors.
NG >> Repair harness or connector.

Headlamp Low Beam Does Not Illuminate (One Side)

AKS00AOW

1. CHECK BULB

Check bulb of lamp which does not illuminate.

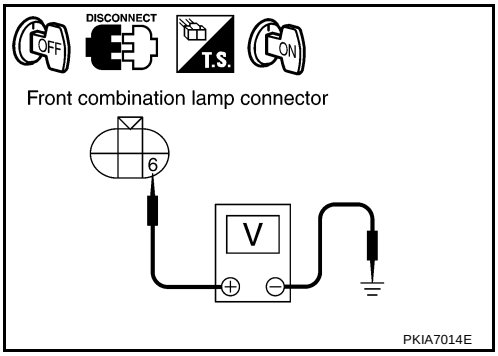
OK or NG

OK >> GO TO 2.
NG >> Repair malfunctioning part.

2. CHECK HEADLAMP INPUT SIGNAL

With CONSULT-II

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Select “IPDM E/R” on CONSULT-II, and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
4. Select “LAMPS” on “SELECT TEST ITEM” screen.
5. Touch “LO” screen.
6. When headlamp low beam is operating, check voltage between front combination lamp RH and LH harness connector and ground.



Terminals				Voltage
(+)			(-)	
Connector		Terminal (Wire color)		
RH	E25	6 (R)	Ground	Battery voltage
LH	E41	6 (R/B)		

Without CONSULT-II

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Start auto active test. Refer to PG-24, "Auto Active Test" .
4. When headlamp low beam is operating, check voltage between front combination lamp RH and LH harness connector and ground.

Terminals				Voltage
(+)			(-)	
Connector		Terminal (Wire color)		
RH	E25	6 (R)	Ground	Battery voltage
LH	E41	6 (R/B)		

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

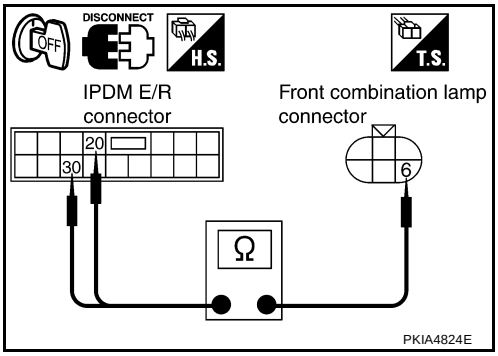
3. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front combination lamp RH or LH connector.
3. Check continuity between IPDM E/R harness connector E7 terminal 20 (R) and front combination lamp RH harness connector E24 terminal 6 (R).

20 (R) – 6 (R) : Continuity should exist.

4. Check continuity between IPDM E/R harness connector E7 terminal 30 (R/B) and front combination lamp LH harness connector E41 terminal 6 (R/B).

30 (R/B) – 6 (R/B) : Continuity should exist.



OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.

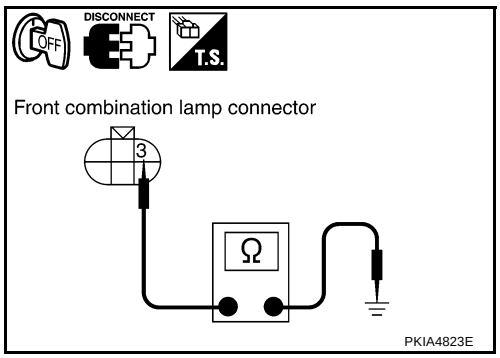
4. CHECK HEADLAMP GROUND

1. Check continuity between front combination lamp RH harness connector E25 terminal 3 (B/W) and ground.

   3 (B/W) – Ground : Continuity should exist.

2. Check continuity between front combination lamp LH harness connector E41 terminal 3 (B/W) and ground.

   3 (B/W) – Ground : Continuity should exist.



OK or NG

OK >> Check headlamp harness and connector.
NG >> Repair harness or connector.

Headlamps Does Not Turn OFF

AKS00AOX

1. CHECK HEADLAMP TURN OFF

Make sure that lighting switch is OFF. And make sure is headlamp turns off when ignition switch is turned OFF.

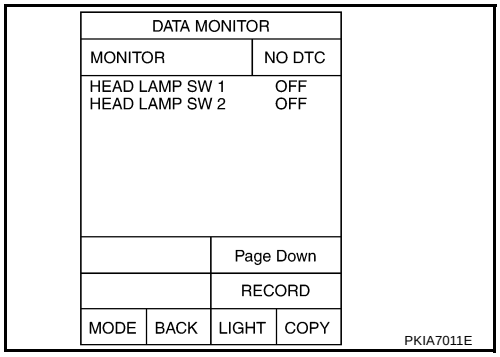
OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. CHECK COMBINATION SWITCH INPUT SIGNAL

Select “BCM” on CONSULT-II. With “HEAD LAMP” data monitor, make sure “HEAD LAMP SW 1” and “HEAD LAMP SW 2” turns ON-OFF linked with operation of lighting switch.

When lighting switch is OFF position : HEAD LAMP SW 1 OFF
: HEAD LAMP SW 2 OFF



OK or NG

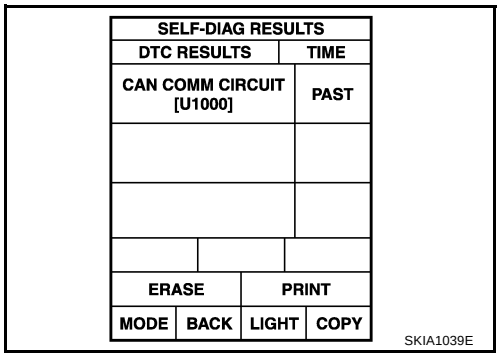
OK >> Replace IPDM E/R.
NG >> Check lighting switch. Refer to LT-170, "Combination Switch Inspection" .

3. CHECKING CAN COMMUNICATIONS BETWEEN BCM AND IPDM E/R

Select “BCM” by CONSULT-II, and perform self-diagnosis for “BCM”.

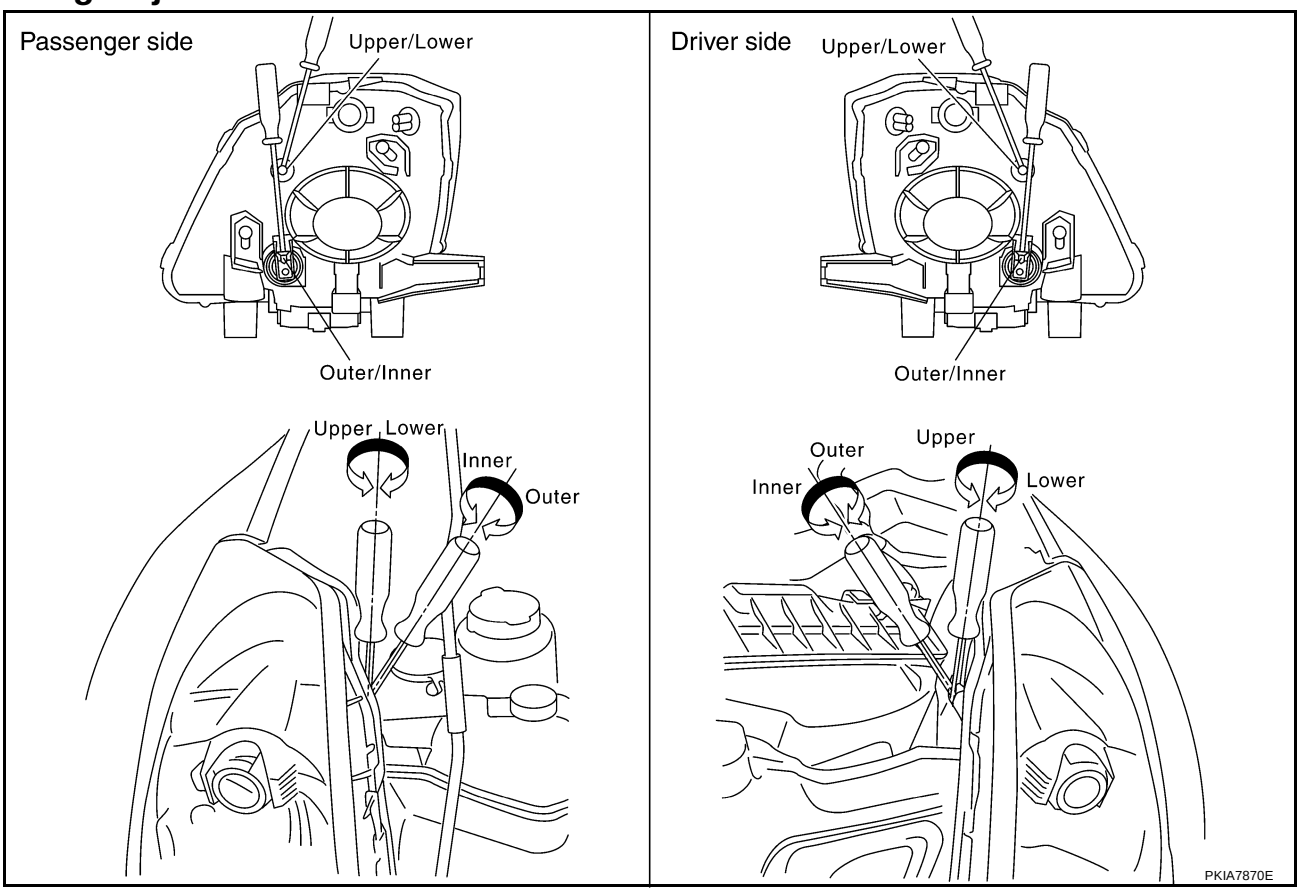
Display of self-diagnosis results

NO DTC>> Replace IPDM E/R.
CAN COMM CIRCUIT>> Refer to BCS-16, "CAN Communication Inspection Using CONSULT-II (Self-Diagnosis)" .



Aiming Adjustment

AKS00ABI



PREPARATION BEFORE ADJUSTING

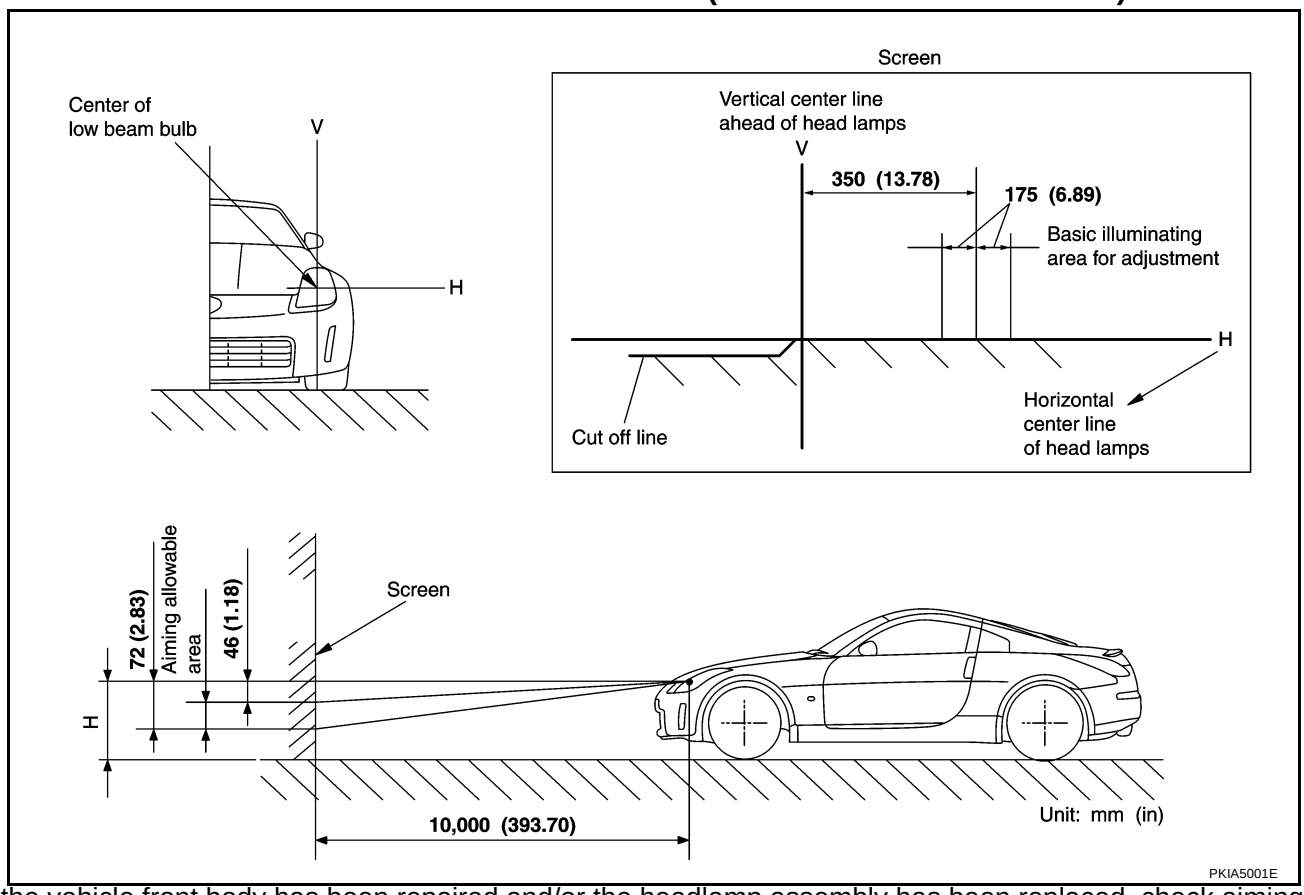
For details, refer to the regulations in your own country.
Before performing aiming adjustment, check the following.

1. Keep all tires inflated to correct pressures.
2. Place vehicle on flat surface.
3. Set that there is no-load in vehicle other than the driver (or equivalent weight placed in driver's position). Coolant, engine oil filled up to correct level and full fuel tank.

LOW BEAM AND HIGH BEAM

1. Turn headlamp low beam on.
2. Use adjusting screws to perform aiming adjustment.

ADJUSTMENT USING AN ADJUSTMENT SCREEN (LIGHT/DARK BORDERLINE)



If the vehicle front body has been repaired and/or the headlamp assembly has been replaced, check aiming. Use the aiming chart shown in the figure.

- Basic illumination area for adjustment should be within the range shown on the aiming chart. Adjust headlamp accordingly.

Bulb Replacement

AKS00ABJ

HEADLAMP (UPPER) LOW BEAM

1. Turn lighting switch OFF.
2. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" in “EI” section.
3. Turn plastic cap counterclockwise and unlock it.
4. Disconnect bulb terminal.
5. Unlock retaining spring and remove bulb from headlamp.
6. Install in reverse order of removal.

Headlamp (upper) low beam (Halogen) **: 12V - 55W (H7)**

HEADLAMP (LOWER) HIGH BEAM

1. Turn lighting switch OFF.
2. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" in “EI” section.
3. Turn plastic cap counterclockwise and unlock it.
4. Disconnect bulb terminal.
5. Unlock retaining spring and remove bulb from headlamp.
6. Install in the reverse order of removal.

Headlamp (lower) high beam/Fog lamp : 12V - 55W (H1)

PARKING LAMPS (CLEARANCE LAMPS)

1. Turn lighting switch OFF.
2. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" in “EI” section.
3. Turn bulb socket counterclockwise and unlock it.
4. Remove bulb from its socket.
5. Install in the reverse order of removal.

Parking lamps (Clearance lamps) : 12V - 5W

FRONT TURN SIGNAL LAMP

1. Turn lighting switch OFF.
2. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" in “EI” section.
3. Turn bulb socket counterclockwise and unlock it.
4. Remove bulb from its socket.
5. Install in the reverse order of removal.

Front turn signal lamp : 12V - 21W

CAUTION:
After installing bulb, be sure to install plastic cap and bulb socket securely to insure watertightness.

FRONT SIDE MARKER LAMP

1. Turn lighting switch OFF.
2. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" in “EI” section.
3. Turn bulb socket counterclockwise and unlock it.
4. Remove bulb from its socket.
5. Install in the reverse order of removal.

Front side marker lamp : 12V - 5W

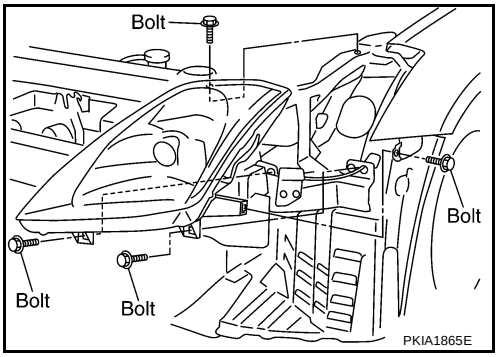
CAUTION:
After installing bulb, be sure to install plastic cap and socket securely to insure watertightness.

Removal and Installation

AKS00ABK

REMOVAL

1. Remove front bumper. Refer to EI-14, "FRONT BUMPER" in “EI” section.
2. Remove headlamp mounting bolts.
3. Pull headlamp toward vehicle front, disconnect connector, and remove headlamp.



INSTALLATION

Install in the reverse order of removal. Be careful of the following:

Headlamp mounting bolt:

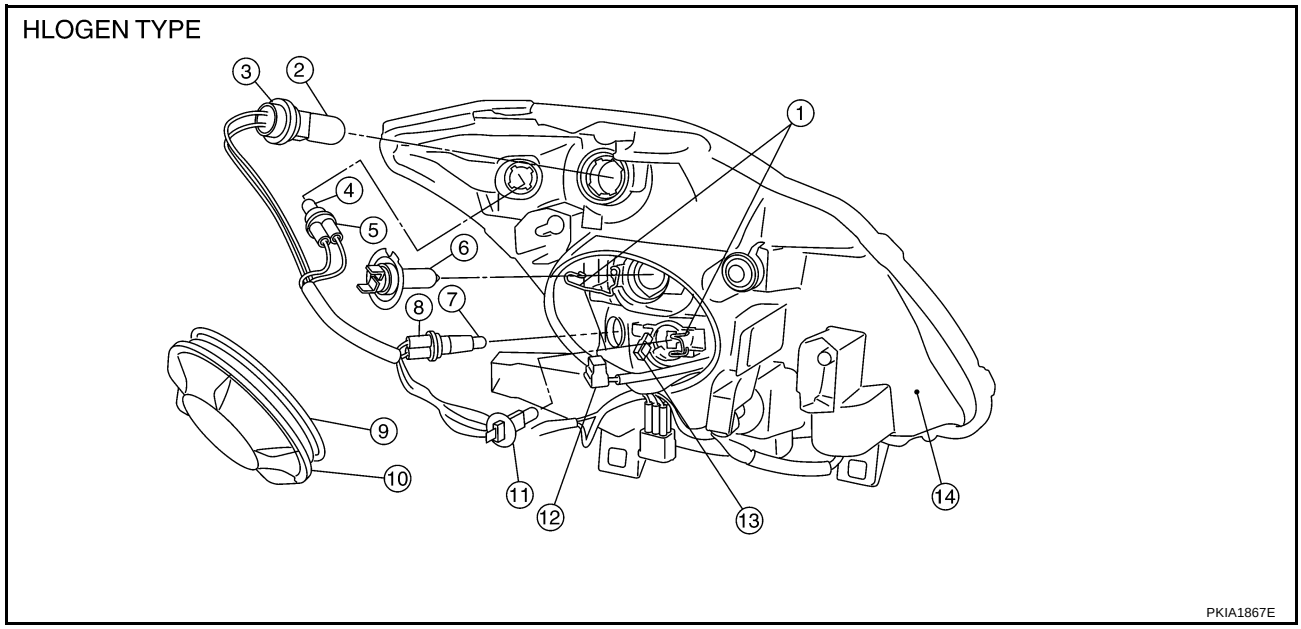
: 6.1 N·m (0.62 kg-m, 54 in-lb)

NOTE:

After installation, perform aiming adjustment. Refer to LT-63, "Aiming Adjustment" .

Disassembly and Assembly

AKS00ABL



1. Retaining spring
2. Front turn signal lamp bulb
3. Front turn signal lamp bulb socket
4. Side marker lamp bulb
5. Side marker lamp bulb socket
6. Halogen bulb (low)
7. Clearance lamp bulb
8. Clearance lamp bulb socket
9. Seal rubber
10. Plastic cap
11. Halogen bulb (high)
12. Halogen bulb socket (low)
13. Halogen bulb socket (high)
14. Headlamp housing assembly

DISASSEMBLY

1. Turn plastic cap counterclockwise and unlock it.
2. Disconnect bulb socket (low).
3. Unlock retaining spring, and remove halogen bulb (low).
4. Disconnect the socket connected to halogen bulb (high).
5. Unlock retaining spring, and remove halogen bulb (high).
6. Turn parking lamp bulb socket counterclockwise and unlock it.
7. Remove parking lamp bulb from its socket.
8. Turn front turn signal lamp bulb socket counterclockwise and unlock it.
9. Remove front turn signal lamp bulb from its socket.
10. Turn front side marker lamp bulb socket counterclockwise and unlock it
11. Remove front side lamp marker lamp bulb from its socket.

ASSEMBLY

Assemble in reverse order of disassembly. Be careful of the following:

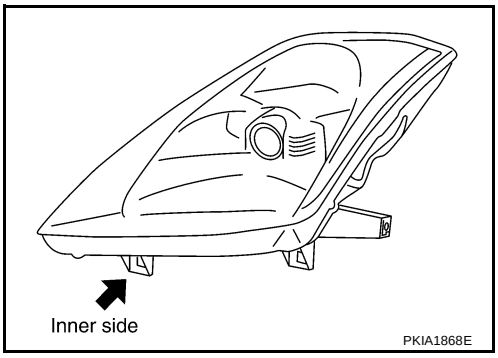
CAUTION:

- **After installing bulb, be sure to install plastic cap and bulb socket securely to insure watertightness.**

Servicing to Replace Headlamps When Damaged

AKS00ABN

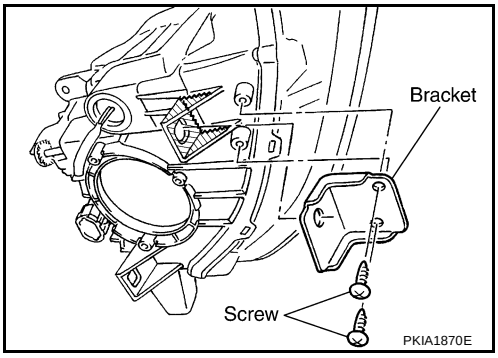
If only installation part as shown in the figure is damaged, and headlamp housing itself is not damaged, repair can be completed easily by installing correction brackets.



INSTALLATION OF HEADLAMP BRACKET

1. Remove headlamps. Refer to LT-65, "Removal and Installation" .
2. Cut damaged section of installation part, then shape with sandpaper.
3. Attach each correction bracket to headlamp housing boss with 2 screws.

RH headlamp	**Inner side**	**26040 CD000**
LH headlamp	**Inner side**	**26090 CD000**

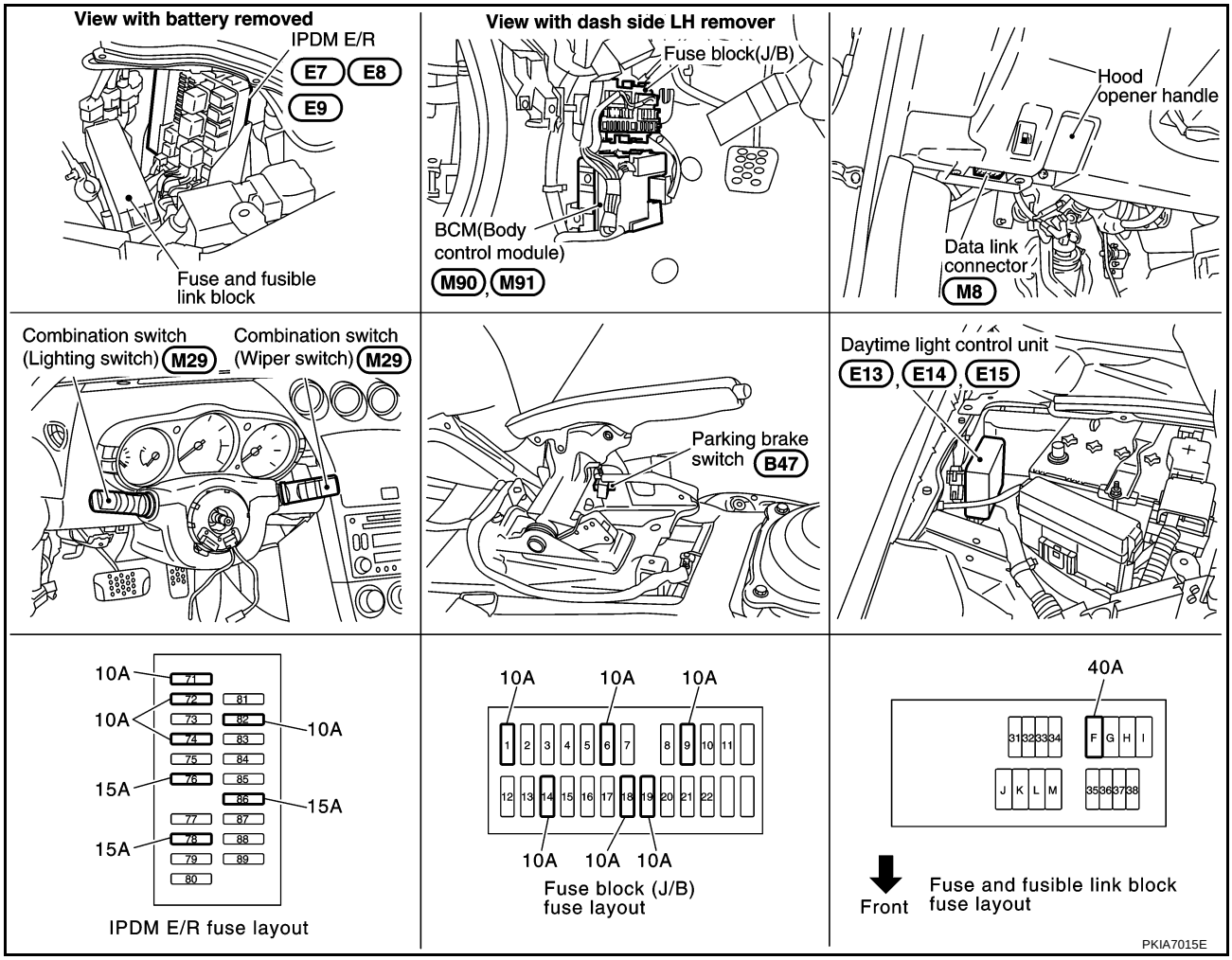


HEADLAMP (FOR CANADA) - XENON TYPE -

PFP:26010

Component Parts and Harness Connector Location

AKS009N4



System Description

AKS009N5

Headlamp system for Canada vehicles is equipped with a daytime light control unit that activates high beam headlamps at approximately half illumination whenever engine is running. If parking brake is applied before engine is started daytime lights will not be illuminated. Daytime lights will illuminate once parking brake is released. Thereafter, daytime lights will continue to operate when parking brake is applied.
And battery saver system is controlled by BCM (body control module).

OUTLINE

Power is supplied at all times

- to headlamp high and low relays [located in IPDM E/R (intelligent power distribution module engine room)]
- through 15A fuse [No. 78, located in IPDM E/R (intelligent power distribution module engine room)]
- to CPU (central processing unit) [located in IPDM E/R (intelligent power distribution module engine room)].

Power is also supplied at all times

- through 40A fusible link [letter F, located in the fuse and fusible link block.]
- to BCM (body control module) terminal 55
- through 10A fuse [No.18, located in fuse block (J/B)]
- to BCM (body control module) terminal 42.

With ignition switch in ON or START position, power is supplied

- to CPU (central processing unit) [located in IPDM E/R (intelligent power distribution module engine room)]
- through 10A fuse [No. 82, located in IPDM E/R (intelligent power distribution module engine room)]

- to daytime light control unit terminal 3
- through 10A fuse [No. 1, located in fuse block (J/B)]
- to BCM (body control module) terminal 38.

With ignition switch in ACC or ON position, power is supplied

- through 10A fuse [No. 6, located in fuse block (J/B)]
- to BCM (body control module) terminal 11.

With ignition switch in START position, power is supplied

- through 10A fuse [No. 9, located in fuse block (J/B)]
- to daytime light control unit terminal 2.

Ground is supplied

- to daytime light control unit terminals 14 and 16
- through groundsE17, E43 and F152
- to IPDM E/R (intelligent power distribution module engine room) terminals 38 and 60
- through grounds E17, E43 and F152
- to BCM (body control module) terminal 52
- through grounds M30 and M66.

HEADLAMP OPERATION

Low Beam Operation

With lighting switch in 2ND position, BCM receives input signal requesting headlamps to illuminate. This input signal is communicated to IPDM E/R across CAN communication lines. CPU in IPDM E/R controls headlamp low relay coil, which when energized, directs power

- through 15A fuse [No. 76, located in IPDM E/R]
- through IPDM E/R terminal 20
- to front combination lamp RH terminal 7, and
- through 15A fuse [No. 86, located in IPDM E/R]
- through IPDM E/R terminal 30
- to front combination lamp LH terminal 7.

Ground is supplied at all times

- to front combination lamp RH terminal 8
- through grounds E17, E43 and F152, and
- to front combination lamp LH terminal 8
- through grounds E17, E43 and F152.

With power and ground supplied, low beam headlamps illuminate.

High Beam Operation (When Engine Stopped) /Flash-to-Pass Operation

With lighting switch in 2ND position and placed in HIGH or PASS position, BCM receives input signal requesting headlamp high beams to illuminate. This input signal is communicated to IPDM E/R across CAN communication lines. CPU in IPDM E/R controls headlamp high relay coil turned on, which when energized, directs power

- through 15A fuse [No. 76, located in IPDM E/R]
- through IPDM E/R terminal 20
- to front combination lamp RH terminal 7, and
- through 15A fuse [No. 86, located in IPDM E/R]
- through IPDM E/R terminal 30
- to front combination lamp LH terminal 7
- through 10A fuse [No.74, located in IPDM E/R]
- through IPDM E/R terminal 28
- to daytime light control unit terminal 4
- through daytime light control unit terminal 7
- to front combination lamp LH terminal 3

- through 10A fuse [No.72, located in IPDM E/R]
- through IPDM E/R terminal 27
- to daytime light control unit terminal 5
- through daytime light control unit terminal 6
- to front combination lamp RH terminal 3.

Ground is supplied

- to front combination lamp LH terminal 4
- through daytime light control unit terminal 9
- to daytime light control unit terminal 14
- through grounds E17, E43 and F152
- to front combination lamp RH terminal 4
- through grounds E17, E43 and F152.

With power and ground supplied, high beam headlamps illuminate.
Unified meter and A/C amp. receives signal from BCM across CAN communication lines, and then combination meter indicator illuminates high beam.

COMBINATION SWITCH READING FUNCTION

Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION" .

EXTERIOR LAMP BATTERY SAVER CONTROL

When combination switch (lighting switch) is in the 2ND position (ON), and ignition switch is turned from ON or ACC to OFF, battery saver control function is activated.
Under this condition, headlamps remain illuminated for 5 minutes, then headlamps are turned off.
Exterior lamp battery saver control mode can be changed by function setting of CONSULT-II.

DAYTIME LIGHT OPERATION

With engine running, lighting switch in the OFF or 1ST position and parking brake released, power is supplied

- through daytime light control unit terminal 7
- to front combination lamp LH terminal 3
- through front combination lamp LH terminal 4
- to daytime light control unit terminal 9
- through daytime light control unit terminal 6
- to front combination lamp RH terminal 3.

Ground is supplied

- to front combination lamp RH terminal 4
- through grounds E17, E43 and F152, and
- to daytime light control unit terminal 14
- through grounds E17, E43 and F152.

Because high beam headlamps are now wired in series, they operate at half illumination.
If the lighting switch is in the 2nd position, daytime light operation is canceled.

OPERATION

After starting engine with lighting switch in the “OFF” or 1ST position, headlamp high beam automatically turns on. Lighting switch operations other than above are same as conventional light systems.

Engine		With engine stopped									With engine running								
Lighting switch		OFF			1ST			2ND			OFF			1ST			2ND		
		Hi	Lo	P	Hi	Lo	P	Hi	Lo	P	Hi	Lo	P	Hi	Lo	P	Hi	Lo	P
Head-lamp	High beam	–	–	–	–	–	×	×	–	×	●*	●*	×	●*	●*	×	×	–	×
	Low beam	–	–	–	–	–	×	×	×	×	–	–	×	–	–	×	×	×	×

Engine	With engine stopped									With engine running								
Lighting switch	OFF			1ST			2ND			OFF			1ST			2ND		
	Hi	Lo	P	Hi	Lo	P	Hi	Lo	P	Hi	Lo	P	Hi	Lo	P	Hi	Lo	P
Tail lamp	–	–	–	×	×	×	×	×	×	–	–	–	×	×	×	×	×	×
License and instrument illumination lamp	–	–	–	×	×	×	×	×	×	–	–	–	×	×	×	×	×	×

- Hi: “HIGH BEAM” position
- Lo: “LOW BEAM” position
- P: “FLASH TO PASS” position
- ×: Lamp “ON”
- –: Lamp “OFF”
- ●: Lamp dims. (Added functions)
- *: When starting the engine with the parking brake released, the daytime light will come ON.
  When starting the engine with the parking brake pulled, the daytime light will not come ON.

XENON HEADLAMP

Xenon type headlamp is adopted to low beam headlamps. Xenon bulbs do not use a filament. Instead, they produce light when a high voltage current is passed between two tungsten electrodes through a mixture of xenon (an inert gas) and certain other metal halides. In addition to added lighting power, electronic control of the power supply gives headlamps stable quality and tone color.
Following are some of the many advantages of xenon type headlamp.

- The light produced by headlamps is a white color comparable to sunlight that is easy on the eyes.
- Light output is nearly double that of halogen headlamps, affording increased area of illumination.
- The light features a high relative spectral distribution at wavelengths to which the human eye is most sensitive. This means that even in the rain, more light is reflected back from the road surface toward the vehicle, for added visibility.
- Power consumption is approximately 25 percent less than halogen headlamps, reducing battery load.

CAN Communication System Description

AKS009N6

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

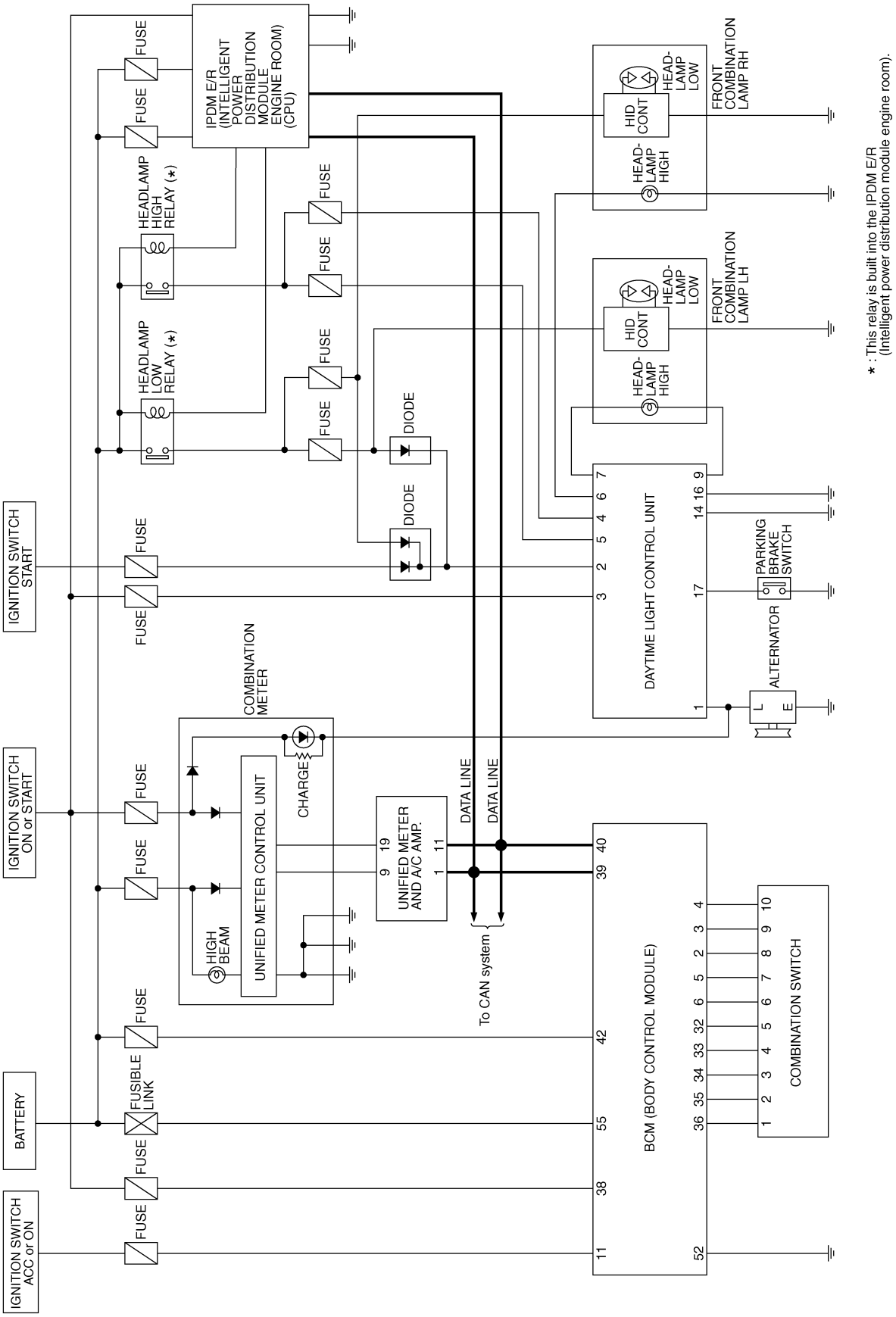
CAN Communication Unit

AKS009N7

Refer to LAN-5, "CAN Communication Unit" .

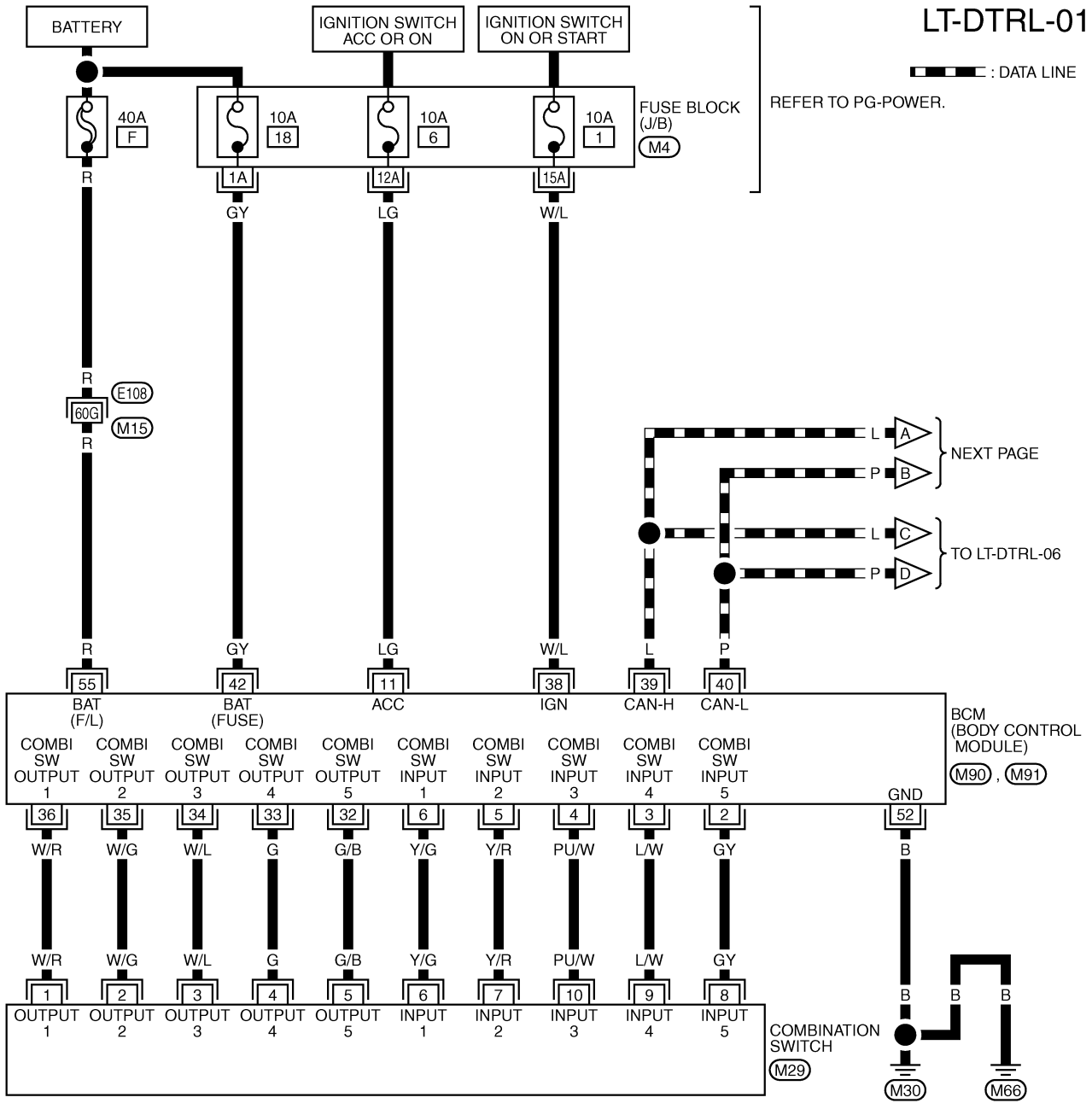
Schematic

AKS009N8



Wiring Diagram — DTRL —

AKS009N9



REFER TO THE FOLLOWING.

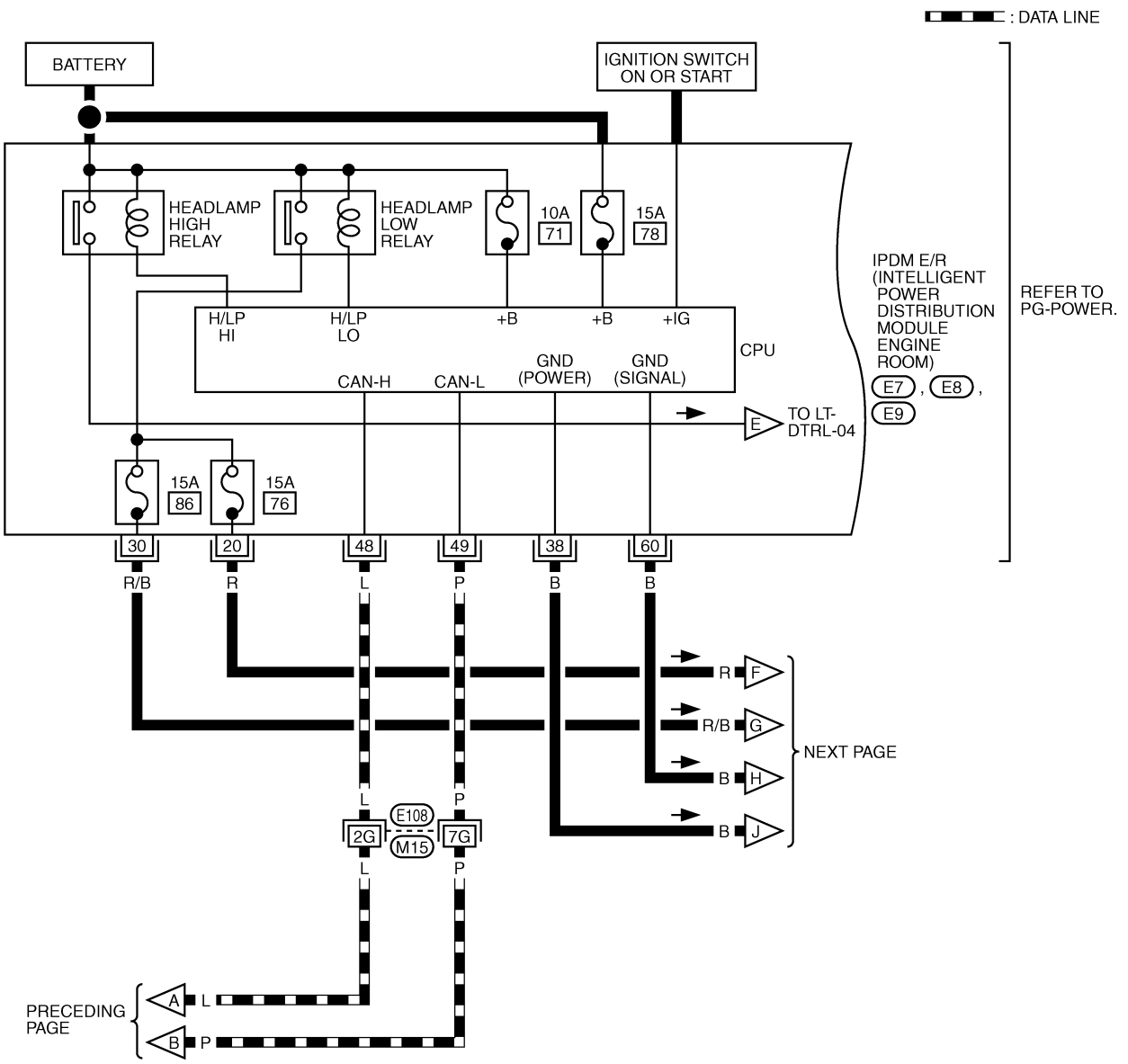
E108 -SUPER MULTIPLE JUNCTION (SMJ)

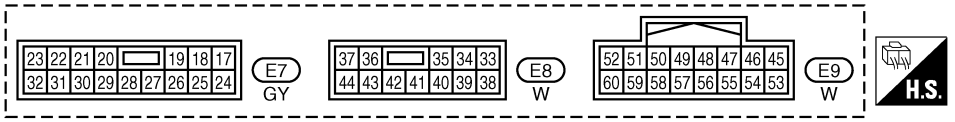
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

M90 , M91 -ELECTRICAL UNITS

TKWT1781E

LT-DTRL-02

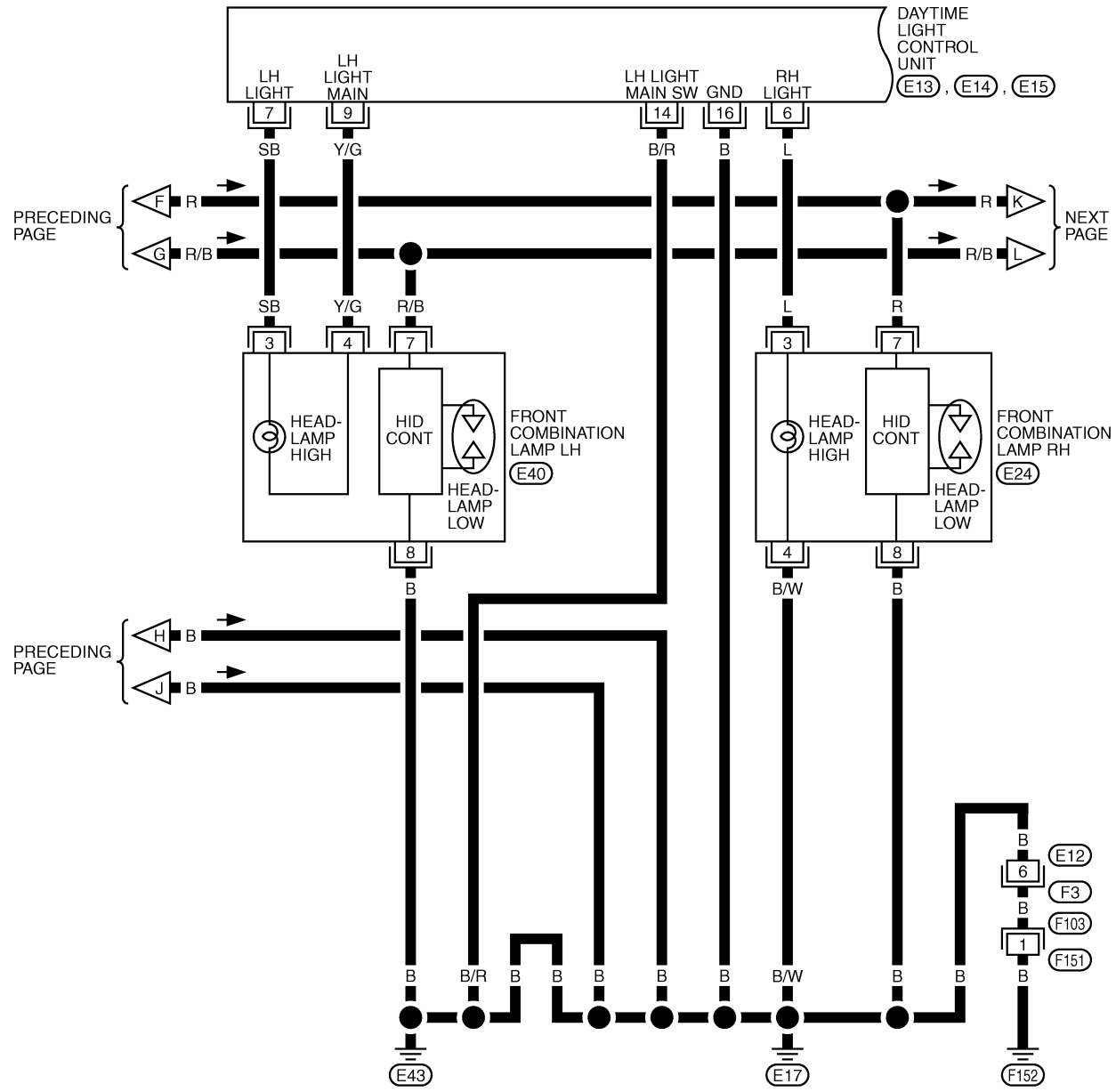


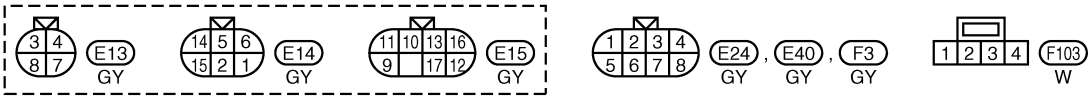


REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT1782E

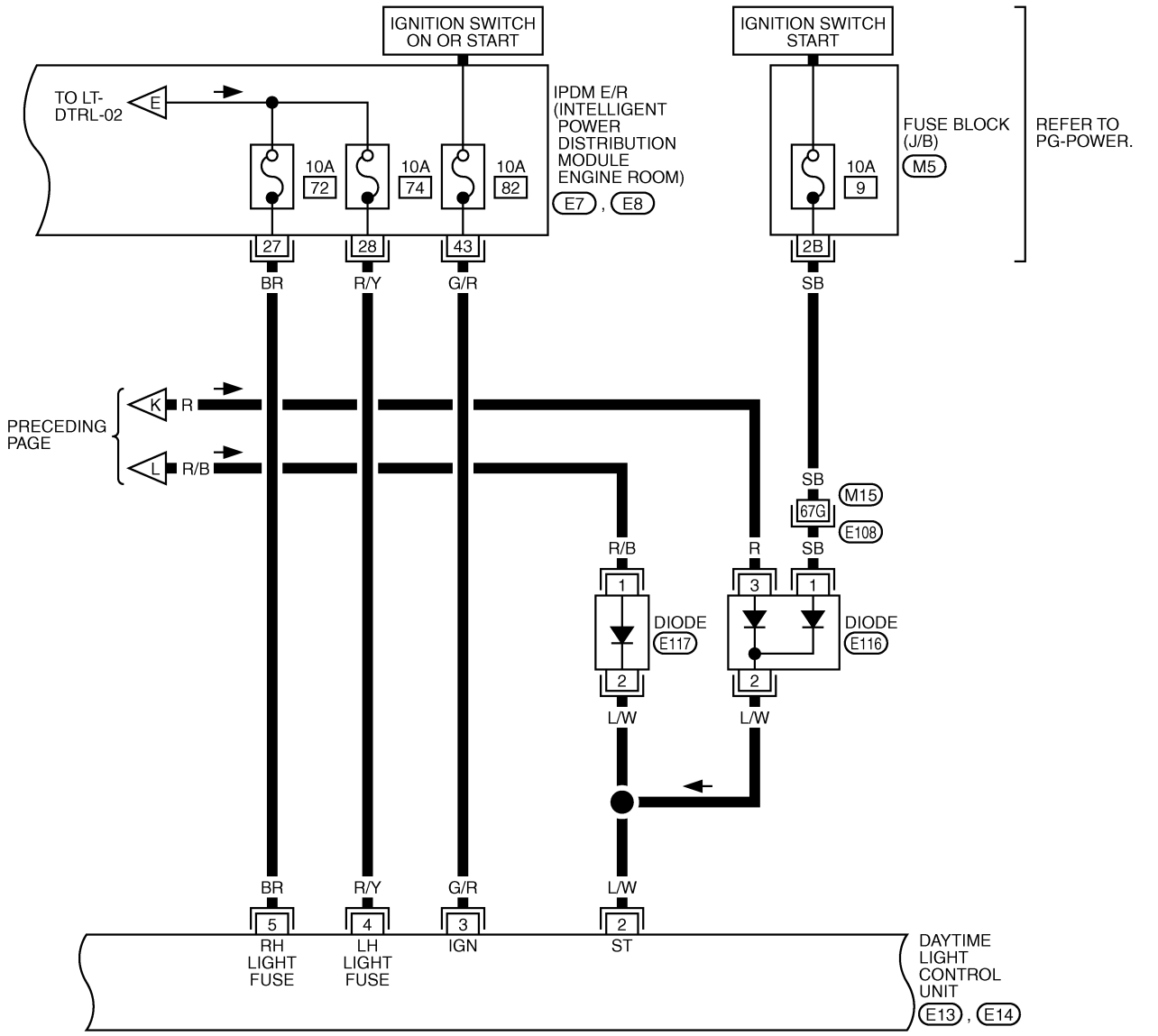
LT-DTRL-03

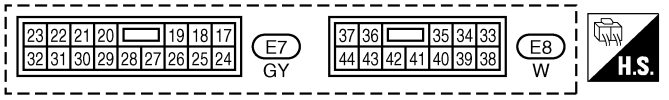




TKWT1783E

LT-DTRL-04





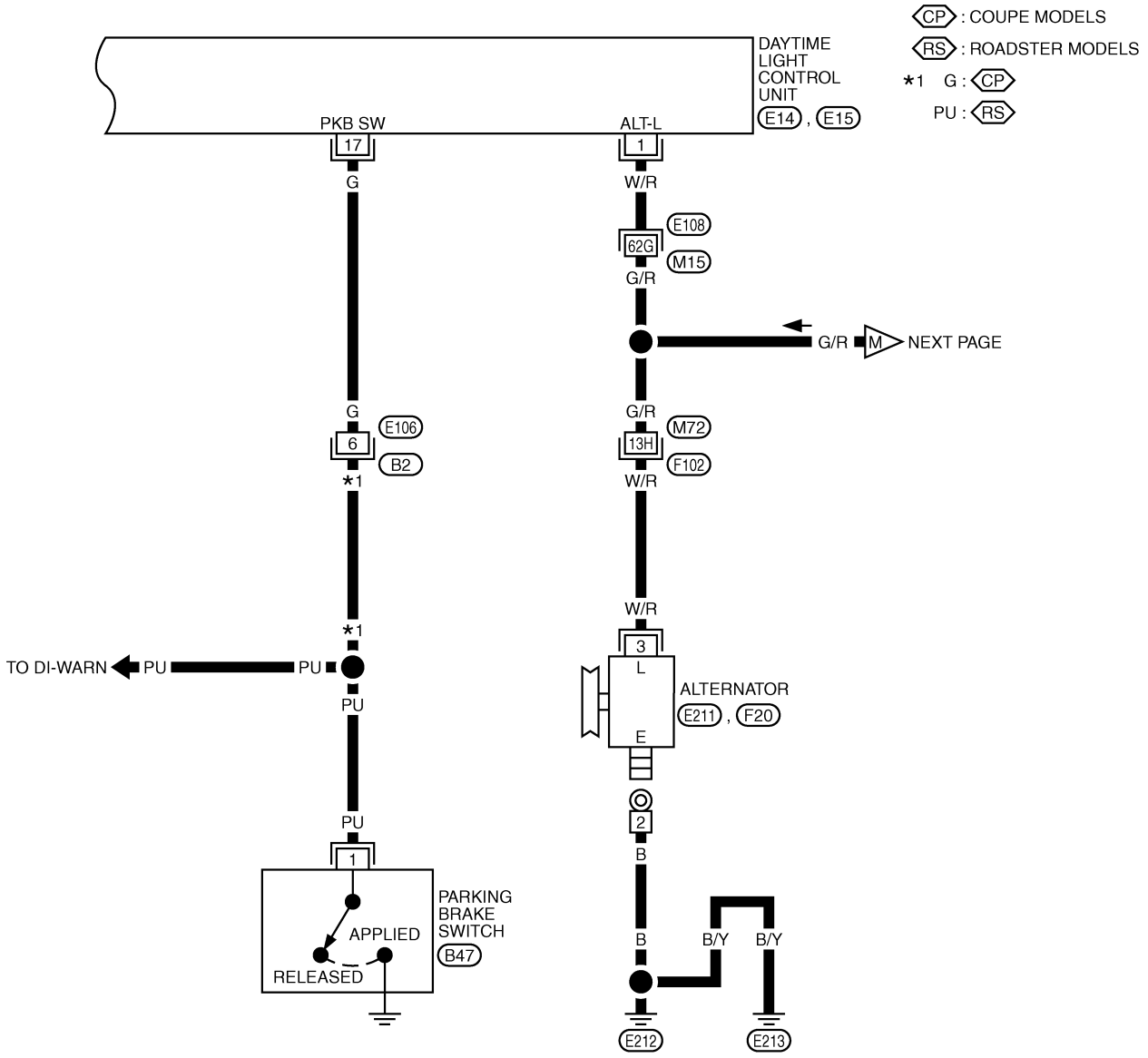
REFER TO THE FOLLOWING.

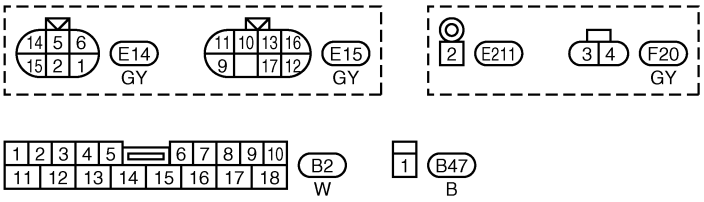
E108 -SUPER MULTIPLE JUNCTION (SMJ)

M5 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT1784E

LT-DTRL-05



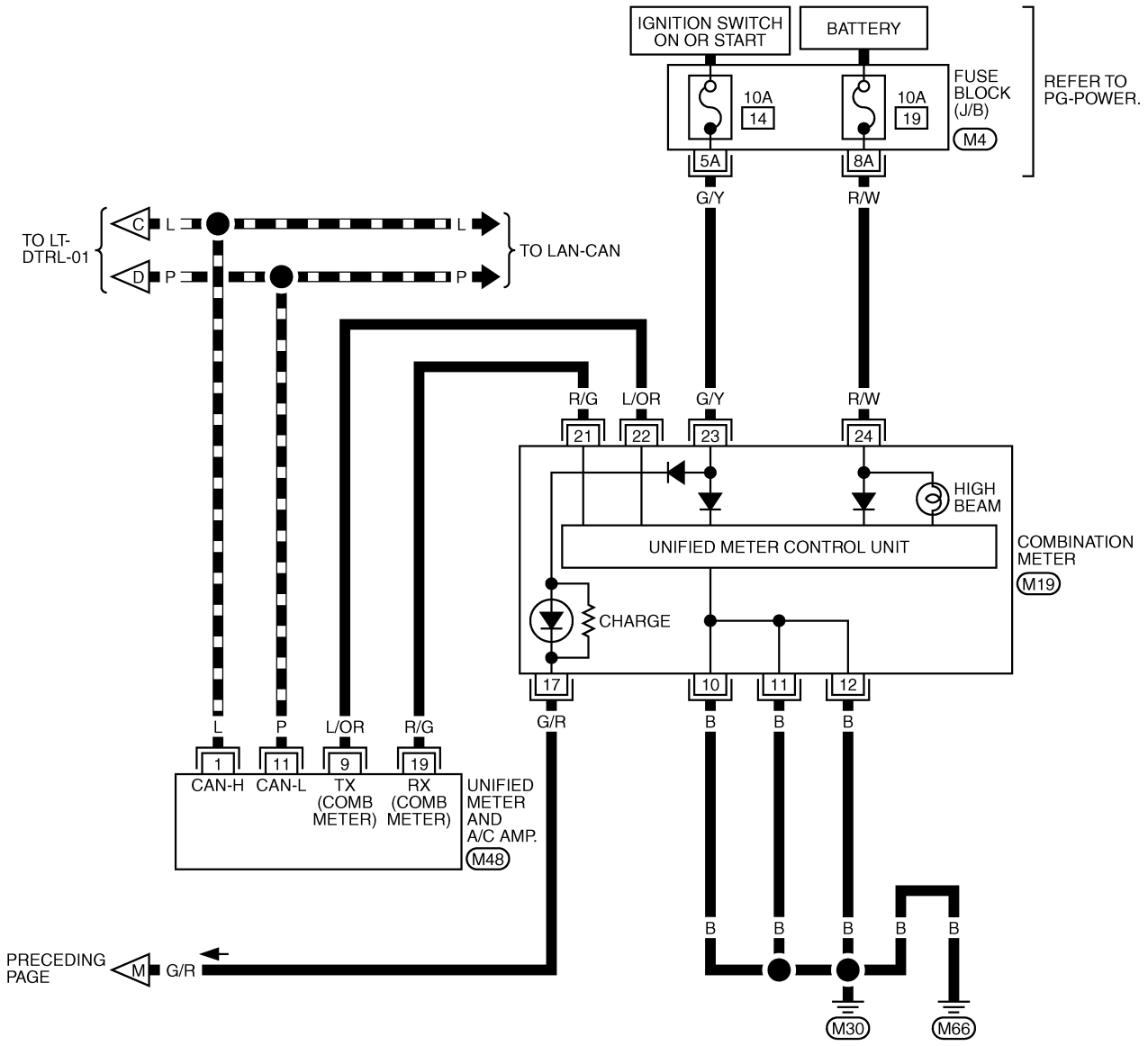


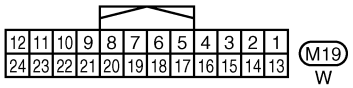
REFER TO THE FOLLOWING.
E108 , F102 -SUPER MULTIPLE JUNCTION (SMJ)

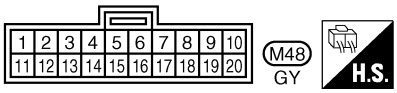
TKWT1589E

LT-DTRL-06

: DATA LINE







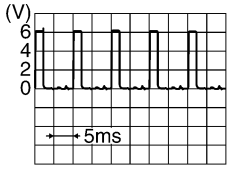
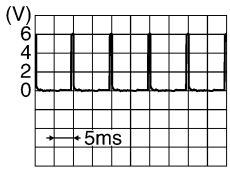
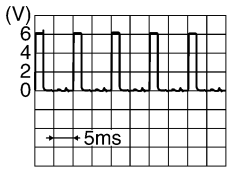
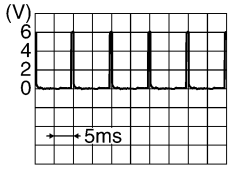
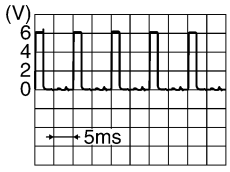
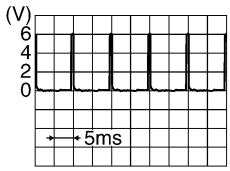
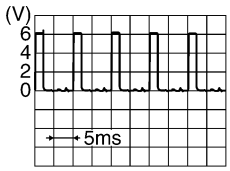
REFER TO THE FOLLOWING.

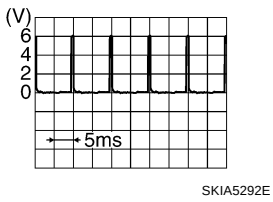
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT1730E

Terminals and Reference Values for BCM

AKS00AOY

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
2	GY	Combination switch input 5	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E
3	L/W	Combination switch input 4	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
4	PU/W	Combination switch input 3	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E
5	Y/R	Combination switch input 2	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
6	Y/G	Combination switch input 1			
11	LG	Ignition switch (ACC)	ACC	—	Battery voltage
32	G/B	Combination switch output 5	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E
33	G	Combination switch output 4	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
34	W/L	Combination switch output 3	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
35	W/G	Combination switch output 2	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
36	W/R	Combination switch output 1			
38	W/L	Ignition switch (ON)	ON	—	Battery voltage
39	L	CAN– H	—	—	—
40	P	CAN– L	—	—	—
42	GY	Battery power supply	OFF	—	Battery voltage
52	B	Ground	ON	—	Approx. 0V
55	R	Battery power supply	OFF	—	Battery voltage

Terminals and Reference Values for IPDM E/R

AKS009QR

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
20	R	Headlamp low (RH)	ON	Lighting switch 2ND position	OFF	Approx. 0V
					ON	Battery voltage
27	BR	Headlamp high (RH)	ON	Lighting switch HIGH or PASS position	OFF	Approx. 0V
					ON	Battery voltage
28	R/Y	Headlamp high (LH)	ON	Lighting switch HIGH or PASS position	OFF	Approx. 0V
					ON	Battery voltage
30	R/B	Headlamp low (LH)	ON	Lighting switch 2ND position	OFF	Approx. 0V
					ON	Battery voltage
38	B	Ground	ON	—		Approx. 0V
43	G/R	Ignition switch (ON)	ON	—		Battery voltage
48	L	CAN– H	—	—		—
49	P	CAN– L	—	—		—
60	B	Ground	ON	—		Approx. 0V

Terminals and Reference Value for Daytime Light Control Unit

AKS009NA

Terminal No.	Wire color	Item	Condition	Reference value
1	W/R	Alternator	When turning ignition switch to “ON”	Approx. 0V
			When engine is running	Battery voltage
			When turning ignition switch to “OFF”	Approx. 0V
2	L/W	Start signal	When turning ignition switch to “START”	Battery voltage
			When turning ignition switch to “ON” from “START”	Approx. 0V
			When turning ignition switch to “OFF”	Approx. 0V
3	G/R	Ignition power supply	When turning ignition switch to “ON”	Battery voltage
4	R/Y	Lighting switch (LH hi beam)	When turning lighting switch to “HI BEAM”	Battery voltage
5	BR	Lighting switch (RH hi beam)	When turning lighting switch to “HI BEAM”	Battery voltage
6	L	RH hi beam	When lighting switch is turned to the 2ND position with “HI BEAM” or “FLASH TO PASS” position	Battery voltage
			When releasing parking brake with engine running and turning lighting switch to “OFF” (daytime light operation) **CAUTION:** **Block wheels and ensure selector lever is in N or P position.**	Battery voltage
7	SB	LH hi beam	When lighting switch is turned to the 2ND position with “HI BEAM” or “FLASH TO PASS” position	Battery voltage
			When releasing parking brake with engine running and turning lighting switch to “OFF” (daytime light operation) **CAUTION:** **Block wheels and ensure selector lever is in N or P position.**	Battery voltage
9	Y/G	LH hi beam (ground)	When turning lighting switch to the 2ND position with “HI BEAM” or “FLASH TO PASS” position	Approx. 0V
			When releasing parking brake with engine running and turning lighting switch to “OFF” (daytime light operation) **CAUTION:** **Block wheels and ensure selector lever is in N or P position.**	Approx. 0V
14	B/R	Ground	—	—
16	B	Ground	—	—
17	G	Parking brake switch	When parking brake is released	Battery voltage
			When parking brake is allied	Approx. 0V

How to Proceed With Trouble Diagnosis

AKS009NB

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-68, "System Description" .
3. Perform the preliminary check. Refer to LT-82, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Does headlamp operate normally? If YES: GO TO 6. If NO: GO TO 4.
6. INSPECTION END

Preliminary Check

AKS00AOZ

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES

- Check for blown fuses.

UNIT	POWER SOURCE	Fuse and fusible link No.
BCM	Battery	F
		18
	Ignition switch ON or START position	1
	Ignition switch ACC or ON position	6
IPDM E/R	Battery	72
		74
		76
		86
	Ignition switch ON or START	82
DAYTIME LIGHT CONTROL UNIT	Ignition switch START position	9

Refer to LT-73, "Wiring Diagram — DTRL —" .

OK or NG

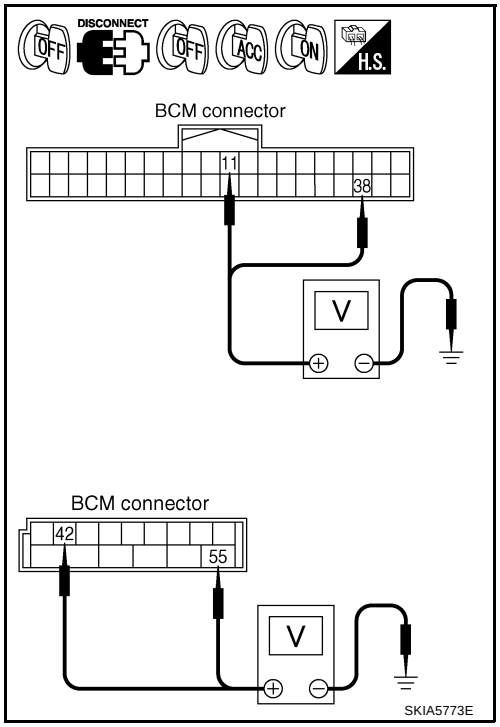
OK >> GO TO 2.

NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Disconnect BCM connector.
2. Check voltage between BCM harness connector and ground.

Terminals			Ignition switch position		
(+)		(-)	OFF	ACC	ON
Connector	Terminal (Wire color)				
M90	11 (LG)	Ground	0V	Battery voltage	Battery voltage
	38 (W/L)		0V	0V	Battery voltage
M91	42 (GY)		Battery voltage	Battery voltage	Battery voltage
	55 (R)		Battery voltage	Battery voltage	Battery voltage



OK or NG

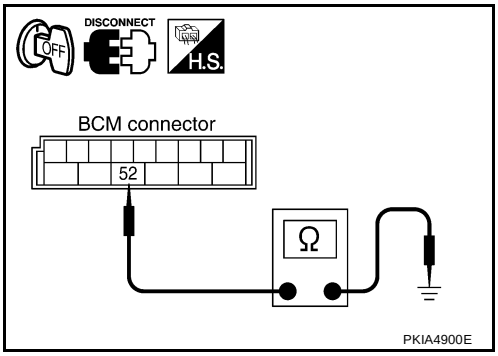
OK >> GO TO 3.

NG >> Check harness for open or short between BCM and fuse.

3. CHECK GROUND CIRCUIT

Check continuity between BCM harness connector and ground.

Terminals			Continuity
Connector	Terminal (Wire color)	Ground	
M91	52 (B)		Yes



OK or NG

OK >> INSPECTION END
NG >> Check ground circuit harness.

CONSULT-II Functions (BCM)

AKS009ND

CONSULT-II performs the following functions communicating with BCM.

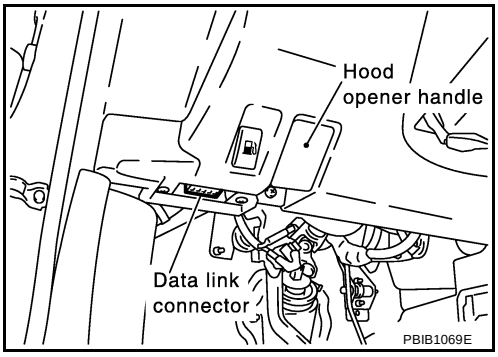
BCM diagnosis part	Check item, diagnosis mode	Description
HEADLAMP	WORK SUPPORT	Changes the setting for each function.
	DATA MONITOR	Displays BCM input data in real time.
	ACTIVE TEST	Operation of electrical loads can be checked by sending drive signal to them.
BCM	CAN DIAG SUPPORT MNTR	The result transmit/receive diagnosis of CAN communication can be read.

CONSULT-II BASIC OPERATION

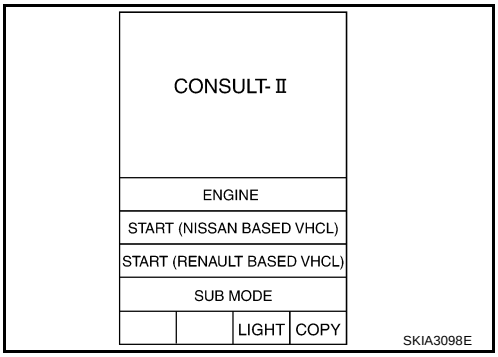
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

1. With ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to data link connector, then turn ignition switch ON.

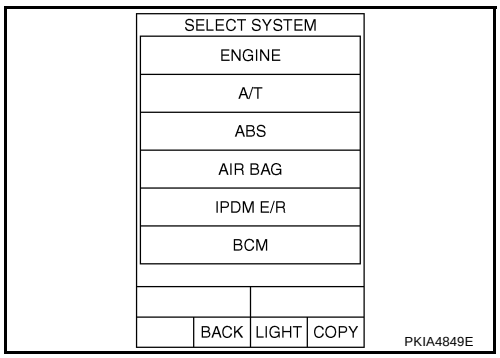


2. Touch “START(NISSAN BASED VHCL)”.

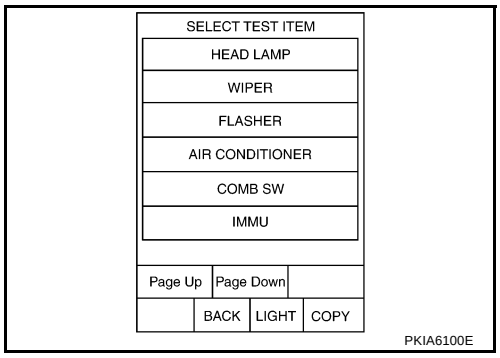


3. Touch “BCM” on “SELECT SYSTEM” screen.

If “BCM” is not indicated, refer to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



4. Touch “HEAD LAMP” on “SELECT TEST ITEM” screen.



WORK SUPPORT

Operation Procedure

1. Touch “HEAD LAMP” on “SELECT TEST ITEM” screen.
2. Touch “WORK SUPPORT” on “SELECT DIAG MODE” screen.
3. Touch “BATTERY SAVER SET” on “SELECT WORK ITEM” screen.
4. Touch “START”.
5. Touch “CHANGE SET”.
6. The setting will be changed and “CUSTOMIZING COMPLETED” will be displayed.
7. Touch “END”.

Display Item List

Item	Description	CONSULT-II	Factory setting
BATTERY SAVER SET	Exterior lamp battery saver control mode can be changed in this mode. Selects exterior lamp battery saver control mode between two ON/OFF.	ON	×
		OFF	—

DATA MONITOR

Operation Procedure

1. Touch “HEAD LAMP” on “SELECT TEST ITEM” screen.
2. Touch “DATA MONITOR” on “SELECT DIAG MODE” screen.
3. Touch either “ALL SIGNALS” or “SELECTION FROM MENU” on “DATA MONITOR” screen.

ALL SIGNALS	Monitors all the signals.
SELECTIONFROMMENU	Selects and monitors individual signal.

4. Touch “START”.
5. When “SELECTION FROM MENU” is selected, touch individual items to be monitored. When “ALL SIGNALS” is selected, all the items will be monitored.
6. Touch “RECORD” while monitoring, then the status of the monitored item can be recorded. To stop recording, touch” STOP”.

Display Item List

Monitor item		Contents
IGN ON SW	“ON/OFF”	Displays “IGN position (ON)/OFF, ACC position (OFF)” judged from the ignition switch signal.
ACC ON SW	“ON/OFF”	Displays “ACC (ON)/OFF, Ignition OFF (OFF)” status judged from ignition switch signal.
HI BEAM SW	“ON/OFF”	Displays status (high beam switch: ON/Others: OFF) of high beam switch judged from lighting switch signal.
HEAD LAMP SW 1	“ON/OFF”	Displays status (headlamp switch 1: ON/Others: OFF) of headlamp switch 2 judged from lighting switch signal.
HEAD LAMP SW 2	“ON/OFF”	Displays status (headlamp switch 2: ON/Others: OFF) of headlamp switch 2 judged from lighting switch signal.
LIGHT SW 1 ST	“ON/OFF”	Displays status (lighting switch 1st position: ON/Others: OFF) of lighting switch judged from lighting switch signal.
AUTO LIGHT SW[NOTE]	“ON/OFF”	—
PASSING SW	“ON/OFF”	Displays status (flash-to-pass switch: ON/Others: OFF) of flash-to-pass switch judged from lighting switch signal.
FR FOG SW[NOTE]	“ON/OFF”	—
DOOR SW - DR	“ON/OFF”	Displays status of driver door as judged from driver door switch signal. (Door is open: ON/ Door is closed: OFF)
DOOR SW - AS	“ON/OFF”	Displays status of passenger door as judged from passenger door switch signal. (Door is open: ON/Door is closed: OFF)
DOOR SW - RR[NOTE]	“OFF”	—
DOOR SW - RL[NOTE]	“OFF”	—
BACK DOOR SW	“ON/OFF”	● Displays status of back door as judged from back door switch signal. (Coupe models) ● Displays status of rear trunk hood as judged from trunk lamp switch signal. (Roadster models)
TURN SIGNAL R	“ON/OFF”	Displays status (Turn right: ON/Others: OFF) as judged from lighting switch signal.
TURN SIGNAL L	“ON/OFF”	Displays status (Turn left: ON/Others: OFF) as judged from lighting switch signal.
CARGO LAMP SW[NOTE]	“OFF”	—

NOTE:
This item is displayed, but cannot monitor it.

ACTIVE TEST

Operation Procedure

1. Touch “HEAD LAMP” on “SELECT TEST ITEM” screen.
2. Touch “ACTIVE TEST” on “SELECT DIAG MODE” screen.
3. Touch item to be tested and check operation of the selected item.
4. During the operation check, touching “BACK” deactivates the operation.

Display Item List

Test item	Description
TAIL LAMP	Allows tail lamp relay to operate by switching ON–OFF.
HEAD LAMP	Allows headlamp relay to operate by switching ON–OFF.
FR FOG LAMP[NOTE]	—
CORNERING LAMP[NOTE]	—

NOTE:
This item is displayed, but cannot test it.

CONSULT-II Functions (IPDM E/R)

AKS00ABO

CONSULT-II performs the following functions communicating with IPDM E/R.

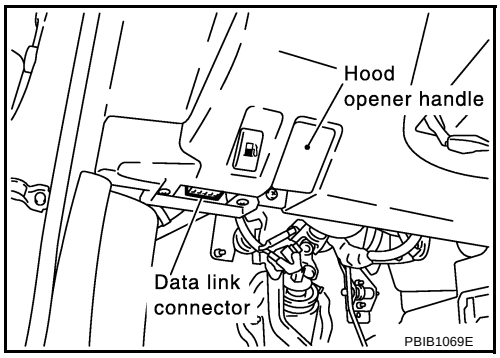
Check Item, Diagnosis Mode	Description
SELF-DIAGNOSTIC RESULTS	IPDM E/R performs self-diagnosis of CAN communication.
DATA MONITOR	The input/output data of IPDM E/R is displayed in real time.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
ACTIVE TEST	IPDM E/R sends a drive signal to electronic components to check their operation.

CONSULT-II BASIC OPERATION

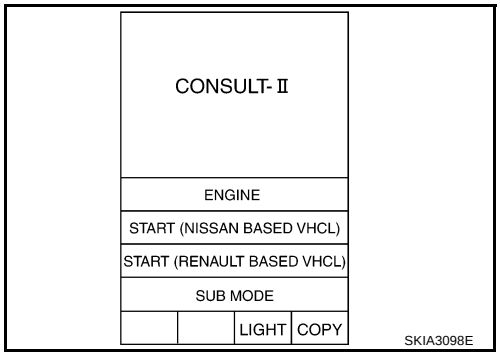
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

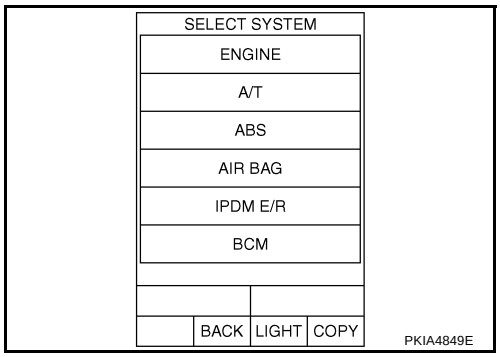
1. With ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to data link connector, then turn ignition switch ON.



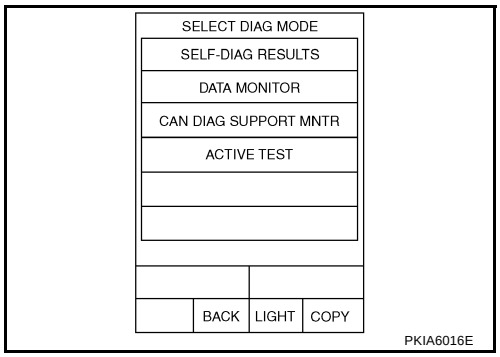
2. Touch “START (NISSAN BASED VHCL)”.



3. Touch “IPDM E/R” on “SELECT SYSTEM” screen.
If “IPDM E/R” is not displayed, print “SELECT SYSTEM” screen, then refer to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



4. Select the desired part to be diagnosed on “SELECT DIAG MODE” screen.



DATA MONITOR

Operation Procedure

1. Touch “DATA MONITOR” on “SELECT DIAG MODE ” screen.
2. Touch “ALL SIGNALS”, “MAIN SIGNALS” or “SELECTION FROM MENU” on “DATA MONITOR” screen.

ALL SIGNALS	All items will be monitored.
MAIN SIGNALS	Monitor the predetermined item.
SELECTION FROM MENU	Select any item for monitoring.

3. Touch “START”.
4. Touch the required monitoring item on “SELECTION FROM MENU”. In “ALL SIGNALS”, all items are monitored. In “MAIN SIGNALS”, predetermined items are monitored.
5. Touch “RECORD” while monitoring to record the status of the item being monitored. To stop recording, touch “STOP”.

All Signals, Main Signals, Selection From Menu

Item name	CONSULT-II screen display	Display or unit	Monitor item selection			Description
			ALL SIG-NALS	MAIN SIGNALS	SELECTION FROM MENU	
Position lights request	TAIL&CLR REQ	ON/OFF	×	×	×	Signal status input from BCM
Headlamp low beam request	HL LO REQ	ON/OFF	×	×	×	Signal status input from BCM
Headlamp high beam request	HL HI REQ	ON/OFF	×	×	×	Signal status input from BCM

NOTE:
Perform monitoring of IPDM E/R data with ignition switch ON. When ignition switch is at ACC, the display may not be correct.

ACTIVE TEST

Operation Procedure

1. Touch “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Touch item to be tested, and check operation.
3. Touch “START”.
4. Touch “STOP” while testing to stop the operation.

Test item	CONSULT-II screen display	Description
Tail lamp relay output	TAIL LAMP	Allows tail lamp relay to operate by switching operation ON-OFF at your option.
Headlamp relay (HI, LO) output	LAMPS	Allows headlamp relay (HI, LO) to operate by switching operation (OFF, HI ON, LO ON) at your option (Headlamp high beam repeats ON– OFF every 1 second).

SELF-DIAGNOSTIC RESULTS

Refer to PG-21, "SELF-DIAG RESULTS" .

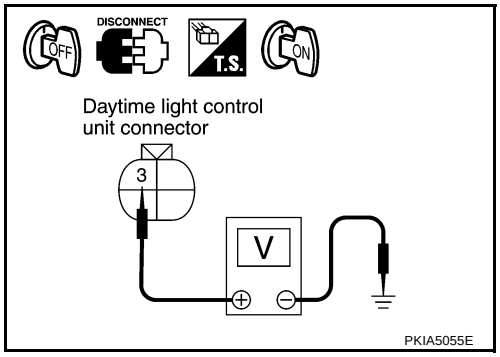
Daytime Light Control Does Not Operate Properly

AKS009NE

1. CHECK DAYTIME LIGHT CONTROL UNIT

1. Turn ignition switch OFF.
2. Disconnect daytime light control unit connectors.
3. Turn ignition switch ON.
4. Check voltage between daytime light control unit harness connector E13 terminal 3 (G/R) and ground.

3 (G/R) – Ground : Battery voltage should exist.



OK or NG

OK >> GO TO 2.
NG >> Repair or replace daytime light control unit power supply circuit harness.

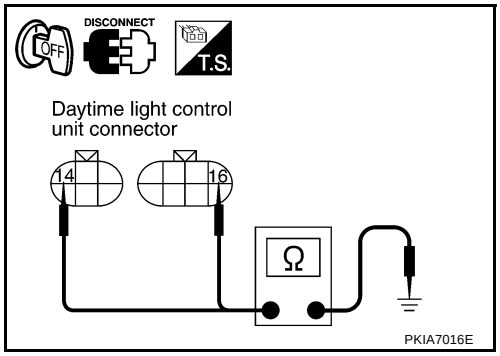
2. CHECK DAYTIME LIGHT CONTROL UNIT AND GROUND

1. Check continuity between daytime light control unit harness connector E14 terminal 14 (B/R) and ground.

14 (B/R) – Ground : Continuity should exist.

2. Check continuity between daytime light control unit harness connector E15 terminal 16 (B) and ground.

16 (B) – Ground : Continuity should exist.



OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

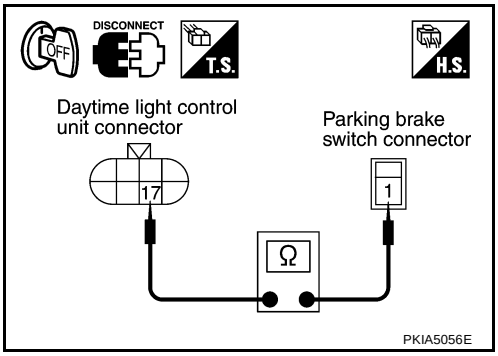
3. CHECK PARKING BRAKE SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect daytime light control unit connector and parking brake switch connector.
3. Check harness continuity between daytime light control unit harness connector E15 terminal 17 (G) and parking brake switch harness connector B47 terminal 1 (PU).

17 (G) – 1 (PU) : Continuity should exist.

OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.



4. CHECK PARKING BRAKE SWITCH

1. Connect daytime light control unit connector and parking brake switch connector.
2. Turn ignition switch ON.
3. Check voltage between parking brake switch connector B47 terminal 1 (PU) and ground, when parking brake is released.

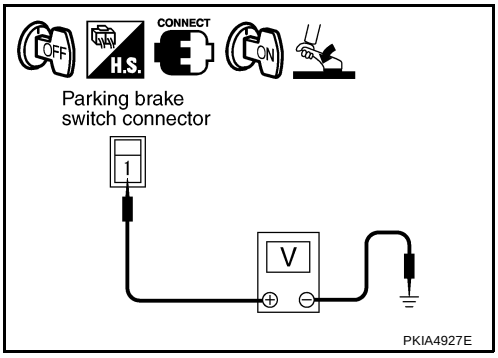
1 (PU) – Ground : Battery voltage should exist.

4. Check voltage between parking brake switch connector B47 terminal 1(PU) and ground, when parking brake is applied.

1 (PU) – Ground : Approx. 0V

OK or NG

OK >> GO TO 5.
NG >> Replace parking brake switch.



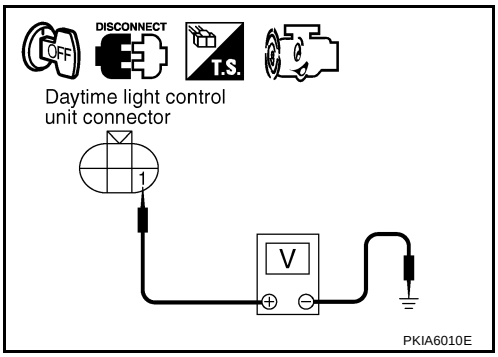
5. CHECK ALTERNATOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect daytime light control unit connector.
3. Start engine running.
4. Check voltage between daytime light control unit harness connector E14 terminal 1 (W/R) and ground.

1 (W/R) – Ground : Battery voltage should exist.

OK or NG

OK >> GO TO 6.
NG >> Repair harness or connector.



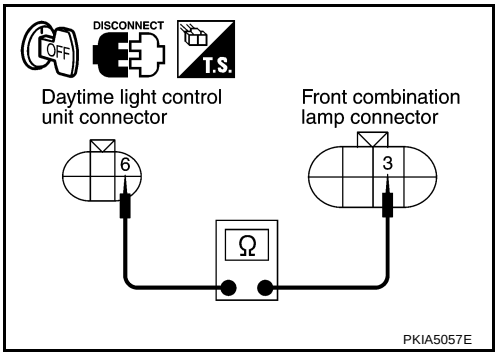
6. CHECK DAYTIME LIGHT CONTROL UNIT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect daytime light control unit connector and front combination lamp RH connector.
3. Check harness continuity between daytime light control unit harness connector E14 terminal 6 (L) and front combination lamp RH harness connector E24 terminal 3 (L).

6 (L) – 3 (L) : Continuity should exist.

OK or NG

OK >> Replace daytime light control unit.
NG >> Repair harness or connector.



Headlamp High Beam Does Not Illuminate (Both Sides)

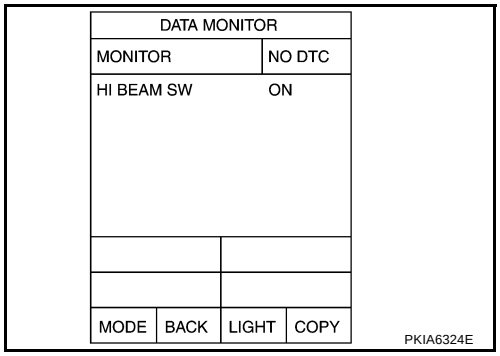
AKS00AT9

1. CHECK COMBINATION SWITCH INPUT SIGNAL

With CONSULT-II

Select “BCM” on CONSULT-II, With “HEAD LAMP” data monitor, make sure “HI BEAM SW” turns ON-OFF linked with operation of lighting switch.

When lighting switch is HIGH BEAM position : HI BEAM SW ON



Without CONSULT-II

Refer to LT-170, "Combination Switch Inspection" .

OK or NG

OK >> GO TO 2.

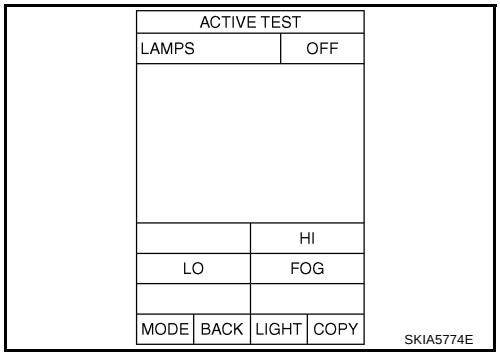
NG >> Check lighting switch. Refer to LT-170, "Combination Switch Inspection" .

2. HEADLAMP ACTIVE TEST

With CONSULT-II

1. Select “IPDM E/R” on CONSULT-II, and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Select “LAMPS” on “SELECT TEST ITEM” screen.
3. Touch “HI” screen.
4. Make sure headlamp high beam operation.

Headlamp high beam should operate.
(Headlamp high beam repeats ON-OFF every 1 second).



Without CONSULT-II

1. Start auto active test. Refer to PG-24, "Auto Active Test" .
2. Make sure headlamp high beam operation.

Headlamp high beam should operate.

OK or NG

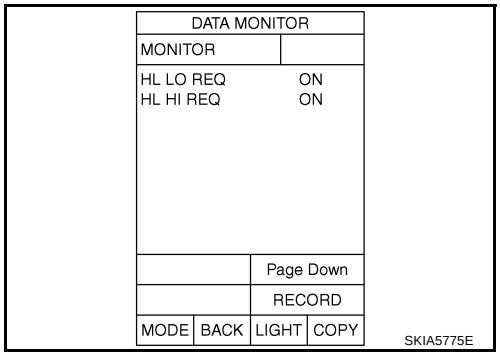
OK >> GO TO 3.

NG >> GO TO 4.

3. CHECK IPDM E/R

1. Select “IPDM E/R” on CONSULT-II, and select “DATA MONITOR” on “SELECT DIAG MODE” screen.
2. Make sure “HL LO REQ” and “HL HI REQ” turns ON when lighting switch is in HIGH BEAM position.

When lighting switch is HIGH BEAM position : HL LO REQ ON
: HL HI REQ ON



OK or NG

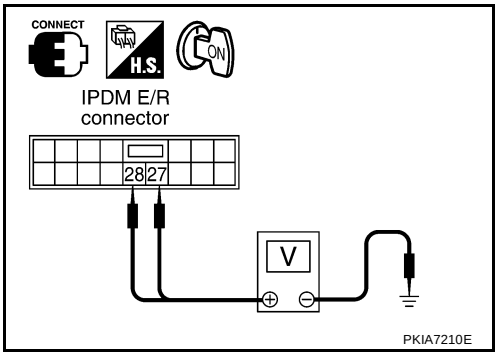
OK >> Replace IPDM E/R.

NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

4. CHECK HEADLAMP INPUT SIGNAL

With CONSULT-II

1. Select “IPDM E/R” on CONSULT-II, and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Select “LAMPS” on “SELECT TEST ITEM” screen.
3. Touch “HI” screen.
4. When headlamp high beam is operating, check voltage between front combination lamp RH and LH harness connector and ground (Headlamp high beam repeats ON–OFF every 1 second).



Terminals			Voltage
(+)		(-)	
Connector	Terminal (Wire color)		
E7	27 (BR)	Ground	Battery voltage
	28 (R/Y)		

Without CONSULT-II

1. Start auto active test. Refer to PG-24, "Auto Active Test" .
2. When headlamp high beam is operating, check voltage between front combination lamp RH and LH harness connector and ground.

Terminals			Voltage
(+)		(-)	
Connector	Terminal (Wire color)		
E7	27 (BR)	Ground	Battery voltage
	28 (R/Y)		

OK or NG

OK >> Check headlamp bulbs.
NG >> GO TO 5.

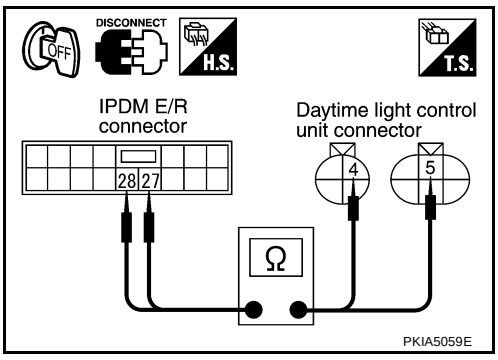
5. CHECK IPDM E/R CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check harness continuity between IPDM E/R harness connector E7 terminal 28 (R/Y) and daytime light control unit harness connector E13 terminal 4 (R/Y).

28 (R/Y) – 4 (R/Y) : Continuity should exist.

4. Check harness continuity between IPDM E/R harness connector E7 terminal 27 (BR) and daytime light control unit harness connector E14 terminal 5 (BR).

27 (BR) – 5 (BR) : Continuity should exist.



OK or NG

OK >> Replace daytime light control unit.
NG >> Repair harness or connector.

RH High Beam Does Not Illuminate But RH Low Beam Illuminates

AKS009NG

1. CHECK BULB

Inspect bulb of lamp.

OK or NG

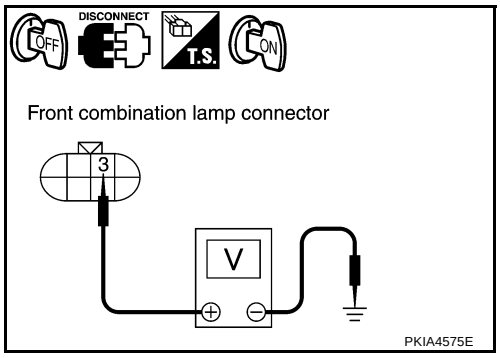
OK >> GO TO 2.
NG >> Replace headlamp bulb.

2. CHECK HEADLAMP INPUT SIGNAL

With CONSULT-II

1. Connect daytime light control unit connector.
2. Select “IPDM E/R” on CONSULT-II and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
3. Touch “HI” screen.
4. When headlamp high beam is operating, check voltage between front combination lamp RH harness connector E24 terminal 3 (L) and ground (Headlamp high beam repeats ON–OFF every 1 second).

3 (L) – Ground : Battery voltage should exist.



Without CONSULT-II

1. Start auto active test. Refer to PG-24, "Auto Active Test" .
2. When headlamp high beam is operating, check voltage between front combination lamp RH harness connector E24 terminal 3 (L) and ground.

3 (L) – Ground : Battery voltage should exist.

OK or NG

OK >> GO TO 6.
NG >> GO TO 3.

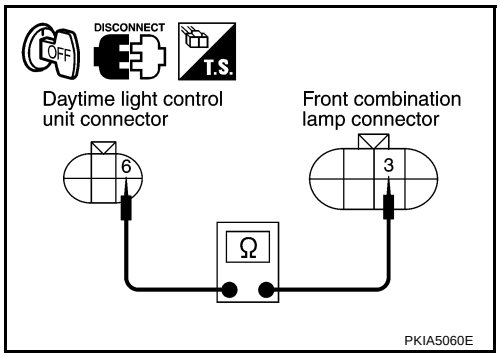
3. CHECK DAYTIME LIGHT CONTROL CIRCUIT

1. Disconnect daytime light control unit connector and front combination lamp RH connector.
2. Check continuity between daytime light control unit harness connector E14 terminal 6 (L) and front combination lamp RH harness connector E24 terminal 3 (L).

6 (L) – 3 (L) : Continuity should exist.

OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

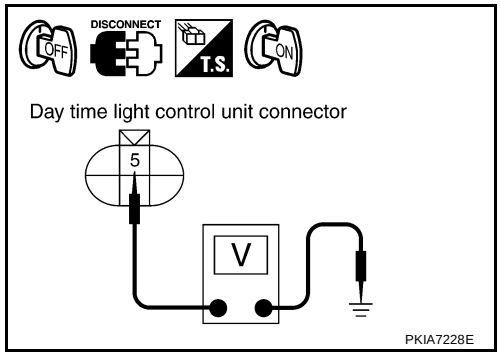


4. CHECK DAYTIME LIGHT CONTROL UNIT INPUT SIGNAL

With CONSULT-II

1. Disconnect daytime light control unit connector.
2. Select “IPDM E/R” on CONSULT-II and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
3. Touch “HI” screen.
4. When headlamp high beam is operating, check voltage between daytime light control unit harness connector E14 terminal 5 (BR) and ground (Headlamp high beam repeats ON–OFF every 1 second).

5 (BR) – Ground : Battery voltage should exist.



Without CONSULT-II

1. Start auto active test. Refer to PG-24, "Auto Active Test" .
2. When headlamp high beam is operating, check voltage between daytime light control unit harness connector E14 terminal 5 (BR) and ground.

5 (BR) – Ground : Battery voltage should exist.

OK or NG

OK >> Replace daytime light control unit.
NG >> GO TO 5.

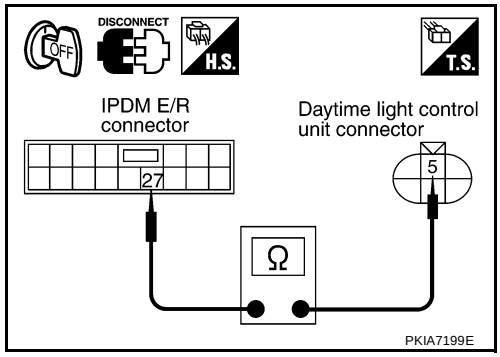
5. CHECK IPDM E/R CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check harness continuity between IPDM E/R harness connector E7 terminal 27 (BR) and daytime light control unit harness connector E14 terminal 5 (BR).

27 (BR) – 5 (BR) : Continuity should exist.

OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.



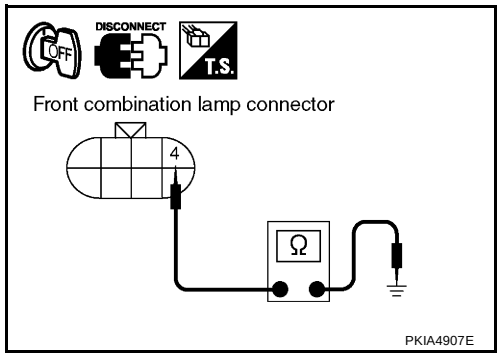
6. CHECK HEADLAMP GROUND

Check continuity between front combination lamp RH harness connector E24 terminal 4 (B/W) and ground.

4 (B/W) – Ground : Continuity should exist.

OK or NG

OK >> Check headlamp harness and connector and headlamp-bulbs.
NG >> Repair harness or connector.



LH High Beam Does Not Illuminate But LH Low Beam Illuminates

AKS009NH

1. CHECK BULB

Inspect bulb of lamp.

OK or NG

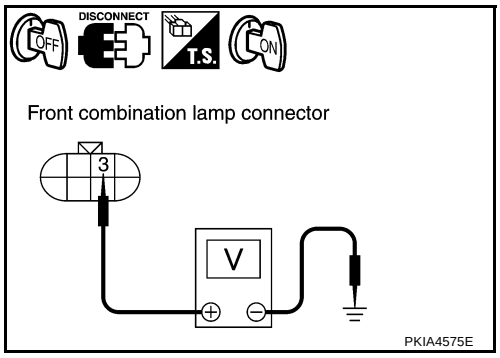
OK >> GO TO 2.
NG >> Replace bulb of lamp.

2. CHECK HEADLAMP INPUT SIGNAL

With CONSULT-II

1. Connect daytime light control unit connector.
2. Select “IPDM E/R” on CONSULT-II and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
3. Touch “HI” screen.
4. When headlamp high beam is operating, check voltage between front combination lamp LH harness connector E40 terminal 3 (SB) and ground (Headlamp high beam repeats ON–OFF every 1 second).

3 (SB) – Ground : Battery voltage should exist.



Without CONSULT-II

1. Start auto active test. Refer to PG-24, "Auto Active Test" .
2. When headlamp high beam is operating, check voltage between front combination lamp LH harness connector E40 terminal 3 (SB) and ground.

3 (SB) – Ground : Battery voltage should exist.

OK or NG

OK >> GO TO 6.
NG >> GO TO 3.

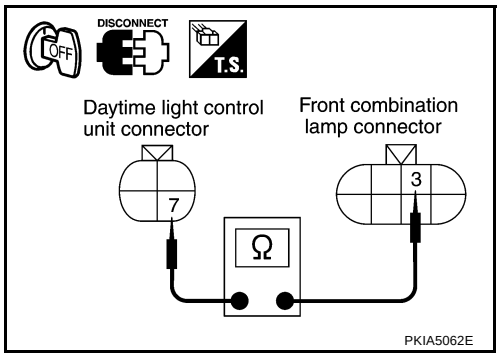
3. CHECK DAYTIME LIGHT CONTROL UNIT CIRCUIT

1. Disconnect daytime light control unit connector and front combination lamp LH connector.
2. Check continuity between daytime light control harness connector E13 terminal 7 (SB) and front combination lamp LH harness connector E40 terminal 3 (SB).

7 (SB) – 3 (SB) : Continuity should exist.

OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

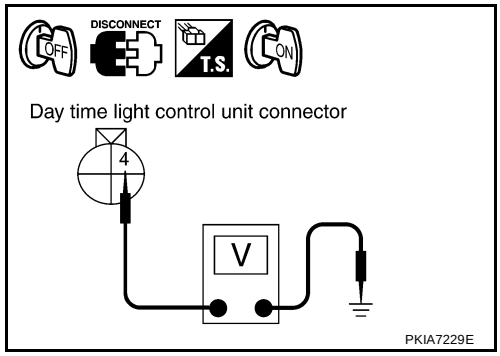


4. CHECK DAYTIME LIGHT CONTROL UNIT INPUT SIGNAL

With CONSULT-II

1. Disconnect daytime light control unit connector.
2. Select “IPDM E/R” on CONSULT-II and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
3. Touch “HI” screen.
4. When headlamp high beam is operating, check voltage between daytime light control unit harness connector E13 terminal 4 (R/Y) and ground (Headlamp high beam repeats ON–OFF every 1 second).

4 (R/Y) – Ground : Battery voltage should exist.



Without CONSULT-II

1. Start auto active test. Refer to PG-24, "Auto Active Test" .
2. When headlamp high beam is operating, check voltage between daytime light control unit harness connector E13 terminal 4 (R/Y) and ground.

4 (R/Y) – Ground : Battery voltage should exist.

OK or NG

OK >> Replace daytime light control unit.
NG >> GO TO 5.

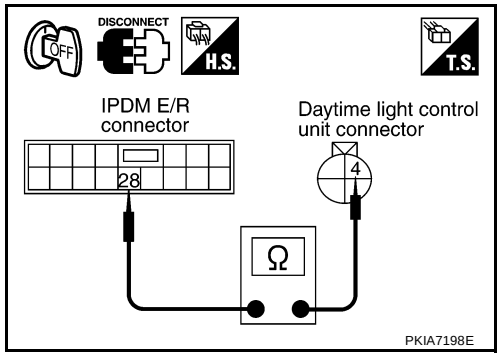
5. CHECK IPDM E/R CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check harness continuity between IPDM E/R harness connector E7 terminal 28 (R/Y) and daytime light control unit harness connector E13 terminal 4 (R/Y).

28 (R/Y) – 4 (R/Y) : Continuity should exist.

OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.



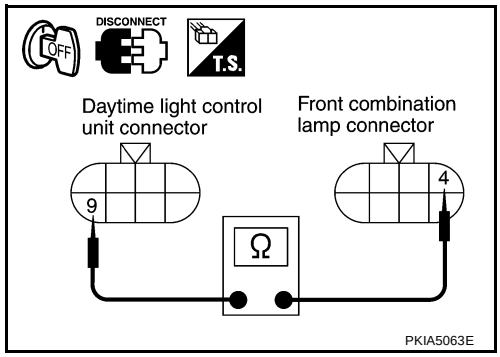
6. CHECK DAYTIME LIGHT CONTROL UNIT CIRCUIT

1. Disconnect daytime light control unit connector.
2. Check continuity between daytime light control harness connector E15 terminal 9 (Y/G) and front combination lamp LH harness connector E40 terminal 4 (Y/G).

9 (Y/G) – 4 (Y/G) : Continuity should exist.

OK or NG

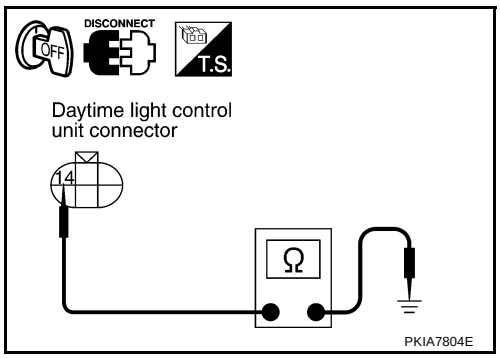
OK >> GO TO 7.
NG >> Repair harness or connector.



7. CHECK DAYTIME LIGHT CONTROL UNIT GROUND

Check continuity between daytime light control unit harness connector E14 terminal 14 (B/R) and ground.

14 (B/R) – Ground : Continuity should exist.



OK or NG

OK >> Replace daytime light control unit.
NG >> Repair harness or connector.

Headlamp Low Beam Does Not Illuminate (Both Sides)

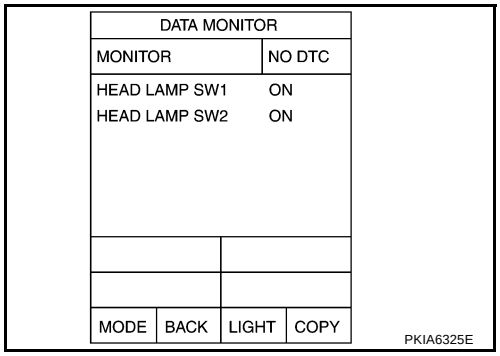
AKS00ABP

1. CHECK COMBINATION SWITCH INPUT SIGNAL

With CONSULT-II

Select “BCM” on CONSULT-II. With “HEADLAMP” data monitor, make sure “HEAD LAMP SW 1” and “HEAD LAMP SW 2” turn ON-OFF linked with operation of lighting switch.

When lighting switch is 2ND position : HEAD LAMP SW 1 ON
: HEAD LAMP SW 2 ON



Without CONSULT-II

Refer to LT-170, "Combination Switch Inspection" .

OK or NG

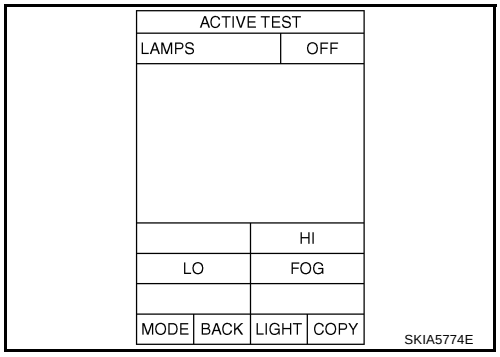
OK >> GO TO 2.
NG >> Check lighting switch. Refer to LT-170, "Combination Switch Inspection" .

2. HEADLAMP ACTIVE TEST

With CONSULT-II

1. Select “IPDM E/R” on CONSULT-II and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Select “LAMPS” on “SELECT TEST” ITEM screen.
3. Touch “LO” screen.
4. Make sure headlamp low beam operation.

Headlamp low beam should operate.



Without CONSULT-II

1. Start auto active test. Refer to PG-24, "Auto Active Test" .
2. Make sure headlamp low beam operation.

Headlamp low beam should operate.

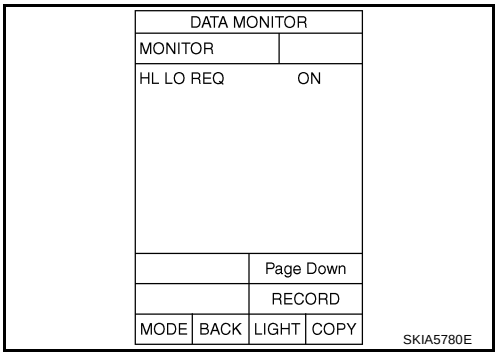
OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK IPDM E/R

1. Select “IPDM E/R” on CONSULT-II and select “DATA MONITOR” on “SELECT DIAG MODE” screen.
2. Make sure “HL LO REQ” turns ON when lighting switch is in 2ND position.

When lighting switch is 2ND position : HL LO REQ ON



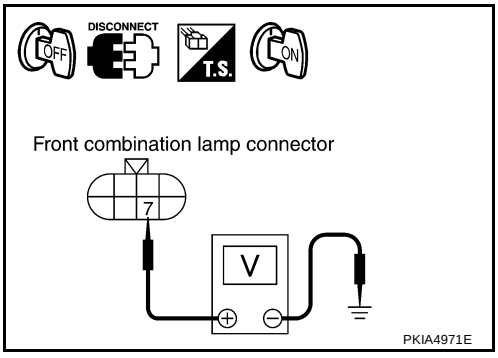
OK or NG

OK >> Replace IPDM E/R.
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

4. CHECK HEADLAMP INPUT SIGNAL

With CONSULT-II

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Select “IPDM E/R” on CONSULT-II and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
4. Select “LAMPS” on “SELECT TEST ITEM” screen.
5. Touch “LO” screen.
6. When headlamp low beam is operating, check voltage between front combination lamp RH and LH harness connector and ground.



Terminals				Voltage
(+)			(-)	
Connector		Terminal (Wire color)		
RH	E24	7 (R)	Ground	Battery voltage
LH	E40	7 (R/B)		

Without CONSULT-II

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Start auto active test. Refer to PG-24, "Auto Active Test" .
4. When headlamp low beam is operating, check voltage between front combination lamp RH and LH harness connector and ground.

Terminals				Voltage
(+)			(-)	
Connector		Terminal (Wire color)		
RH	E24	7 (R)	Ground	Battery voltage
LH	E40	7 (R/B)		

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

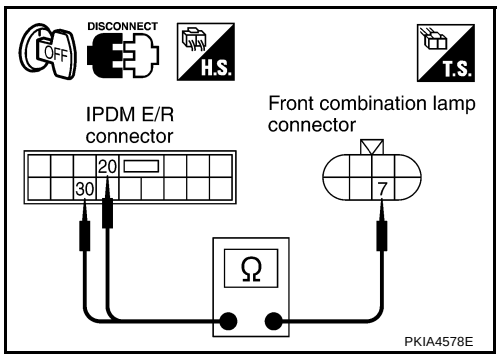
5. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector E7 terminal 20 (R) and front combination lamp RH harness connector E24 terminal 7 (R).

20 (R) – 7 (R) : Continuity should exist.

4. Check continuity between IPDM E/R harness connector E7 terminal 30 (R/B) and front combination lamp LH harness connector E40 terminal 7 (R/B).

30 (R/B) – 7 (R/B) : Continuity should exist.



OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.

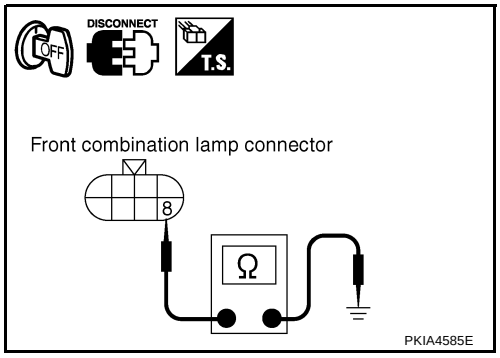
6. CHECK HEADLAMP GROUND

1. Turn ignition switch OFF.
2. Check continuity between front combination lamp RH harness connector E24 terminal 8 (B) and ground.

8 (B) – Ground : Continuity should exist.

3. Check continuity between front combination lamp LH harness connector E40 terminal 8 (B) and ground.

8 (B) – Ground : Continuity should exist.



OK or NG

OK >> Check headlamp harness and connectors, ballasts (HID control unit). Refer to LT-32, "Xenon Headlamp Trouble Diagnosis" .
NG >> Repair harness or connector.

Headlamp Low Beam Does Not Illuminate (One Side)

AKS00ABQ

1. CHECK BULB

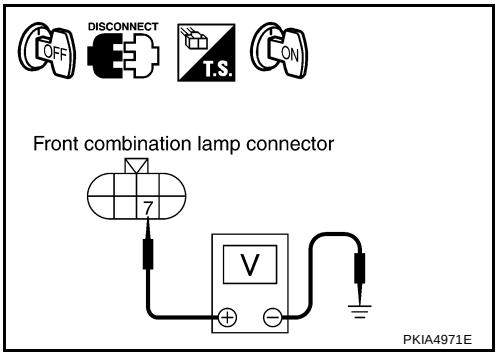
Check ballasts (HID control unit) and xenon bulb of lamp which does not illuminate. Refer to LT-32, "Xenon Headlamp Trouble Diagnosis" .

OK or NG

OK >> GO TO 2.
NG >> Repair malfunctioning part.

2. CHECK HEADLAMP INPUT SIGNAL

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH or LH connector.
3. Turn ignition switch ON.
4. Lighting switch is turned 2ND position.
5. Check voltage between front combination lamp RH or LH harness connector and ground.



Terminals				Voltage
(+)			(-)	
Connector		Terminal (Wire color)		
RH	E24	7 (R)	Ground	Battery voltage
LH	E40	7 (R/B)		

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

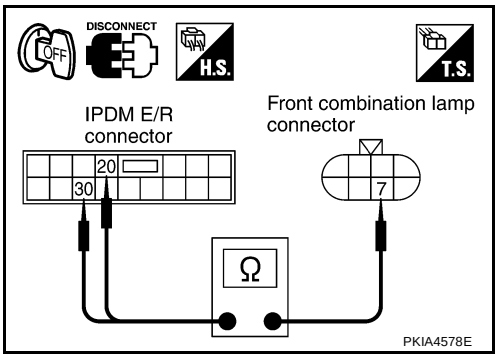
3. CHECK HEADLAMP CIRCUIT

1. Disconnect IPDM E/R connector and front combination lamp RH or LH connector.
2. Check continuity between IPDM E/R harness connector E7 terminal 20 (R) and front combination lamp RH harness connector E24 terminal 7 (R).

20 (R) – 7 (R) : Continuity should exist.

3. Check continuity between IPDM E/R harness connector E7 terminal 30 (R/B) and front combination lamp LH harness connector E40 terminal 7 (R/B).

30 (R/B) – 7 (R/B) : Continuity should exist.



OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.

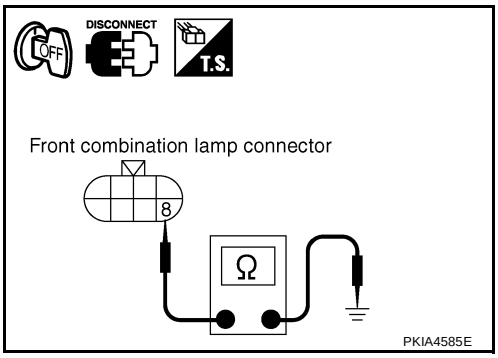
4. CHECK HEADLAMP GROUND

1. Check continuity between front combination lamp RH harness connector E24 terminal 8 (B) and ground.

8 (B) – Ground : Continuity should exist.

2. Check continuity between front combination lamp LH harness connector E40 terminal 8 (B) and ground.

8 (B) – Ground : Continuity should exist.

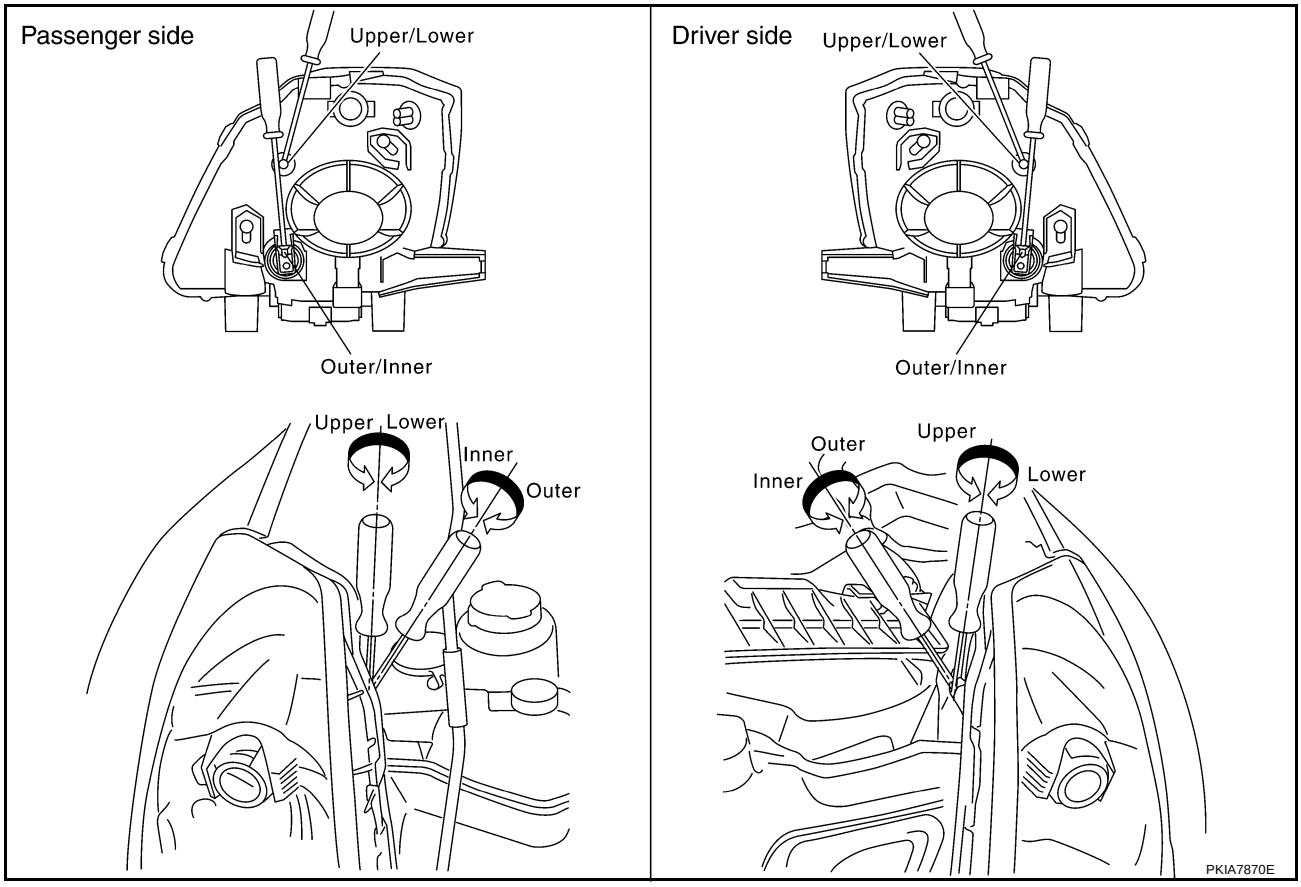


OK or NG

OK >> Check headlamp harness and connectors.
NG >> Repair harness or connector.

Aiming Adjustment

AKS009NL



PREPARATION BEFORE ADJUSTING

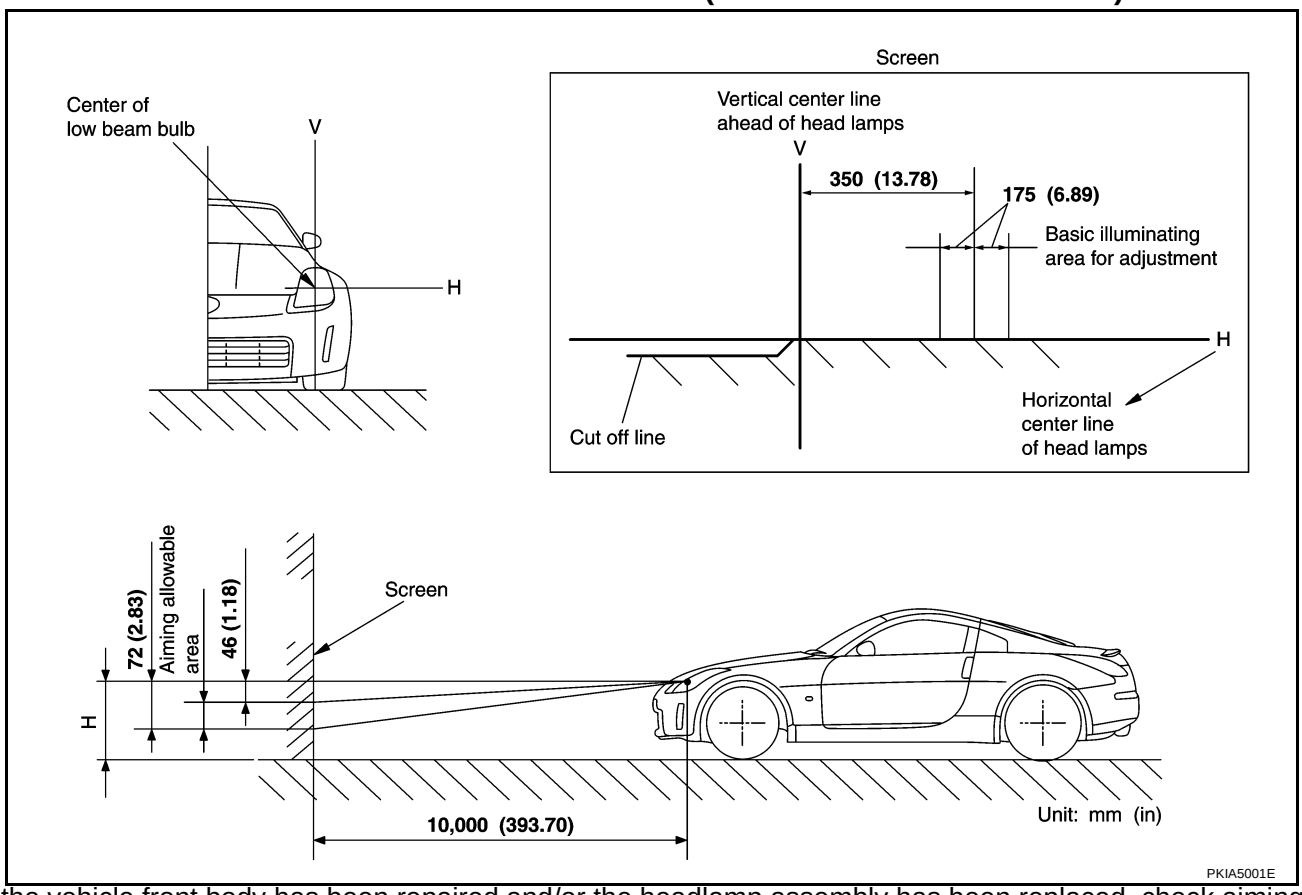
For details, refer to the regulations in your own country.
Before performing aiming adjustment, check the following.

1. Keep all tires inflated to correct pressures.
2. Place vehicle on flat surface.
3. Set that there is no-load in vehicle other than the driver (or equivalent weight placed in driver's position). Coolant, engine oil filled up to correct level and full fuel tank.

LOW BEAM AND HIGH BEAM

1. Turn headlamp low beam on.
2. Use adjusting screws to perform aiming adjustment.

ADJUSTMENT USING AN ADJUSTMENT SCREEN (LIGHT/DARK BORDERLINE)



If the vehicle front body has been repaired and/or the headlamp assembly has been replaced, check aiming. Use the aiming chart shown in the figure.

- Basic illumination area for adjustment should be within the range shown on the aiming chart. Adjust headlamp accordingly.

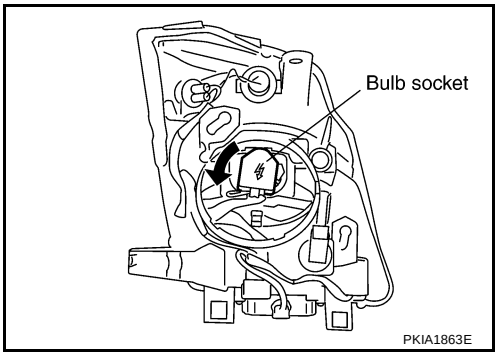
Bulb Replacement

AKS009NM

HEADLAMP (UPPER) LOW BEAM

1. Turn lighting switch OFF.
2. Remove headlamp. Refer to LT-103, "Removal and Installation" .
3. Turn plastic cap counterclockwise and unlock it.
4. Turn bulb socket counterclockwise and unlock it.
5. Unlock retaining spring and remove bulb from headlamp.
6. Install in reverse order of removal.

NOTE:
After installation, aiming adjustment. Refer to LT-100, "Aiming Adjustment" .



Headlamp (upper) low beam : 12V - 35W (D2R) (Xenon)

HEADLAMP (LOWER) HIGH BEAM

1. Turn lighting switch OFF.
2. Open the driver and front passenger window, and then disconnect the battery negative cable.

   CAUTION:
   After the battery cables are disconnected, do not open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.
3. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" in “EI” section.
4. Turn plastic cap counterclockwise and unlock it.
5. Disconnect bulb socket.
6. Unlock retaining spring and remove bulb from headlamp.
7. Install in reverse order of removal.

Headlamp (lower) high beam	**: 12V - 55W (H7)**

PARKING LAMP (CLEARANCE LAMP)

1. Turn lighting switch OFF.
2. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" in “EI” section.
3. Turn bulb socket counterclockwise and unlock it.
4. Remove bulb from its socket.
5. Install in reverse order of removal.

Parking lamp (Clearance lamp)	**: 12V - 5W**

FRONT TURN SIGNAL LAMP

1. Turn lighting switch OFF.
2. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" in “EI” section.
3. Turn bulb socket counterclockwise and unlock it.
4. Remove bulb from its socket.
5. Install in reverse order of removal.

Front turn signal lamp	**: 12V - 21W**

FRONT SIDE MARKER LAMP

1. Turn lighting switch OFF.
2. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" in "EI" section.
3. Turn bulb socket counterclockwise and unlock it.
4. Remove bulb from its socket.
5. Install in reverse order of removal.

Front side marker lamp	**: 12V - 5W**

CAUTION:
After installing bulb, be sure to install plastic cap and bulb socket securely to insure watertightness.

Removal and Installation

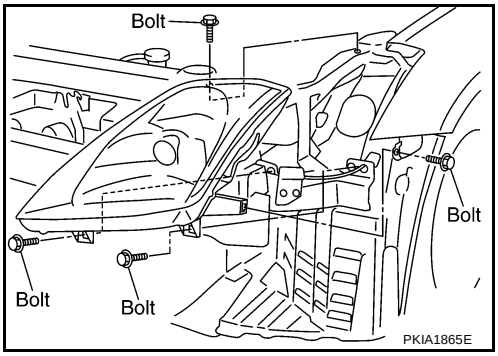
AKS009NN

REMOVAL

1. Open the driver and front passenger window, and then disconnect the battery negative cable.

   CAUTION:
   After the battery cables are disconnected, do not open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.

2. Remove front bumper. Refer to EI-14, "FRONT BUMPER" in "EI" section.
3. Remove headlamp mounting bolts.
4. Pull head lamp toward vehicle front, disconnect connector, and remove headlamp.



INSTALLATION

Installation in the reverse order if removal. Be careful of the following.

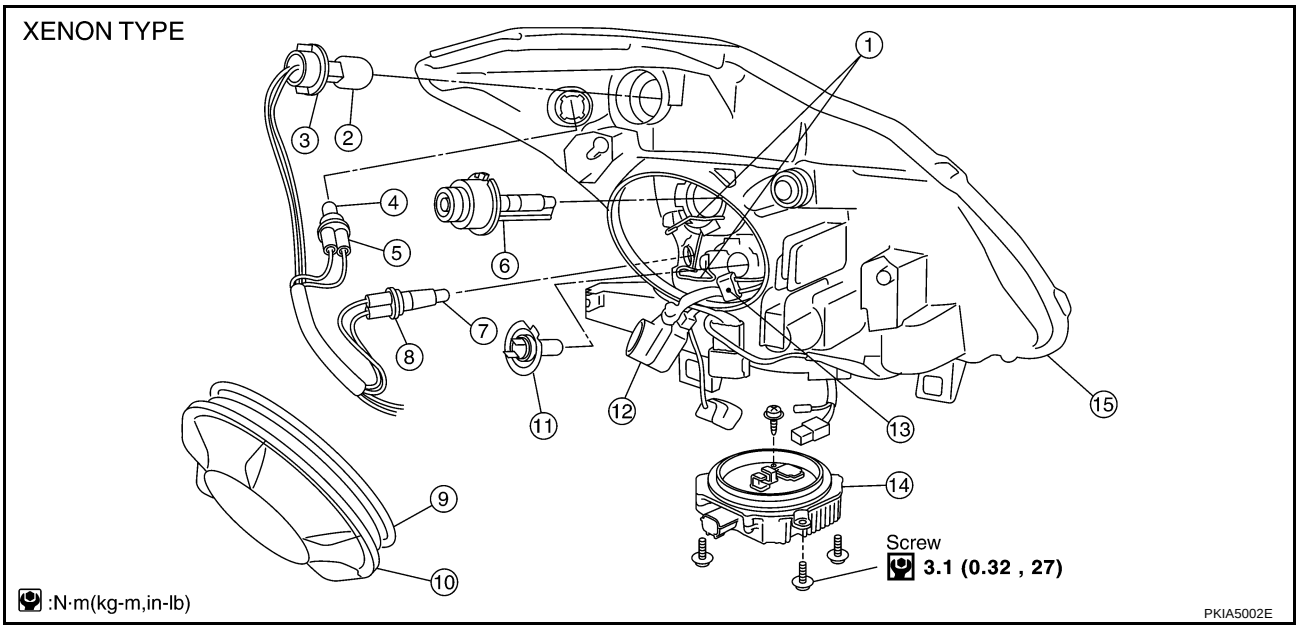
Headlamp mounting bolt:

: 6.1N·m (0.62 kg-m, 54 in lb)

NOTE:
After installation, perform aiming adjustment. Refer to LT-100, "Aiming Adjustment" .

Disassembly and Assembly

AKS009NO



1. Retaining spring	2. Front turn signal lamp bulb	3. Front turn signal lamp bulb socket
4. Side marker lamp bulb	5. Side marker lamp bulb socket	6. Xenon bulb
7. Parking lamp (Clearance lamp) bulb	8. Parking lamp (Clearance lamp) bulb socket	9. Seal rubber
10. Plastic cap	11. Halogen bulb (high)	12. Xenon bulb socket
13. Halogen bulb socket	14. HID C/U	15. Headlamp housing assembly

DISASSEMBLY

1. Turn plastic cap counterclockwise and unlock it.
2. Turn xenon bulb socket counterclockwise, and unlock it.
3. Unlock retaining spring, and remove xenon bulb (low).
4. Disconnect HID control unit connector, and remove HID control unit screws.
5. Disconnect the socket connected to halogen bulb (high).
6. Unlock retaining spring, and remove halogen bulb (high).
7. Turn parking lamp bulb socket counterclockwise and unlock it.
8. Remove parking lamp bulb from its socket.
9. Turn front turn signal lamp bulb socket counterclockwise and unlock it.
10. Remove front turn signal lamp bulb from its socket.
11. Turn front side marker lamp bulb socket counterclockwise and unlock it.
12. Remove front side marker lamp bulb from its socket.

ASSEMBLY

Assemble in reverse order of disassembly. Be careful of the following:

HID control unit mounting screw:

: 3.1 N·m (0.32 kg-m, 27 in-lb)

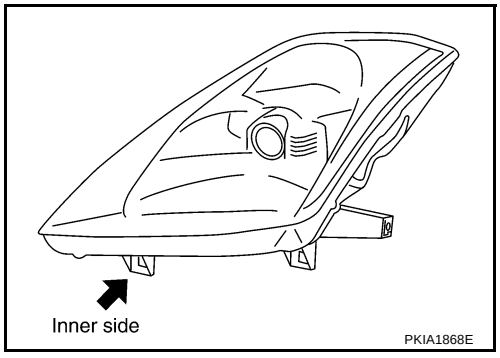
CAUTION:

- **When HID control unit is removed, reinstall it securely and avoid any looseness.**
- **After installing bulb, be sure to install plastic cap and bulb socket securely to insure watertightness**

Serving to Replace Headlamps When Damaged

AKS009NP

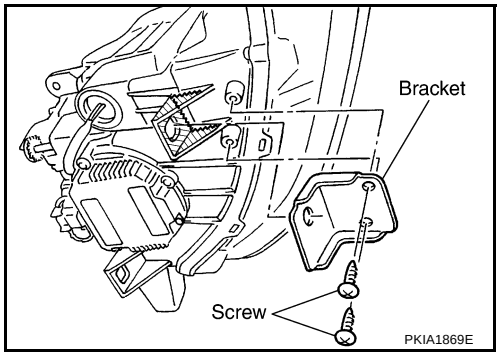
If only installation part as shown in the figure is damaged, and headlamp housing itself is not damaged, repair can be completed easily by installing correction brackets.



INSTALLATION OF HEADLAMP BRACKET

1. Remove headlamps. Refer to LT-103, "Removal and Installation" .
2. Cut damaged section of installation part, then shape with sandpaper.
3. Attach each correction bracket to headlamp housing boss with 2 screws.

RH headlamp	**Inner side**	**26040 CD000**
LH headlamp	**Inner side**	**26090 CD000**

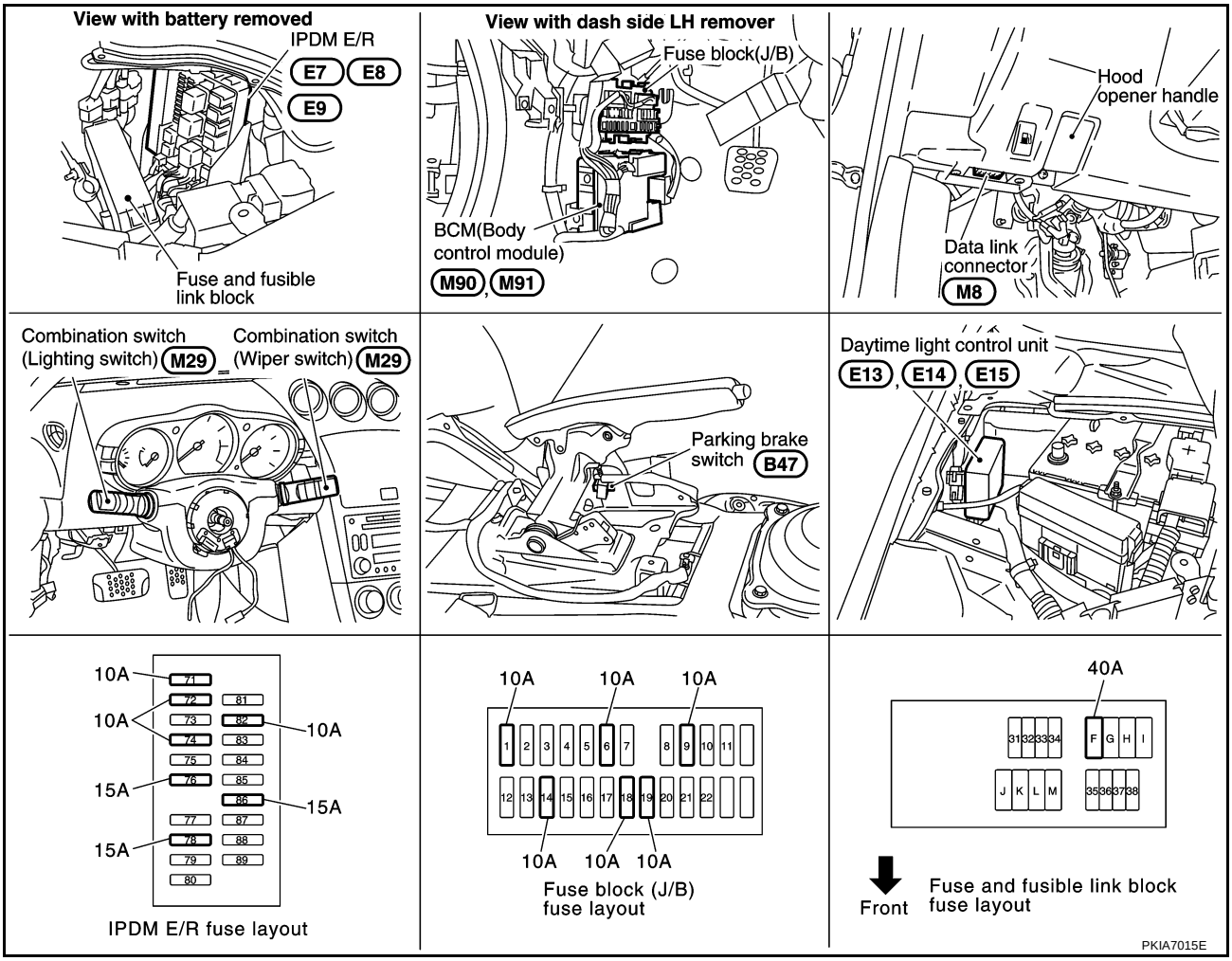


HEADLAMP (FOR CANADA) - CONVENTIONAL TYPE -

PFP:26010

Component Parts and Harness Connector Location

AKS009SK



System Description

AKS009SL

Headlamp system for Canada vehicles is equipped with a daytime light control unit that activates high beam headlamps at approximately half illumination whenever engine is running. If parking brake is applied before engine is started daytime lights will not be illuminated. Daytime lights will illuminate once parking brake is released. Thereafter, daytime lights will continue to operate when parking brake is applied.
And battery saver system is controlled by BCM (body control module).

OUTLINE

Power is supplied at all times

- to headlamp high and low relays [located in IPDM E/R (intelligent power distribution module engine room)]
- through 15A fuse [No. 78, located in IPDM E/R (intelligent power distribution module engine room)]
- to CPU (central processing unit) [located in IPDM E/R (intelligent power distribution module engine room)].

Power is also supplied at all times

- through 40A fusible link [letter F, located in fuse and fusible link block]
- to BCM (body control module) terminal 55
- through 10A fuse [No. 18, located in fuse block (J/B)]
- to BCM (body control module) terminal 42.

With ignition switch in ON or START position, power is supplied

- to CPU (central processing unit) [located in IPDM E/R (intelligent power distribution module engine room)]
- through 10A fuse [No. 82, located in IPDM E/R (intelligent power distribution module engine room)]

- to daytime light control unit terminal 3
- through 10A fuse [No. 1, located in fuse block (J/B)]
- to BCM (body control module) terminal 38.

With ignition switch in ACC or ON position, power is supplied

- through 10A fuse [No. 6, located in fuse block (J/B)]
- to BCM (body control module) terminal 11.

With ignition switch in START position, power is supplied

- through 10A fuse [No. 9, located in fuse block (J/B)]
- to daytime light control unit terminal 2.

Ground is supplied

- to daytime light control unit terminals 14 and 16
- through grounds E17, E43 and F152
- to IPDM E/R (intelligent power distribution module engine room) terminals 38 and 60
- through grounds E17, E43 and F152
- to BCM (body control module) terminal 52
- through grounds M30 and M66.

HEADLAMP OPERATION

Low Beam Operation

With lighting switch in 2ND position, BCM receives input signal requesting headlamps to illuminate. This input signal is communicated to IPDM E/R across CAN communication lines. CPU in IPDM E/R controls headlamp low relay coil, which when energized, directs power

- through 15A fuse [No. 76, located in IPDM E/R]
- through IPDM E/R terminal 20
- to front combination lamp RH terminal 6
- through 15A fuse [No. 86, located in IPDM E/R]
- through IPDM E/R terminal 30
- to daytime light control unit terminal 11
- through daytime light control unit terminal 12
- to front combination lamp LH terminal 6.

Ground is supplied at all times

- to front combination lamp RH terminal 3
- through grounds E17, E43 and F152
- to front combination lamp LH terminal 3
- through daytime light control unit terminal 9
- to daytime light control unit terminal 14
- through grounds E17, E43 and F152.

With power and ground supplied, low beam headlamps illuminate.

High Beam Operation (When Engine Stopped) /Flash-to-Pass Operation

With lighting switch in 2ND position and placed in HIGH or PASS position, BCM receives input signal requesting headlamp high beams to illuminate. This input signal is communicated to IPDM E/R across CAN communication lines. CPU in IPDM E/R controls headlamp high relay coil turned on, which when energized, directs power

- through daytime light control unit terminal 7
- to front combination lamp LH terminal 2
- through 10 A fuse [No. 74, located in IPDM E/R]
- through IPDM E/R terminal 28
- to daytime light control unit terminal 4
- through daytime light control unit terminal 6
- to front combination lamp RH terminal 2

- through 10 A fuse [No. 72, located in IPDM E/R]
- through IPDM E/R terminal 27
- to daytime light control unit terminal 5.

Ground is supplied

- to front combination lamp LH terminal 3
- through daytime light control unit terminal 9
- to daytime light control unit terminal 14
- through grounds E17,E43 and F152
- to front combination lamp RH terminal 3
- through grounds E17, E43 and F152.

With power and ground supplied, the high beam headlamps illuminate.
Unified meter and A/C amp. receives signal from BCM across CAN communication lines, and then combination meter indicator illuminates high beam.

COMBINATION SWITCH READING FUNCTION

Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION" .

EXTERIOR LAMP BATTERY SAVER CONTROL

With combination switch (lighting switch) is in the 2ND position (ON), and ignition switch is turned from ON or ACC to OFF, battery saver control function is activated.
Under this condition, headlamps remain illuminated for 5 minutes, then headlamps are turned off.
Exterior lamp battery saver control mode can be changed by the function setting of CONSULT-II.

DAYTIME LIGHT OPERATION

With engine running, lighting switch in the OFF or 1ST position and parking brake released, power is supplied

- through daytime light control unit terminal 7
- to front combination lamp LH terminal 2
- through front combination lamp LH terminal 3
- to daytime light control unit terminal 9
- through daytime light control unit terminal 6
- to front combination lamp RH terminal 2.

Ground is supplied

- to front combination lamp RH terminal 3
- through grounds E17, E43 and F152, and
- to daytime light control unit terminal 14
- through grounds E17, E43 and F152.

Because high beam headlamps are now wired in series, they operate at half illumination.
If lighting switch is in the 2nd position, daytime light operation is canceled.

OPERATION

After starting engine with lighting switch in the “OFF” or 1ST position, headlamp high beam automatically turns on. Lighting switch operations other than the above are the same as conventional light systems.

Engine		With engine stopped									With engine running								
Lighting switch		OFF			1ST			2ND			OFF			1ST			2ND		
		Hi	Lo	P	Hi	Lo	P	Hi	Lo	P	Hi	Lo	P	Hi	Lo	P	Hi	Lo	P
Head-lamp	High beam	–	–	–	–	–	×	×	–	×	●*	●*	×	●*	●*	×	×	–	×
	Low beam	–	–	–	–	–	×	×	×	×	–	–	×	–	–	×	×	×	×
Tail lamp		–	–	–	×	×	×	×	×	×	–	–	–	×	×	×	×	×	×
License and instru-ment illumination lamp		–	–	–	×	×	×	×	×	×	–	–	–	×	×	×	×	×	×

- Hi: “HIGH BEAM” position
- Lo: “LOW BEAM” position
- P: “FLASH TO PASS” position
- ×: Lamp “ON”
- –: Lamp “OFF”
- ●: Lamp dims. (Added functions)
- *: When starting engine with parking brake released, daytime light will come ON.
  When starting engine with parking brake pulled, daytime light will not come ON.

CAN Communication System Description

AKS009SM

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

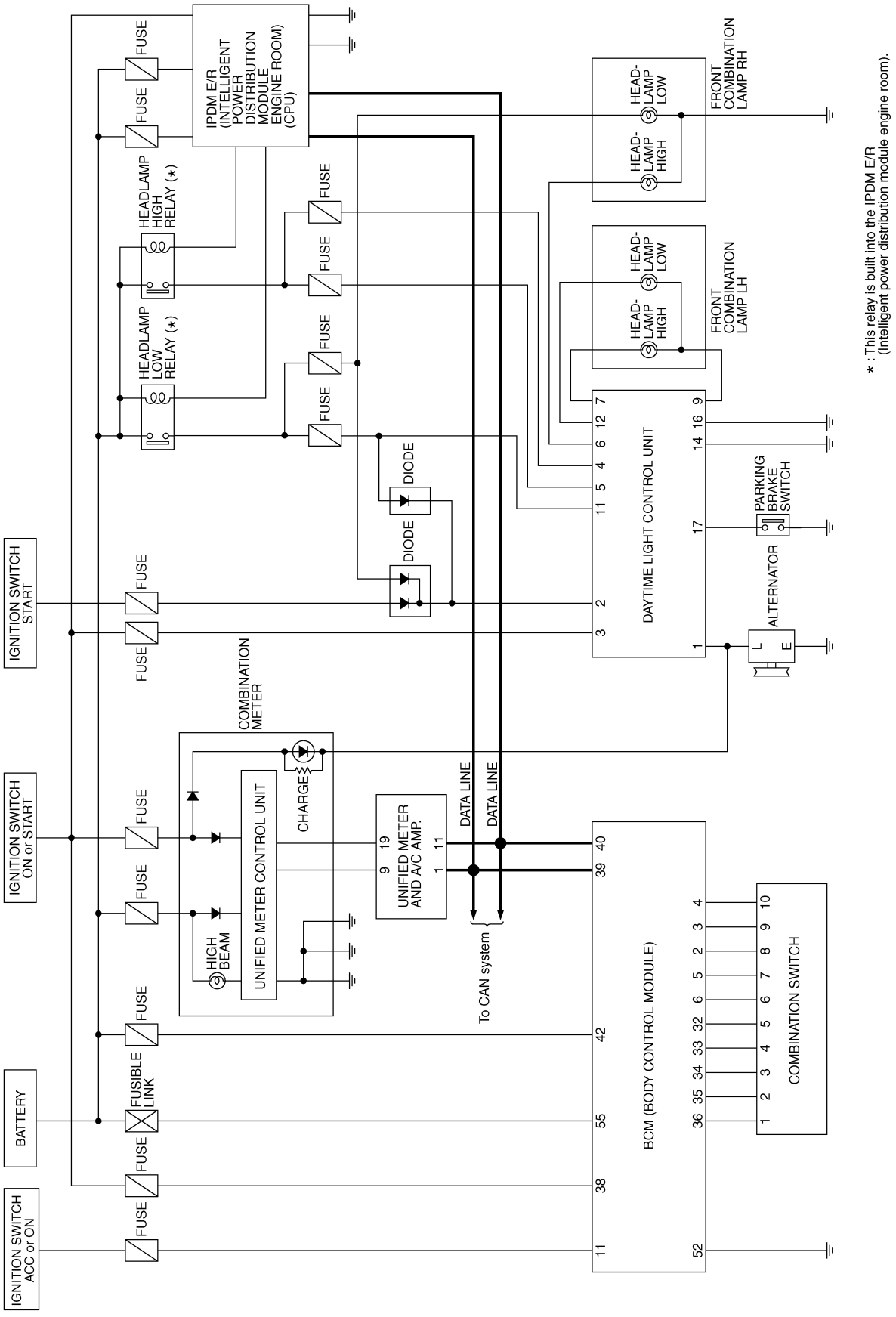
CAN Communication Unit

AKS009SN

Refer to LAN-5, "CAN Communication Unit" .

Schematic

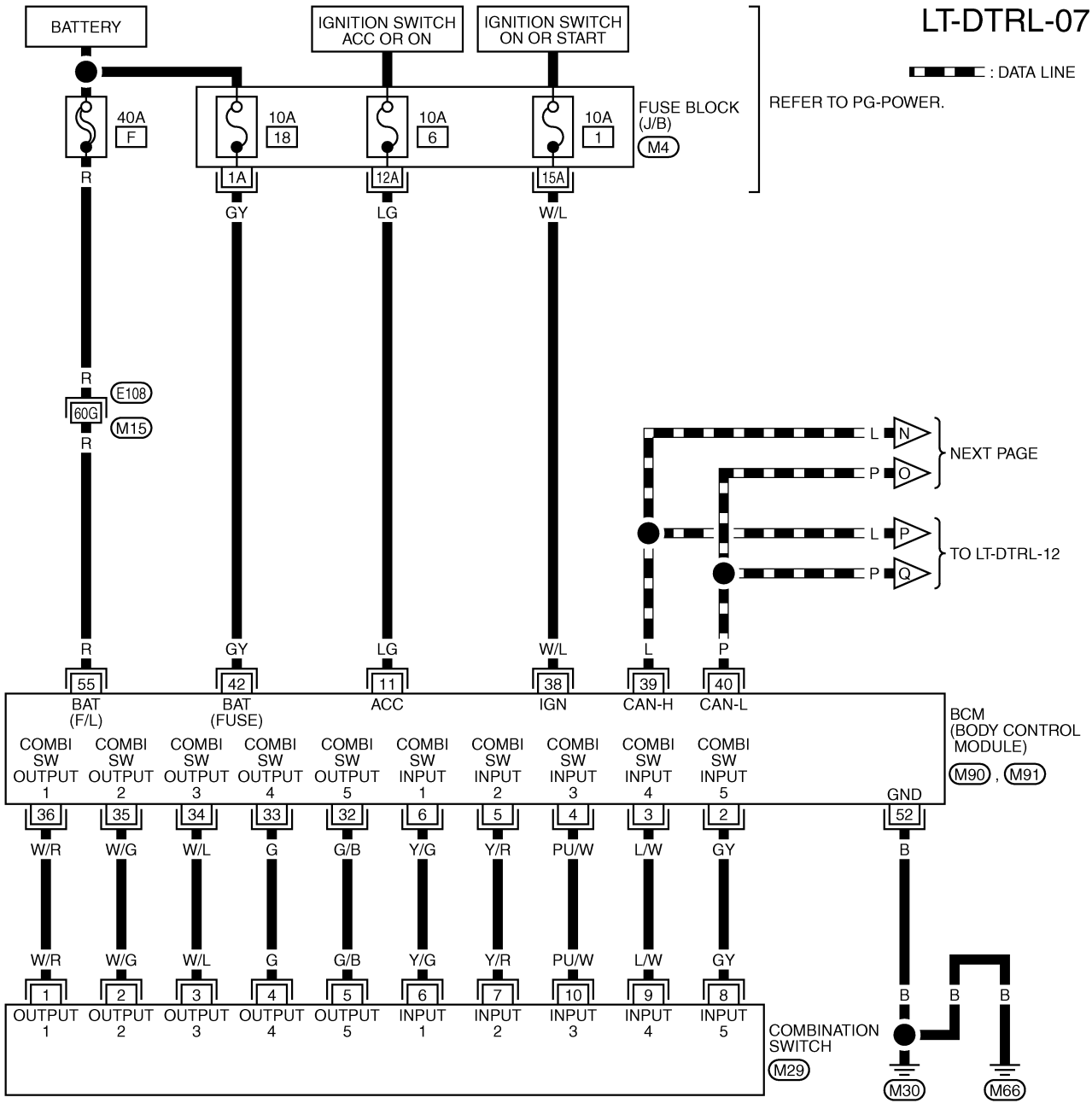
AKS009SO



TKWT1793E

Wiring Diagram — DTRL —

AKS009SP



REFER TO THE FOLLOWING.

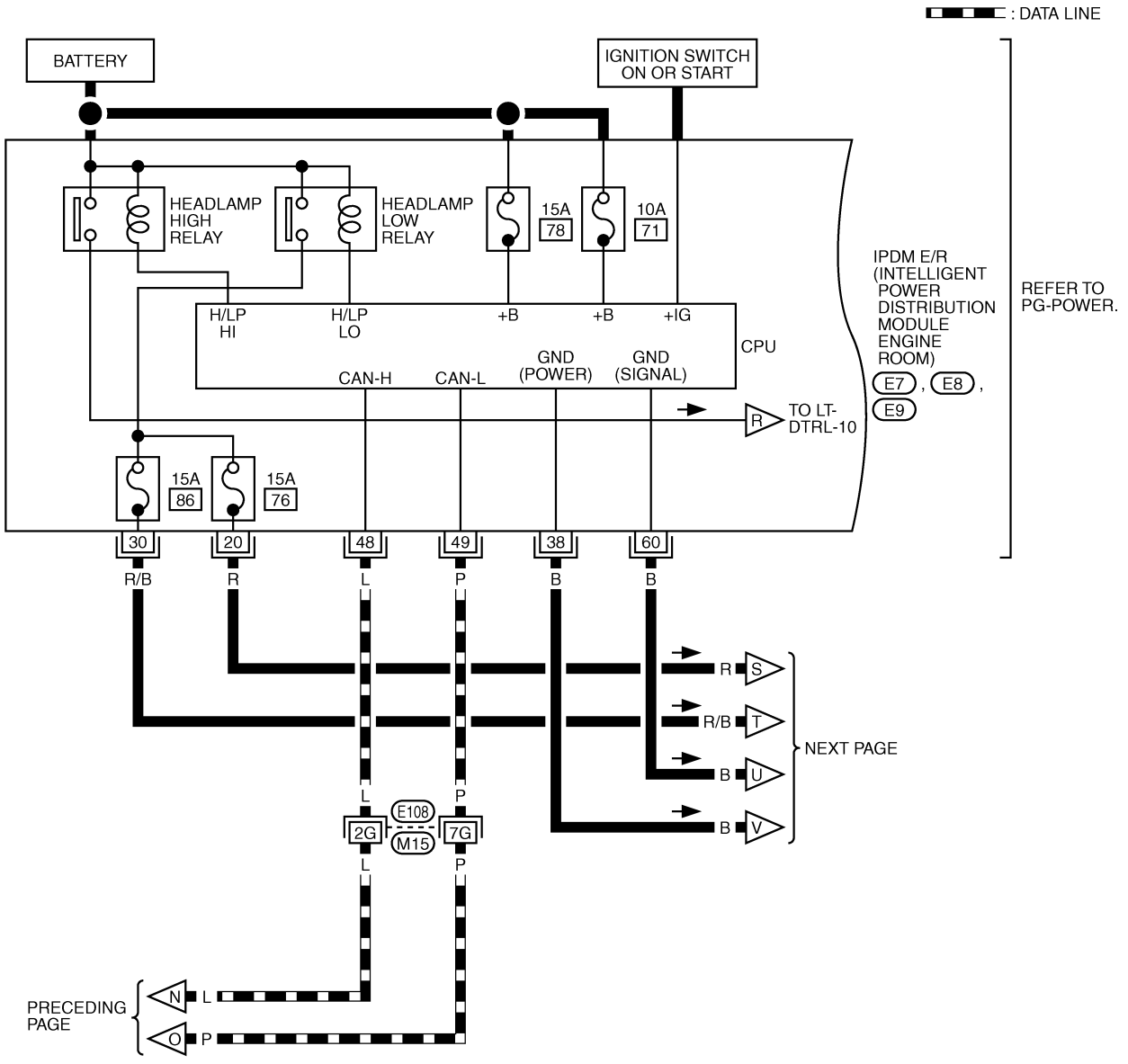
E108 -SUPER MULTIPLE JUNCTION (SMJ)

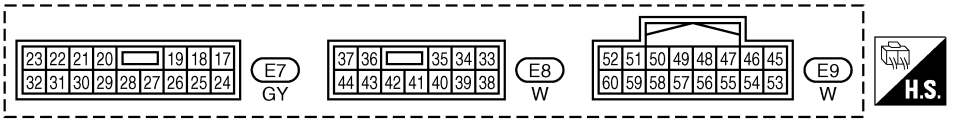
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

M90, M91 -ELECTRICAL UNITS

TKWT1794E

LT-DTRL-08

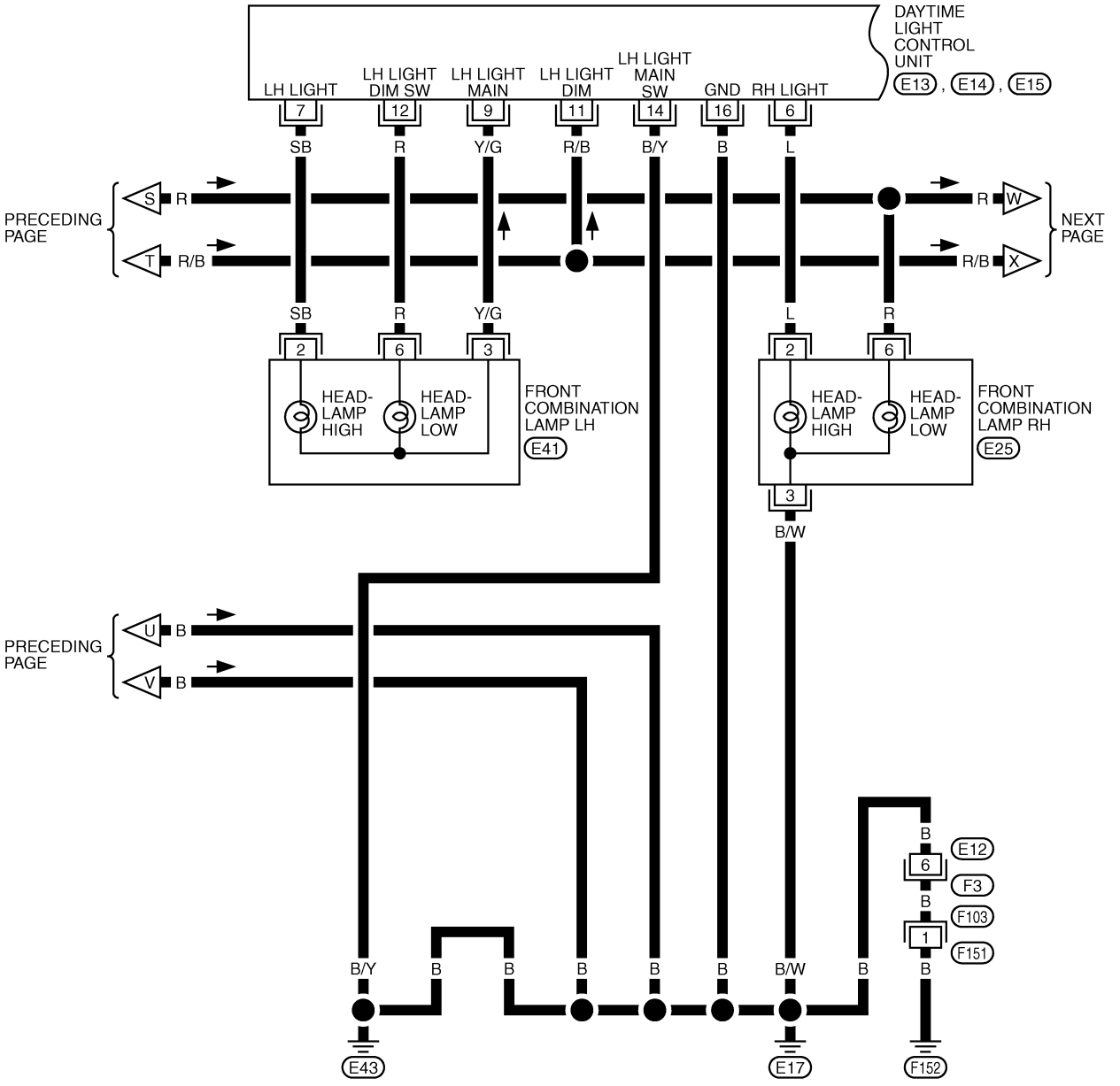


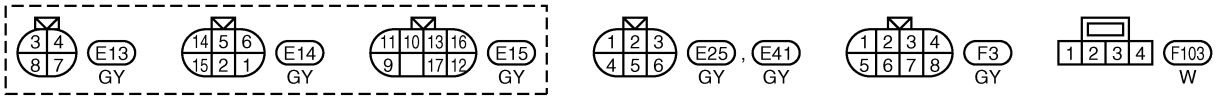


REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT1795E

LT-DTRL-09





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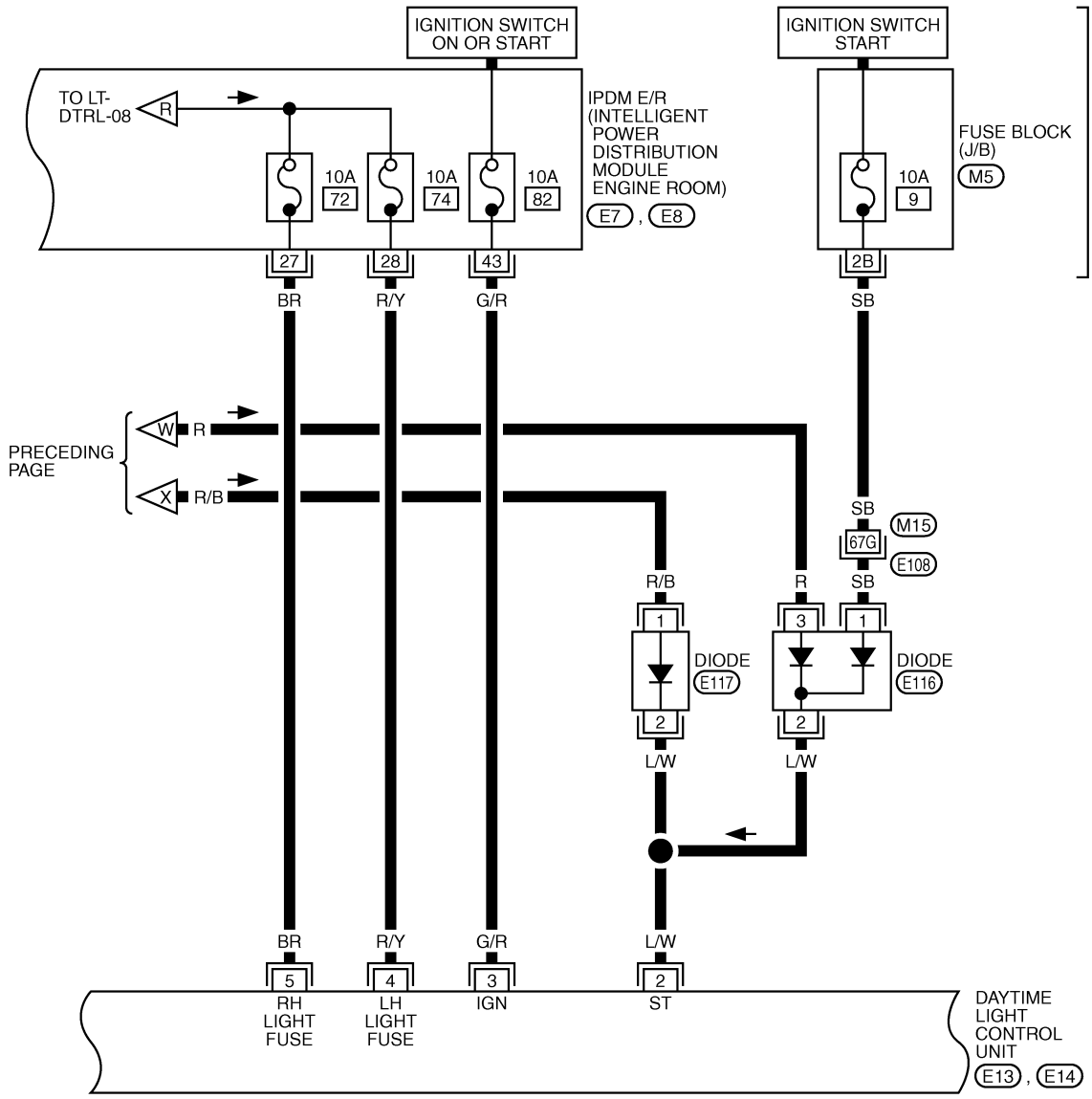
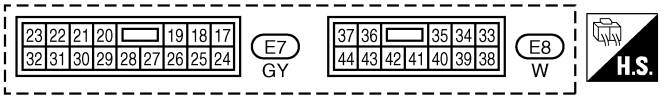




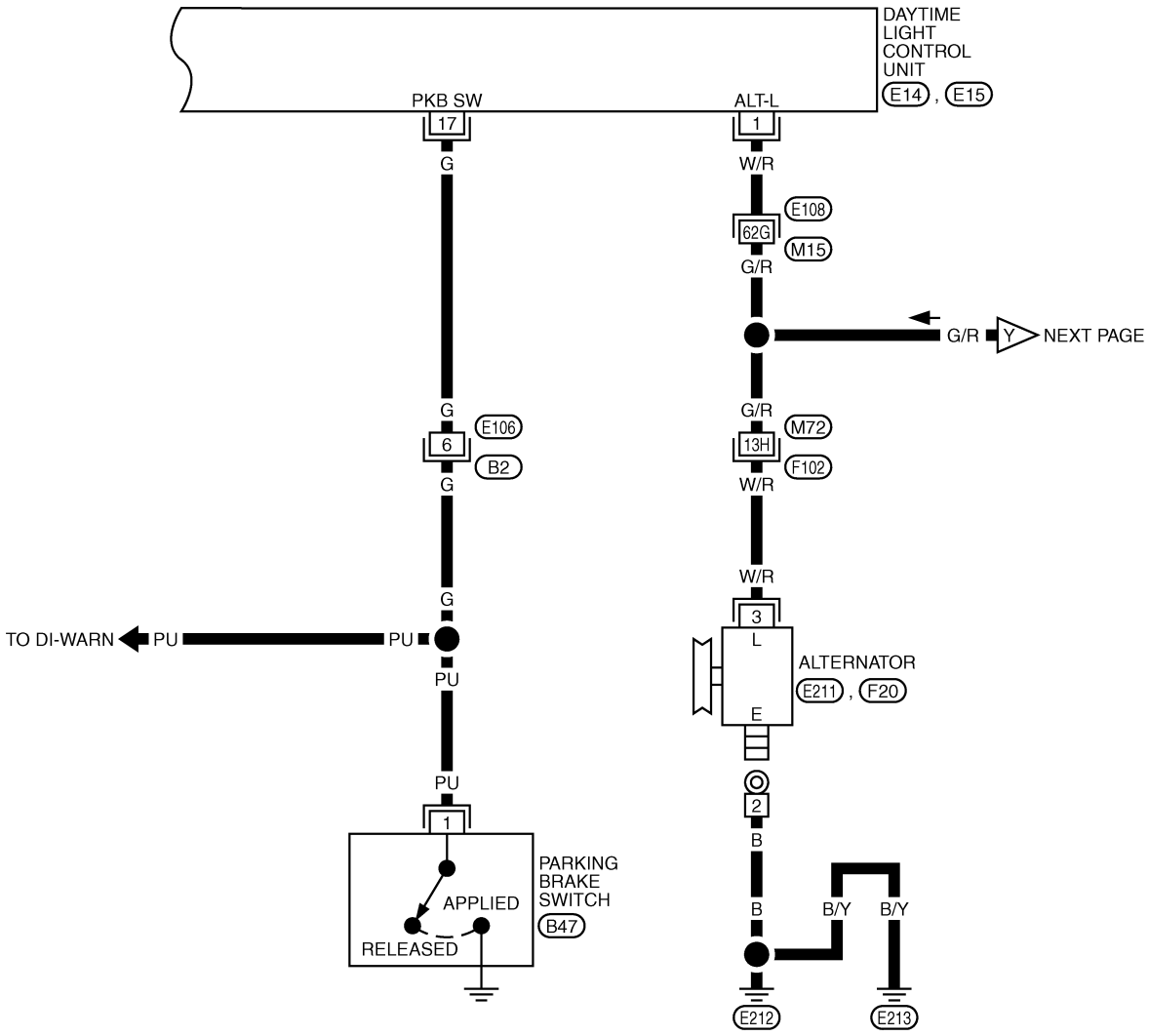
REFER TO THE FOLLOWING.

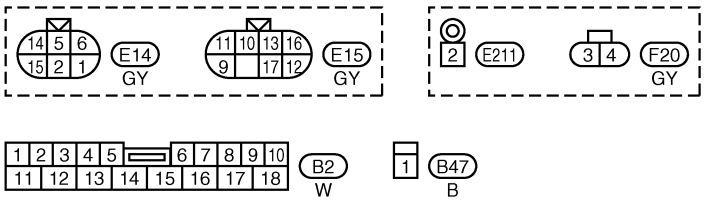
E108 -SUPER MULTIPLE JUNCTION (SMJ)

M5 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT1797E

LT-DTRL-11



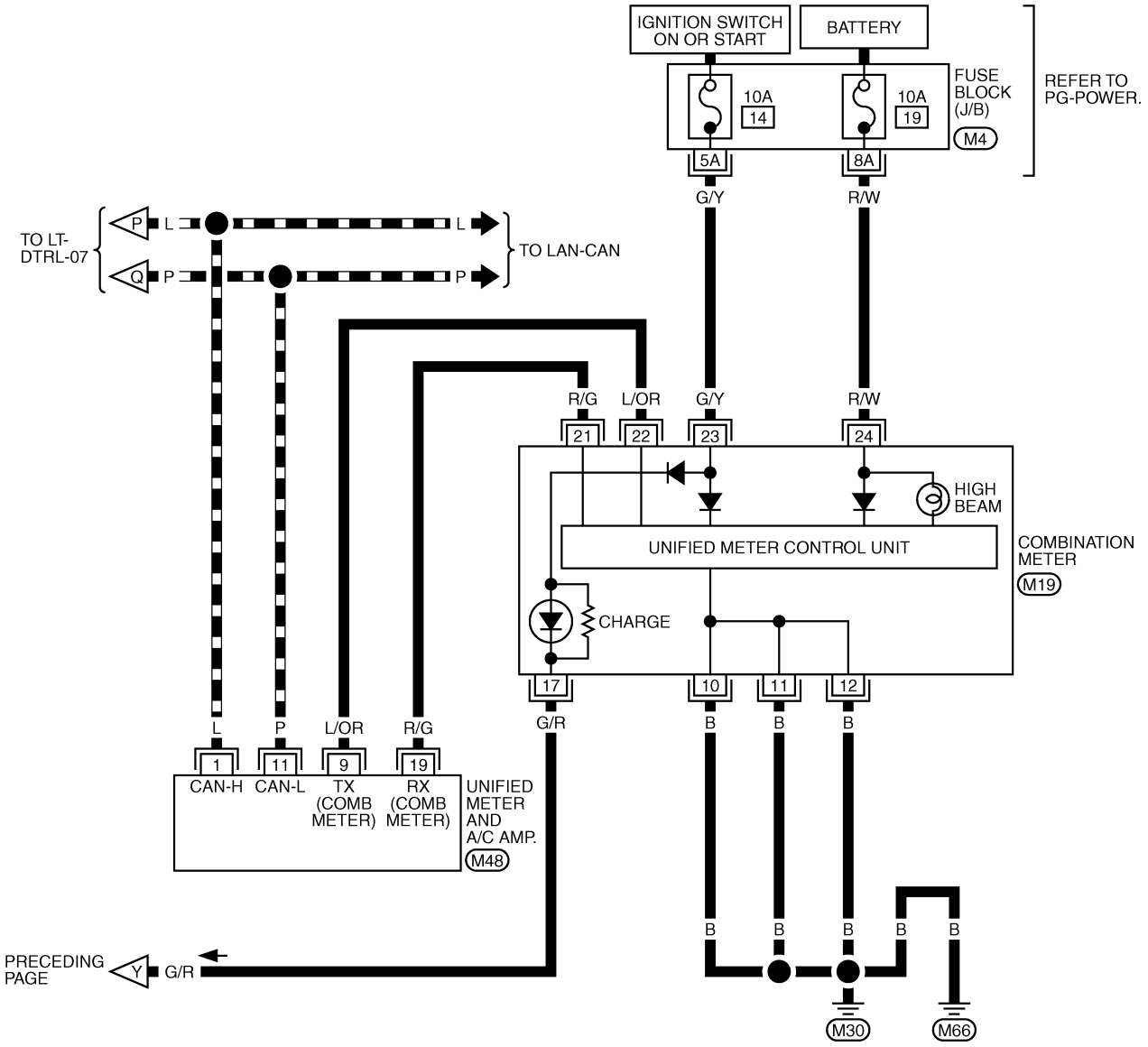


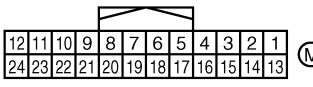
REFER TO THE FOLLOWING.
E108 , F102 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT1798E

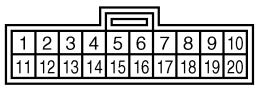
LT-DTRL-12

: DATA LINE





M19
W



M48
GY

H.S.

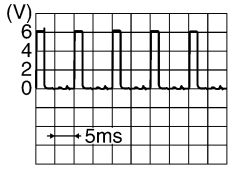
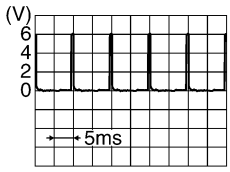
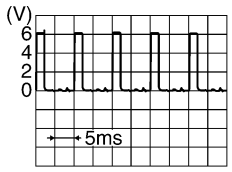
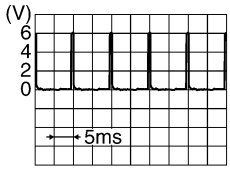
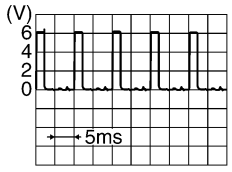
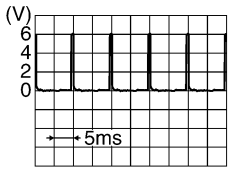
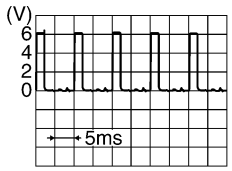
REFER TO THE FOLLOWING.

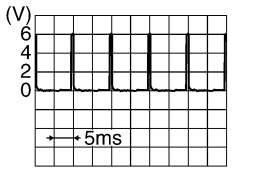
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT1799E

Terminals and Reference Values for BCM

AKS00AQE

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
2	GY	Combination switch input 5	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E
3	L/W	Combination switch input 4	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
4	PU/W	Combination switch input 3	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E
5	Y/R	Combination switch input 2	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
6	Y/G	Combination switch input 1			
11	LG	Ignition switch (ACC)	ACC	—	Battery voltage
32	G/B	Combination switch output 5	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E
33	G	Combination switch output 4	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
34	W/L	Combination switch output 3	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
35	W/G	Combination switch output 2	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
36	W/R	Combination switch output 1			
38	W/L	Ignition switch (ON)	ON	—	Battery voltage
39	L	CAN– H	—	—	—
40	P	CAN– L	—	—	—
42	GY	Battery power supply	OFF	—	Battery voltage
52	B	Ground	ON	—	Approx. 0V
55	R	Battery power supply	OFF	—	Battery voltage

Terminals and Reference Values for IPDM E/R

AKS009T8

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
20	R	Headlamp low (RH)	ON	Lighting switch 2ND position	OFF	Approx. 0V
					ON	Battery voltage
27	BR	Headlamp high (RH)	ON	Lighting switch HIGH or PASS position	OFF	Approx. 0V
					ON	Battery voltage
28	R/Y	Headlamp high (LH)	ON	Lighting switch HIGH or PASS position	OFF	Approx. 0V
					ON	Battery voltage
30	R/B	Headlamp low (LH)	ON	Lighting switch 2ND position	OFF	Approx. 0V
					ON	Battery voltage
38	B	Ground	ON	—		Approx. 0V
43	G/R	Ignition power supply	ON	—		Battery voltage
48	L	CAN– H	—	—		—
49	P	CAN– L	—	—		—
60	B	Ground	ON	—		Approx. 0V

Terminals and Reference Value for Daytime Light Control Unit

AKS009SQ

Terminal No.	Wire color	Item	Condition	Reference value
1	W/R	Alternator	When turning ignition switch to “ON”	Approx. 0V
			When engine is running	Battery voltage
			When turning ignition switch to “OFF”	Approx. 0V
2	L/W	Start signal	When turning ignition switch to “START”	Battery voltage
			When turning ignition switch to “ON” from “START”	Approx. 0V
			When turning ignition switch to “OFF”	Approx. 0V
3	G/R	Ignition power supply	When turning ignition switch to “ON”	Battery voltage
4	R/Y	Lighting switch (LH hi beam)	When turning lighting switch to “HI BEAM”	Battery voltage
5	BR	Lighting switch (RH hi beam)	When turning lighting switch to “HI BEAM”	Battery voltage
6	L	RH hi beam	When lighting switch is turned to the 2ND position with “HI BEAM” or “ FLASH TO PASS” position	Battery voltage
			When releasing parking brake with engine running and turning lighting switch to “OFF” (daytime light operation) **CAUTION:** **Block wheels and ensure selector lever is in N or P position.**	Battery voltage
7	SB	LH hi beam	When lighting switch is turned to the 2ND position with “HI BEAM” or “FLASH TO PASS” position	Battery voltage
			When releasing parking brake with engine running and turning lighting switch to “OFF” (daytime light operation) **CAUTION:** **Block wheels and ensure selector lever is in N or P position.**	Battery voltage
9	Y/G	LH hi/low beam (ground)	When turning lighting switch to the 2ND position with “HI BEAM” or “FLASH TO PASS” position	Approx. 0V
			When releasing parking brake with engine running and turning lighting switch to “OFF” (daytime light operation) **CAUTION:** **Block wheels and ensure selector lever is in N or P position.**	Approx. 0V
11	R/B	Lighting switch (LH low beam)	When turning lighting switch to “LOW BEAM”	Battery voltage
12	R	LH Low beam	When turning lighting switch to “LOW BEAM”	Battery voltage
14	B/Y	Ground	—	—
16	B	Ground	—	—
17	G	Parking brake switch	When parking brake is released	Battery voltage
			When parking brake is applied	Approx. 0V

How to Proceed with Trouble Diagnosis

AKS009SR

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-105, "System Description" .
3. Perform the preliminary check. Refer to LT-119, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Does headlamp operate normally? If YES: GO TO 6. If NO: GO TO 4.
6. INSPECTION END

Preliminary Check

AKS009SS

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES

- Check for blown fuses.

UNIT	POWER SOURCE	Fuse and fusible link No.
BCM	Battery	F
		18
	Ignition switch ON or START position	1
	Ignition switch ACC or ON position	6
IPDM E/R	Battery	71
		72
		74
		76
		78
		86
	Ignition switch ON or START position	82
DAYTIME LIGHT CONTROL UNIT	Ignition switch START position	9

Refer to LT-110, "Wiring Diagram — DTRL —" .

OK or NG

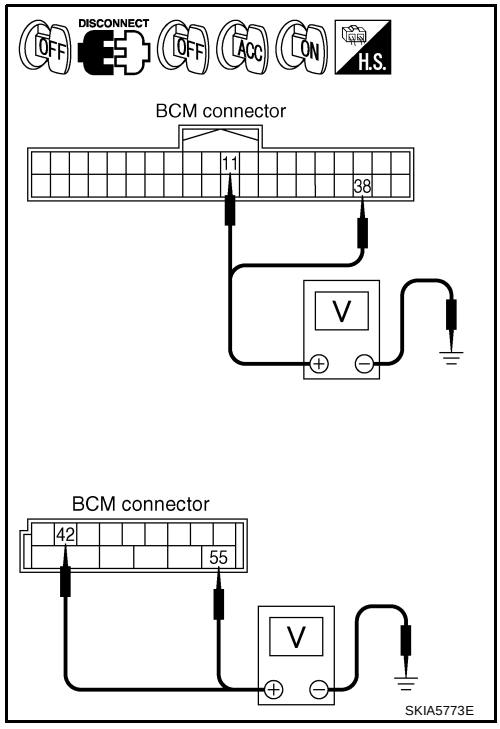
OK >> GO TO 2.

NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connectors.
3. Check voltage between BCM harness connector and ground.

Terminals			Ignition switch position		
(+)		(-)	OFF	ACC	ON
Connector	Terminal (Wire color)				
M90	11 (LG)	Ground	0V	Battery voltage	Battery voltage
	38 (W/L)		0V	0V	Battery voltage
M91	42 (GY)		Battery voltage	Battery voltage	Battery voltage
	55 (R)		Battery voltage	Battery voltage	Battery voltage



OK or NG

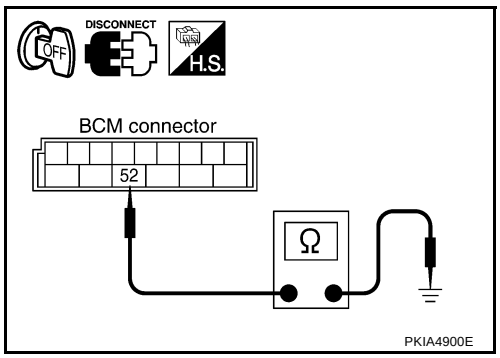
OK >> GO TO 3.

NG >> Check harness for open or short between BCM and fuse.

3. CHECK GROUND CIRCUIT

Check continuity between BCM harness connector and ground.

Terminals			Continuity
Connector	Terminal (Wire color)	Ground	
M91	52 (B)		Yes



OK or NG

OK >> INSPECTION END
NG >> Check ground circuit harness.

CONSULT-II Functions (BCM)

AKS00ABR

CONSULT-II performs the followings communicating with BCM.

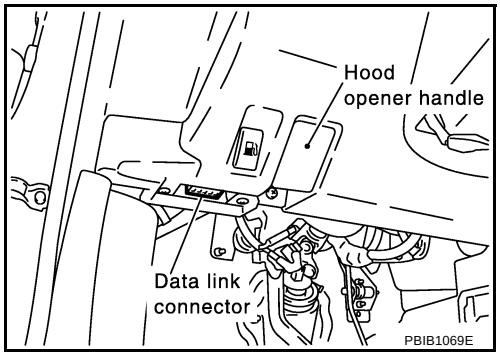
BCM diagnosis part	Check item, diagnosis mode	Description
HEADLAMP	WORK SUPPORT	Changes the setting for each function.
	DATA MONITOR	Displays BCM input data in real time.
	ACTIVE TEST	Operation of electrical loads can be checked by sending drive signal to them.
BCM	CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.

CONSULT-II BASIC OPERATION

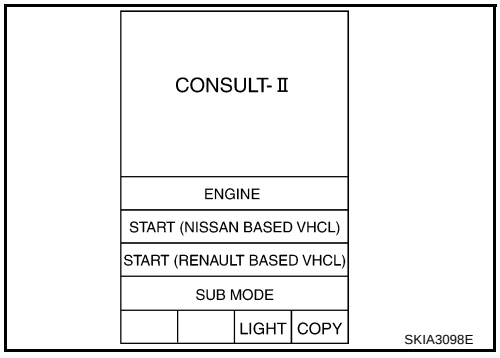
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

1. With ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to data link connector, then turn ignition switch ON.

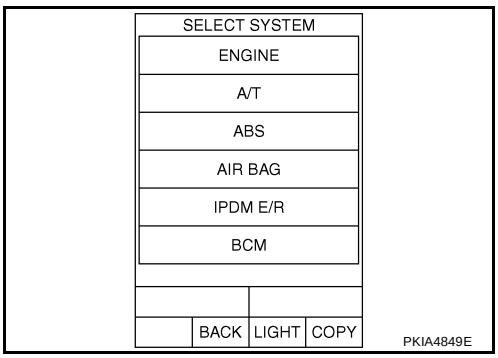


2. Touch “START(NISSAN BASED VHCL)”.

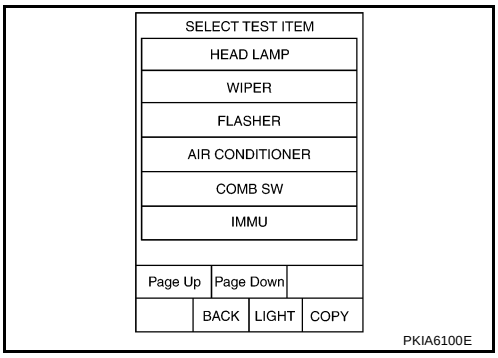


3. Touch “BCM” on “SELECT SYSTEM” screen.

If “BCM” is not indicated, refer to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



4. Touch “HEAD LAMP” on “SELECT TEST ITEM” screen.



WORK SUPPORT

Operation Procedure

1. Touch “HEAD LAMP” on “SELECT TEST ITEM” screen.
2. Touch “WORK SUPPORT” on “SELECT DIAG MODE” screen.
3. Touch “BATTERY SAVER SET” on “SELECT WORK ITEM” screen.
4. Touch “START”.
5. Touch “CHANGE SET”.
6. The setting will be changed and “CUSTOMIZING COMPLETED” will be displayed.
7. Touch “END”.

Display Item List

Item	Description	CONSULT-II	Factory setting
BATTERY SAVER SET	Exterior lamp battery saver control mode can be changed in this mode. Selects exterior lamp battery saver control mode between two ON/OFF.	ON	×
		OFF	—

DATA MONITOR

Operation Procedure

1. Touch “HEAD LAMP” on “SELECT TEST ITEM” screen.
2. Touch “DATA MONITOR” on “SELECT DIAG MODE” screen.
3. Touch either “ALL SIGNALS” or “SELECTION FROM MENU” on “DATA MONITOR” screen.

ALL SIGNALS	Monitors all the signals.
SELECTION FROM MENU	Selects and monitors individual signal.

4. Touch “START”.
5. When “SELECTION FROM MENU” is selected, touch individual items to be monitored. When “ALL SIGNALS” is selected, all the items will be monitored.
6. Touch “RECORD” while monitoring, then the status of the monitored item can be recorded. To stop recording, touch” STOP”.

Display Item List

Monitor item		Contents
IGN ON SW	“ON/OFF”	Displays “IGN position (ON)/OFF, ACC position (OFF)” judged from the ignition switch signal.
ACC ON SW	“ON/OFF”	Displays “ACC (ON)/OFF, Ignition OFF (OFF)” status judged from ignition switch signal.
HI BEAM SW	“ON/OFF”	Displays status (high beam switch: ON/Others: OFF) of high beam switch judged from lighting switch signal.
HEAD LAMP SW 1	“ON/OFF”	Displays status (headlamp switch 1: ON/Others: OFF) of headlamp switch 2 judged from lighting switch signal.
HEAD LAMP SW 2	“ON/OFF”	Displays status (headlamp switch 2: ON/Others: OFF) of headlamp switch 2 judged from lighting switch signal.
LIGHT SW 1 ST	“ON/OFF”	Displays status (lighting switch 1st position: ON/Others: OFF) of lighting switch judged from lighting switch signal.
AUTO LIGHT SW[NOTE]	“ON/OFF”	—
PASSING SW	“ON/OFF”	Displays status (flash-to-pass switch: ON/Others: OFF) of flash-to-pass switch judged from lighting switch signal.
FR FOG SW[NOTE]	“ON/OFF”	—
DOOR SW - DR	“ON/OFF”	Displays status of the driver door as judged from the driver door switch signal. (Door is open: ON/Door is closed: OFF)
DOOR SW - AS	“ON/OFF”	Displays status of the passenger door as judged from the passenger door switch signal. (Door is open: ON/Door is closed: OFF)
DOOR SW - RR[NOTE]	“OFF”	—
DOOR SW - RL[NOTE]	“OFF”	—
BACK DOOR SW	“ON/OFF”	● Displays status of the back door as judged from the back door switch signal. (Coupe models) ● Displays status of the rear trunk hood as judged from the trunk lamp switch signal. (Roadster models)
TURN SIGNAL R	“ON/OFF”	Displays status (Turn right: ON/Others: OFF) as judged from lighting switch signal.
TURN SIGNAL L	“ON/OFF”	Displays status (Turn left: ON/Others: OFF) as judged from lighting switch signal.
CARGO LAMP SW[NOTE]	“OFF”	—

NOTE:
This item is displayed, but cannot monitor it.

ACTIVE TEST

Operation Procedure

1. Touch “HEAD LAMP” on “SELECT TEST ITEM” screen.
2. Touch “ACTIVE TEST” on “SELECT DIAG MODE” screen.
3. Touch item to be tested and check operation of the selected item.
4. During the operation check, touching “BACK” deactivates the operation.

Display Item List

Test item	Description
TAIL LAMP	Allows tail lamp relay to operate by switching ON–OFF.
HEAD LAMP	Allows headlamp relay to operate by switching ON–OFF.
FR FOG LAMP[NOTE]	—
CORNERING LAMP[NOTE]	—

NOTE:
This item is displayed, but cannot test it.

CONSULT-II Functions (IPDM E/R)

AKS00ABS

CONSULT-II performs the following functions communicating with IPDM E/R.

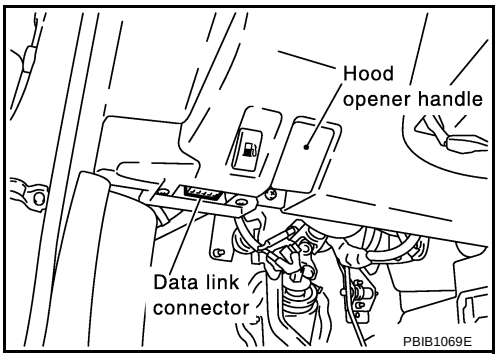
Check Item, Diagnosis Mode	Description
SELF-DIAGNOSTIC RESULTS	The IPDM E/R performs self-diagnosis of CAN communication.
DATA MONITOR	The input/output data of the IPDM E/R is displayed in real time.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
ACTIVE TEST	The IPDM E/R sends a drive signal to electronic components to check their operation.

CONSULT-II BASIC OPERATION

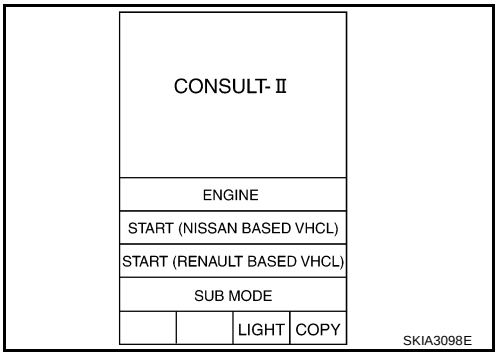
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

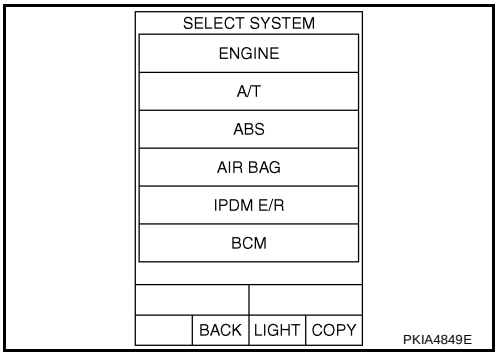
1. With ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to data link connector, then turn ignition switch ON.



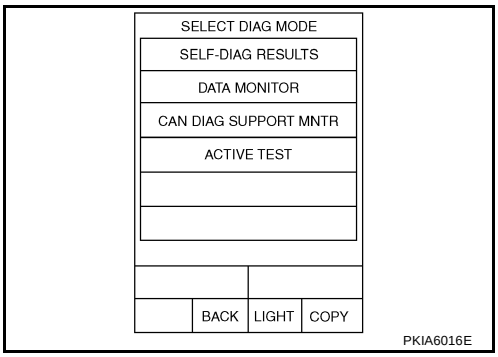
2. Touch “START (NISSAN BASED VHCL)”.



3. Touch “IPDM E/R” on “SELECT SYSTEM” screen.
If “IPDM E/R” is not displayed, print “SELECT SYSTEM” screen, then refer to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



4. Select the desired part to be diagnosed on “SELECT DIAG MODE” screen.



DATA MONITOR

Operation Procedure

1. Touch “DATA MONITOR” on “SELECT DIAG MODE ” screen.
2. Touch “ALL SIGNALS”, “MAIN SIGNALS” or “SELECTION FROM MENU” on “DATA MONITOR” screen.

ALL SIGNALS	All items will be monitored.
MAIN SIGNALS	Monitor the predetermined item.
SELECTION FROM MENU	Select any item for monitoring.

3. Touch “START”.
4. Touch the required monitoring item on “SELECTION FROM MENU”. In “ALL SIGNALS”, all items are monitored. In “MAIN SIGNALS”, predetermined items are monitored.
5. Touch “RECORD” while monitoring to record the status of the item being monitored. To stop recording, touch “STOP”.

All Signals, Main Signals, Selection From Menu

Item name	CONSULT-II screen display	Display or unit	Monitor item selection			Description
			ALL SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
Position lights request	TAIL&CLR REQ	ON/OFF	×	×	×	Signal status input from BCM
Headlamp low beam request	HL LO REQ	ON/OFF	×	×	×	Signal status input from BCM
Headlamp high beam request	HL HI REQ	ON/OFF	×	×	×	Signal status input from BCM

NOTE:
Perform monitoring of IPDM E/R data with ignition switch ON. When ignition switch is at ACC, the display may not be correct.

ACTIVE TEST

Operation Procedure

1. Touch “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Touch item to be tested, and check operation.
3. Touch “START”.
4. Touch “STOP” while testing to stop the operation.

Test item	CONSULT-II screen display	Description
Tail lamp relay output	TAIL LAMP	Allows tail lamp relay to operate by switching operation ON-OFF at your option.
Headlamp relay (HI, LO) output	LAMPS	Allows headlamp relay (HI, LO) to operate by switching operation (OFF, HI ON, LO ON) at your option (Headlamp high beam repeats ON– OFF every 1 second).

SELF-DIAGNOSTIC RESULTS

Refer to PG-21, "SELF-DIAG RESULTS" .

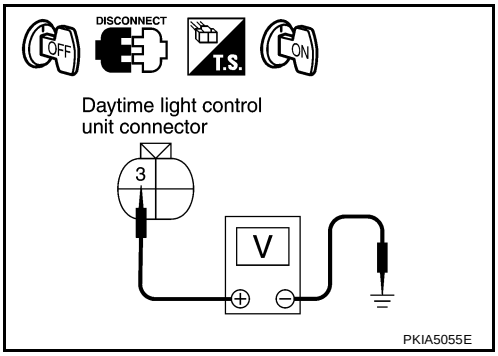
Daytime Light Control Does Not Operate Properly

AKS00ABU

1. CHECK DAYTIME LIGHT CONTROL UNIT

1. Turn ignition switch OFF.
2. Disconnect daytime light control unit connectors.
3. Turn ignition switch ON.
4. Check voltage between daytime light control unit harness connector E13 terminal 3 (G/R) and ground.

3 (G/R) – Ground : Battery voltage should exist.



OK or NG

OK >> GO TO 2.
NG >> Repair or replace daytime light control unit power supply circuit harness.

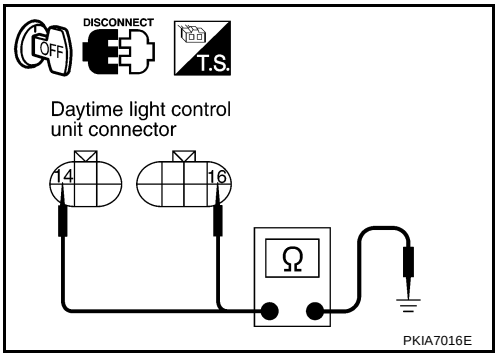
2. CHECK FOR DAYTIME LIGHT CONTROL UNIT GROUND

1. Check continuity between daytime light control unit harness connector E14 terminal 14 (B/Y) and ground.

14 (B/Y) - Ground : Continuity should exist.

2. Check continuity between daytime light control unit harness connector E15 terminal 16 (B) and ground.

16 (B) - Ground : Continuity should exist.



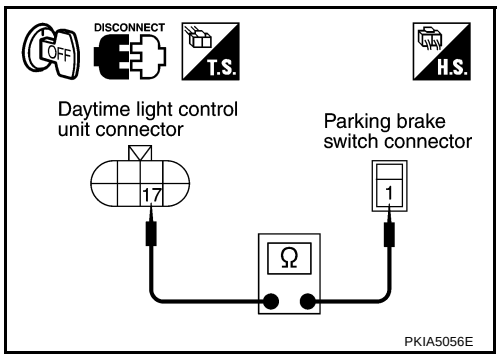
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK PARKING BRAKE SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect daytime light control unit connector and parking brake switch connector.
3. Check harness continuity between daytime light control unit harness connector E15 terminal 17 (G) and parking brake switch harness connector B47 terminal 1 (PU).

17 (G) – 1 (PU) : Continuity should exist.



OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

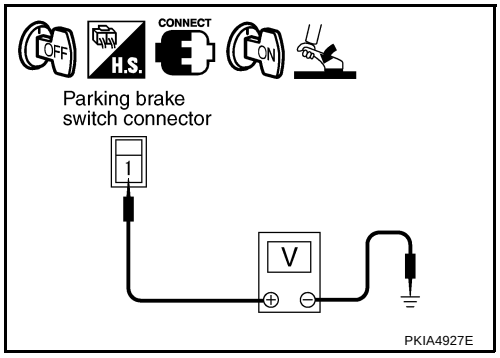
4. CHECK PARKING BRAKE SWITCH

1. Connect daytime light control unit connector and parking brake switch connector.
2. Turn ignition switch ON.
3. Check voltage between parking brake switch connector B47 terminal 1 (PU) and ground, when parking brake is released.

1 (PU) – Ground : Battery voltage should exist.

4. Check voltage between parking brake switch connector B47 terminal 1(PU) and ground, when parking brake is applied.

1 (PU) – Ground : Approx. 0V



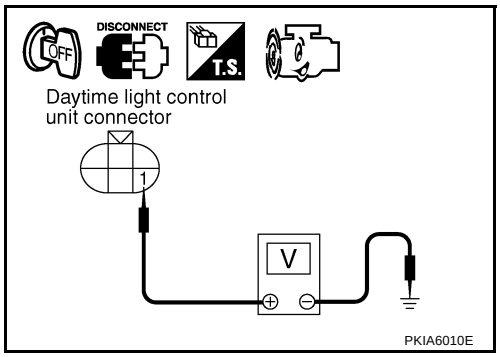
OK or NG

OK >> GO TO 5.
NG >> Replace parking brake switch.

5. CHECK ALTERNATOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect daytime light control unit connector.
3. Start engine running.
4. Check voltage between daytime light control unit harness connector E14 terminal 1 (W/R) and ground.

1 (W/R) – Ground : Battery voltage should exist.



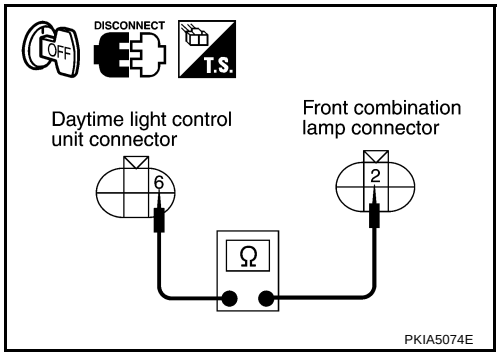
OK or NG

OK >> GO TO 6.
NG >> Repair harness or connector.

6. CHECK DAYTIME LIGHT CONTROL UNIT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect daytime light control unit connector and front combination lamp RH connector.
3. Check harness continuity between daytime light control unit harness connector E14 terminal 6 (L) and front combination lamp RH harness connector E25 terminal 2 (L).

6 (L) – 2 (L) : Continuity should exist.



OK or NG

OK >> Replace daytime light control unit.
NG >> Repair harness or connector.

Headlamp High Beam Does Not Illuminate (Both Sides)

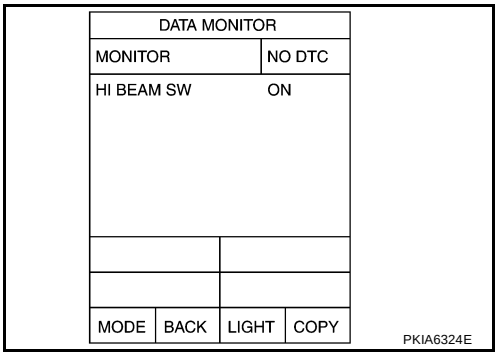
AKS00ATA

1. CHECK COMBINATION SWITCH INPUT SIGNAL

With CONSULT-II

Select “BCM” on CONSULT-II, With “HEAD LAMP” data monitor, make sure “HI BEAM SW” turns ON-OFF linked with operation of lighting switch.

When lighting switch is HIGH BEAM position : HI BEAM SW ON



Without CONSULT-II

Refer to LT-170, "Combination Switch Inspection" .

OK or NG

OK >> GO TO 2.

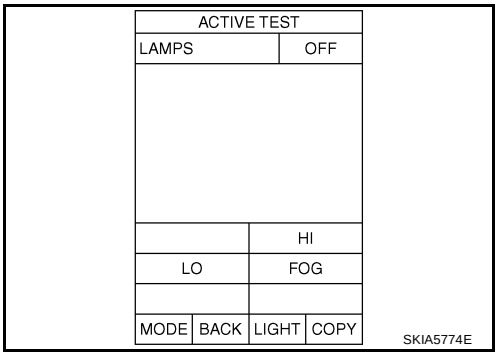
NG >> Check lighting switch. Refer to LT-170, "Combination Switch Inspection" .

2. HEADLAMP ACTIVE TEST

With CONSULT-II

1. Select “IPDM E/R” on CONSULT-II, and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Select “LAMPS” on “SELECT TEST ITEM” screen.
3. Touch “HI” screen.
4. Make sure headlamp high beam operation.

Headlamp high beam should operate.
(Headlamp high beam repeats ON-OFF every 1 second).



Without CONSULT-II

1. Start auto active test. Refer to PG-24, "Auto Active Test" .
2. Make sure headlamp high beam operation.

Headlamp high beam should operate.

OK or NG

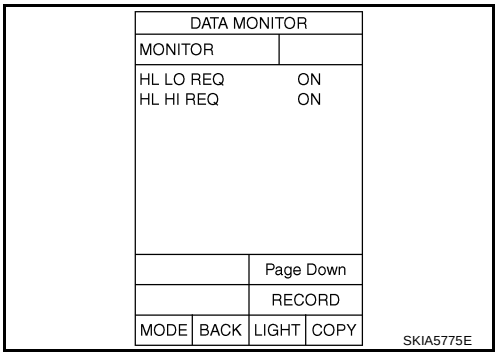
OK >> GO TO 3.

NG >> GO TO 4.

3. CHECK IPDM E/R

1. Select “IPDM E/R” on CONSULT-II, and select “DATA MONITOR” on “SELECT DIAG MODE” screen.
2. Make sure “HL LO REQ” and “HL HI REQ” turns ON when lighting switch is in HIGH BEAM position.

When lighting switch is HIGH BEAM position : HL LO REQ ON
: HL HI REQ ON



OK or NG

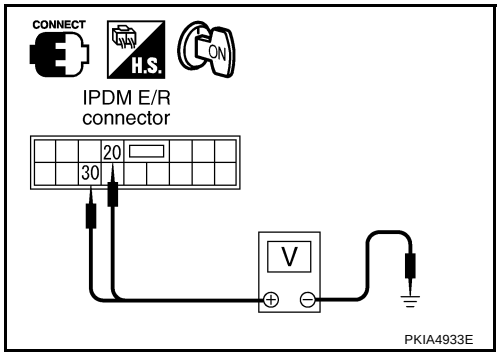
OK >> Replace IPDM E/R.

NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

4. CHECK HEADLAMP INPUT SIGNAL

With CONSULT-II

1. Select “IPDM E/R” on CONSULT-II, and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Select “LAMPS” on “SELECT TEST ITEM” screen.
3. Touch “HI” screen.
4. When headlamp high beam is operating, check voltage between front combination lamp RH and LH harness connector and ground (Headlamp high beam repeats ON–OFF every 1 second).



Terminals			Voltage
(+)		(-)	
Connector	Terminal (Wire color)		
E13	20 (R)	Ground	Battery voltage
	30 (R/B)		

Without CONSULT-II

1. Start auto active test. Refer to PG-24, "Auto Active Test" .
2. When headlamp high beam is operating, check voltage between front combination lamp RH and LH harness connector and ground.

Terminals			Voltage
(+)		(-)	
Connector	Terminal (Wire color)		
E13	20 (R)	Ground	Battery voltage
	30 (R/B)		

OK or NG

OK >> Check headlamp bulbs.
NG >> GO TO 5.

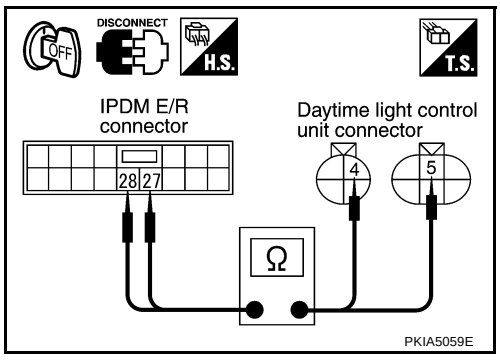
5. CHECK IPDM E/R CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check harness continuity IPDM E/R harness connector E7 terminal 28 (R/Y) and daytime light control unit harness connector E13 terminal 4 (R/Y).

28 (R/Y) – 4 (R/Y) : Continuity should exist.

4. Check harness continuity IPDM E/R harness connector E7 terminal 27 (BR) daytime light control unit harness connector E14 terminal 5 (BR).

27 (BR) – 5 (BR) : Continuity should exist.



OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.

RH High Beam Does Not Illuminate But RH Low Beam Illuminates

AKS00ABW

1. CHECK BULB

Inspect bulb of lamp.

OK or NG

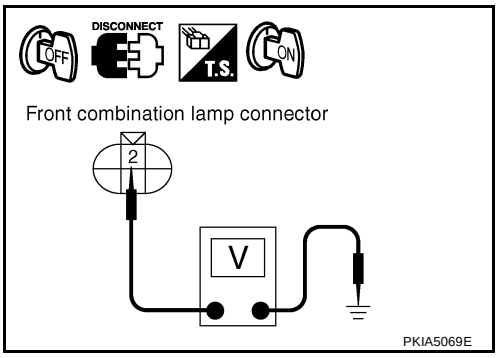
OK >> GO TO 2.
NG >> Replace headlamp bulb.

2. CHECK HEADLAMP INPUT SIGNAL

With CONSULT-II

1. Connect daytime light control unit connector.
2. Select “IPDM E/R” on CONSULT-II and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
3. Touch “HI” screen.
4. When headlamp HI is operating, check voltage between front combination lamp RH harness connector E25 terminal 2 (L) and ground (Headlamp high beam repeats ON–OFF every 1 second).

2 (L) – Ground : Battery voltage should exist.



Without CONSULT-II

1. Start auto active test. Refer to PG-24, "Auto Active Test" .
2. When headlamp HI is operating, check voltage between front combination lamp RH harness connector E25 terminal 2 (L) and ground.

2 (L) – Ground : Battery voltage should exist.

OK or NG

OK >> GO TO 6.
NG >> GO TO 3.

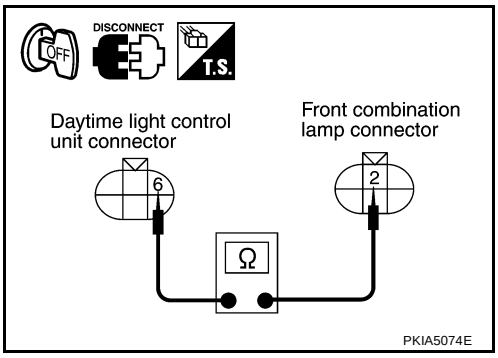
3. CHECK DAYTIME LIGHT CONTROL UNIT CIRCUIT

1. Disconnect daytime light control unit connector and front combination lamp RH connector.
2. Check continuity between daytime light control unit harness connector E14 terminal 6 (L) and front combination lamp RH harness connector E25 terminal 2 (L).

6 (L) – 2 (L) : Continuity should exist.

OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

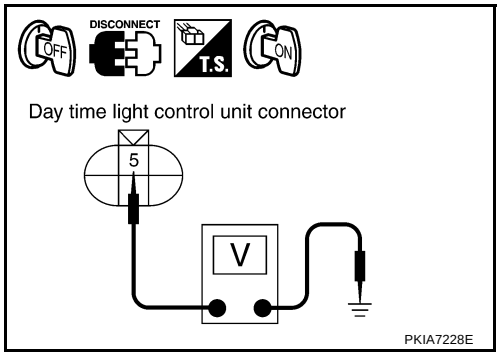


4. CHECK DAYTIME LIGHT CONTROL UNIT INPUT SIGNAL

With CONSULT-II

1. Disconnect daytime light control unit connector.
2. Select “IPDM E/R” on CONSULT-II and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
3. Touch “HI” screen.
4. When headlamp HI is operating, check voltage between daytime light control unit harness connector E14 terminal 5 (BR) and ground (Headlamp high beam repeats ON–OFF every 1 second).

5 (BR) – Ground : Battery voltage should exist.



Without CONSULT-II

1. Start auto active test. Refer to PG-24, "Auto Active Test" .
2. When headlamp HI is operating, check voltage between daytime light control unit harness connector E14 terminal 5 (BR) and ground.

5 (BR) – Ground : Battery voltage should exist.

OK or NG

OK >> Replace daytime light control unit.
NG >> GO TO 5.

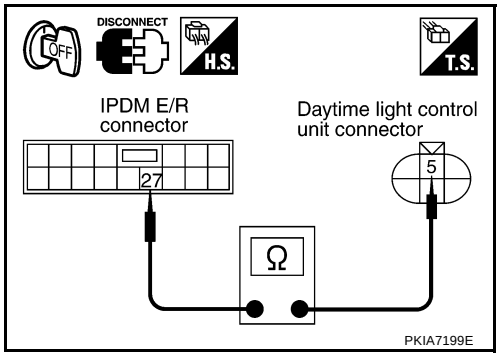
5. CHECK IPDM E/R CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check harness continuity IPDM E/R harness connector E7 terminal 27 (BR) daytime light control unit harness connector E14 terminal 5 (BR).

27 (BR) – 5 (BR) : Continuity should exist.

OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.



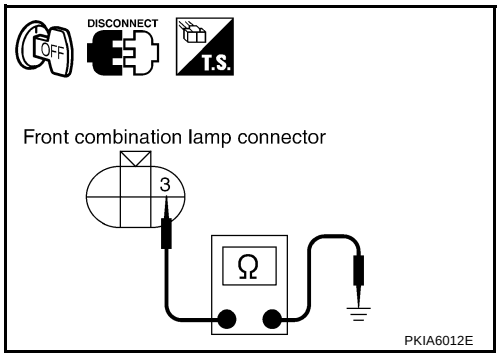
6. CHECK HEADLAMP GROUND

Check continuity between front combination lamp RH harness connector E25 terminal 3 (B/W) and ground.

3 (B/W) – Ground : Continuity should exist.

OK or NG

OK >> Check headlamp harness and connector.
NG >> Repair harness or connector.



LH High Beam Does Not Illuminate But LH Low Beam Illuminates

AKS00ABX

1. CHECK BULB

Inspect bulb of lamp.

OK or NG

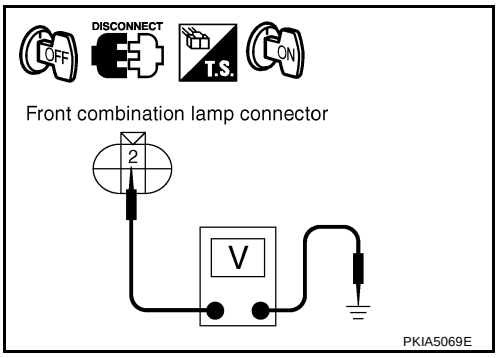
OK >> GO TO 2.
NG >> Replace bulb of lamp.

2. CHECK HEADLAMP INPUT SIGNAL

With CONSULT-II

1. Connect daytime light control unit connector.
2. Select “IPDM E/R” on CONSULT-II and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
3. Touch “HI” screen.
4. When headlamp high beam is operating, check voltage between front combination lamp LH harness connector E41 terminal 2 (SB) and ground (Headlamp high beam repeats ON–OFF every 1 second).

2 (SB) – Ground : Battery voltage should exist.



Without CONSULT-II

1. Start auto active test. Refer to PG-24, "Auto Active Test" .
2. When headlamp high beam is operating, check voltage between front combination lamp LH harness connector E41 terminal 2 (SB) and ground.

2 (SB) – Ground : Battery voltage should exist.

OK or NG

OK >> GO TO 6.
NG >> GO TO 3.

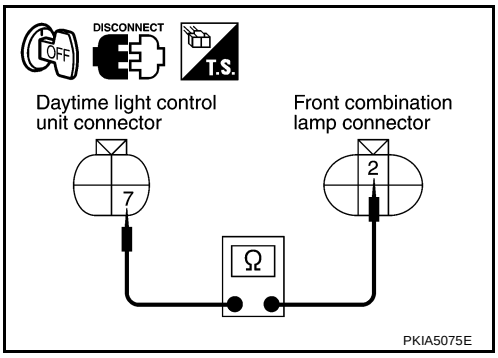
3. CHECK DAYTIME LIGHT CONTROL UNIT CIRCUIT

1. Disconnect daytime light control unit connector and front combination lamp LH connector.
2. Check continuity between daytime light control harness connector E13 terminal 7 (SB) and front combination lamp LH harness connector E41 terminal 2 (SB).

7 (SB) – 2 (SB) : Continuity should exist.

OK or NG

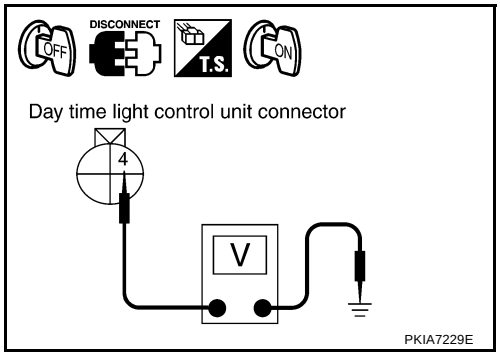
OK >> GO TO 4.
NG >> Repair harness or connector.



4. CHECK DAYTIME LIGHT CONTROL UNIT INPUT SIGNAL

With CONSULT-II

1. Disconnect daytime light control unit connector.
2. Select “IPDM E/R” on CONSULT-II and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
3. Touch “HI” screen.
4. When headlamp HI is operating, check voltage between daytime light control unit harness connector E13 terminal 4 (R/Y) and ground (Headlamp high beam repeats ON–OFF every 1 second).



4 (R/Y) – Ground : Battery voltage should exist.

Without CONSULT-II

1. Start auto active test. Refer to PG-24, "Auto Active Test" .
2. When headlamp HI is operating, check voltage between daytime light control unit harness connector E13 terminal 4 (R/Y) and ground.

4 (R/Y) – Ground : Battery voltage should exist.

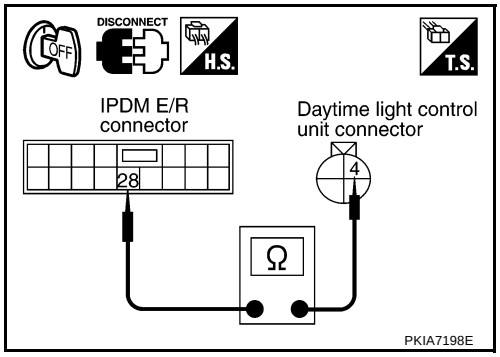
OK or NG

OK >> Replace daytime light control unit.
NG >> GO TO 5.

5. CHECK IPDM E/R CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check harness continuity IPDM E/R harness connector E7 terminal 28 (R/Y) and daytime light control unit harness connector E13 terminal 4 (R/Y).

28 (R/Y) – 4 (R/Y) : Continuity should exist.



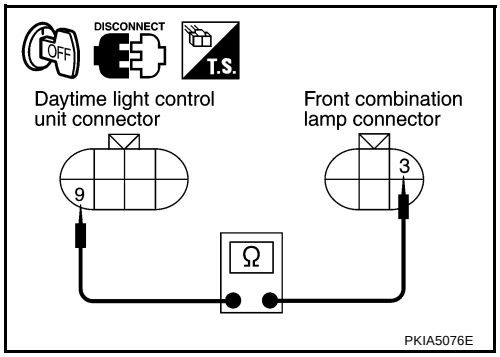
OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.

6. CHECK DAYTIME LIGHT CONTROL UNIT CIRCUIT

1. Disconnect daytime light control unit connector.
2. Check continuity between daytime light control harness connector E15 terminal 9 (Y/G) and front combination lamp LH harness connector E41 terminal 3 (Y/G).

9 (Y/G) – 3 (Y/G) : Continuity should exist.



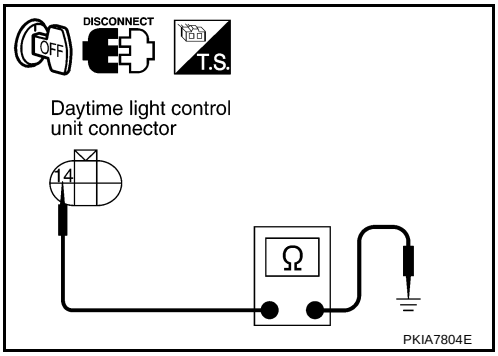
OK or NG

OK >> GO TO 7.
NG >> Repair harness or connector.

7. CHECK DAYTIME LIGHT CONTROL UNIT AND GROUND

Check continuity between daytime light control unit harness connector E14 terminal 14 (B/Y) and ground.

14 (B/Y) – Ground : Continuity should exist.



OK or NG

OK >> Replace daytime light control unit.
NG >> Repair harness or connector.

Headlamp Low Beam Does Not Illuminate (Both Sides)

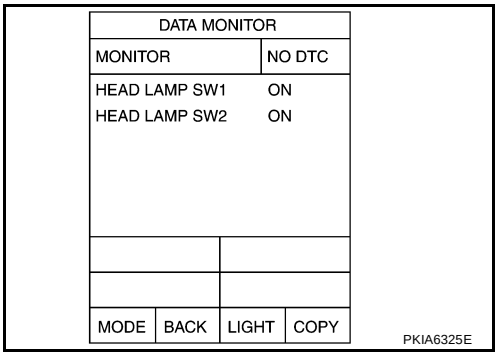
AKS00ATB

1. CHECK COMBINATION SWITCH INPUT SIGNAL

With CONSULT-II

Select “BCM” on CONSULT-II. With “HEAD LAMP” data monitor, make sure “HEAD LAMP SW 1” and “HEAD LAMP SW 2” turns ON-OFF linked with operation of lighting switch.

When lighting switch is 2ND position : HEAD LAMP SW 1 ON
: HEAD LAMP SW 2 ON



Without CONSULT-II

Refer to LT-170, "Combination Switch Inspection" .

OK or NG

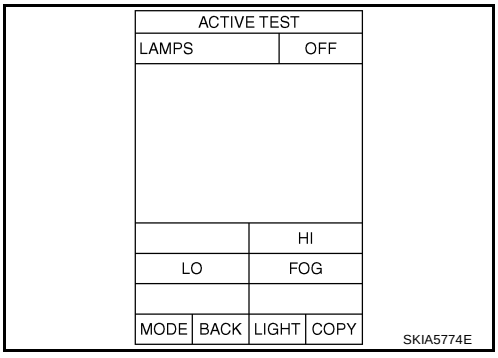
OK >> GO TO 2.
NG >> Check lighting switch. Refer to LT-170, "Combination Switch Inspection" .

2. HEADLAMP ACTIVE TEST

With CONSULT-II

1. Select “IPDM E/R” on CONSULT-II, and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Select “LAMPS” on “SELECT TEST” ITEM screen.
3. Touch “LO” screen.
4. Make sure headlamp low beam operation.

Headlamp low beam should operate.



Without CONSULT-II

1. Start auto active test. Refer to PG-24, "Auto Active Test" .
2. Make sure headlamp low beam operation.

Headlamp low beam should operate.

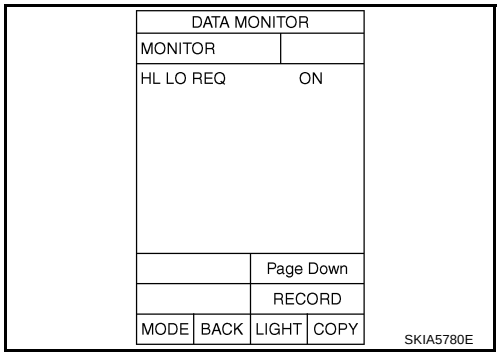
OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK IPDM E/R

1. Select “IPDM E/R” on CONSULT-II, and select “DATA MONITOR” on “SELECT DIAG MODE” screen.
2. Make sure “HL LO REQ” turns ON when lighting switch is in 2ND position.

When lighting switch is 2ND position : HL LO REQ ON



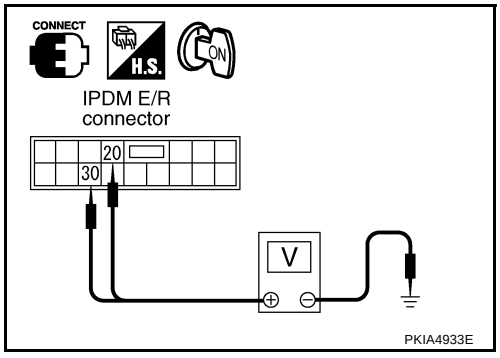
OK or NG

OK >> Replace IPDM E/R.
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

4. CHECK IPDM E/R SIGNAL

With CONSULT-II

1. Select “IPDM E/R” on CONSULT-II. and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Select “LAMPS” on “SELECT TEST ITEM” screen.
3. Touch “LO” screen.
4. When headlamp low beam is operating, check voltage between IPDM E/R and ground.



Terminals			Voltage
(+)		(-)	
Connector	Terminal (wire color)		
E7	30 (R/B)	Ground	Battery voltage
	20 (R)		

Without CONSULT-II

1. Start auto active test. Refer to PG-24, "Auto Active Test" .
2. When headlamp low beam is operating, check voltage between IPDM E/R and ground.

Terminals			Voltage
(+)		(-)	
Connector	Terminal (wire color)		
E7	30 (R/B)	Ground	Battery voltage
	20 (R)		

OK or NG

OK >> Check headlamp bulbs.
NG >> Replace IPDM E/R.

RH Low Beam Does Not Illuminate But RH High Beam Illuminates

AKS009SZ

1. CHECK BULB

Check bulb of lamp.

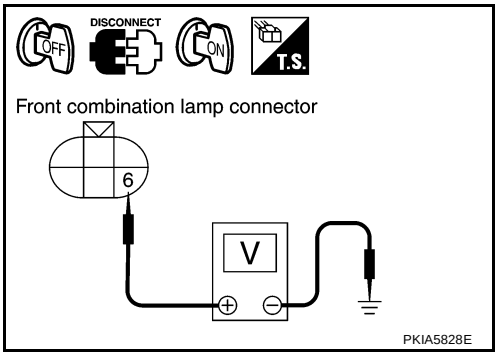
OK or NG

OK >> GO TO 2.
NG >> Replace headlamp bulb.

2. CHECK HEADLAMP INPUT SIGNAL

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH connector E25.
3. Turn ignition switch ON.
4. Lighting switch is turned 2ND position.
5. Check voltage between front combination lamp RH harness connector E25 terminal 6 (R) and ground.

6 (R) - Ground : Battery voltage should exist.



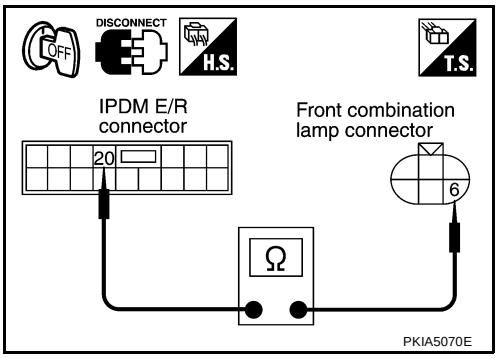
OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. CHECK HEADLAMP RH CIRCUIT

1. Disconnect IPDM E/R connector and front combination lamp RH connector.
2. Check harness continuity between IPDM E/R harness connector E7 terminal 20 (R) and front combination lamp RH harness connector E25 terminal 6 (R).

20 (R) – 6 (R) : Continuity should exist.



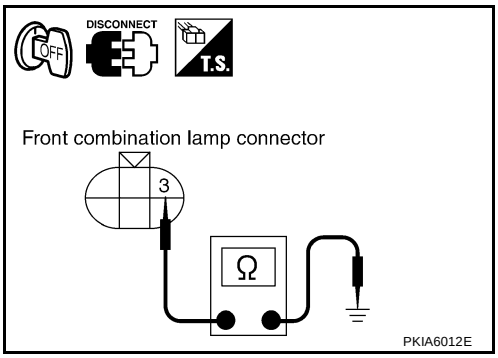
OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.

4. CHECK HEADLAMP GROUND

Check continuity between front combination lamp RH harness connector E25 terminal 3 (B/W) and ground.

3 (B/W) – Ground : Continuity should exist.



OK or NG

OK >> Check headlamp harness and connectors.
NG >> Repair harness or connector.

LH Low Beam Does Not Illuminate But LH High Beam Illuminates

AKS009T0

1. CHECK BULB

Check bulb of lamp.

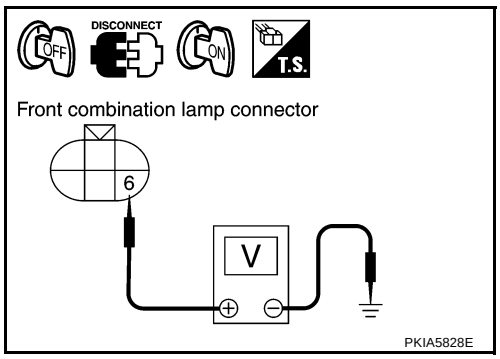
OK or NG

OK >> GO TO 2.
NG >> Replace bulb of lamp.

2. CHECK HEADLAMP INPUT SIGNAL

1. Turn ignition switch OFF.
2. Disconnect front combination lamp LH connector E41.
3. Turn ignition switch ON.
4. Lighting switch is turned 2ND position.
5. Check voltage between front combination lamp LH harness connector E41 terminal 6 (R) and ground.

6 (R) - Ground : Battery voltage should exist.



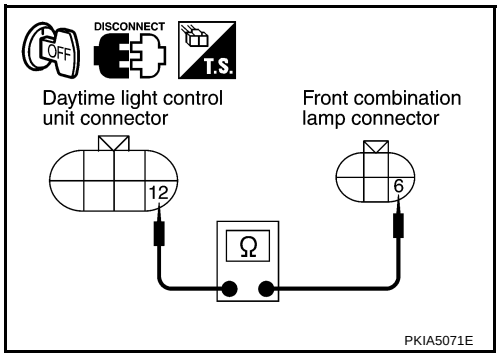
OK or NG

OK >> GO TO 6.
NG >> GO TO 3.

3. CHECK DAYTIME LIGHT CONTROL UNIT CIRCUIT

1. Disconnect daytime light control unit connector and front combination lamp LH connector.
2. Check harness continuity between daytime light control unit harness connector E15 terminal 12 (R) and front combination lamp LH harness connector E41 terminal 6 (R).

12 (R) – 6 (R) : Continuity should exist.



OK or NG

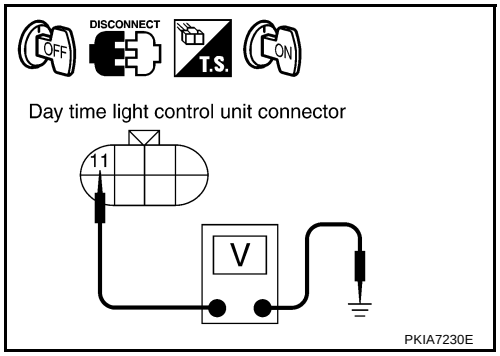
OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK DAYTIME LIGHT CONTROL UNIT INPUT SIGNAL

With CONSULT-II

1. Disconnect daytime light control unit connector.
2. Select “IPDM E/R” on CONSULT-II and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
3. Touch “LO” screen.
4. When headlamp LO is operating, check voltage between daytime light control unit harness connector E15 terminal 11 (R/B) and ground.

11 (R/B) – Ground : Battery voltage should exist.



Without CONSULT-II

1. Start auto active test. Refer to PG-24, "Auto Active Test" .
2. When headlamp LO is operating, check voltage between daytime light control unit harness connector E15 terminal 11 (R/B) and ground.

11 (R/B) – Ground : Battery voltage should exist.

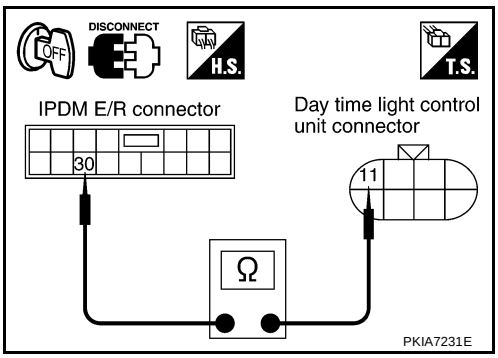
OK or NG

OK >> Replace daytime light control unit.
NG >> GO TO 6.

5. CHECK IPDM E/R CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check harness continuity IPDM E/R harness connector E7 terminal 30 (R/B) daytime light control unit harness connector E15 terminal 11 (R/B).

30 (R/B) – 11 (R/B) : Continuity should exist.



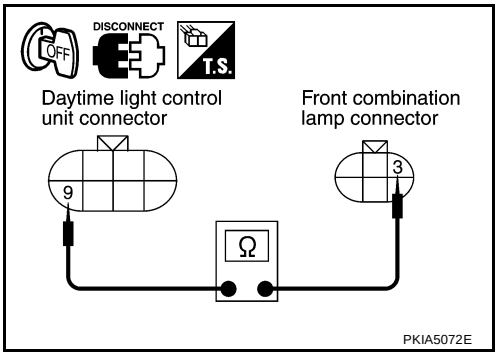
OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.

6. CHECK DAYTIME LIGHT CONTROL UNIT CIRCUIT

1. Disconnect daytime light control unit connector and front combination lamp connector.
2. Check harness continuity between daytime light control unit harness connector E15 terminal 9 (Y/G) and front combination lamp LH harness connector E41 terminal 3 (Y/G).

9 (Y/G) – 3 (Y/G) : Continuity should exist.



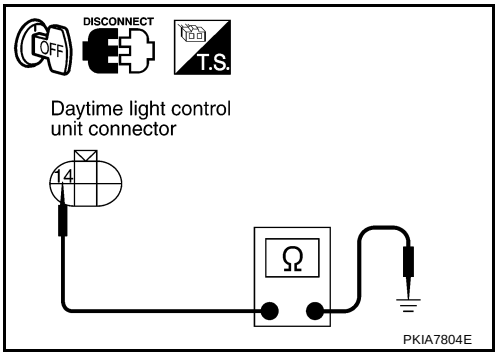
OK or NG

OK >> GO TO 7.
NG >> Repair harness or connector.

7. CHECK DAYTIME LIGHT CONTROL UNIT AND GROUND

Check continuity between daytime light control unit harness connector E14 terminal 14 (B/Y) and ground.

14 (B/Y) – Ground : Continuity should exist.

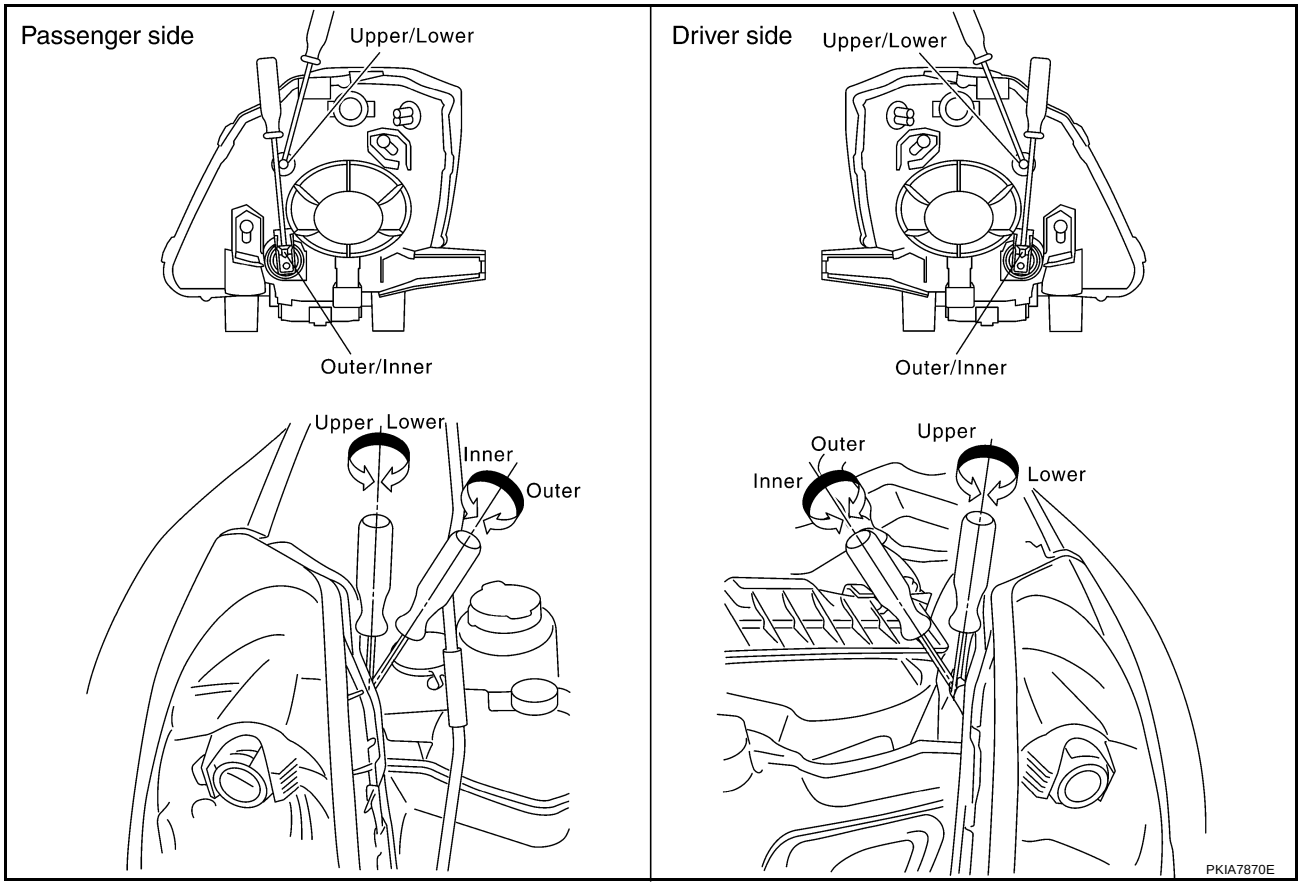


OK or NG

OK >> Replace daytime light control unit.
NG >> Repair harness or connector.

Aiming Adjustment

AKS009T1



PREPARATION BEFORE ADJUSTING

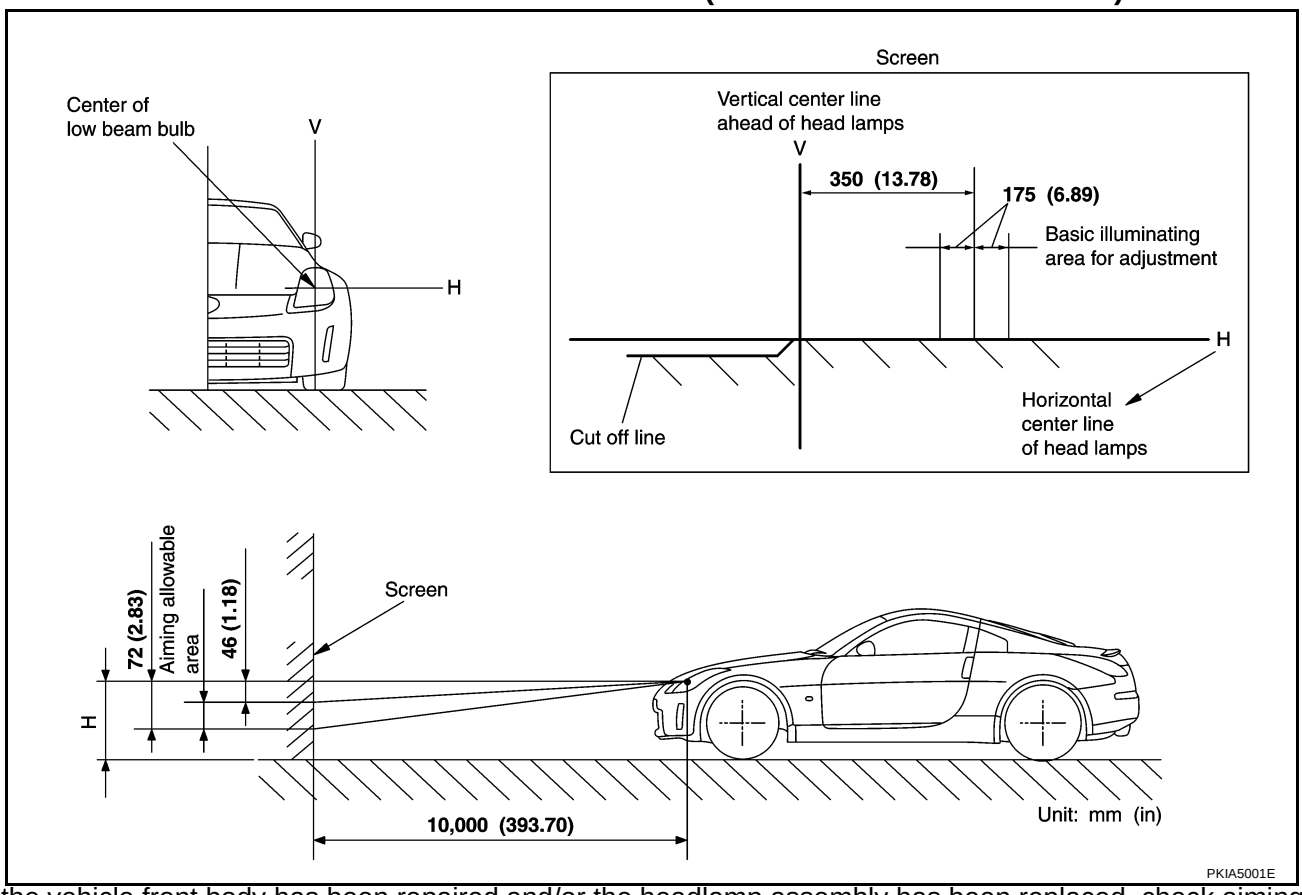
For details, refer to the regulations in your own country.
Before performing aiming adjustment, check the following.

1. Keep all tires inflated to correct pressures.
2. Place vehicle on flat surface.
3. Set that there is no-load in vehicle other than the driver (or equivalent weight placed in driver's position). Coolant, engine oil filled up to correct level and full fuel tank.

LOW BEAM AND HIGH BEAM

1. Turn headlamp low beam on.
2. Use adjusting screws to perform aiming adjustment.

ADJUSTMENT USING AN ADJUSTMENT SCREEN (LIGHT/DARK BORDERLINE)



If the vehicle front body has been repaired and/or the headlamp assembly has been replaced, check aiming. Use the aiming chart shown in the figure.

- Basic illumination area for adjustment should be within the range shown on the aiming chart. Adjust headlamp accordingly.

Bulb Replacement

AKS009T2

HEADLAMP (UPPER) LOW BEAM

1. Turn lighting switch OFF.
2. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" in “EI” section.
3. Turn plastic cap counterclockwise and unlock it.
4. Disconnect bulb terminal.
5. Unlock retaining spring and remove bulb from headlamp.
6. Install in reverse order of removal.

Headlamp (upper) low beam (Halogen) : 12V - 55W (H7)

HEADLAMP (LOWER) HIGH BEAM

1. Turn lighting switch OFF.
2. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" in “EI” section.
3. Turn plastic cap counterclockwise and unlock it.
4. Disconnect bulb terminal.
5. Unlock retaining spring and remove bulb from headlamp.
6. Install in the reverse order of removal.

Headlamp (lower) high beam/Fog lamp : 12V - 55W (H1)

PARKING LAMPS (CLEARANCE LAMPS)

1. Turn lighting switch OFF.

2. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" in “EI” section.
3. Turn bulb socket counterclockwise and unlock it.
4. Remove bulb from its socket.
5. Install in the reverse order of removal.

Parking lamps (Clearance lamps) : 12V - 5W

FRONT TURN SIGNAL LAMP

1. Turn lighting switch OFF.
2. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" in “EI” section.
3. Turn bulb socket counterclockwise and unlock it.
4. Remove bulb from its socket.
5. Install in the reverse order of removal.

Front turn signal lamp : 12V - 21W

CAUTION:
After installing bulb, be sure to install plastic cap and bulb socket securely to insure watertightness.

FRONT SIDE MARKER LAMP

1. Turn lighting switch OFF.
2. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" in “EI” section.
3. Turn bulb socket counterclockwise and unlock it.
4. Remove bulb from its socket.
5. Install in the reverse order of removal.

Front side marker lamp : 12V - 5W

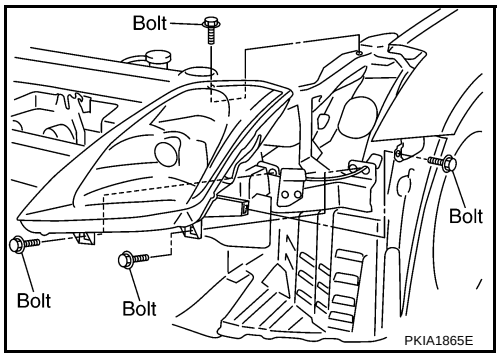
CAUTION:
After installing bulb, be sure to install plastic cap and socket securely to insure watertightness.

Removal and Installation

AKS009T3

REMOVAL

1. Remove front bumper. Refer to EI-14, "FRONT BUMPER" in “EI” section.
2. Remove headlamp mounting bolts.
3. Pull headlamp toward vehicle front, disconnect connector, and remove headlamp.



INSTALLATION

Install in the reverse order of removal. Be careful of the following:

Headlamp mounting bolt:

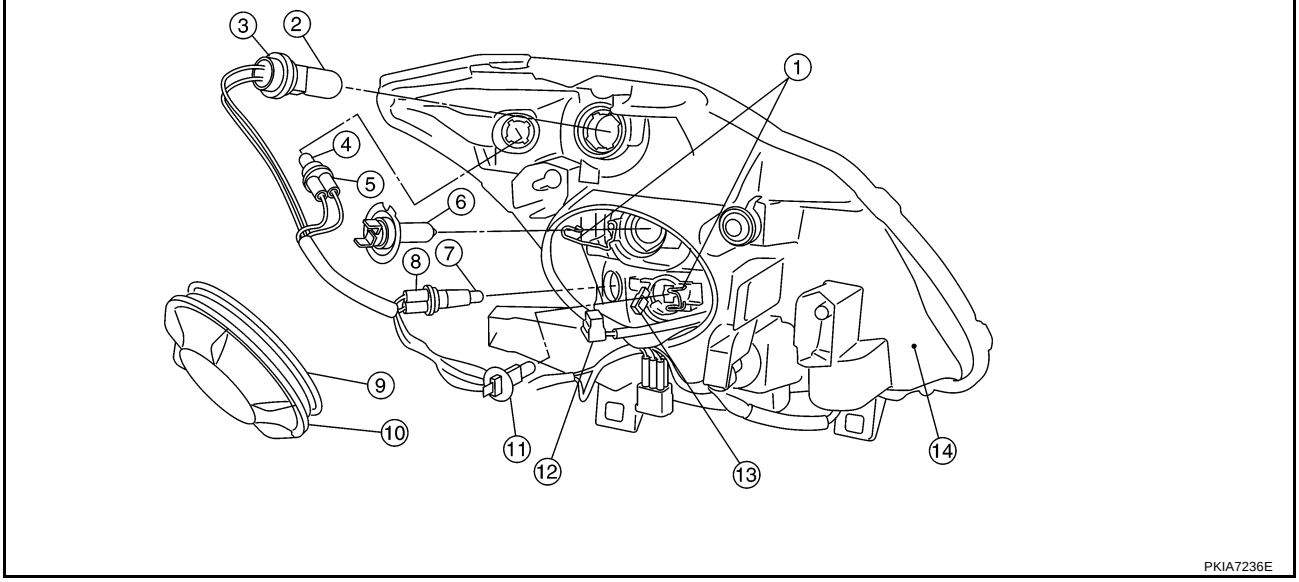
: 6.1 N·m (0.62 kg-m, 54 in-lb)

NOTE:
After installation, perform aiming adjustment. Refer to LT-138, "Aiming Adjustment" .

Disassembly and Assembly

AKS009T4

HALOGEN TYPE



PKIA7236E

1. Retaining spring	2. Front turn signal lamp bulb	3. Front turn signal lamp bulb socket
4. Side marker lamp bulb	5. Side marker lamp bulb socket	6. Halogen bulb (low)
7. Halogen bulb socket	8. Clearance lamp bulb socket	9. Seal rubber
10. Plastic cap	11. Halogen bulb (high)	12. Halogen bulb socket (low)
13. Halogen bulb socket (high)	14. Headlamp housing assembly	

DISASSEMBLY

1. Turn plastic cap counterclockwise and unlock it.
2. Disconnect bulb socket (low).
3. Unlock retaining spring, and remove halogen bulb (low).
4. Disconnect the socket connected to halogen bulb (high).
5. Unlock retaining spring, and remove halogen bulb (high).
6. Turn parking lamp bulb socket counterclockwise and unlock it.
7. Remove parking lamp bulb from its socket.
8. Turn front turn signal lamp bulb socket counterclockwise and unlock it.
9. Remove front turn signal lamp bulb from its socket.
10. Turn front side marker lamp bulb socket counterclockwise and unlock it
11. Remove front side lamp marker lamp bulb from its socket.

ASSEMBLY

Assemble in reverse order of disassembly. Be careful of the following:

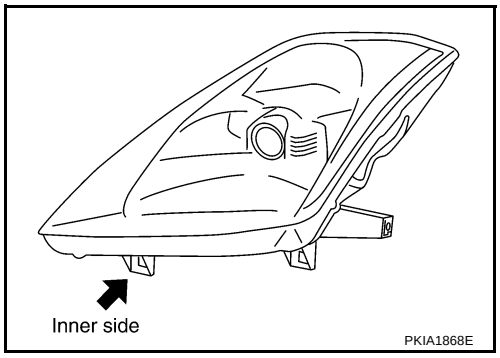
CAUTION:

- **After installing bulb, be sure to install plastic cap and bulb socket securely to insure watertightness.**

Servicing to Replace Headlamps When Damaged

AKS009T6

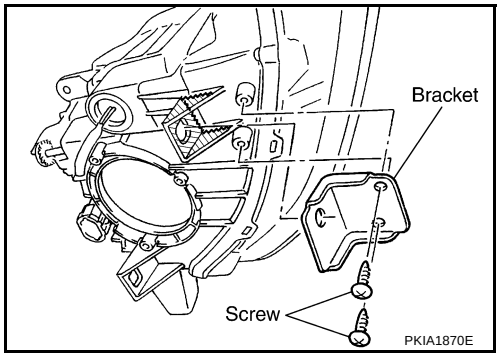
If only installation part as shown in the figure is damaged, and headlamp housing itself is not damaged, repair can be completed easily by installing correction brackets.



INSTALLATION OF HEADLAMP BRACKET

1. Remove headlamps. Refer to LT-140, "Removal and Installation" .
2. Cut damaged section of installation part, then shape with sandpaper.
3. Attach each correction bracket to headlamp housing boss with 2 screws.

RH headlamp	**Inner side**	**26040 CD000**
LH headlamp	**Inner side**	**26090 CD000**

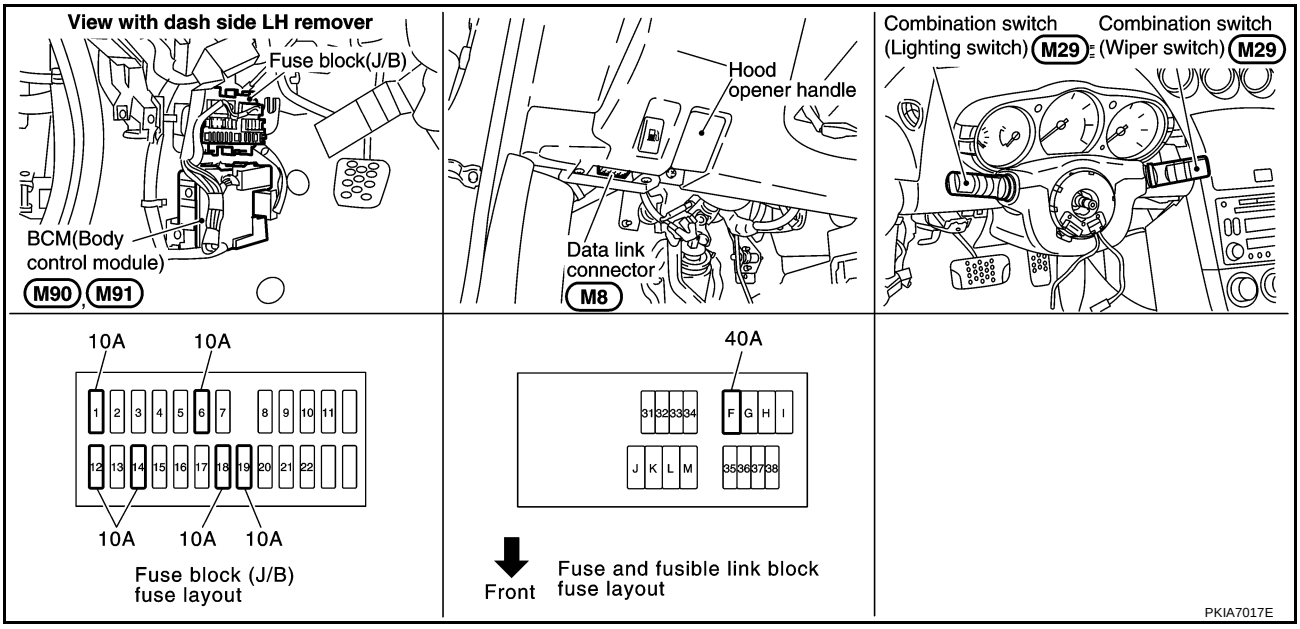


TURN SIGNAL AND HAZARD WARNING LAMPS

PFP:26120

Component Parts and Harness Connector Location

AKS009RI



System Description

AKS009QS

TURN SIGNAL OPERATION

When ignition switch is in ON or START position, power is supplied

- through 10A fuse [No.1, located in fuse block (J/B)]
- to BCM (body control module) terminal 38,
- through 10A fuse [No.12, located in fuse block (J/B)]
- to unified meter and A/C amp. terminal 22, and
- through 10A fuse [No.14, located in fuse block (J/B)]
- to combination meter terminal 23.

Ground is supplied

- to BCM terminal 52
- through grounds M30 and M66,
- to unified meter and A/C amp. terminals 29 and 30
- through grounds M30 and M66, and
- to combination meter terminals 10, 11 and 12
- through grounds M30 and M66.

LH Turn

When turn signal switch (combination switch) is moved to LH position, BCM receives left turn signal by combination switch reading function (Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION"). Power is supplied

- through BCM terminal 45
- to front combination lamp LH terminal 2*1
- to front combination lamp LH terminal 1*2
- to rear combination lamp LH terminal 2.

Ground is supplied to front combination lamp LH terminal 1 through grounds E17, E43 and F152*1 .

Ground is supplied to front combination lamp LH terminal 4 through grounds E17, E43 and F152*2 .
Ground is supplied to rear combination lamp LH terminal 4 through grounds T14, B5, B6 and D105.
BCM also supplies ground to unified meter and A/C amp. terminals 1and 11 across CAN communication lines. This input signal is processed by unified meter control unit in combination meter through unified meter and A/C amp., which in turn supplies ground to left turn signal indicator lamp.

With power and ground supplied, BCM controls the flashing of LH turn signal lamps.

NOTE:
*1: Xenon headlamp, *2: halogen headlamp.

RH Turn

When turn signal switch (combination switch) is moved to RH position, BCM receives right turn signal by combination switch reading function (Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION"). Power is supplied

- through BCM terminal 46
- to front combination lamp RH terminal 2[*1]
- to front combination lamp RH terminal 1[*2]
- to rear combination lamp RH terminal 2.

Ground is supplied to combination lamp RH terminal 1 through grounds E17, E43 and F152[*1] .

Ground is supplied to front combination lamp RH terminal 4 through grounds E17, E43 and F152[*2] .
Ground is supplied to rear combination lamp RH terminal 4 through grounds T14, B5, B6 and D105.
BCM also supplies ground to unified meter and A/C amp. terminals 1 and 11 across CAN communication lines. This input is processed by unified meter control unit in combination meter through unified meter and A/C amp., which in turn supplies ground to right turn signal indicator lamp.
With power and ground supplied, BCM controls the flashing of RH turn signal lamps.

NOTE:
*1: Xenon headlamp, *2: Halogen headlamp.

HAZARD LAMP OPERATION

Power is supplied at all times

- to BCM terminal 55
- through 40A fusible link [letter F, located in fuse and fusible link block], and
- to combination meter terminal 24
- to unified meter and A/C amp. terminal 21
- through 10A fuse [No. 19, located in fuse block (J/B)].

Ground is supplied

- to hazard switch terminal 1
- through grounds M30 and M66,
- to BCM terminals 52
- through grounds M30 and M60,
- to unified meter and A/C amp. terminals 29 and 30
- through grounds M30 and M66,
- to combination meter terminals 10, 11 and 12
- through grounds M30 and M66.

When hazard switch is depressed, ground is supplied

- to BCM terminal 29
- through hazard lamp switch terminal 2.

BCM then supplies power

- through BCM terminal 45
- to front combination lamp LH terminal 2*[1]
- to front combination lamp LH terminal 1*[2]
- to rear combination lamp LH terminal 2
- through BCM terminal 46
- to front combination lamp RH terminal 2*[1]
- to front combination lamp RH terminal 1*[2]
- to rear combination lamp RH terminal 2.

Ground is supplied

- to front combination lamp LH terminal 1 through grounds E17, E43 and F152*1
- to front combination lamp LH terminal 4 through grounds E17, E43 and F152*2
- to front combination lamp RH terminal 1 through grounds E17, E43 and F152*1
- to front combination lamp RH terminal 4 through grounds E17, E43 and F152*2
- to rear combination lamp LH terminal 4 through grounds T14, B5, B6 and D105.
- to rear combination lamp RH terminal 4 through grounds T14, B5, B6 and D105.

BCM also supplies input to unified meter and A/C amp. terminals 1 and 11 across CAN communication lines. This input is processed by unified meter control unit in combination meter through unified meter and A/C amp., which in turn supplies ground to the left and right turn signal indicator lamps.
With power and ground supplied, BCM controls the flashing of hazard warning lamps.

NOTE:
*1: Xenon headlamp, *2: Halogen headlamp.

REMOTE KEYLESS ENTRY SYSTEM OPERATION

Power is supplied at all times

- through 40A fusible link [letter F, located in fuse and fusible link block]
- to BCM (body control module) terminal 55
- through 10A fuse [No. 18, located in fuse block (J/B)]
- to BCM (body control module) terminal 42
- through 10A fuse [No. 19, located in fuse block (J/B)]
- to combination meter terminal 24, and
- to unified meter and A/C amp. terminal 21.

Ground is supplied

- to BCM terminal 8
- through grounds E17, E43 and F152
- to unified meter and A/C amp. terminals 29 and 30
- through grounds M30 and M66
- to combination meter terminals 10, 11 and 12
- through grounds M30 and M66.

When remote keyless entry system is triggered by input signal from key fob, BCM supplies power

- through BCM terminal 45
- to front combination lamp LH terminal 2*1
- to front combination lamp LH terminal 1*2
- to rear combination lamp LH terminal 2
- through BCM terminal 46
- to front combination lamp RH terminal 2*1
- to front combination lamp RH terminal 1*2
- to rear combination lamp RH terminal 2.

Ground is supplied

- to front combination lamp LH terminal 1 through grounds E17, E43 and F152*1
- to front combination lamp LH terminal 4 through grounds E17, E43 and F152*2
- to front combination lamp RH terminal 1 through grounds E17, E43 and F152*1
- to front combination lamp RH terminal 4 through grounds E17, E43 and F152*2
- to rear combination lamp LH terminal 4 through grounds T14, B5, B6 and D105
- to rear combination lamp RH terminal 4 through grounds T14, B5, B6 and D105.

BCM also supplies input signal to unified meter and A/C amp terminals 1 and 11 across CAN communication lines. This input is processed by unified meter control unit in combination meter through unified meter and A/C amp., which in turn supplies ground to the left and right turn signal indicator lamps.

With power and ground supplied, BCM controls the flashing of hazard warning lamps when key fob is used to activate remote keyless entry system.

NOTE:
*1: Xenon headlamp, *2: Halogen headlamp

COMBINATION SWITCH READING FUNCTION

Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION" .

CAN Communication System Description

AKS009QT

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

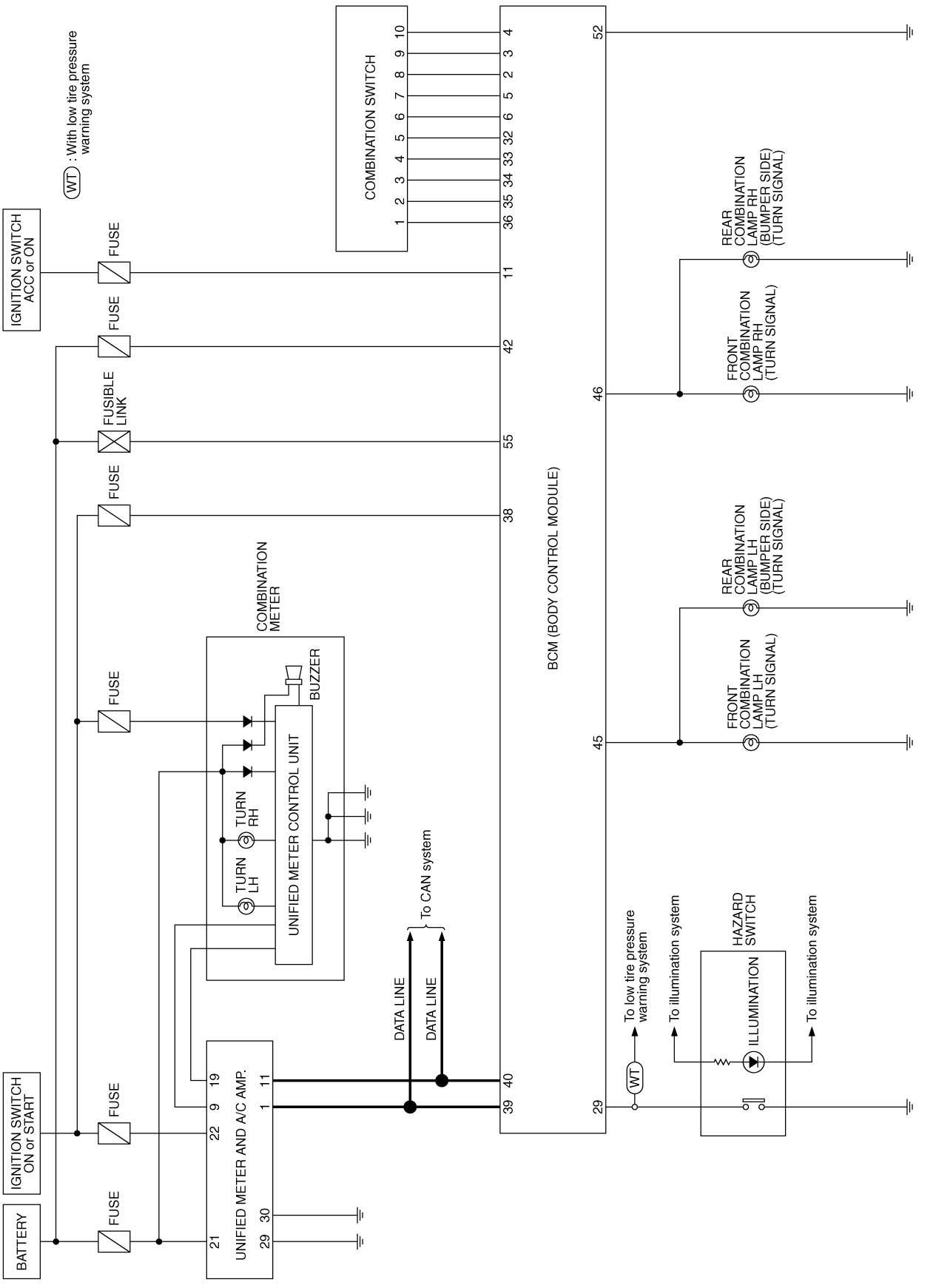
CAN Communication Unit

AKS009QU

Refer to LAN-5, "CAN Communication Unit" .

Schematic

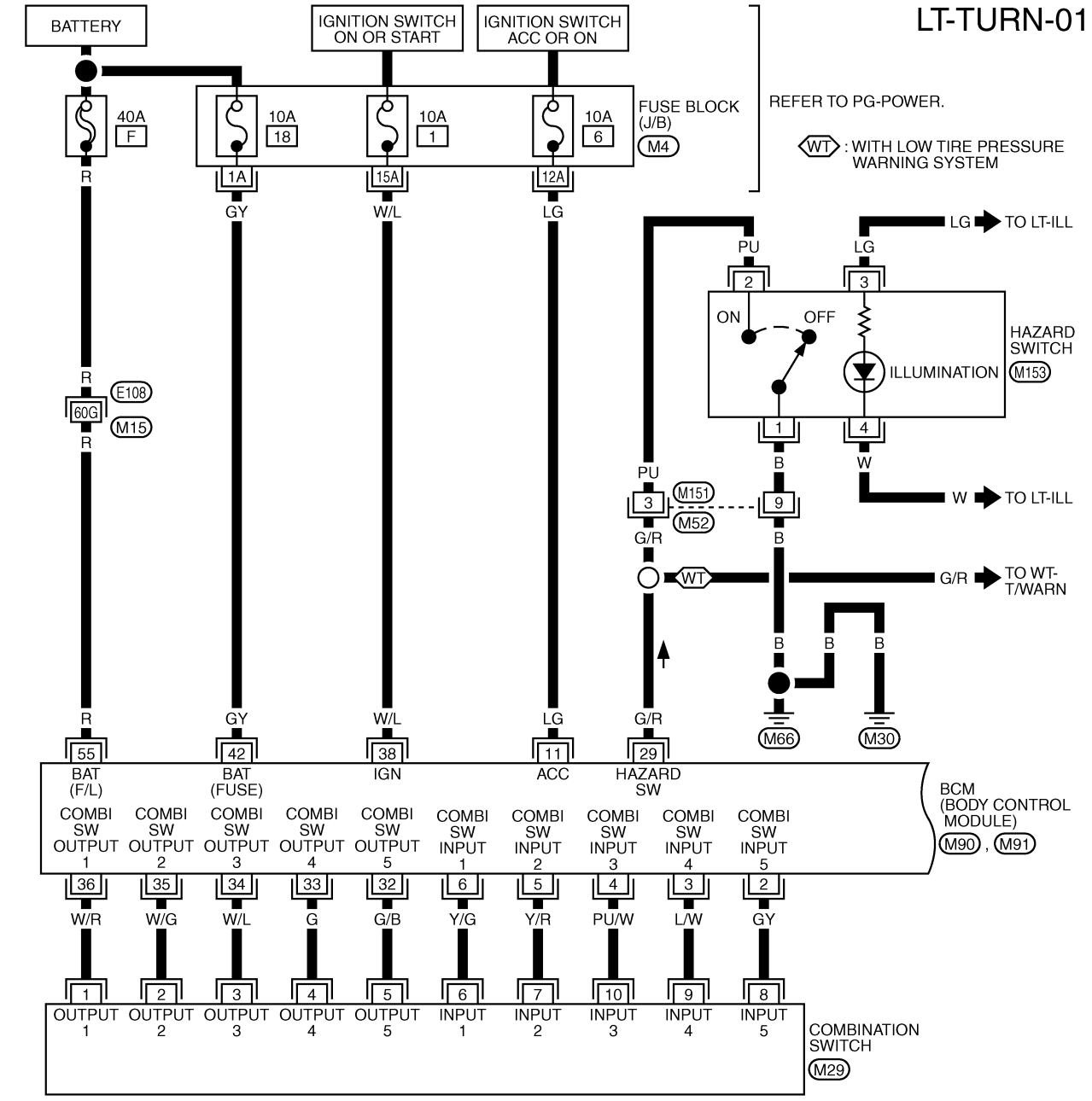
AKS009QV

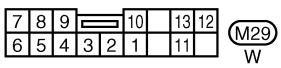


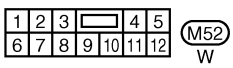
Wiring Diagram — TURN —

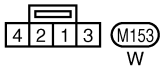
AKS009QW

COUPE MODELS









REFER TO THE FOLLOWING.

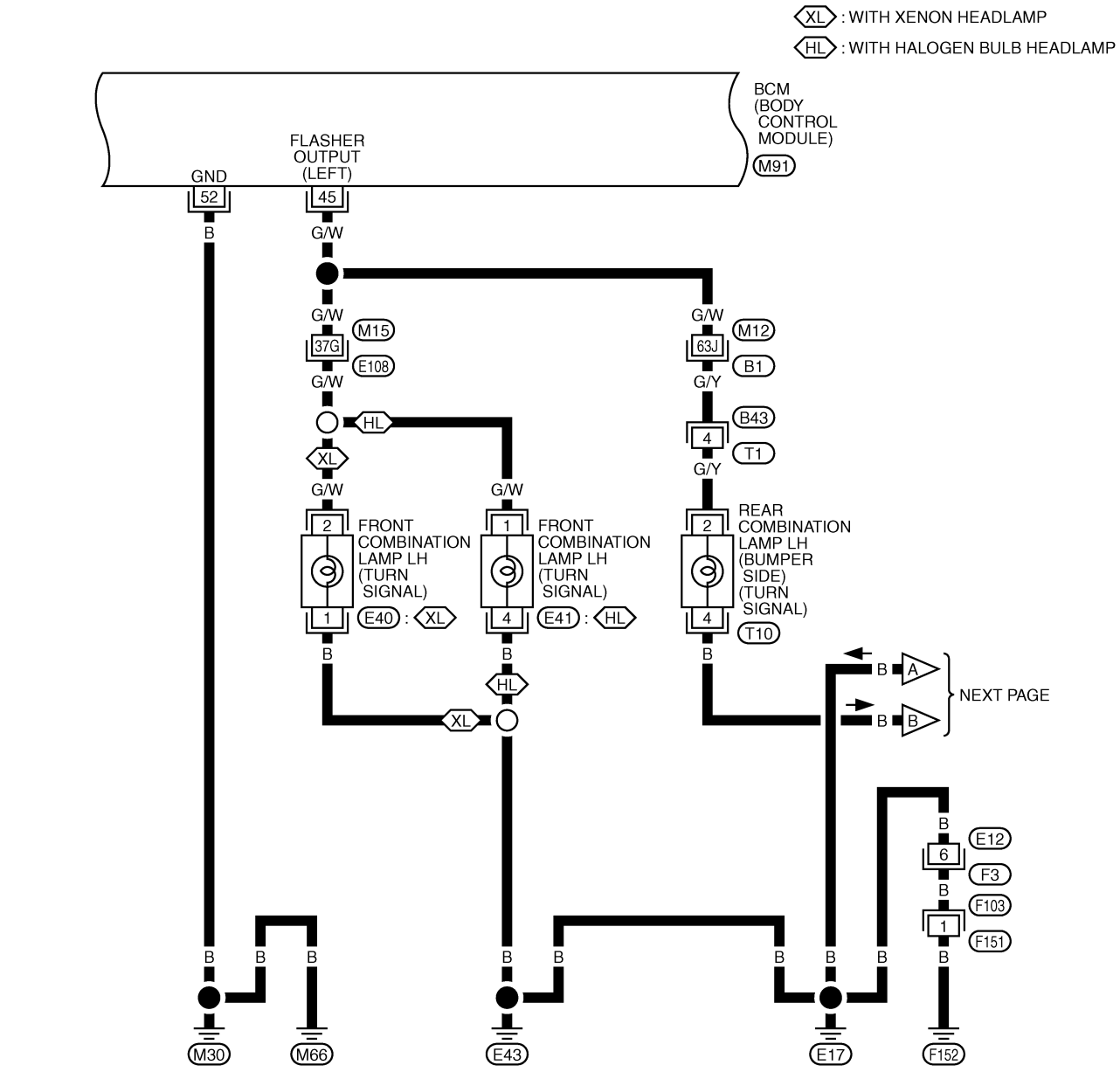
E108 -SUPER MULTIPLE JUNCTION (SMJ)

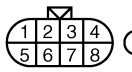
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

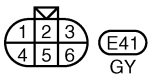
M90 , M91 -ELECTRICAL UNITS

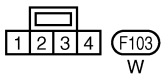
TKWT1801E

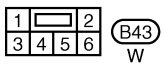
LT-TURN-02







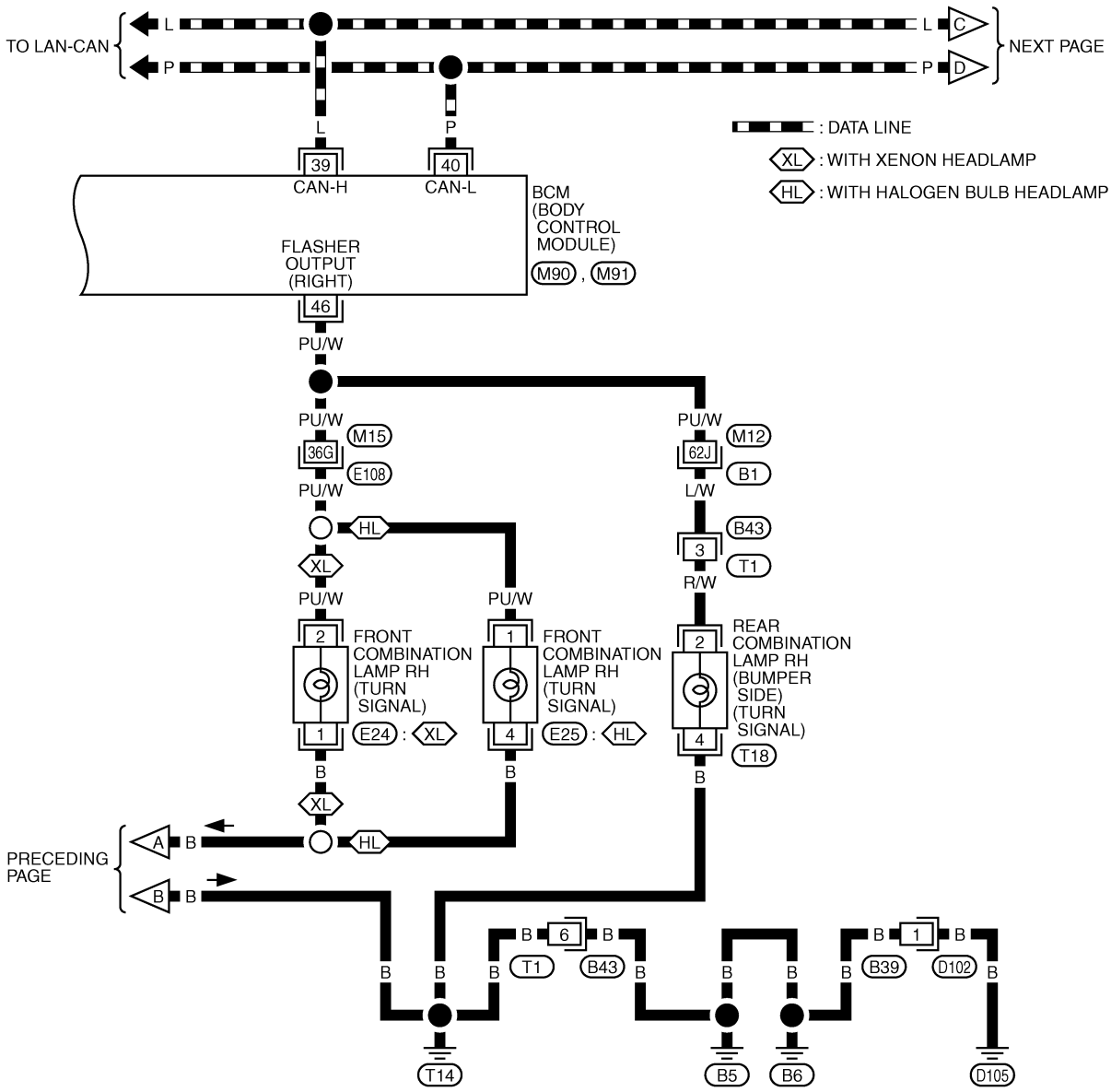


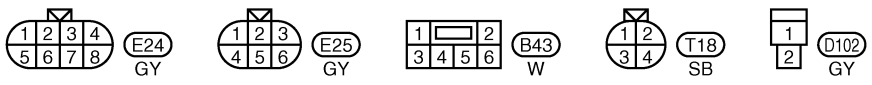


REFER TO THE FOLLOWING.
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M91 -ELECTRICAL UNITS

TKWT1802E

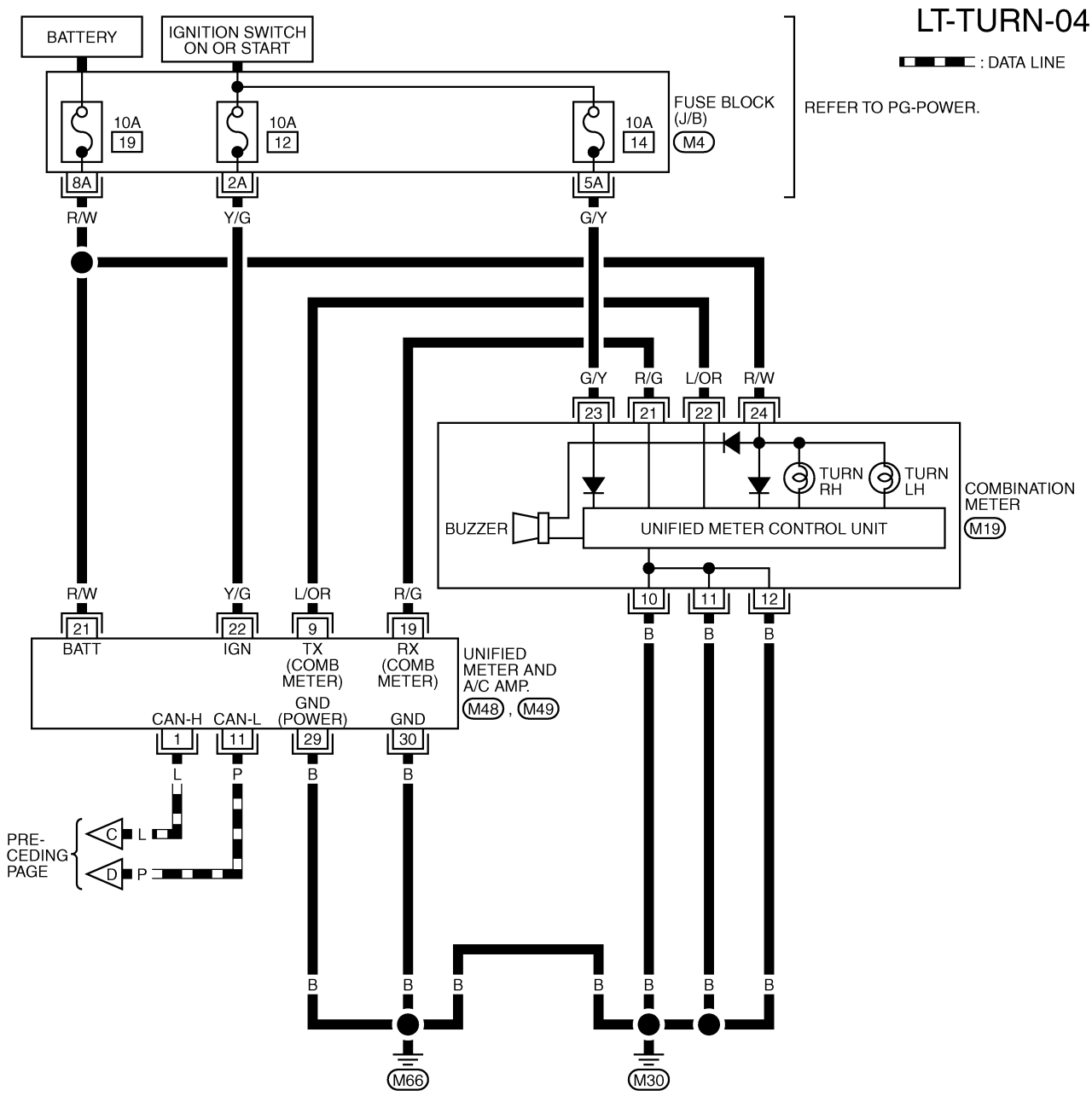
LT-TURN-03

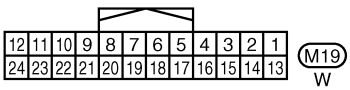


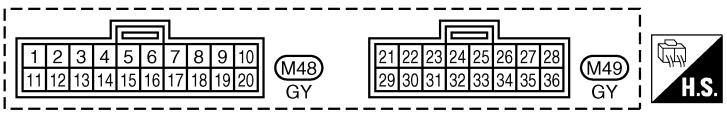


REFER TO THE FOLLOWING.
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M90 , M91 -ELECTRICAL UNITS

TKWT1803E



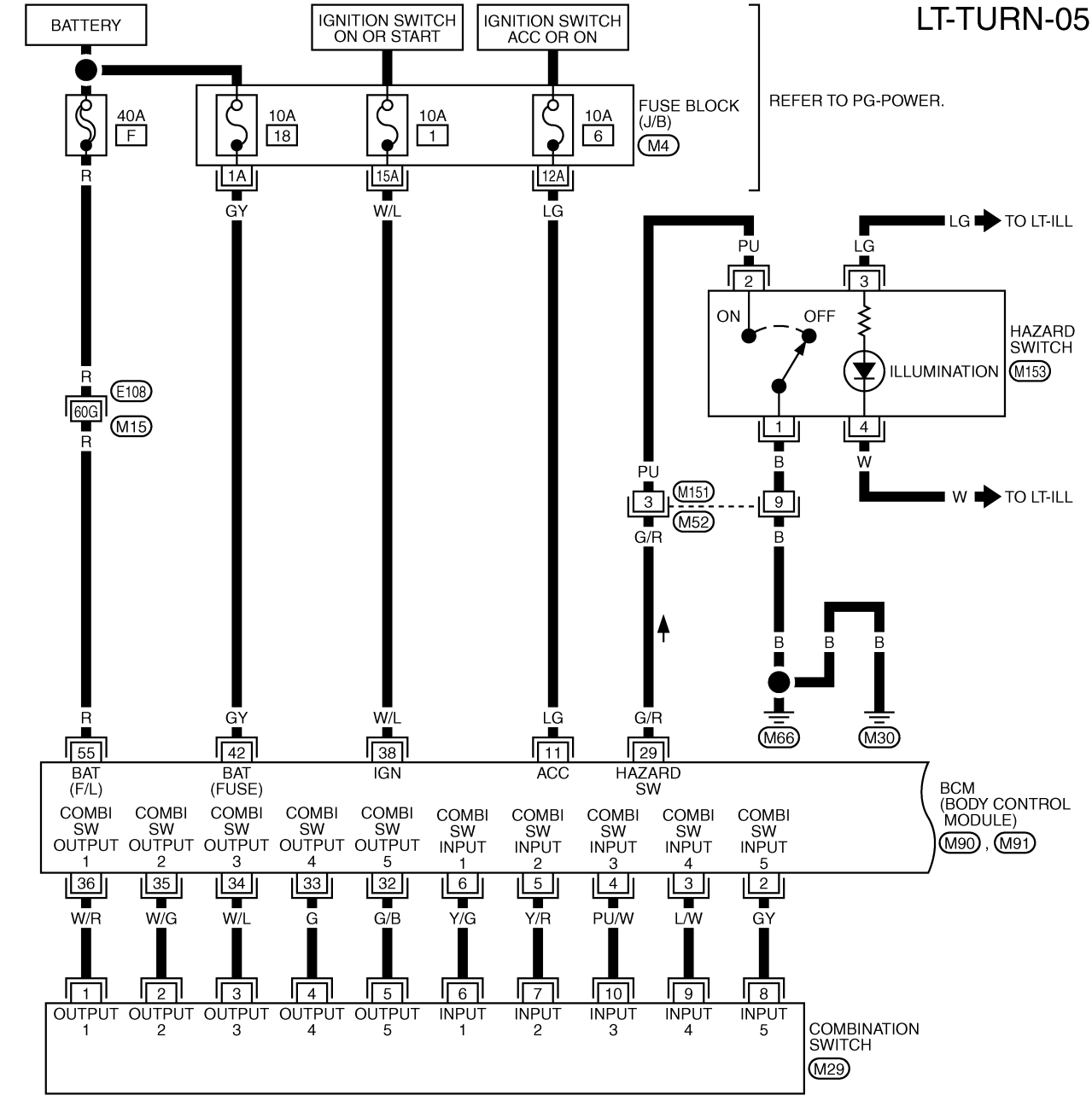


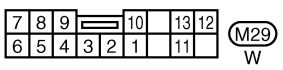


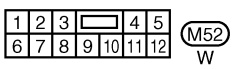
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

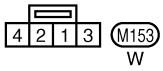
TKWT1732E

ROADSTER MODELS









REFER TO THE FOLLOWING.

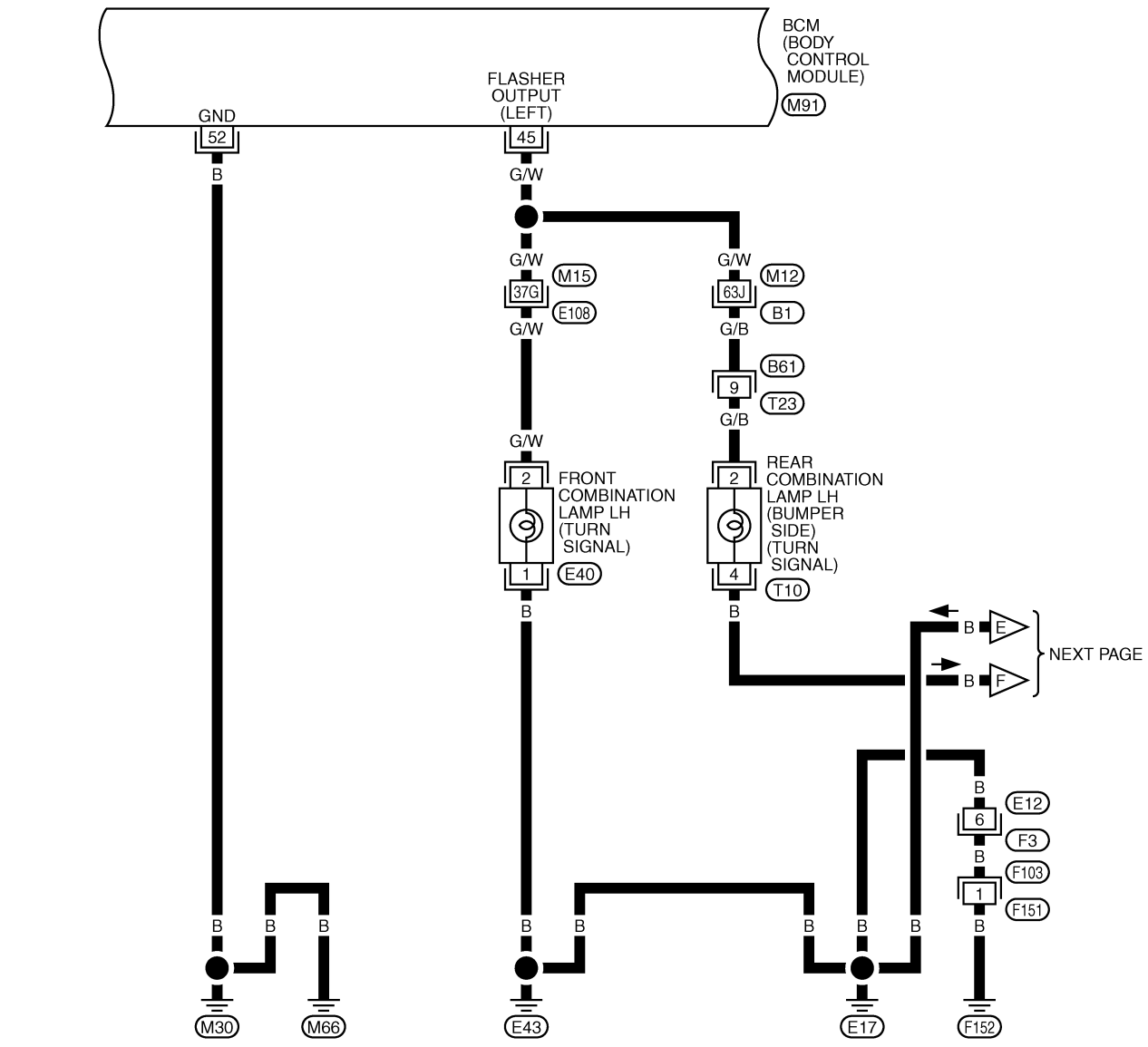
E108 -SUPER MULTIPLE JUNCTION (SMJ)

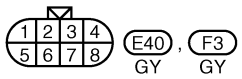
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

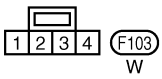
M90, M91 -ELECTRICAL UNITS

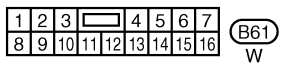
TKWT1805E

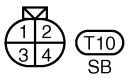
LT-TURN-06







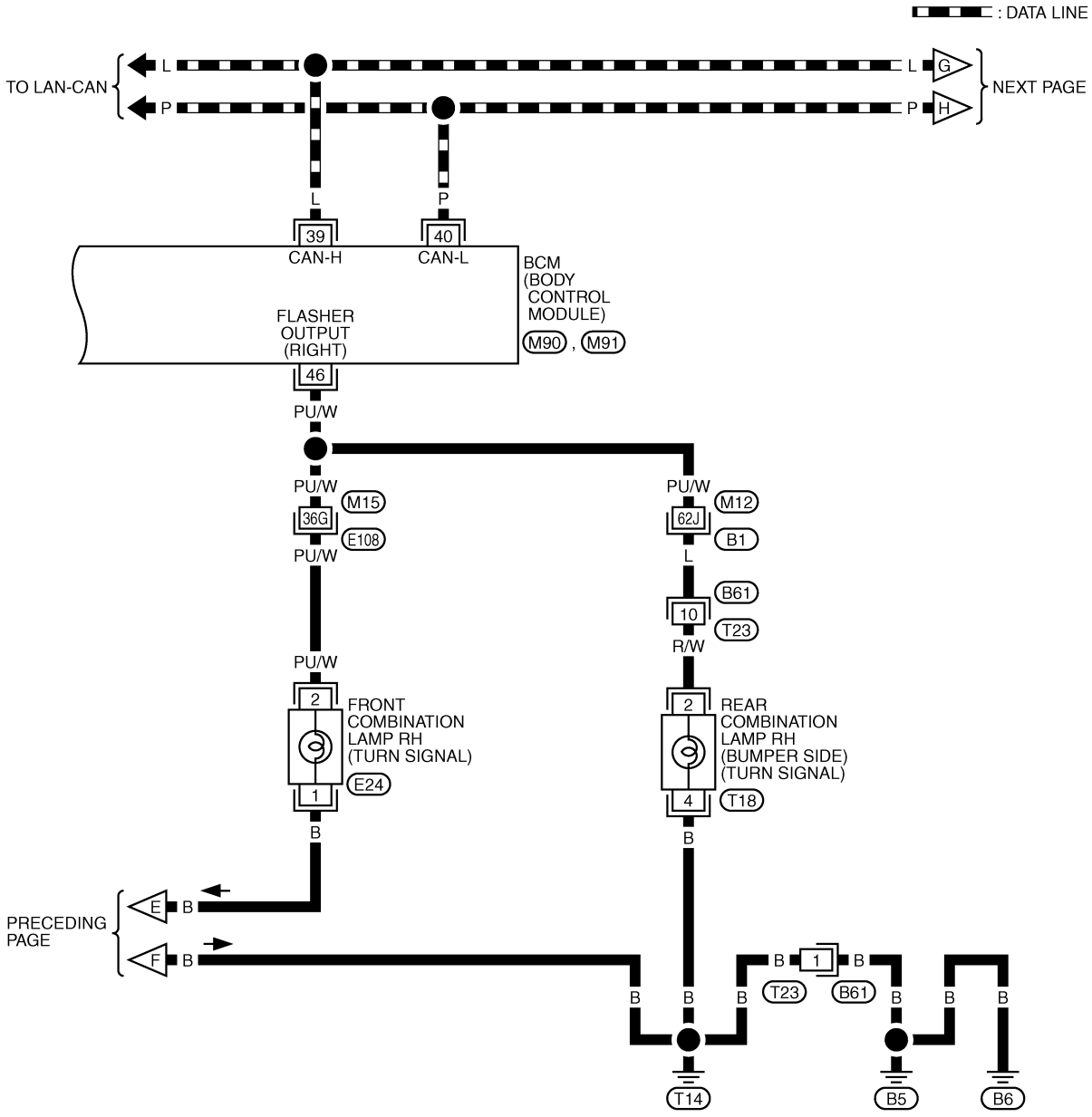


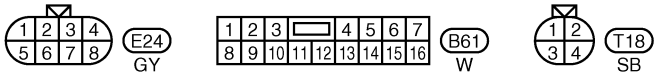


REFER TO THE FOLLOWING.
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M91 -ELECTRICAL UNITS

TKWT1806E

LT-TURN-07



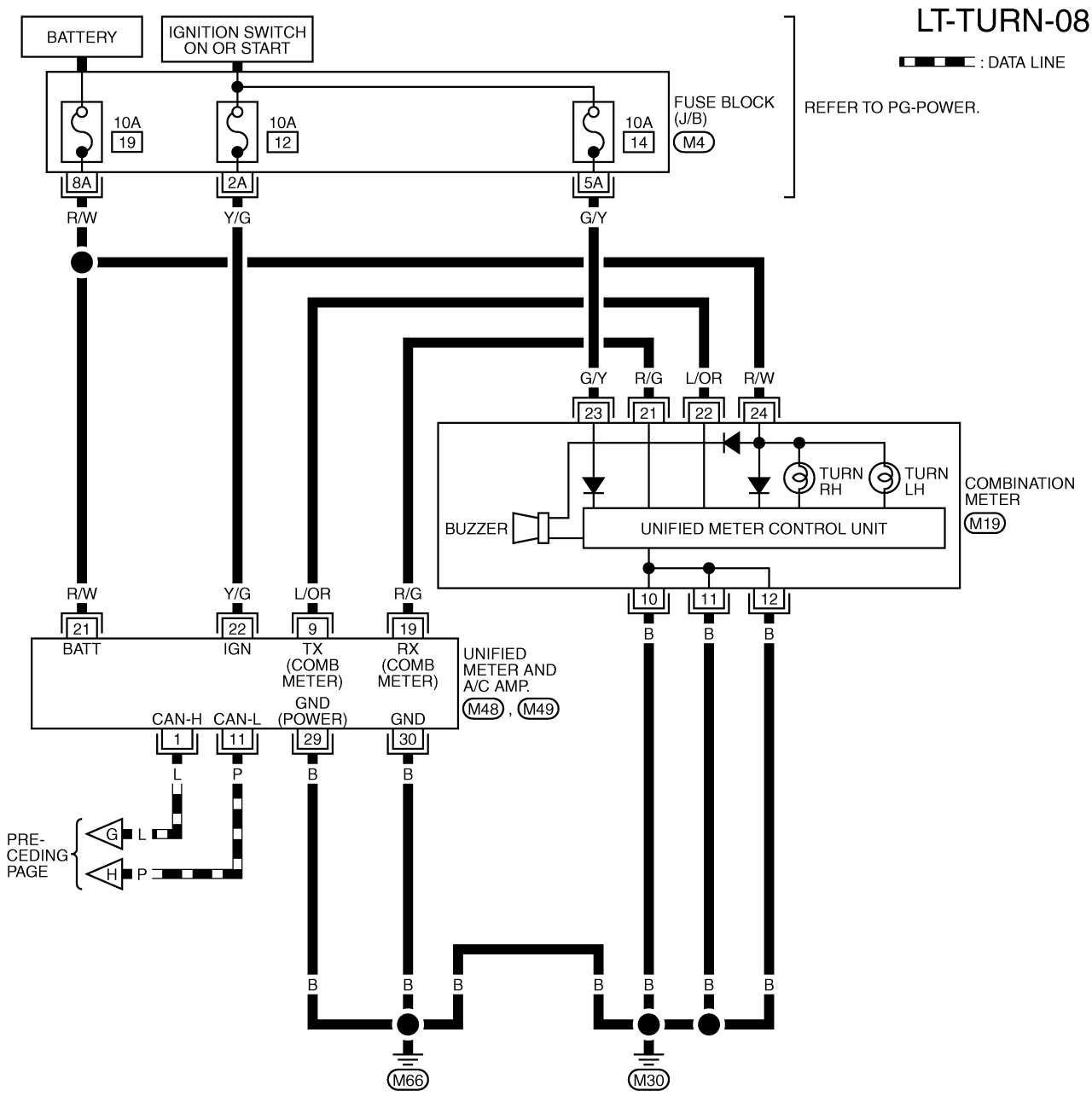


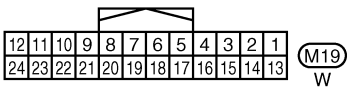
REFER TO THE FOLLOWING.

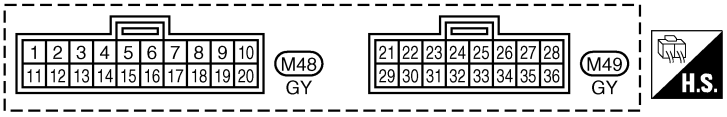
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

M90 , M91 -ELECTRICAL UNITS

TKWT1807E





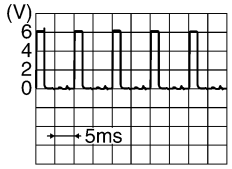
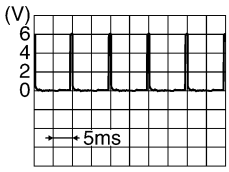
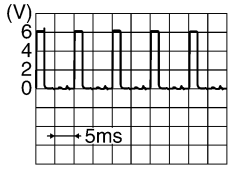
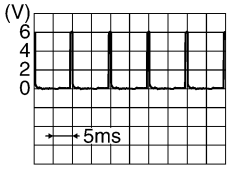
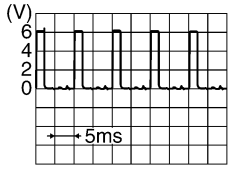
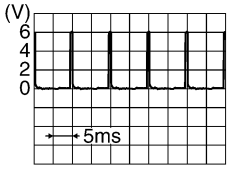


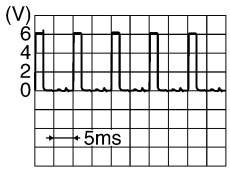
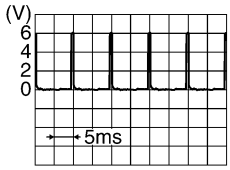
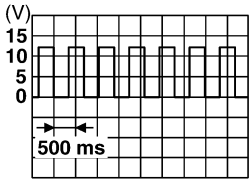
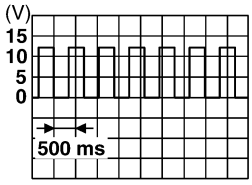
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT1600E

Terminals and Reference Values for BCM

AKS009QX

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
2	GY	Combination switch input 5	ON	Lighting, turn, wiper OFF Wiper dial position 4		 SKIA5291E
3	L/W	Combination switch input 4	ON	Lighting, turn, wiper OFF Wiper dial position 4		 SKIA5292E
4	PU/W	Combination switch input 3	ON	Lighting, turn, wiper OFF Wiper dial position 4		 SKIA5291E
5	Y/R	Combination switch input 2	ON	Lighting, turn, wiper OFF Wiper dial position 4		 SKIA5292E
6	Y/G	Combination switch input 1				
11	LG	Ignition switch (ACC)	ACC	—		Battery voltage
29	G/R	Hazard switch signal	OFF	Hazard switch	ON	Approx. 0V
					OFF	Approx. 5V
32	G/B	Combination switch output 5	ON	Lighting, turn, wiper OFF Wiper dial position 4		 SKIA5291E
33	G	Combination switch output 4	ON	Lighting, turn, wiper OFF Wiper dial position 4		 SKIA5292E

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
34	W/L	Combination switch output 3	ON	Lighting, turn, wiper OFF Wiper dial position 4		 SKIA5291E
35	W/G	Combination switch output 2	ON	Lighting, turn, wiper OFF Wiper dial position 4		 SKIA5292E
36	W/R	Combination switch output 1				
38	W/L	Ignition switch (ON)	ON	—		Battery voltage
39	L	CAN–H	—	—		—
40	P	CAN–L	—	—		—
42	GY	Battery power supply	OFF	—		Battery voltage
45	G/W	Turn signal (left)	ON	Combination switch	Turn left ON	 SKIA3009J
46	PU/W	Turn signal (right)	ON	Combination switch	Turn right ON	 SKIA3009J
52	B	Ground	ON	—		Approx. 0V
55	R	Battery power supply	OFF	—		Battery voltage

How to Proceed With Trouble Diagnosis

AKS009QY

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-143, "System Description" .
3. Perform preliminary check. Refer to LT-158, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Do turn signal and hazard warning lamps operate normally? If Yes: Go to 6. If No: Go to 4.
6. INSPECTION END

Preliminary Check

AKS009QZ

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES

- Check for blown BCM fuses.

UNIT	POWER SOURCE	Fuse and fusible link No.
BCM	Battery	F
		18
	Ignition switch ON or START position	1
	Ignition switch ACC or ON position	6
Combination meter	Battery	19
	Ignition switch ON or START position	14
Unified meter and A/C amp.	Battery	19
	Ignition switch ON or START position	12

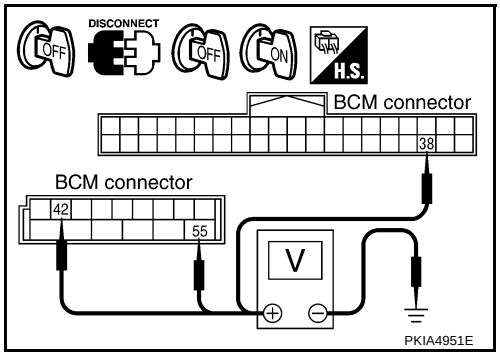
Refer to LT-148, "Wiring Diagram — TURN —" .

OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connectors.
3. Check voltage between BCM harness connector terminals and ground.



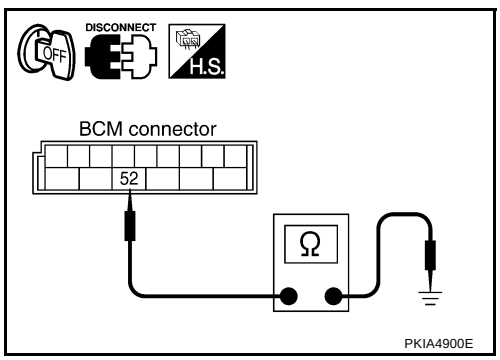
Terminals			Ignition switch position	
(+)		(-)	OFF	ON
Connector	Terminal (Wire color)			
M90	38 (W/L)	Ground	0V	Battery voltage
M91	42 (GY)		Battery voltage	Battery voltage
	55 (R)		Battery voltage	Battery voltage

OK or NG

OK >> GO TO 3.
NG >> Check harness for open or short between BCM and fuse.

3. CHECK GROUND CIRCUIT

Check continuity between BCM harness connector terminal and ground.



Terminals			Continuity
Connector	Terminal (Wire color)	Ground	
M91	52 (B)		Yes

OK or NG

OK >> INSPECTION END
NG >> Check ground circuit harness.

CONSULT-II Functions

AKS009R0

CONSULT-II performs the following functions communicating with BCM.

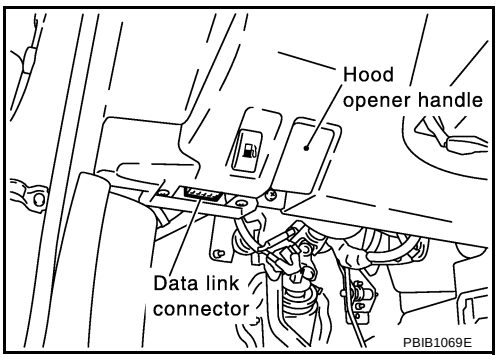
BCM diagnosis part	Check item, diagnosis mode	Description
FLASHER	DATA MONITOR	Displays BCM input data in real time.
	ACTIVE TEST	Operation of electrical loads can be checked by sending driving signal to them.

CONSULT-II BASIC OPERATION

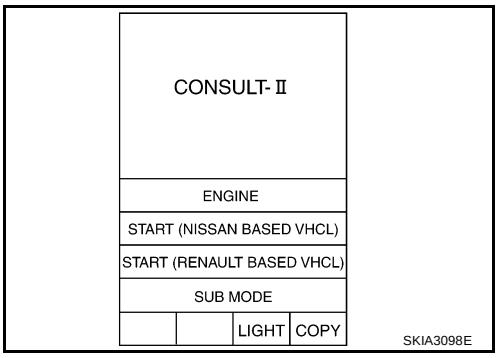
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

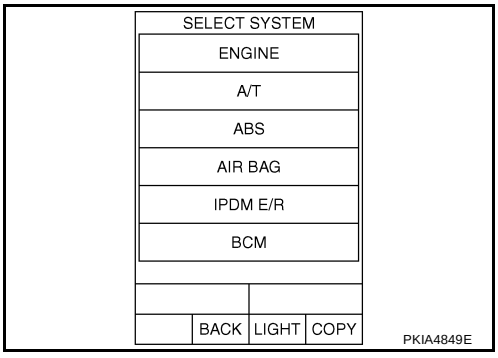
1. With ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to data link connector, then turn ignition switch ON.



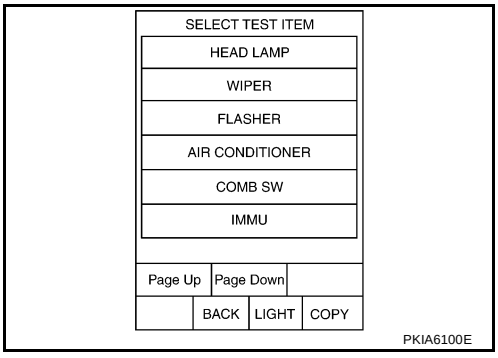
2. Touch “START(NISSAN BASED VHCL)”.



3. Touch “BCM” on “SELECT SYSTEM” screen.
If “BCM” is not indicated, refer to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



4. Touch “FLASHER” on “SELECT TEST ITEM” screen.



DATA MONITOR

Operation Procedure

1. Touch “FLASHER” on “SELECT TEST ITEM” screen.
2. Touch “DATA MONITOR” on “SELECT DIAG MODE” screen.
3. Touch either “ALL SIGNALS” or “SELECTION FROM MENU” on “DATA MONITOR” screen.

ALL SIGNALS	Monitors all the signals.
SELECTION FROM MENU	Selects and monitors the individual signal.

4. Touch “START”.
5. When “SELECTION FROM MENU” is selected, touch items to be monitored. When “ALL SIGNALS” is selected, all the items will be monitored.
6. Touch “RECORD” while monitoring, then the status of the monitored item can be recorded. To stop recording, touch “STOP”.

Display Item List

Monitor item		Contents
IGN ON SW	“ON/OFF”	Displays “IGN position (ON)/OFF, ACC position (OFF)” judged from ignition switch signal.
HAZARD SW	“ON/OFF”	Displays “Hazard ON (ON)/Hazard OFF (OFF)” status, determined from hazard switch signal.
TURN SIGNAL R	“ON/OFF”	Displays “Turn right (ON)/Other (OFF)” status, determined from lighting switch signal.
TURN SIGNAL L	“ON/OFF”	Displays “Turn left (ON)/Other (OFF)” status, determined from lighting switch signal.
BRAKE SW[NOTE]	“OFF”	—

NOTE:
This item is displayed, but cannot monitor it.

ACTIVE TEST

Operation Procedure

1. Touch “FLASHER” on “SELECT TEST ITEM” screen.
2. Touch “ACTIVE TEST” on “SELECT DIAG MODE” screen.
3. Touch item to be tested and check operation of the selected item.
4. During the operation check, touching “BACK” deactivates the operation.

Display Item List

Test item	Description
FLASHER	With a certain operation (OFF, RH, LH), turn signal lamp can be operated.

Turn Signal Lamp Does Not Operate

AKS00AP2

1. CHECK BULB

Check bulb standard of each turn signal lamp is correct.

OK or NG

OK >> GO TO 2.
NG >> Replace turn signal lamp bulb.

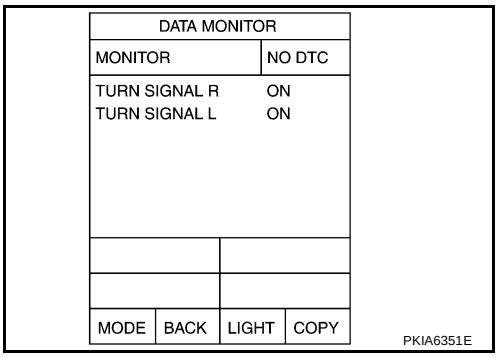
2. CHECK COMBINATION SWITCH INPUT SIGNAL

With CONSULT-II

Select “BCM” on CONSULT-II. With “FLASHER” data monitor, make sure “TURN SIGNAL R” and “TURN SIGNAL L” turns ON-OFF linked with operation of lighting switch.

When lighting switch is TURN RH position : TURN SIGNAL R ON

When lighting switch is TURN LH position : TURN SIGNAL L ON



Without CONSULT-II

Refer to LT-170, "Combination Switch Inspection" .

OK or NG

OK >> GO TO 3.

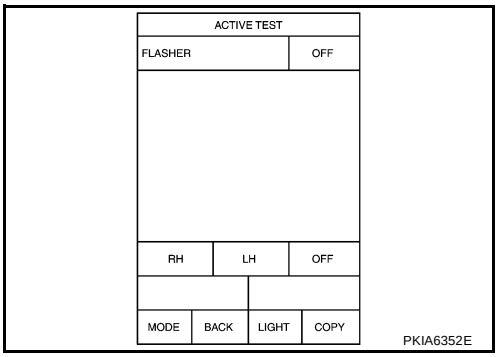
NG >> Check lighting switch. Refer to LT-170, "Combination Switch Inspection" .

3. ACTIVE TEST

With CONSULT-II

1. Select “FLASHER” during active test. Refer to LT-160, "ACTIVE TEST" .
2. Make sure “FLASHER RIGHT” and “FLASHER LEFT” operate.

Turn signal lamp should operate.



Without CONSULT-II

GO TO 4.

OK or NG

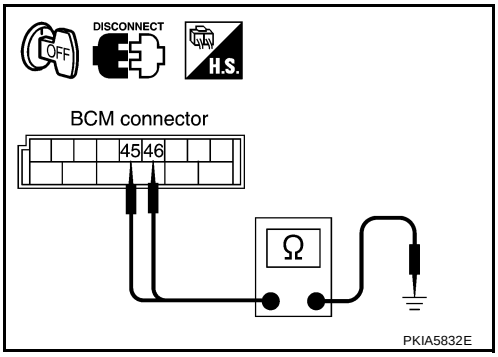
OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> GO TO 4.

4. CHECK SHORT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and all turn signal lamp connectors.
3. Check continuity (short circuit) between harness connector of BCM and ground.

Terminals			Ground	Continuity
BCM				
Connector		Terminal (Wire color)		
RH	M91	46 (PU/W)		No
LH		45 (G/W)		



OK or NG

OK >> Replace BCM if turn signal lamps does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> Repair harness or connector.

Hazard Warning Lamp Does Not Operate But Turn Signal Lamp Operate

AKS00AP3

1. CHECK BULB

Make sure bulb standard of each turn signal lamp is correct.

OK or NG

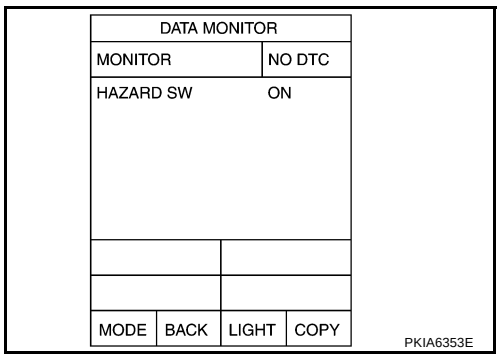
OK >> GO TO 2.
NG >> Replace bulb.

2. CHECK HAZARD SWITCH INPUT SIGNAL

With CONSULT-II

Select “BCM” on CONSULT-II. With “FLASHER” data monitor to make sure “HAZARD SW” turns ON-OFF linked with operation of hazard switch.

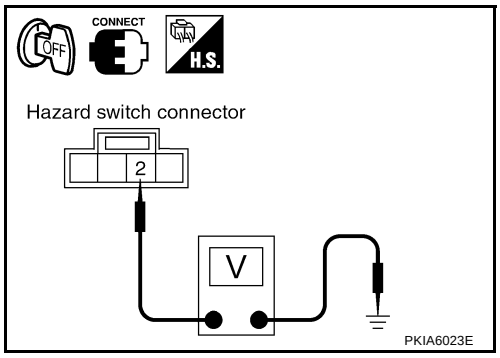
When hazard switch is ON : HAZARD SW ON position



Without CONSULT-II

Check voltage between BCM harness connector M153 terminal 2 (PU) and ground.

Terminals			Condition	Voltage
(+)		(-)		
Connector	Terminal (Wire color)			
M153	2 (PU)	Ground	Hazard switch is ON	Approx. 0V
			Hazard switch is OFF	Approx. 5V



OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> GO TO 3.

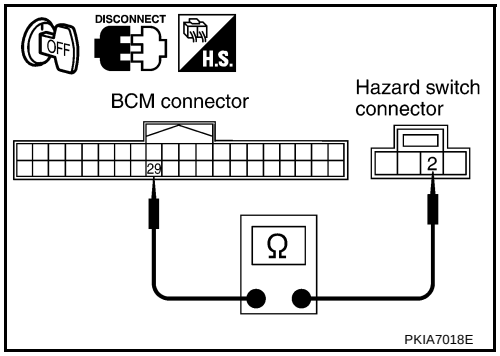
3. CHECK HAZARD SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and hazard switch connector.
3. Check continuity BCM harness connector M90 terminal 29 (G/R) and hazard switch harness connector M153 terminal 2 (PU).

29 (G/R) – 2 (PU) : Continuity should exist.

OK or NG

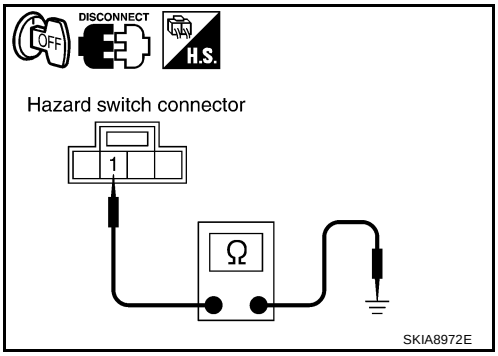
OK >> GO TO 4.
NG >> Repair harness or connector.



4. CHECK GROUND

Check continuity hazard switch harness connector M153 terminal 1 (B) and ground.

1 (B) – Ground : Continuity should exist.



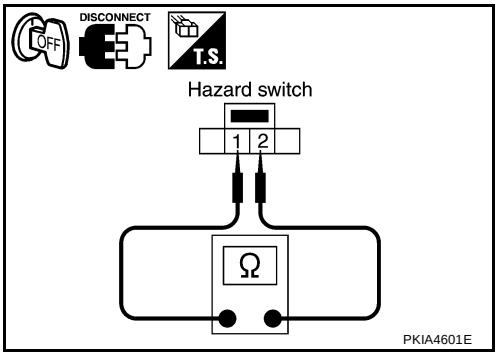
OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK HAZARD SWITCH

1. Disconnect hazard switch connector.
2. Check continuity hazard switch.

Terminal		Condition	Continuity
Hazard switch			
1	2	Hazard switch is ON.	Yes
		Hazard switch is OFF.	No



OK or NG

OK >> Replace BCM if turn signal lamps does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Replace hazard switch.

Turn Signal Indicator Lamp Does Not Operate

AKS00AP4

1. CHECK BULB

Inspect bulb of turn signal indicator lamp in combination meter.

OK or NG

OK >> Replace combination meter.
NG >> Replace indicator bulb.

Bulb Replacement (Front Turn Signal Lamp)

AKS00AP5

Refer to LT-34, "Bulb Replacement" in "HEADLAMP (FOR USA)".

Bulb Replacement (Rear Turn Signal Lamp)

AKS00AP6

Refer to LT-205, "Bulb Replacement" in "REAR COMBINATION LAMP".

Removal and Installation of Front Turn Signal Lamp

AKS00AP7

Refer to LT-36, "Removal and Installation" in "HEADLAMP (FOR USA)".

Removal and Installation of Rear Turn Signal Lamp

AKS00AP8

Refer to LT-206, "Removal and Installation" in "REAR COMBINATION LAMP".

LIGHTING AND TURN SIGNAL SWITCH

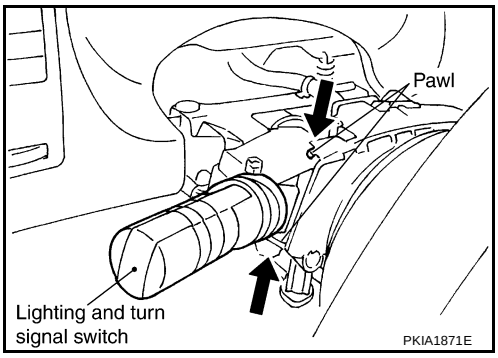
PFP:25540

Removal and Installation

AKS000UU

REMOVAL

1. Remove steering column lower cover. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" in "IP" section.
2. Remove column upper cover and combination meter assembly. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" in “IP” section.
3. While pressing pawls in direction as shown in the figure, pull lighting and turn signal switch toward driver door and disconnect from the base.



INSTALLATION

Install in the reverse order of removal.

HAZARD SWITCH

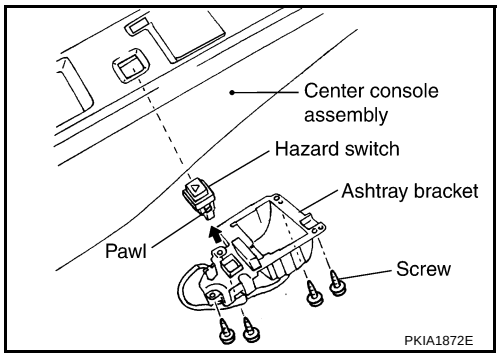
PFP:25290

Removal and Installation

AKS000UV

REMOVAL

1. Remove center console assembly. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" in “IP” section.
2. Disconnect hazard switch connector.
3. Remove ashtray bracket assembly from center console assembly.
4. Press pawl on reverse side and remove the hazard switch.



INSTALLATION

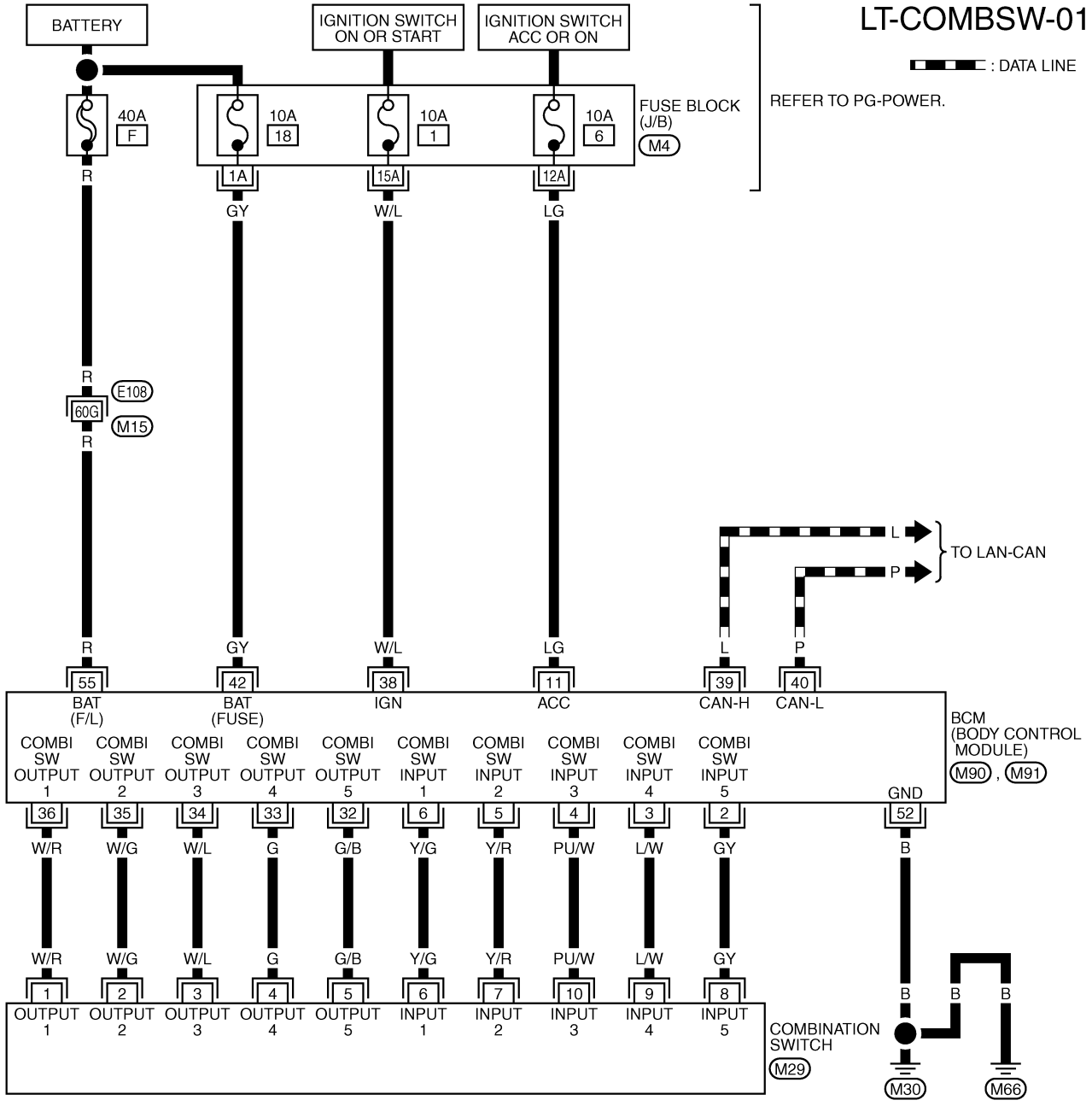
Install in the reverse order of removal.

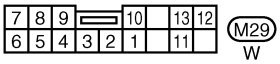
COMBINATION SWITCH

PFP:25567

Wiring Diagram—COMBSW—

AKS009RM





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M90, M91 -ELECTRICAL UNITS

TKWT1809E

Combination Switch Reading Function

AKS00AP9

For details, refer to BCS-3, "COMBINATION SWITCH READING FUNCTION" in "BCS" section.

CONSULT-II Functions

AKS00APA

CONSULT-II performs the following functions with combination of data receiving, command and transmission using CAN communication line from BCM.

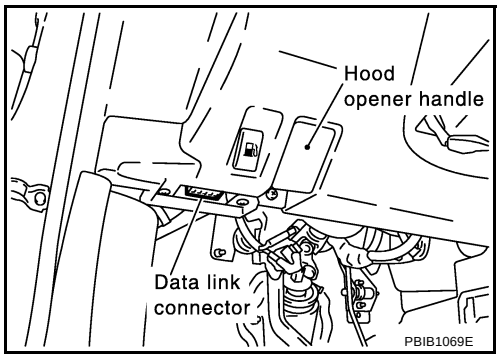
BCM diagnosis part	Check item, diagnosis mode	Description
Combination switch	Data monitor	Displays BCM input data in real time.

CONSULT-II BASIC OPERATION

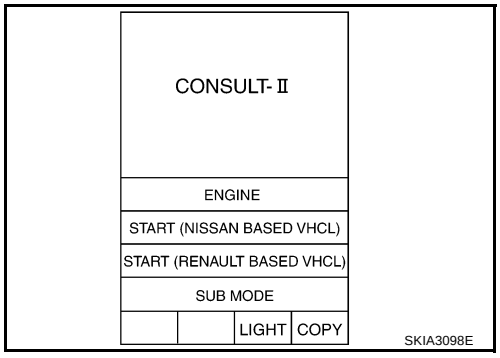
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

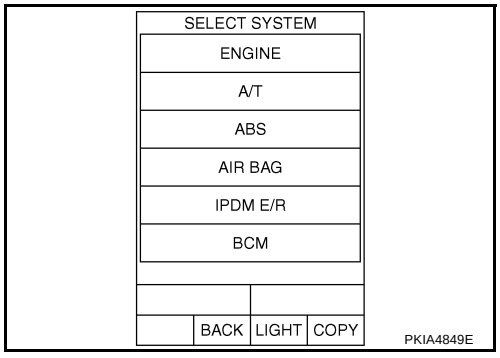
1. With ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to data link connector, then turn ignition switch ON.



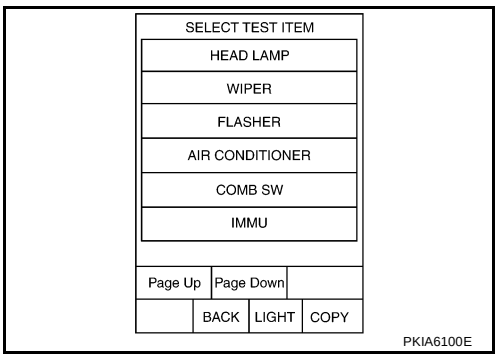
2. Touch “START (NISSAN BASED VHCL)”.



3. Touch “BCM” on “SELECT SYSTEM” screen.
If “BCM” is not indicated, refer to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



4. Touch “COMB SW”.



DATA MONITOR

Operation Procedure

1. Touch “COMB SW” on “SELECT TEST ITEM” screen.
2. Touch “DATA MONITOR” on “SELECT DIAG MODE” screen.
3. Touch either “ALL SIGNALS” or “SELECTION FROM MENU” on “DATA MONITOR” screen.

ALL SIGNALS	Monitors all the signals.
SELECTION FROM MENU	Selects and monitors individual signal.

4. Touch “START”.
5. When “SELECTION FROM MENU” is selected, touch items to be monitored. When “ALL SIGNALS” is selected, all the signals will be monitored.
6. Touch “RECORD” while monitoring, then the status of the monitored item can be recorded. To stop recording, touch “STOP”.

Display Item List

Monitor item name “OPERATION OR UNIT”		Contents
TURN SIGNAL R	“ON/OFF”	Displays “Turn Right (ON)/Other (OFF)” status, determined from lighting switch signal.
TURN SIGNAL L	“ON/OFF”	Displays “Turn Left (ON)/Other (OFF)” status, determined from lighting switch signal.
HI BEAM SW	“ON/OFF”	Displays status (high beam switch: ON/Others: OFF) of high beam switch judged from lighting switch signal.
HEAD LAMP SW 1	“ON/OFF”	Displays “Headlamp switch 1 (ON)/Other (OFF)” status, determined from lighting switch signal.
HEAD LAMP SW 2	“ON/OFF”	Displays status (headlamp switch 2: ON/Others: OFF) of headlamp switch 2 judged from lighting switch signal.
LIGHT SW 1ST	“ON/OFF”	Displays status (lighting switch 1st position: ON/Others: OFF) of lighting switch judged from lighting switch signal.
PASSING SW	“ON/OFF”	Displays status (flash-to-pass switch: ON/Others: OFF) of flash-to-pass switch judged from lighting switch signal.
FR FOG SW[NOTE]	“ON/OFF”	—
FR WIPER HI	“ON/OFF”	Displays “Front Wiper HI (ON)/Other (OFF)” status, determined from wiper switch signal.
FR WIPER LOW	“ON/OFF”	Displays “Front Wiper LOW (ON)/Other (OFF)” status, determined from wiper switch signal.
FR WIPER INT	“ON/OFF”	Displays “Front Wiper INT (ON)/Other (OFF)” status, determined from wiper switch signal.
FR WASHER SW	“ON/OFF”	Displays “Front Washer Switch (ON)/Other (OFF)” status, determined from wiper switch signal.
INT VOLUME	[1 - 7]	Displays intermittent operation knob setting (1 - 7), determined from wiper switch signal.
RR WIPER ON	“ON/OFF”	Displays “rear Wiper (ON)/Other (OFF)” status as judged from wiper switch signal.
RR WIPER INT	“ON/OFF”	Displays “rear Wiper INT (ON)/Other (OFF)” status as judged from wiper switch signal.
RR WASHER SW	“ON/OFF”	Displays “rear Washer Switch (ON)/Other (OFF)” status as judged from wiper switch signal.

NOTE:
This item is displayed, but cannot monitor it.

Combination Switch Inspection

AKS00APB

1. SYSTEM CHECK

1. Referring to table below, check which system malfunctioning switch belongs to.

System 1	System 2	System 3	System 4	System 5
—	FR WASHER	FR WIPER LO	TURN LH	TURN RH
FR WIPER HI	—	FR WIPER INT	PASSING	HEAD LAMP1
INT VOLUME 1	RR WASHER	—	HEAD LAMP2	HI BEAM
RR WIPER INT	INT VOLUME 3	—	—	LIGHT SW 1ST
INT VOLUME 2	RR WIPER ON	—	FR FOG	—

>> Check the system to which malfunctioning switch belongs, and GO TO 2.

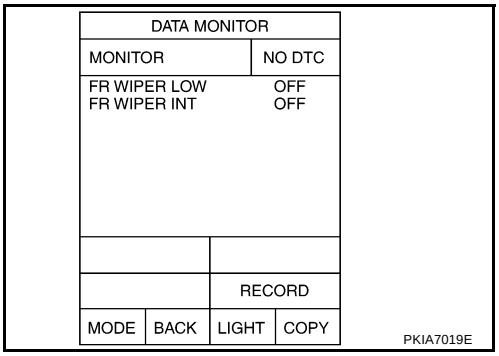
2. SYSTEM CHECK

With CONSULT-II

CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

1. Connect CONSULT-II, and select “COMB SW” on “SELECT TEST ITEM” screen.
2. Select “DATA MONITOR”.
3. Select “START”, and confirm that other switches in malfunctioning system operate normally.
   Example: When auto light switch is malfunctioning, confirm that “FR WIPER LOW” and “FR WIPER INT” in System 3, to which auto light switch belongs, turn ON-OFF normally.



Without CONSULT-II

Operating combination switch, and confirm that other switches in malfunctioning system operate normally.
Example: When auto light switch is malfunctioning, confirm that FRONT WIPER LOW and FRONT WIPER INT in System 3, to which auto light switch belongs, operate normally.

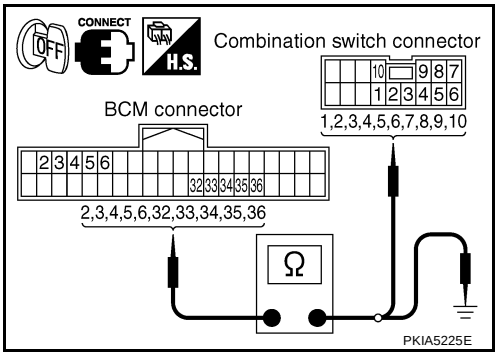
Check results

Other switches in malfunctioning system operate normally.>>Replace lighting switch or wiper switch.
Other switches in malfunctioning system do not operate normally.>>GO TO 3.

3. HARNESS INSPECTION

1. Turn ignition switch OFF.
2. Disconnect BCM and combination switch connectors.
3. Check for continuity between BCM harness connector of the suspect system and the corresponding combination switch connector terminals.

Suspect system	Terminals					Continuity
	BCM			Combination switch		
	Connector	Terminal (Wire color)		Connector	Terminal (Wire color)	
1	M90	Input 1	6 (YG)	M29	6 (YG)	Yes
		Output 1	36 (W/R)		1 (W/R)	
2		Input 2	5 (Y/R)		7 (Y/R)	
		Output 2	35 (W/G)		2 (W/G)	
3		Input 3	4 (PU/W)		10 (PU/W)	
		Output 3	34 (W/L)		3 (W/L)	
4		Input 4	3 (L/W)		9 (L/W)	
		Output 4	33 (G)		4 (G)	
5		Input 5	2 (GY)		8 (GY)	
		Output 5	32 (G/B)		5 (G/B)	



4. Check for continuity between each terminal of BCM harness connector in suspect malfunctioning system and ground.

Suspect system	Terminals				Continuity
	BCM (+)			(-)	
	Connector	Terminal (Wire color)			
1	M90	Input 1	6 (YG)	Ground	No
		Output 1	36 (W/R)		
2		Input 2	5 (Y/R)		
		Output 2	35 (W/G)		
3		Input 3	4 (PU/W)		
		Output 3	34 (W/L)		
4		Input 4	3 (L/W)		
		Output 4	33 (G)		
5		Input 5	2 (GY)		
		Output 5	32 (G/B)		

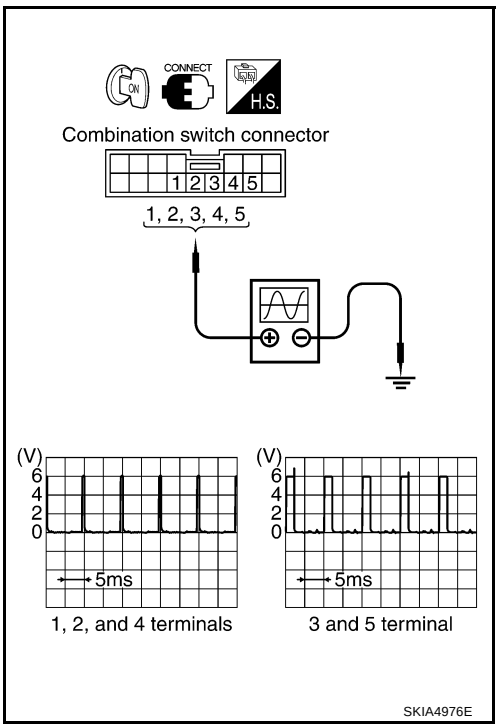
OK or NG

OK >> GO TO 4.
NG >> Check harness between BCM and combination switch for open or short circuit.

4. BCM OUTPUT TERMINAL INSPECTION

1. Turn lighting switch and wiper switch OFF.
2. Set wiper dial position 4.
3. Connect BCM and combination switch connectors, and check BCM output terminal voltage waveform of suspect malfunctioning system.

Suspect system	Terminals		
	Combination switch (+)		(-)
	Connector	Terminal (Wire color)	
1	M29	1 (W/R)	Ground
2		2 (W/G)	
3		3 (W/L)	
4		4 (G)	
5		5 (G/B)	



OK or NG

OK >> Open circuit in combination switch, GO TO 5.
NG >> Replace BCM.

5. COMBINATION SWITCH INSPECTION

Referring to table below, perform combination switch inspection.

Procedure													
1	2		3		4		5		6		7		
Replace lighting switch.	Confirm check results.	OK	INSPECTION END		Confirm check results.	OK	INSPECTION END		Confirm check results.	OK	INSPECTION END		
		NG	Replace wiper switch.			NG	Replace switch base.			NG	Confirm symptom again.		

>> INSPECTION END

Removal and Installation

AKS00APC

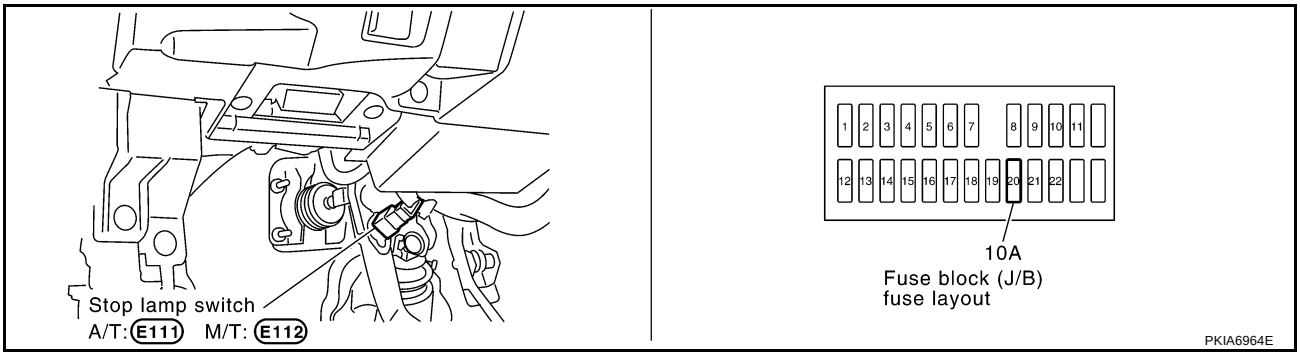
For details, refer to LT-165, "LIGHTING AND TURN SIGNAL SWITCH" .

STOP LAMP

PFP:26550

Component Parts and Harness Connector Location

AKS00AT0



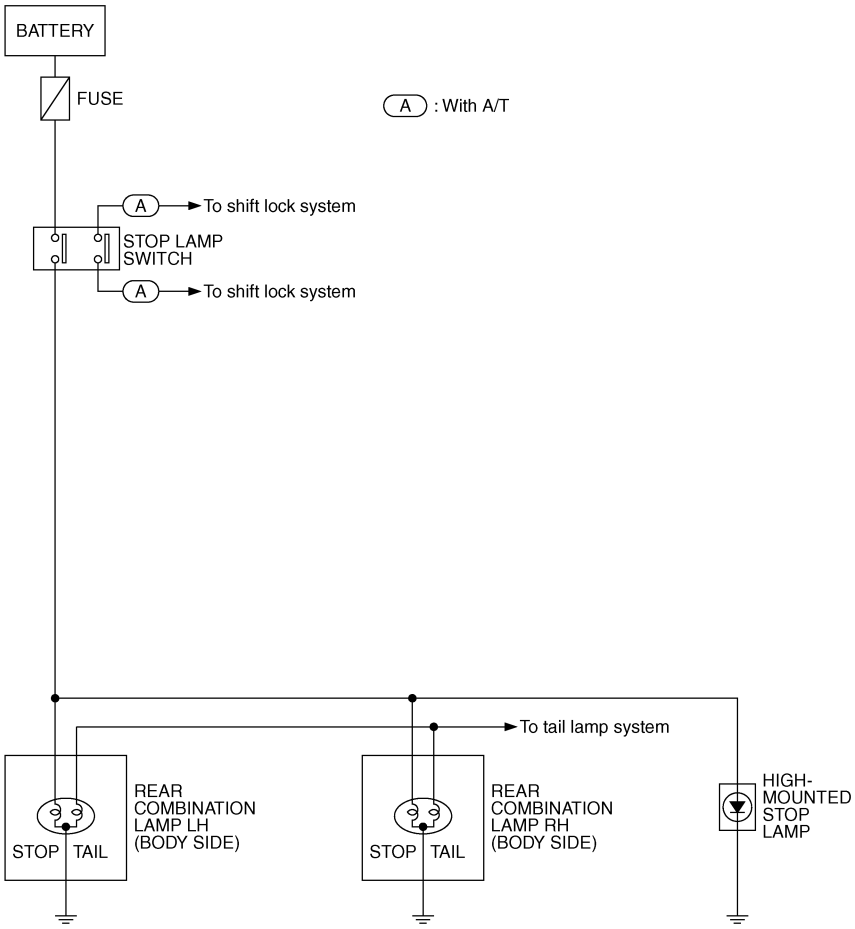
System Description

AKS00AT1

The current that flows by Rear combination lamp unit is controlled, and a stop lamp (LED) is made to turn on.

Schematic

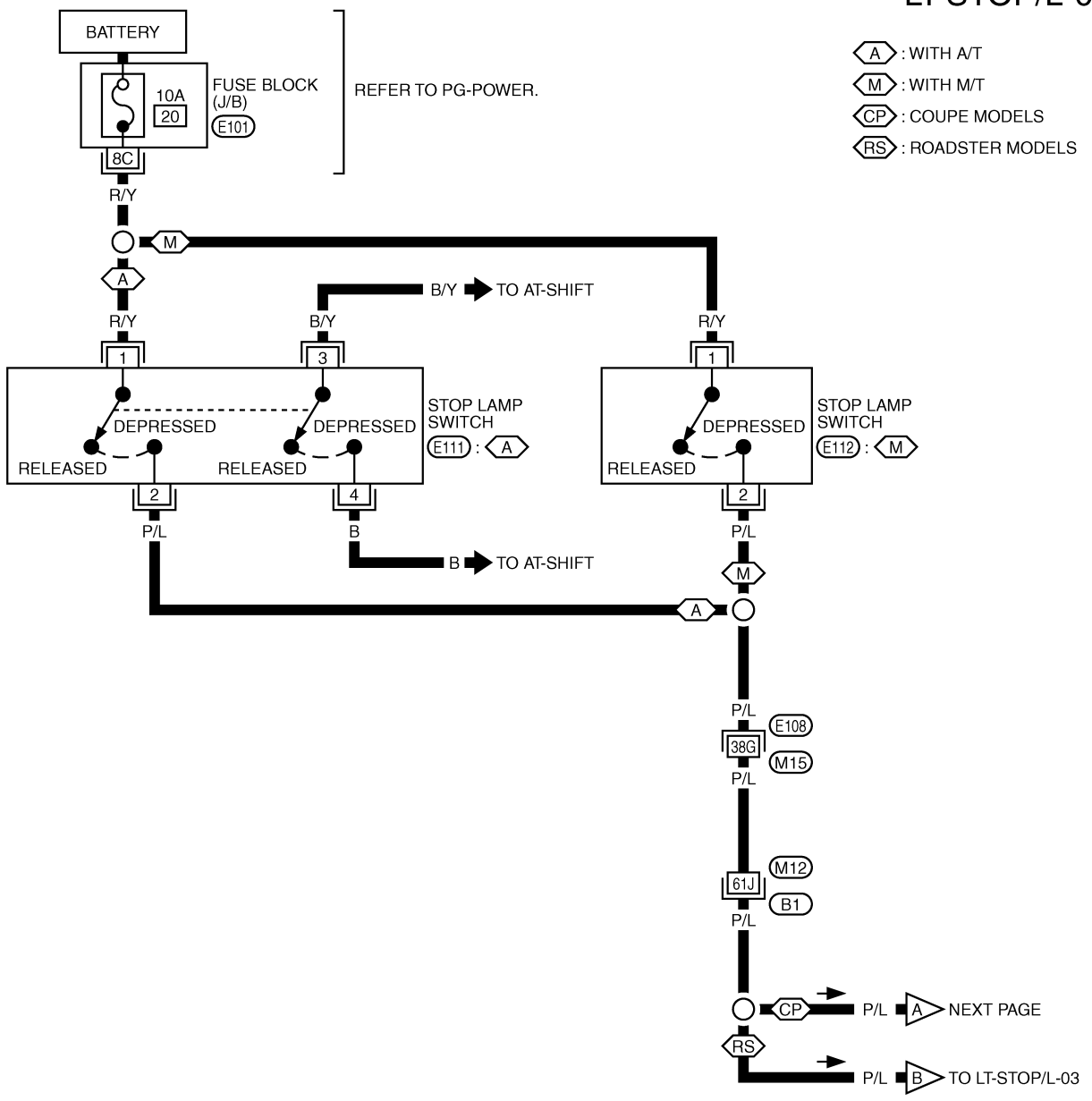
AKS00ADW

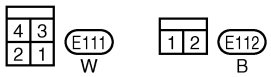


TKWT1601E

Wiring Diagram — STOP/L —

AKS009S8





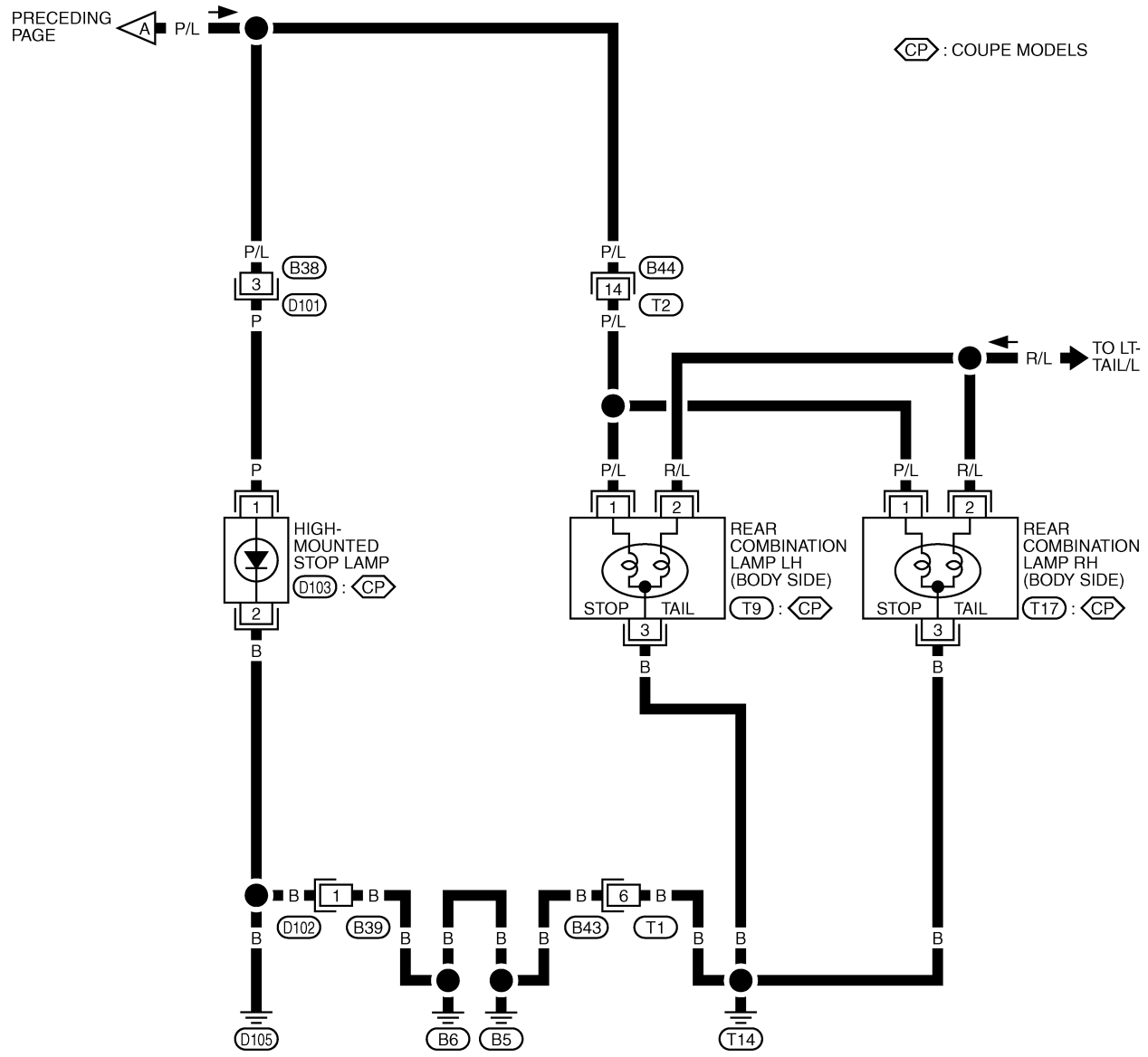
REFER TO THE FOLLOWING.

E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

E101 -FUSE BLOCK-JUNCTION BOX (J/B)

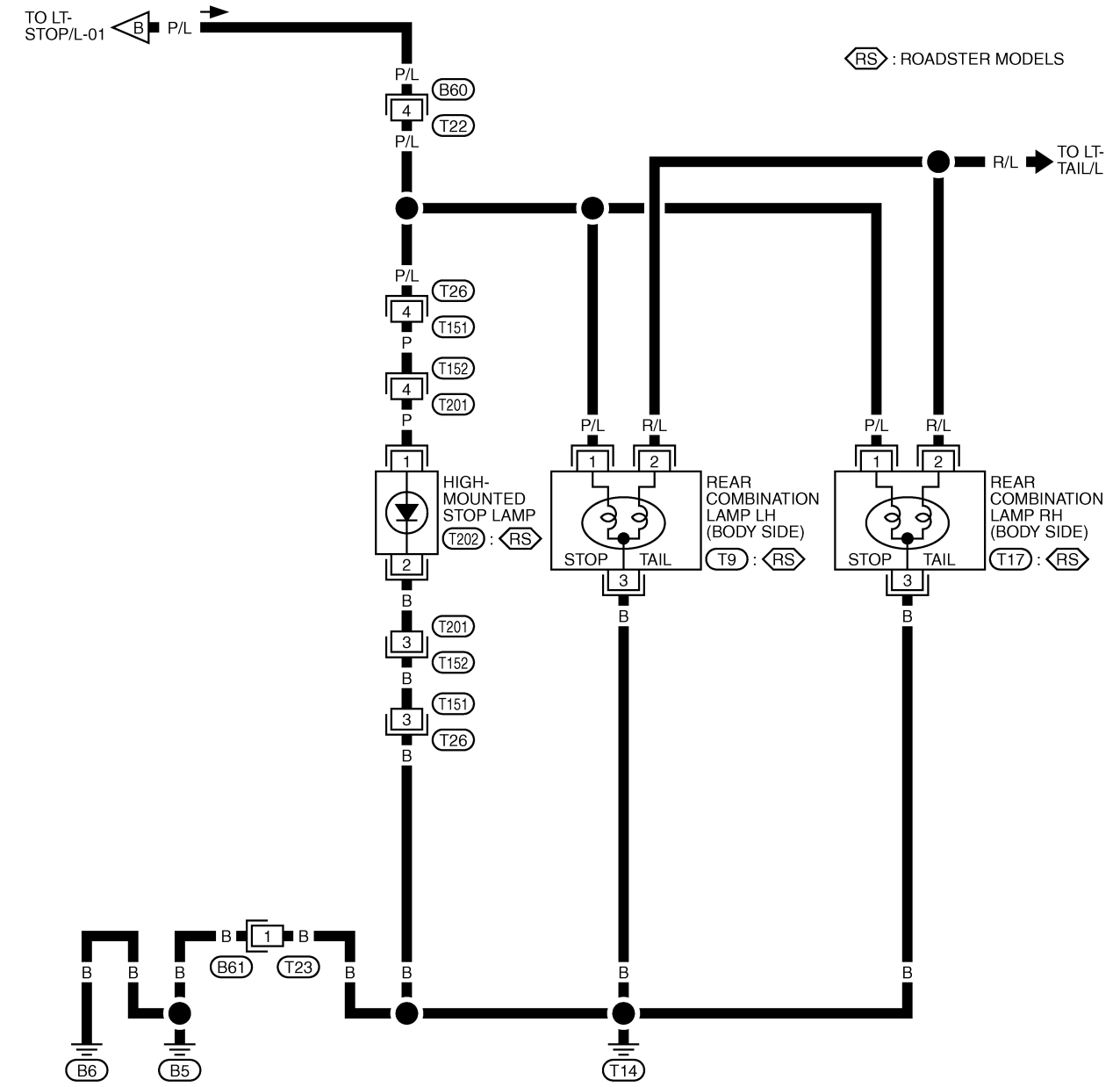
TKWT1602E

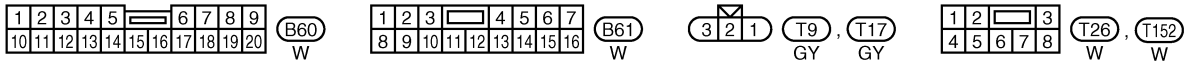
LT-STOP/L-02

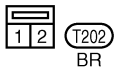


TKWT1603E

LT-STOP/L-03







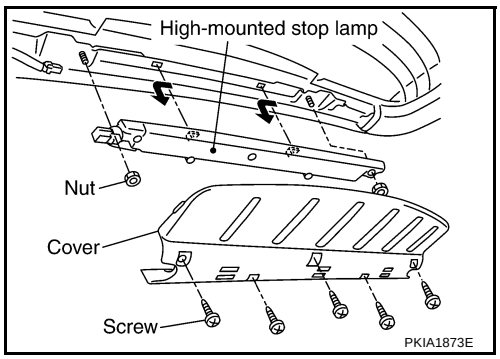
TKWT1604E

High-Mounted Stop Lamp (Coupe Models)

AKS009S9

BULB REPLACEMENT, REMOVAL AND INSTALLATION

1. Remove back door finisher upper Refer to EI-47, "BACK DOOR FINISHER" in "EI" section.
2. Disconnect high-mounted stop lamp connector.
3. Remove Nuts and remove high-mounted stop lamp with cover from back door. Be sure to pull toward the arrow in the figure.
4. Remove screws and remove high-mounted stop lamp assembly from cover.
5. Install in the reverse order of removal.



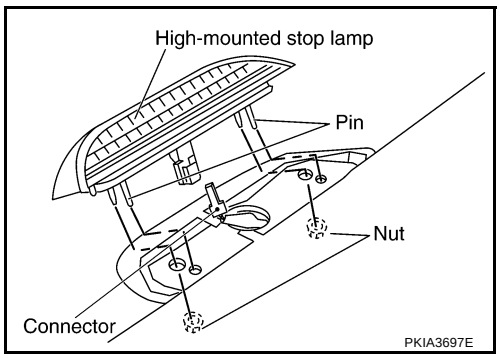
High-mounted stop lamp : LED

High-Mounted Stop Lamp (Roadster Models)

AKS003U0

BULB REPLACEMENT, REMOVAL AND INSTALLATION

1. Turn ignition switch ON, and turn soft-top OPEN/CLOSE switch ON.
2. When the storage lid is fully opened, soft-top OPEN/CLOSE switch to OFF.
3. Remove battery negative cable.
4. Disconnect high-mounted stop lamp connector.
5. Remove high-mounted stop lamp. Be sure to pull toward the arrow in the figure.
6. Remove high-mounted stop lamp assembly from storage lid.
7. Install in the reverse order of removal.



High-mounted stop lamp : LED

Stop Lamp

AKS009SA

BULB REPLACEMENT

Refer to LT-205, "Bulb Replacement" in “REAR COMBINATION LAMP”.

REMOVAL AND INSTALLATION

Refer to LT-206, "Removal and Installation" in “REAR COMBINATION LAMP”.

BACK-UP LAMP

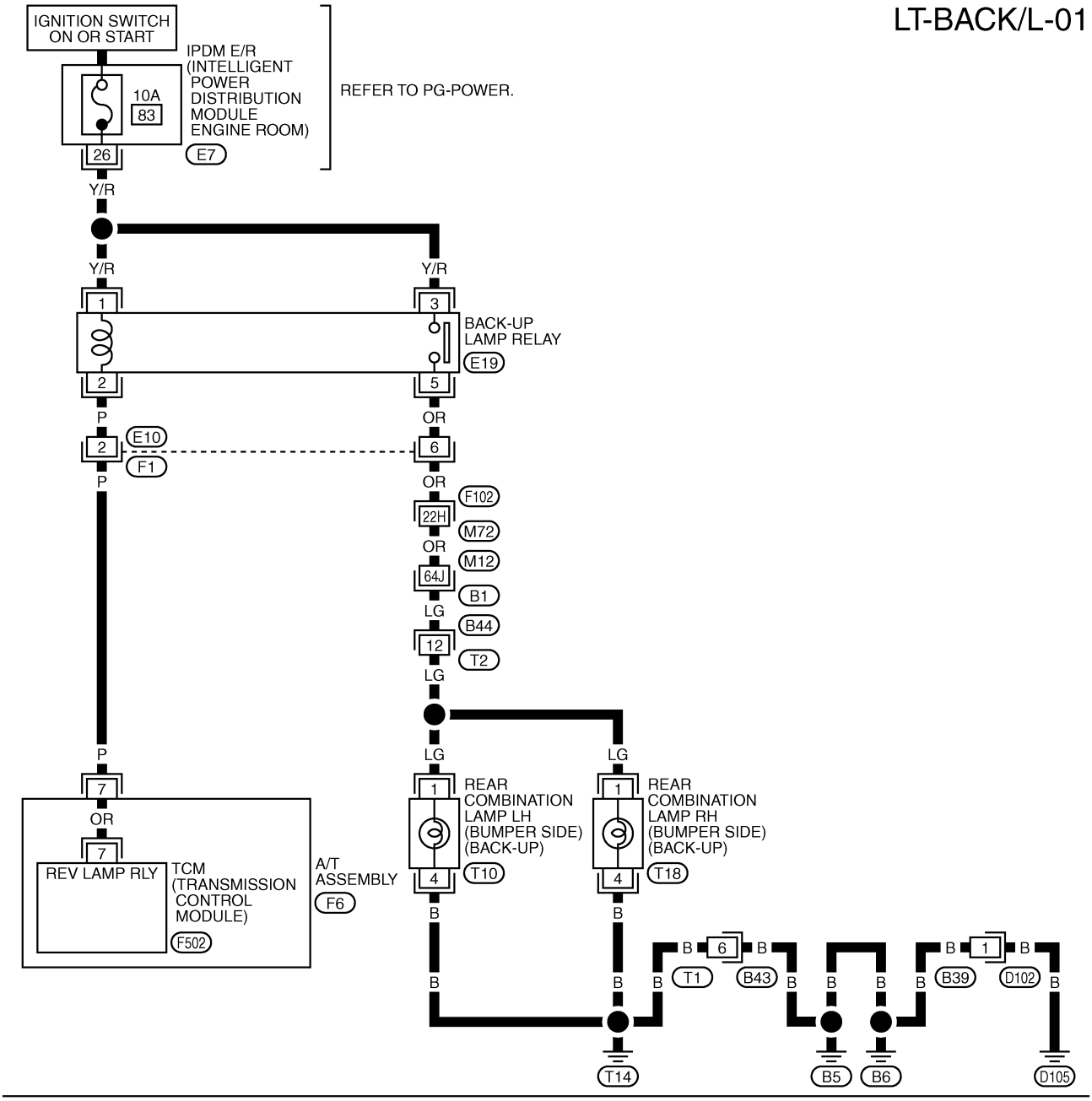
PFP:26550

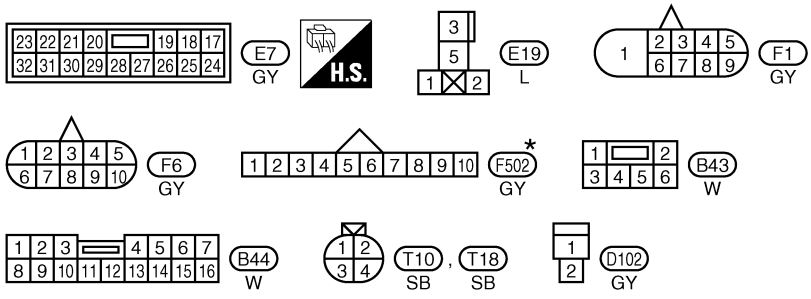
Wiring Diagram — BACK/L —

AKS009SF

COUPE MODELS (A/T)

LT-BACK/L-01





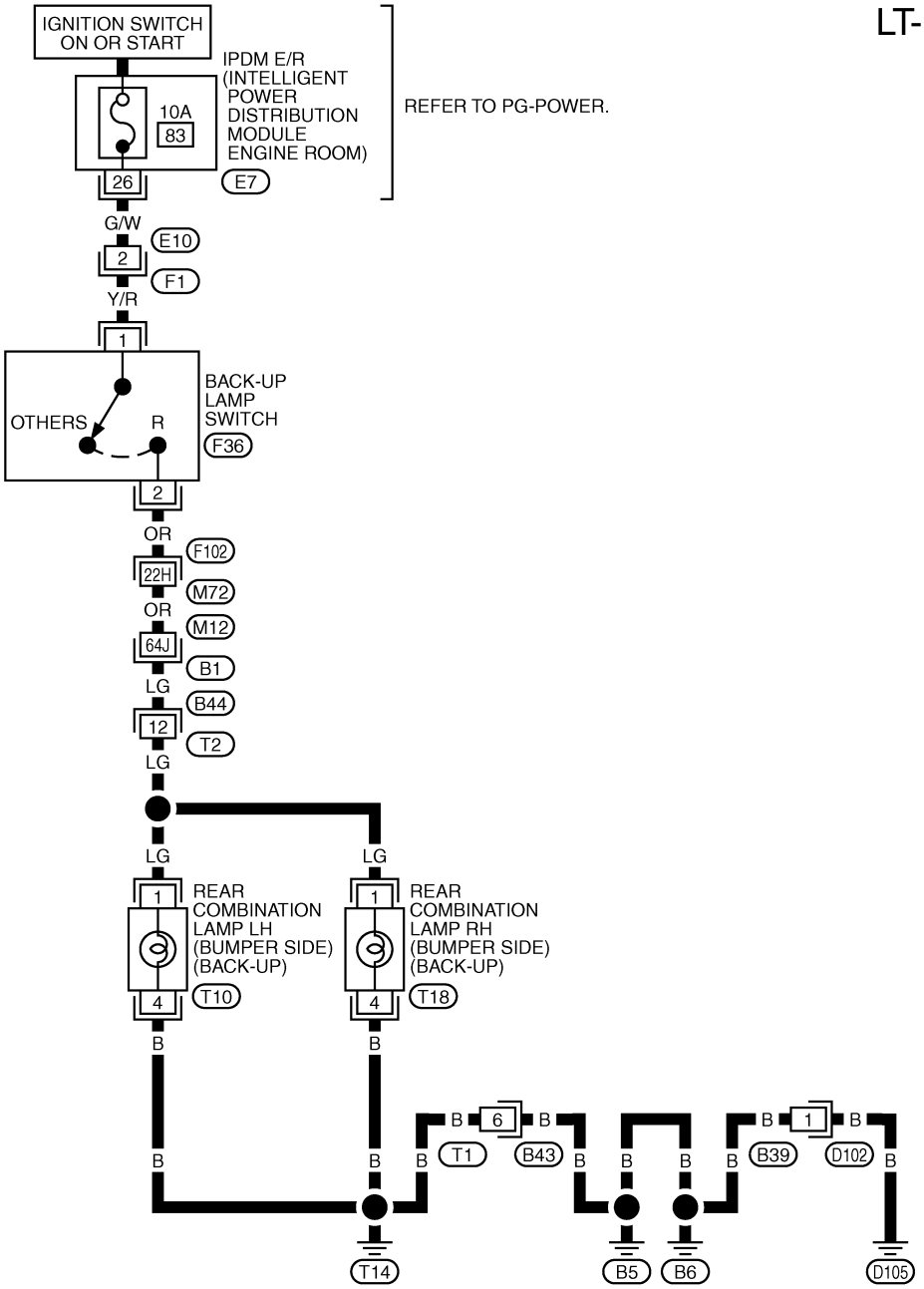
∗: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

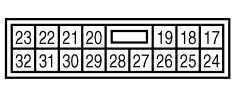
REFER TO THE FOLLOWING.
F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

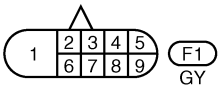
TKWM1315E

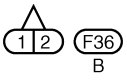
COUPE MODELS (M/T)

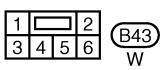
LT-BACK/L-02

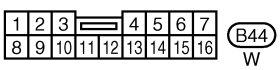


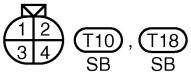


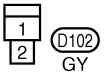










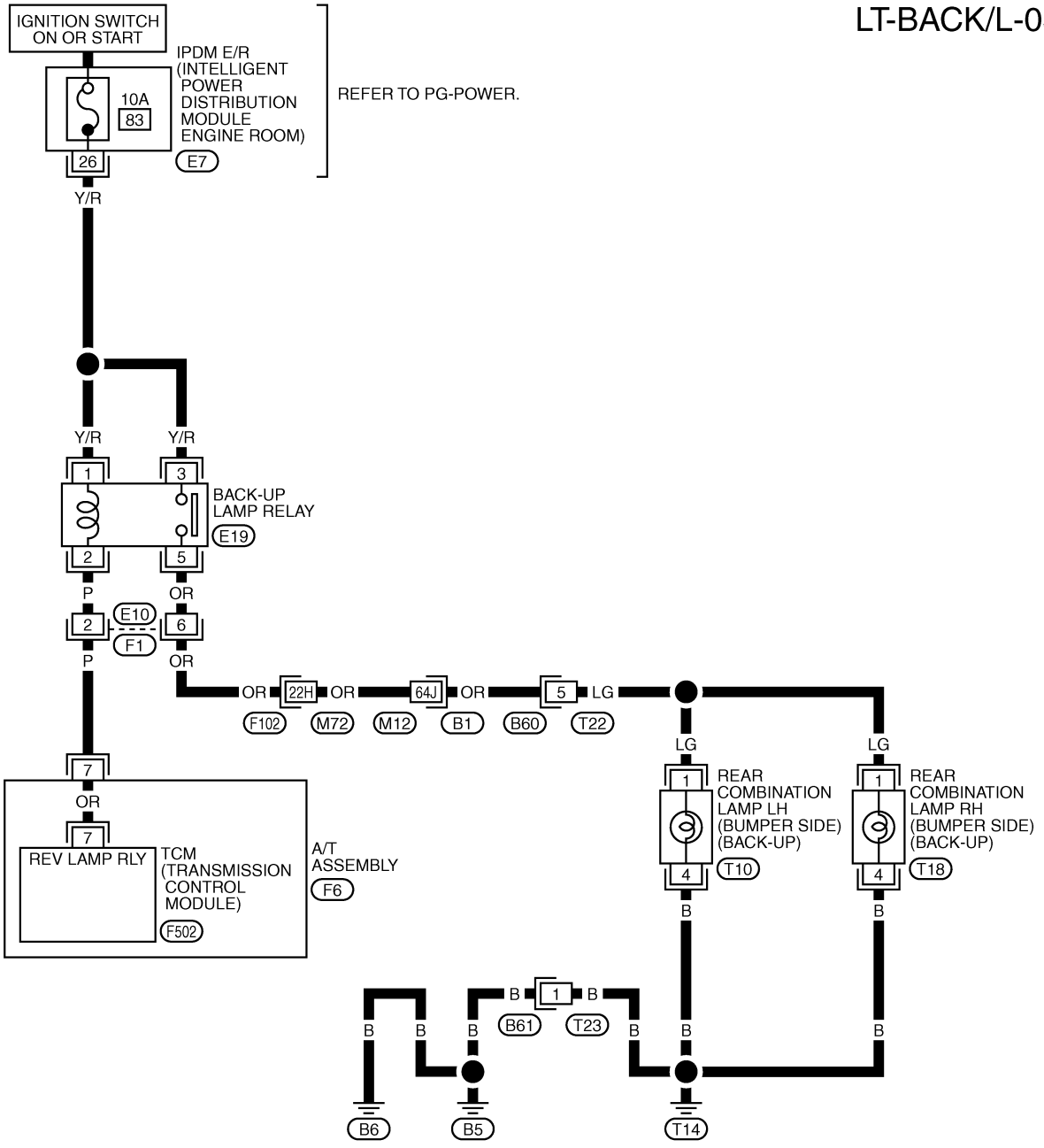


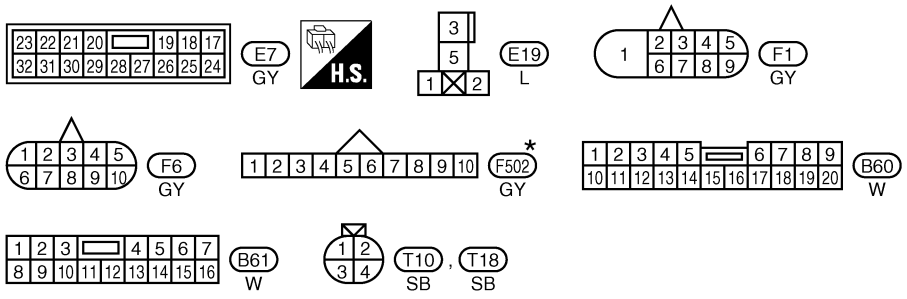
REFER TO THE FOLLOWING.
F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT1326E

ROADSTER MODELS (A/T)

LT-BACK/L-03





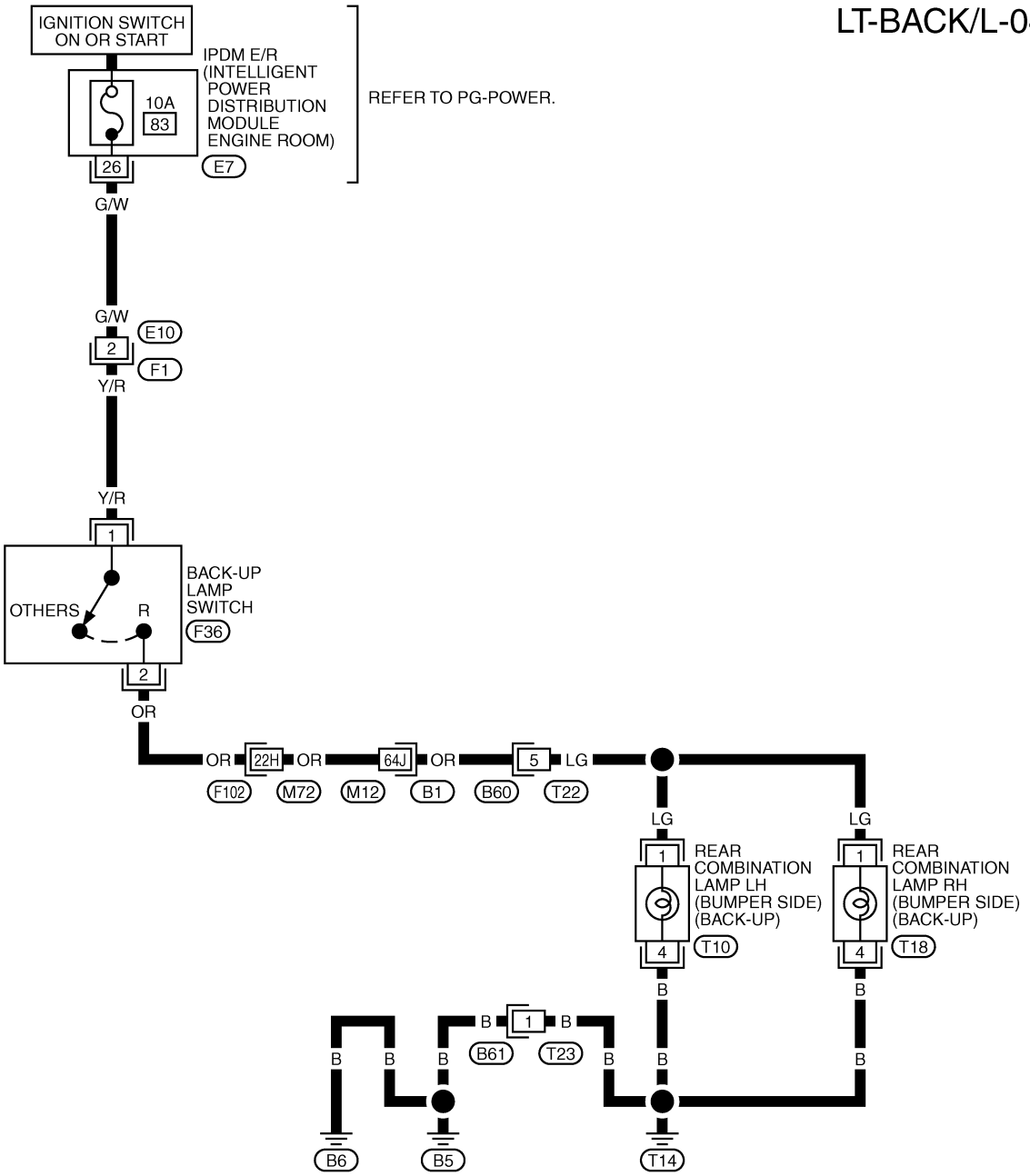
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

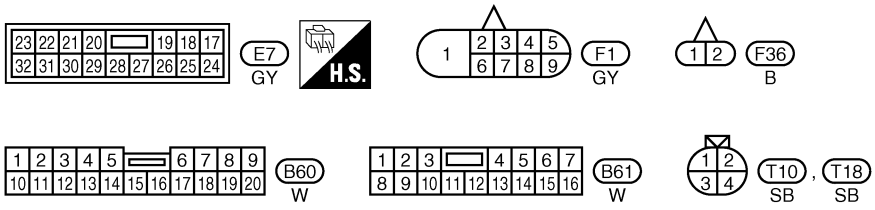
REFER TO THE FOLLOWING.
F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWM1316E

ROADSTER MODELS (M/T)

LT-BACK/L-04





REFER TO THE FOLLOWING.
F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT1606E

Bulb Replacement

AKS000V8

Refer to LT-205, "Bulb Replacement" in “REAR COMBINATION LAMP”.

Removal and Installation

AKS000V9

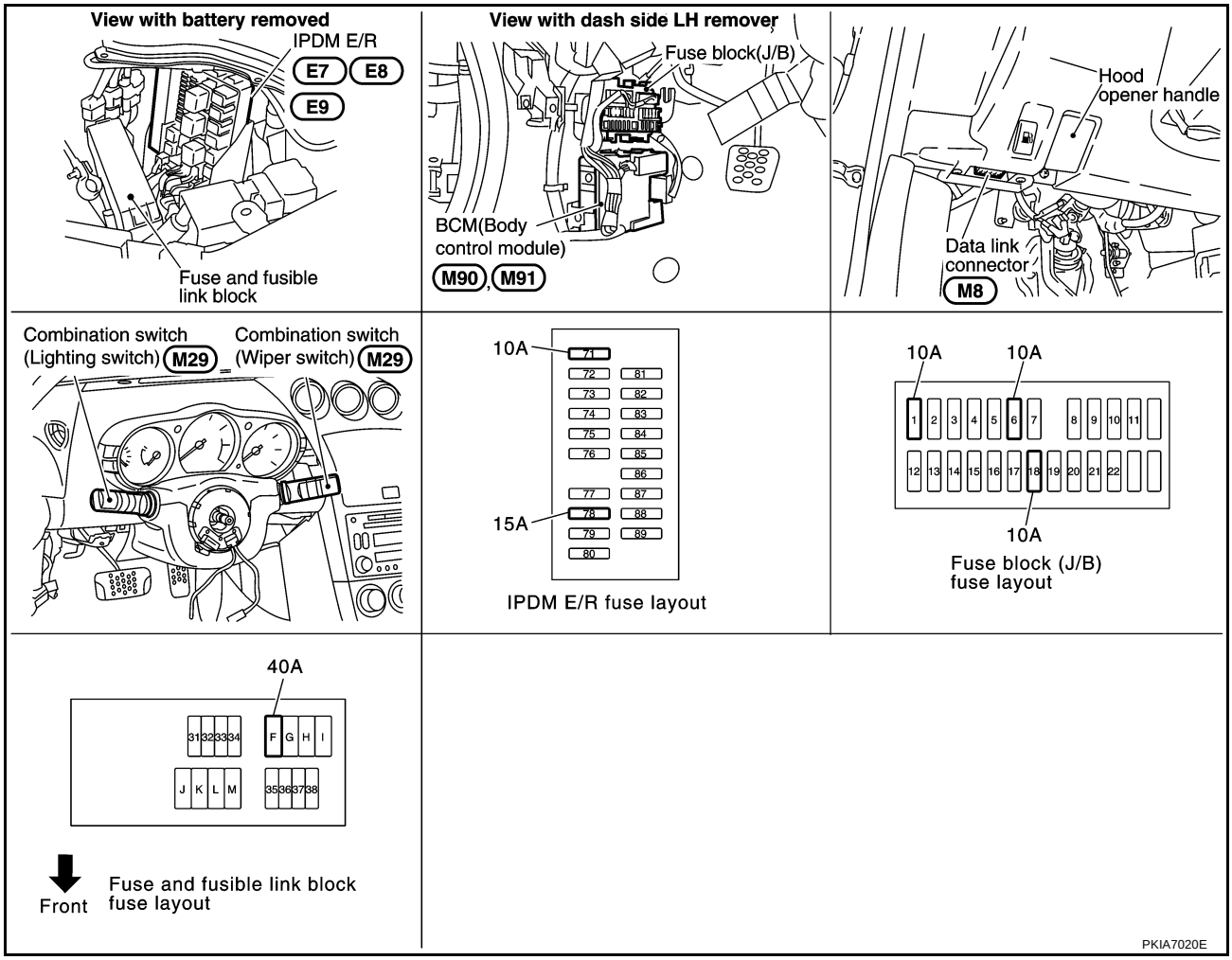
Refer to LT-206, "Removal and Installation" in “REAR COMBINATION LAMP”.

PARKING, LICENSE PLATE AND TAIL LAMPS

PFP:26550

Component Parts and Harness Connector Location

AKS00ADQ



System Description

AKS009RU

Control of parking, license plate, and tail lamp operation is dependent upon the position of lighting switch (combination switch). When lighting switch is placed in the 1ST position, BCM (body control module) receives input signal requesting parking, license plate, side marker and tail lamps to illuminate. This input signal is communicated to IPDM E/R (intelligent power distribution module engine room) across CAN communication lines. CPU (central processing unit) of IPDM E/R (intelligent power distribution module engine room) controls tail lamp relay coil. This relay, when energized, directs power to parking, license plate, side marker and tail lamps, which then illuminate.

OUTLINE

Power is supplied at all times

- through 10A fuse [No.71, located in IPDM E/R (intelligent power distribution module engine room)]
- to tail lamp relay [located in IPDM E/R (intelligent power distribution module engine room)]
- through 15A fuse [No.78, located in IPDM E/R (intelligent power distribution module engine room)]
- to CPU (central processing unit) [located in IPDM E/R (intelligent power distribution module engine room)].

Power is also supplied at all times

- through 40A fusible link (letter F, located in fuse and fusible link block)
- to BCM (body control module) terminal 55
- through 10A fuse [No.18, located in fuse block (J/B)]
- to BCM (body control module) terminal 42.

With ignition switch in ON or START position, power is supplied

- to CPU (central processing unit) [located in IPDM E/R (intelligent power distribution module engine room)]
- through 10A fuse [No.1, located in fuse block (J/B)]
- to BCM (body control module) terminal 38.

With ignition switch in ACC or ON position, power is supplied

- through 10A fuse [No. 6, located in fuse block (J/B)]
- to BCM (body control module) terminal 11.

Ground is supplied

- to BCM (body control module) terminal 52
- through grounds M30 and M66
- to IPDM E/R (intelligent power distribution module engine room) terminals 38 and 60
- through grounds E17, E43 and F152.

OPERATION BY LIGHTING SWITCH

With lighting switch in the 1st or 2nd position (or if auto light system is activated), BCM receives input signal requesting parking, license plate, side marker and tail lamps to illuminate. This input is communicated to IPDM E/R across CAN communication lines. CPU in IPDM E/R controls tail lamp relay coil, which when energized, directs power

- through IPDM E/R terminal 22
- to front combination lamp LH terminals 5 and 6 (With xenon bulb headlamp)
- to front combination lamp LH terminal 5 (With halogen bulb headlamp)
- to front combination lamp RH terminals 5 and 6 (With xenon bulb headlamp)
- to front combination lamp RH terminal 5 (With halogen bulb headlamp)
- to rear combination lamp LH terminals 2 and 5
- to rear combination lamp RH terminals 2 and 5
- to license plate lamp LH terminal 2
- to license plate lamp RH terminal 2.

Ground is supplied at all times

- to front combination lamp LH terminal 1 (With xenon bulb headlamp)
- to front combination lamp LH terminal 4 (With halogen bulb headlamp)
- through grounds E17, E43 and F152
- to front combination lamp RH terminal 1 (With xenon bulb headlamp)
- to front combination lamp RH terminal 4 (With halogen bulb headlamp)
- through grounds E17, E43 and F152
- to rear combination lamp LH terminals 3 and 4
- through grounds D105, B5, B6 and T14 (Coupe models)
- through grounds B5, B6 and T14 (Roadster models)
- to rear combination lamp RH terminals 3 and 4
- through grounds D105, B5, B6 and T14 (Coupe models)
- through grounds B5, B6 and T14 (Roadster models)
- to license plate lamp LH terminal 1
- through grounds D105, B5, B6 and T14 (Coupe models)
- through grounds B5, B6 and T14 (Roadster models)
- to license plate lamp RH terminal 1
- through grounds D105, B5, B6 and T14 (Coupe models)
- through grounds B5, B6 and T14 (Roadster models).

With power and ground supplied, parking, license plate side marker and tail lamps illuminate.

COMBINATION SWITCH READING FUNCTION

Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION" .

EXTERIOR LAMP BATTERY SAVER CONTROL

When combination switch (lighting switch) is in the 1ST (or 2ND) position, and ignition switch is turned from ON or ACC to OFF, battery saver control function is activated.
Under this condition, parking, license plate, side marker and tail lamps remain illuminated for 5 minutes, then parking, license plate, side marker and tail lamps are turned off.
Exterior lamp battery saver control mode can be changed by the function setting of CONSULT-II.

CAN Communication System Description

AKS009RV

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

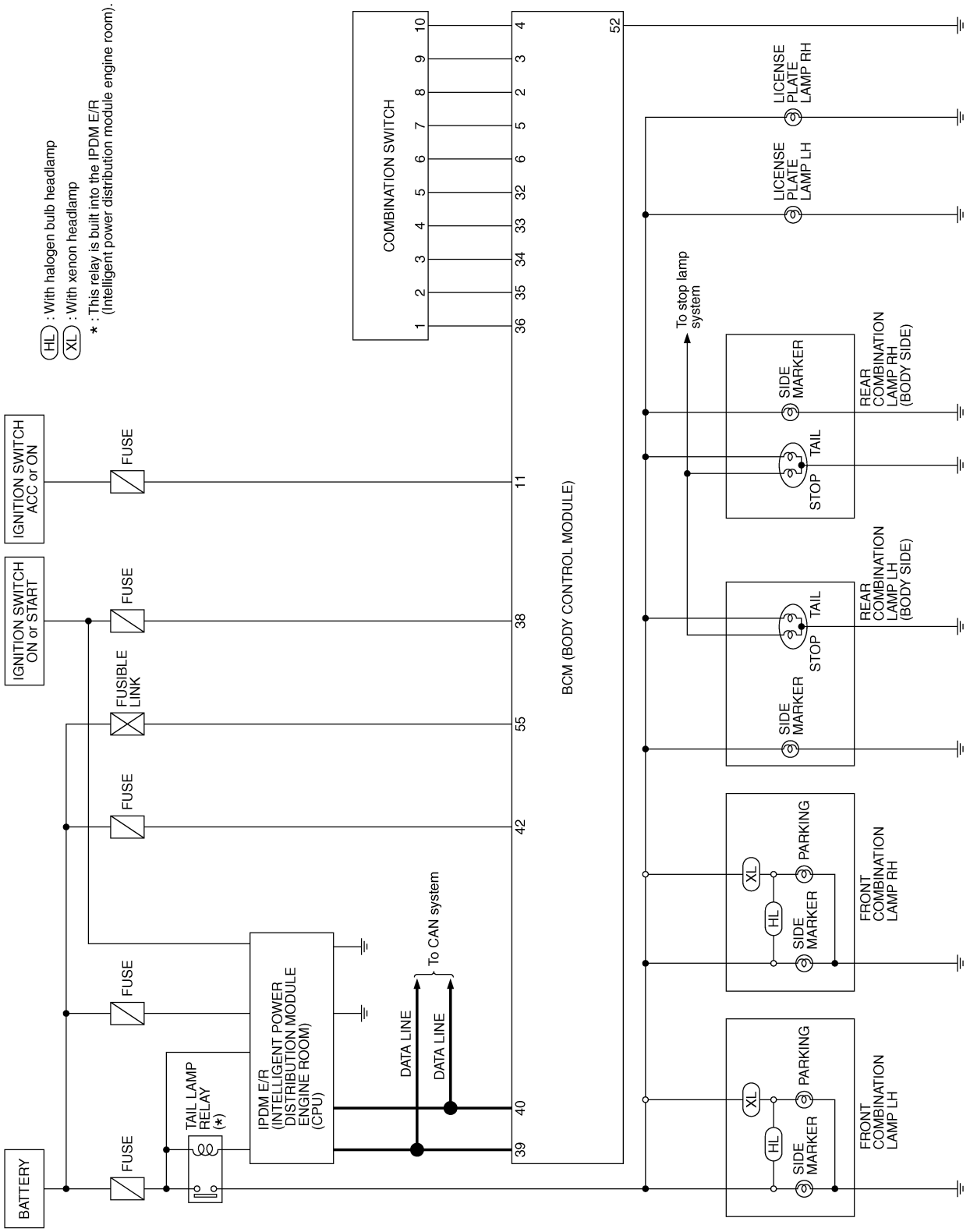
CAN Communication Unit

AKS009RW

Refer to LAN-5, "CAN Communication Unit" .

Schematic

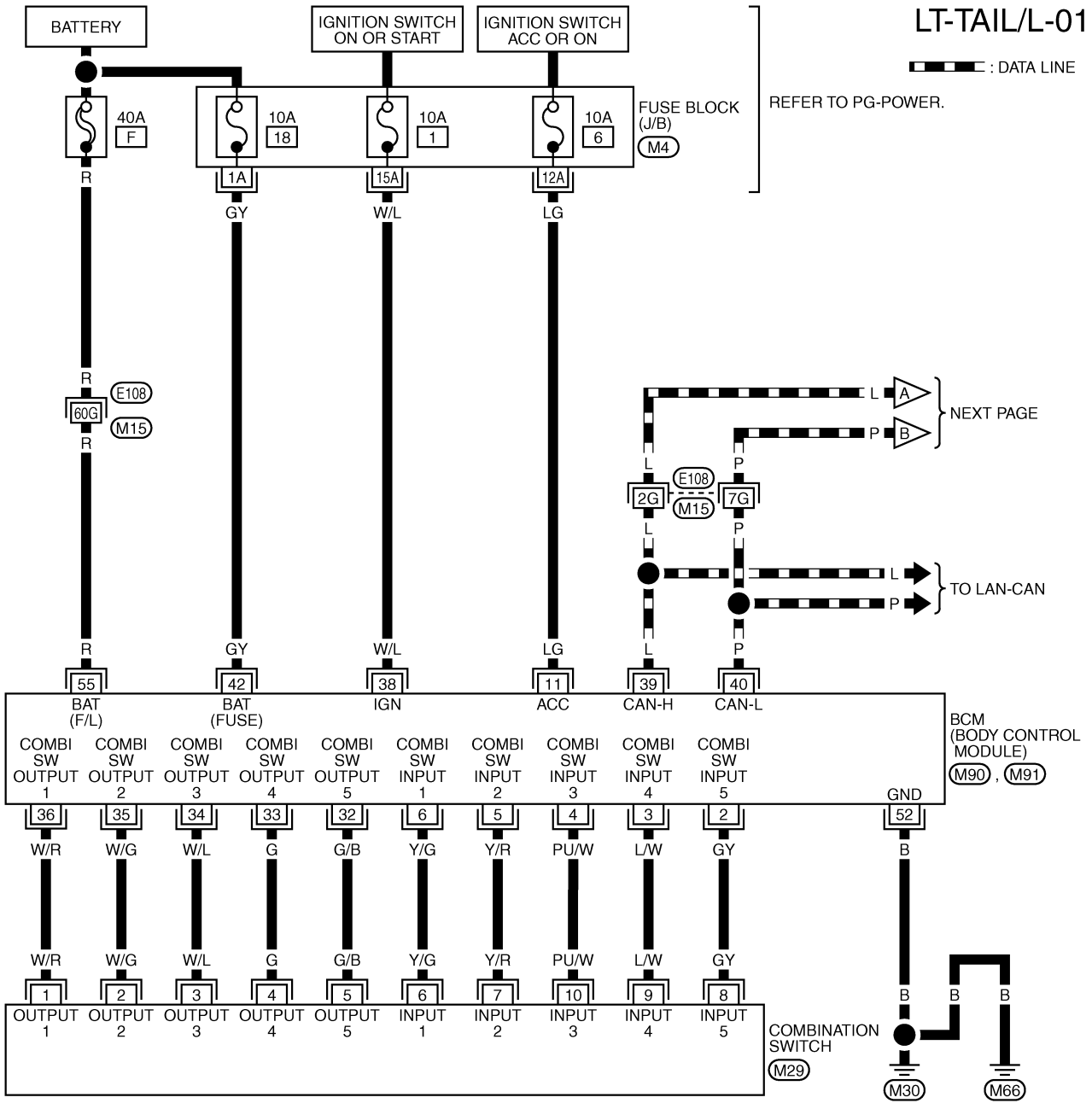
AKS009RX



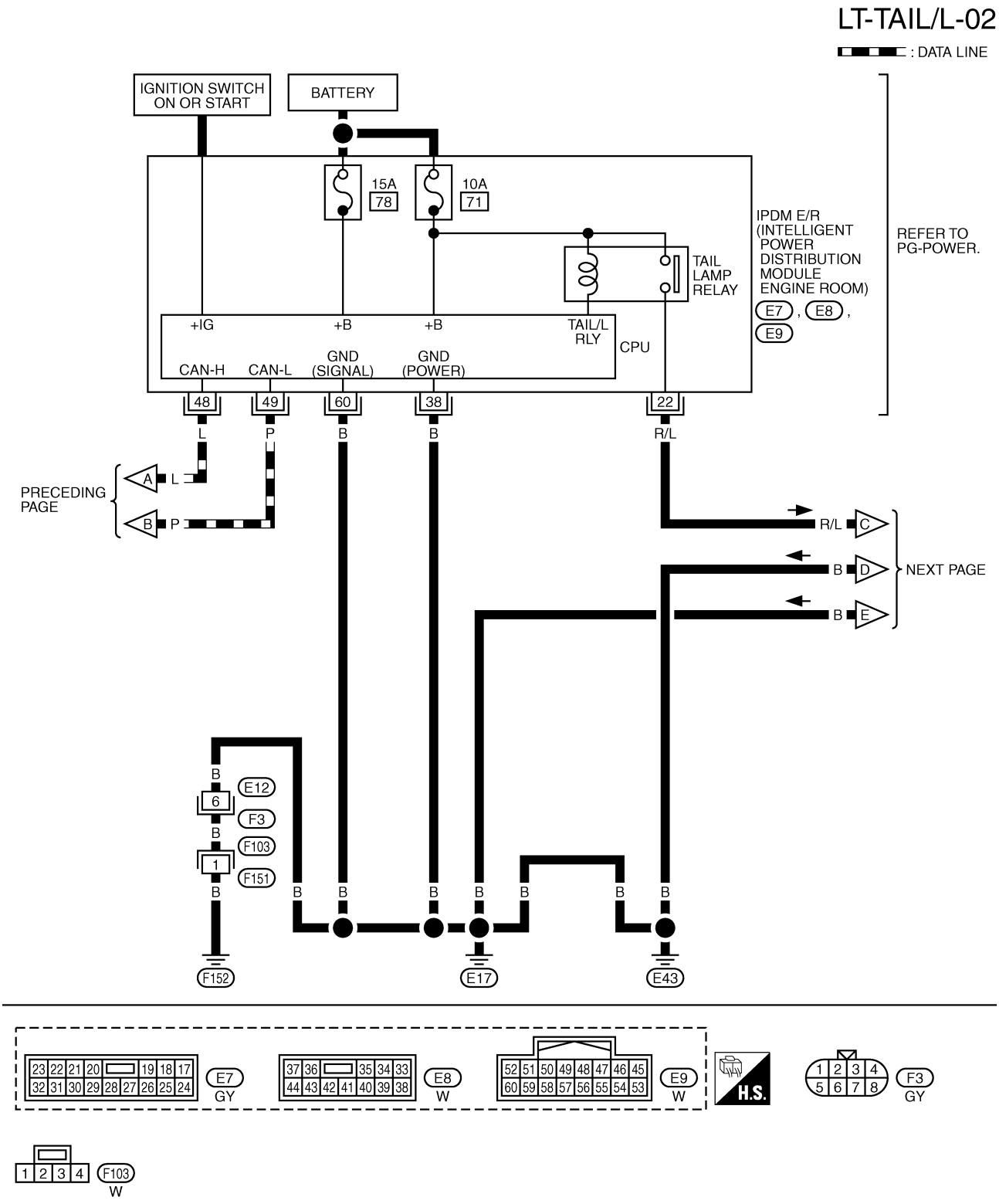
TKWT1810E

Wiring Diagram — TAIL/L —

AKS009RY



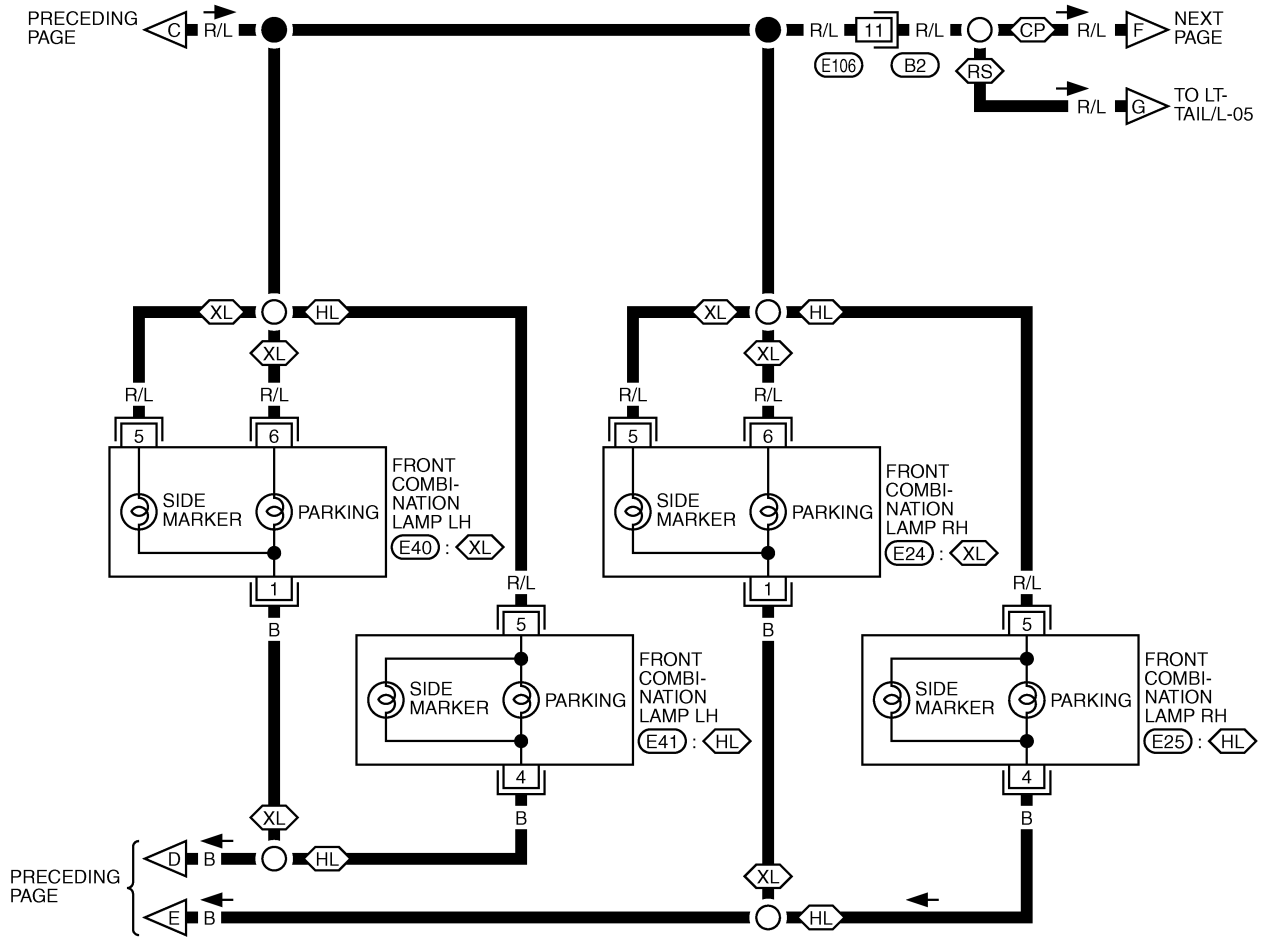
TKWT1811E

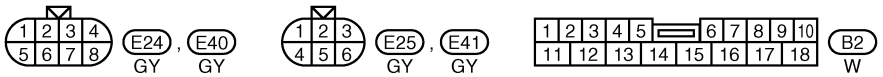

LT-TAIL/L-02
: DATA LINE
IGNITION SWITCH ON OR START
BATTERY
15A 78
10A 71
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E7 , E8 , E9
REFER TO PG-POWER.
TAIL LAMP RELAY
+IG
+B
+B
TAIL/L RLY
CPU
CAN-H
CAN-L
GND (SIGNAL)
GND (POWER)
48
49
60
38
22
L
P
B
B
R/L
PRECEDING PAGE
A L
B P
R/L C
B D
B E
NEXT PAGE
E12
6
F3
F103
1
F151
F152
E17
E43
E7 GY
E8 W
E9 W
H.S.
F3 GY
F103 W

TKWT1812E

LT-TAIL/L-03

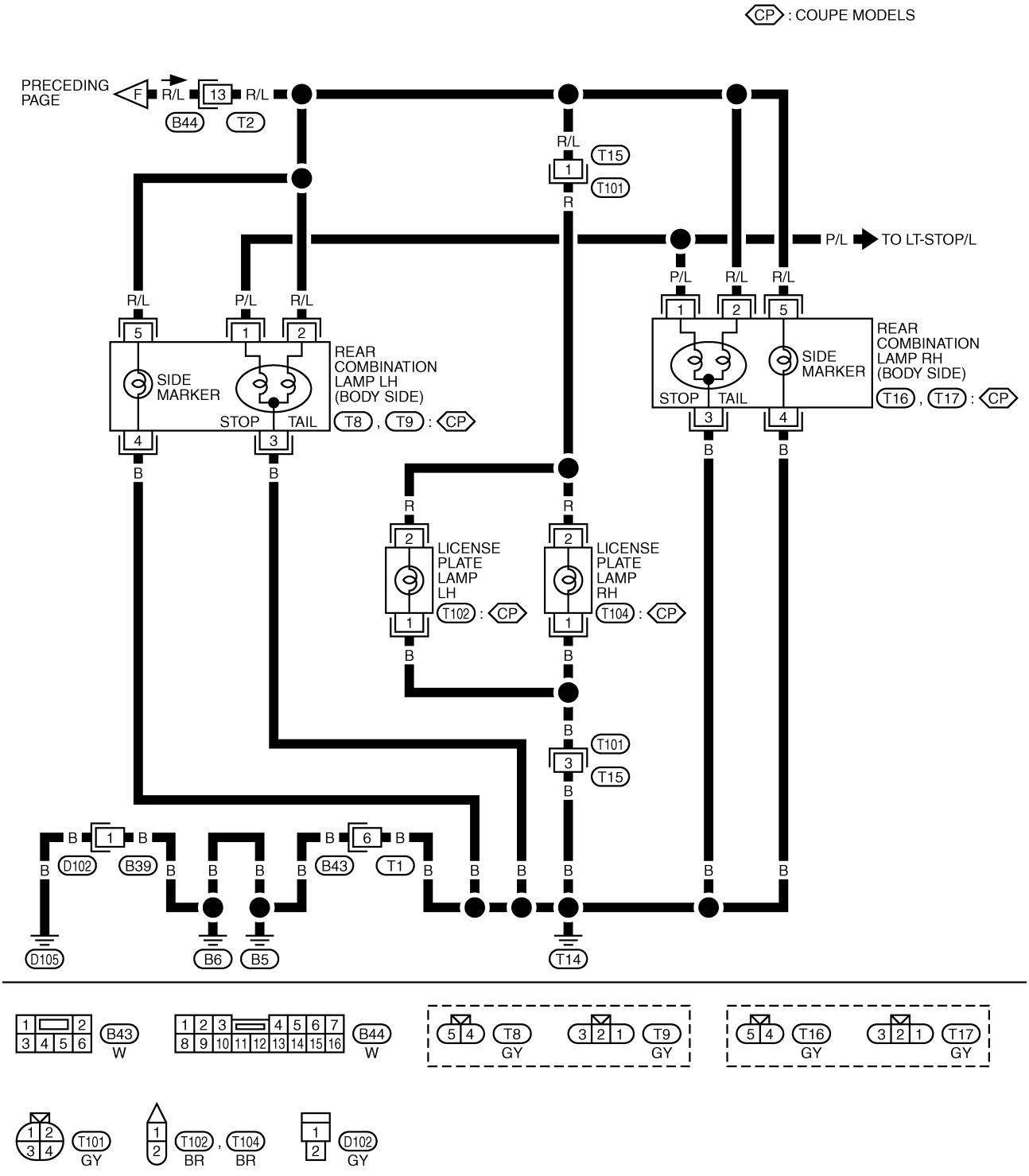
CP : COUPE MODELS
RS : ROADSTER MODELS
HL : WITH HALOGEN BULB HEADLAMP
XL : WITH XENON HEADLAMP





TKWT1813E

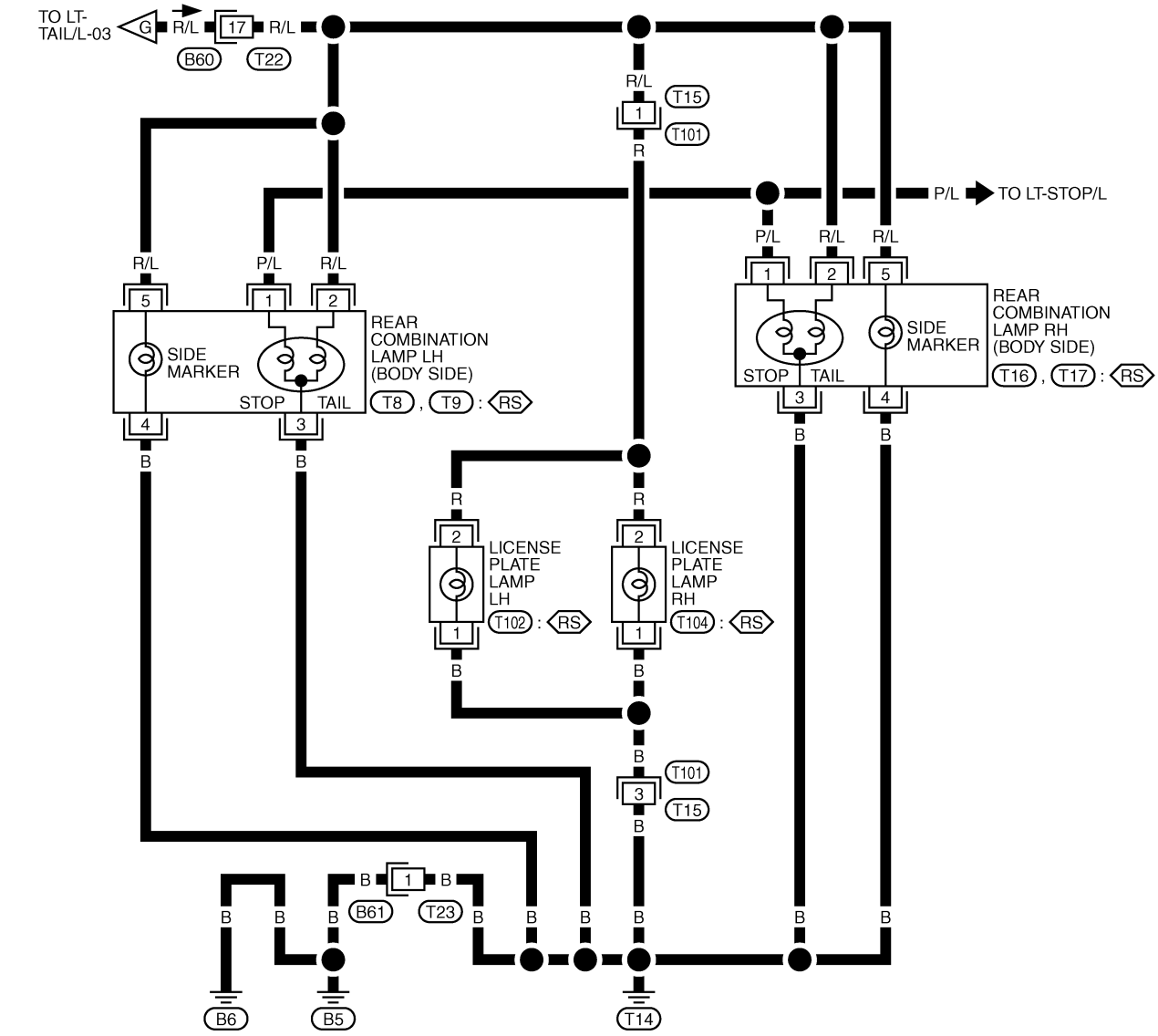
LT-TAIL/L-04

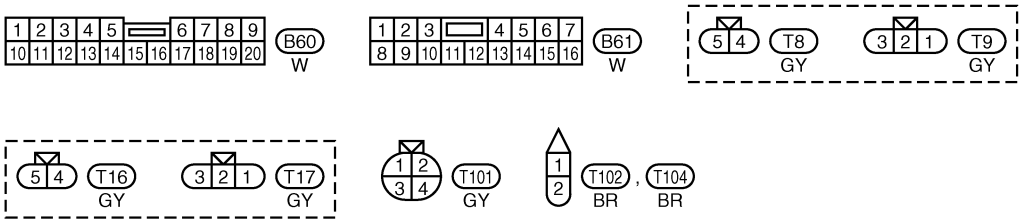


TKWT1814E

LT-TAIL/L-05

RS : ROADSTER MODELS

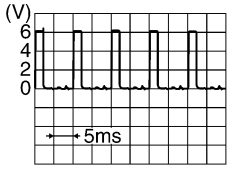
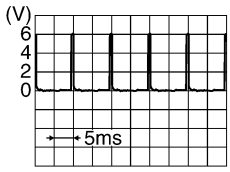
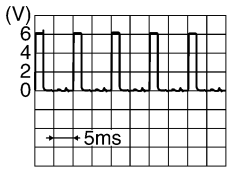
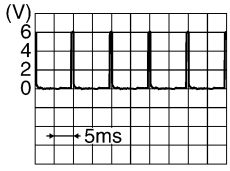
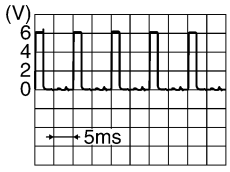
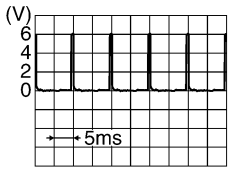
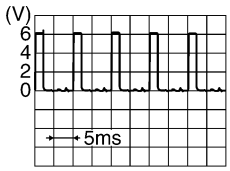


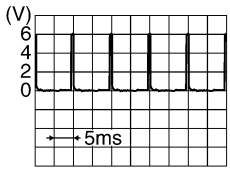


TKWT1815E

Terminals and Reference Values for BCM

AKS00APD

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
2	GY	Combination switch input 5	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E
3	L/W	Combination switch input 4	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
4	PU/W	Combination switch input 3	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E
5	Y/R	Combination switch input 2	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
6	Y/G	Combination switch input 1			
11	LG	Ignition switch (ACC)	ACC	—	Battery voltage
32	G/B	Combination switch output 5	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E
33	G	Combination switch output 4	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
34	W/L	Combination switch output 3	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
35	W/G	Combination switch output 2	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
36	W/R	Combination switch output 1			
38	W/L	Ignition switch (ON)	ON	—	Battery voltage
39	L	CAN– H	—	—	—
40	P	CAN– L	—	—	—
42	GY	Battery power supply	OFF	—	Battery voltage
52	B	Ground	ON	—	Approx. 0V
55	R	Battery power supply	OFF	—	Battery voltage

Terminals and Reference Values for IPDM E/R

AKS009SG

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
22	R/L	Parking, license, and tail lamp	ON	Lighting switch 1ST position	OFF	Approx. 0V
					ON	Battery voltage
38	B	Ground	ON	—		Approx. 0V
48	L	CAN– H	—	—		—
49	P	CAN– L	—	—		—
60	B	Ground	ON	—		Approx. 0V

How to Proceed With Trouble Diagnosis

AKS009S0

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-184, "System Description" .
3. Carry out preliminary check. Refer to LT-194, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Do parking, license plate and tail lamps operate normally? If YES: GO TO 6. If NO: GO TO 4.
6. INSPECTION END

Preliminary Check

AKS009S1

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES

- Check fuses for blown-out.

Unit	Power source	Fuse and fusible link No.
BCM	Battery	F
		18
	Ignition switch ON or START position	1
	Ignition switch ACC or ON position	6
IPDM E/R	Battery	71
		78

Refer to LT-188, "Wiring Diagram — TAIL/L —" .

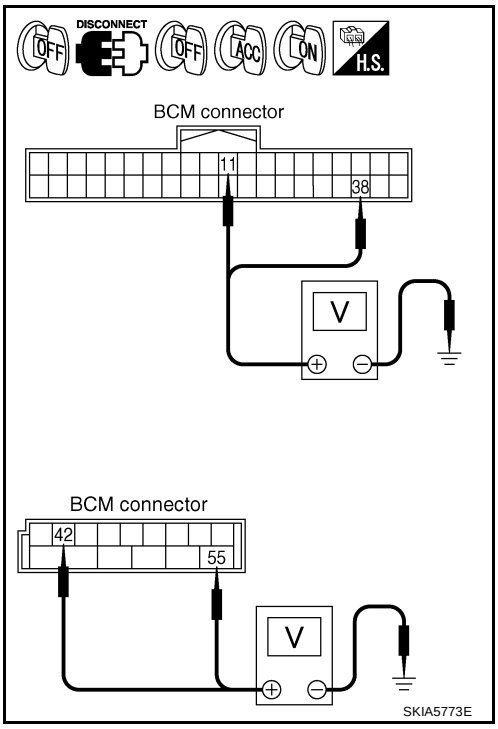
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM harness connector terminals and ground.

Terminals			Ignition switch position		
(+)		(–)	OFF	ACC	ON
Connector	Terminal (Wire color)				
M90	11 (LG)	Ground	0V	Battery voltage	Battery voltage
	38 (W/L)		0V	0V	Battery voltage
M91	42 (GY)		Battery voltage	Battery voltage	Battery voltage
	55 (R)		Battery voltage	Battery voltage	Battery voltage



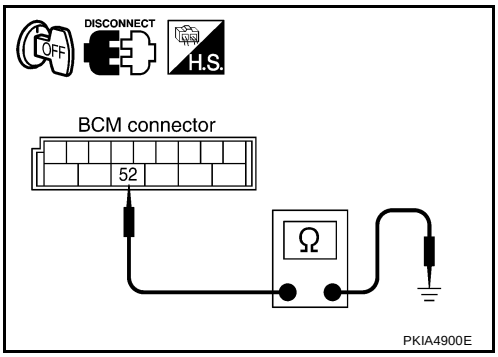
OK or NG

OK >> GO TO 3.
NG >> Check harness for open or short between BCM and fuse.

3. CHECK GROUND CIRCUIT

Check continuity between BCM harness connector terminal and ground.

Terminals			Continuity
Connector	Terminal (Wire color)	Ground	
M91	52 (B)		Yes



OK or NG

OK >> INSPECTION END
NG >> Check ground circuit harness.

CONSULT-II Functions (BCM)

AKS009S2

Refer to LT-18, "CONSULT-II Functions (BCM)" in XENON TYPE (FOR USA).
Refer to LT-49, "CONSULT-II Functions (BCM)" in CONVENTIONAL TYPE (FOR USA).
Refer to LT-83, "CONSULT-II Functions (BCM)" in XENON TYPE (FOR CANADA).
Refer to LT-120, "CONSULT-II Functions (BCM)" in CONVENTIONAL TYPE (FOR CANADA).

CONSULT-II Functions (IPDM E/R)

AKS00ADT

Refer to LT-20, "CONSULT-II Functions (IPDM E/R)" in XENON TYPE (FOR USA).
Refer to LT-51, "CONSULT-II Functions (IPDM E/R)" in CONVENTIONAL TYPE (FOR USA).
Refer to LT-85, "CONSULT-II Functions (IPDM E/R)" in XENON TYPE (FOR CANADA).
Refer to LT-122, "CONSULT-II Functions (IPDM E/R)" in CONVENTIONAL TYPE (FOR CANADA).

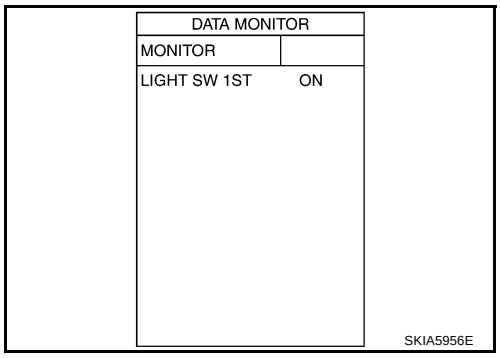
Parking, License Plate and Tail Lamps Do Not Illuminate

AKS00AP0

1. CHECK COMBINATION SWITCH INPUT SIGNAL

With CONSULT-II
Select “BCM” on CONSULT-II. With “HEAD LAMP” data monitor, make sure “LIGHT SW 1 ST” turns ON-OFF linked with operation of lighting switch.

When lighting switch is 1ST position : LIGHT SW 1 ST ON



Without CONSULT-II
Refer to LT-170, "Combination Switch Inspection" .

OK or NG

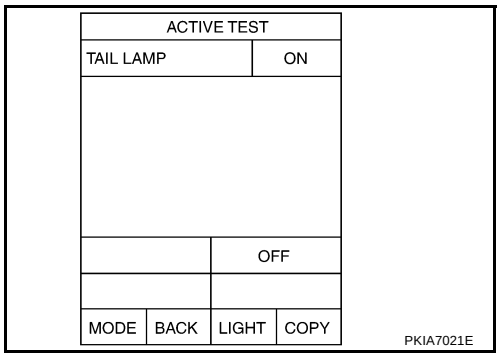
OK >> GO TO 2.
NG >> Check lighting switch. Refer to LT-170, "Combination Switch Inspection" .

2. ACTIVE TEST

With CONSULT-II

1. Select “IPDM E/R” on CONSULT-II, and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Select “TAIL LAMP” on “SELECT TEST ITEM” screen.
3. Touch “ON” screen.
4. Make sure parking, license plate, side marker and tail lamp operation.

Parking, license plate, side marker and tail lamp should operate.



Without CONSULT-II

1. Start auto active test. Refer to PG-24, "Auto Active Test" .
2. Make sure parking, license plate, side marker and tail lamp operation.

Parking, license plate, side marker and tail lamp should operate.

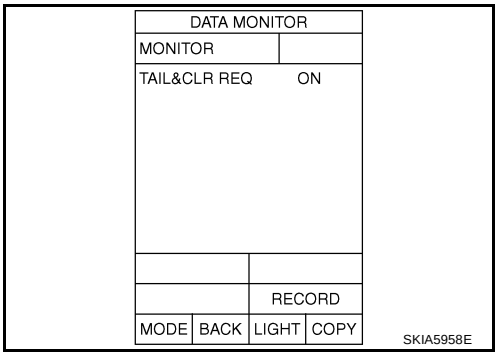
OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK IPDM E/R

1. Select “IPDM E/R” on CONSULT-II, and select “DATA MONITOR” on “SELECT DIAG MODE” screen.
2. Make sure “TAIL & CLR REQ” turns ON when lighting switch is in 1ST position.

When lighting switch is 1ST position : TAIL & CLR REQ ON



OK or NG

OK >> Replace IPDM E/R.

NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

4. CHECK IPDM E/R

With CONSULT-II

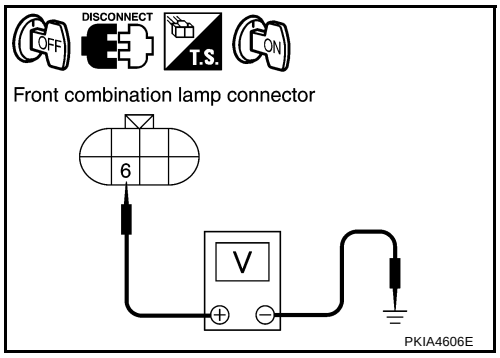
1. Turn ignition switch OFF.
2. Disconnect front combination lamp, rear combination lamp and license plate lamp connectors.
3. Select “IPDM E/R” on CONSULT-II. and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
4. Select “TAIL LAMP” on “SELECT TEST ITEM” screen.
5. Touch “ON” screen.
6. When tail lamp relay is operating, check voltage between front combination lamp, rear combination lamp and license plate lamp harness connector and ground.

With out CONSULT-II

1. Turn ignition switch OFF.
2. Disconnect front combination lamp, rear combination lamp and license plate lamp connector.
3. Start auto active test. Refer to PG-24, "Auto Active Test" .
4. When tail lamp relay is operating, check voltage between front combination lamp, rear combination lamp and license plate lamp harness connector and ground.

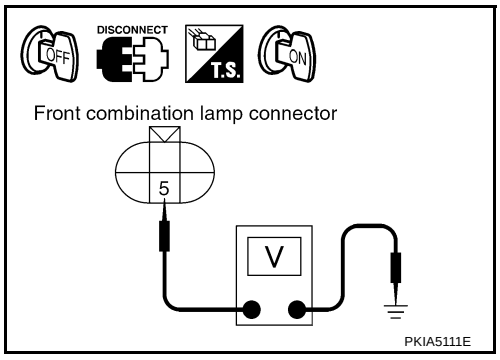
With xenon headlamp

Terminals				Voltage
Front combination lamp (+) (Parking)			(-)	
Connector		Terminal (wire color)		
RH	E24	6 (R/L)	Ground	Battery voltage
LH	E40			



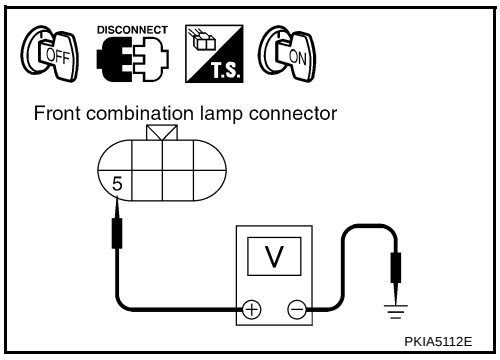
With halogen headlamp

Terminals				Voltage
Front combination lamp (+) (Parking)			(-)	
Connector		Terminal (wire color)		
RH	E25	5 (R/L)	Ground	Battery voltage
LH	E41			



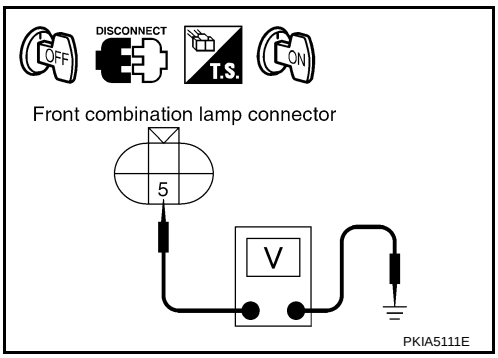
With xenon headlamp

Terminals				Voltage
Front combination lamp (+) (Side marker)			(-)	
Connector		Terminal (wire color)		
RH	E24	5 (R/L)	Ground	Battery voltage
LH	E40			

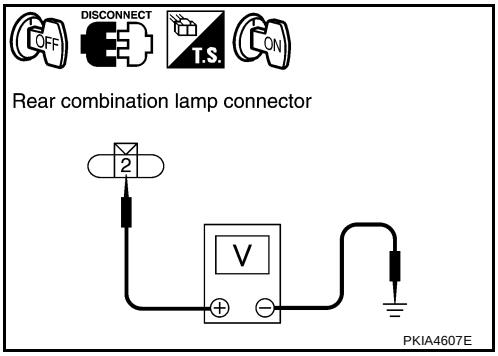


With halogen headlamp

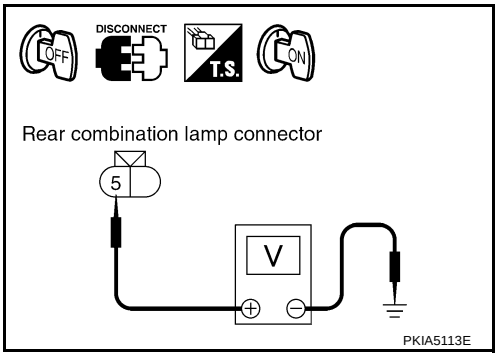
Terminals				Voltage
Front combination lamp (+) (side marker)			(-)	
Connector		Terminal (wire color)		
RH	E25	5 (R/L)	Ground	Battery voltage
LH	E41			



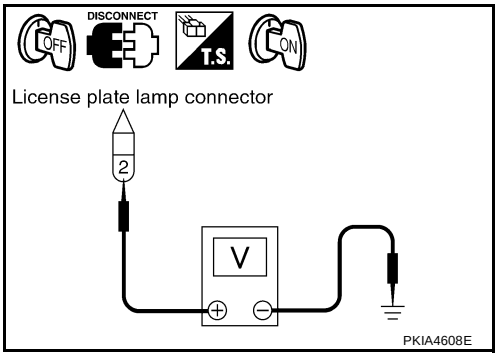
Terminals				Voltage
Rear combination lamp (+) (Tail)			(-)	
Connector		Terminal (wire color)		
RH	T17	2 (R/L)	Ground	Battery voltage
LH	T9			



Terminals				Voltage
Rear combination lamp (+) (Side marker)			(-)	
Connector		Terminal (wire color)		
RH	T16	5 (R/L)	Ground	Battery voltage
LH	T8			



Terminals				Voltage
License plate lamp (+)			(-)	
Connector		Terminal (wire color)		
RH	T104	2 (R)	Ground	Battery voltage
LH	T102			



OK or NG

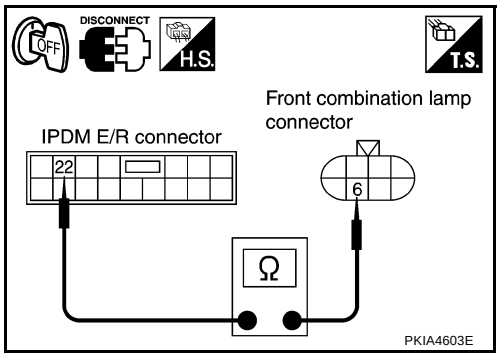
OK >> GO TO 6.
NG >> GO TO 5.

5. CHECK BETWEEN IPDM E/R AND PARKING, LICENSE PLATE, SIDE MARKER AND TAIL LAMPS

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check harness continuity between IPDM E/R connector and front combination lamp, rear combination lamp and license plate lamp connectors.

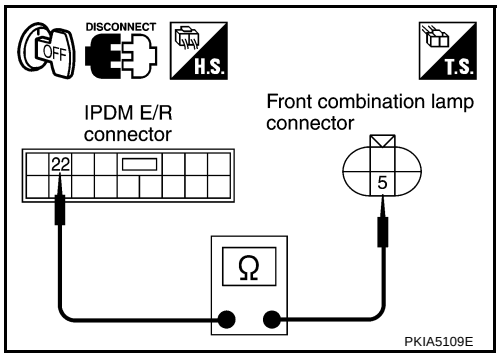
With xenon headlamp

Terminals					Continuity
IPDM E/R		Front combination lamp (Parking)			
Connector	Terminal (wire color)	Connector		Terminal (wire color)	
E7	22 (R/L)	RH	E24	6 (R/L)	Yes
		LH	E40	6 (R/L)	



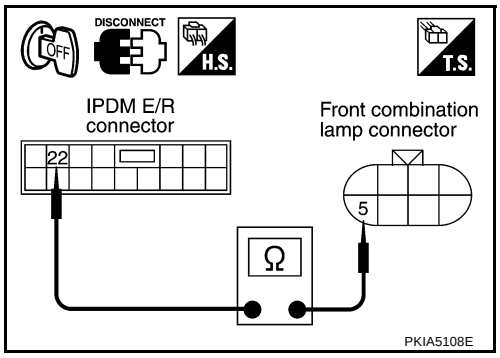
With halogen bulb headlamp

Terminals					Continuity
IPDM E/R		Front combination lamp (Parking)			
Connector	Terminal (wire color)	Connector		Terminal (wire color)	
E7	22 (R/L)	RH	E25	5 (R/L)	Yes
		LH	E41	5 (R/L)	



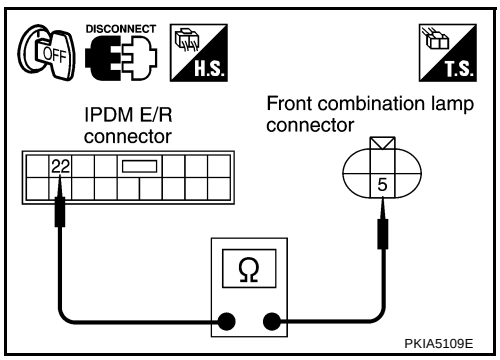
With xenon headlamp

Terminals					Continuity
IPDM E/R		Front combination lamp (side marker)			
Connector	Terminal (wire color)	Connector		Terminal (wire color)	
E7	22 (R/L)	RH	E24	5 (R/L)	Yes
		LH	E40	5 (R/L)	

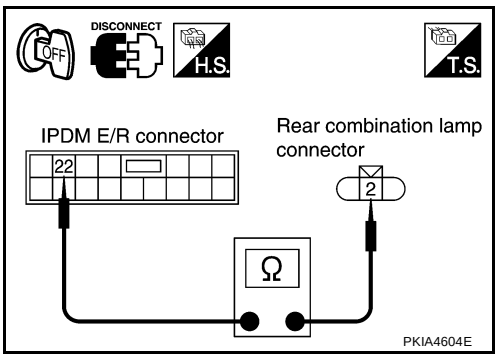


With halogen bulb headlamp

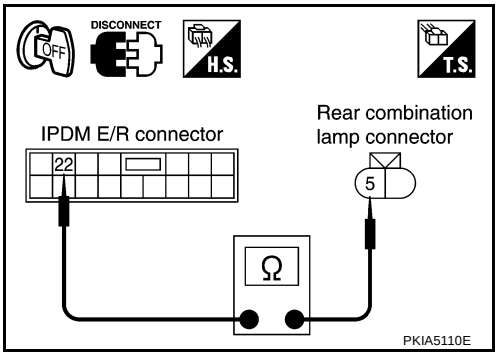
Terminals					Continuity
IPDM E/R		Front combination lamp (side marker)			
Connector	Terminal (wire color)	Connector		Terminal (wire color)	
E7	22 (R/L)	RH	E25	5 (R/L)	Yes
		LH	E41	5 (R/L)	



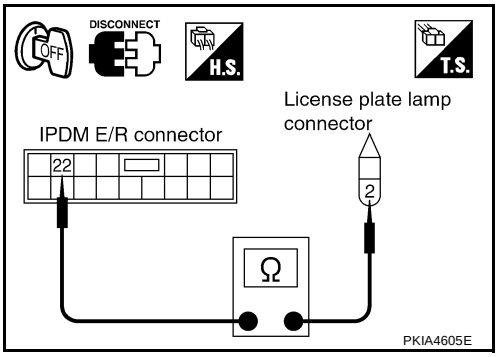
Terminals					Continuity
IPDM E/R		Rear combination lamp (Tail)			
Connector	Terminal (wire color)	Connector		Terminal (wire color)	
E7	22(R/L)	RH	T17	2 (R/L)	Yes
		LH	T9	2 (R/L)	



Terminals					Continuity
IPDM E/R		Rear combination lamp (side marker)			
Connector	Terminal (wire color)	Connector		Terminal (wire color)	
E7	22(R/L)	RH	T16	5 (R/L)	Yes
		LH	T8	5 (R/L)	



Terminals					Continuity
IPDM E/R		Licence plat lamp			
Connector	Terminal (wire color)	Connector		Terminal (wire color)	
E7	22 (R/L)	RH	T104	2 (R)	Yes
		LH	T102	2 (R)	



OK or NG

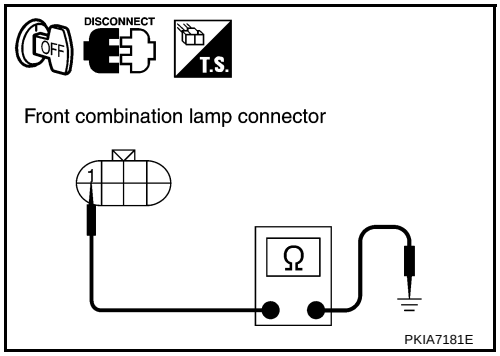
OK >> Replace IPDM E/R.
NG >> Repair harness or connector.

6. CHECK GROUND

1. Check harness continuity between front combination lamp, rear combination lamp and license plate lamp connectors and ground.

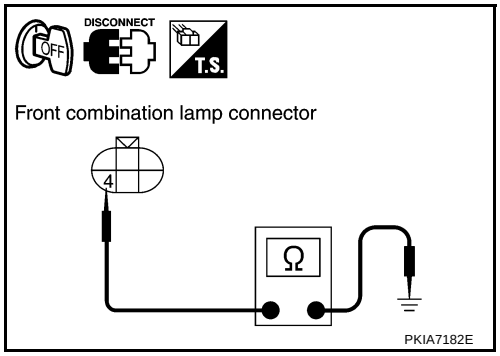
With xenon headlamp

Terminals				Continuity
Front combination lamp (Parking and side marker)			Ground	
Connector		Terminal (wire color)		
RH	E24	1 (B)		Yes
LH	E40			

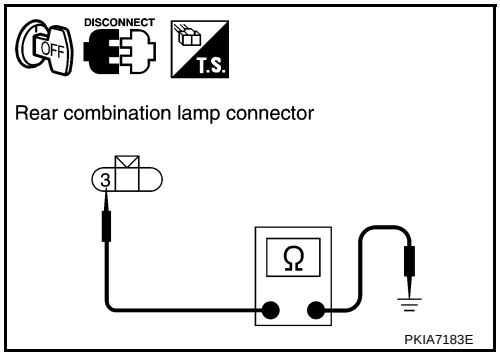


With halogen headlamp

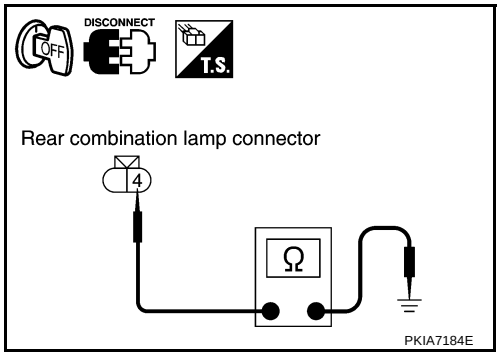
Terminals				Continuity
Front combination lamp (Parking and side marker)			Ground	
Connector		Terminal (wire color)		
RH	E25	4 (B)		Yes
LH	E41			



Terminals				Continuity
Rear combination lamp (Tail)			Ground	
Connector		Terminal (wire color)		
RH	T17	3 (B)		Yes
LH	T9			



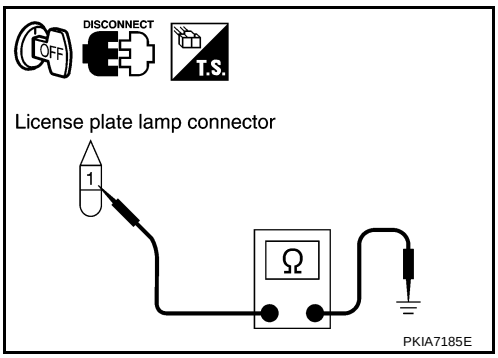
Terminals				Continuity
Rear combination lamp (Side marker)			Ground	
Connector		Terminal (wire color)		
RH	T16	4 (B)		Yes
LH	T8			



Terminals				Continuity
License plate lamp			Ground	
Connector		Terminal (wire color)		
RH	T104	1 (B)		Yes
LH	T102			

OK or NG

OK >> Check bulb.
NG >> Repair harness or connector.



Parking, License Plate and Tail Lamps Do Not Turn OFF (After Approx. 10 Minutes)

AKS00AP1

1. CHECK IPDM E/R

1. Turn ignition switch ON. Place combination switch (lighting switch) in the ON position. Turn ignition switch OFF.
2. Make sure parking, license plate, and tail lamps turn OFF after approximately 10 minutes.

OK or NG

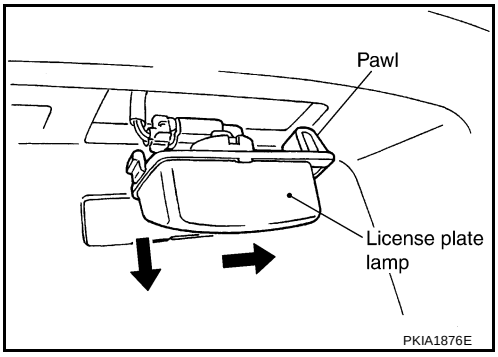
OK >> INSPECTION END.
NG >> Ignition relay malfunction. Refer to PG-19, "Function of Detecting Ignition Relay Malfunction" .

License Plate Lamp

AKS009S5

BULB REPLACEMENT, REMOVAL AND INSTALLATION

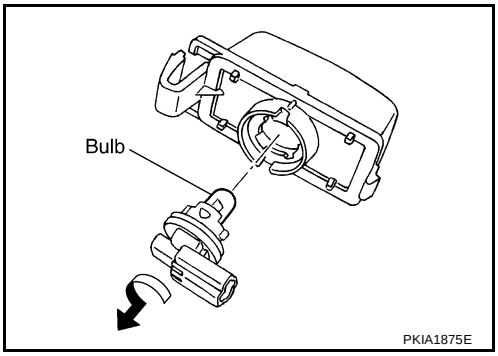
1. While pressing license plate lamp to right side, pull left side of it and remove.
2. Disconnect license plate lamp connector.



3. Turn bulb socket counterclockwise and unlock it.
4. Remove bulb from it's socket.

License plate lamp : 12V - 5W

5. Install in the reverse order of removal.



Front Parking (Clearance) Lamp

AKS009S6

BULB REPLACEMENT

For bulb replacement, refer to LT-34, "Bulb Replacement" in “HEAD LAMP (FOR USA)”.

REMOVAL AND INSTALLATION

For front parking (clearance) lamp removal and installation procedures, refer to LT-36, "Removal and Installation" in “HEAD LAMP (FOR USA)”.

Tail Lamp

AKS009S7

BULB REPLACEMENT

For bulb replacement, refer to LT-205, "Bulb Replacement" in “REAR COMBINATION LAMP”.

REMOVAL AND INSTALLATION

For tail lamp removal and installation procedures, refer to LT-206, "Removal and Installation" in “REAR COMBINATION LAMP”.

REAR COMBINATION LAMP

PFP:26554

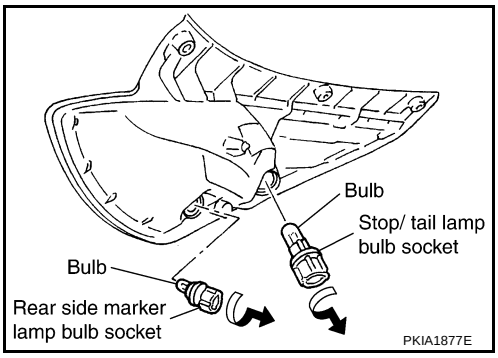
Bulb Replacement

AKS000VN

REAR FENDER SIDE (STOP & TAIL LAMP BULB, REAR SIDE MARKER LAMP BULB)

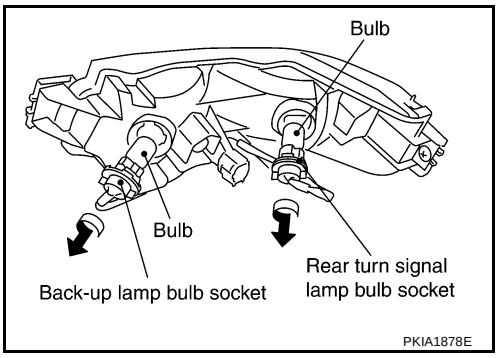
1. Remove rear combination lamp. Refer to LT-206, "Removal and Installation"
2. Turn bulb socket counterclockwise and unlock it.
3. Remove bulb.
4. Install in the reverse order of removal.

Stop/tail lamp (rear fender side)	**: 12V - 21/5W**
Rear side marker lamp (rear fender side)	**: 12V - 5W**



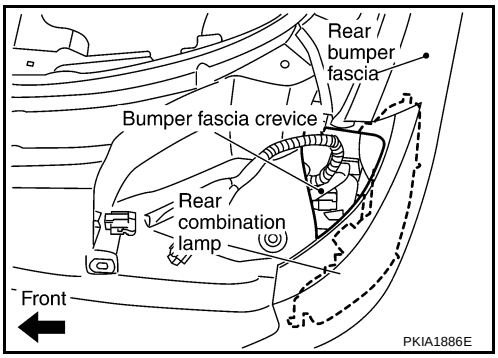
REAR BUMPER SIDE (BACK-UP LAMP BULB, REAR TURN SIGNAL LAMP BULB)

1. Remove rear combination lamp. Refer to LT-206, "Removal and Installation"
2. Turn bulb socket counterclockwise and unlock it through bumper fascia crevice.



3. Remove bulb.
4. Install in the reverse order of removal.

Rear turn signal lamp (rear bumper side)	**: 12V - 21W (umber bulb)**
Back-up lamp (rear bumper side)	**: 12V - 21W**



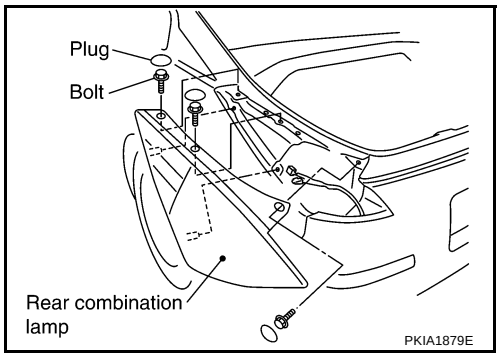
Removal and Installation

AKS000VO

REMOVAL

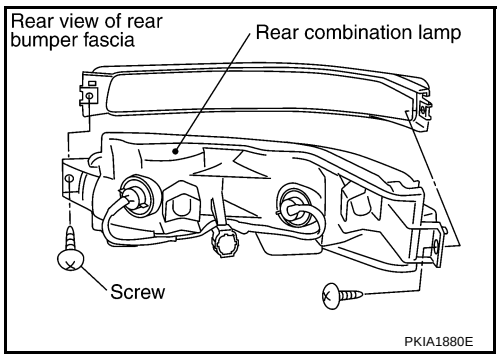
Rear Fender Side

1. Remove plugs and remove rear combination lamp mounting bolts.
2. Pull rear combination lamp toward side of the vehicle and remove from the vehicle.
3. Disconnect rear combination lamp connector.



Rear Bumper Side

1. Remove rear bumper fascia. Refer to EI-17, "REAR BUMPER" in “EI” section.
2. Disconnect rear combination lamp connector.
3. Remove rear combination lamp mounting screws.
4. Remove rear combination lamp from rear bumper fascia.



INSTALLATION

Install in the reverse order of removal. Be careful of the following:

Rear combination lamp mounting bolt: (Rear fender side)

: 5.2 N·m (0.53 kg-m, 45 in-lb)

Rear combination lamp mounting screw: (Rear bumper side)

: 3.1 N·m (0.32 kg-m, 27 in-lb)

VANITY MIRROR LAMP

PFP:96400

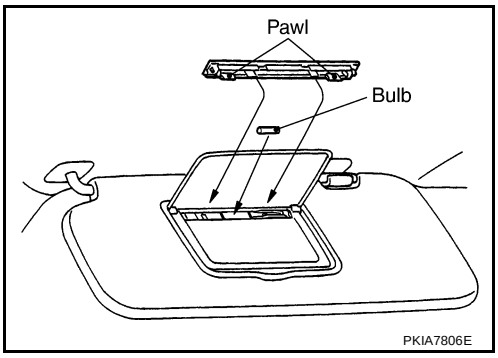
Bulb Replacement

AKS000VP

1. Insert a thin screwdriver in the lens end and remove lens.
2. Remove bulb.

Vanity mirror lamp : 12V - 1.32W

3. Install in the reverse order of removal.



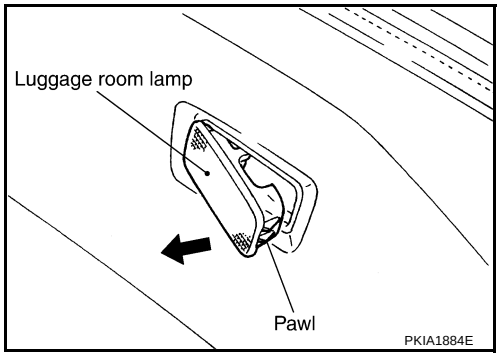
TRUNK ROOM LAMP

PFP:26470

Bulb Replacement, Removal and Installation of Luggage Room Lamp (Coupe Models)

AKS00ADR

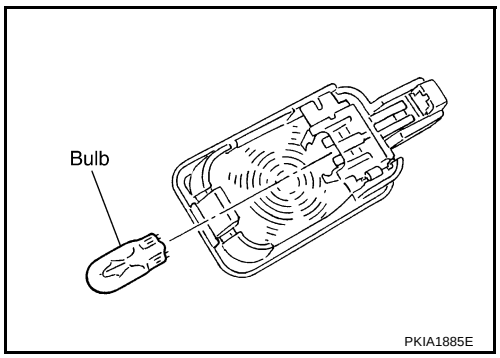
1. Pull out luggage room lamp in direction shown by the arrow in the figure.
2. Disconnect luggage room lamp connector.



3. Remove bulb.

Luggage room lamp : 12V - 5W

4. Install in the reverse order of removal.

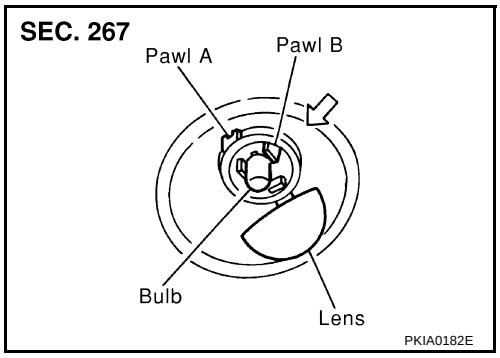


Bulb Replacement, Removal and Installation of Trunk Room Lamp (Roadster Models)

AKS00997

1. Unfold pawl A and remove lens.
2. Remove trunk room lamp while pressing pawl B in the direction of the arrow.
3. Disconnect trunk room lamp connector.

Trunk room lamp : 12V - 3.4W



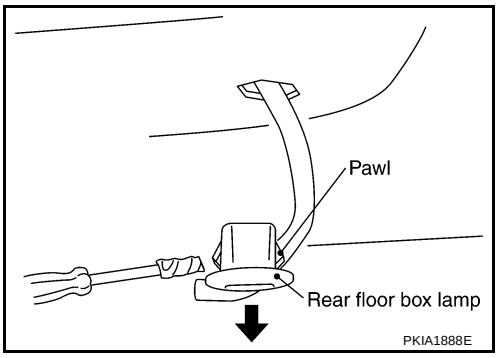
REAR FLOOR BOX LAMP

PFP:68520

Bulb Replacement, Removal and Installation

AKS003MW

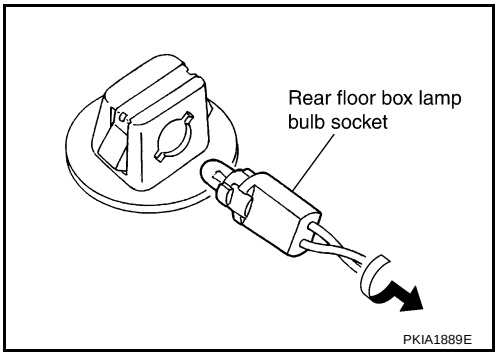
1. Pull out rear floor box lamp using screwdriver or similar tool.



2. Turn bulb socket counterclockwise to release lock and remove it.

Rear floor box lamp : 12V - 1.4W

3. Install in the reverse order of removal.



ASHTRAY ILLUMINATION

PFP:25860

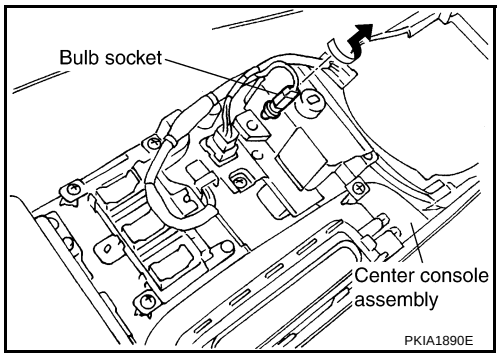
Bulb Replacement, Removal and Installation

AKS000VY

1. Remove center console assembly. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" in “IP” section.
2. Turn bulb socket counterclockwise to undo lock and remove bulb socket.

Ashtray illumination : 12V - 1.4W

3. Install in the reverse order of removal.

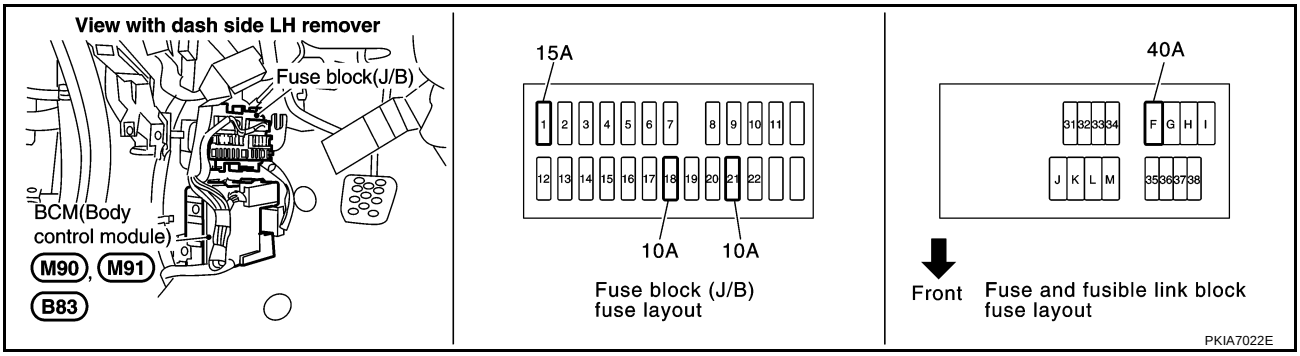


INTERIOR ROOM LAMP

PFP:26410

Component Parts and Harness Connector Location

AKS00ADS



System Description

AKS000W0

When map lamp switch is in DOOR position, map lamp ON/OFF is controlled by timer according to signals from switches including key switch, door switch driver side and assist side, unlock and lock signal from key fob, door lock and unlock switch, key cylinder lock and unlock switch, ignition switch.
When map lamp turns ON, there is a gradual brightening over 1 second. When map lamp turns OFF, there is a gradual dimming over 1 second.
map lamp timer is controlled by BCM (body control module).
Map lamp timer control settings can be changed with CONSULT-II.

POWER SUPPLY AND GROUND

Power is supplied at all times

- through 10A fuse [No.21, located in fuse block (J/B)]
- to key switch terminal 2
- through 10A fuse [No.18, located in fuse block (J/B)]
- to BCM (body control module) terminal 42
- through 40A fusible link [letter F, located in fuse and fusible link block]
- to BCM (body control module) terminal 55.

When key is removed from ignition key cylinder, power is interrupted

- through key switch terminal 1
- to BCM (body control module) terminal 37.

With ignition switch in ON or START position, power is supplied

- through 10A fuse [No.1, located in fuse block (J/B)]
- to BCM (body control module) terminal 38.

When room lamp and vanity mirror lamp power is supplied at times

- through BCM (body control module) terminal 41
- to map lamp terminal 3 (Coupe models)
- to map lamp terminal 2 (Roadster models)
- to luggage room lamp terminal 1 (Coupe models)
- to trunk room lamp terminal 1 (Roadster models)
- to vanity mirror lamp LH and RH terminal 1.

Ground is supplied

- to BCM (body control module) terminal 52
- through grounds M30 and M66.

When driver side door is opened, ground is supplied

- through case ground of driver side door switch
- to BCM (body control module) terminal 62.

When passenger side door is opened, ground is supplied

- through case ground of passenger side door switch

- to BCM (body control module) terminal 12.

When back door is opened, ground is supplied (Coupe models)

- through grounds B5, B6, D105 and T14
- to back door switch terminal 3
- from back door switch terminal 1
- to BCM (body control module) terminal 58.

When trunk hood is opened, ground is supplied (Roadster models)

- through grounds B5, B6 and T14
- to trunk room lamp switch terminal 2
- from trunk room lamp switch terminal 1
- to BCM (body control module) terminal 57.

When driver side door or passenger side door is unlocked by door lock and unlock switch, BCM (body control module) receives unlock signal with power window serial link

- through grounds M30 and M66
- to power window main switch (door lock and unlock switch) terminal 15 or power window sub switch (door lock and unlock switch) terminal 11
- from power window main switch (door lock and unlock switch) terminal 12 and power window sub switch (door lock and unlock switch) terminal 16
- to BCM (body control module) terminal 22.

When driver side door is unlocked by door key cylinder switch, BCM (body control module) receives information by communicating with power window main switch

- through grounds M30 and M66
- to door key cylinder switch terminal 2
- from door key cylinder switch terminal 1
- to power window main switch terminal 7
- from power window main switch (door lock and unlock switch) terminal 12
- to BCM (body control module) terminal 22.

When a signal, or combination of signals is received by BCM (body control module), ground is supplied

- through BCM (body control module) terminal 48
- to map lamp terminal 2 (Coupe models)
- to map lamp terminal 3 (Roadster models).

With power and ground are supplied, map lamp illuminates.

SWITCH OPERATION

When map lamp switch is ON, ground is supplied

- to map lamp terminal 1
- through grounds M30 and M66.

And power is supplied

- from BCM terminal 41
- to map lamp terminal 3 (Coupe models)
- to map lamp terminals 2 (Roadster models).

When vanity mirror lamp (LH and RH) is ON, ground is supplied

- to vanity mirror lamp terminal 2
- through grounds M30 and M66.

And power is supplied

- from BCM terminal 41
- to vanity mirror lamp terminal 1.

MAP LAMP TIMER OPERATION

When map lamp switch is in DOOR position, and when all conditions below are met, BCM performs timer control (maximum 30 seconds) for map lamp ON/OFF.

In addition, when map lamp turns ON or OFF there is gradual brightening or dimming over 1 second.
Power is supplied

- to 10A fuse [No. 21 (located in fuse block (J/B)]
- through key switch terminal 2.

When all doors are closed (all door switches OFF) and key is removed from key cylinder (key switch OFF), power will not be supplied to BCM terminal 37.
Ground is supplied

- from BCM terminal 22
- to power window main switch (door lock and unlock switch) terminal 12.

At this time, BCM detects that driver door is unlocked. It determines that map lamp timer operation conditions are met, and turns map lamp ON for 30 seconds.
When all doors are closed (all door switches OFF) and key is in key cylinder (key switch ON),
Power is supplied

- through key switch terminal 1
- to BCM terminal 37.

When key is removed from key switch (key switch OFF), power supply to BCM terminal 37 is terminated. BCM detects that key has been removed. It determines that map lamp timer conditions are met, and turns map lamp ON for 30 seconds.
When driver door opens → closes, and key is not inserted in key switch (key switch OFF), BCM terminal 62 changes between 0V (door open) → 5V (door closed). BCM determines that conditions for spot lamp operation are met and turns interior lamp ON for 30 seconds.
Timer control is canceled under the following conditions.

- Driver door is locked (When locked key fob or power window main switch (door lock and unlock switch, door key cylinder switch).
- Driver door is opened (driver door switch turns ON).
- Ignition switch ON.

INTERIOR LAMP BATTERY SAVER CONTROL

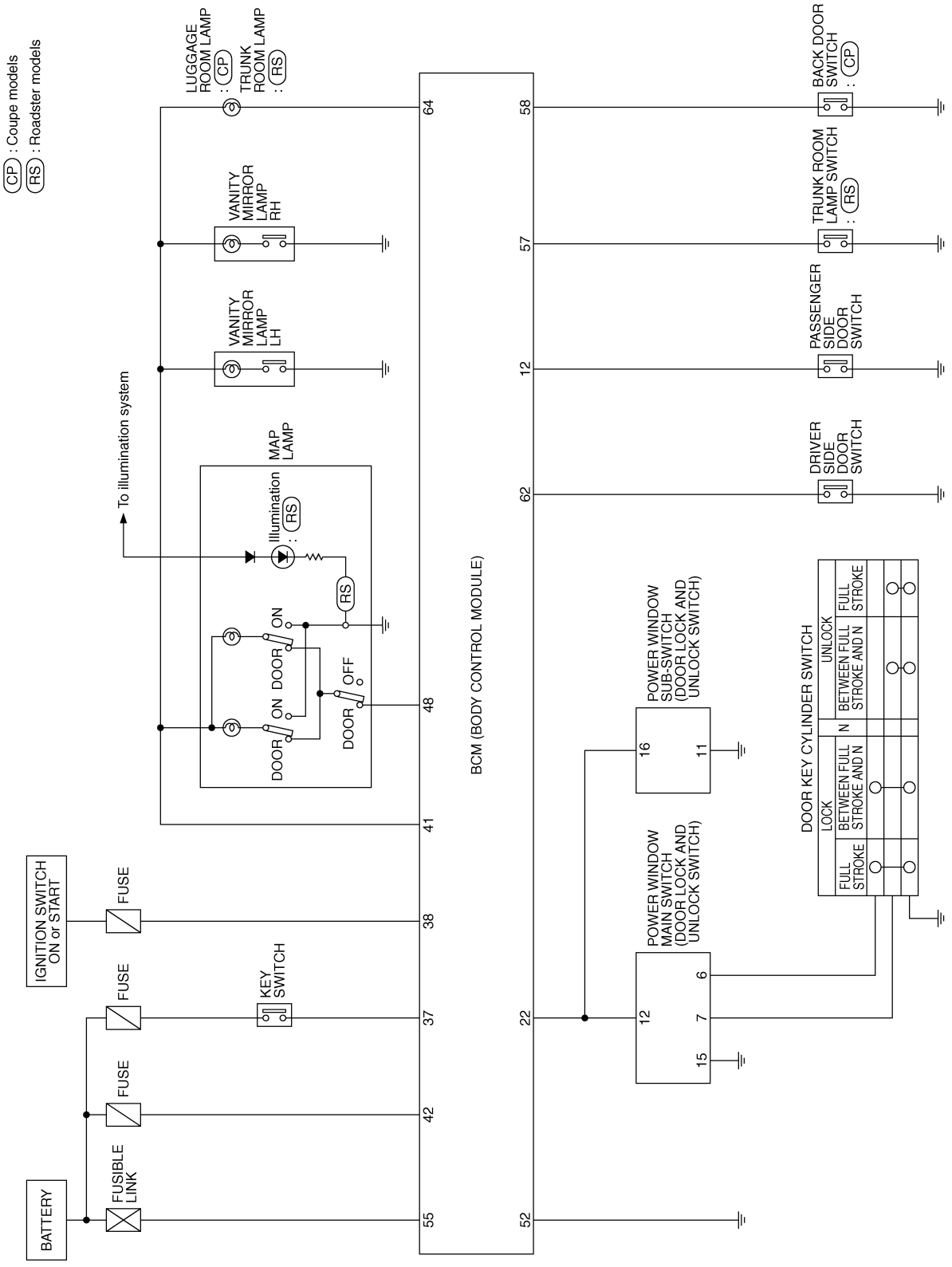
If room lamp remains illuminated by door switch open signal, or if room lamp switch is in ON position for more than 30 minutes after ignition switch is turned to OFF position, BCM will automatically turn off map lamp, step lamp, and/or personal lamp and vanity mirror lamp.
After lamps turn OFF by battery saver system, lamps illuminate again when

- signal from key fob, or door lock and unlock switch, or key cylinder is locked or unlocked,
- door is opened or closed,
- key is removed from ignition key cylinder or inserted in ignition key cylinder.

Interior lamp battery saver control period can be changed by the function setting of CONSULT-II.

Schematic

AKS000W2

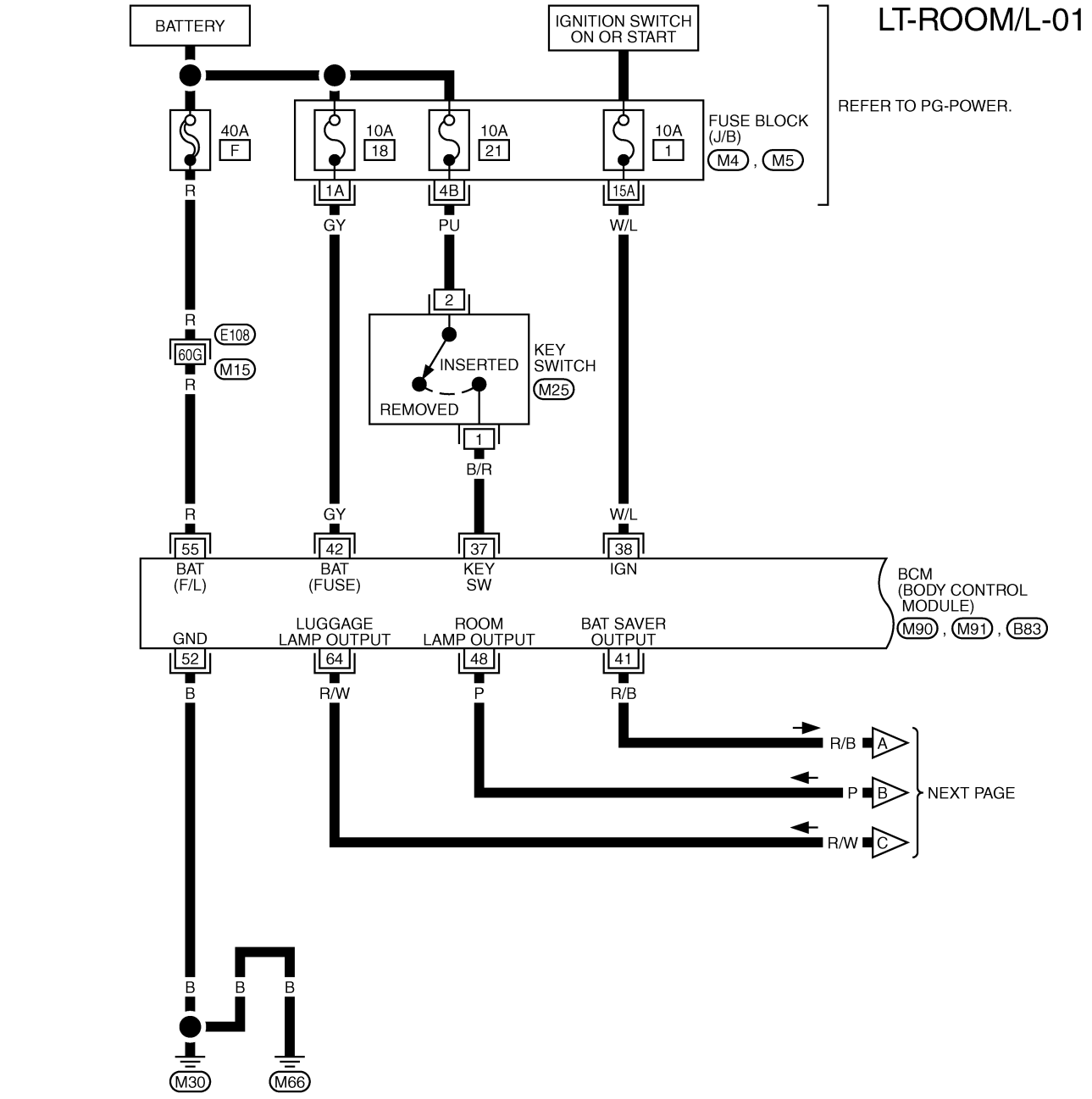


TKWT1816E

Wiring Diagram — ROOM/L —

AKS000W3

COUPE MODELS

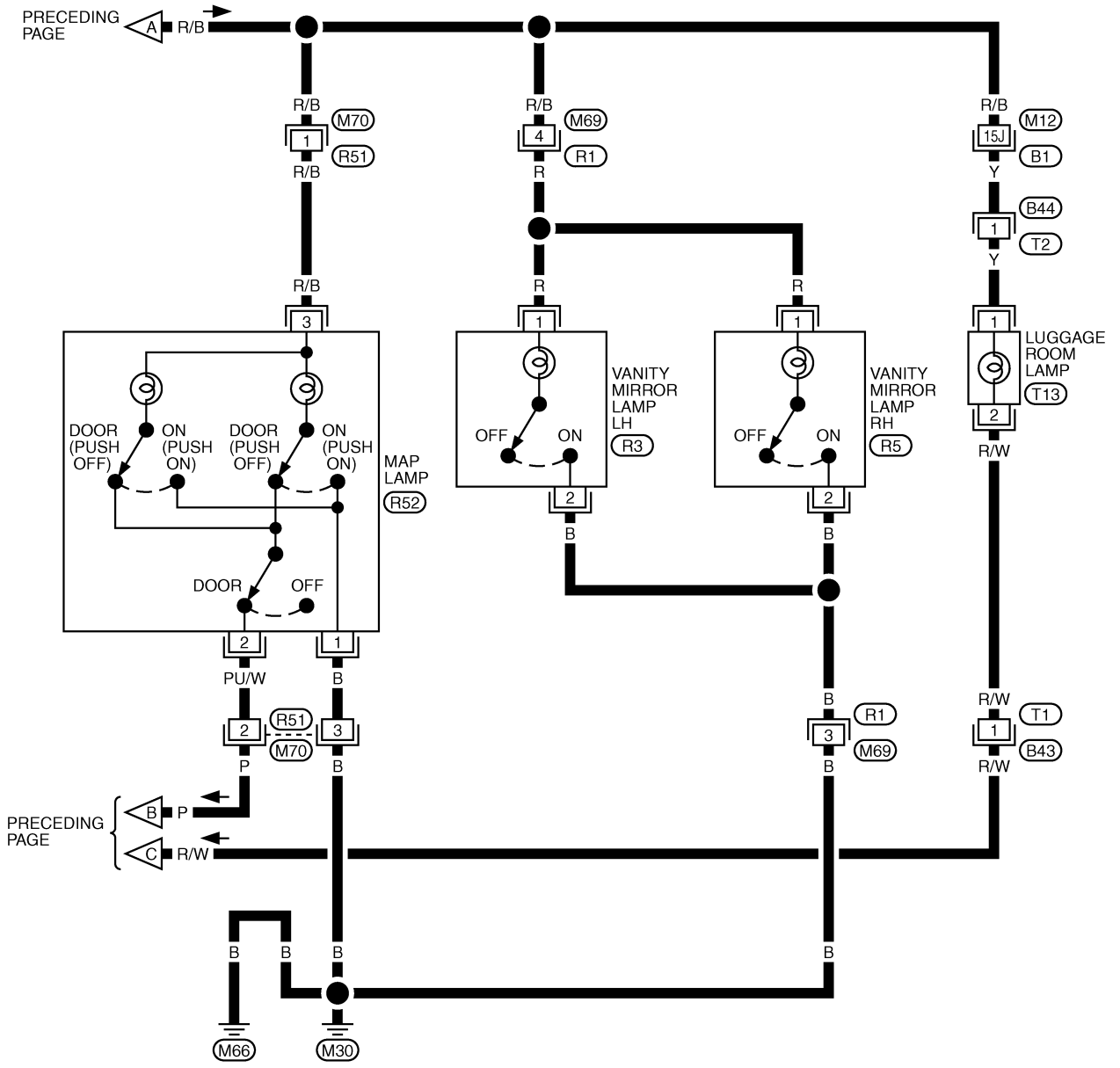


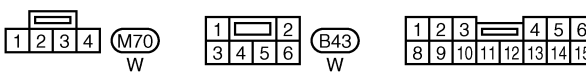
1 2 M25
BR

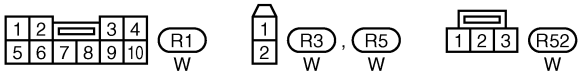
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)
M90 , M91 , B83 -ELECTRICAL UNITS

TKWT1817E

LT-ROOM/L-02





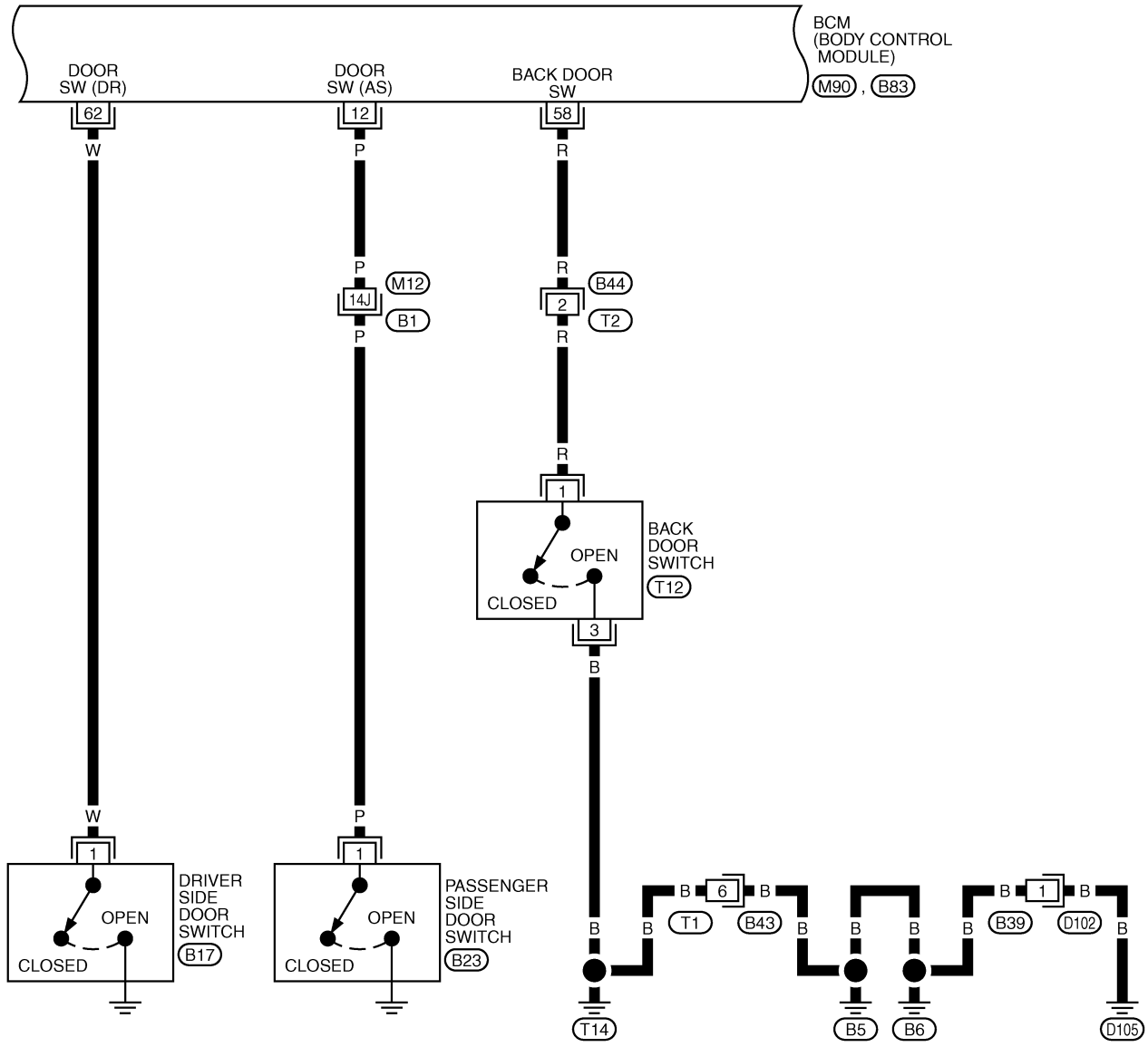


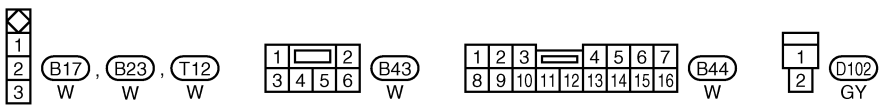
REFER TO THE FOLLOWING.

B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT1818E

LT-ROOM/L-03

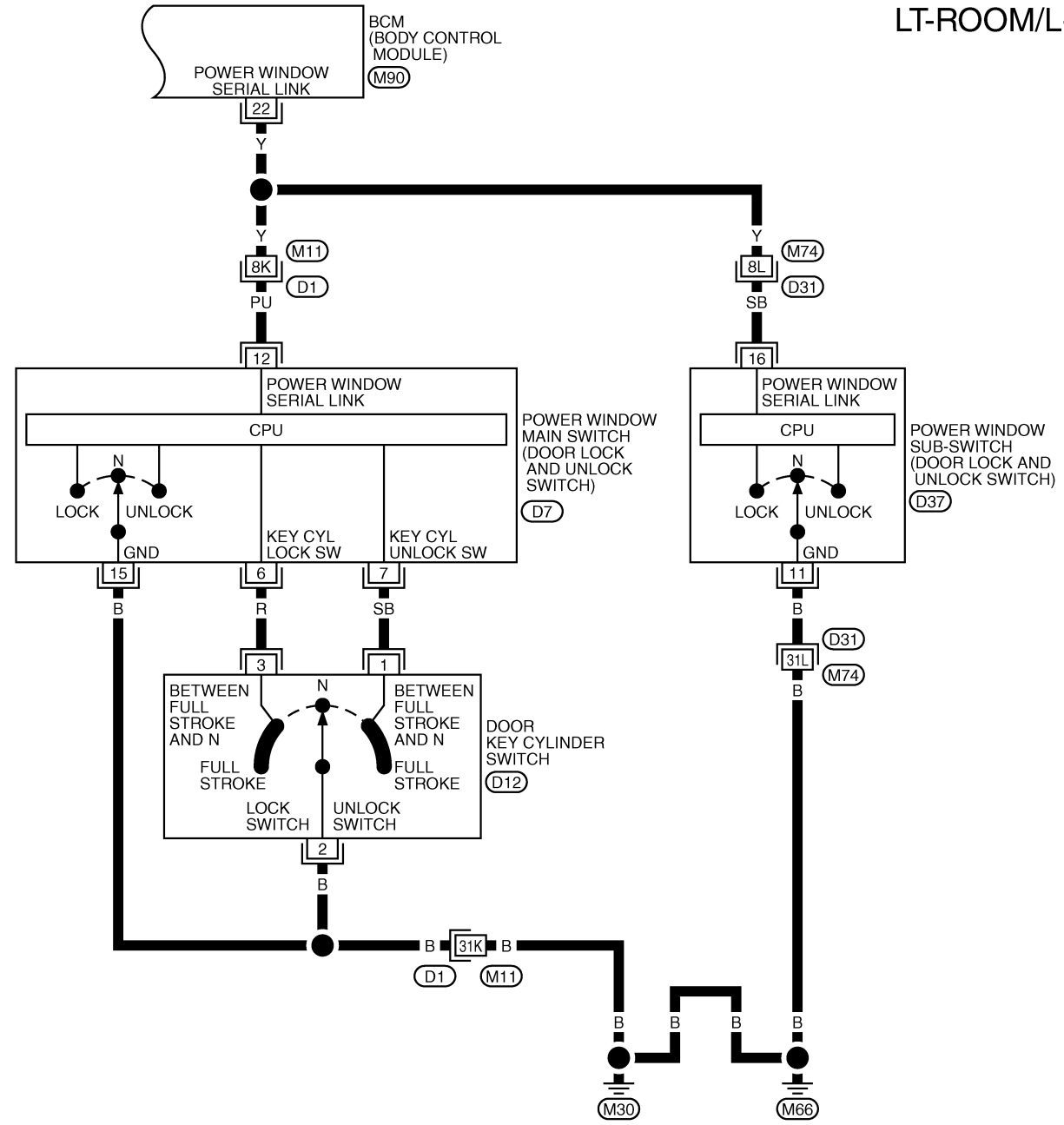


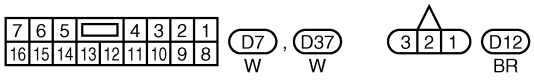


REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)
M90 , B83 -ELECTRICAL UNITS

TKWT1819E

LT-ROOM/L-04





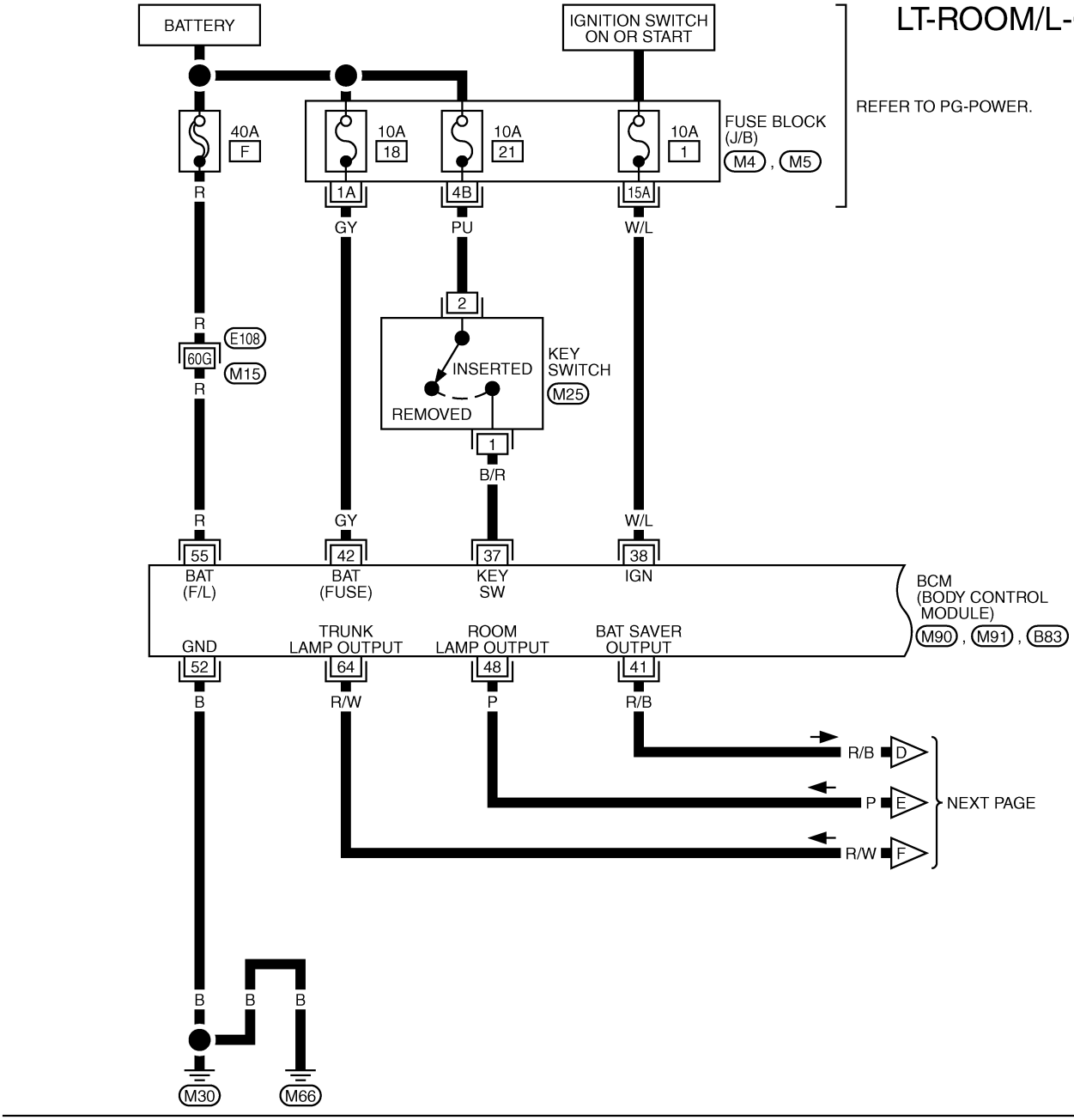
REFER TO THE FOLLOWING.

D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

M90 -ELECTRICAL UNITS

TKWT1820E

ROADSTER MODELS

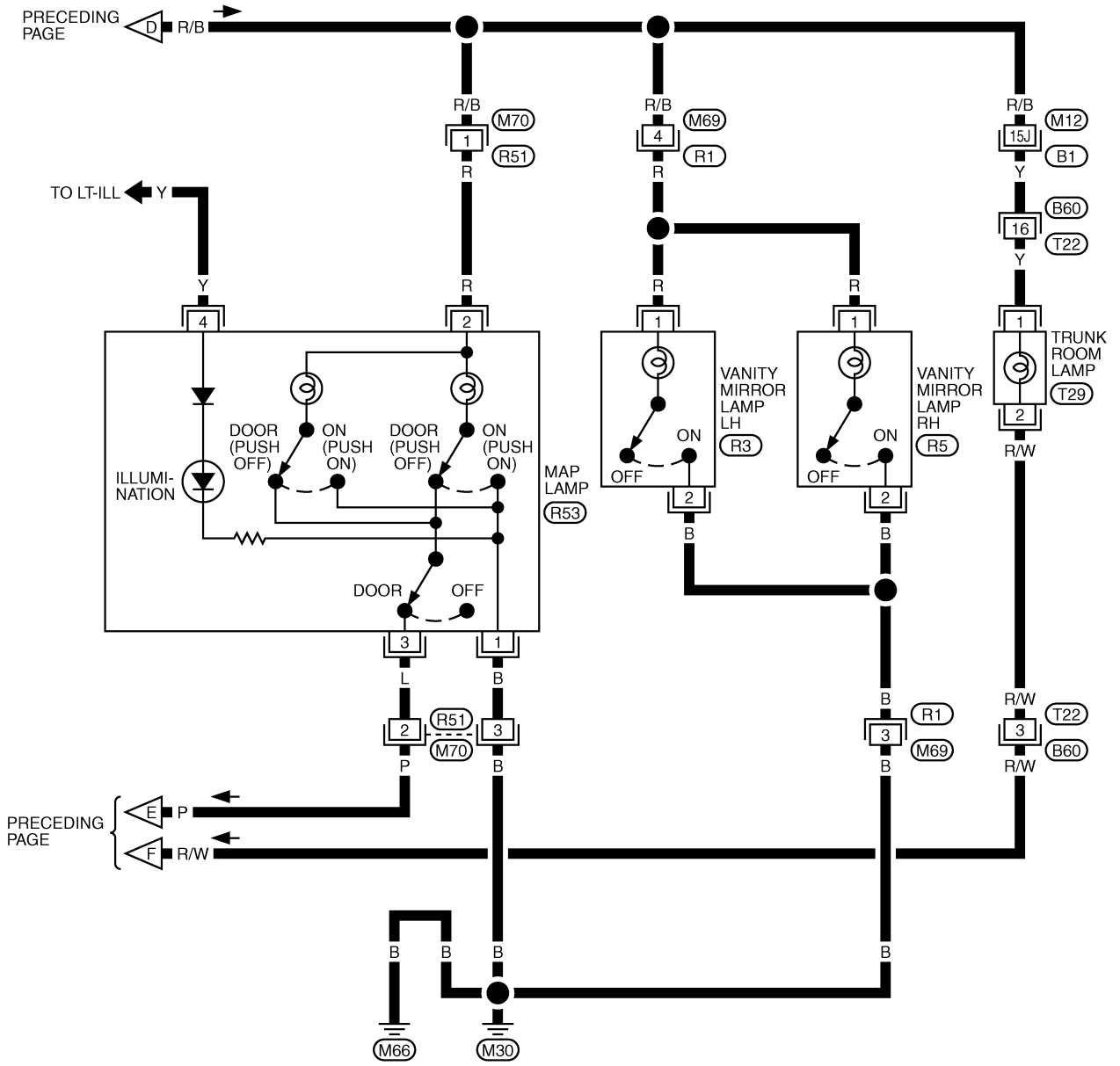


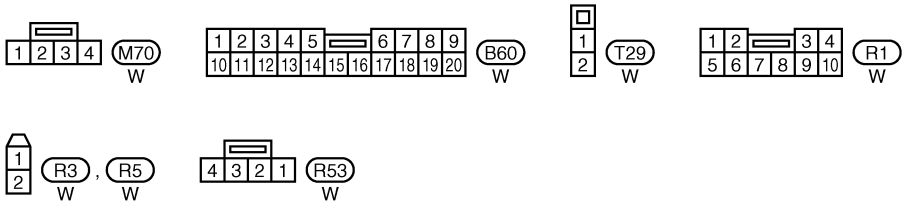
1 2 M25
BR

REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4, M5 -FUSE BLOCK-JUNCTION BOX (J/B)
M90, M91, B83 -ELECTRICAL UNITS

TKWT1821E

LT-ROOM/L-06



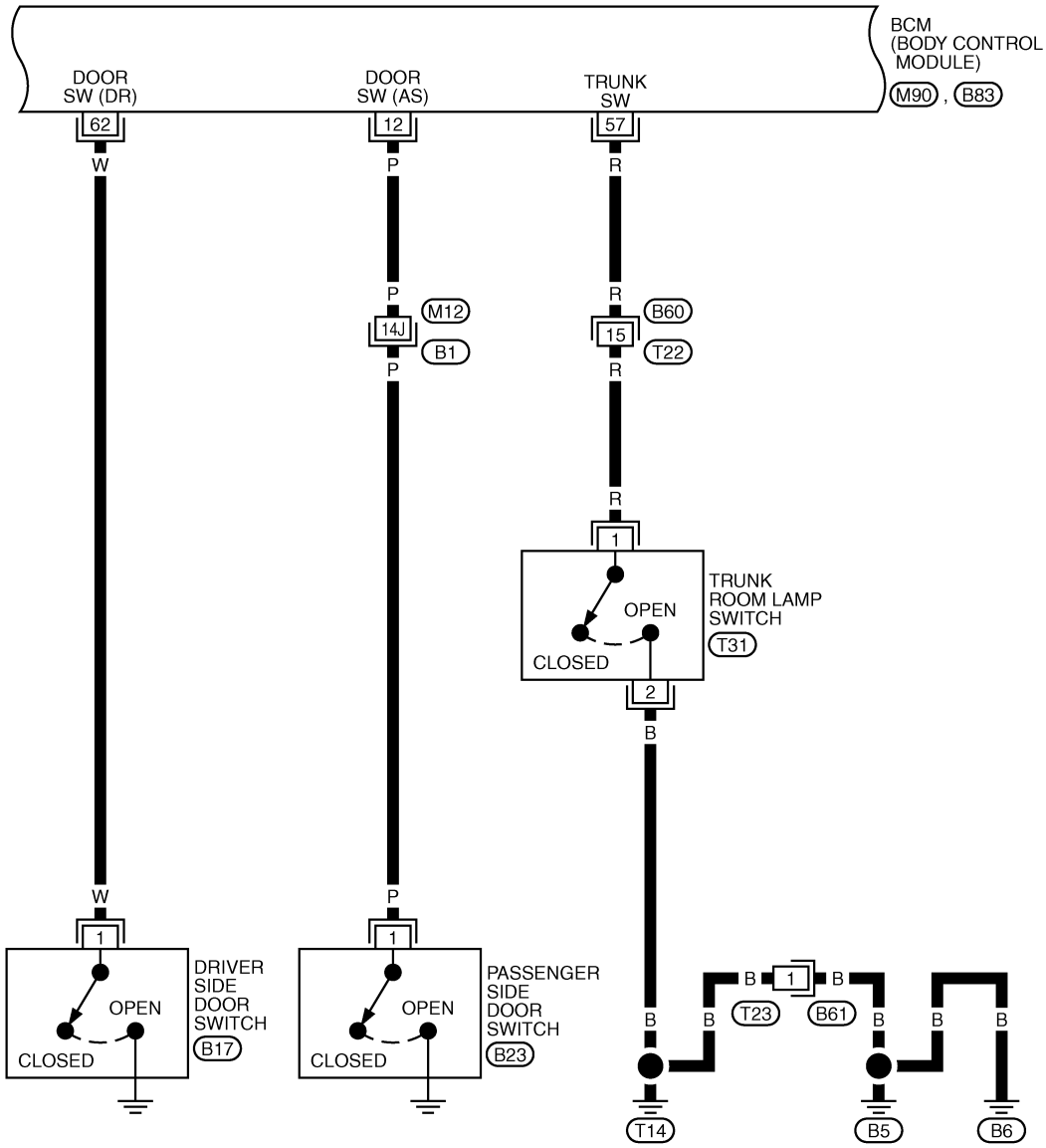


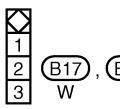
REFER TO THE FOLLOWING.

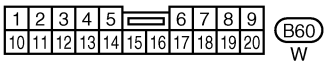
B1 -SUPER MULTIPLE JUNCTION (SMJ)

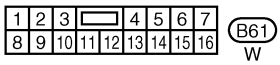
TKWT1822E

LT-ROOM/L-07









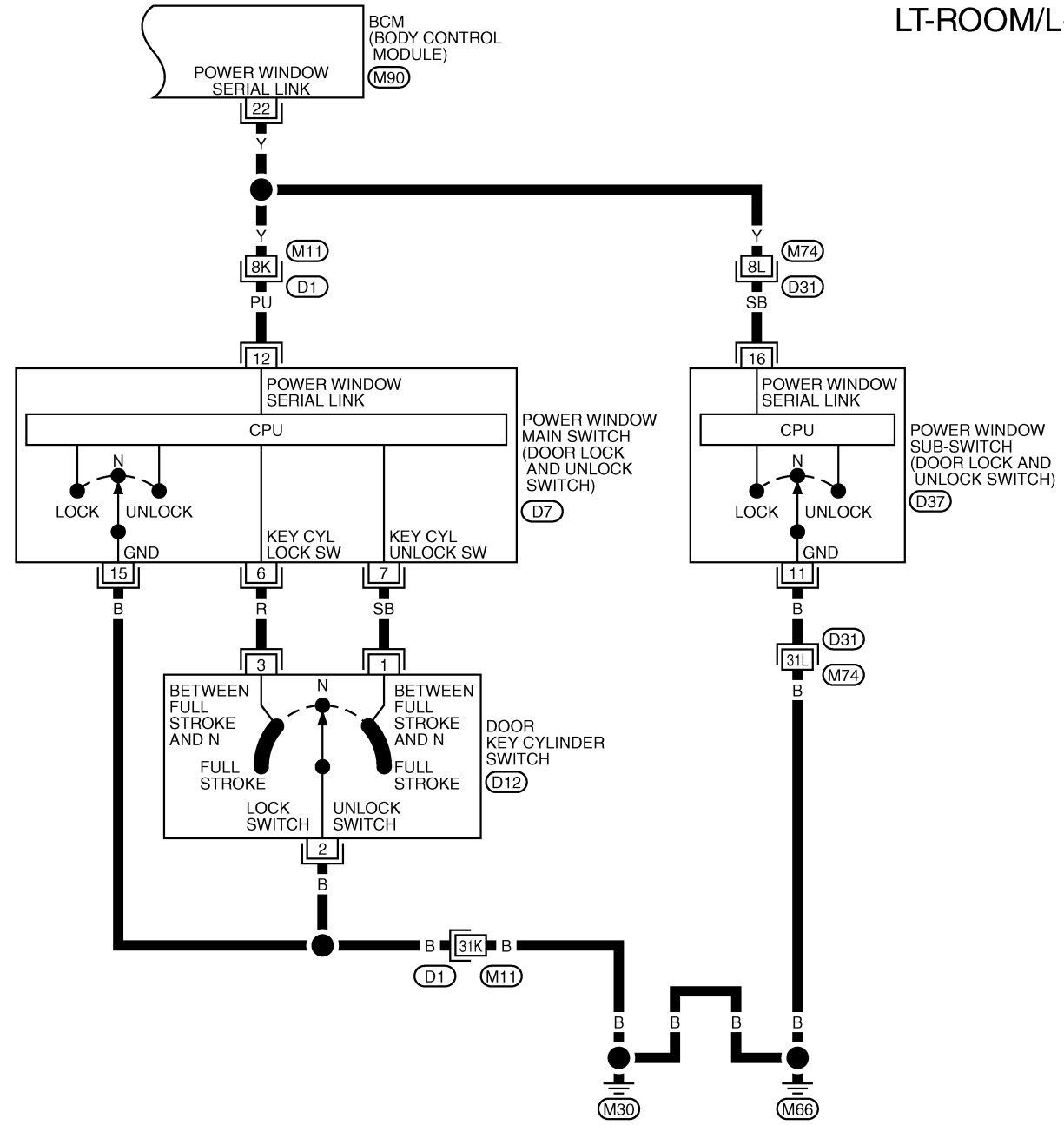
REFER TO THE FOLLOWING.

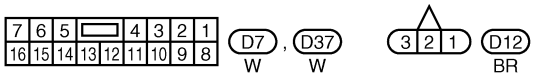
B1 -SUPER MULTIPLE JUNCTION (SMJ)

M90 , B83 -ELECTRICAL UNITS

TKWT1823E

LT-ROOM/L-08





REFER TO THE FOLLOWING.

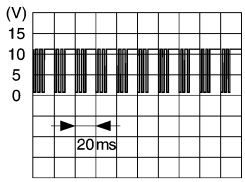
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

M90 -ELECTRICAL UNITS

TKWT1824E

Terminals and Reference Values for BCM

AKS00APE

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
12	P	Front door switch AS signal	OFF	Front door switch AS	ON (open)	Approx. 0V
					OFF (closed)	Battery voltage
22	Y	Power window switch serial link	ON	—		 PKIA7023E
37	B/R	Key-in detection switch signal	OFF	Vehicle key is removed.		Approx. 0V
				Vehicle key is inserted.		Battery voltage
38	W/L	Ignition power supply	ON	—		Battery voltage
41	R/B	Battery saver output signal	OFF	30 minutes after ignition switch is turned to OFF.		Approx. 0V
			ON	—		Battery voltage
42	GY	Battery power supply	OFF	—		Battery voltage
48	P	Interior room lamp, map lamp and front door inside handle illumination output signal	OFF	Interior door switch: DOOR position	Any door switch: ON (open)	Approx. 0V
					Any door switch: OFF (closed)	Battery voltage
52	B	Ground	ON	—		Approx. 0V
55	R	Battery power supply	OFF	—		Battery voltage
57*1	R	Trunk room lamp switch signal	OFF	Trunk room lamp switch	ON (open)	Approx. 0V
					OFF (closed)	Battery voltage
58*2	R	Back door switch signal	OFF	Luggage room lamp switch	ON (open)	Approx. 0V
					OFF (closed)	Battery voltage
62	W	Front door switch DR signal	OFF	Front door switch DR	ON (open)	Approx. 0V
					OFF (closed)	Battery voltage
64	R/W	Trunk room lamp*1 or back door*2 switch signal	OFF	Trunk room lamp*1 or back door*2 switch	ON (open)	Approx. 0V
					OFF (closed)	Battery voltage

*1: Roadster models, *2: Coupe models

How to Proceed with Trouble Diagnosis

AKS000W5

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-211, "System Description" .
3. Perform preliminary check. Refer to LT-224, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Does interior room lamp operate normally? If YES: GO TO 6. If NO: GO TO 4.
6. INSPECTION END

Preliminary Check

AKS000W6

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES

- Check for blown BCM fuses.

Unit	Power source	Fuse and fusible link No.
BCM	Battery	F
		18
		21
	Ignition switch ON or START position	1

Refer to LT-215, "Wiring Diagram — ROOM/L —" .

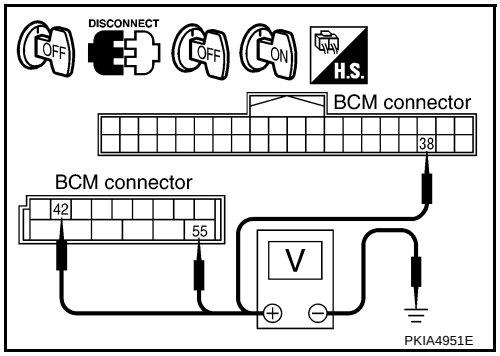
OK or NG

OK >> GO TO 2.

NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM connector and ground.



Terminals			Ignition switch position	
(+)		(-)	OFF	ON
Connector	Terminal (Wire color)			
M91	42 (GY)	Ground	Battery voltage	Battery voltage
	55 (R)		Battery voltage	Battery voltage
M90	38 (W/L)		0V	Battery voltage

OK or NG

OK >> GO TO 3.

NG >> Check harness for open or short between BCM and fuse.

3. CHECK GROUND CIRCUIT

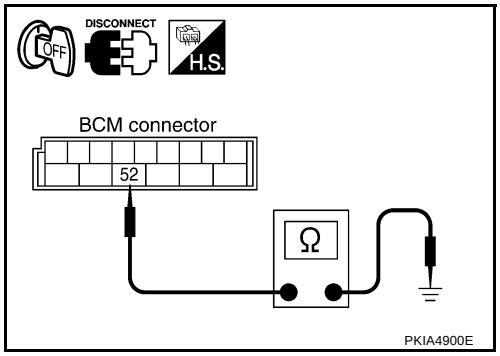
Check continuity between BCM and ground.

Terminals			Continuity
Connector	Terminal (Wire color)	Ground	
M91	52 (B)		Yes

OK or NG

OK >> INSPECTION END

NG >> Check harness ground circuit.



CONSULT-II Functions

AKS00APF

CONSULT-II has a display function for work support, self-diagnosis, data monitor, and active test for each part by combining data receiving and sending via communication line from BCM.

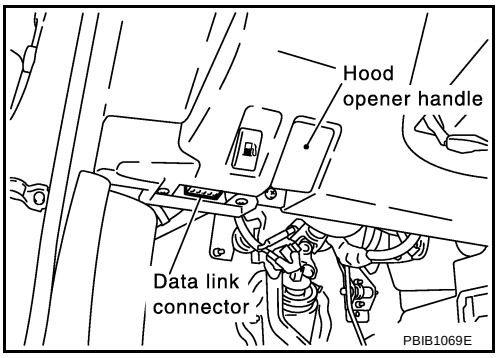
BCM diagnosis part	Check item, diagnosis mode	Description
INTERIOR LAMP	WORK SUPPORT	Changes the setting for each function.
	DATA MONITOR	Displays BCM input data in real time.
	ACTIVE TEST	Operation of electrical loads can be checked by sending driving signal to them.

CONSULT-II BASIC OPERATION

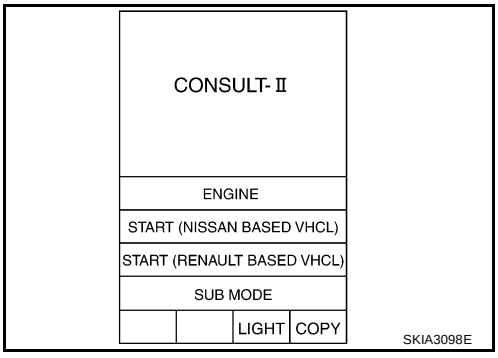
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

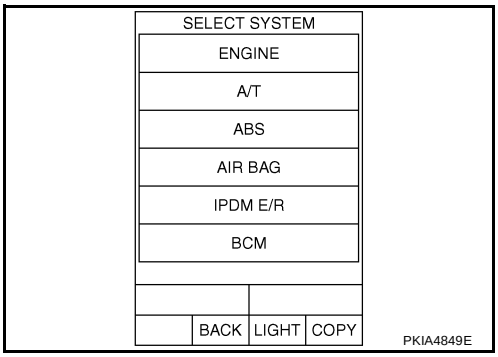
1. With ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to data link connector, then turn ignition switch ON.



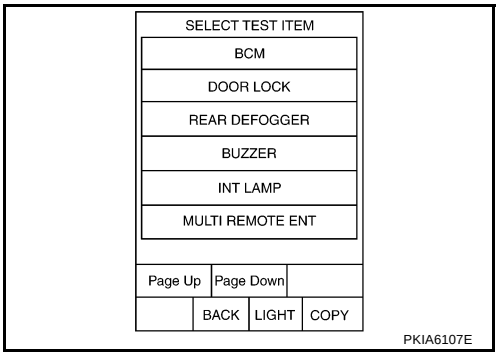
2. Touch “START (NISSAN BASED VHCL)”.



3. Touch “BCM” on “SELECT SYSTEM” screen.
If “BCM” is not indicated, refer to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



4. Touch “INT LAMP” on “SELECT TEST ITEM” screen.



WORK SUPPORT

Operation Procedure

1. Touch “INT LAMP” on “SELECT TEST ITEM” screen.
2. Touch “WORK SUPPORT” on “SELECT DIAG MODE” screen.
3. Touch “SET I/L D– UNLCK INTCON” on “SELECT WORK ITEM” screen.
4. Touch “START”.
5. Touch “CHANGE SETT”.
6. The setting will be changed and “CUSTOMIZING COMPLETED ” will be displayed.
7. Touch “END”.

Display Item List

Item	Description	CONSULT-II
SET I/L D–UNLCK INTCON	The 30 seconds glowing function interior room lamps and ignition keyhole illumination can be selected when driver door is released (unlocked).	ON/OFF
ROOM LAMP ON TIME SET	The time in order to escalate illumination can be adjusted when interior room lamps and ignition keyhole illumination is turned on.	MODE 1 – 7
ROOM LAMP OFF TIME SET	The time in order to diminish illumination can be adjusted when interior room lamps and ignition keyhole illumination is turned off.	MODE 1 – 7

Reference between “MODE” and “TIME” for “TURN ON/OFF”

MODE	1	2	3	4	5	6	7
Time (sec.)	0.5	1	2	3	4	5	0

DATA MONITOR

Operation Procedure

1. Touch “INT LAMP” on “SELECT TEST ITEM” screen.
2. Touch “DATA MONITOR” on “SELECT DIAG MODE” screen.
3. Touch either “ALL SIGNALS” or “SELECTION FROM MENU” on “DATA MONITOR” screen.

All signals	Monitors all the signals.
Selection from menu	Selects and monitors the individual signal.

4. Touch “START”.
5. When “SELECTION FROM MENU” is selected, touch items to be monitored. When “ALL SIGNALS” is selected, all the items will be monitored.
6. Touch “RECORD” while monitoring, then the status of the monitored item can be recorded. To stop recording, touch “STOP”.

Display Item List

Monitor item		Contents
IGN ON SW	“ON/OFF”	Displays “IGN position (ON)/OFF, ACC position (OFF)” judged from ignition switch signal.
KEY ON SW	“ON/OFF”	Displays “Key inserted (ON)/key removed (OFF)” status judged from key switch signal.

Monitor item		Contents
DOOR SW - DR	“ON/OFF”	Displays status of driver door as judged from driver door switch signal. (Door is open: ON/Door is closed: OFF)
DOOR SW - AS	“ON/OFF”	Displays “Door open (ON)/Door closed (OFF)” status, determined from passenger door switch signal.
DOOR SW - RR[NOTE]	“OFF”	—
DOOR SW - RL[NOTE]	“OFF”	—
BACK DOOR SW	“ON/OFF”	● Displays status of back door as judged from back door switch signal. (Coupe models) ● Displays status of rear trunk hood as judged from trunk lamp switch signal. (Roadster models)
KEY CYL LK - SW	“ON/OFF”	Displays “Door locked (ON) status, determined from key cylinder lock switch in driver door.
KEY CYL UN - SW	“ON/OFF”	Displays “Door unlocked (OFF) status, determined from key cylinder lock switch in driver door.
CDL LOCK SW	“ON/OFF”	Displays “Door locked (ON)/Door unlocked (OFF) status, determined from locking detection switch in driver door.
CDL UNLOCK SW	“ON/OFF”	Displays “Door unlocked (OFF)” status, determined from locking detection switch in passenger door.
KEYLESS LOCK	“ON/OFF”	Displays “Locked (ON)/Other (OFF)” status, determined from lock signal.
KEYLESS UNLOCK	“ON/OFF”	Displays “Unlocked (ON)/Other (OFF)” status, determined from unlock signal.

NOTE:
This item is displayed, but cannot monitor it.

ACTIVE TEST

Operation Procedure

1. Touch “INT LAMP” on “SELECT TEST ITEM” screen.
2. Touch “ACTIVE TEST” on “SELECT DIAG MODE” screen.
3. Touch item to be tested and check operation of the selected item.
4. During the operation check, touching “BACK” deactivates the operation.

Display Item List

Test item	Description
INT LAMP	Map lamp can be operated by any ON-OFF operations.
IGN ILLUM[NOTE]	—
STEM LAMP TEST [NOTE]	—
LUGGAGE LAMP TEST	● Luggage room lamp can be operated by any ON-OFF operations. (Coupe models) ● Trunk room lamp can be operated by any ON-OFF operations. (Roadster models)

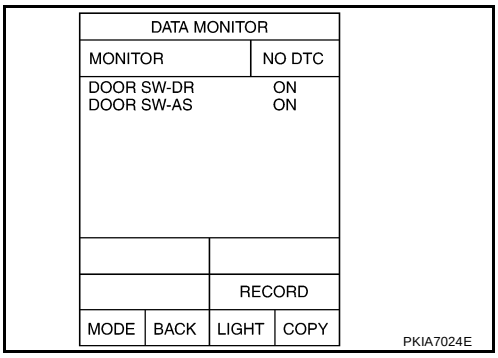
NOTE:
This item is displayed, but cannot monitor it.

Map Lamp Control Does Not Operate (Coupe models)

AKS009SI

1. CHECK BETWEEN EACH SWITCH AND BCM

Select BCM on CONSULT-II. Use “INT LAMP” data monitor to make sure switches listed in display item list turn ON-OFF linked with switch operation. Refer to LT-226, "Display Item List" for switches and their functions.



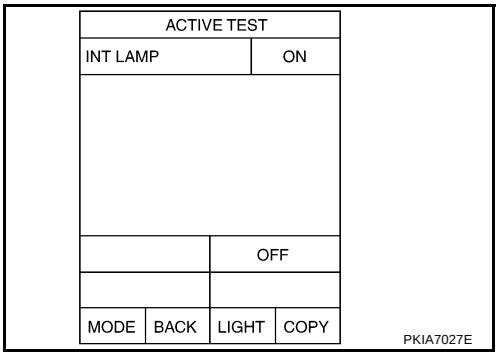
OK or NG

OK >> GO TO 2.
NG >> Inspect malfunctioning switch system.

2. CHECK BETWEEN BCM AND MAP LAMP

1. Select “BCM” on CONSULT-II. Select “INT LAMP” active test.
2. When map lamp switch is in DOOR position, use active test to make sure room lamp operates.

Map lamp should operate.



OK or NG

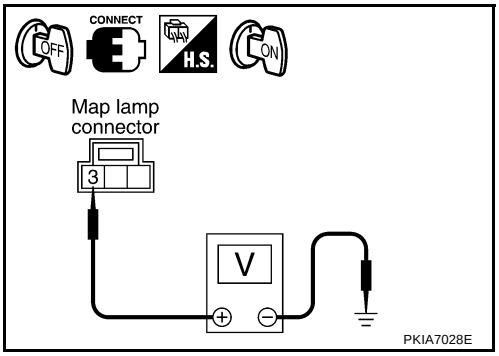
OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> GO TO 3.

3. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between map lamp harness connector R52 terminal 3 (R/B) and ground.

3 (R/B) – Ground : Battery voltage should exist.



OK or NG

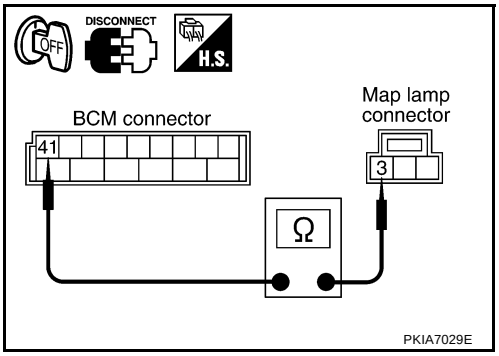
OK >> GO TO 6.

NG >> GO TO 4

4. CHECK MAP LAMP CIRCUIT

1. Disconnect BCM connector and map lamp connector.
2. Check continuity between BCM harness connector M91 terminal 41 (R/B) and map lamp harness connector R52 terminal 3 (R/B).

41 (R/B) – 3 (R/B) : Continuity should exist.



OK or NO

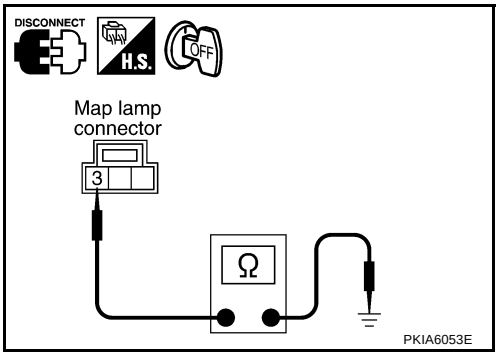
OK >> GO TO 5.

NG >> Repair harness or connector.

5. CHECK SHORT CIRCUIT

Check continuity between map lamp harness connector R52 terminal 3 (R/B) and ground.

3 (R/B) – Ground : Continuity should not exist.



OK or NG

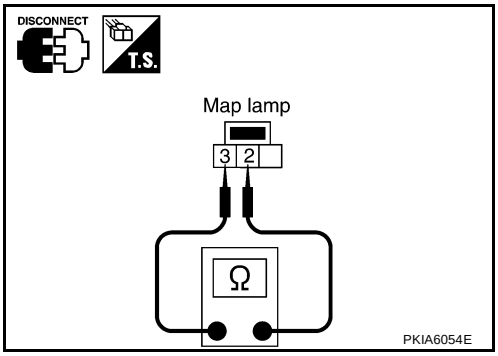
OK >> Replace BCM if map lamp does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> After repairing harness, be sure to disconnect battery negative cable, and then reconnect it.

6. CHECK MAP LAMP

1. Disconnect map lamp connector.
2. Check continuity between map lamp.

Terminal		Condition	Continuity
Map lamp			
3	2	Map lamp switch is DOOR.	Yes
		Map lamp switch is OFF.	No



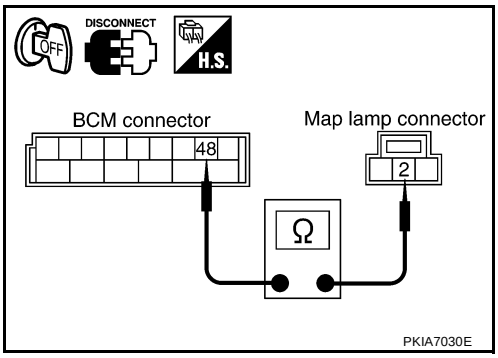
OK or NG

OK >> GO TO 7.
NG >> Replace map lamp

7. CHECK MAP LAMP CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M91 terminal 48 (P) and map lamp harness connector R52 terminal 2 (PU/W).

48 (P) – 2 (PU/W) : Continuity should exist.



OK or NO

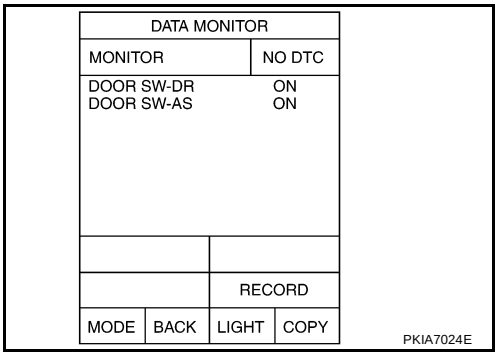
OK >> Replace BCM if map lamp does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Repair harness or connector.

Map Lamp Control Does Not Operate (Roadster models)

AKS009SJ

1. CHECK BETWEEN EACH SWITCH AND BCM

Select BCM on CONSULT-II. Use “INT LAMP” data monitor to check that switches listed in display item list turn ON-OFF linked with switch operation. Refer to LT-226, "Display Item List" for switches and their functions.



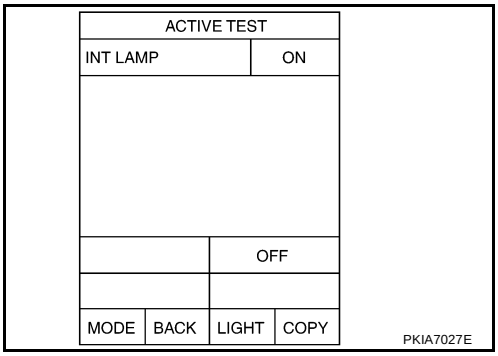
OK or NG

OK >> GO TO 2.
NG >> Inspect malfunctioning switch system.

2. CHECK BETWEEN BCM AND MAP LAMP

1. Select “BCM” on CONSULT-II. Select “INT LAMP” active test.
2. When map lamp switch is in DOOR position, use active test to make sure map lamp operates.

Map lamp should operate.



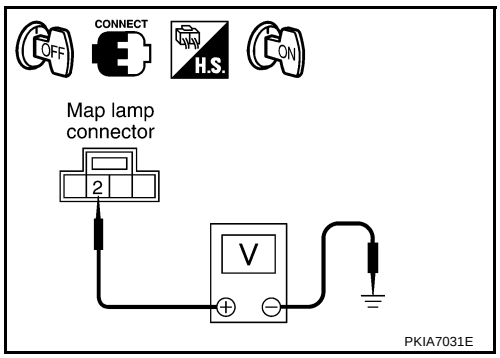
OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> GO TO 3.

3. CHECK BETWEEN BCM AND MAP LAMP

1. Turn ignition switch ON.
2. Check voltage between map lamp harness connector R53 terminal 2 (R) and ground.

2 (R) – Ground : Battery voltage should exist.



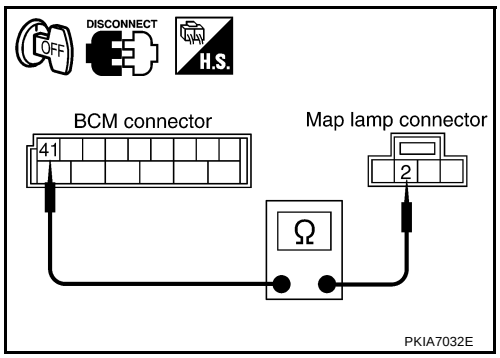
OK or NG

OK >> GO TO 6.
NG >> GO TO 4.

4. CHECK POWER SUPPLY CIRCUIT

1. Disconnect BCM connector and map lamp connector.
2. Check continuity between BCM harness connector M91 terminal 41 (R/B) and map lamp harness connector R53 terminal 2 (R).

41 (R/B) – 2 (R) : Continuity should exist.



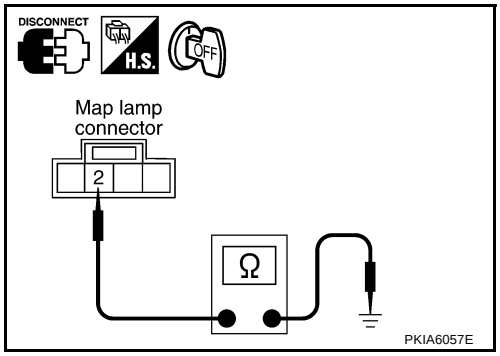
OK or NO

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK SHORT CIRCUIT

Check continuity between map lamp harness connector R53 terminal 2 (R) and ground.

2 (R) – Ground : Continuity should not exist.



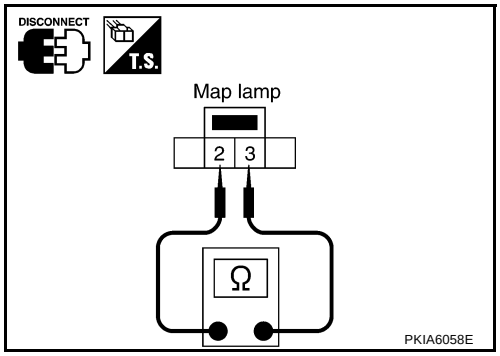
OK or NG

OK >> Replace BCM if map lamp does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> After repairing harness, be sure to disconnect battery negative cable, and then reconnect it.

6. CHECK MAP LAMP

1. Disconnect map lamp connector.
2. Check continuity between map lamp.

Terminal		Condition	Continuity
Map lamp			
2	3	Map lamp switch is DOOR.	Yes
		Map lamp switch is OFF.	No



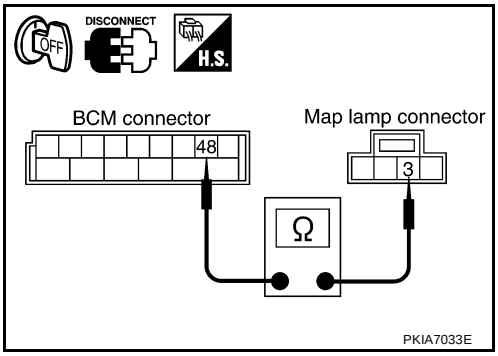
OK or NG

OK >> GO TO 7.
NG >> Replace map lamp

7. CHECK MAP LAMP CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M91 terminal 48 (P) and map lamp harness connector R53 terminal 3 (L).

48 (P) – 3 (L) : Continuity should exist.



OK or NO

OK >> Replace BCM if map lamp does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> Repair harness or connector.

Luggage Room Lamp Does Not Illuminate (Coupe Models)

AKS00AT6

1. CHECK BULB

Inspect bulb of luggage room lamp.

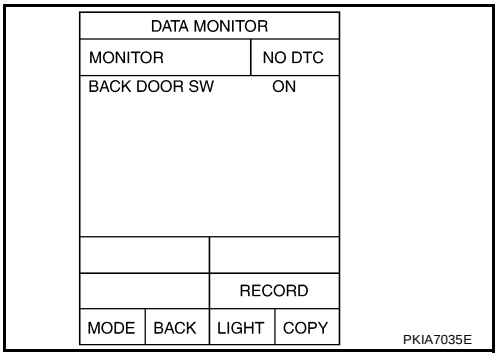
OK or NG

OK >> GO TO 2.

NG >> Replace bulb of luggage room lamp.

2. CHECK BETWEEN BACK DOOR SWITCH AND BCM

Select BCM on CONSULT-II. Use “INT LAMP” data monitor to make sure switches listed in display item list turn ON-OFF linked with switch operation. Refer to LT-226, "Display Item List" for switches and their functions.



OK or NG

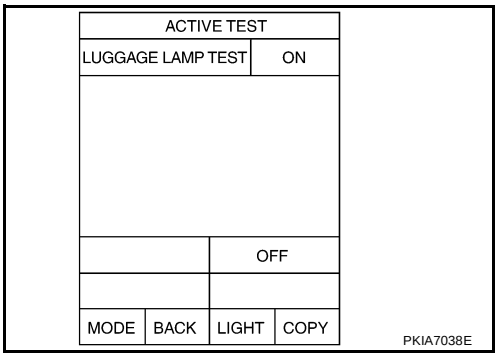
OK >> GO TO 3.

NG >> Inspect malfunctioning switch system.

3. CHECK BETWEEN BCM AND LUGGAGE ROOM LAMP

1. Select “BCM” on CONSULT-II. Select “LAGGUAGE LAMP TEST” active test.
2. Make sure luggage room lamp operates.

Luggage room lamp should operate.



OK or NG

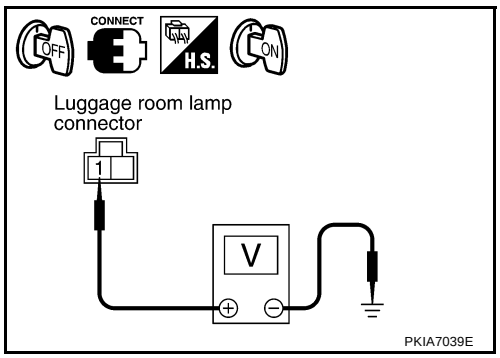
OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> GO TO 4.

4. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between luggage room lamp harness connector T13 terminal 1 (Y) and ground.

1 (Y) – Ground : Battery voltage should exist.



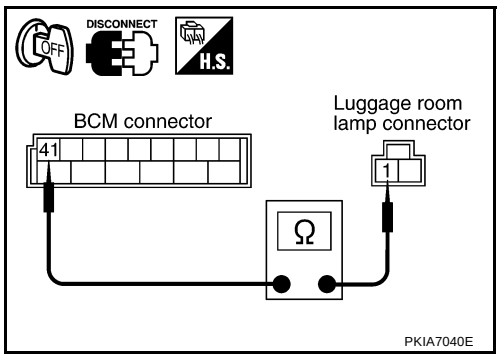
OK or NG

OK >> GO TO 7.
NG >> GO TO 5.

5. CHECK LUGGAGE ROOM LAMP CIRCUIT

1. Disconnect BCM connector and luggage room lamp connector.
2. Check continuity between BCM harness connector M91 terminal 41 (R/B) and luggage room lamp harness connector T13 terminal 1 (Y).

41 (R/B) – 1 (Y) : Continuity should exist.



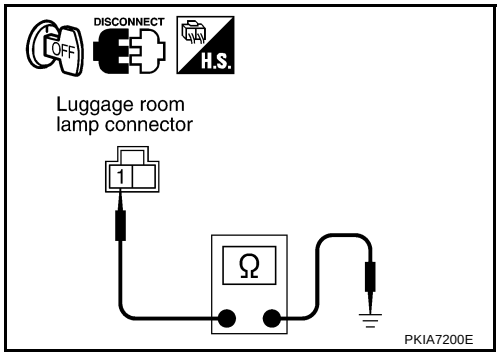
OK or NO

OK >> GO TO 6.
NG >> Repair harness or connector.

6. CHECK SHORT CIRCUIT

Check continuity between luggage room lamp harness connector T13 terminal 1 (Y) and ground.

1 (Y) – Ground : Continuity should not exist.



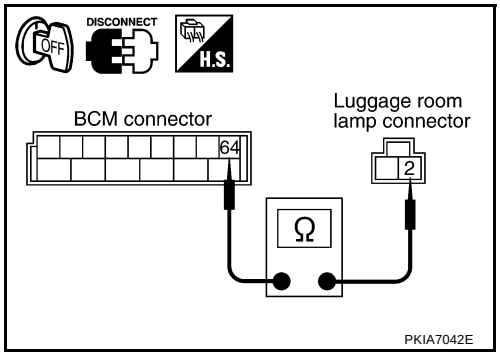
OK or NG

OK >> Replace BCM if luggage room lamp does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> After repairing harness, be sure to disconnect battery negative cable, and then reconnect it.

7. CHECK LUGGAGE ROOM LAMP CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector B83 terminal 64 (R/W) and luggage room lamp harness connector T13 terminal 2 (R/W).

64 (R/W) – 2 (R/W) : Continuity should exist.



OK or NO

OK >> Replace BCM if luggage room lamp does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Repair harness or connector.

Trunk Room Lamp Does Not Illuminate (Roadster Models)

AKS00AT7

1. CHECK BULB

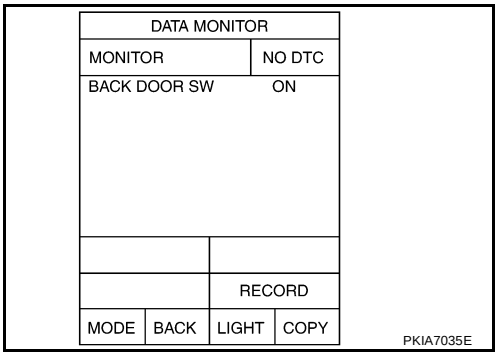
Inspect bulb of trunk room lamp.

OK or NG

OK >> GO TO 2.
NG >> Replace map lamp

2. CHECK BETWEEN BACK DOOR SWITCH AND BCM

Select BCM on CONSULT-II. Use “INT LAMP” data monitor to check that switches listed in display item list turn ON-OFF linked with switch operation. Refer to LT-226, "Display Item List" for switches and their functions.



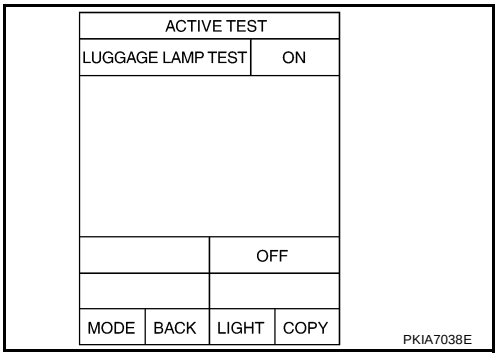
OK or NG

OK >> GO TO 3.
NG >> Inspect malfunctioning switch system.

3. CHECK BETWEEN BCM AND TRUNK ROOM LAMP

1. Select “BCM” on CONSULT-II. Select “LUGGAGE LAMP TEST” active test.
2. Make sure trunk room lamp operates.

Trunk room lamp should operate.



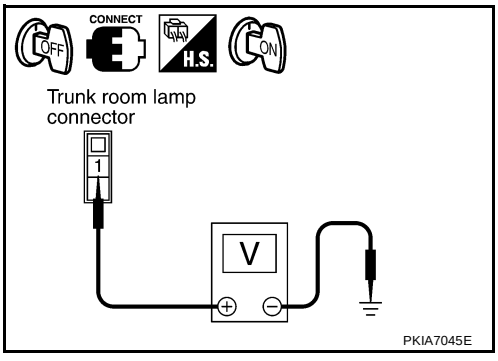
OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> GO TO 4.

4. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between trunk room lamp harness connector T29 terminal 1 (Y) and ground.

1 (Y) – Ground : Battery voltage should exist.



OK or NG

OK >> GO TO 7.
NG >> GO TO 5.

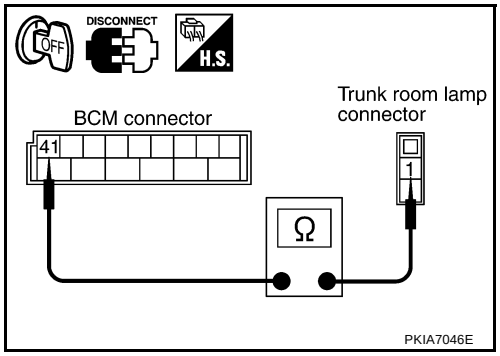
5. CHECK TRUNK ROOM LAMP CIRCUIT

1. Disconnect BCM connector and trunk room lamp connector.
2. Check continuity between BCM harness connector M91 terminal 41 (R/B) and trunk room lamp harness connector T29 terminal 1 (Y).

41 (R/B) – 1 (Y) : Continuity should exist.

OK or NO

OK >> GO TO 6.
NG >> Repair harness or connector.



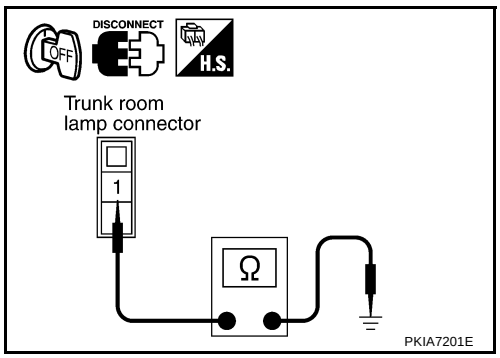
6. CHECK SHORT CIRCUIT

Check continuity between trunk room lamp harness connector T29 terminal 1 (Y) and ground.

1 (Y) – Ground : Continuity should not exist.

OK or NG

OK >> Replace BCM if trunk room lamp does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> After repairing harness, be sure to disconnect battery negative cable, and then reconnect it.



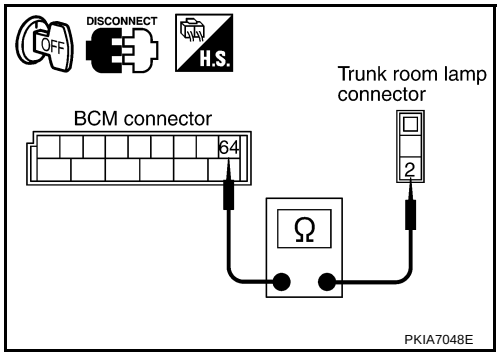
7. CHECK TRUNK ROOM LAMP CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector B83 terminal 64 (R/W) and trunk room lamp harness connector T29 terminal 2 (R/W).

64 (R/W) – 2 (R/W) : Continuity should exist.

OK or NO

OK >> Replace BCM if trunk room lamp does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Repair harness or connector.



Bulb Replacement

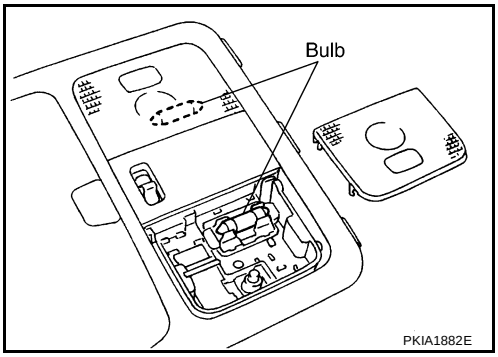
AKS00999

COUPE MODELS

1. Open driver and passenger window, and then disconnect battery negative cable.

   CAUTION:
   After battery cables are disconnected, do not open/close driver and/or passenger door with the window in the full up position. Automatic window adjusting function will not work and side roof panel may be damaged.
2. Remove lens using clip driver or suitable tool.
3. Remove bulb.

   Map lamp :12V - 8 W
4. Install in the reverse order of removal.

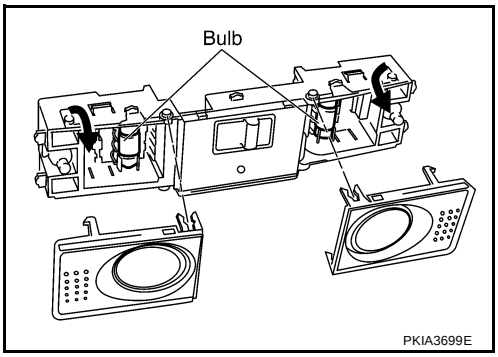


ROADSTER MODELS

1. Open driver and passenger window, and then disconnect battery negative cable.

   CAUTION:
   After battery cables are disconnected, do not open/close driver and/or passenger door with the window in the full up position. Automatic window adjusting function will not work and side roof panel may be damaged.
2. Remove lens using clip driver or suitable tool.
3. Remove bulb.

   Map lamp :12V - 8 W
4. Install in the reverse order of removal.

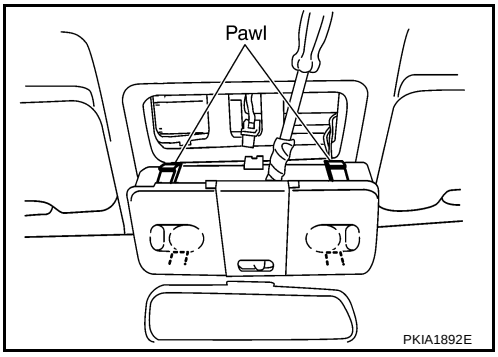


Removal and Installation

AKS0099A

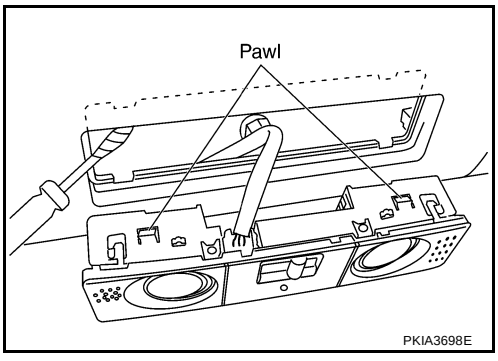
REMOVAL (COUPE MODELS)

1. Insert a clip driver or suitable tool and disengage pawl fittings of map lamp.
2. Disconnect map lamp connector and remove map lamp.



REMOVAL (ROADSTER MODELS)

1. Insert a clip driver or suitable tool and disengage pawl fittings of map lamp.
2. Disconnect map lamp connector and remove map lamp.



INSTALLATION

Install in the reverse order of removal.

ILLUMINATION

PFP:27545

System Description

AKS009QH

Control of illumination lamps operation is dependent upon the position of lighting switch (combination switch). When lighting switch is placed in the 1ST or 2ND position, BCM receives input signal requesting illumination lamps to illuminate. This input signal is communicated to IPDM E/R (intelligent power distribution module engine room) across CAN communication lines. CPU (central processing unit) of IPDM E/R (intelligent power distribution module engine room) controls tail lamp relay coil. This relay, when energized, directs power to illumination lamps, which then illuminate.

Power is supplied at all times

- through 10A fuse [No.71, located in IPDM E/R (intelligent power distribution module engine room)]
- to tail lamp relay [located in IPDM E/R (intelligent power distribution module engine room)]
- through 15A fuse [No.78, located in IPDM E/R (intelligent power distribution module engine room)]
- to CPU (central processing unit) [located in IPDM E/R (intelligent power distribution module engine room)].

Power is also supplied at all times

- through 40A fusible link (letter F, located in fuse and fusible link block)
- to BCM (body control module) terminal 55
- through 10A fuse [No.18, located in fuse block (J/B)]
- to BCM (body control module) terminal 42
- through 10A fuse [No.19, located in fuse block (J/B)]
- to unified meter and A/C amp. terminal 21
- through 10A fuse [No.19, located in fuse block (J/B)]
- to combination meter terminal 24.

With ignition switch in the ON or START position, power is supplied

- to CPU (central processing unit) [located in IPDM E/R (intelligent power distribution module engine room)]
- to BCM (body control module) terminal 38
- through 10A fuse [No.1, located in fuse block (J/B)]
- through 10A fuse [No.12, located in fuse block (J/B)]
- to unified meter and A/C amp. terminal 22.

With ignition switch in the ACC or ON position, power is supplied

- to BCM (body control module) terminal 11
- through 10A fuse [No.6, located in fuse block (J/B)].

Ground is supplied

- to BCM (body control module) terminal 52
- through grounds M30 and M66
- to IPDM E/R (intelligent power distribution module engine room) terminals 38 and 60
- through grounds E17, E43 and F152
- to unified meter and A/C amp. terminals 29 and 30
- through grounds M30 and M66.

ILLUMINATION OPERATION BY LIGHTING SWITCH

With lighting switch in the 1ST or 2ND position, BCM receives input signal requesting illumination lamps to illuminate. This input signal is communicated to IPDM E/R across CAN communication lines. CPU of IPDM E/R controls tail lamp relay coil, which, when energized, directs power

- through terminal 22 of IPDM E/R
- to NAVI control unit terminal 9 (With navigation system),
- to NAVI switch terminal 2 (With navigation system),
- to VDC off switch (illumination) terminal 3 (with VDC),
- to TCS off switch (illumination) terminal 3 (with TCS),
- to A/T device A/T illumination terminal 3 (With A/T),
- to hazard switch (illumination) terminal 3,

- to map lamp (illumination) terminal 4 (Roadster models)
- to ashtray illumination terminal 1 (With ashtray),
- to heated seat switch (driver side) (illumination) terminal 5 (With heated seat),
- to heated seat switch (passenger side) (illumination) terminal 5 (With heated seat),
- to luggage floor box lamp terminal 1,
- to soft top switch (illumination) terminal 5 (Roadster model),
- to audio unit terminal 8.

Ground is supplied at all times

- to luggage floor box lamp terminal 2,
- through grounds D105, B5, B6, and T14 (Coupe model),
- through grounds B5, B6 and T14 (Roadster model),
- to ashtray illumination terminal 2 (With ashtray),
- to map lamp (illumination) terminal 1 (Roadster models),
- through grounds M30 and M66
- to soft top switch (illumination) terminal 6 (Roadster models),
- to hazard switch (illumination) terminal 4,
- to VDC off switch (illumination) terminal 4 (With VDC),
- to TCS off switch (illumination) terminal 4 (With TCS),
- to A/T device (A/T illumination) terminal 5 (With A/T),
- to NAVI switch terminal 3 (With navigation system),
- to audio unit terminal 7,
- to heated seat switch (driver side) (illumination) terminal 6 (With heated seat),
- to heated seat switch (passenger side) (illumination) terminal 6,
- through combination meter terminal 18,
- to combination meter terminals 10, 11 and 12,
- through grounds M30 and M66.

With power and ground supplied, illumination lamps illuminate.

EXTERIOR LAMP BATTERY SAVER CONTROL

When combination switch (lighting switch) is in the 1ST or 2ND position, and ignition switch is turned from ON or ACC to OFF, battery saver control function is activated.
Under this condition, illumination lamps remain illuminated for 5 minutes, then illumination lamps are turned off.
When lighting switch is turned from OFF to 1ST or 2ND position after illumination lamps are turned off by battery saver control, and illumination lamps illuminate again.
Exterior lamp battery saver control mode can be changed by the function setting of CONSULT-II.

CAN Communication System Description

AKS009QI

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

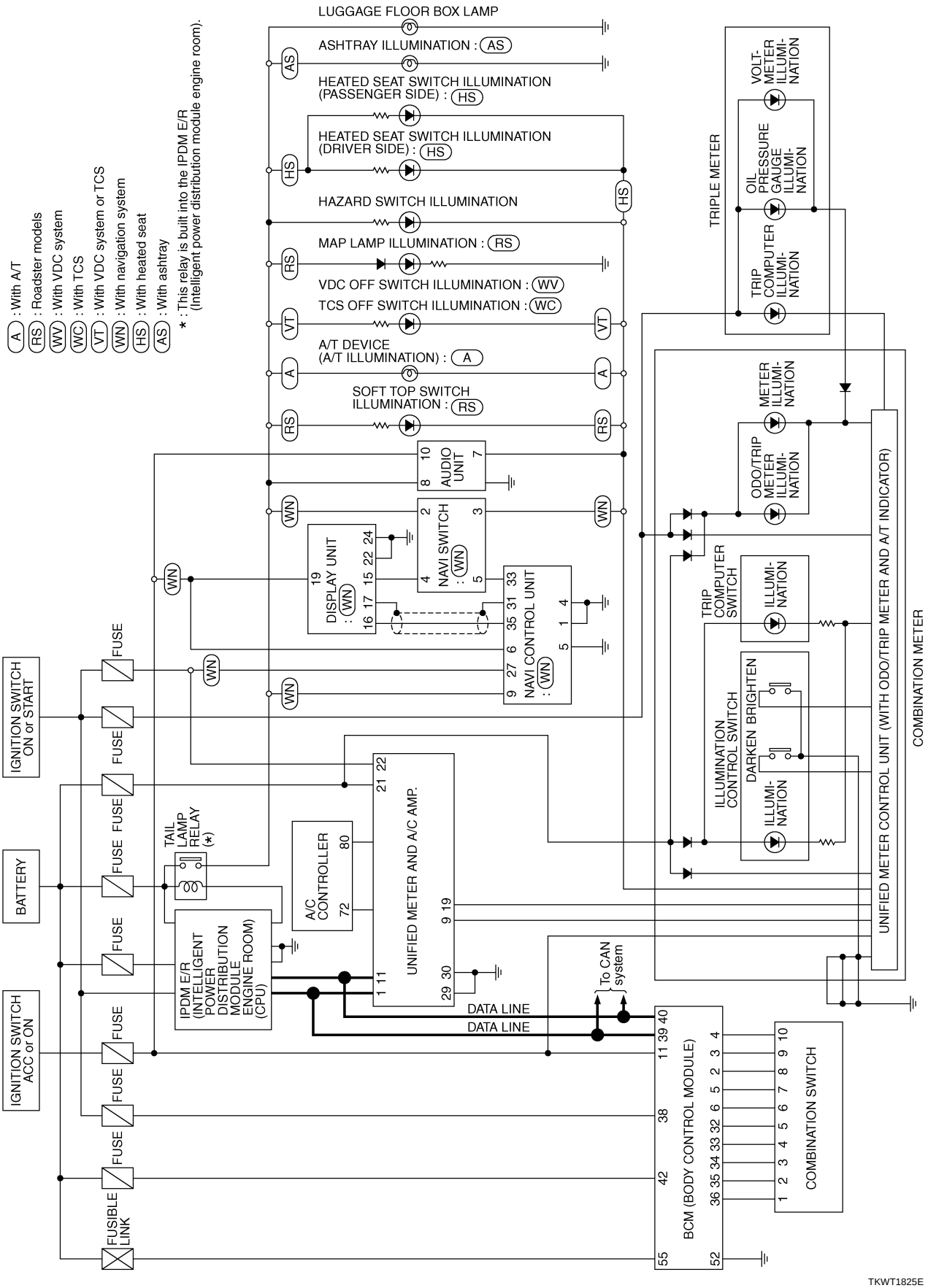
CAN Communication Unit

AKS009QJ

Refer to LAN-5, "CAN Communication Unit" .

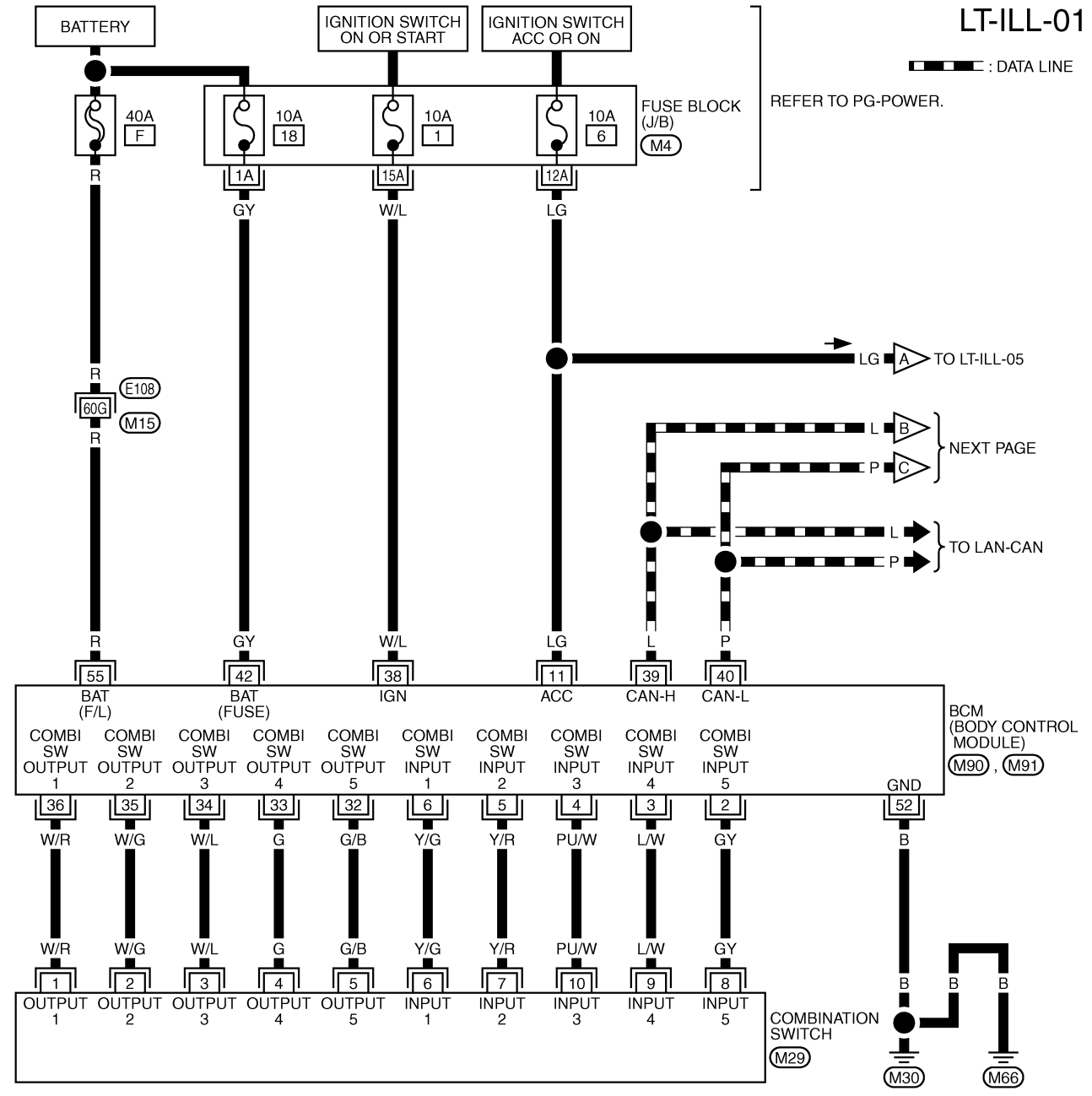
Schematic

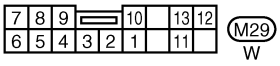
AKS009QK



Wiring Diagram — ILL —

AKS009QL





REFER TO THE FOLLOWING.

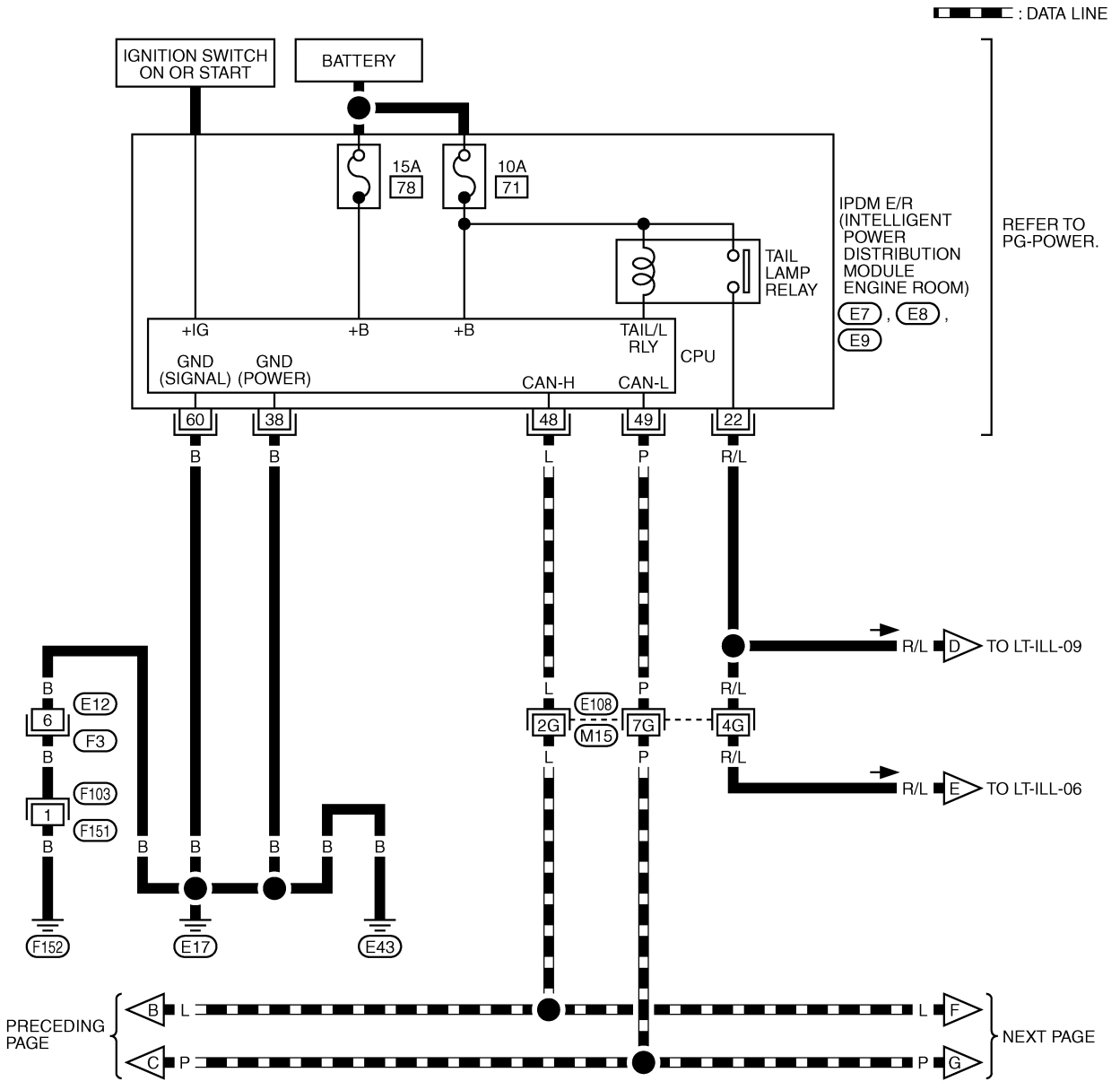
E108 -SUPER MULTIPLE JUNCTION (SMJ)

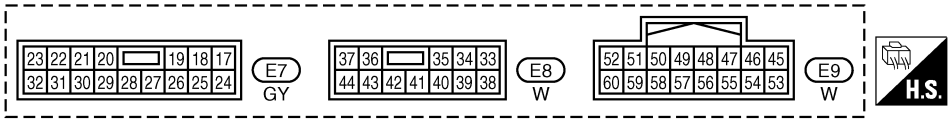
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

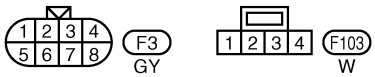
M90, M91 -ELECTRICAL UNITS

TKWT1826E

LT-ILL-02

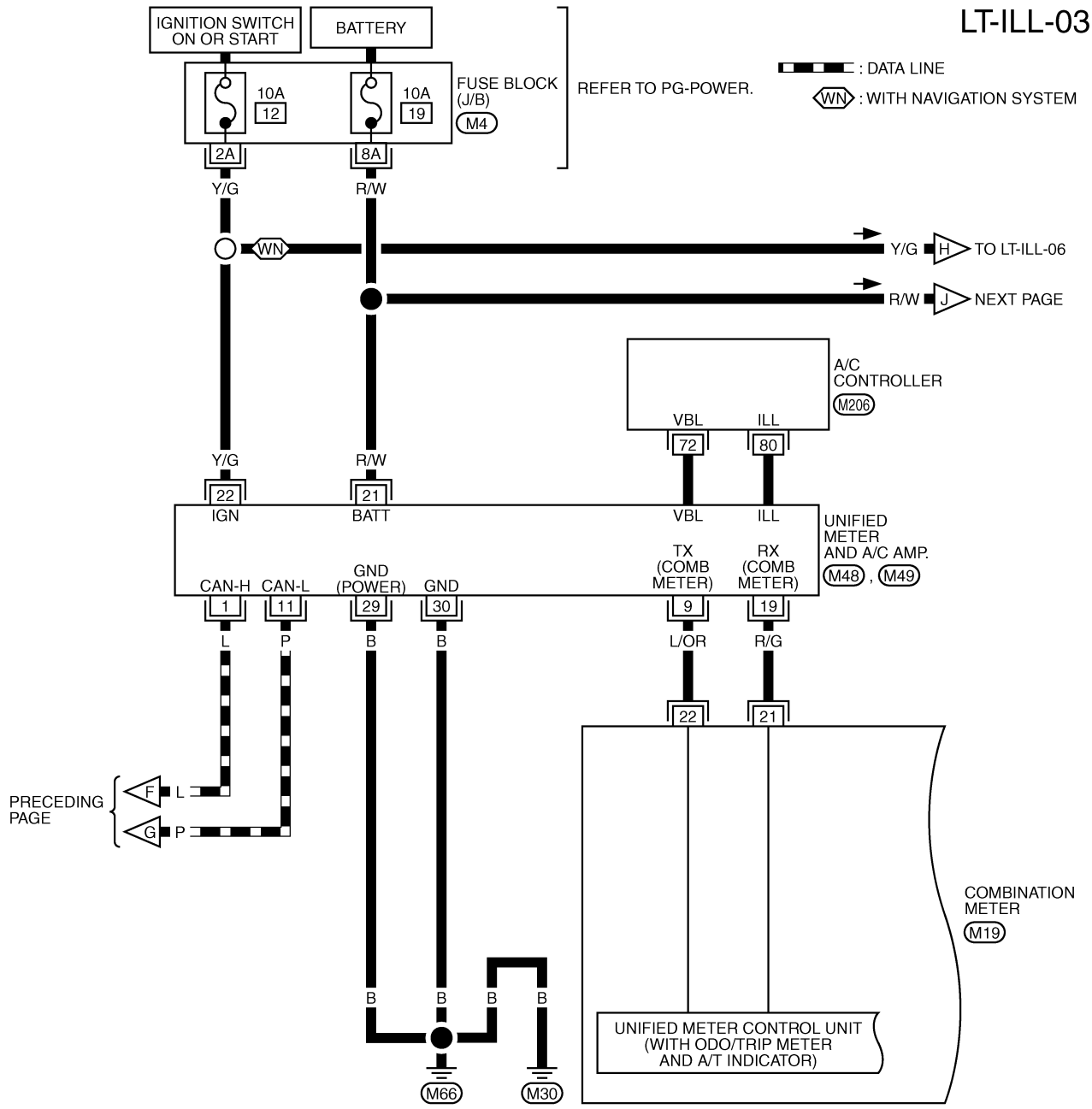


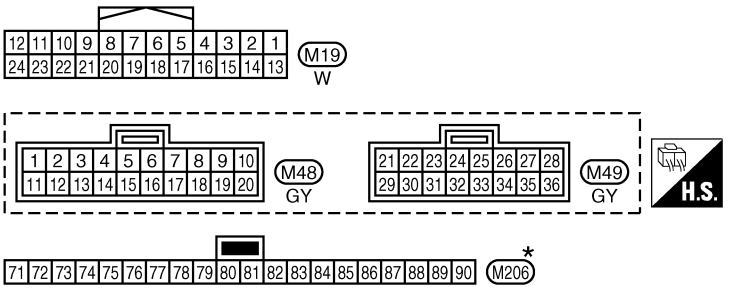




REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT1827E



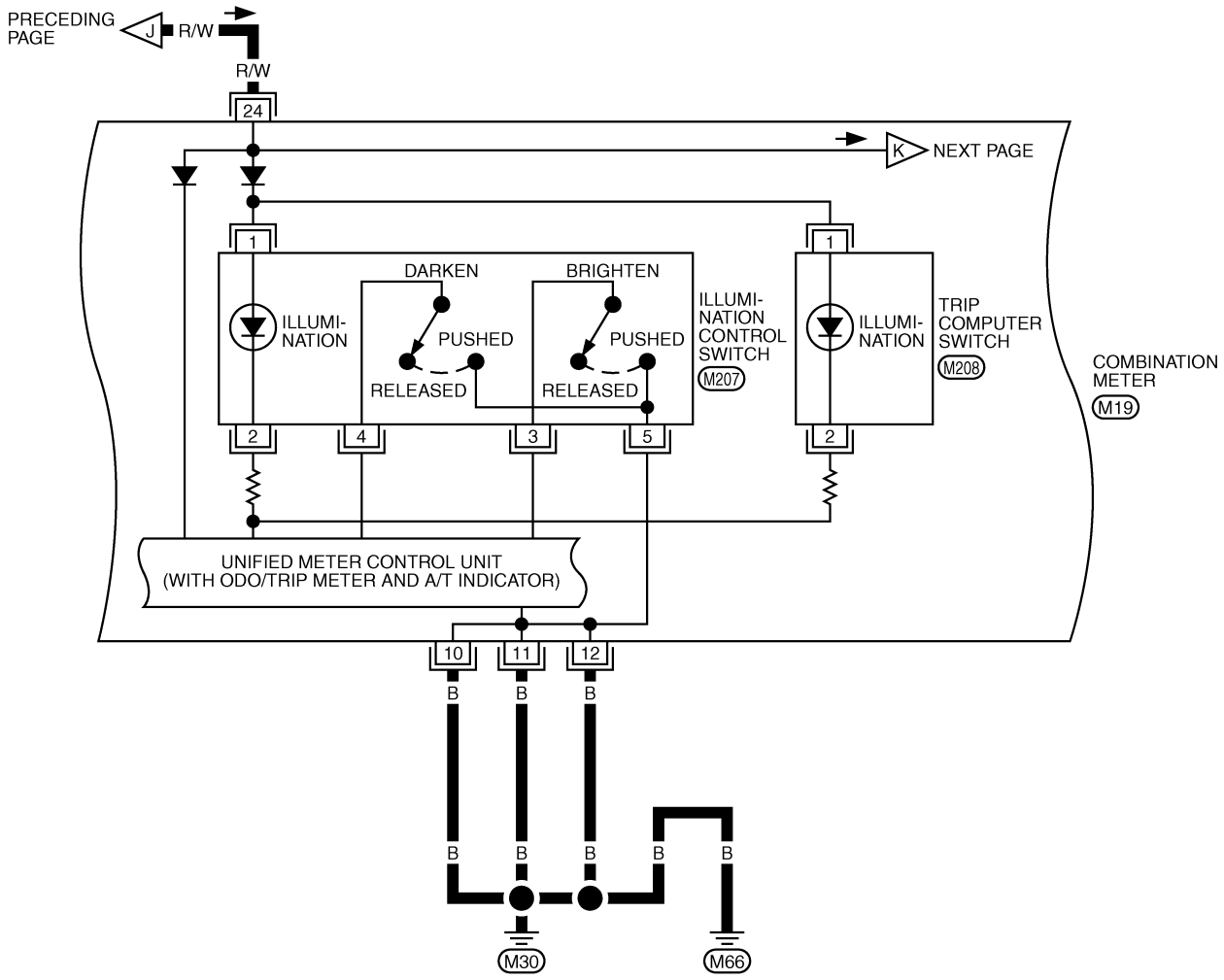


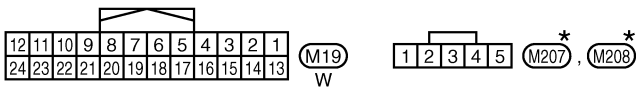
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT1828E

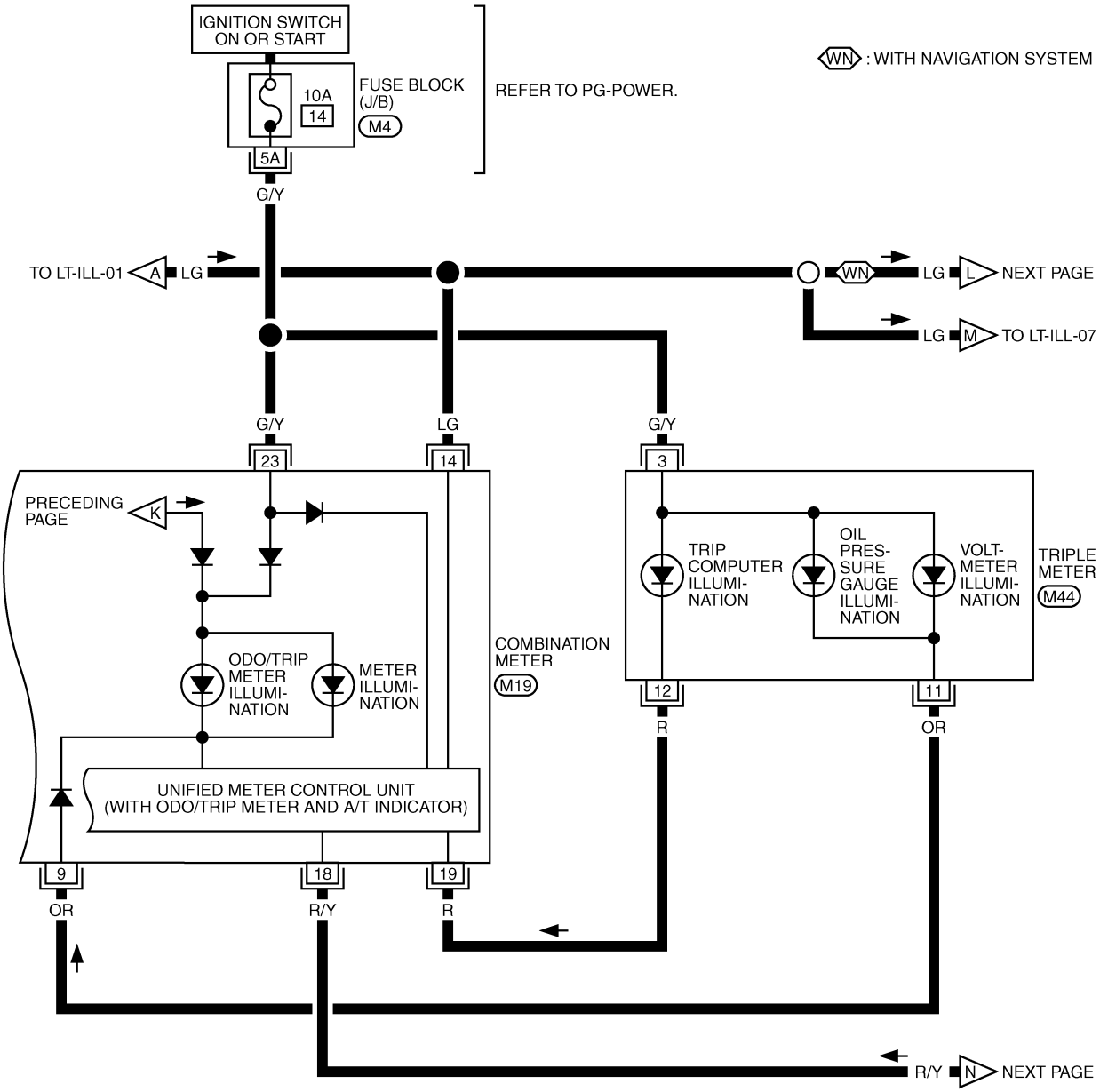


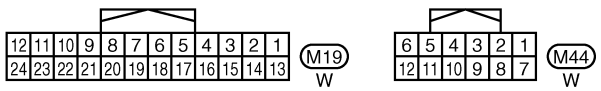


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT1829E

LT-ILL-05

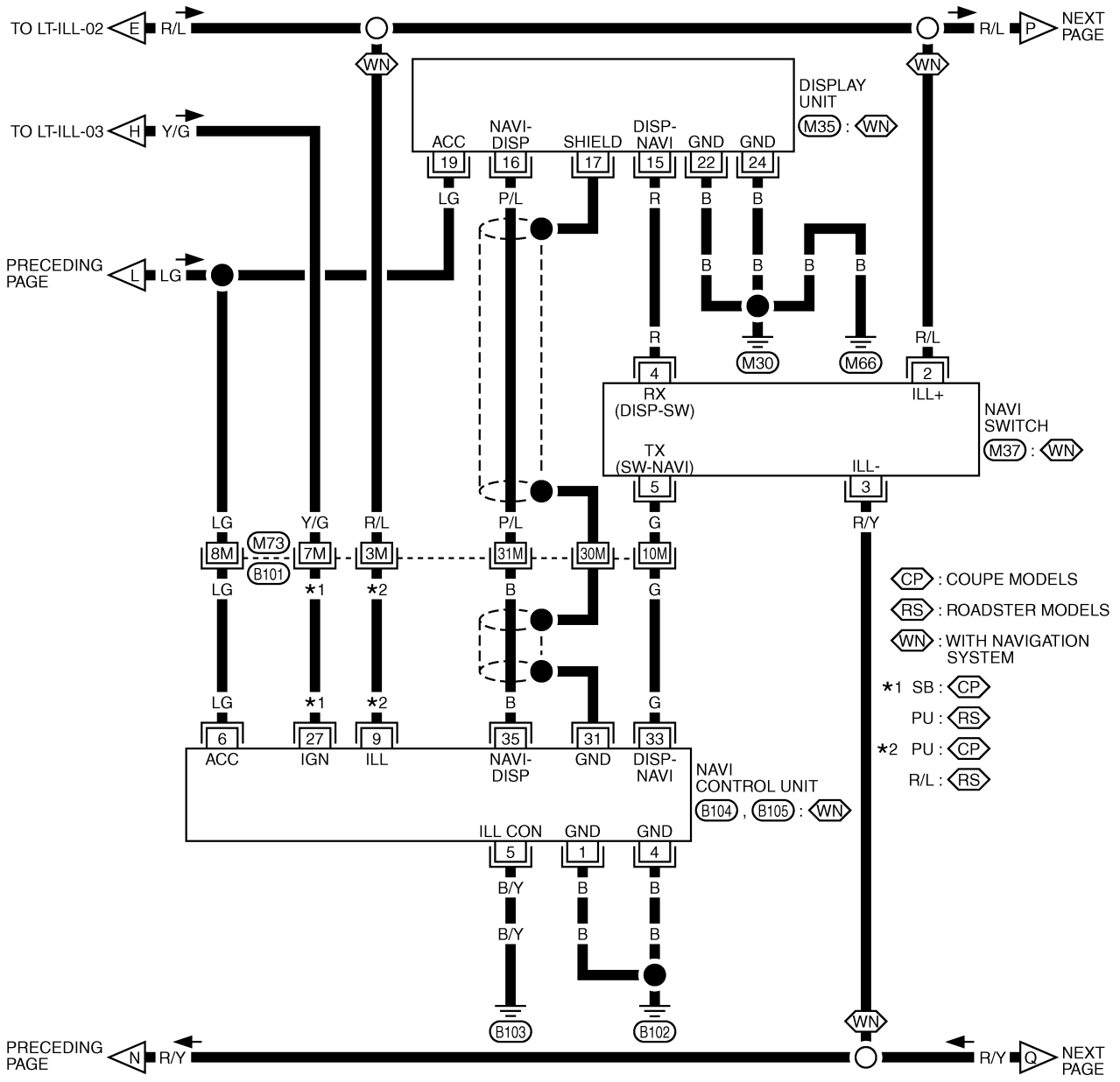


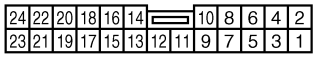


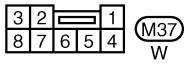
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

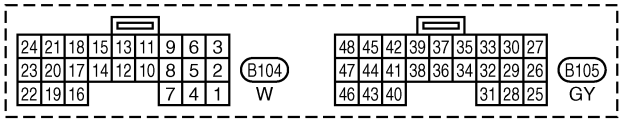
TKWT1830E

LT-ILL-06







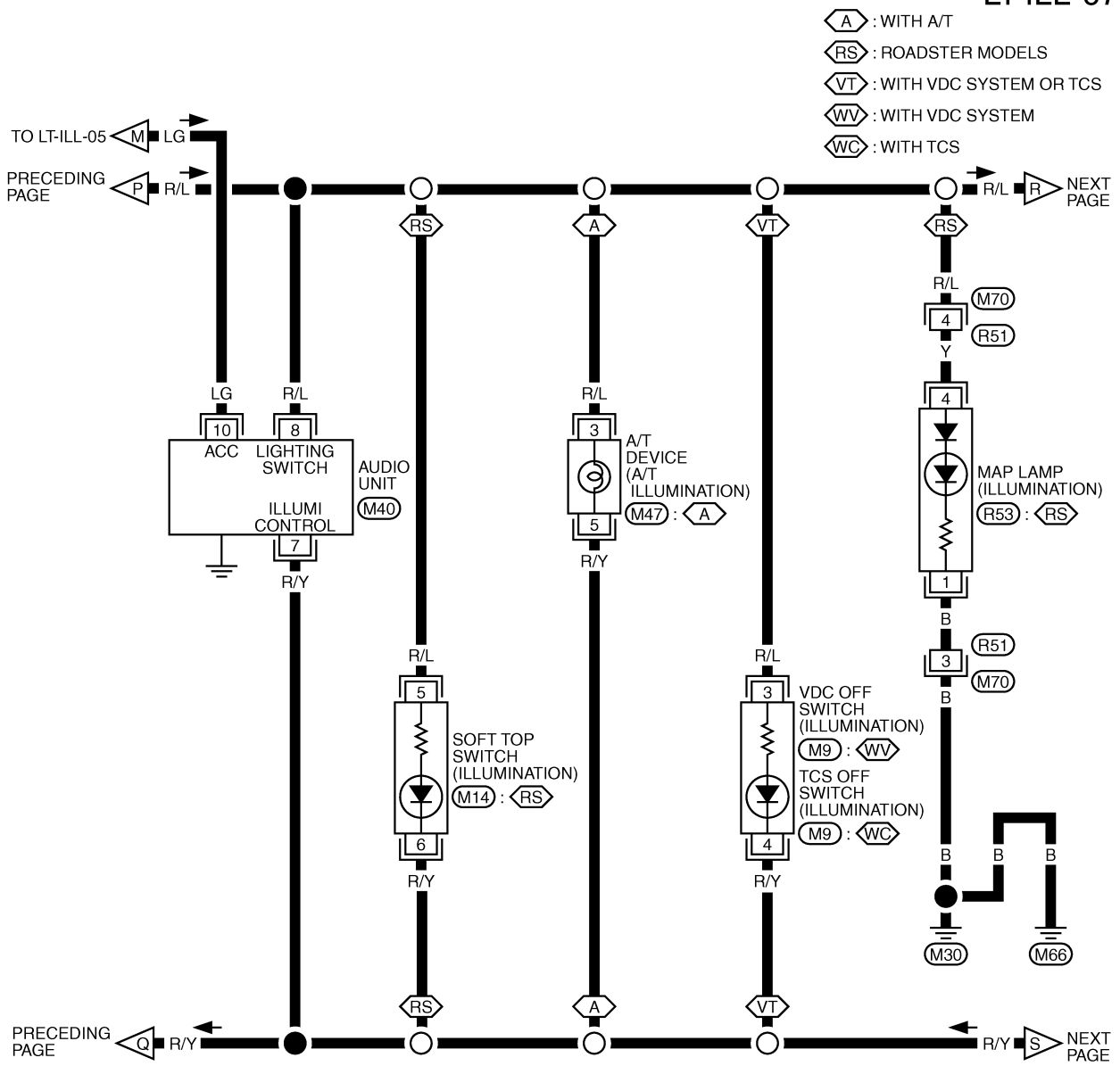


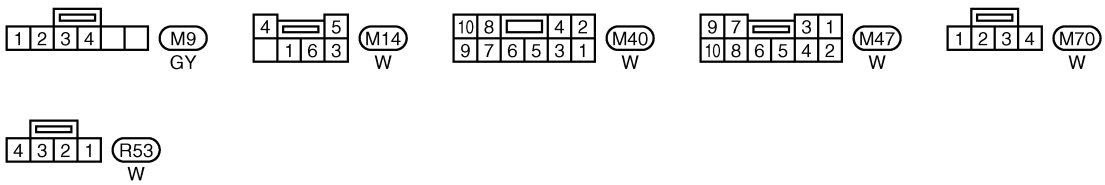
REFER TO THE FOLLOWING.

B101 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT1831E

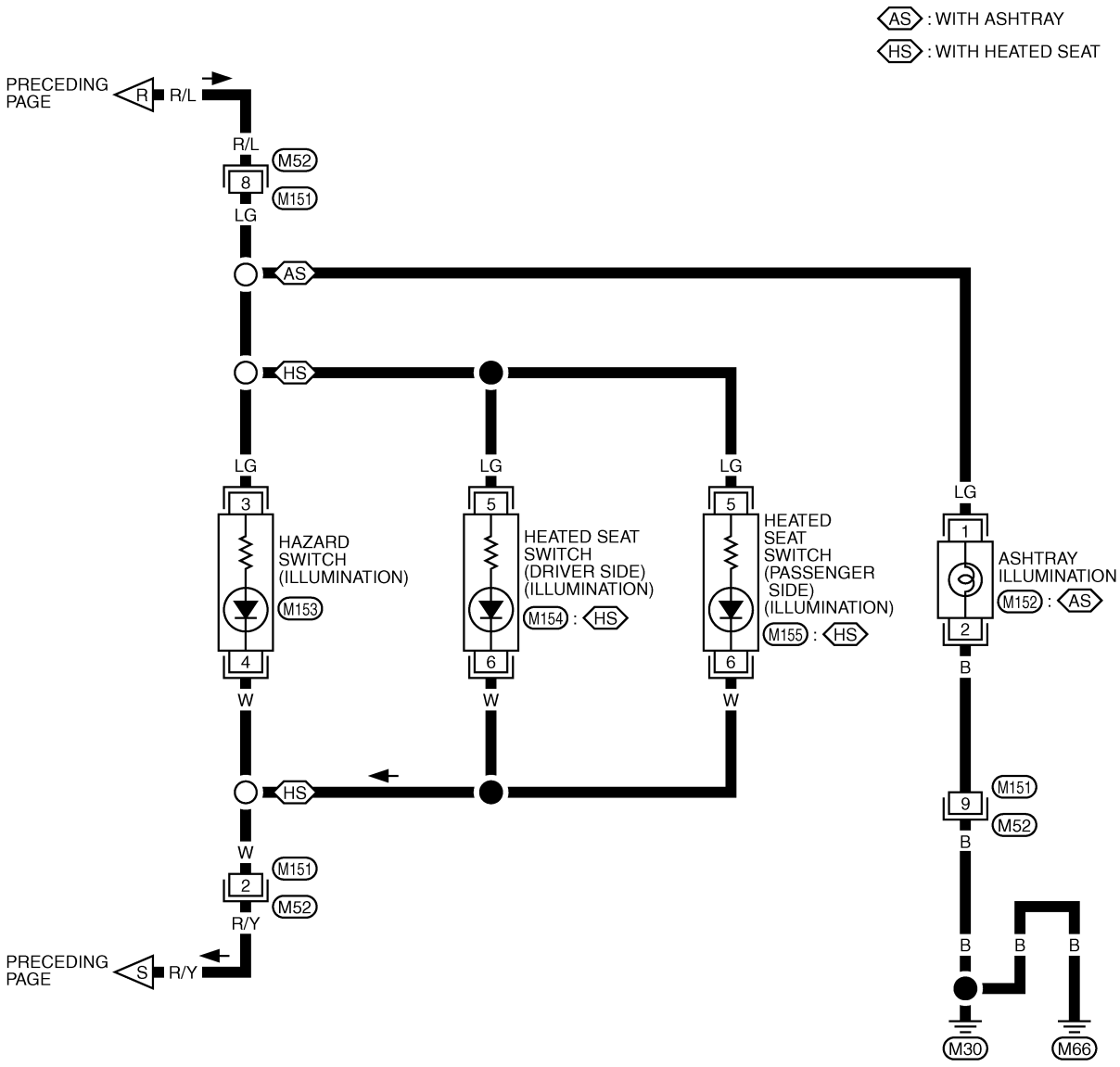
LT-ILL-07

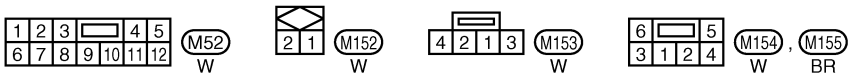




TKWT1832E

LT-ILL-08

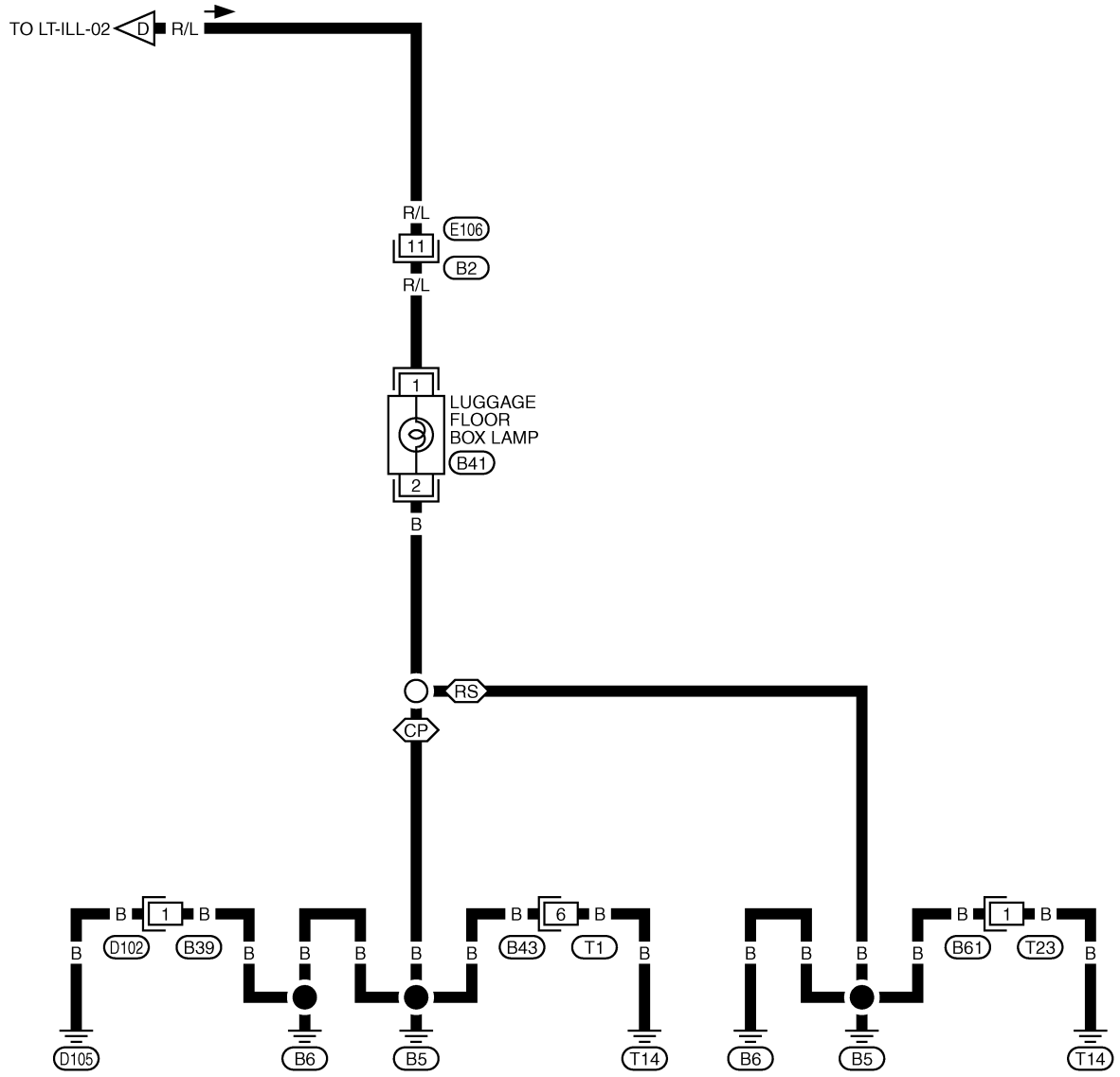


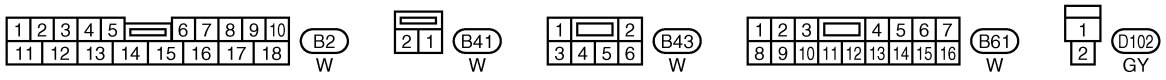


TKWT1833E

LT-ILL-09

CP : COUPE MODELS
RS : ROADSTER MODELS





TKWT1834E

BULB SPECIFICATIONS

PFP:26297

Headlamp

AKS000WI

Item	Wattage (W)
Low (Halogen type)	55 (H7)
Low (Xenon type)	35 (D2R)
High (Halogen type)	55 (H1)
High (Xenon type)	55 (H7)

Exterior Lamp

AKS000WJ

Item		Wattage (W)
Front combination lamp	Front Turn signal lamp	21 (amber)
	Parking lamp	5
	Front side marker lamp	5
Rear combination lamp	Stop/Tail lamp	21/5
	Rear Turn signal lamp	21
	Back-up lamp	21
	Rear side marker lamp	5
License plate lamp		5
High-mounted stop lamp (back door mount)		LED

Interior Lamp/Illumination

AKS000WK

Item	Wattage (W)
Rear floor box lamp	1.4
Ashtray illumination lamp	1.4
Map lamp	8
Luggage room lamp	5
Trunk room lamp	3.4
Vanity mirror lamp	1.32

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DRIVER INFORMATION SYSTEM

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PRECAUTIONS

PFP:00011

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

AKS003V4

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

AKS00AVA

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Wiring Diagrams and Trouble Diagnosis

AKS000WM

When you read wiring diagrams, refer to the following:

- Refer to GI-15, "How to Read Wiring Diagrams" .
- Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" for power distribution circuit.

When you perform trouble diagnosis, refer to the following:

- Refer to GI-11, "HOW TO FOLLOW TEST GROUPS IN TROUBLE DIAGNOSES" .
- Refer to GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident" .

COMBINATION METERS

PFP:24814

System Description

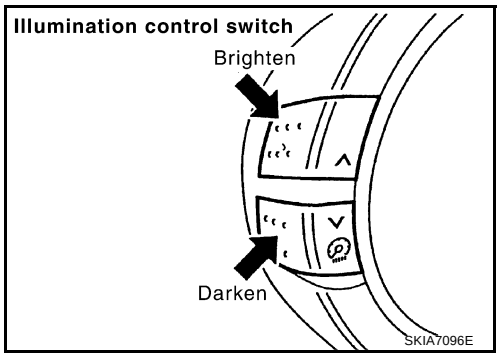
AKS0093R

UNIFIED METER CONTROL UNIT

- Speedometer, odo/trip meter, tachometer, fuel gauge and water temperature gauge are controlled by the unified meter control unit, which is built into the combination meter. Unified meter control unit receives signals from unified meter and A/C amp.
- Warning lamp and indicator lamp of combination meter are controlled by signals drawn from the unified meter and A/C amp.
- For trip meter, adopted twin trip meter which can integrate two modes.*
  *The record of the odo meter is kept even if the battery cable is disconnected. The record of the trip meter is erased when the battery cable is disconnected.
- Odo/trip meter and A/T indicator segments can be checked in diagnosis mode.
- Meters/gauges can be checked in diagnosis mode.

Illumination Control

The unified meter control unit outputs the combination meter and triple meter dial lighting when the ignition switch is turned on. When the lighting switch is turned on, light on for the trip computer switch, illumination control switch and external lighting are output. In addition, when the lighting switch is turned on, the illumination control switch on the left side of the combination meter can be used to adjust the brightness of each light. Pressing the illumination control switch will brighten or darken the lights. When the key switch is in the START position, the combination meter and triple meter dial lighting and the trip computer switch and illumination control switch lighting are turned off.

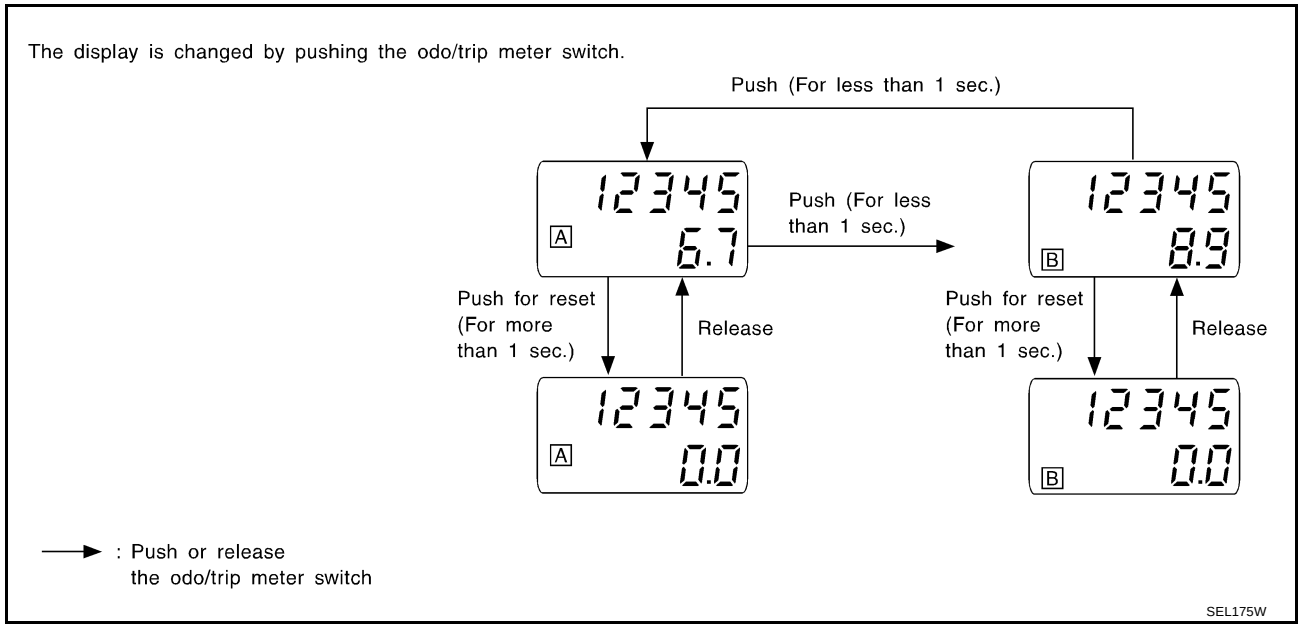


UNIFIED METER AND A/C AMP.

Refer to DI-54, "System Description" in “UNIFIED METER AND A/C AMP”.

HOW TO CHANGE THE DISPLAY FOR ODO/TRIP METER

- The vehicle speed signal and the memory signals from the meter memory circuit are processed by the combination meter and the mileage is displayed.
- Depressing the odo/trip meter switch toggles the mode in the following order.



- The odo/trip meter display mode toggling and trip display resetting can be identified by the amount of time that elapses from pressing the odo/trip meter switch to releasing it.
- When resetting with trip A displayed, only trip A display is reset (The same way for trip B).

POWER SUPPLY AND GROUND CIRCUIT

Power is supplied at all times

- through 10A fuse [No. 19, located in the fuse block (J/B)]
- to combination meter terminal 24, and
- to unified meter and A/C amp. terminal 21.

With the ignition switch in the ON or START position, power is supplied

- through 10A fuse [No. 14, located in the fuse block (J/B)]
- to combination meter terminal 23
- through 10A fuse [No. 12, located in the fuse block (J/B)]
- to unified meter and A/C amp. terminal 22.

With the ignition switch in the ACC or ON position, power is supplied

- through 10A fuse [No. 6, located in the fuse block (J/B)]
- to combination meter terminal 14
- through 15A fuse [No. 10, located in the fuse block (J/B)], and
- through 15A fuse [No. 11, located in the fuse block (J/B)]
- to unified meter and A/C amp. terminal 46.

Ground is supplied

- to combination meter terminals 10, 11 and 12
- through body grounds M30 and M66
- to unified meter and A/C amp. terminals 29 and 30
- through body grounds M30 and M66.

WATER TEMPERATURE GAUGE

The water temperature gauge indicates the engine coolant temperature.
ECM provides an engine coolant temperature signal to unified meter and A/C amp. with CAN communication line. Unified meter and A/C amp. provides an engine coolant temperature signal to combination meter for water temperature gauge with communication line between unified meter and A/C amp. and combination meter.

TACHOMETER

The tachometer indicates engine speed in revolutions per minute (rpm).
ECM provides an engine speed signal to unified meter and A/C amp. CAN communication line. Unified meter and A/C amp. provides an engine speed signal to combination meter for tachometer with communication line between unified meter and A/C amp. and combination meter.

FUEL GAUGE

The fuel gauge indicates the approximate fuel level in the fuel tank.
The fuel gauge is regulated by a variable ground signal supplied

- from unified meter and A/C amp. terminal 36
- through terminals 5 and 2 of the fuel level sensor unit and fuel pump (main), and
- through terminals 2 and 1 of the fuel level sensor unit (sub)
- to unified meter and A/C amp. terminal 28 for the fuel gauge.

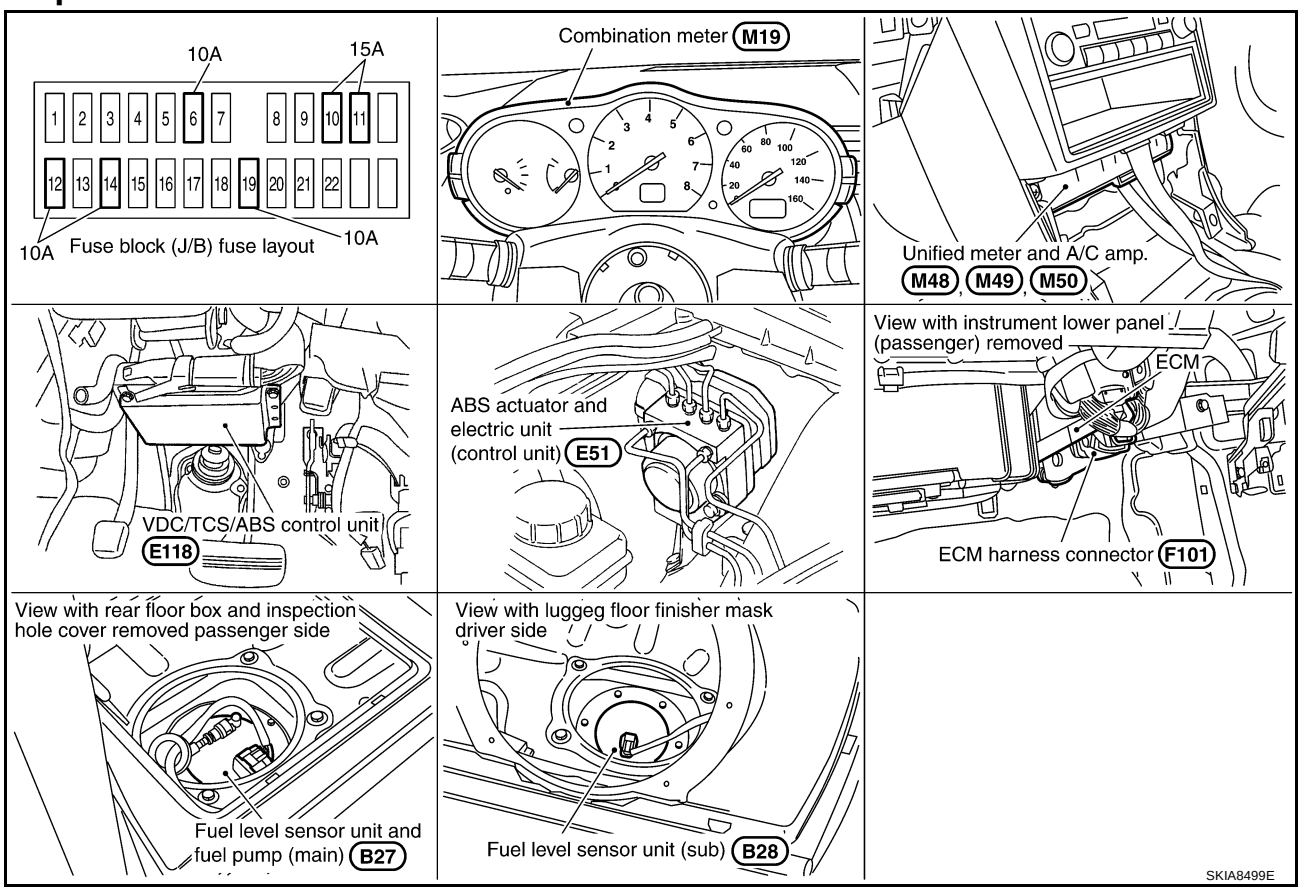
Unified meter and A/C amp. provides an fuel level signal to combination meter for fuel gauge with communication line between unified meter and A/C amp. and combination meter.

SPEEDOMETER

VDC/TCS/ABS control unit [with VDC system] or ABS actuator and electric unit (control unit) [without VDC system] provides a vehicle speed signal to the unified meter and A/C amp. with CAN communication line. After unified meter and A/C amp. received the vehicle speed signal, it changes the signal to 8 pulse signal to the combination meter for speedometer.

Component Parts and Harness Connector Location

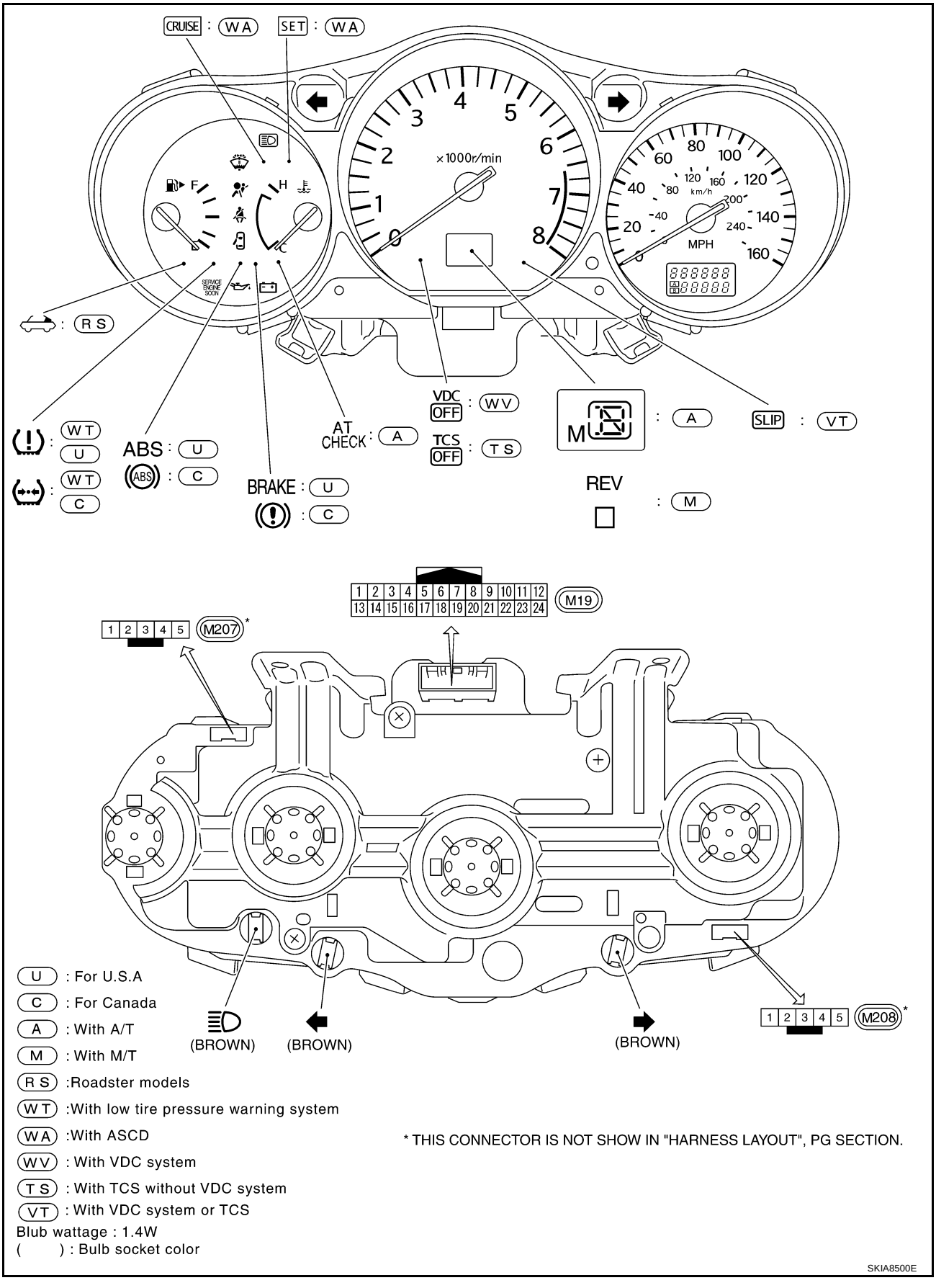
AKS0093S



Combination Meter

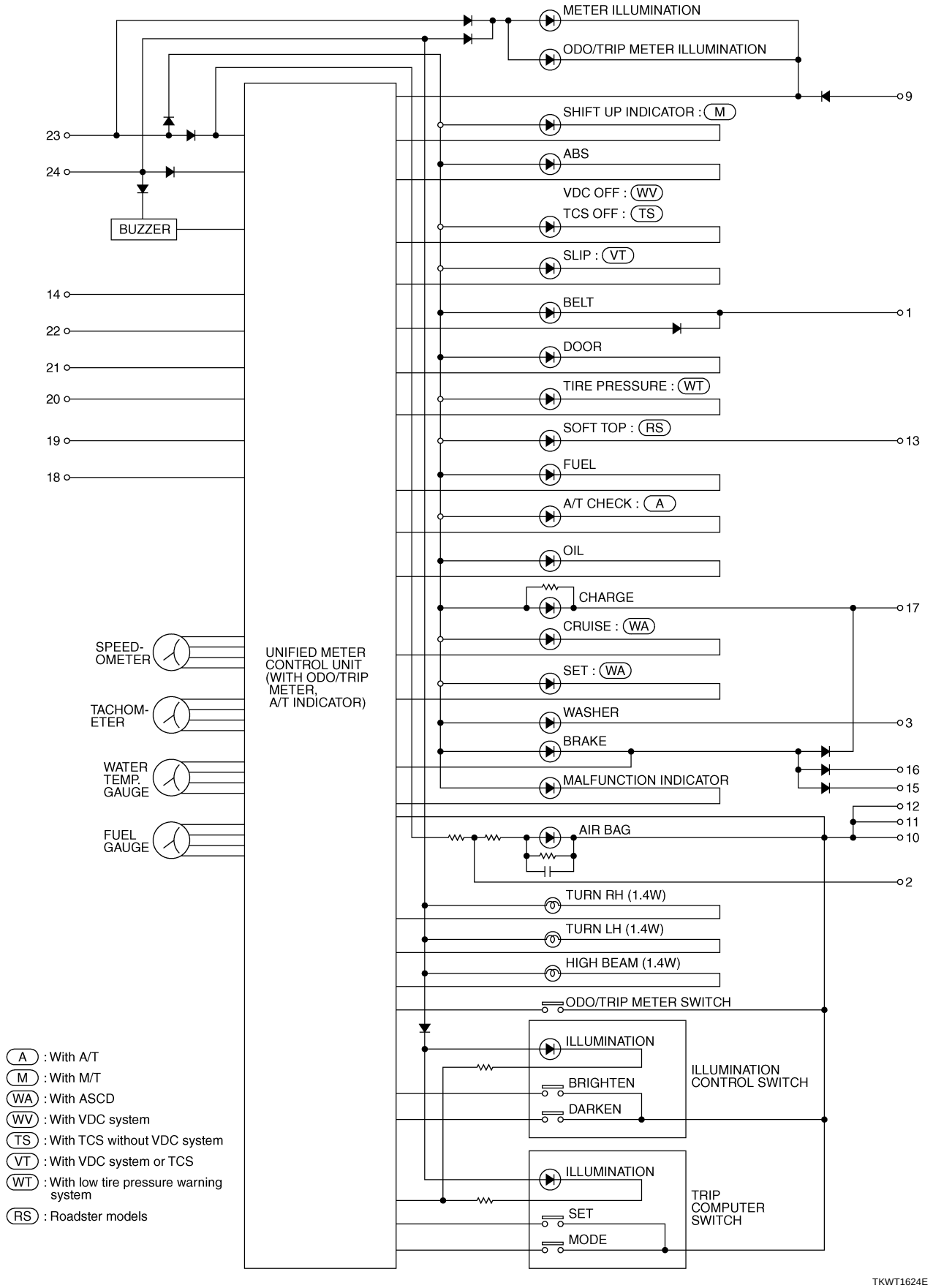
AKS0093T

CHECK



Circuit Diagram

AKS0093U



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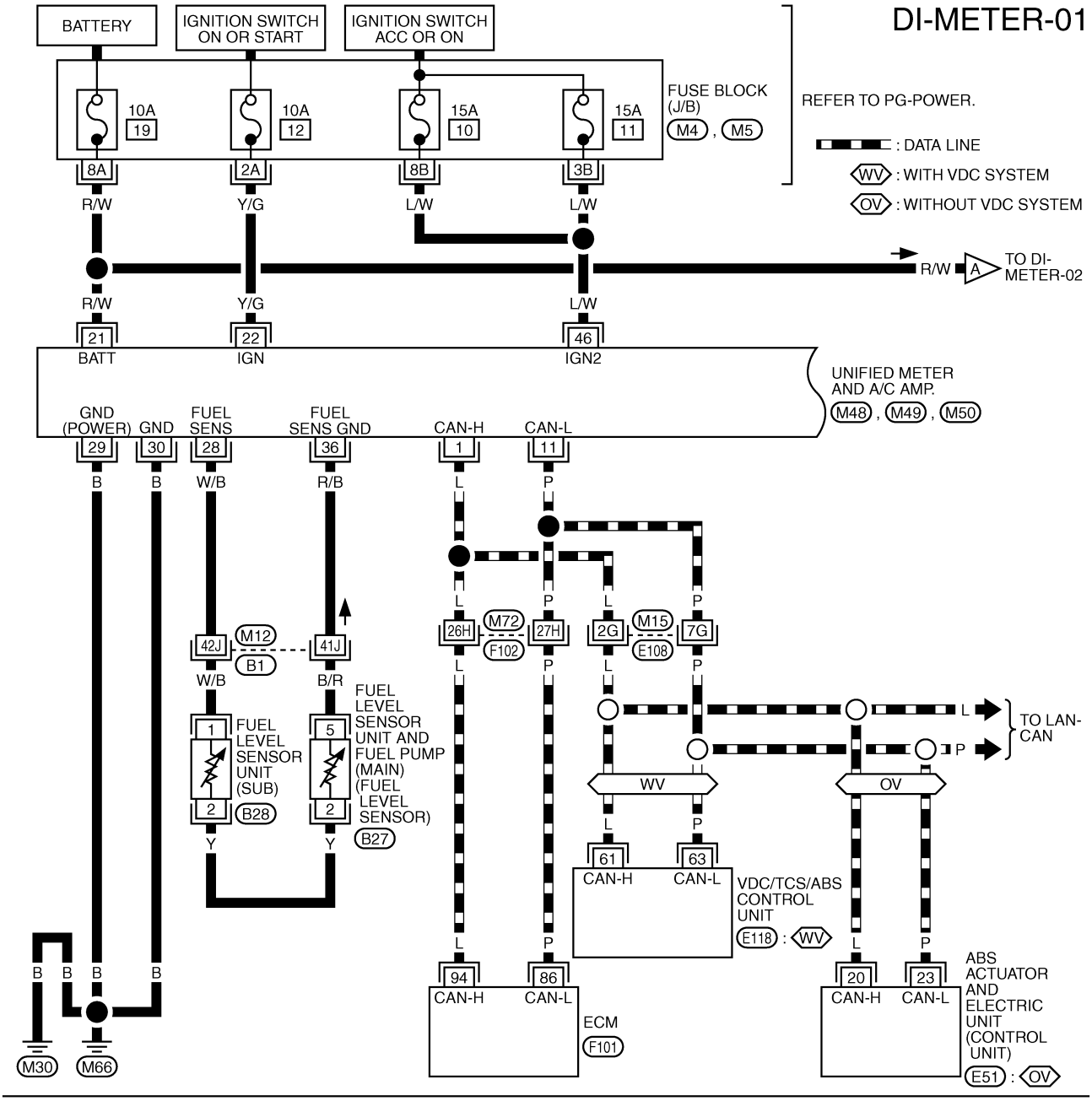
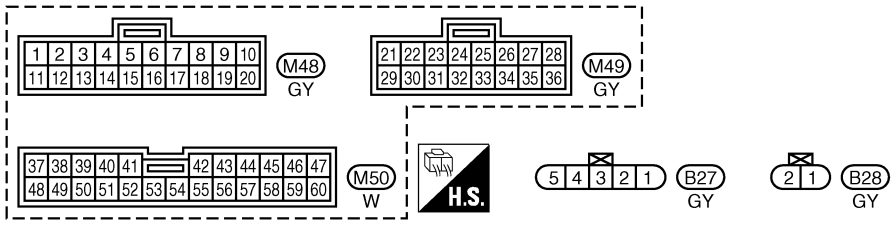
Wiring Diagram — METER —

AKS0093V

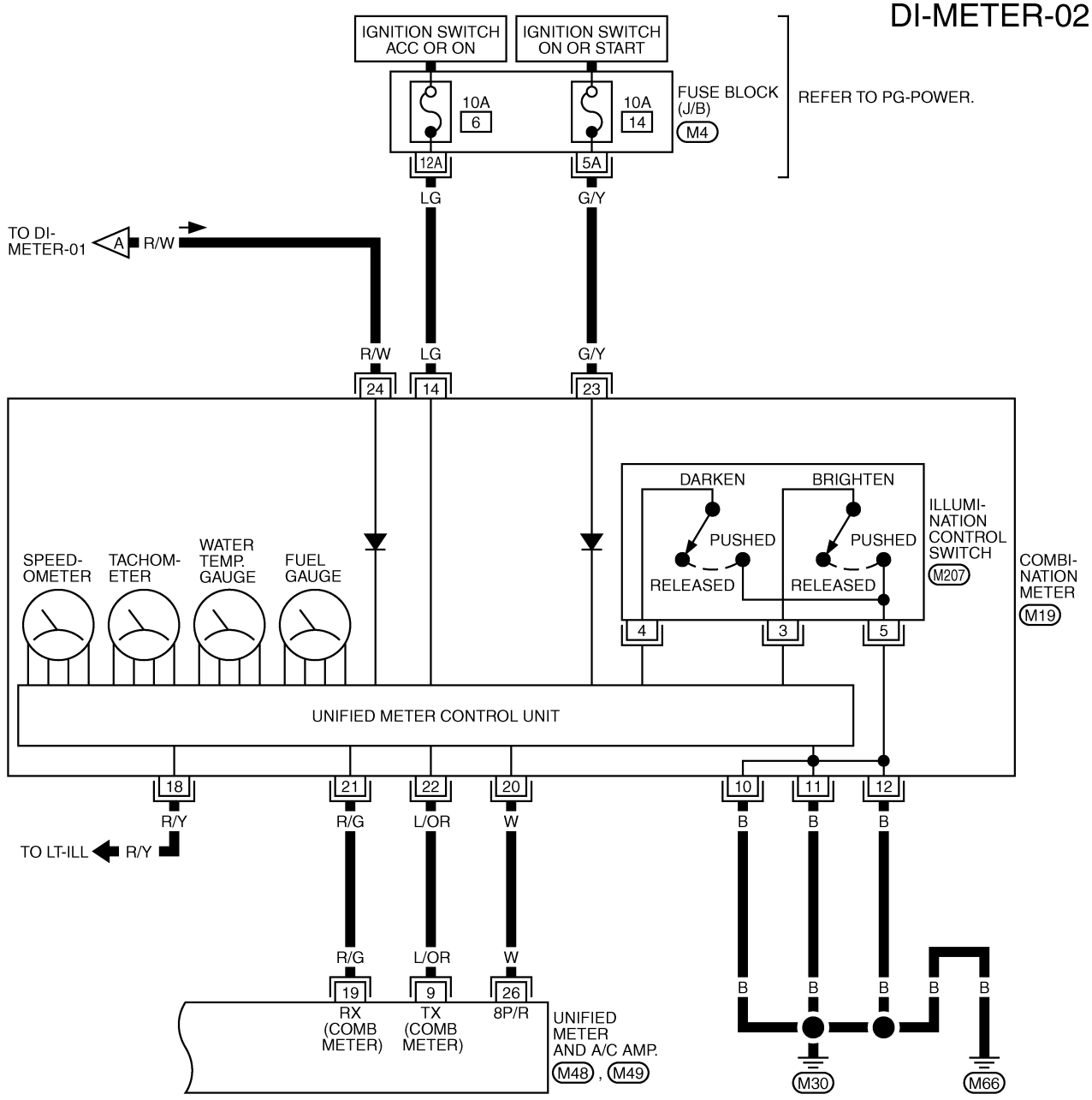


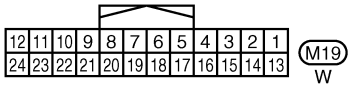


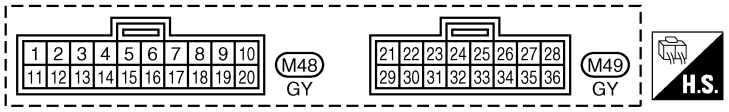
REFER TO THE FOLLOWING.
E108 , F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)
E51 , E118 , F101 -ELECTRICAL UNITS

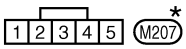
TKWT1752E

DI-METER-02









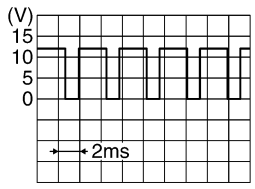
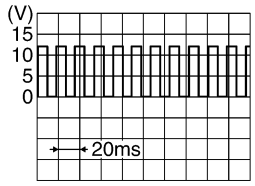
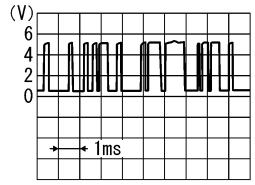
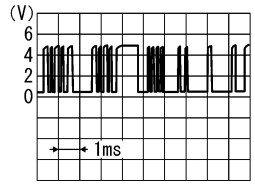
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT0482E

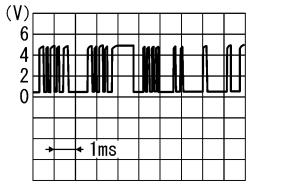
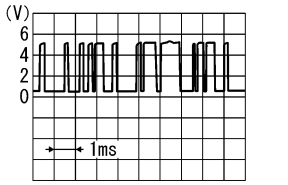
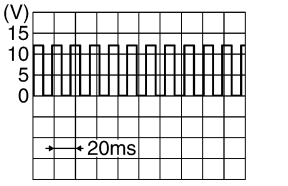
Terminals and Reference Value for Combination Meter

AKS00962

Terminal No.	Wire color	Item	Measuring condition		Reference value (V)
			Ignition switch	Operation or condition	
10	B	Ground	ON	—	Approx. 0
11					
12					
14	LG	Ignition switch ACC or ON	ACC	—	Battery voltage
18	R/Y	Illumination signal	ON	Lighting switch ON, then operate the illumination control switch.	<e.g.>When brightness level is midway  PKIA3771E
				Lighting switch OFF	Approx. 0
20	W	Vehicle speed signal (8-pulse)	ON	Speedometer operated. [When vehicle speed is approx. 40km/h (25MPH)]	**NOTE:** Maximum voltage may be 5V due to specifications (connected units).  PKIA1935E
21	R/G	TX communication line (To unified meter and A/C amp.)	ON	—	 SKIA3361E
22	L/OR	RX communication line (From unified meter and A/C amp.)	ON	—	 SKIA3362E
23	G/Y	Ignition switch ON or START	ON	—	Battery voltage
24	R/W	Battery power supply	OFF	—	Battery voltage

Terminals and Reference Value for Unified Meter and A/C Amp.

AKS0093X

Terminal No.	Wire color	Item	Measuring condition		Reference value (V)
			Ignition switch	Operation or condition	
1	L	CAN H	—	—	—
9	L/OR	TX communication line (To combination meter)	ON	—	 SKIA3362E
11	P	CAN L	—	—	—
19	R/G	RX communication line (From combination meter)	ON	—	 SKIA3361E
21	R/W	Battery power supply	OFF	—	Battery voltage
22	Y/G	Ignition switch ON or START	ON	—	Battery voltage
26	W	Vehicle speed signal (8-pulse)	ON	Speedometer operated. [When vehicle speed is approx. 40km/h (25MPH)]	**NOTE:** Maximum voltage may be 5V due to specifications (connected units).  PKIA1935E
28	W/B	Fuel level sensor signal	—	—	Refer to DI-27, "FUEL LEVEL SENSOR UNIT CHECK" .
29	B	Ground (For power)	ON	—	Approx. 0
30	B	Ground	ON	—	Approx. 0
36	R/B	Fuel level sensor ground	ON	—	Approx. 0
46	L/W	Ignition switch ACC or ON	ACC	—	Battery voltage

Meter/Gauges Operation and Odo/Trip Meter

AKS0093Y

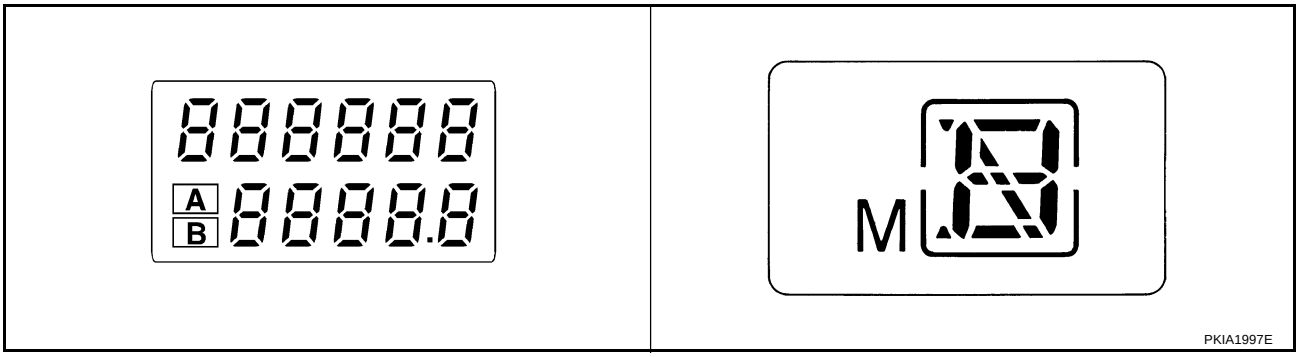
SELF-DIAGNOSIS FUNCTION

- Odo/trip meter segment and A/T indicator segment operation can be checked in self-diagnosis mode.
- Meters/gauges can be checked in self-diagnosis mode.

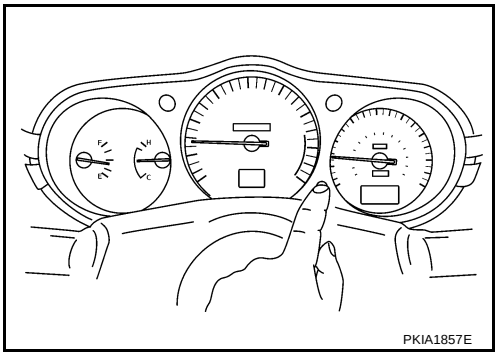
HOW TO ALTERNATE DIAGNOSIS MODE

1. Turn ignition switch ON, and switch the odo/trip meter to “trip A” or “trip B”.

   NOTE:
   If the diagnosis function is activated with the trip meter A displayed, the mileage on the trip meter A will indicate 0000.0, but the actual trip mileage will be retained. (The same way for trip B.)
2. Turn ignition switch OFF.
3. While pushing the odo/trip meter switch, turn ignition switch ON again.
4. Confirm that the trip meter displays “0000.0”.
5. Push the odo/trip meter switch at least 3 times. (Within 7 seconds after the ignition switch is turned ON.)
6. All the segments on the odo/trip meter and A/T indicator illuminate, and simultaneously the fuel warning lamp indicator illuminates. At this time, the unified meter control unit is turned to diagnosis mode.



7. Push the odo/trip meter switch. Each meter/gauge should indicate as shown in the figure while pushing odo/trip meter switch. (At this time, the low-fuel warning lamp goes off).



CONSULT-II Function

AKS0093Z

Refer to DI-58, "CONSULT-II Function" in “UNIFIED METER AND A/C AMP”.

How to Proceed with Trouble Diagnosis

AKS00940

1. Confirm the symptom or customer complaint.
2. Perform diagnosis according to diagnosis flow. Refer to DI-14, "Diagnosis Flow" .
3. According to the symptom chart, repair or replace the cause of the symptom.
4. Does the meter operate normally? If so, go to 5. If not, go to 2.
5. INSPECTION END

Diagnosis Flow

AKS00941

1. CHECK SELF-DIAGNOSTIC RESULTS OF UNIFIED METER AND A/C AMP.

Select “METER A/C AMP” on CONSULT-II, and then perform self-diagnosis of unified meter and A/C amp. Refer to DI-58, "CONSULT-II Function" .

Self-diagnostic results content

No malfunction detected>>GO TO 2.
Malfunction detected>> Go to DI-17, "Symptom Chart 2" .

2. CHECK WARNING LAMP ILLUMINATION

Turn ignition switch ON.

Do warning lamps (such as malfunction indicator lamp and oil pressure warning lamp) illuminate?

YES >> GO TO 3.
NO >> Check power supply circuit of combination meter when ignition switch is ON. Refer to DI-15, "Power Supply and Ground Circuit Inspection" .

3. CHECK SELF-DIAGNOSIS OPERATION OF COMBINATION METER

Perform combination meter self-diagnosis. Refer to DI-13, "HOW TO ALTERNATE DIAGNOSIS MODE" .

Does self-diagnosis function operate?

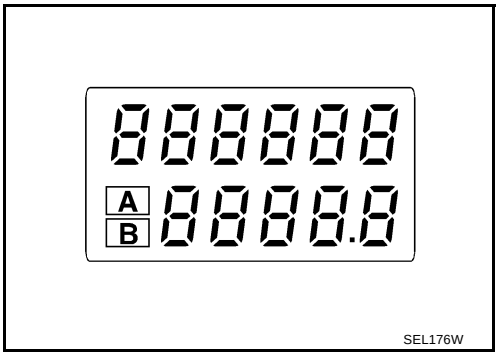
YES >> GO TO 4.
NO >> Check battery power supply circuit and ground circuit of combination meter. Refer to DI-15, "Power Supply and Ground Circuit Inspection" .

4. CHECK ODO/TRIP METER OPERATION

Check segment display status of odo/trip meter.

Is the display normal?

YES >> GO TO 5.
NO >> Replace combination meter.



SEL176W

5. CHECK FUEL WARNING LAMP ILLUMINATION

While checking fuel warning lamp, confirm illumination of fuel warning lamp.

Condition of odo/trip meter switch	Fuel warning lamp
Pushed	Does not illuminate.
Released	Illuminates.

OK or NG

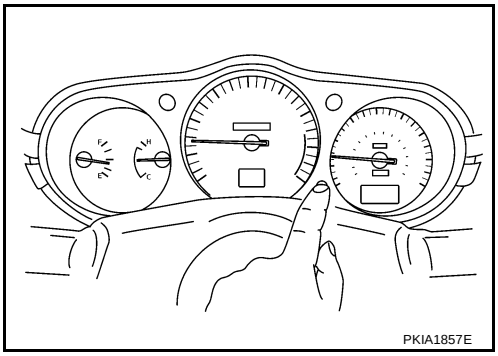
OK >> GO TO 6.
NG >> Replace combination meter.

6. CHECK COMBINATION METER CIRCUIT

Check indication of each meter/gauge in self-diagnosis mode.

OK or NG

OK >> Go to DI-17, "Symptom Chart 1" .
NG >> Replace combination meter.



Power Supply and Ground Circuit Inspection

AKS00942

1. CHECK FUSE

Check for blown combination meter and unified meter and A/C amp. fuses.

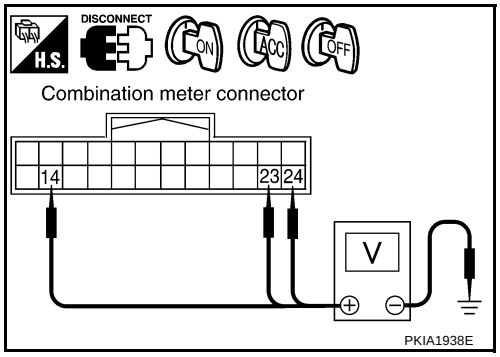
Unit	Power source	Fuse No.
Combination meter	Battery	19
Unified meter and A/C amp.		
Combination meter	Ignition switch ACC or ON	6
	Ignition switch ON or START	14
Unified meter and A/C amp.	Ignition switch ACC or ON	10, 11
	Ignition switch ON or START	12

OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

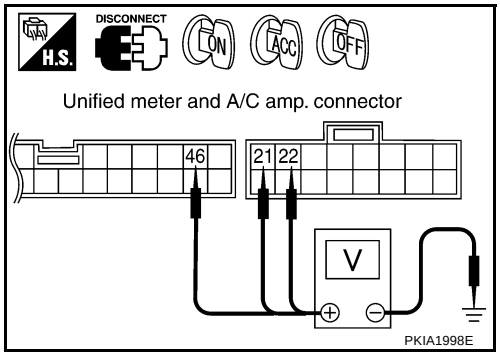
2. CHECK POWER SUPPLY CIRCUIT

1. Disconnect combination meter connector and unified meter and A/C amp. connector.
2. Check voltage between combination meter harness connector terminals and ground.



Terminals			Ignition switch position		
(+)		(–)	OFF	ACC	ON
Connector	Terminal (Wire color)				
M19	24 (R/W)	Ground	Battery voltage	Battery voltage	Battery voltage
	23 (G/Y)		0V	0V	Battery voltage
	14 (LG)		0V	Battery voltage	Battery voltage

3. Check voltage between unified meter and A/C amp. harness connector terminals and ground.



Terminals			Ignition switch position		
(+)		(–)	OFF	ACC	ON
Connector	Terminal (Wire color)				
M49	21 (R/W)	Ground	Battery voltage	Battery voltage	Battery voltage
	22 (Y/G)		0V	0V	Battery voltage
M50	46 (L/W)		0V	Battery voltage	Battery voltage

OK or NG

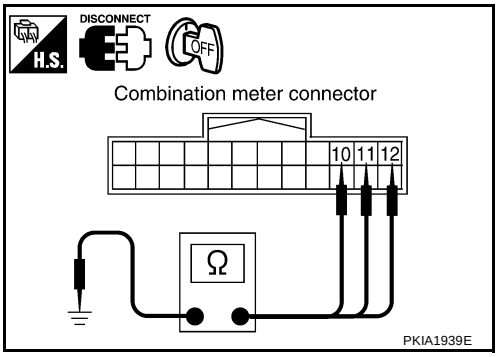
OK >> GO TO 3.
NG >> Check the following.

- Harness for open between combination meter and fuse
- Harness for open between unified meter and A/C amp. and fuse

3. CHECK GROUND CIRCUIT

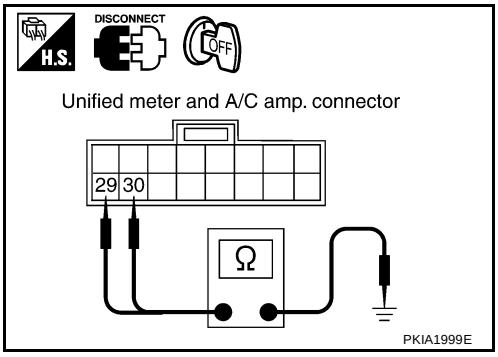
1. Turn ignition switch OFF.
2. Check continuity between combination meter harness connector M19 terminals 10 (B), 11 (B), 12 (B) and ground.

Continuity should exist.



3. Check continuity between unified meter and A/C amp. harness connector M49 terminals 29 (B), 30 (B) and ground.

Continuity should exist.



OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

Symptom Chart 1

AKS00943

Trouble phenomenon	Possible cause
Indication is irregular for the speedometer and odo/trip meter.	Refer to DI-18, "Vehicle Speed Signal Inspection" .
Tachometer indication is malfunction.	Refer to DI-19, "Engine Speed Signal Inspection" .
Water temperature gauge indication is malfunction.	Refer to DI-20, "Engine Coolant Temperature Signal Inspection" .
Fuel gauge indication is malfunction.	Refer to DI-21, "Fuel Level Sensor Signal Inspection" .
Low-fuel warning lamp indication is irregular.	
Indications are irregular for more than one gauge.	Replace combination meter.
A/T position indicator is malfunction.	Refer to DI-76, "A/T Indicator Is Malfunction" .
Illumination control does not operate.	Refer to DI-25, "Illumination Control Switch Inspection" .

Symptom Chart 2

AKS00944

Displayed item [Code]	Inspection contents	Possible cause
CAN COMM CIRC [U1000]	Inspect the CAN communication.	Refer to DI-22, "CAN Communication System Inspection" . **CAUTION:** **Even when there is no malfunction on CAN communication system, malfunction may be misinterpreted when battery has low voltage (when maintaining 7-8V for about 2 seconds) or 10A fuse [No. 19, located in the fuse block (J/B)] fuse is disconnected.**
T/METER COMM CIRC [B2201]	Inspect the communication line between triple meter and unified meter and A/C amp.	Refer to DI-50, "Communication Line Inspection" in “TRIPLE METERS”.

Displayed item [Code]	Inspection contents	Possible cause
METER COMM CIRC [B2202]	Inspect the communication line between combination meter and unified meter and A/C amp.	Refer to DI-23, "Communication Line Inspection" .
VEHICLE SPEED CIRC [B2205]	Inspect the vehicle speed input signal.	Perform the following self-diagnosis. ● VDC/TCS/ABS control unit [with VDS system]; refer to BRC-108, "CONSULT-II Functions" . ● ABS actuator and electric unit (control unit) [without VDC system]; refer to BRC-61, "CONSULT- II Functions" (with TCS) or BRC-19, "CONSULT- II Functions" (without TCS). Replace unified meter and A/C amp. if the above system is normal. **CAUTION:** **Even when there is no malfunction on speed signal system, malfunction may be misinterpreted when battery has low voltage (when maintaining 7-8V for about 2 seconds).**

Vehicle Speed Signal Inspection

AKS00945

1. CHECK VDC/TCS/ABS CONTROL UNIT OR ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Perform the following self-diagnosis.

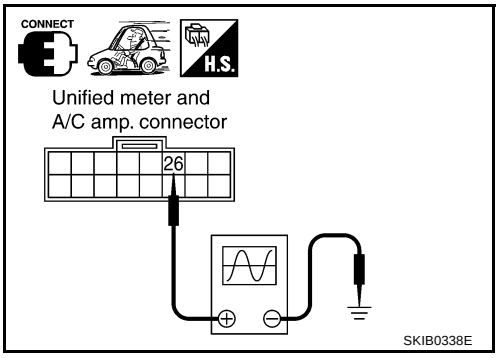
- VDC/TCS/ABS control unit [with VDC system]; refer to BRC-108, "CONSULT-II Functions" .
- ABS actuator and electric unit (control unit) [without VDC system]; refer to BRC-61, "CONSULT- II Functions" (with TCS) or BRC-19, "CONSULT- II Functions" (without TCS).

Self-diagnostic results content

No malfunction detected>>GO TO 2.
Malfunction detected>>Check applicable parts, and repair or replace corresponding parts.

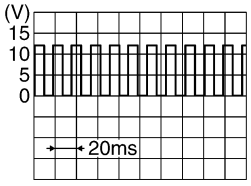
2. CHECK UNIFIED METER AND A/C AMP. OUTPUT SIGNAL

1. Start engine and drive vehicle at approximately 40km/h (25MPH).
2. Check voltage signal between unified meter and A/C amp. harness connector M49 terminal 26 (W) and ground with simple oscilloscope of CONSULT-II.



NOTE:
Maximum voltage may be 5V due to specifications (connected units).

26 (W) - Ground:



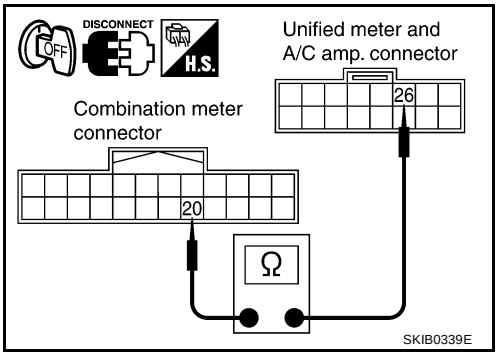
OK or NG

OK >> GO TO 3.
NG-1 >> If monitor indicates “0V” constantly, repair harness or connector.
NG-2 >> If monitor indicates “5V” or “12V” constantly, replace unified meter and A/C amp. Refer to DI-61, "Removal and Installation of Unified Meter and A/C Amp." .

3. CHECK CONTINUITY BETWEEN COMBINATION METER AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect combination meter connector and unified meter and A/C amp. connector.
3. Check continuity between combination meter harness connector M19 terminal 20 (W) and unified meter and A/C amp. harness connector M49 terminal 26 (W).

Continuity should exist.



OK or NG

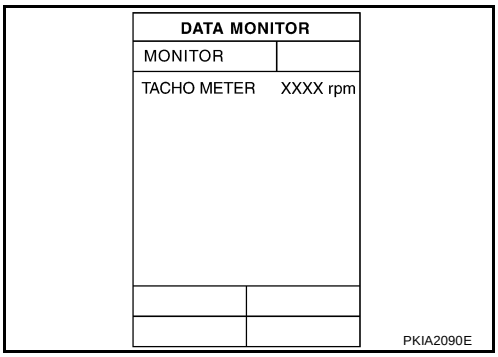
OK >> Replace combination meter.
NG >> Repair harness or connector.

Engine Speed Signal Inspection

AKS00946

1. CHECK UNIFIED METER AND A/C AMP. OUTPUT SIGNAL

1. Start engine and select “METER A/C AMP” on CONSULT-II.
2. Using “TACHO METER” on “DATA MONITOR”, compare the value of “DATA MONITOR” with tachometer pointer of combination meter.

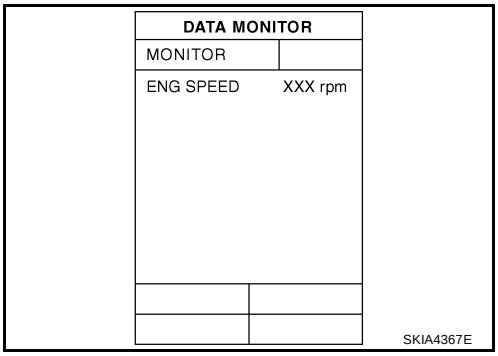


OK or NG

OK >> GO TO 2.
NG >> Replace combination meter.

2. CHECK UNIFIED METER AND A/C AMP. INPUT SIGNAL

1. Select “ENGINE” on CONSULT-II.
2. Using “ENG SPEED” on “DATA MONITOR”, print out the CONSULT-II screen when the engine is idling.
3. Select “METER A/C AMP” on CONSULT-II.
4. Using “TACHO METER” on “DATA MONITOR”, compare the value of “DATA MONITOR” of the idling speed with that of the “ENG SPEED”.



OK or NG

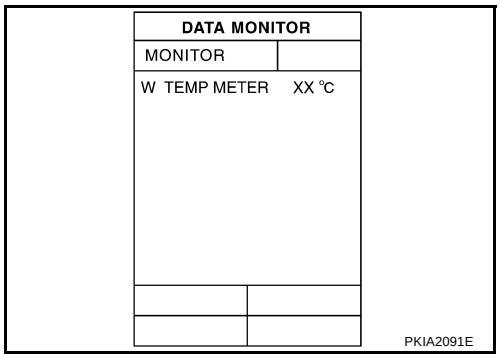
OK >> Perform ECM self-diagnosis. Refer to EC-104, "CONSULT-II Function" .
NG >> Replace unified meter and A/C amp. Refer to DI-61, "Removal and Installation of Unified Meter and A/C Amp." .

Engine Coolant Temperature Signal Inspection

AKS00947

1. CHECK UNIFIED METER AND A/C AMP. OUTPUT SIGNAL

1. Start engine and select “METER A/C AMP” on CONSULT-II.
2. Using “W TEMP METER” on the “DATA MONITOR”, compare the value of “DATA MONITOR” with water temperature gauge pointer of combination meter.



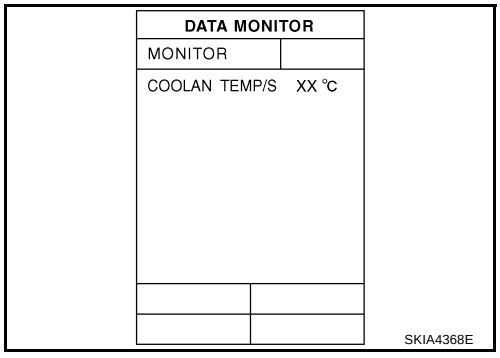
Water temperature gauge pointer	Reference value of data monitor [°C (°F)]
Hot	Approx. 130 (266)
Middle	Approx. 70-105 (158 - 221)
Cold	Approx. 50 (122)

OK or NG

OK >> GO TO 2.
NG >> Replace combination meter.

2. CHECK UNIFIED METER AND A/C AMP. INPUT SIGNAL

1. Select “ENGINE” on CONSULT-II.
2. Using “COOLAN TEMP/S” on “DATA MONITOR”, print out the CONSULT-II screen.
3. Select “METER A/C AMP” on CONSULT-II.
4. Using “W TEMP METER” on, compare the value of “DATA MONITOR” with that of the “COOLAN TEMP/S”.



OK or NG

OK >> Perform ECM self-diagnosis. Refer to EC-104, "CONSULT-II Function" .
NG >> Replace unified meter and A/C amp. Refer to DI-61, "Removal and Installation of Unified Meter and A/C Amp." .

Fuel Level Sensor Signal Inspection

AKS00948

The following symptoms do not indicate a malfunction.

FUEL GAUGE

- Depending on vehicle position or driving circumstance, the fuel in the tank flows and the pointer may fluctuate.
- If the vehicle is fueled with the ignition switch ON, the pointer will move slowly.

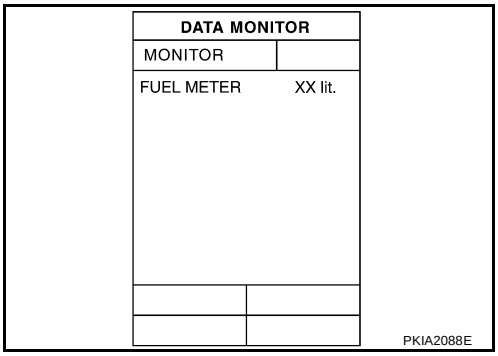
LOW-FUEL WARNING LAMP

- Depending on vehicle position or driving circumstance, the fuel in the tank flows and the warning lamp ON timing may change.

1. CHECK UNIFIED METER AND A/C AMP. INPUT SIGNAL

1. Select “METER A/C AMP” on CONSULT-II.
2. Using “FUEL METER” on “DATA MONITOR”, compare the value of “DATA MONITOR” with fuel gauge pointer of combination meter.

Fuel gauge indication	Value on monitor [lit.]
Full	Approx. 74
Three quarters	Approx. 61
Half	Approx. 42
A quarter	Approx. 22
Empty	Approx. 8



OK or NG

OK >> GO TO 2.
NG >> Replace combination meter.

2. CHECK FUEL LEVEL SENSOR

1. Turn ignition switch OFF.
2. Check components. Refer to DI-27, "FUEL LEVEL SENSOR UNIT CHECK" .

OK or NG

OK >> GO TO 3.
NG >> Replace fuel level sensor unit.

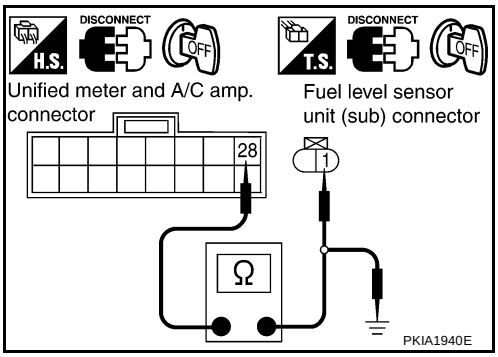
3. CHECK FUEL LEVEL SENSOR (SUB) CIRCUIT

1. Disconnect unified meter and A/C amp. connector and fuel level sensor unit (sub) connector.
2. Check continuity between unified meter and A/C amp. harness connector M49 terminal 28 (W/B) and fuel level sensor unit (sub) harness connector B28 terminal 1 (W/B).

Continuity should exist.

3. Check continuity between unified meter and A/C amp. harness connector M49 terminal 28 (W/B) and ground.

Continuity should not exist.



OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

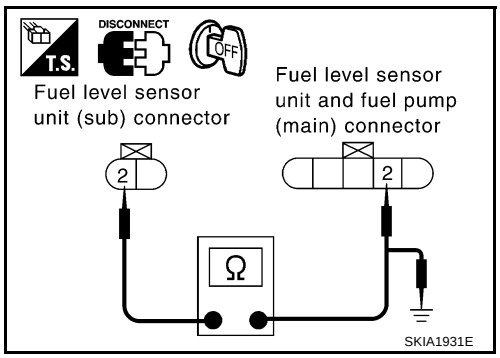
4. CHECK FUEL LEVEL SENSOR (MAIN·SUB) CIRCUIT

1. Disconnect fuel level sensor unit and fuel pump (main) connector.
2. Check continuity between fuel level sensor unit (sub) harness connector B28 terminal 2 (Y) and fuel level sensor unit and fuel pump (main) harness connector B27 terminal 2 (Y).

Continuity should exist.

3. Check continuity between fuel level sensor unit (sub) harness connector B28 terminal 2 (Y) and ground.

Continuity should not exist.



OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

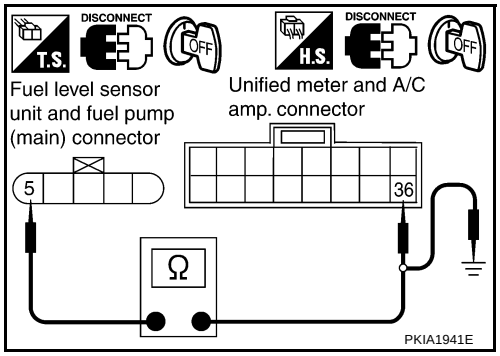
5. CHECK FUEL LEVEL SENSOR (MAIN) CIRCUIT

1. Check continuity between fuel level sensor unit and fuel pump (main) harness connector B27 terminal 5 (B/R) and unified meter and A/C amp. harness connector M49 terminal 36 (R/B).

Continuity should exist.

2. Check continuity between fuel level sensor unit and fuel pump (main) harness connector B27 terminal 5 (B/R) and ground.

Continuity should not exist.



OK or NG

OK >> GO TO 6.
NG >> Repair harness or connector.

6. CHECK INSTALLATION CONDITION

Check fuel level sensor unit installation, and check whether the float arm interferes or binds with any of the internal components in the fuel tank.

OK or NG

OK >> Replace unified meter and A/C amp. Refer to DI-61, "Removal and Installation of Unified Meter and A/C Amp." .
NG >> Install the fuel level sensor unit properly.

CAN Communication System Inspection

AKS00BRC

1. CHECK CAN COMMUNICATION

1. Select “SELF-DIAG RESULTS” mode for “METER A/C AMP” with CONSULT-II.
2. Print out CONSULT-II screen.

>> Go to “CAN system”. Refer to LAN-3, "Precautions When Using CONSULT-II" .

Communication Line Inspection

AKS0094C

1. CHECK CONNECTOR

Check combination meter, unified meter and A/C amp. and terminals (combination meter-side, unified meter and A/C amp.-side, and harness-side) for looseness or bent terminals.

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CHECK METER/GAUGES VISUALLY

Does the pointer on the meter/gauges fluctuate at the engine start?

Is the fluctuation acceptable?

YES >> GO TO 3.
NO >> GO TO 6.

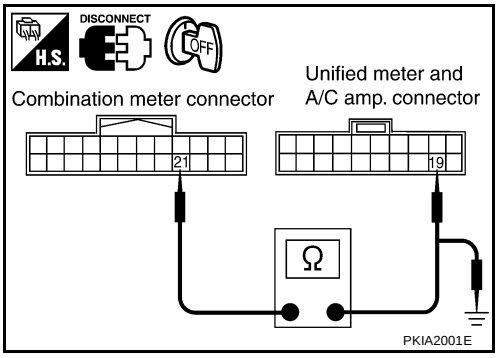
3. CHECK CONTINUITY COMMUNICATION CIRCUIT (TX: COMBINATION METER)

1. Turn ignition switch OFF.
2. Disconnect combination meter connector and unified meter and A/C amp. connector.
3. Check continuity between combination meter harness connector M19 terminal 21 (R/G) and unified meter and A/C amp. harness connector M48 terminal 19 (R/G).

   Continuity should exist.

4. Check continuity between combination meter harness connector M19 terminal 21 (R/G) and ground.

   Continuity should not exist.



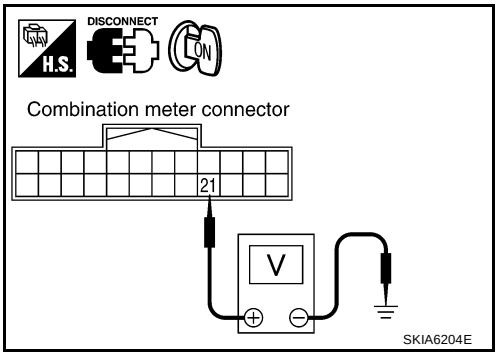
OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK VOLTAGE OF UNIFIED METER AND A/C AMP.

1. Connect unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Check voltage between combination meter harness connector M19 terminal 21 (R/G) and ground.

   Approx. 5V

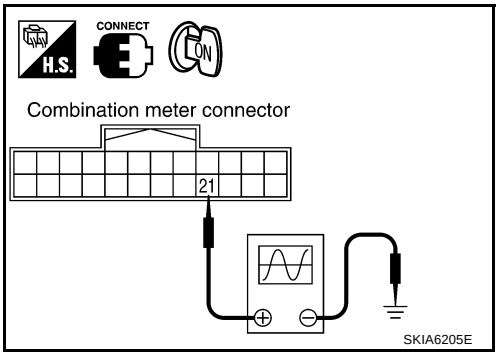


OK or NG

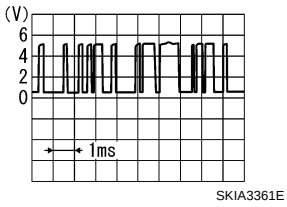
OK >> GO TO 5.
NG >> Replace unified meter and A/C amp. Refer to DI-61, "Removal and Installation of Unified Meter and A/C Amp." .

5. CHECK VOLTAGE SIGNAL OF COMBINATION METER

1. Turn ignition switch OFF and connect combination meter connector.
2. Turn ignition switch ON.
3. Check voltage signal between combination meter harness connector M19 terminal 21 (R/G) and ground with simple oscilloscope of CONSULT-II.



21 (R/G) - Ground:



OK or NG

OK >> Replace unified meter and A/C amp. Refer to DI-61, "Removal and Installation of Unified Meter and A/C Amp." .

NG >> Replace combination meter.

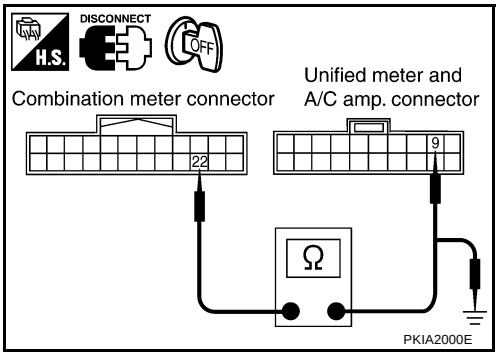
6. CHECK CONTINUITY COMMUNICATION CIRCUIT (RX: COMBINATION METER)

1. Turn ignition switch OFF.
2. Disconnect combination meter connector and unified meter and A/C amp. connector.
3. Check continuity between combination meter harness connector M19 terminal 22 (L/OR) and unified meter and A/C amp. harness connector M48 terminal 9 (L/OR).

Continuity should exist.

4. Check continuity between combination meter harness connector M19 terminal 22 (L/OR) and ground.

Continuity should not exist.



OK or NG

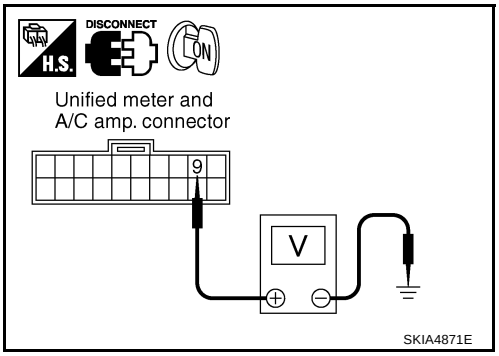
OK >> GO TO 7.

NG >> Repair harness or connector.

7. CHECK VOLTAGE OF COMBINATION METER

1. Connect combination meter connector.
2. Turn ignition switch ON.
3. Check voltage between unified meter and A/C amp. harness connector M48 terminal 9 (L/OR) and ground.

Approx. 5V



OK or NG

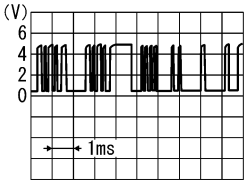
OK >> GO TO 8.

NG >> Replace combination meter.

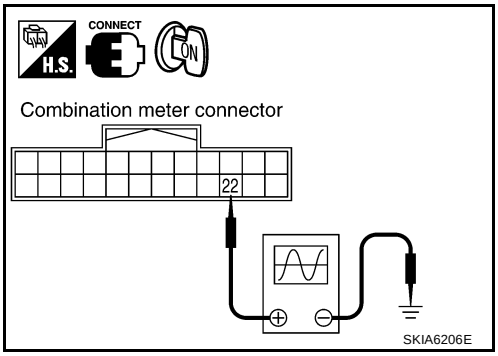
8. CHECK VOLTAGE SIGNAL OF UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF and connect unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Check voltage signal between combination meter harness connector M19 terminal 22 (L/OR) and ground with simple oscilloscope of CONSULT-II.

22 (L/OR) - Ground:



SKIA3362E



SKIA6206E

OK or NG

OK >> Replace combination meter.
NG >> Replace unified meter and A/C amp. Refer to DI-61, "Removal and Installation of Unified Meter and A/C Amp." .

Illumination Control Switch Inspection

AKS0094E

1. CHECK CONNECTOR

1. Remove combination meter. Refer to DI-28, "Removal and Installation for Combination Meter" .
2. Remove rear finisher to combination meter. Refer to DI-28, "Disassembly and Assembly for Combination Meter" .
3. Check illumination control switch connector for looseness.

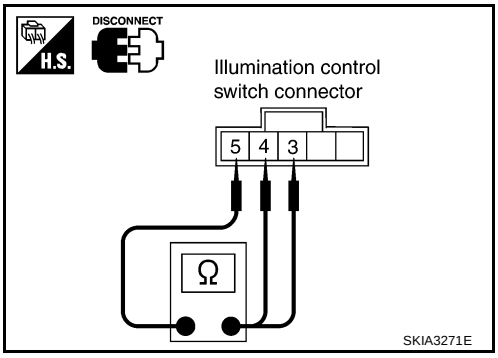
OK or NG

OK >> GO TO 2.
NG >> Repair illumination control switch connector.

2. CHECK ILLUMINATION CONTROL SWITCH

1. Disconnect illumination control switch connector.
2. Check continuity between illumination control switch harness connector M207 terminals 3 or 4 and 5.

Terminal		Condition	Continuity
3	5	Illumination control switch upper side (BRIGHTEN) is pushed.	Yes
		Illumination control switch upper side (BRIGHTEN) is released.	No
4	5	Illumination control switch lower side (DARKEN) is pushed.	Yes
		Illumination control switch lower side (DARKEN) is released.	No



SKIA3271E

OK or NG

OK >> Replace combination meter.
NG >> Replace illumination control switch.

Fuel Gauge Pointer Fluctuates, Indicator Wrong Value or Varies

AKS0094F

1. CHECK FUEL GAUGE FLUCTUATION

Test drive vehicle to see if gauge fluctuates only during driving or at the instant of stopping.

Does the indication value vary only during driving or at the instant of stopping?

YES >> The pointer fluctuation may be caused by fuel level change in the fuel tank. Condition is normal.
NO >> Ask the customer about the situation when the symptom occurs in detail, and perform the trouble diagnosis. Refer to DI-14, "How to Proceed with Trouble Diagnosis" .

Fuel Gauge Does Not Move to FULL Position

AKS0094G

1. QUESTION 1

Does it take a long time for the pointer to move to FULL position?

YES >> GO TO 2.
NO >> GO TO 3.

2. QUESTION 2

Was the vehicle fueled with the ignition switch ON?

YES >> Be sure to fuel the vehicle with the ignition switch OFF. Otherwise, it will take a long time to move to FULL position because of the characteristic of the fuel gauge.
NO >> GO TO 3.

3. QUESTION 3

Is the vehicle parked on an incline?

YES >> Check the fuel level indication with vehicle on a level surface.
NO >> GO TO 4.

4. QUESTION 4

During driving, does the fuel gauge pointer move gradually toward EMPTY position?

YES >> Check the fuel level sensor unit. Refer to DI-27, "FUEL LEVEL SENSOR UNIT CHECK" .
NO >> The float arm may interfere or bind with any of the components in the fuel tank.

Electrical Components Inspection

AKS0094H

FUEL LEVEL SENSOR UNIT CHECK

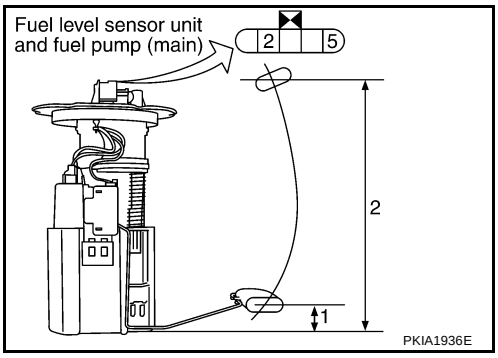
For removal, refer to FL-4, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY" .

Check Fuel Level Sensor Unit and Fuel Pump (Main)

1. Check the resistance between terminals 2 and 5.

Terminal		Float position mm (in)			Resistance value Ω
2	5	*1	Empty	30 (1.18)	Approx. 80
		*2	Full	210 (8.27)	Approx. 3

*1 and *2: When float rod is in contact with stopper.

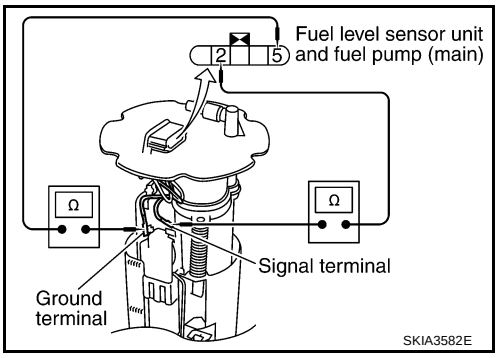


2. If the results of check is NG, perform check the fuel level sensor unit and fuel pump (main) harness. Refer to DI-27, "Check Fuel Level Sensor Unit and Pump (Main) Harness" .

Check Fuel Level Sensor Unit and Pump (Main) Harness

1. Check the continuity following terminals.

Terminal	Continuity
2 - Signal terminal	Yes
5 - Ground terminal	



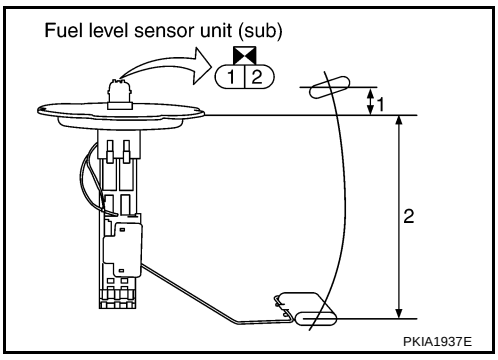
2. If the results of check is NG, replace fuel pump assembly. If the results of check is OK, replace fuel level sensor unit.

Check Fuel Level Sensor Unit (Sub)

Check the resistance between terminals 1 and 2.

Terminal		Float position mm (in)			Resistance value Ω
1	2	*1	Full	8 (0.31)	Approx. 3
		*2	Empty	175 (6.89)	Approx. 43

*1 and *2: When float rod is in contact with stopper.

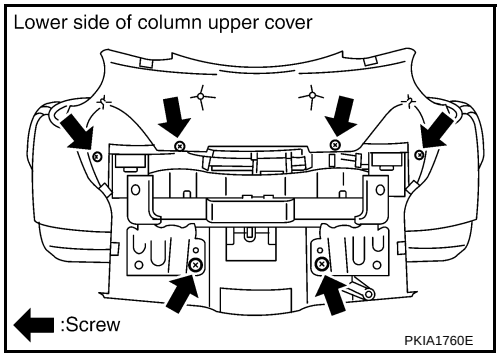


Removal and Installation for Combination Meter

AKS0094I

REMOVAL

1. Remove instrument driver panel lower. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove steering column lower cover. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY"
3. Remove bolts (4) and remove column upper cover and combination meter assembly. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
4. Remove screws (6) and remove combination meter.



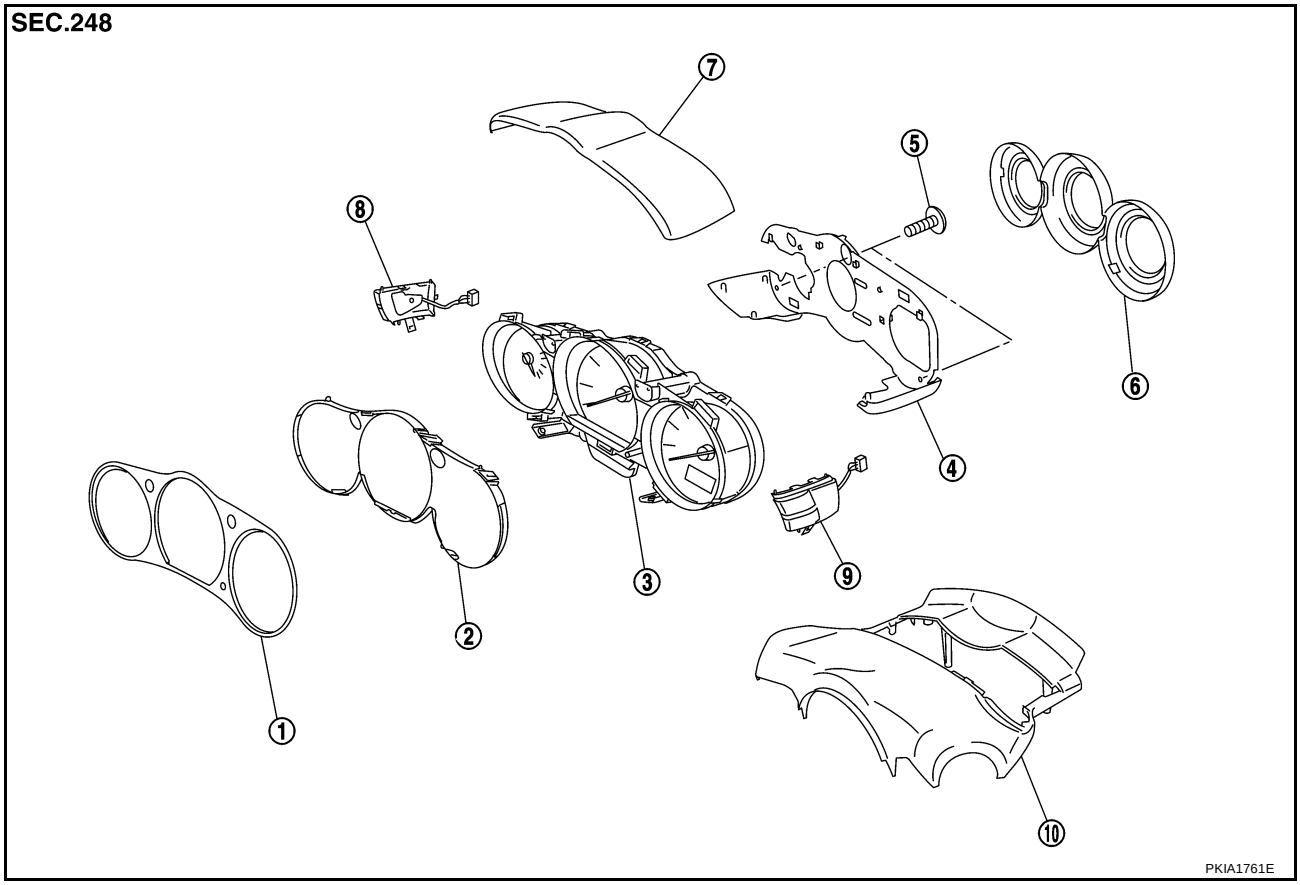
INSTALLATION

Install in the reverse order of removal.

Disassembly and Assembly for Combination Meter

AKS0094J

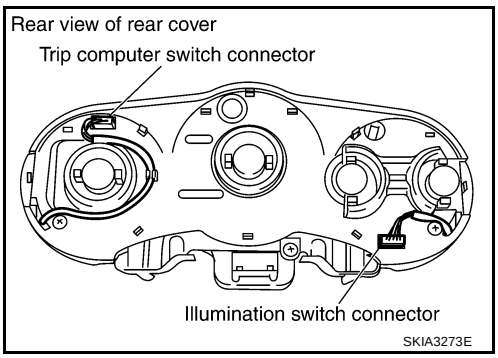
DISASSEMBLY



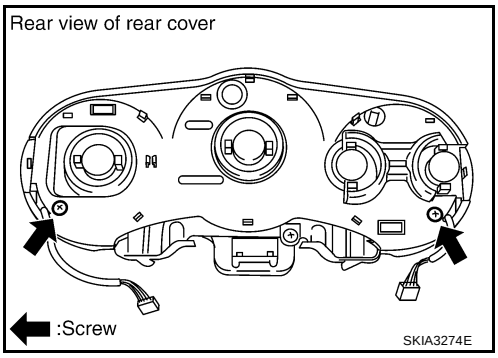
1. Front finisher
2. Front cover
3. Unified meter control unit
4. Rear cover
5. Screws
6. Rear finisher
7. Upper cover
8. Illumination control switch
9. Trip computer switch
10. Steering column upper cover

1. Remove screws (6) to separate steering column upper cover.
2. Disengage tabs (2) to separate front finisher.
3. Disengage tabs (8) to separate rear finisher.

4. Disconnect illumination control switch connector and trip computer switch connector.



5. Remove screws (2) and remove rear cover.



6. Disengage tabs (4) to separate upper cover from rear cover.
7. Remove illumination control switch.
8. Remove trip computer switch.
9. Disengage tabs (7) to separate front cover.

ASSEMBLY

Assemble in reverse order of disassembly.

TRIPLE METERS

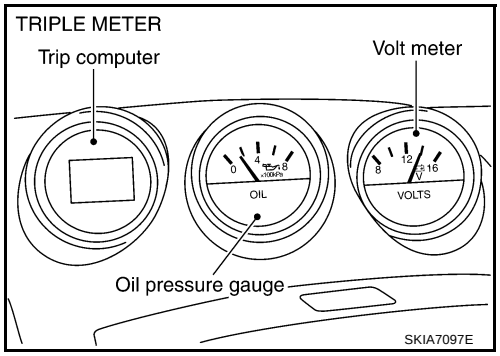
PFP:24845

System Description

AKS0094K

TRIPLE METER

- Oil pressure gauge and voltmeter are controlled by the triple meter.
- Trip computer are controlled by signals from the unified meter and A/C amp.
- Trip computer segment can be checked in self-diagnosis mode of combination meter.
- Meters/gauges can be checked in self-diagnosis mode of combination meter.



POWER SUPPLY AND GROUND CIRCUIT

Power is supplied at all times

- through 10A fuse [No. 19, located in the fuse block (J/B)]
- to triple meter terminal 2,
- to combination meter terminal 24, and
- to unified meter and A/C amp. terminal 21.

With the ignition switch in the ON or START position, power is supplied

- through 10A fuse [No. 14, located in the fuse block (J/B)]
- to triple meter terminal 3, and
- to combination meter terminal 23
- through 10A fuse [No. 12, located in the fuse block (J/B)]
- to unified meter and A/C amp. terminal 22.

With the ignition switch in the ACC or ON position, power is supplied

- through 15A fuse [No. 10, located in the fuse block (J/B)], and
- through 15A fuse [No. 11, located in the fuse block (J/B)]
- to unified meter and A/C amp. terminal 46.

Ground is supplied

- to triple meter terminal 1
- through body grounds M30 and M66
- to combination meter terminals 10,11 and 12
- through body grounds M30 and M66
- to unified meter and A/C amp. terminals 29 and 30
- through body grounds M30 and M66.

TRIP COMPUTER

Function

The display of the trip computer is situated in the triple meter. When the ignition switch is turned to ON, the display scrolls all the modes of the trip computer and then shows the mode chosen before the ignition switch is turned OFF.
The trip computer can indicate the following items.

- Vehicle speed
- Outside air temperature
- DTE (distance to empty)
- Average fuel consumption
- Average vehicle speed
- Trip time
- Trip distance

- Stopwatch
- Tire pressure
- Shift-up indicator setting

Vehicle Speed Indication

With ignition switch ON or START position, trip computer displays vehicle speed according to vehicle speed signal from unified meter and A/C amp. Unified meter and A/C amp. received this signal from the combination meter.
The vehicle speed indication is displayed in km/h (MPH) while driving.

Outside Air Temperature Indication

With ignition switch ON position, trip computer displays outside air temperature according to signal of outside air temperature from unified meter and A/C amp. Unified meter and A/C amp. receives these signals from outside air temperature sensor.
The outside air temperature is displayed while the ignition switch is in the ON position.
Signal is supplied

- through ambient sensor terminal 1
- to unified meter and A/C amp. terminal 39
- through unified meter and A/C amp. terminal 10
- to triple meter terminal 5.

Indication range is between -30 and 55°C (-22 and 131°F). When outside air temperature is less than -30°C (-22°F) or more than 55°C (131°F), display shows "--". When outside temperature is less than 3°C (37°F) continuously, display will "ICY" indicator illuminate as warning. In this case, the display will change to the outside air temperature mode even though the display is showing a different mode. The "ICY" indicator will continue illuminate as long as the temperature remains below 4°C (39°F).

DTE (Distance to Empty) Indication

With ignition switch ON position, trip computer displays DTE according to signal to DTE from unified meter and A/C amp.
The DTE indication provides the driver with an estimation of the distance that can be driven before refueling. The DTE is calculated by signals from the fuel level sensor unit (fuel remaining), ECM (fuel consumption) and VDC/TCS/ABS control unit or ABS actuator and electric unit (control unit) [vehicle speed].
The indication will be refreshed every 30 seconds. When fuel remaining is less than approximately 10 ℓ (10-5/8 US qt, 8-3/4 Imp qt), the indication will "dte" indicator blink as a warning. If the fuel remaining is less than approximately 8 ℓ (8-1/2 US qt, 7 Imp qt), the indication will show "----". In this case, the display will change to the DTE mode even though the display is showing a different mode. Press trip computer mode switch if you wish to return to the mode that was selected before the warning occurred. The "dte" indicator will remain blinking until the vehicle is refueled. When the battery is disconnected and reconnected, DTE mode will display "----" for 30 seconds.

Average Fuel Consumption Indication

With ignition switch ON position, trip computer displays average fuel consumption according to signal of average fuel consumption from unified meter and A/C amp. Average fuel consumption is calculated by signals from the VDC/TCS/ABS control unit or ABS actuator and electric unit (control unit) [vehicle speed] and the ECM (fuel consumption). The indication will be refreshed every 30 seconds. If average fuel consumption is reset, average vehicle speed will be reset at the same time. At about 1/3 miles (500 m) or for 80 seconds after resetting, the display shows "----".

Average Vehicle Speed Indication

With ignition switch ON position, trip computer displays average vehicle speed according to signal of average vehicle speed from unified meter and A/C amp.
Average vehicle speed indication is calculated by running distance and running time. The indication will be refreshed every 30 seconds. If average vehicle speed is reset, average fuel consumption will be reset at the same time. After resetting, the display will show "----" for 30 seconds.

Trip Time Indication

With ignition switch ON position, trip computer displays trip time according to trip time signal from unified meter and A/C amp.
Trip time displays accumulate ignition switch ON time. If trip time is reset, trip distance will be reset at the same time.

Trip Distance Indication

With ignition switch ON position, trip computer displays trip distance according to trip distance signal from unified meter and A/C amp.
Trip distance is calculated by vehicle speed signal from the VDC/TCS/ABS control unit or ABS actuator and electric unit (control unit) [vehicle speed] with CAN communication line. If trip distance is reset, trip time will be reset at the same time.

Stopwatch Indication

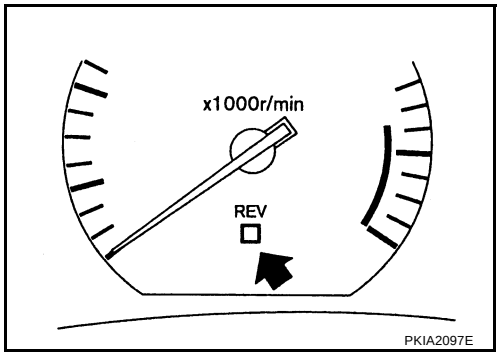
With ignition switch ON position, trip computer displays stopwatch according to trip computer setting switch signal from unified meter and A/C amp.
Stopwatch can be changed in START, STOP or RESET by pressing trip computer setting switch. After 100 hours, the time will start from the reset display again. Even if the display is switched to the other mode while the time is starting, the stopwatch continues to advance until you stop the time in the stopwatch mode. When the ignition switch is turned OFF, the time is reset.

Tire Pressure Indication

With ignition switch ON position, trip computer displays tire pressure according to signals of each tire pressure indication, tire pressure warning and tire pressure irregular from unified meter and A/C amp. Unified meter and A/C amp. receives these signals from tire pressure warning control unit with CAN communication line.

The tire pressure indicator shows tire pressure 0 - 51 psi (0 - 353kPa, 0 - 3.6kg/cm^2) of all wheels (except the spare tire) by sending a signal from a tire pressure sensor that is installed in each wheel. If the tire pressure signal cannot be received correctly, the display shows "----". If the vehicle is being driven with very low tire pressure or a flat tire, the tire pressure indicator mode is automatically selected and "PSI" indicator will blink as warning. When pressing the trip computer mode switch, return to the mode that was selected before the warning occurred. The "PSI" indicator will continue blinking until the tire pressure of each tire is properly adjusted.

Shift-up Indicator Setting Indication



With ignition switch ON position, trip computer displays shift-up indicator setting according to trip computer setting switch signal from unified meter and A/C amp. Shift-up indicator in combination meter is setting according to trip computer setting switch signal from unified meter and A/C amp.
The shift-up indicator setting indication is used to set the desired engine speed (rpm) for the shift-up indicator (situated in the tachometer) to illuminate. When the engine speed approaches or reaches the set figure, the shift-up indicator will flash or illuminate to show the driver the timing for shifting into a higher gear. The shift-up indicator will start flashing when the engine speed is within 500 rpm of the set figure while driving, and then illuminate after the engine speed reaches the set figure. The figure of engine speed can changed between 2,000 and 8,000 rpm by pressing trip computer setting switch. Pressing the trip computer setting switch for less than approximately 1 second will add the figure by 100 rpm. If pressing for more than approximately 1 second, the figure will increase by 500 rpm.

For example, you can use the shift-up indicator when driving as follows:

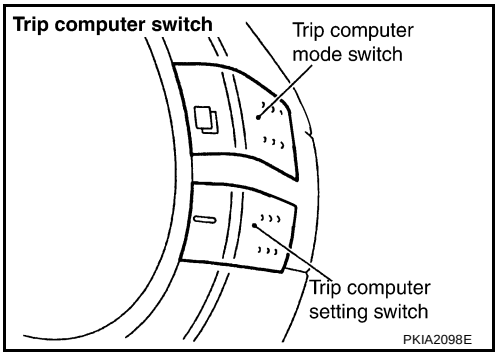
- If the maximum engine speed is desired, set the figure at 6,600 rpm. (The indicator starts flashing from about 6,100 rpm and comes on steady at 6,600 rpm.)
- If the maximum acceleration performance is desired, set the figure at 4,800 rpm. (The indicator starts flashing from about 4,300 rpm and comes on steady at 4,800 rpm.)

NOTE:

- **There may be a lag between the timing of the shift-up indicator illumination and the tachometer indication.**
- **If the battery cable is disconnected, the set engine speed will be returned to the initial figure (6,600 rpm).**
- **This is also available for the purpose of breaking in to the vehicle.**

How to Change/ Reset Indication

When the ignition switch is turned to ON, modes of the trip computer can be selected by pressing trip computer mode switch. The switches for the trip computer are located on the right side of the combination meter. Indication can be changed in the following order by momentarily depressing the trip computer mode switch. Vehicle speed → Outside air temperature → DTE → Average fuel consumption and average vehicle speed → Trip time and trip distance → Stopwatch → Tire pressure → Shift-up indicator setting.
Holding the trip computer setting switch for more than 0.8 second will reset the indication of the currently displayed mode (Average fuel consumption, average vehicle speed, trip time, trip distance or stopwatch).



NOTE:
When the OUTSIDE AIR TEMPERATURE warning, TIRE PRESSURE warning and the DTE warning match warning conditions at the same time, the display automatically indicates the OUTSIDE AIR TEMPERATURE.

OIL PRESSURE GAUGE

The oil pressure gauge indicates engine oil pressure drawn from oil pressure sensor.
With the ignition switch in the ON or START position, power is supplied

- through triple meter terminal 9
- to oil pressure sensor terminal 1.

Ground is supplied

- to triple meter terminal 7
- through oil pressure sensor terminal 3.

And triple meter receives oil pressure signal from oil pressure sensor

- through oil pressure sensor terminal 2
- to triple meter terminal 8.

NOTE:
This gauge is not designed to indicate low oil level. Use the oil level gauge to check the oil level.

VOLTMETER

When the ignition switch is turned to the ON position, the voltmeter indicates the battery voltage drawn from battery, while the engine is running, it indicates the alternator voltage of about 13 to 15 volts.
With the ignition switch in the ON or START position, power is supplied

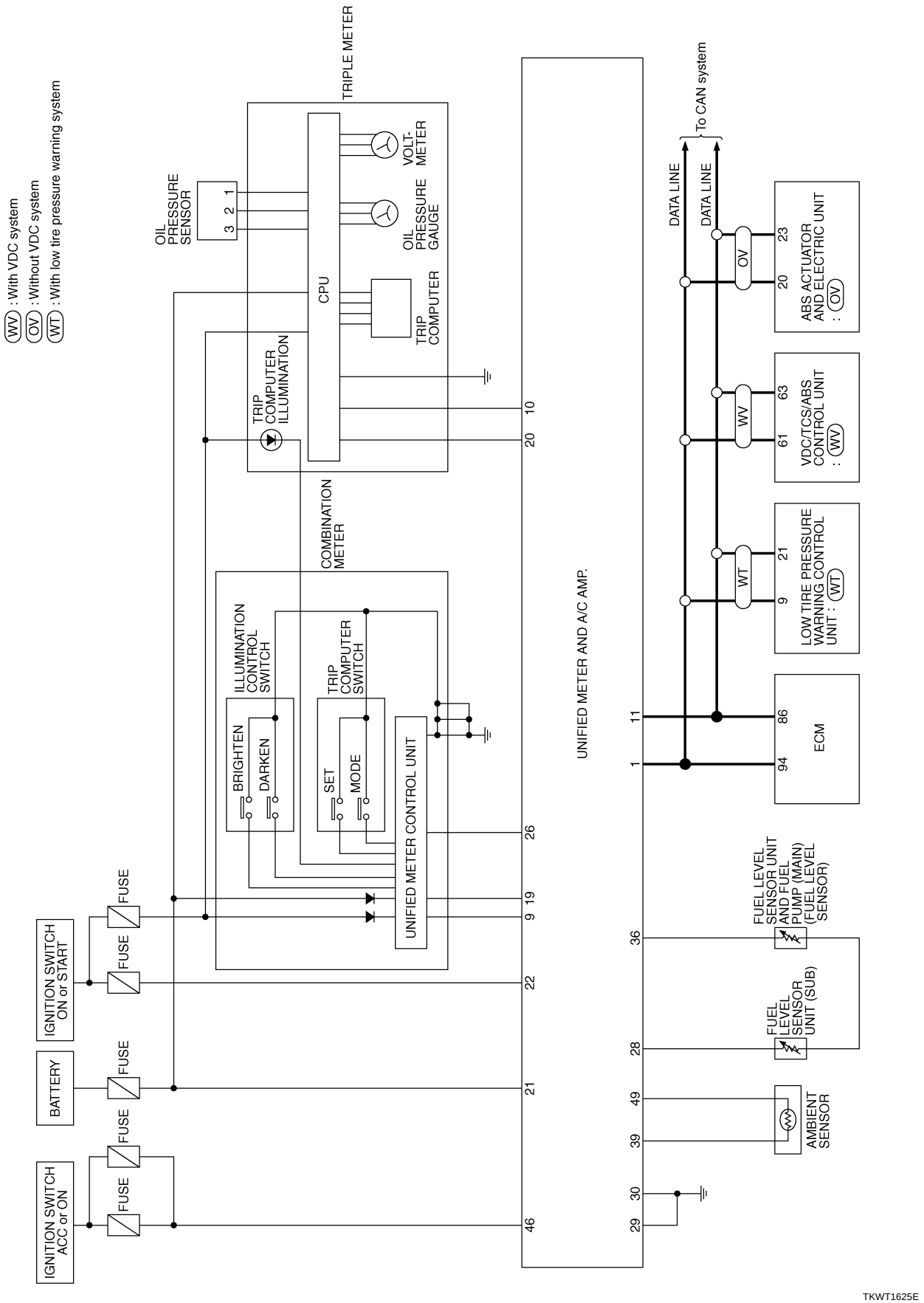
- through 10A fuse [No. 14, located in the fuse block (J/B)]
- to triple meter terminal 3.

Ground is supplied

- to triple meter terminal 1
- through body grounds M30 and M66.

Schematic

AKS0094L

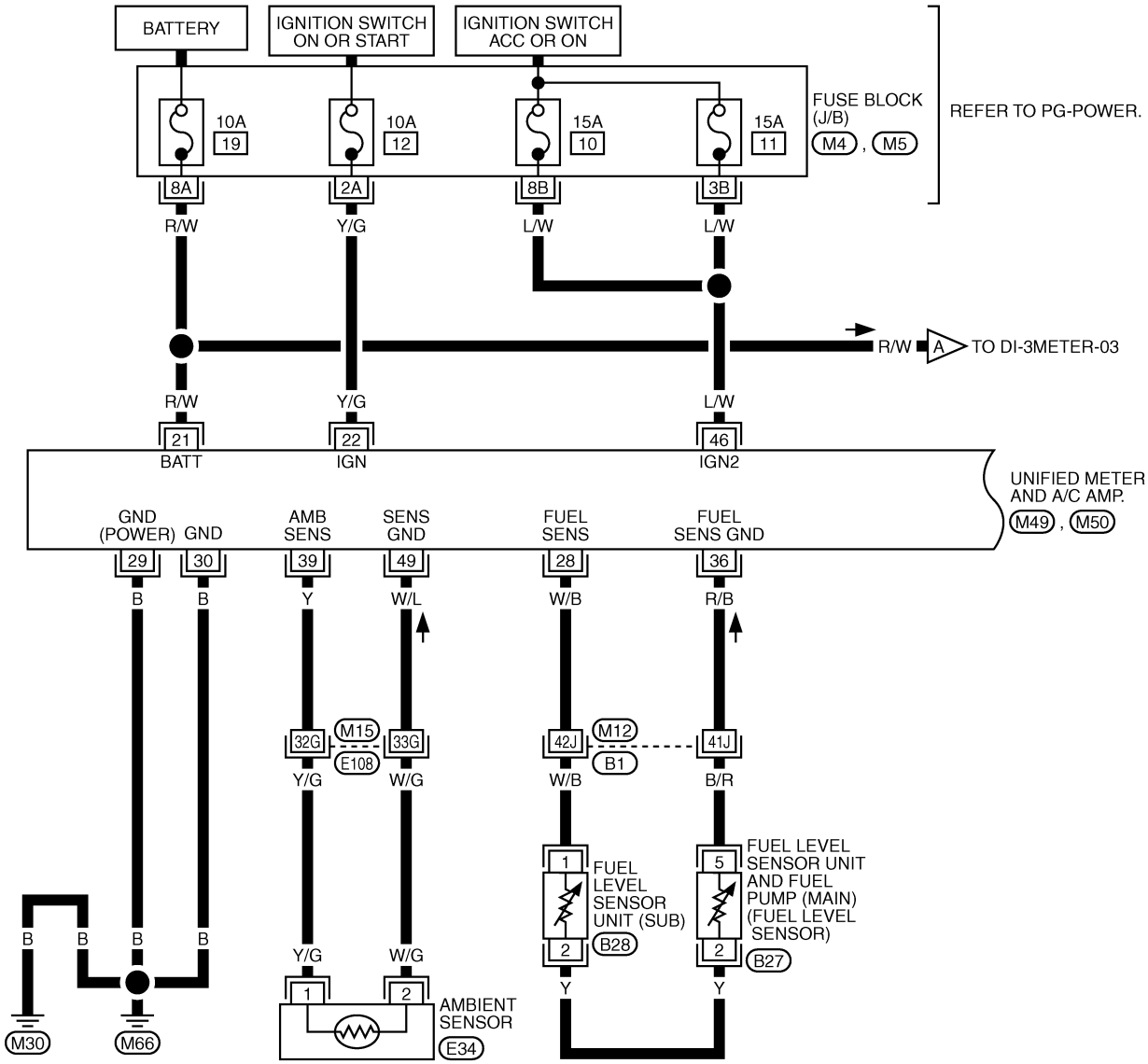


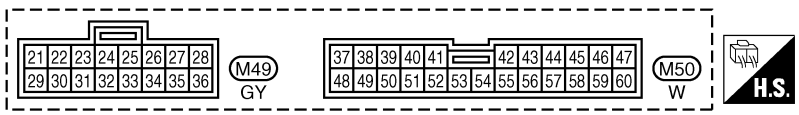
TKWT1625E

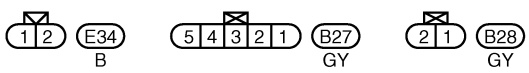
Wiring Diagram — 3METER —

AKS0094M

DI-3METER-01



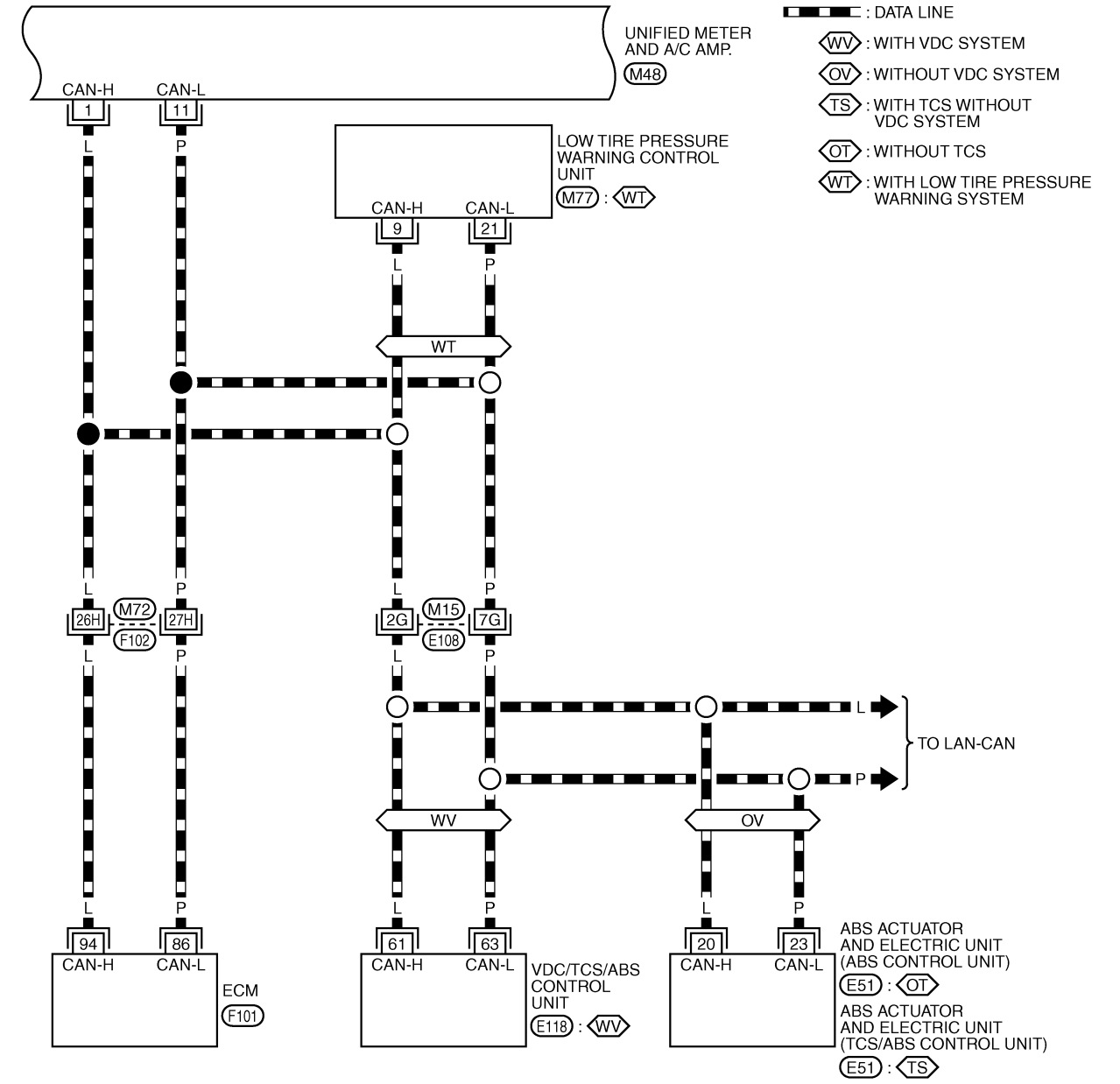


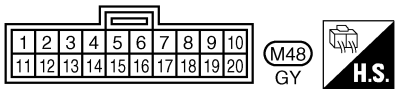


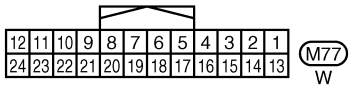
REFER TO THE FOLLOWING.
E108, B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4, M5 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT0497E

DI-3METER-02

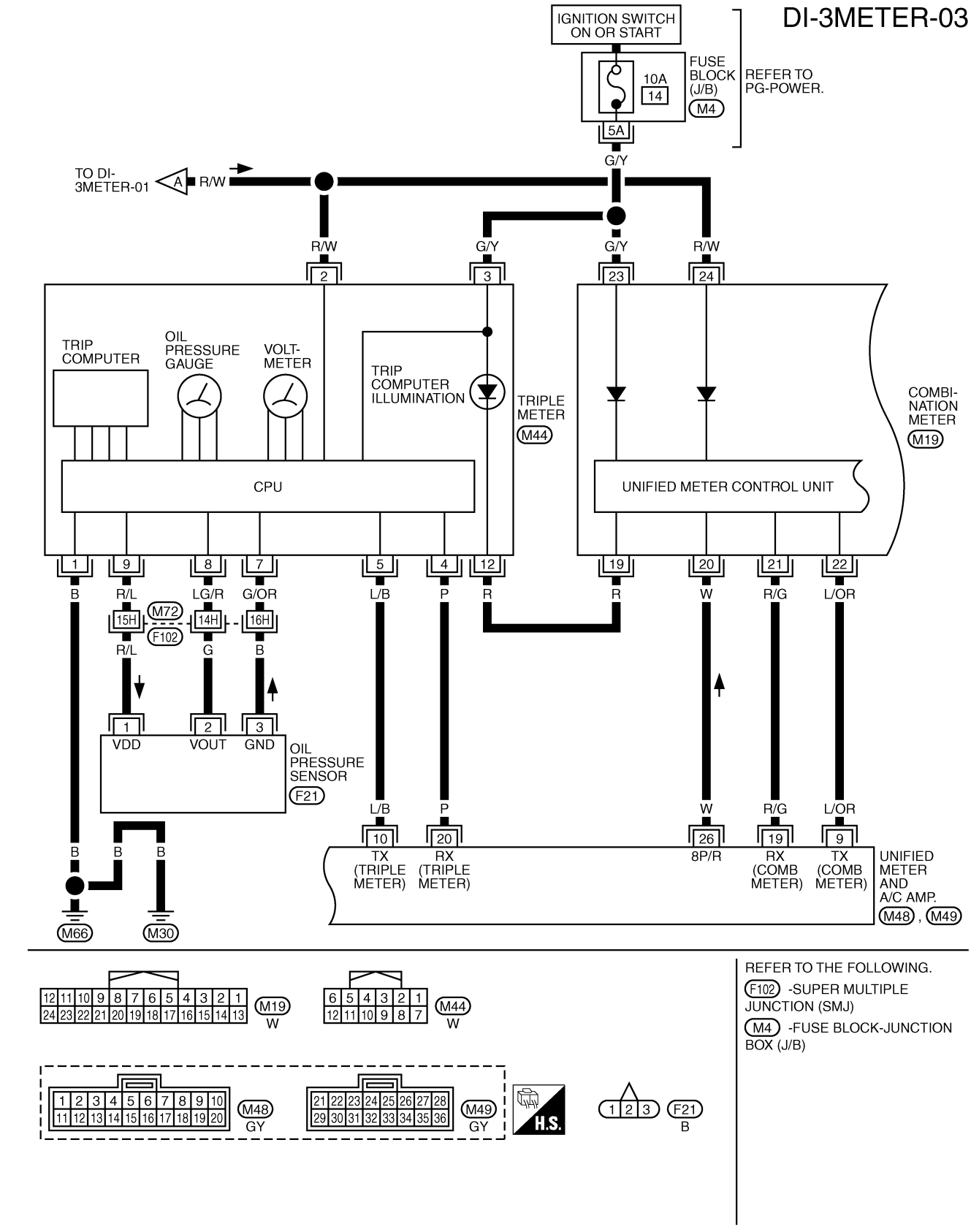






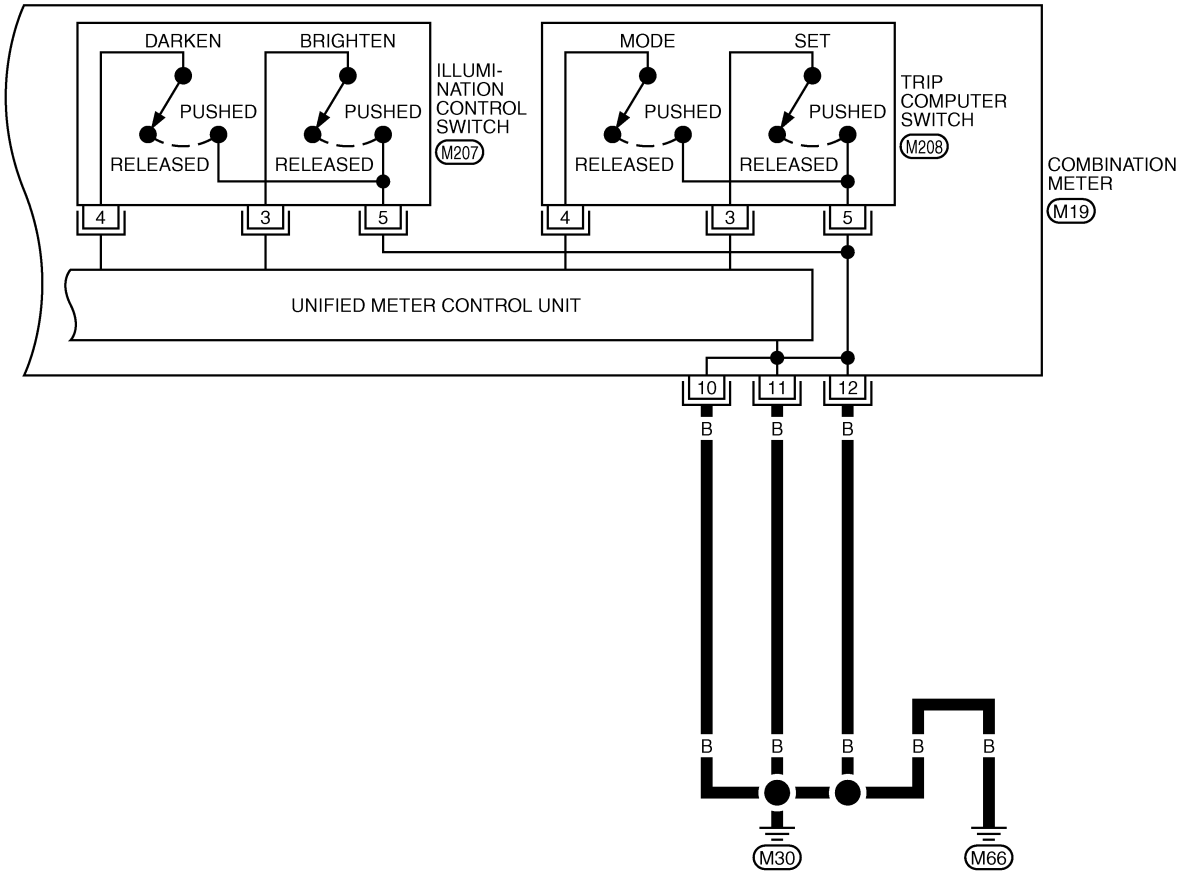
REFER TO THE FOLLOWING.
E108 , F102 -SUPER MULTIPLE JUNCTION (SMJ)
E51 , E118 , F101 -ELECTRICAL UNITS

TKWT1626E


DI-3METER-03
IGNITION SWITCH ON OR START
FUSE BLOCK (J/B) M4
10A 14
5A
REFER TO PG-POWER.
G/Y
TO DI-3METER-01
A
R/W
R/W
G/Y
G/Y
R/W
2
3
23
24
TRIP COMPUTER
OIL PRESSURE GAUGE
VOLT-METER
TRIP COMPUTER ILLUMINATION
TRIPLE METER M44
COMBI-NATION METER M19
CPU
UNIFIED METER CONTROL UNIT
1
9
8
7
5
4
12
19
20
21
22
B
R/L
LG/R
G/OR
L/B
P
R
R
W
R/G
L/OR
15H
14H
16H
M72
F102
R/L
G
B
1
2
3
VDD
VOUT
GND
OIL PRESSURE SENSOR F21
L/B
P
W
R/G
L/OR
10
20
26
19
9
TX (TRIPLE METER)
RX (TRIPLE METER)
8P/R
RX (COMB METER)
TX (COMB METER)
UNIFIED METER AND A/C AMP. M48, M49
B
B
B
M66
M30
M19 W
M44 W
M48 GY
M49 GY
H.S.
F21 B
REFER TO THE FOLLOWING.
F102 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT0499E

DI-3METER-04

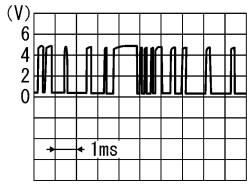
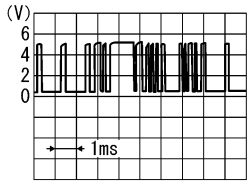
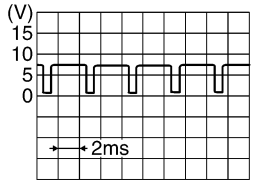


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT0522E

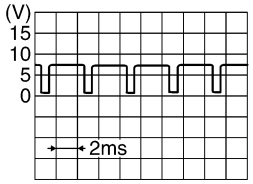
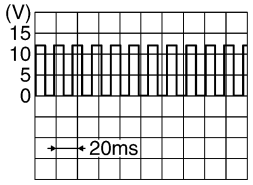
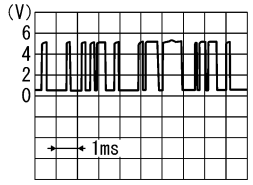
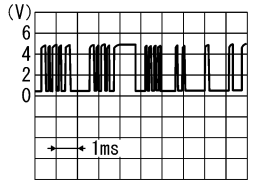
Terminals and Reference Value for Triple Meter

AKS0094O

Terminal No.	Wire color	Item	Measuring condition		Reference value (V)
			Ignition switch	Operation or condition	
1	B	Ground	ON	—	Approx. 0
2	R/W	Battery power supply	OFF	—	Battery voltage
3	G/Y	Ignition switch ON or START	ON	—	Battery voltage
4	P	TX communication line (To unified meter and A/C amp.)	ON	—	 SKIA3364E
5	L/B	RX communication line (From unified meter and A/C amp.)	ON	—	 SKIA3363E
7	G/OR	Oil pressure sensor ground	ON	—	Approx. 0
8	LG/R	Oil pressure sensor signal	ON	When ignition switch is in ON position (Engine stopped.)	Approx. 1
				Engine running [When the oil pressure is 80psi (500kPa)]	Approx. 3
9	R/L	Oil pressure sensor power supply	ON	—	Approx. 5
12	R	Illumination signal	ON	Lighting switch ON, then operate the illumination control switch.	<e.g.> When brightness level is midway  SKIA7256E
				Lighting switch OFF	Approx. 0

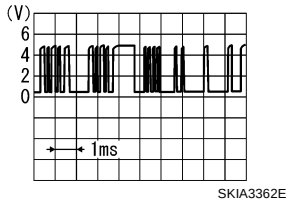
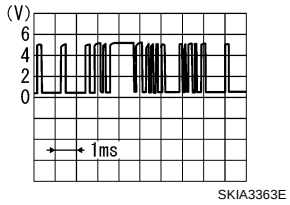
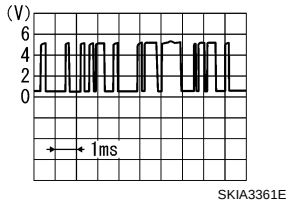
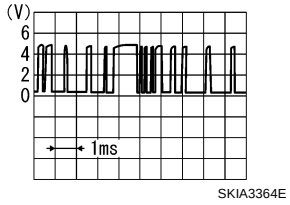
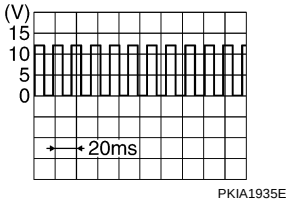
Terminals and Reference Value for Combination Meter

AKS0094P

Terminal No.	Wire color	Item	Measuring condition		Reference value (V)
			Ignition switch	Operation or condition	
10	B	Ground	ON	—	Approx. 0
11					
12					
19	R	Illumination signal	ON	Lighting switch ON, then operate the illumination control switch.	<e.g.> When brightness level is midway  SKIA7256E
				Lighting switch OFF	Approx. 0
20	W	Vehicle speed signal (8-pulse)	ON	Speedometer operated. [When vehicle speed is approx. 40km/h (25MPH)]	**NOTE:** Maximum voltage may be 5V due to specifications (connected units).  PKIA1935E
21	R/G	TX communication line (To unified meter and A/C amp.)	ON	—	 SKIA3361E
22	L/OR	RX communication line (From unified meter and A/C amp.)	ON	—	 SKIA3362E
23	G/Y	Ignition switch ON or START	ON	—	Battery voltage
24	R/W	Battery power supply	OFF	—	Battery voltage

Terminals and Reference Value for Unified Meter and A/C Amp.

AKS0094Q

Terminal No.	Wire color	Item	Measuring condition		Reference value (V)
			Ignition switch	Operation or condition	
1	L	CAN H	—	—	—
9	L/OR	TX communication line (To combination meter)	ON	—	 SKIA3362E
10	L/B	TX communication line (To triple meter)	ON	—	 SKIA3363E
11	P	CAN L	—	—	—
19	R/G	RX communication line (From combination meter)	ON	—	 SKIA3361E
20	P	RX communication line (From triple meter)	ON	—	 SKIA3364E
21	R/W	Battery power supply	OFF	—	Battery voltage
22	Y/G	Ignition switch ON or START	ON	—	Battery voltage
26	W	Vehicle speed signal (8-pulse)	ON	Speedometer operated. [When vehicle speed is approx. 40km/h (25MPH)]	**NOTE:** Maximum voltage may be 5V due to specifications (connected units).  PKIA1935E
28	W/B	Fuel level sensor signal	—	—	Refer to DI-27, "FUEL LEVEL SENSOR UNIT CHECK" .
29	B	Ground (For power)	ON	—	Approx. 0
30	B	Ground	ON	—	Approx. 0
36	R/B	Fuel level sensor ground	ON	—	Approx. 0
39	Y	Ambient sensor signal	—	—	Refer to ATC-98, "Ambient Sensor Circuit" .

Terminal No.	Wire color	Item	Measuring condition		Reference value (V)
			Ignition switch	Operation or condition	
46	L/W	Ignition switch ACC or ON	ACC	—	Battery voltage
49	W/L	Ambient sensor ground	ON	—	Approx. 0

Meter/Gauges Operation and Trip Computer

AKS0094R

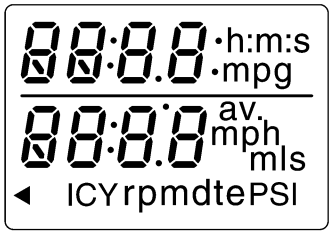
SELF-DIAGNOSIS FUNCTION

- Trip computer segment operation can be checked in self-diagnosis mode of combination meter.
- Meters/gauges can be checked in self-diagnosis mode of combination meter.

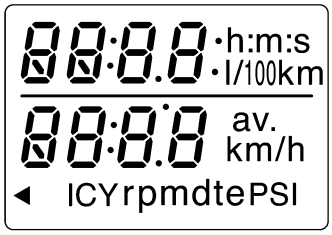
HOW TO ALTERNATE DIAGNOSIS MODE

1. While pushing the odo/trip meter switch, turn ignition switch ON.
2. Confirm that the trip meter displays “0000.0”.
3. Push the odo/trip meter switch at least 3 times. (Within 7 seconds after the ignition switch is turned ON.)
4. All the segments on the trip computer illuminate. At this time, the unified meter control unit is turned to diagnosis mode.

For USA

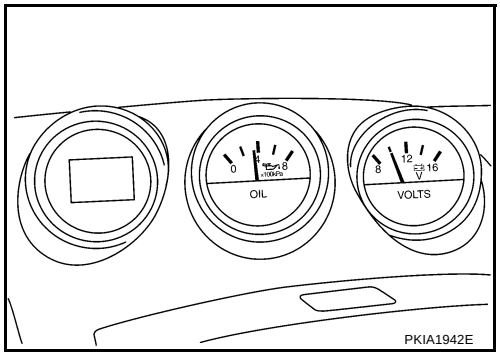


For Canada



SKIA8981E

5. Push the odo/trip meter switch. Each meter/gauge should indicate as shown in the figure while pushing odo/trip meter switch.



PKIA1942E

CONSULT-II Function

AKS0094S

Refer to DI-58, "CONSULT-II Function" in “UNIFIED METER AND A/C AMP”.

How to Proceed With Trouble Diagnosis

AKS0094T

1. Confirm the symptom or customer complaint.
2. Perform diagnosis according to diagnosis flow. Refer to DI-43, "Diagnosis Flow" .
3. According to the symptom chart, repair or replace the cause of the symptom.
4. Does the meter operate normally? If so, go to 5. If not, go to 2.
5. INSPECTION END

Diagnosis Flow

AKS0094U

1. CHECK SELF-DIAGNOSTIC RESULTS OF UNIFIED METER AND A/C AMP.

Select “METER A/C AMP” on CONSULT-II, and then perform self-diagnosis of unified meter and A/C amp. Refer to DI-58, "CONSULT-II Function" .

Self-diagnostic results content

No malfunction detected>>GO TO 2.
Malfunction detected>> Go to DI-47, "Symptom Chart 2" .

2. CHECK TRIP COMPUTER ILLUMINATION

Turn ignition switch ON.

Do trip computer display illuminate?

YES >> GO TO 3.
NO >> Check power supply circuit of triple meter when ignition switch is ON. Refer to DI-44, "Power Supply and Ground Circuit Inspection" .

3. CHECK SELF-DIAGNOSIS OPERATION OF COMBINATION METER

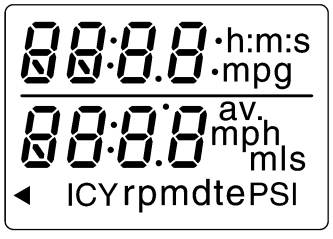
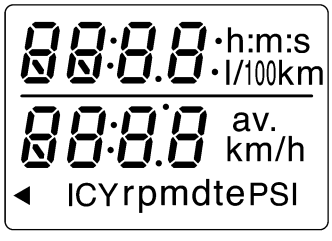
Perform combination meter self-diagnosis. Refer to DI-13, "HOW TO ALTERNATE DIAGNOSIS MODE" .

Does self-diagnosis function operate?

YES >> GO TO 4.
NO >> Check battery power supply circuit and ground circuit of triple meter. Refer to DI-44, "Power Supply and Ground Circuit Inspection" .

4. CHECK TRIP COMPUTER OPERATION

Check segment display status of trip computer.

For USA	For Canada
	

SKIA8981E

Is the display normal?

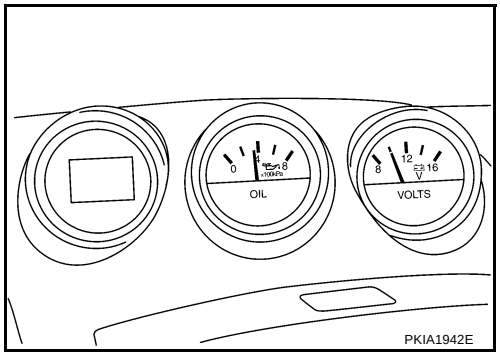
YES >> GO TO 5.
NO >> Replace triple meter.

5. CHECK METER CIRCUIT

Check indication of each meter/gauge in self-diagnosis mode.

OK or NG

OK >> Go to DI-46, "Symptom Chart 1" .
NG >> Replace triple meter.



Power Supply and Ground Circuit Inspection

AKS0094V

1. CHECK FUSE

Check for blown triple meter fuses.

Unit	Power source	Fuse No.
Triple meter	Battery	19
Unified meter and A/C amp.		
Unified meter and A/C amp.	Ignition switch ACC or ON	10, 11
Triple meter	Ignition switch ON or START	14
Unified meter and A/C amp.		12

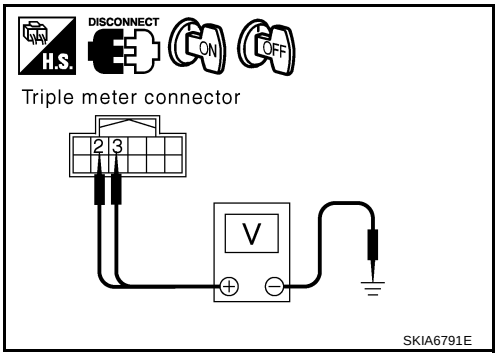
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

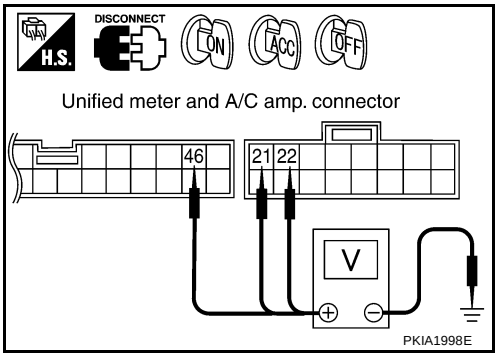
1. Disconnect the triple meter connector.
2. Check voltage between triple meter harness connector terminals and ground.

Terminals			Ignition switch position	
(+)		(–)	OFF	ON
Connector	Terminal (Wire color)			
M44	2 (R/W)	Ground	Battery voltage	Battery voltage
	3 (G/Y)		0V	Battery voltage



3. Check voltage between unified meter and A/C amp. harness connector terminals and ground.

Terminals			Ignition switch position		
(+)		(–)	OFF	ACC	ON
Connector	Terminal (Wire color)				
M49	21 (R/W)	Ground	Battery voltage	Battery voltage	Battery voltage
	22 (Y/G)		0V	0V	Battery voltage
M50	46 (L/W)		0V	Battery voltage	Battery voltage



OK or NG

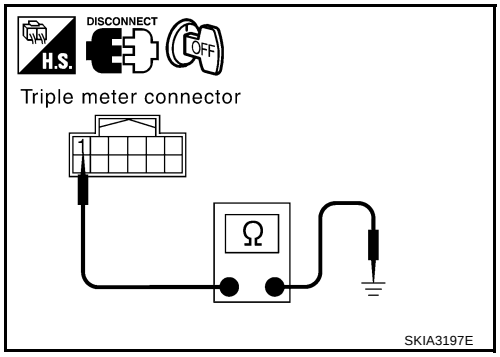
OK >> GO TO 3.
NG >> Check the following.

- Harness for open between triple meter and fuse
- Harness for open between unified meter and A/C amp. and fuse

3. CHECK GROUND CIRCUIT

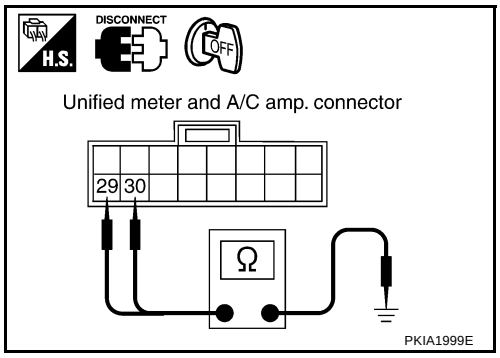
1. Turn ignition switch OFF.
2. Check continuity between triple meter harness connector M44 terminal 1 (B) and ground.

   Continuity should exist.



3. Check continuity between unified meter and A/C amp. harness connector M49 terminals 29 (B), 30 (B) and ground.

   Continuity should exist.



OK or NG

OK >> INSPECTION END
NG >> Check harness or connector.

Symptom Chart 1

AKS0094W

Trouble phenomenon	Possible cause
Speed indication is not displayed properly.	Refer to DI-47, "Vehicle Speed Signal Inspection" .
Outside air temperature indication is not displayed properly. (It may take a short time to steady the indication after ignition switch is turned ON.) **NOTE:** If the meter is powered up with the ambient sensor disconnected, outside air temperature display will show "---" even if the sensor is reconnected. In this case, with the sensor connected, disconnect and reconnect the battery, then the correct temperature will be displayed.	Refer to ATC-98, "AMBIENT TEMPERATURE INPUT PROCESS" in "ATC".
DTE (distance to empty) indication is not displayed properly.	Refer to DI-47, "Fuel Consumption Monitor Signal Inspection" .
Average fuel consumption indication is not displayed properly.	
Shift-up indicator setting indication is not displayed properly or shift-up indicator does not operate properly.	Refer to DI-52, "Trip Computer Switch Inspection" .
Average vehicle speed indication is not indicated properly.	Replace triple meter.
Trip distance indication is not indicated properly.	
Trip time indication is not indicated properly.	
Stopwatch indication is not displayed properly.	
Indication is malfunction of voltmeter.	
Indication is malfunction of oil pressure gauge.	Refer to DI-48, "Oil Pressure Sensor Inspection" .
Trip computer switch is not operate.	Refer to DI-52, "Trip Computer Switch Inspection" .

Symptom Chart 2

AKS0094X

Displayed item [Code]	Inspection contents	Possible cause
CAN COMM CIRC [U1000]	Inspect the CAN communication circuit.	Refer to DI-22, "CAN Communication System Inspection" in “COMBINATION METERS”. **CAUTION:** **Even when there is no malfunction on CAN communication system, malfunction may be misinterpreted when battery has low voltage (when maintaining 7-8V for about 2 seconds) or 10A fuse [No. 19, located in the fuse block (J/B)] fuse is disconnected.**
T/METER COMM CIRC [B2201]	Inspect the communication line of between triple meter and unified meter and A/C amp.	Refer to DI-50, "Communication Line Inspection" .
METER COMM CIRC [B2202]	Inspect the communication line of between combination meter and unified meter and A/C amp.	Refer to DI-23, "Communication Line Inspection" in “COMBINATION METERS”.
VEHICLE SPEED CIRC [B2205]	Inspect the vehicle speed input signal.	Perform the following self-diagnosis. ● VDC/TCS/ABS control unit [with VDS system]; refer to BRC-108, "CONSULT-II Functions" . ● ABS actuator and electric unit (control unit) [without VDC system]; refer to BRC-61, "CONSULT- II Functions" (with TCS) or BRC-19, "CONSULT- II Functions" (without TCS). Replace unified meter and A/C amp. if the above system is normal. **CAUTION:** **Even when there is no malfunction on speed signal system, malfunction may be misinterpreted when battery has low voltage (when maintaining 7-8V for about 2 seconds).**

Vehicle Speed Signal Inspection

AKS0094Y

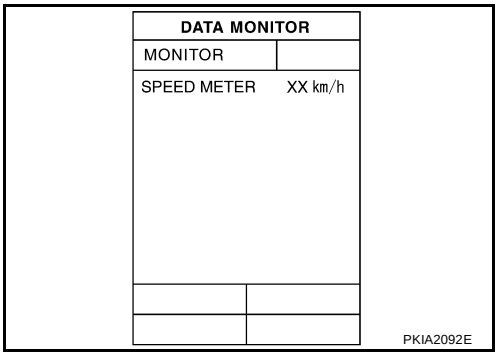
1. CHECK UNIFIED METER AND A/C AMP. INPUT SIGNAL

1. Start engine and select “METER A/C AMP” on CONSULT-II.
2. Using “SPEED METER” on the “DATA MONITOR”, Compare the value of data monitor with speed indication of trip computer.

OK or NG

OK >> Refer to DI-18, "Vehicle Speed Signal Inspection" of “COMBINATION METERS”.

NG >> Replace triple meter.



Fuel Consumption Monitor Signal Inspection

AKS0094Z

1. CHECK ECM SELF-DIAGNOSIS

Perform the ECM self-diagnosis. Refer to EC-104, "CONSULT-II Function" .

Self-diagnostic results content

No malfunction detected>>Replace the unified meter and A/C amp. Refer to DI-61, "Removal and Installation of Unified Meter and A/C Amp." .

Malfunction detected>>Check applicable parts, and repair or replace corresponding parts.

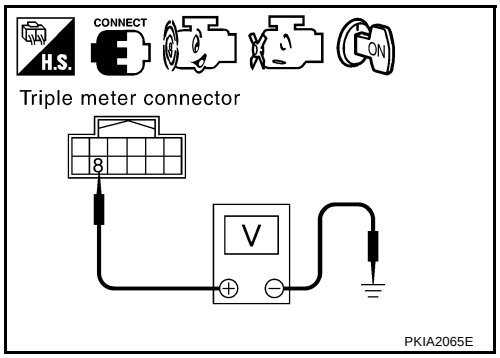
Oil Pressure Sensor Inspection

AKS00950

1. CHECK OIL PRESSURE SENSOR SIGNAL

1. Turn ignition switch ON.
2. Check voltage between triple meter harness connector M44 terminal 8 (LG/R) and ground.

Terminals			Condition	Voltage (V)
(+)		(–)		
Connector	Terminal (Wire color)			
M44	8 (LG/R)	Ground	When ignition switch is in ON position (Engine stopped.)	Approx. 1
			Engine running [When the oil pressure is 80psi (500kPa)]	Approx. 3



OK or NG

OK >> Replace triple meter.
NG >> GO TO 2.

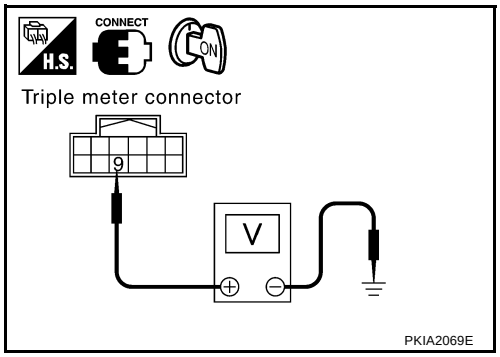
2. CHECK OIL PRESSURE SENSOR POWER SUPPLY

Check voltage between triple meter harness connector M44 terminal 9 (R/L) and ground.

Approx. 5V

OK or NG

OK >> GO TO 3.
NG >> Replace triple meter.



3. CHECK OIL PRESSURE SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect triple meter and oil pressure switch connector.
3. Check continuity between triple meter harness connector M44 terminal 9 (R/L) and oil pressure sensor harness connector F21 terminal 1 (R/L).

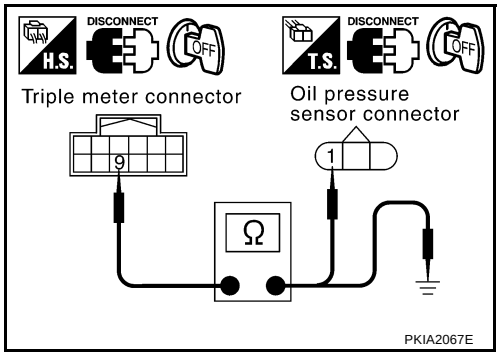
Continuity should exist.

4. Check continuity between triple meter harness connector M44 terminal 9 (R/L) and ground.

Continuity should not exist.

OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector between triple meter and oil pressure sensor.



4. CHECK OIL PRESSURE SENSOR SIGNAL CIRCUIT

1. Check continuity between triple meter harness connector M44 terminal 8 (LG/R) and oil pressure sensor harness connector F21 terminal 2 (G).

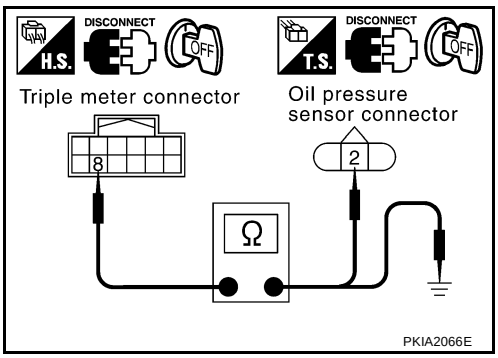
Continuity should exist.

2. Check continuity between triple meter harness connector M44 terminal 8 (LG/R) and ground.

Continuity should not exist.

OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector between triple meter and oil pressure sensor.



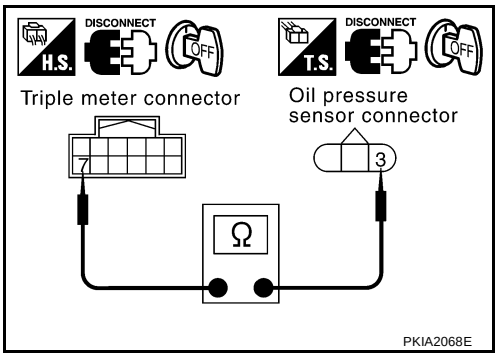
5. CHECK OIL PRESSURE SENSOR GROUND CIRCUIT

Check continuity between triple meter harness connector M44 terminal 7 (G/OR) and oil pressure sensor harness connector F21 terminal 3 (B).

Continuity should exist.

OK or NG

OK >> Replace oil pressure sensor.
NG >> Repair harness or connector between triple meter and oil pressure sensor.



Communication Line Inspection

AKS00951

1. CHECK CONNECTOR

Check triple meter, unified meter and A/C amp. and terminals (triple meter-side, unified meter and A/C amp.-side, and harness-side) for looseness or bent terminals.

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CHECK METER/GAUGES VISUALLY

Does the pointer on the meter/gauges fluctuate at the engine start?

Is the fluctuation acceptable?

YES >> GO TO 3.
NO >> GO TO 6.

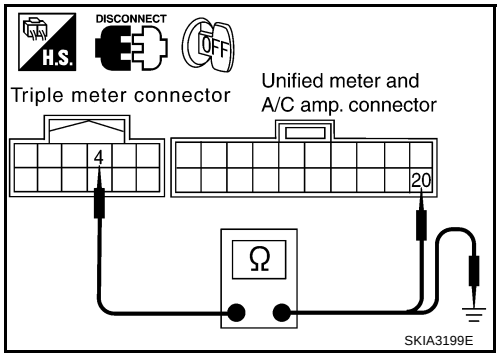
3. CHECK CONTINUITY COMMUNICATION CIRCUIT (TX: TRIPLE METER)

1. Turn ignition switch OFF.
2. Disconnect triple meter connector and unified meter and A/C amp. connector.
3. Check continuity between triple meter harness connector M44 terminal 4 (P) and unified meter and A/C amp. harness connector M48 terminal 20 (P).

   Continuity should exist.

4. Check continuity between triple meter harness connector M44 terminal 4 (P) and ground.

   Continuity should not exist.



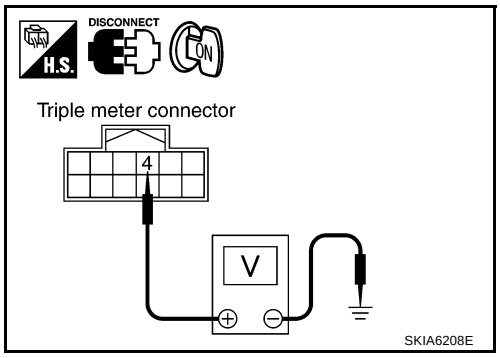
OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK VOLTAGE OF UNIFIED METER AND A/C AMP.

1. Connect unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Check voltage between triple meter harness connector M44 terminal 4 (P) and ground.

   Approx. 5V

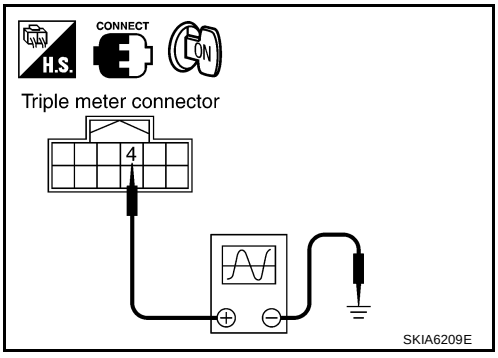


OK or NG

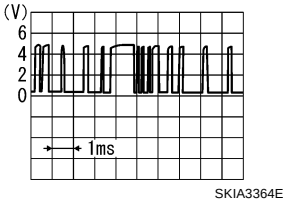
OK >> GO TO 5.
NG >> Replace unified meter and A/C amp. Refer to DI-61, "Removal and Installation of Unified Meter and A/C Amp." .

5. CHECK VOLTAGE SIGNAL OF COMBINATION METER

1. Turn ignition switch OFF and connect triple meter connector.
2. Turn ignition switch ON.
3. Check voltage signal between triple meter harness connector M44 terminal 4 (P) and ground with simple oscilloscope of CONSULT-II.



4 (P) - Ground:



OK or NG

OK >> Replace unified meter and A/C amp. Refer to DI-61, "Removal and Installation of Unified Meter and A/C Amp." .

NG >> Replace triple meter.

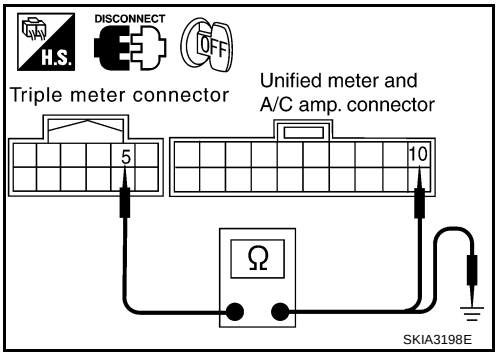
6. CHECK CONTINUITY COMMUNICATION CIRCUIT (RX: TRIPLE METER)

1. Turn ignition switch OFF.
2. Disconnect triple meter connector and unified meter and A/C amp. connector.
3. Check continuity between triple meter harness connector M44 terminal 5 (L/B) and unified meter and A/C amp. harness connector M48 terminal 10 (L/B).

Continuity should exist.

4. Check continuity between triple meter harness connector M44 terminal 5 (L/B) and ground.

Continuity should not exist.



OK or NG

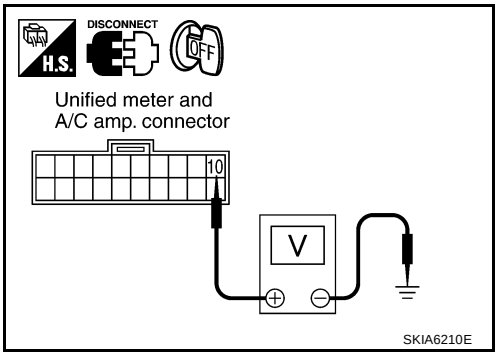
OK >> GO TO 7.

NG >> Repair harness or connector.

7. CHECK VOLTAGE OF COMBINATION METER

1. Connect triple meter connector.
2. Turn ignition switch ON.
3. Check voltage between unified meter and A/C amp. harness connector M48 terminal 10 (L/B) and ground.

Approx. 5V



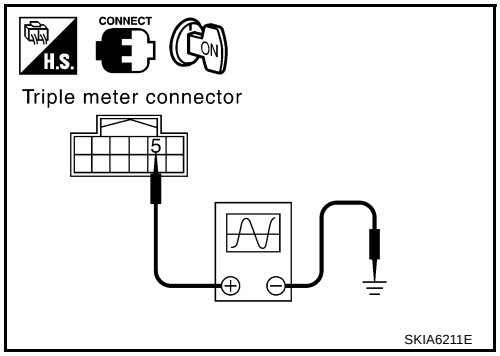
OK or NG

OK >> GO TO 8.

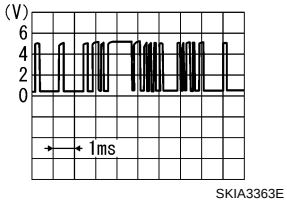
NG >> Replace triple meter.

8. CHECK VOLTAGE SIGNAL OF UNIFIED METER AND A/C AMP.

1. Connect triple meter connector and unified meter and A/C amp. connector.
2. Ignition switch turn ON.
3. Check voltage signal between triple meter harness connector M44 terminal 5 (L/B) and ground with simple oscilloscope of CONSULT-II.



5 (L/B) - Ground :



OK or NG

OK >> Replace triple meter.
NG >> Replace unified meter and A/C amp. Refer to DI-61, "Removal and Installation of Unified Meter and A/C Amp." .

Trip Computer Switch Inspection

AKS00952

1. CHECK CONNECTOR

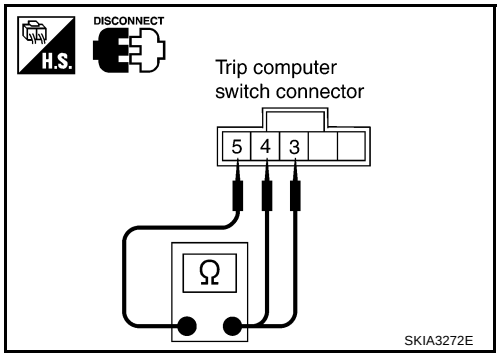
1. Remove combination meter. Refer to DI-28, "Removal and Installation for Combination Meter" .
2. Remove rear finisher to combination meter. Refer to DI-28, "Disassembly and Assembly for Combination Meter" .
3. Check trip computer switch connector for looseness.

OK or NG

OK >> GO TO 2.
NG >> Repair trip computer switch connector.

2. CHECK CIRCUIT

1. Disconnect trip computer switch connector.
2. Check continuity between trip computer switch harness connector M208 terminals 3, 4 and 5.



Terminal		Condition	Continuity
3	5	Setting switch is pushed.	Yes
		Setting switch is released.	No
4		Mode switch is pushed.	Yes
		Mode switch is released.	No

OK or NG

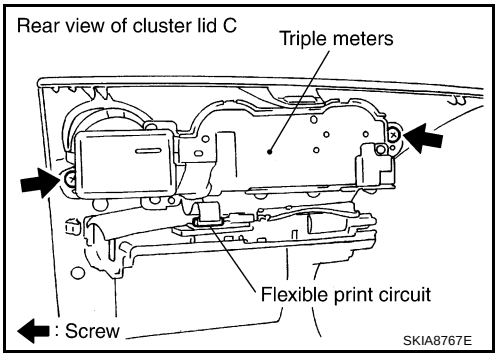
OK >> Replace combination meter.
NG >> Replace trip computer switch.

Removal and Installation of Triple Meters

AKS00953

REMOVAL

1. Remove cluster lid C. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Disconnect flexible print circuit for pwer cluster lid amp. (With NAVI)
3. Remove screws (2), and remove triple meters.



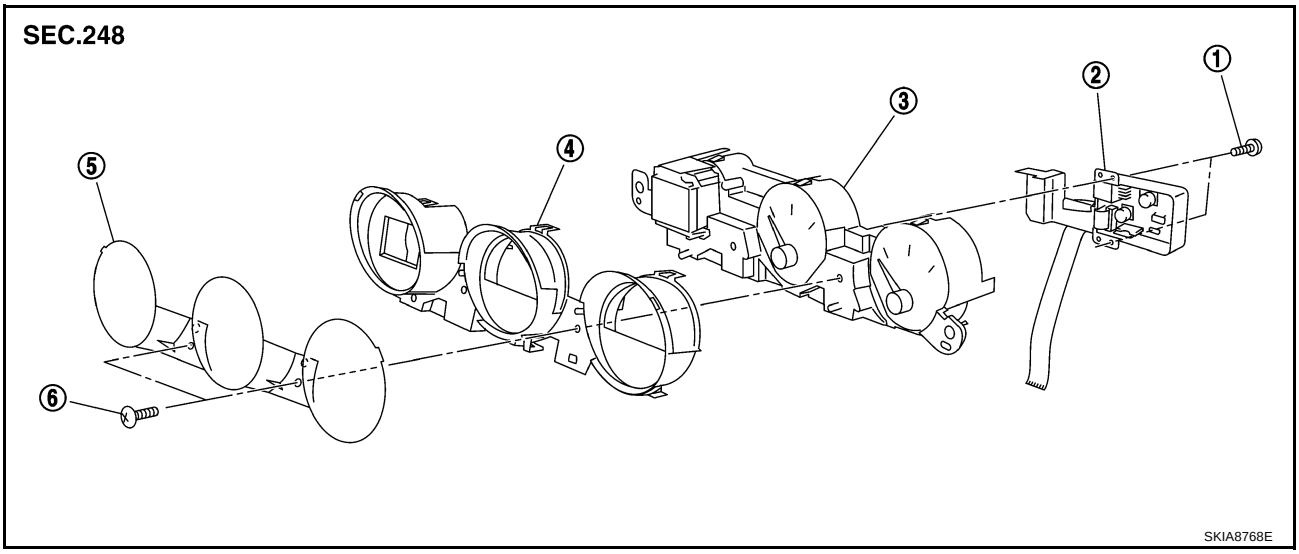
INSTALLATION

Install in the reverse order of removal.

Disassembly and Assembly for Triple Meters

AKS00954

DISASSEMBLY



1.	Screw (with NAVI)	2.	Power cluster lid amp. (with NAVI)	3.	Triple meter
4.	Upper housing	5.	Front cover	6.	Screw

1. Remove screws (2), and remove power cluster lid amp. (with NAVI)
2. Remove screws (2), and remove front cover.
3. Disengage tabs (6) to separate upper housing.

ASSEMBLY

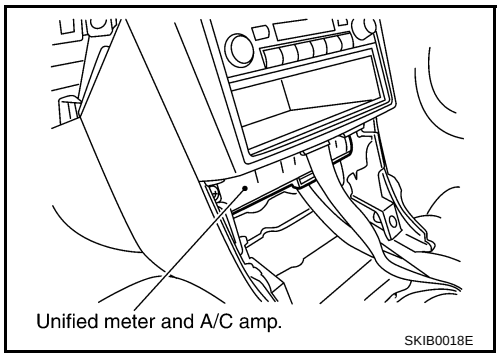
Assemble in reverse order of disassembly.

UNIFIED METER AND A/C AMP

PFP:27760

System Description

AKS00955


Unified meter and A/C amp.
SKIB0018E

- For the unified meter and A/C amp., the signal required for controlling the combination meter and triple meter are integrated in the A/C auto amp.
- Unified meter and A/C amp. controls each operation for A/C auto amp. For information regarding A/C control, refer to ATC-27, "AIR CONDITIONER CONTROL" in “ATC” section.
- Unified meter and A/C amp. inputs necessary information for combination meter and triple meter from each unit by CAN communication and so on.
- And unified meter and A/C amp. outputs these signals using communication line (TX, RX) between unified meter and A/C amp. and various meters.
- In addition to sending output to the combination meter and triple meter containing the signals input from the various units, it also receives the signals between the combination meter and triple meter.
- Other input signals are also sent to the ECM, TCM, and BCM using CAN communication.
- The signals required for the trip computer display are centralized in the unified meter and A/C amp., converted into data, and sent to the triple meter.
- The unified meter and A/C amp. correspond a CONSULT-II function (self-diagnostic results, CAN diagnostic support monitor, data monitor).

INPUT/OUTPUT SIGNALS

Between Unified Meter and A/C Amp. and Combination Meter

Unit	Input	Output
Unified meter and A/C amp.	● Seat belt buckle switch signal (Driver's side) ● Trip computer mode switch signal ● Trip computer setting switch signal ● Illumination control nighttime required signal ● Refuel status signal ● Vehicle speed signal ● Low-fuel warning lamp condition signal ● Self-diagnosis condition signal ● Odo/trip switch signal ● Delivery destination data signal ● Combination meter receive error signal ● Combination meter specifications signal ● Triple meter specifications signal	● Vehicle speed signal (8-pulse) ● Engine speed signal ● Engine coolant temperature signal ● Fuel level sensor signal (resistance value) ● Malfunction indicator lamp signal ● ABS warning lamp signal ● Tire pressure warning lamp signal ● Brake warning lamp signal ● Oil pressure warning lamp signal ● Turn indicator signal ● High beam request signal ● VDC OFF indicator lamp signal ● TCS OFF indicator lamp signal ● SLIP indicator lamp signal ● CRUISE indicator lamp signal ● SET indicator lamp signal ● A/T CHECK indicator lamp signal ● A/T position indicator signal ● Manual mode indicator signal ● Manual mode gear position signal ● Shift-up indicator setting signal ● CAN communication condition signal of A/T ● Door switch signal ● Position lights request signal ● Buzzer output signal

Between Unified Meter and A/C Amp. and Triple Meter

Unit	Input	Output
Unified meter and A/C amp.	● LCD indication condition signal ● Shift-up indicator setting signal ● Oil pressure warning lamp signal ● Triple meter receive error signal	● Outside air temperature signal ● Outside air temperature warning signal ● Trip distance signal ● Trip time signal ● Average vehicle speed signal ● Average fuel consumption signal ● Vehicle speed signal ● DTE (Distance to empty) signal ● DTE (Distance to empty) warning signal ● Tire pressure signal ● Tire pressure warning signal ● Trip computer mode switch signal ● Trip computer setting switch signal ● Self-diagnosis condition signal ● Odo/trip switch signal ● Triple meter specifications signal

FAIL-SAFE

Solution When Communication Error Between Unified Meter and A/C Amp. and Combination Meter

Function		Specifications
Speedometer		Return to zero when discontinuing communication or receiving irregular data.
Tachometer		Reset to zero by suspending communication.
Fuel gauge		
Water temperature gauge		
Illumination control	Combination meter illumination	When suspending communication, change to nighttime mode.
Odo/trip meter		Integrate in response to 8-pulse input.
A/T indicator		The display turns off by suspending communication.
Warning buzzer		The warning buzzer turns off by suspending communication.
Warning lamp/indicator lamp	ABS warning lamp	The light turns on by suspending communication.
	VDC OFF indicator lamp	
	TCS OFF indicator lamp	
	SLIP indicator lamp	
	Brake warning lamp	
	Tire pressure warning lamp	
	A/T CHECK lamp	The light turns off by suspending communication.
	Oil pressure warning lamp	
	Door warning lamp	
	High beam indicator lamp	
	Turn signal indicator lamp	
	Malfunction indicator lamp	
	CRUISE indicator lamp	
	SET indicator lamp	

Solution When Communication Error Between Unified Meter and A/C Amp. and Triple Meter

Function		Specifications
Trip computer	Vehicle speed indication	● Display “---” by suspending communications. ● Display “---” using erroneous signal input.
	Outside air temperature indication	Display “--” by suspending communications.
	DTE (Distance to empty) indication	Display “----” by suspending communications.
	Average fuel consumption indication	
	Average vehicle speed indication	
	Trip distance indication	
	Tire pressure indication	
	Trip time indication	Display “--:--” by suspending communications.
Illumination control	Triple meter illumination	When suspending communication, change to nighttime mode.

CAN Communication System Description

AKS00956

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

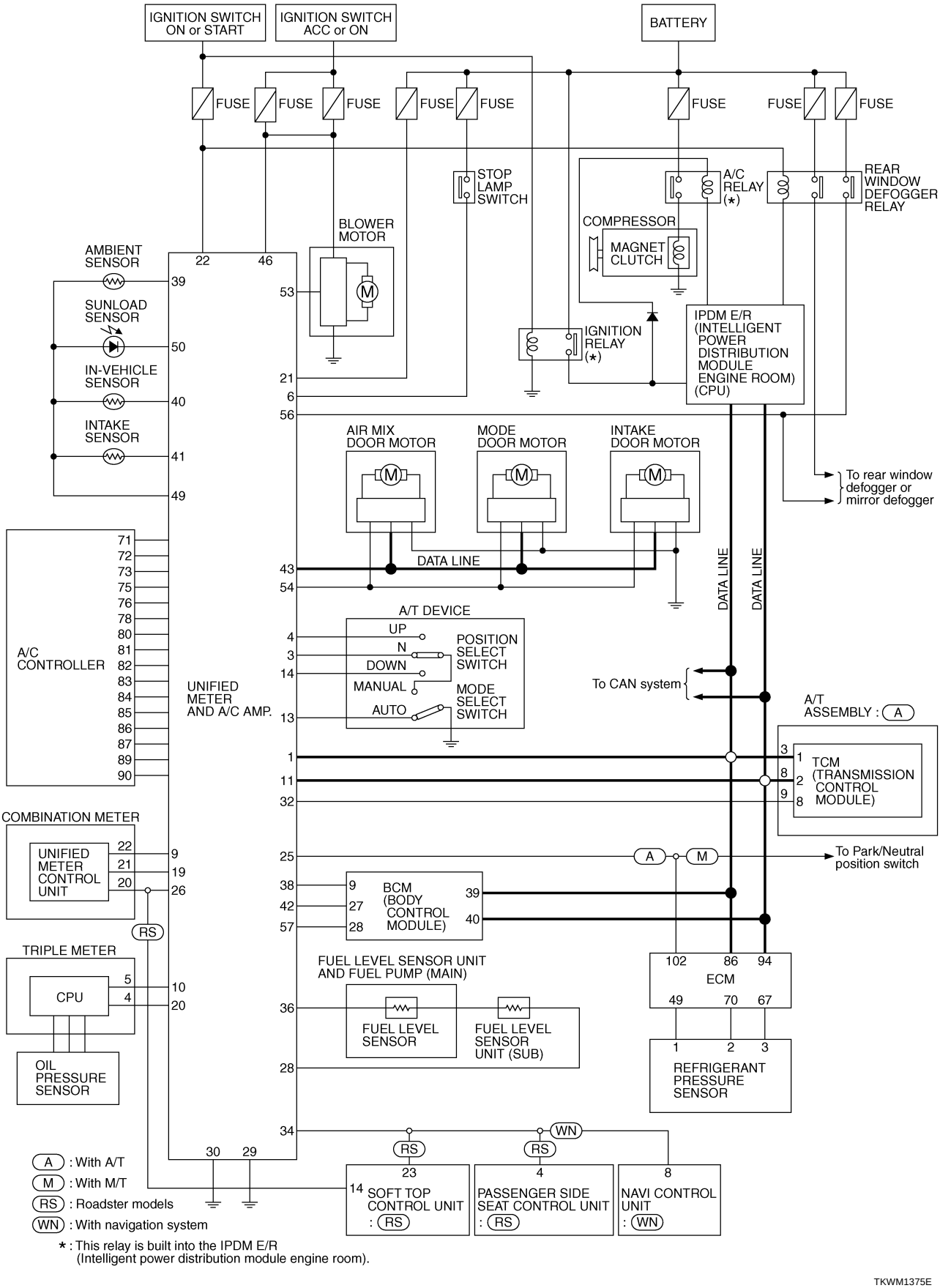
CAN Communication Unit

AKS00A2F

Refer to LAN-5, "CAN Communication Unit" in “CAN SYSTEM”.

Schematic

AKS00958



TKWM1375E

CONSULT-II Function

AKS00959

CONSULT-II performs the following functions communicating with the unified meter and A/C amp.

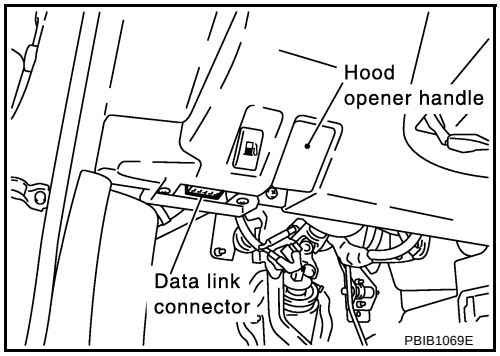
System part	Check item, diagnosis mode	Description
METER A/C AMP	Self-diagnosis results	Unified meter and A/C amp. check the conditions and indicates any error that unified meter and A/C amp. memorized.
	CAN diagnostic support monitor	The results of transmit/receive diagnosis of CAN communication can be read.
	Data monitor	Displays unified meter and A/C amp. input data in real time.

CONSULT-II BASIC OPERATION

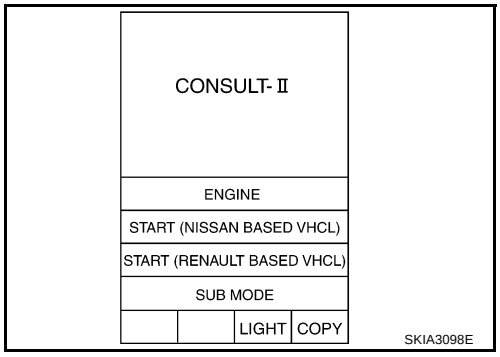
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

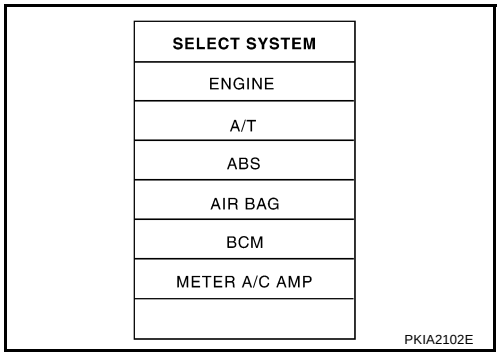
1. With the ignition switch OFF, connect “CONSULT-II” and “CONSULT-II CONVERTER” to the data link connector, then turn ignition switch ON.



2. Touch “START (NISSAN BASED VHCL)”.



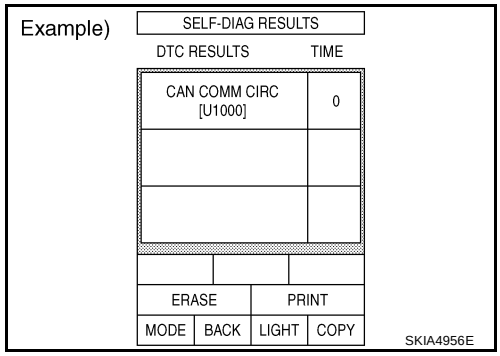
3. Touch “METER A/C AMP” on “SELECT SYSTEM” screen. If “METER A/C AMP” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .
4. Select “SELF-DIAG RESULTS”, “CAN DIAG SUPPORT MNTR” or “DATA MONITOR”.



SELF-DIAGNOSIS RESULTS

Operation Procedure

1. Touch “SELF-DIAG RESULTS” on “SELECT DIAG MODE” screen.
2. Self-diagnosis results are displayed.



Display Item List

CONSULT-II display	Malfunction is detected when...
CAN COMM CIRC [U1000]	Malfunction is detected in CAN communication. **CAUTION:** **Even when there is no malfunction on CAN communication system, malfunction may be misinterpreted when battery has low voltage (when maintaining 7-8V for about 2 seconds) or 10A fuse [No. 19, located in the fuse block (J/B)] is disconnected.**
T/METER COMM CIRC [B2201]	Malfunction is detected in communication of between triple meter and unified meter and A/C amp.
METER COMM CIRC [B2202]	Malfunction is detected in communication of between combination meter and unified meter and A/C amp.
VEHICLE SPEED CIRC [B2205]	When an erroneous signal is input. **CAUTION:** **Even when there is no malfunction on speed signal system, malfunction may be misinterpreted when battery has low voltage (when maintaining 7-8V for about 2 seconds).**

“TIME” indicates the condition of the self-diagnosis results judged by each signal input.

- Normal: In case of operating properly at the present in spite of having problem in the past, then “TIME” indicates “1-63”.
- Malfunction: Soon after detecting malfunctions by self-diagnoses or current malfunction, “0” is indicated.

After returning to normal condition, every time when ignition switch is turned to “OFF” from “ON”, time will be added like “1”→“2”→“3”···“63”, and when the key operation is performed 64 times, the result of the self-diagnoses will be erased. And if any malfunction is detected again, “0” will be indicated.

DATA MONITOR

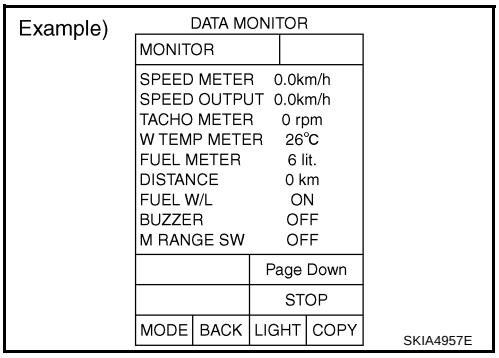
Operation Procedure

1. Touch “DATA MONITOR” on “SELECT DIAG MODE” screen.
2. Touch either “MAIN SIGNALS” or “SELECTION FROM MENU” on the “DATA MONITOR” screen.

MAIN SIGNALS	Monitors main signals.
SELECTION FROM MENU	Selects and monitors individual signal.

3. When “SELECTION FROM MENU” is selected, touch individual items to be monitored. When “MAIN SIGNALS” is selected, main items will be monitored.
4. Touch “START”.
5. Touch “RECORD” while monitoring, then the status of the monitored item can be recorded. To stop recording, touch “STOP”.

Example)



Display Item List

Display item [Unit]	MAIN SIGNALS	SELECTION FROM MENU	Contents
SPEED METER [km/h] or [mph]	X	X	This is the angle correction value after the speed signal from the VDC/TCS/ABS control unit (with VDC system) or ABS actuator and electric unit (without VDC system) is converted into the vehicle speed.
SPEED OUTPUT [km/h] or [mph]	X	X	This is the angle correction value before the speed signal from the VDC/TCS/ABS control unit (with VDC system) or ABS actuator and electric unit (without VDC system) is converted into the vehicle speed.
TACHO METER [rpm]	X	X	This is the converted value for the engine speed signal from the ECM.
W TEMP METER [°C] or [°F]	X	X	This is the converted value for the engine coolant temperature signal from the ECM.
FUEL METER [lit.]	X	X	This is the processed value for the signal (resistance value) from the fuel gauge.
DISTANCE [km] or [mile]	X	X	This is the calculated value for the speed signal from the VDC/TCS/ABS control unit (with VDC system) or ABS actuator and electric unit (without VDC system) and the signal (resistance signal) from the fuel gauge.
FUEL W/L [ON/OFF]	X	X	Indicates [ON/OFF] condition of fuel warning lamp.
MIL [ON/OFF]		X	Indicates [ON/OFF] condition of malfunction indicator lamp.
SEAT BELT W/L [ON/OFF]		X	Indicates [ON/OFF] condition of seat belt warning lamp.
BUZZER [ON/OFF]	X	X	Indicates [ON/OFF] condition of buzzer.
DOOR W/L [ON/OFF]		X	Indicates [ON/OFF] condition of door warning lamp.
HI-BEAM IND [ON/OFF]		X	Indicates [ON/OFF] condition of high beam indicator.
TURN IND [ON/OFF]		X	Indicates [ON/OFF] condition of turn indicator.
OIL W/L [ON/OFF]		X	Indicates [ON/OFF] condition of oil pressure warning lamp.
VDC/TCS IND [ON/OFF]		X	Indicates [ON/OFF] condition of VDC/TCS OFF indicator lamp.
ABS W/L [ON/OFF]		X	Indicates [ON/OFF] condition of ABS warning lamp.
SLIP IND [ON/OFF]		X	Indicates [ON/OFF] condition of SLIP indicator lamp.
BRAKE W/L [ON/OFF]		X	Indicates [ON/OFF] condition of brake warning lamp.*

Display item [Unit]	MAIN SIGNALS	SELECTION FROM MENU	Contents
M RANGE SW [ON/OFF]	X	X	Indicates [ON/OFF] condition of manual mode range switch.
NM RANGE SW [ON/OFF]	X	X	Indicates [ON/OFF] condition of except for manual mode range switch.
AT SFT UP SW [ON/OFF]	X	X	Indicates [ON/OFF] condition of A/T shift up switch.
AT SFT DWN SW [ON/OFF]	X	X	Indicates [ON/OFF] condition of A/T shift down switch.
AT P MODE SW [ON/OFF]		X	Indicates [ON/OFF] condition of A/T power mode switch.
AT S MODE SW [ON/OFF]		X	Indicates [ON/OFF] condition of A/T snow mode switch.
BRAKE SW [ON/OFF]		X	Indicates [ON/OFF] condition of brake switch (stop lamp switch).
AT-M IND [ON/OFF]	X	X	Indicates [ON/OFF] condition of A/T manual mode indicator.
AT-M GEAR [5-1]	X	X	Indicates [5-1] condition of A/T manual mode gear position.
P RANGE IND [ON/OFF]	X	X	Indicates [ON/OFF] condition of A/T shift P range indicator.
R RANGE IND [ON/OFF]	X	X	Indicates [ON/OFF] condition of A/T shift R range indicator.
N RANGE IND [ON/OFF]	X	X	Indicates [ON/OFF] condition of A/T shift N range indicator.
D RANGE IND [ON/OFF]	X	X	Indicates [ON/OFF] condition of A/T shift D range indicator.
AT CHECK W/L [ON/OFF]		X	Indicates [ON/OFF] condition of A/T CHECK warning lamp.
CRUISE IND [ON/OFF]		X	Indicates [ON/OFF] condition of CRUISE indicator.
SET IND [ON/OFF]		X	Indicates [ON/OFF] condition of SET indicator.

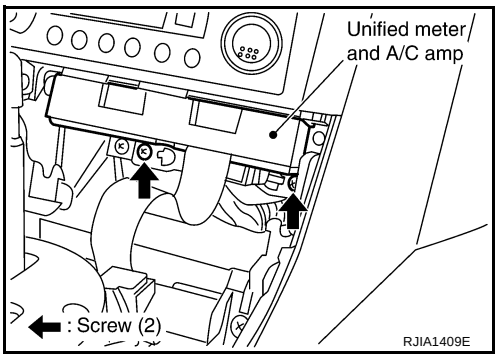
NOTE:
Any monitored item that does not match the vehicle being diagnosed is deleted from the display automatically.
*: Monitor keeps indicating “OFF” when brake warning lamp is on by the parking brake operation or low brake fluid level.

Removal and Installation of Unified Meter and A/C Amp.

AKS0095A

REMOVAL

1. Remove the console finisher (A/T) or console boot (M/T). Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove the fixing screws, then remove the unified meter and A/C amp.



INSTALLATION

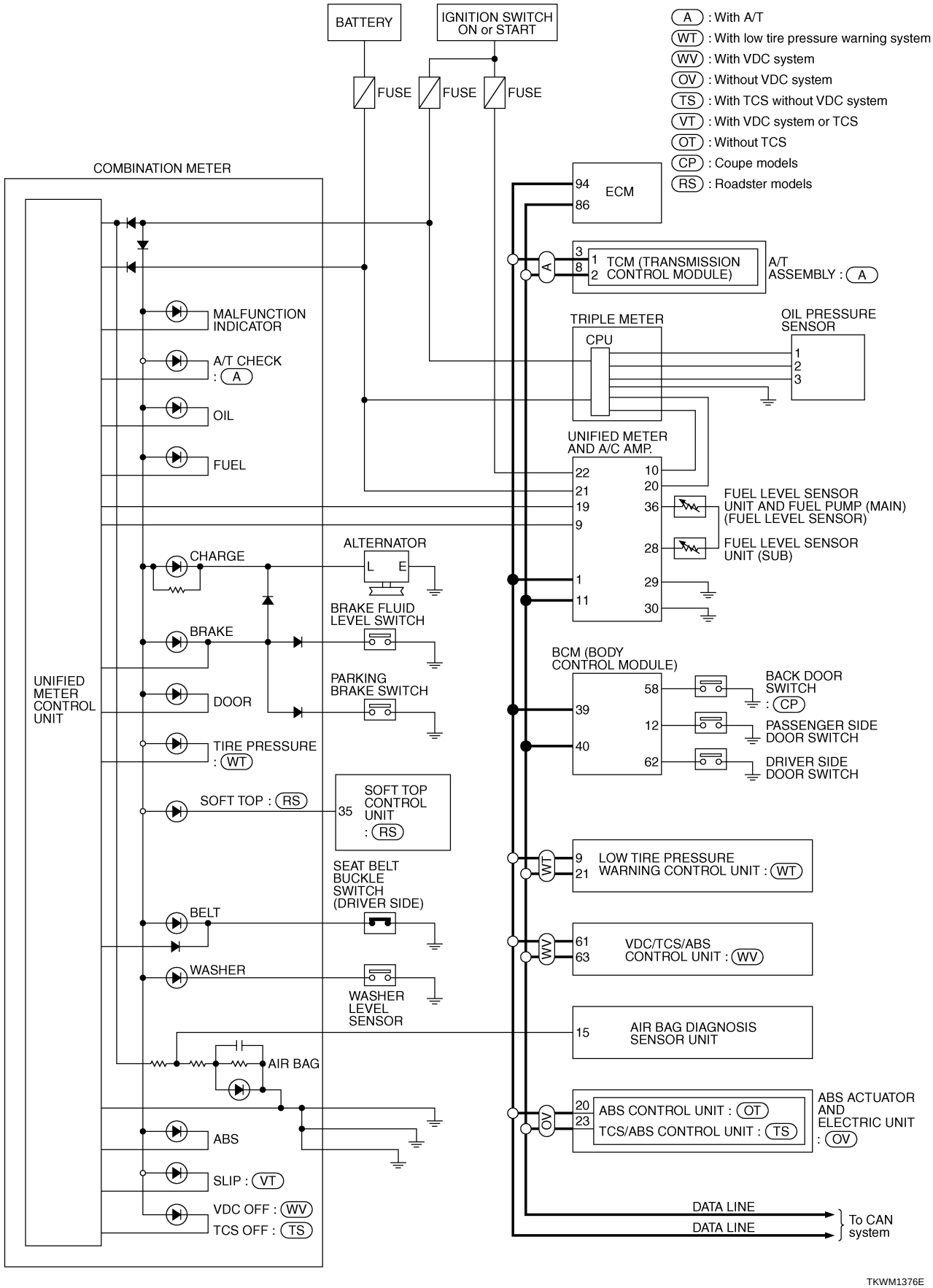
Installation is basically the reverse order of removal.

WARNING LAMPS

PFP:24814

Schematic

AKS0095B

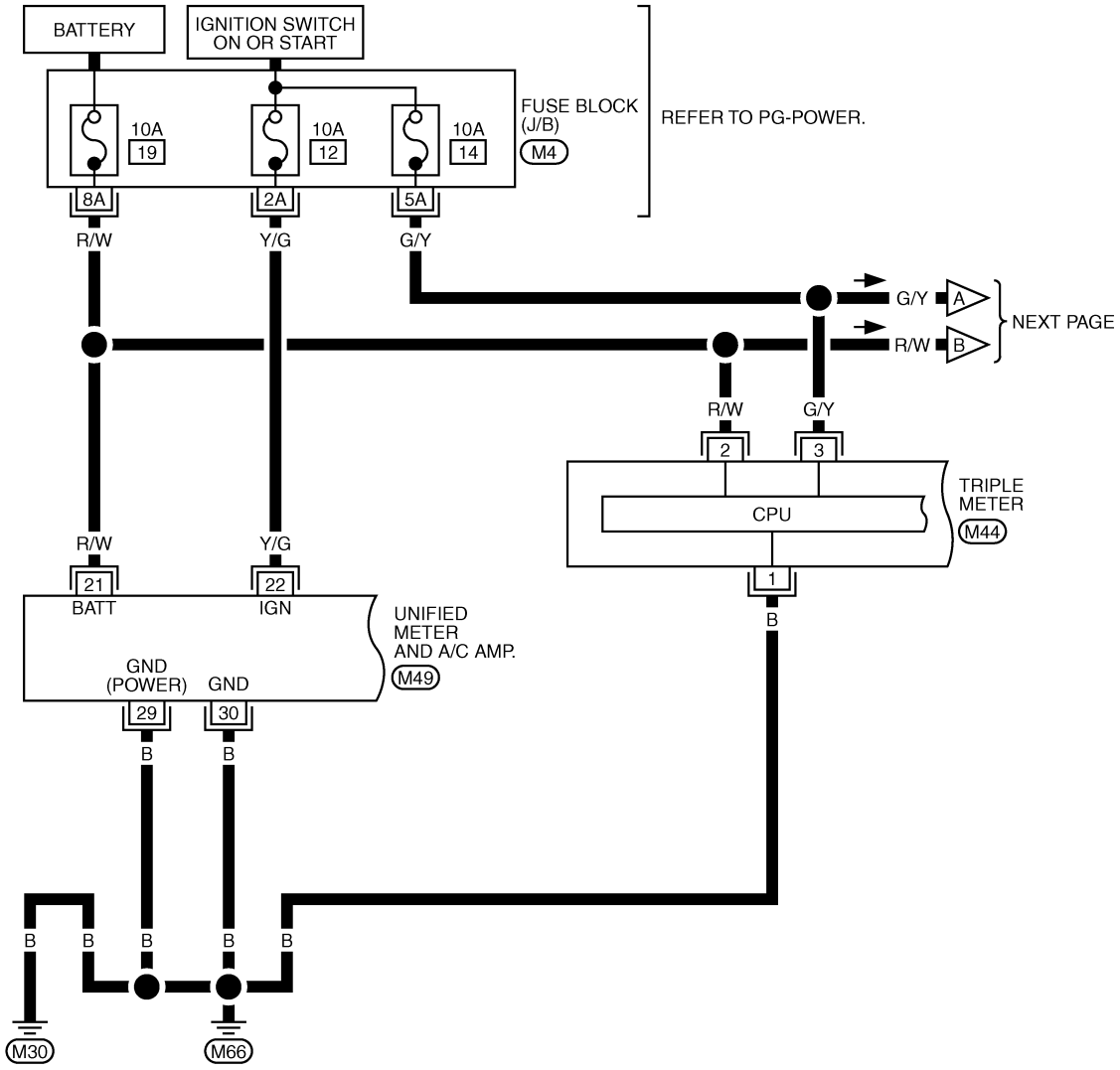


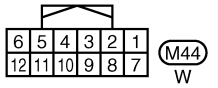
TKWM1376E

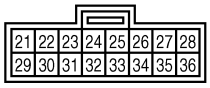
Wiring Diagram — WARN —

AKS0095C

DI-WARN-01

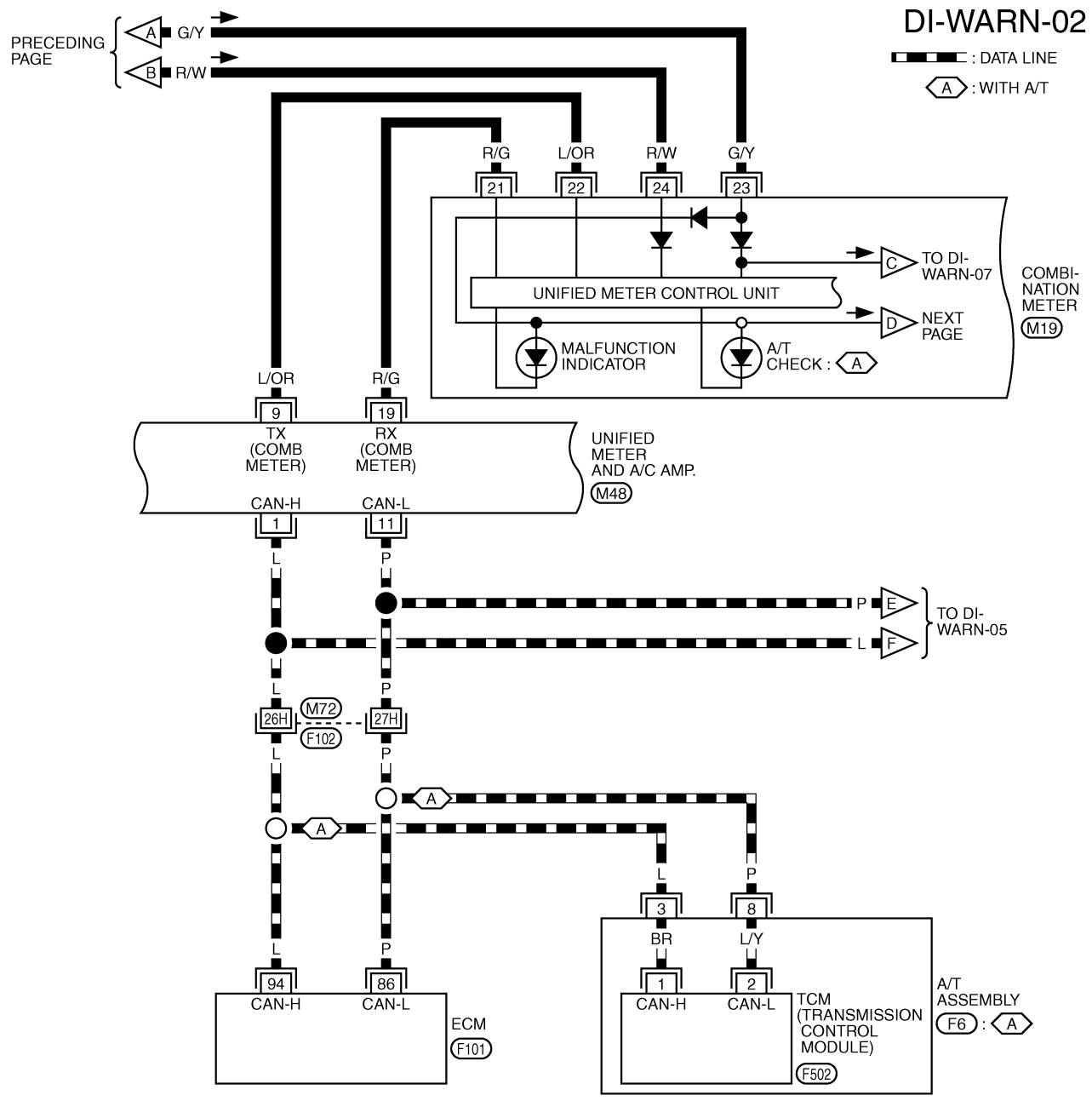


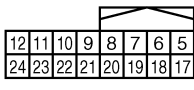




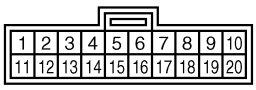
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT0485E

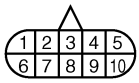




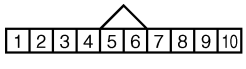
M19
W



M48
GY



F6
GY



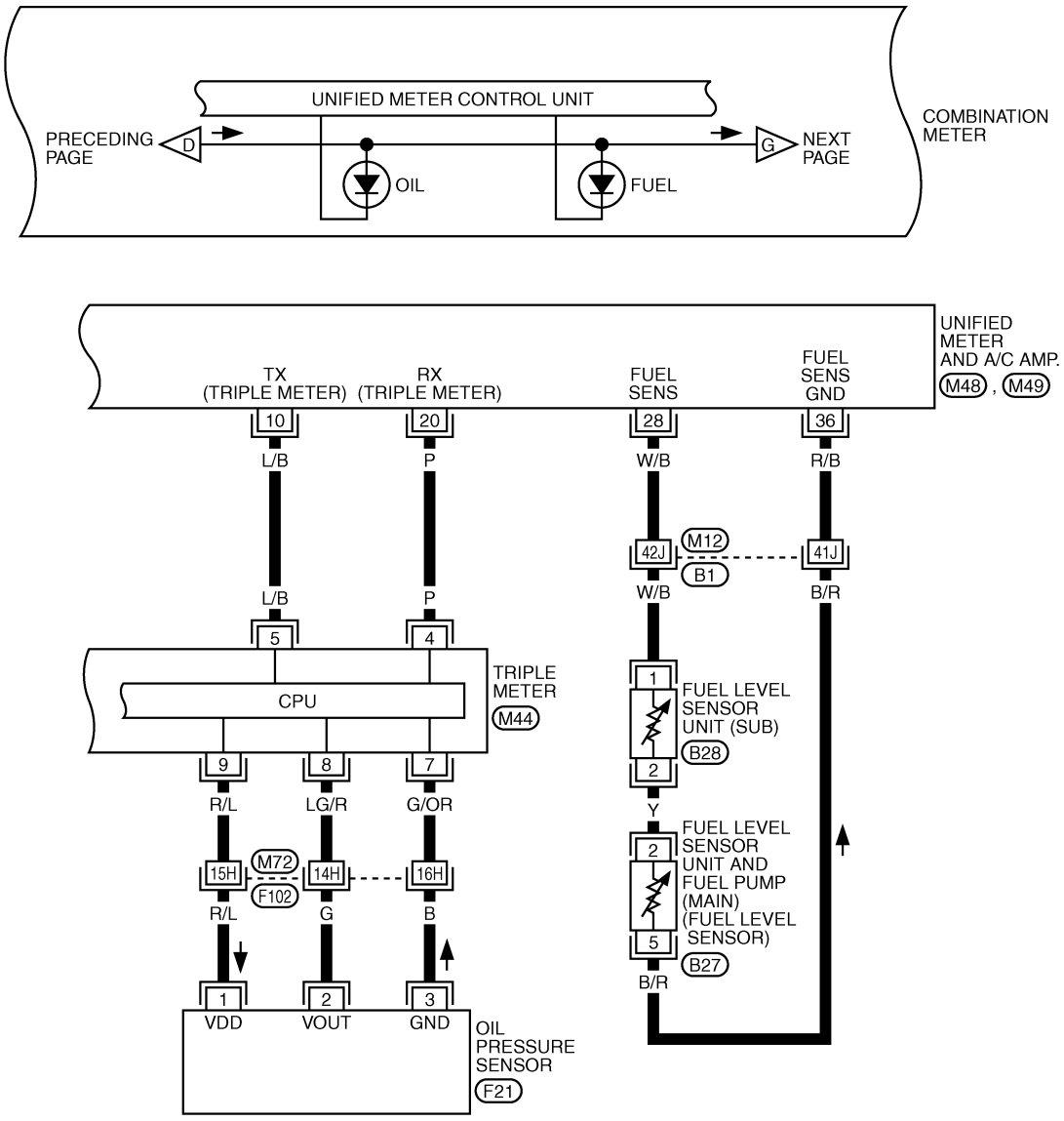
F502 *
GY

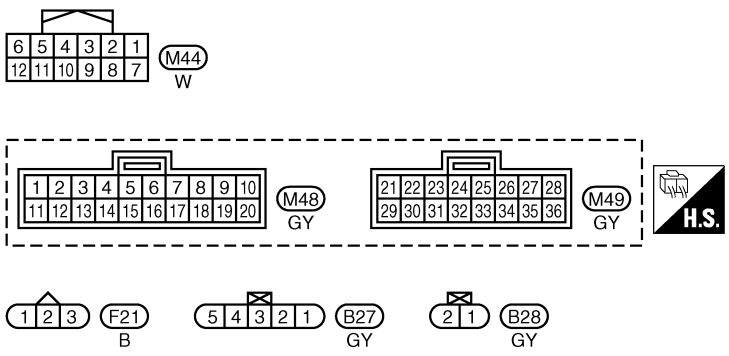
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.
F102 -SUPER MULTIPLE JUNCTION (SMJ)
F101 -ELECTRICAL UNITS

TKWM1319E

DI-WARN-03

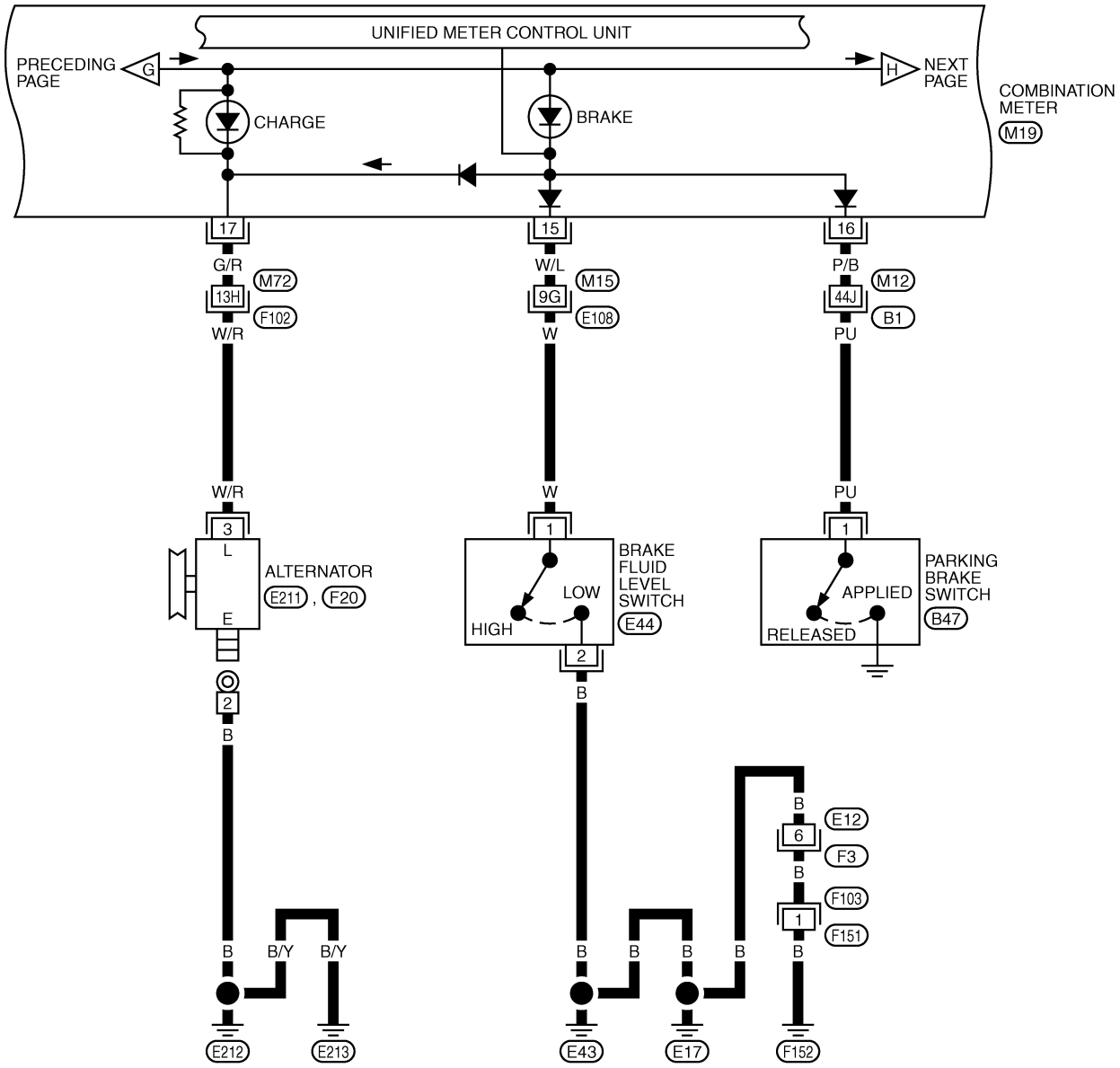


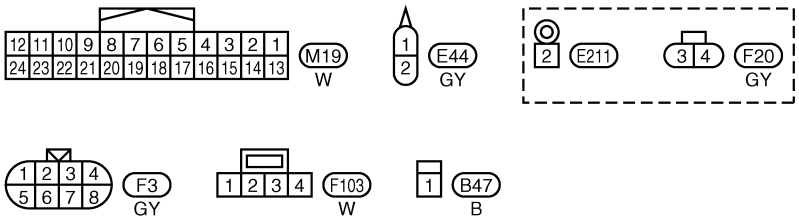


REFER TO THE FOLLOWING.
F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT1630E

DI-WARN-04

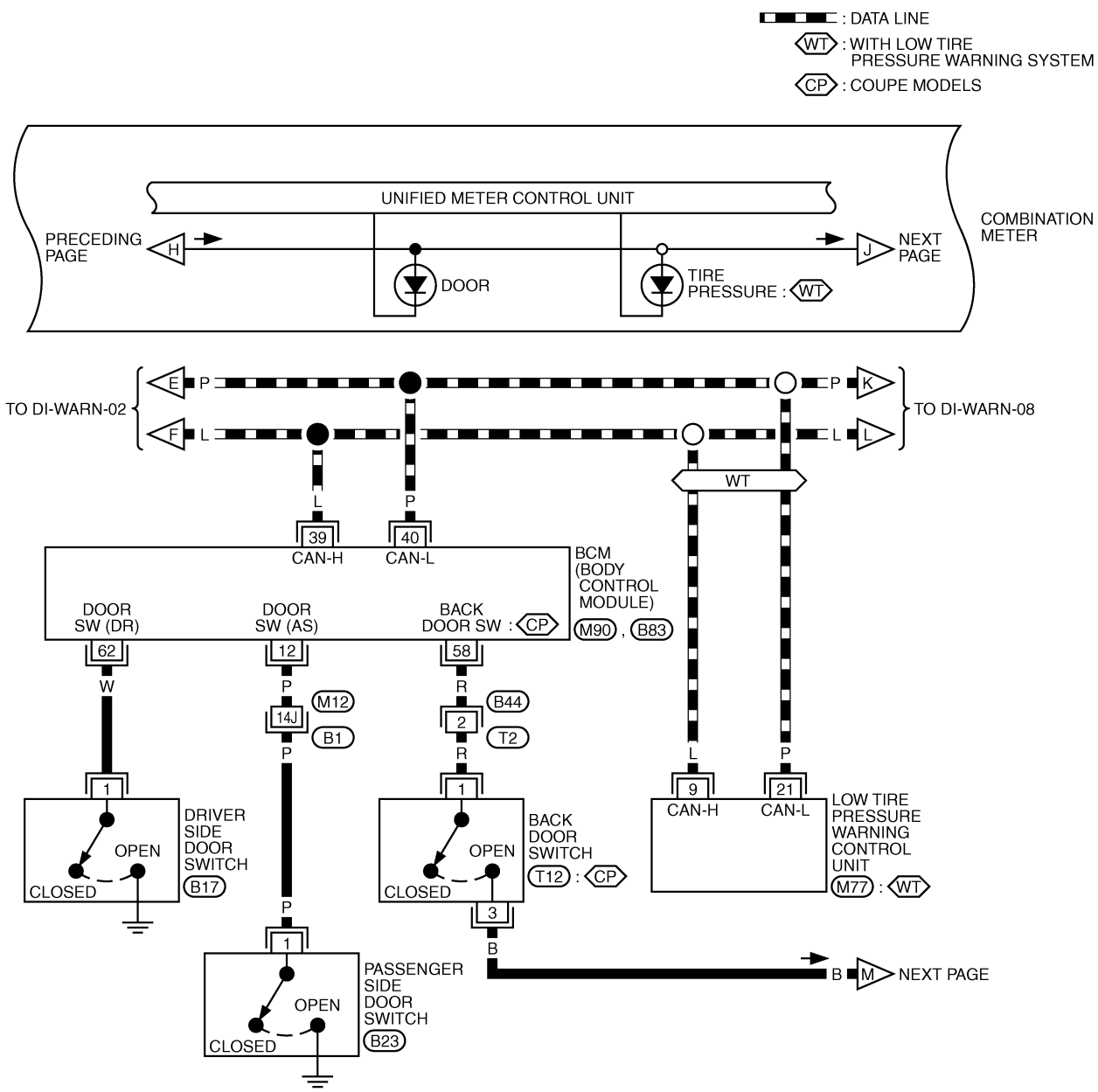


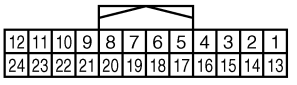


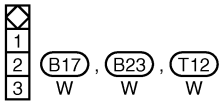
REFER TO THE FOLLOWING.
E108 , F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

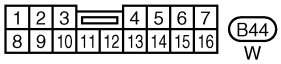
TKWT1631E

DI-WARN-05





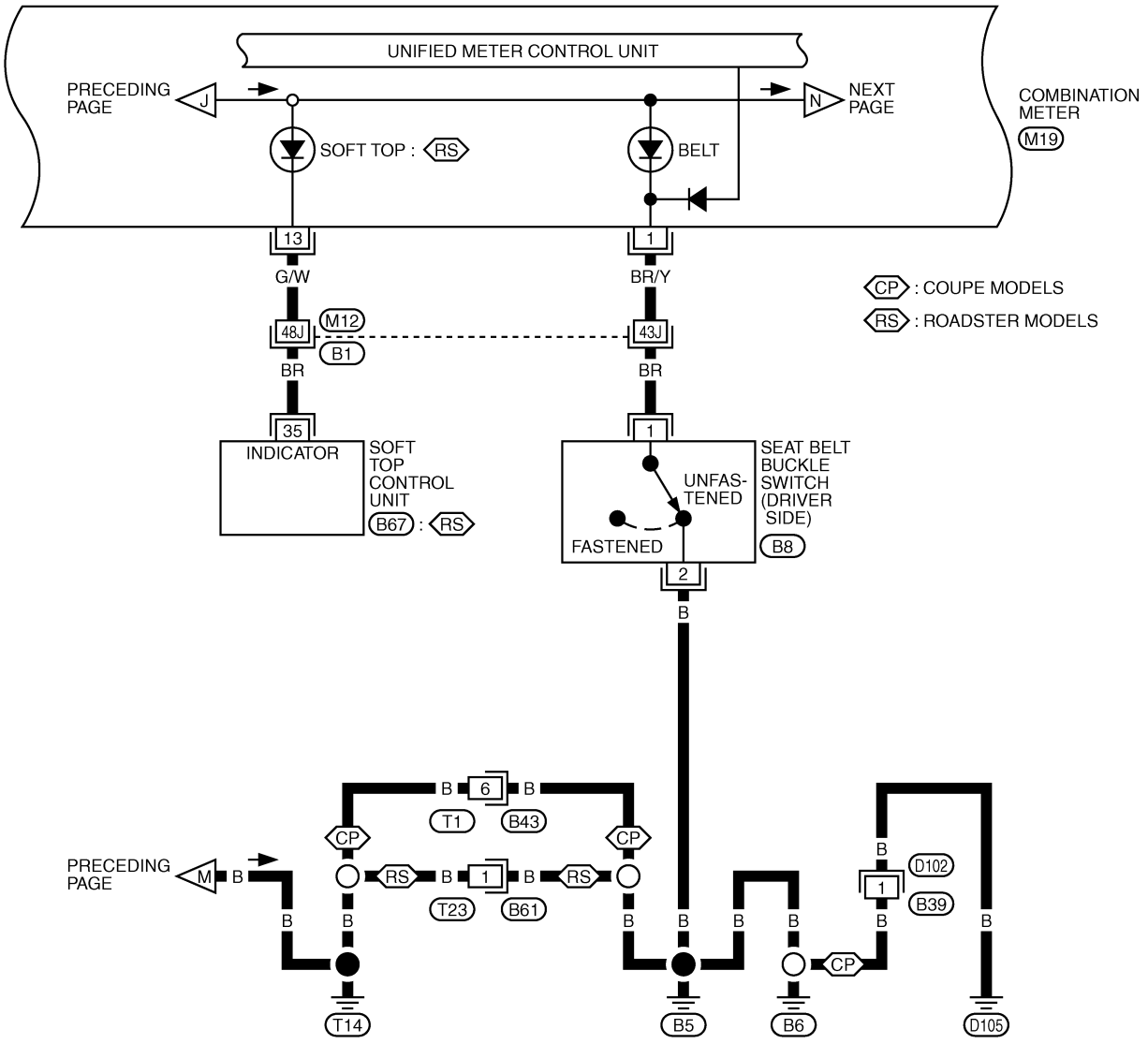


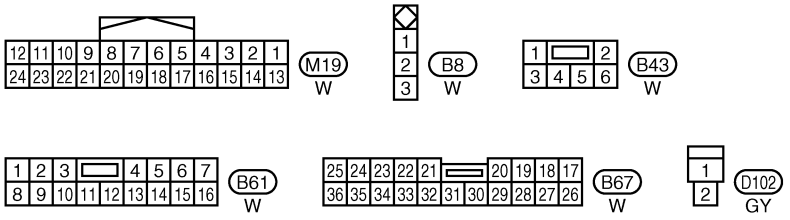


REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)
M90 , B83 -ELECTRICAL UNITS

TKWT1842E

DI-WARN-06

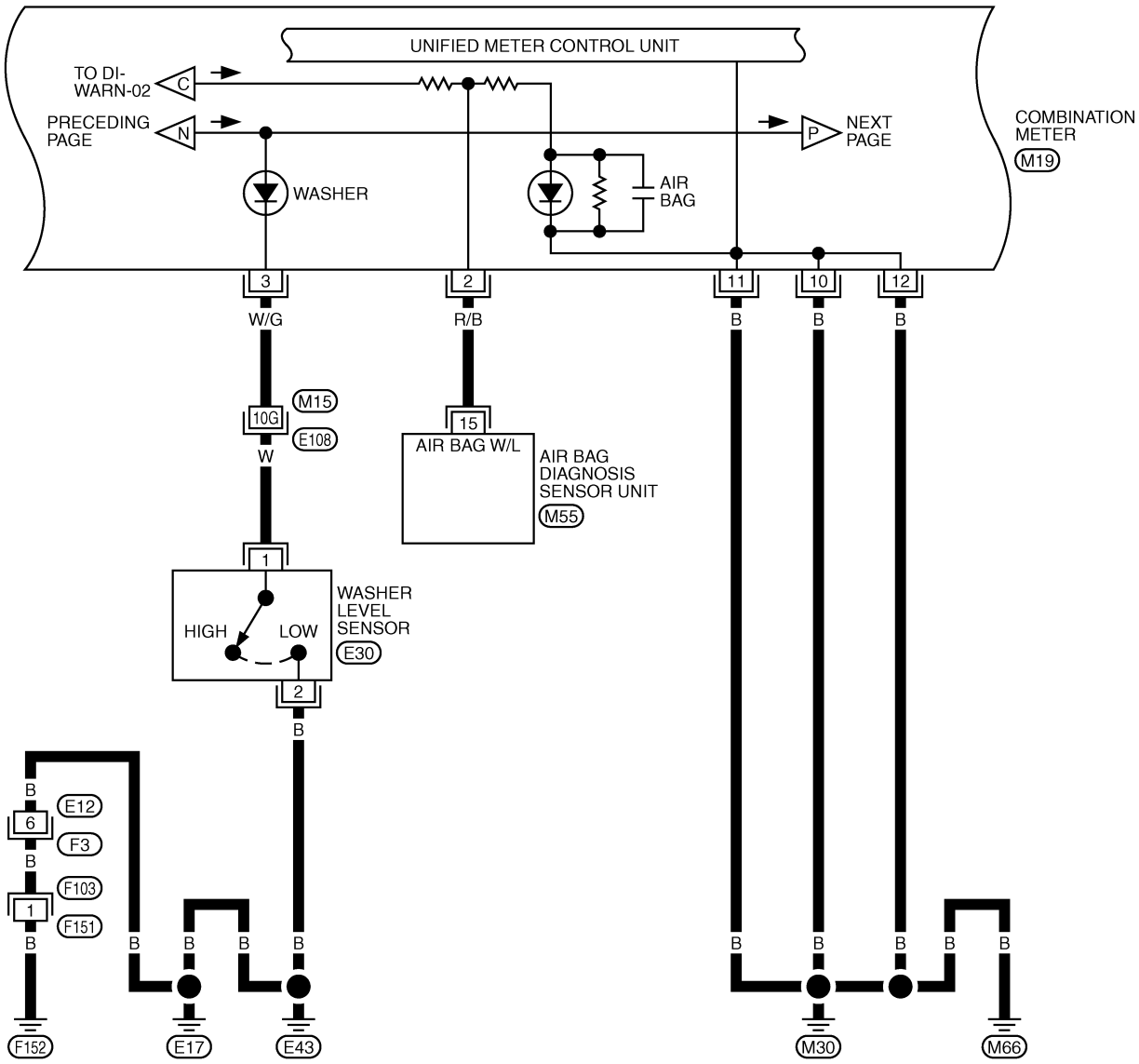


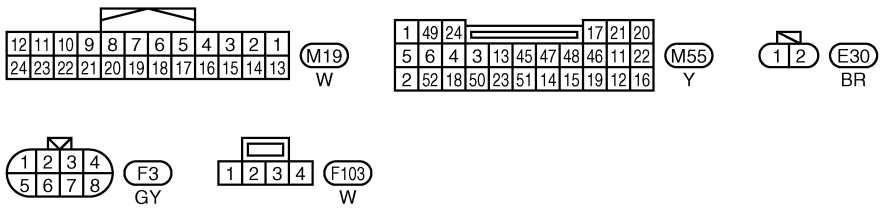


REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT1633E

DI-WARN-07



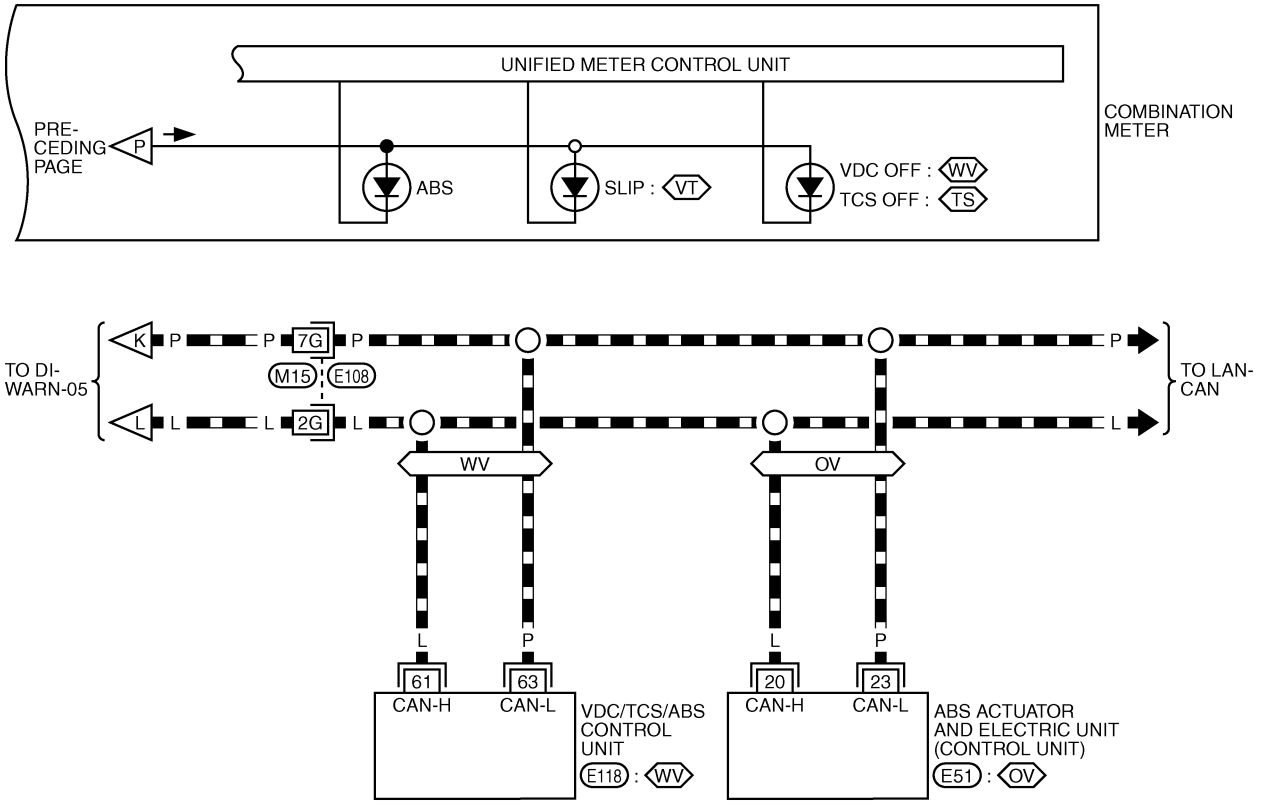


REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT1634E

DI-WARN-08

: DATA LINE
WV : WITH VDC SYSTEM
OV : WITHOUT VDC SYSTEM
TS : WITH TCS WITHOUT VDC SYSTEM
VT : WITH VDC SYSTEM OR TCS



REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
E51 , E118 -ELECTRICAL UNITS

TKWT1635E

Oil Pressure Warning Lamp Stays Off (Ignition Switch ON) or Stays On (Oil Pressure Is Normal)

AKS0095E

NOTE:
For oil pressure inspection, refer to LU-7, "OIL PRESSURE CHECK" .

1. CHECK SELF-DIAGNOSTIC RESULTS OF UNIFIED METER AND A/C AMP.

Select “METER A/C AMP” on CONSULT-II, and then perform self-diagnosis of unified meter and A/C amp. Refer to DI-58, "CONSULT-II Function" .

Self-diagnostic results content

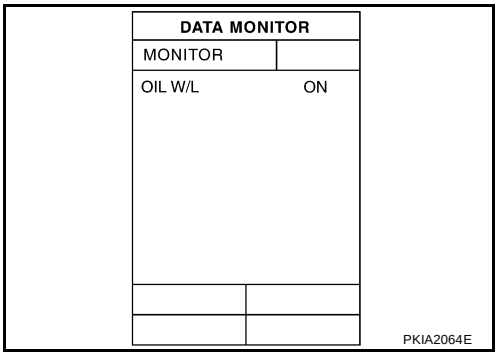
No malfunction detected>>GO TO 2.
Malfunction detected>>Go to DI-17, "Symptom Chart 2" in “COMBINATION METER”.

2. CHECK UNIFIED METER AND A/C AMP. INPUT SIGNAL

Select “METER A/C AMP” on CONSULT-II. Operate ignition switch with “OIL W/L” of “DATA MONITOR” and check operation status.

When ignition switch is in ON position (Engine stopped) : OIL W/L ON

When engine running : OIL W/L OFF



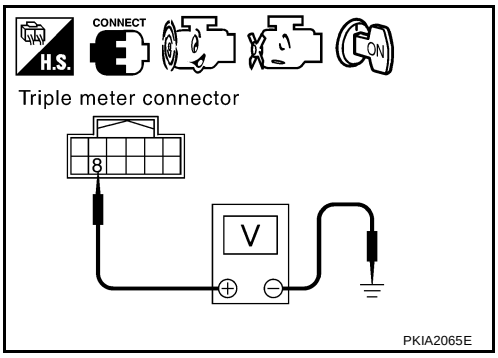
OK or NG

OK >> Replace combination meter.
NG >> GO TO 3.

3. CHECK OIL PRESSURE SENSOR SIGNAL

Check voltage between triple meter harness connector M44 terminal 8 (LG/R) and ground.

Terminals			Condition	Voltage (V)
(+)		(–)		
Connector	Terminal (Wire color)			
M44	8 (LG/R)	Ground	When ignition switch is in ON position (Engine stopped.)	Approx. 1
			Engine running [When the oil pressure is 80psi (500kPa)]	Approx. 3



OK or NG

OK >> Replace triple meter.
NG >> GO TO 4.

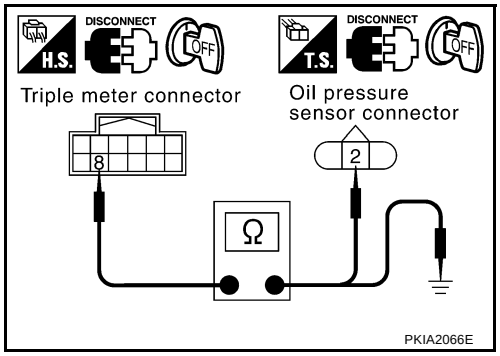
4. CHECK OIL PRESSURE SENSOR INPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect triple meter and oil pressure sensor connector.
3. Check continuity between triple meter harness connector M44 terminal 8 (LG/R) and oil pressure sensor harness connector F21 terminal 2 (G).

Continuity should exist.

4. Check continuity between triple meter harness connector M44 terminal 8 (LG/R) and ground.

Continuity should not exist.



OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

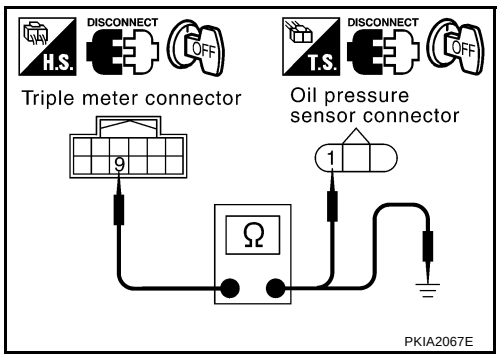
5. CHECK OIL PRESSURE SENSOR POWER SUPPLY CIRCUIT

1. Check continuity between triple meter harness connector M44 terminal 9 (R/L) and oil pressure sensor harness connector F21 terminal 1 (R/L).

Continuity should exist.

2. Check continuity between triple meter harness connector M44 terminal 9 (R/L) and ground.

Continuity should not exist.



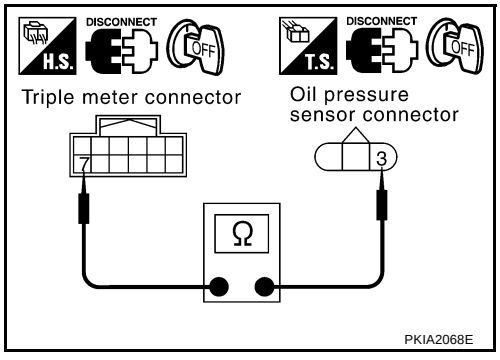
OK or NG

OK >> GO TO 6.
NG >> Repair harness or connector.

6. CHECK OIL PRESSURE SENSOR GROUND CIRCUIT

Check continuity between triple meter harness connector M44 terminal 7 (G/OR) and oil pressure sensor harness connector F21 terminal 3 (B).

Continuity should exist.



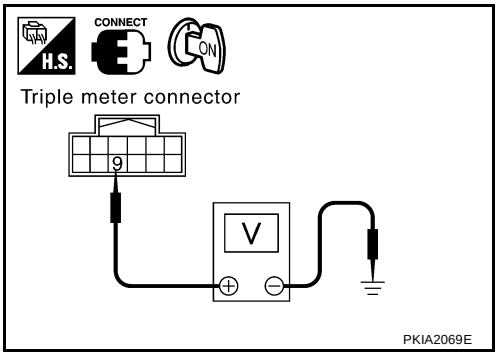
OK or NG

OK >> GO TO 7.
NG >> Repair harness or connector.

7. CHECK OIL PRESSURE SENSOR POWER SUPPLY

1. Connect triple meter connector.
2. Turn ignition switch ON.
3. Check voltage between triple meter harness connector M44 terminal 9 (R/L) and ground.

Approx. 5V



OK or NG

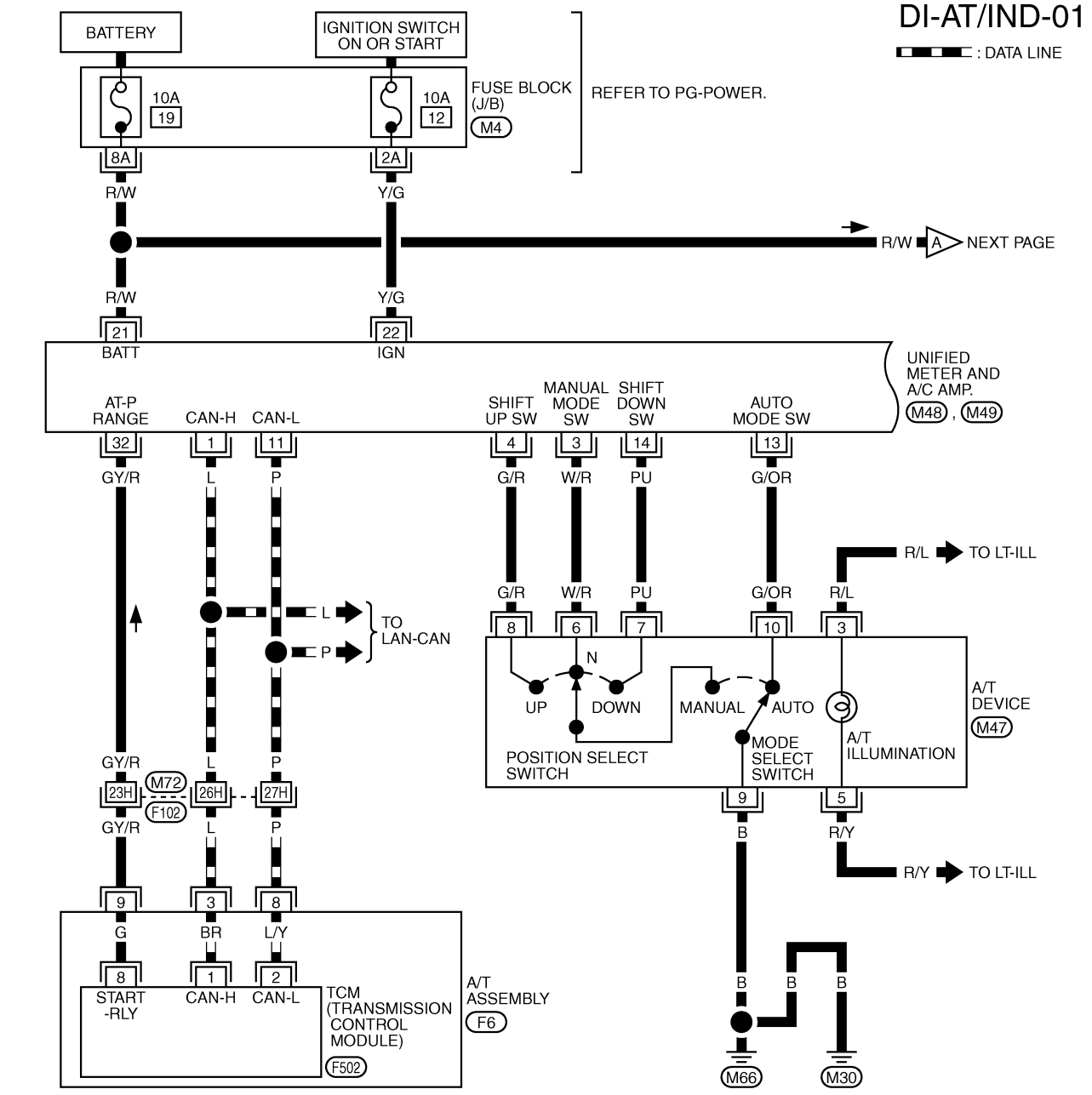
OK >> Replace oil pressure sensor.
NG >> Replace triple meter.

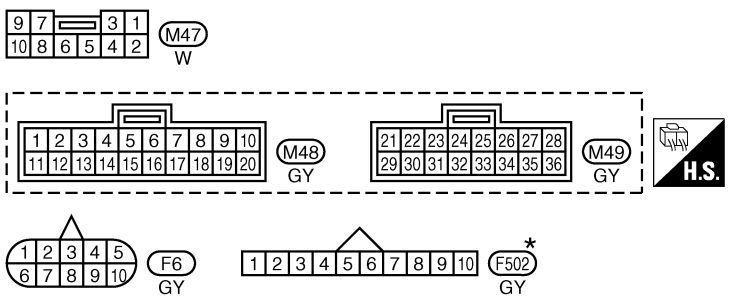
A/T INDICATOR

PFP:24814

Wiring Diagram — AT/IND —

AKS0095F





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

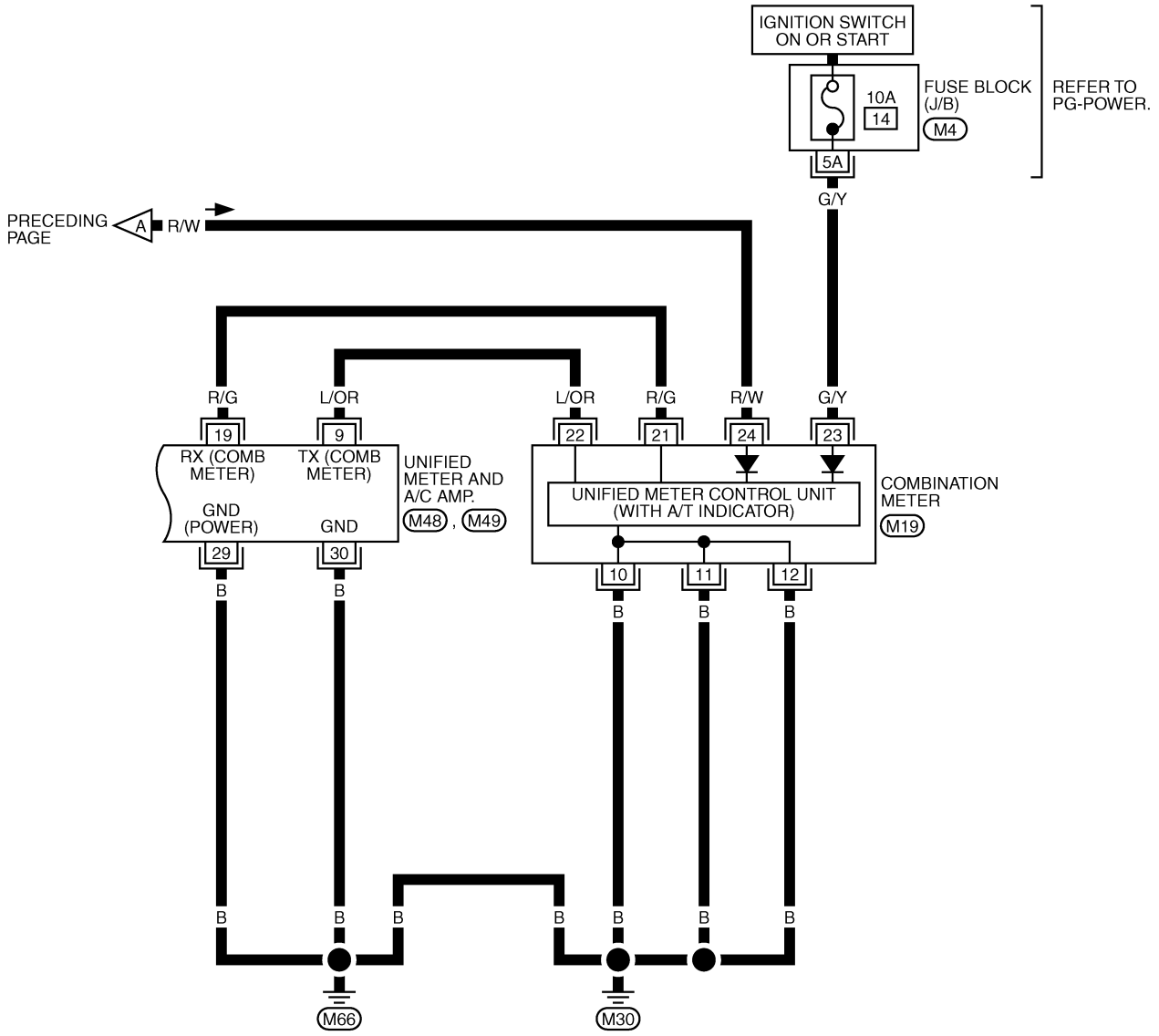
REFER TO THE FOLLOWING.

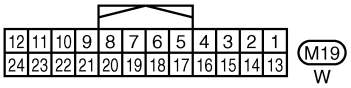
F102 -SUPER MULTIPLE JUNCTION (SMJ)

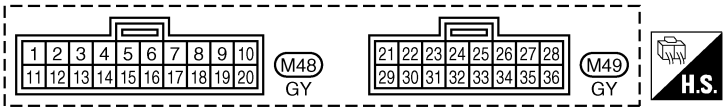
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWM1320E

DI-AT/IND-02







REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT0493E

A/T Indicator Is Malfunction

AKS0095G

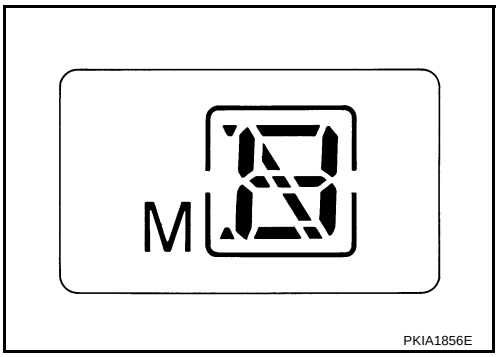
1. CHECK SELF-DIAGNOSIS OF COMBINATION METER

Perform combination meter self-diagnosis. Refer to DI-13, "HOW TO ALTERNATE DIAGNOSIS MODE" .

Are all segments displayed?

YES or NO

YES >> GO TO 2.
NO >> Replace combination meter.



2. CHECK SELF-DIAGNOSTIC RESULTS OF UNIFIED METER AND A/C AMP.

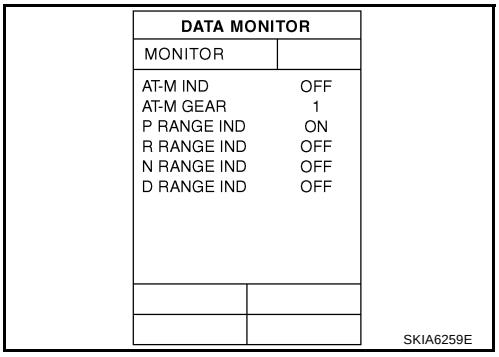
Select “METER A/C AMP” on CONSULT-II, and then perform self-diagnosis of unified meter and A/C amp. Refer to DI-58, "CONSULT-II Function" .

Self-diagnostic results content

No malfunction detected>>GO TO 3.
Malfunction detected>> Go to DI-17, "Symptom Chart 2" in combination meter.

3. CHECK UNIFIED METER AND A/C AMP. INPUT SIGNAL

1. Connect CONSULT-II and start engine.
2. Use “DATA MONITOR” of “METER A/C AMP” on CONSULT-II. Confirm each indication on the monitor when operating the shift lever.



CONSULT-II display	Switch operation	Operation status
AT-M IND	Manual mode range	ON
	Except for manual mode range	OFF
AT-M GEAR	Manual mode range (shift up or down)	5-1
	Except for manual mode range	1
P RANGE IND	P range position	ON
	Except for P range position	OFF
R RANGE IND	R range position	ON
	Except for R range position	OFF
N RANGE IND	N range position	ON
	Except for N range position	OFF
D RANGE IND	D range position	ON
	Except for D range position	OFF

OK or NG

OK >> Replace combination meter.
NG >> GO TO 4.

4. CHECK TCM SELF-DIAGNOSIS

Perform TCM self-diagnosis. Refer to AT-86, "CONSULT-II" .

Self-diagnostic results content

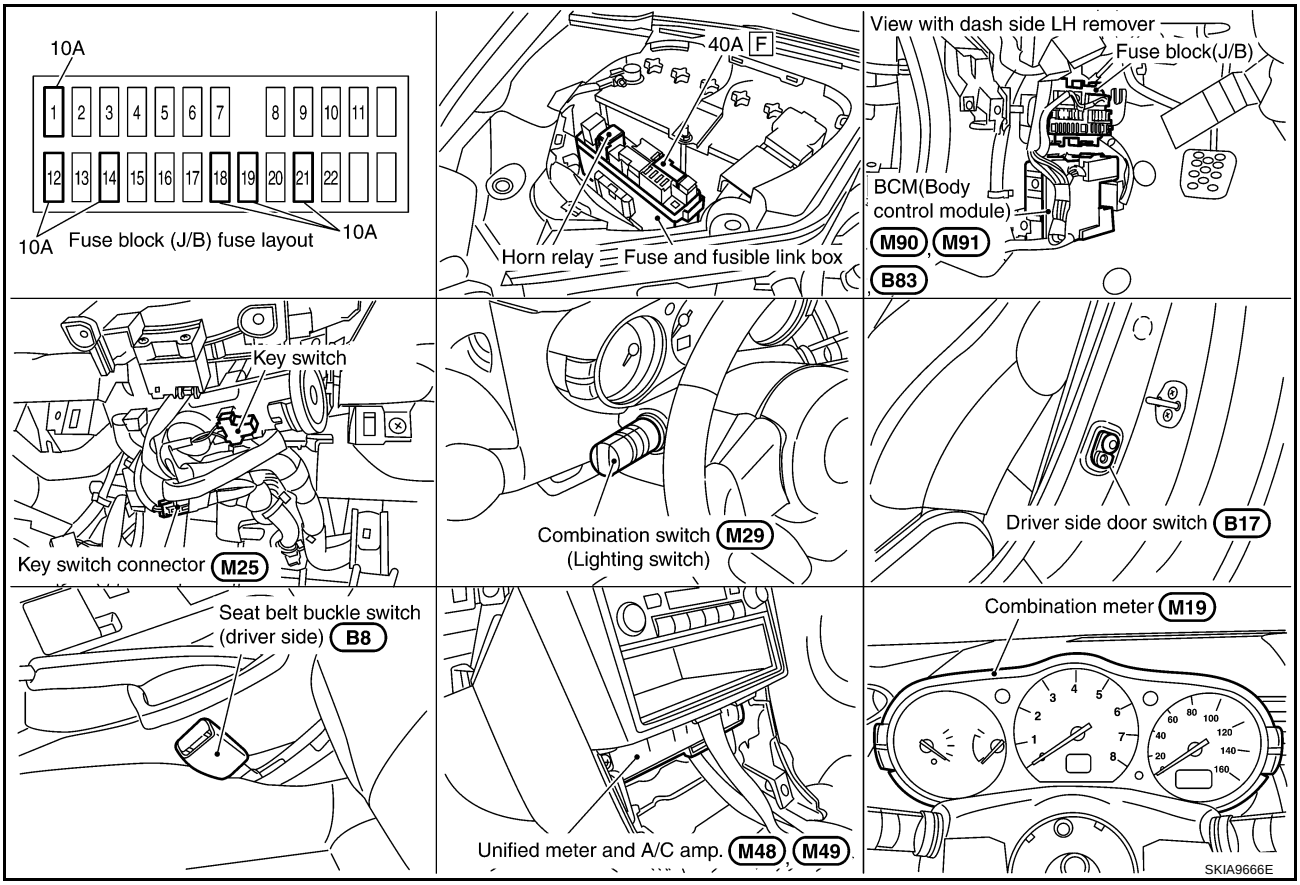
No malfunction detected>>Replace unified meter and A/C amp. Refer to DI-61, "Removal and Installation of Unified Meter and A/C Amp." .
Malfunction detected>>Check applicable parts, and repair or replace corresponding parts.

WARNING CHIME

PFP:24814

Component Parts and Harness Connector Location

AKS0095H



System Description

AKS0095I

FUNCTION

Power is supplied at all times

- through 40A fusible link (letter **F** , located in the fuse and fusible link box)
- to BCM terminal 55
- through 10A fuse [No. 18, located in the fuse block (J/B)]
- to BCM terminal 42
- through 10A fuse [No. 21, located in the fuse block (J/B)]
- to key switch terminal 2
- through 10A fuse [No. 19, located in the fuse block (J/B)]
- to unified meter and A/C amp. terminal 21, and
- to combination meter terminal 24.

When ignition switch ON or START position, power is supplied

- through 10A fuse [No. 1, located in the fuse block (J/B)]
- to BCM terminal 38
- through 10A fuse [No. 12, located in the fuse block (J/B)]
- to unified meter and A/C amp. terminal 22
- through 10A fuse [No. 14, located in the fuse block (J/B)]
- to combination meter terminal 23.

Ground is supplied

- to BCM terminal 52
- through body grounds M30 and M66
- to unified meter and A/C amp. terminals 29 and 30

- through body grounds M30 and M66
- to combination meter terminals 10, 11 and 12
- through body grounds M30 and M66.

IGNITION KEY WARNING CHIME

With the key inserted into the ignition switch, and the driver's door open, the warning chime will sound.
Power is supplied

- through key switch terminal 1
- to BCM terminal 37.

Ground is supplied

- to BCM terminal 62
- through driver side door switch terminal 1.

Driver side door switch is case grounded.
BCM detects key inserted into the ignition switch, and sends key warning signal to unified meter and A/C amp. with CAN communication line. Unified meter and A/C amp. sends key warning signal to combination meter with communication line between unified meter and A/C amp. and combination meter.
When combination meter receives key warning signal, it sounds warning chime.

LIGHT WARNING CHIME

With the key removed from the ignition switch, the driver's door open, and the lighting switch in 1ST or 2ND position, the warning chime will sound. [Except when headlamp battery saver control operates (for 5 minutes after ignition switch is turned to OFF or ACC position) and headlamps do not illuminate.]
Signal is supplied

- from combination switch (lighting switch) terminals 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10
- to BCM terminals 2, 3, 4, 5, 6, 32, 33, 34, 35 and 36.

  NOTE:
  BCM detected lighting switch in 1st or 2nd position, refer to BCS-3, "COMBINATION SWITCH READING FUNCTION" .

Ground is supplied

- to BCM terminal 62
- through driver side door switch terminal 1.

Driver side door switch is case grounded.
BCM detects headlamps are illuminated, and sends light warning signal to unified meter and A/C amp. with CAN communication line. Unified meter and A/C amp. sends light warning signal to combination meter with communication line between unified meter and A/C amp. and combination meter.
When combination meter receives light warning signal, it sounds warning chime.

SEAT BELT WARNING CHIME

With ignition switch turned ON and seat belt unfastened [seat belt buckle switch (driver side) ON], warning chime will sound for approximately 6 seconds.
Ground is supplied

- to combination meter terminal 1
- through seat belt buckle switch (driver side) terminal 1.

Seat belt buckle switch (driver side) terminal 2 is grounded through body grounds B5, B6, D105 (COUPE models only) and T14.
Combination meter sends seat belt unfastened [seat belt buckle switch (driver side) ON] signal to unified meter and A/C amp. with communication line between unified meter and A/C amp. and combination meter.
BCM receives seat belt unfastened [seat belt buckle switch (driver side) ON] signal from unified meter and A/C amp. with CAN communication line, and sends seat belt warning signal to unified meter and A/C amp. with CAN communication line. Unified meter and A/C amp. sends seat belt warning signal to combination meter with communication line between unified meter and A/C amp. and combination meter.
When combination meter receives seat belt warning signal, it sounds warning chime.

CAN Communication System Description

AKS0095J

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

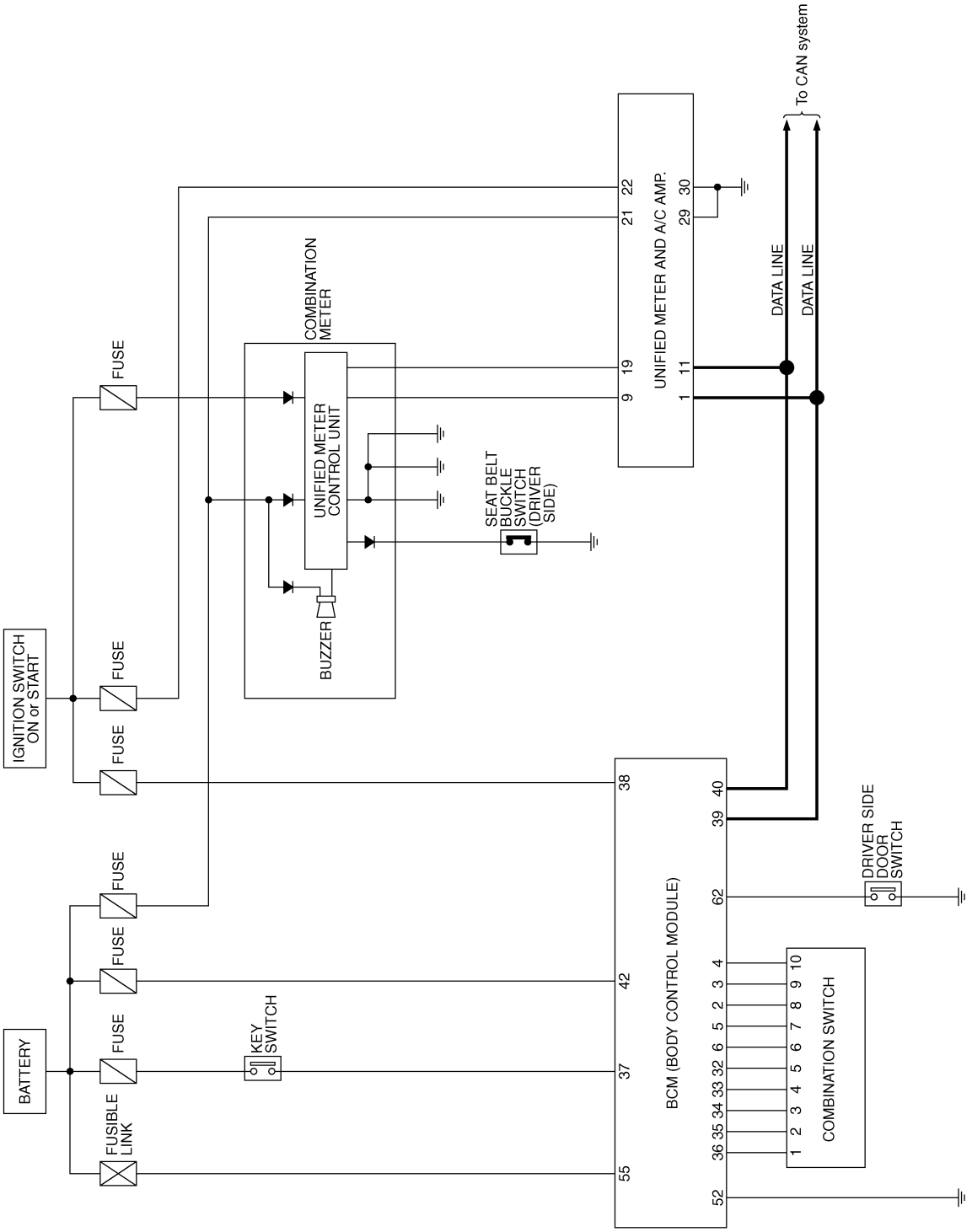
CAN Communication Unit

AKS00A2E

Refer to LAN-5, "CAN Communication Unit" in “LAN SYSTEM”.

Schematic

AKS0095L

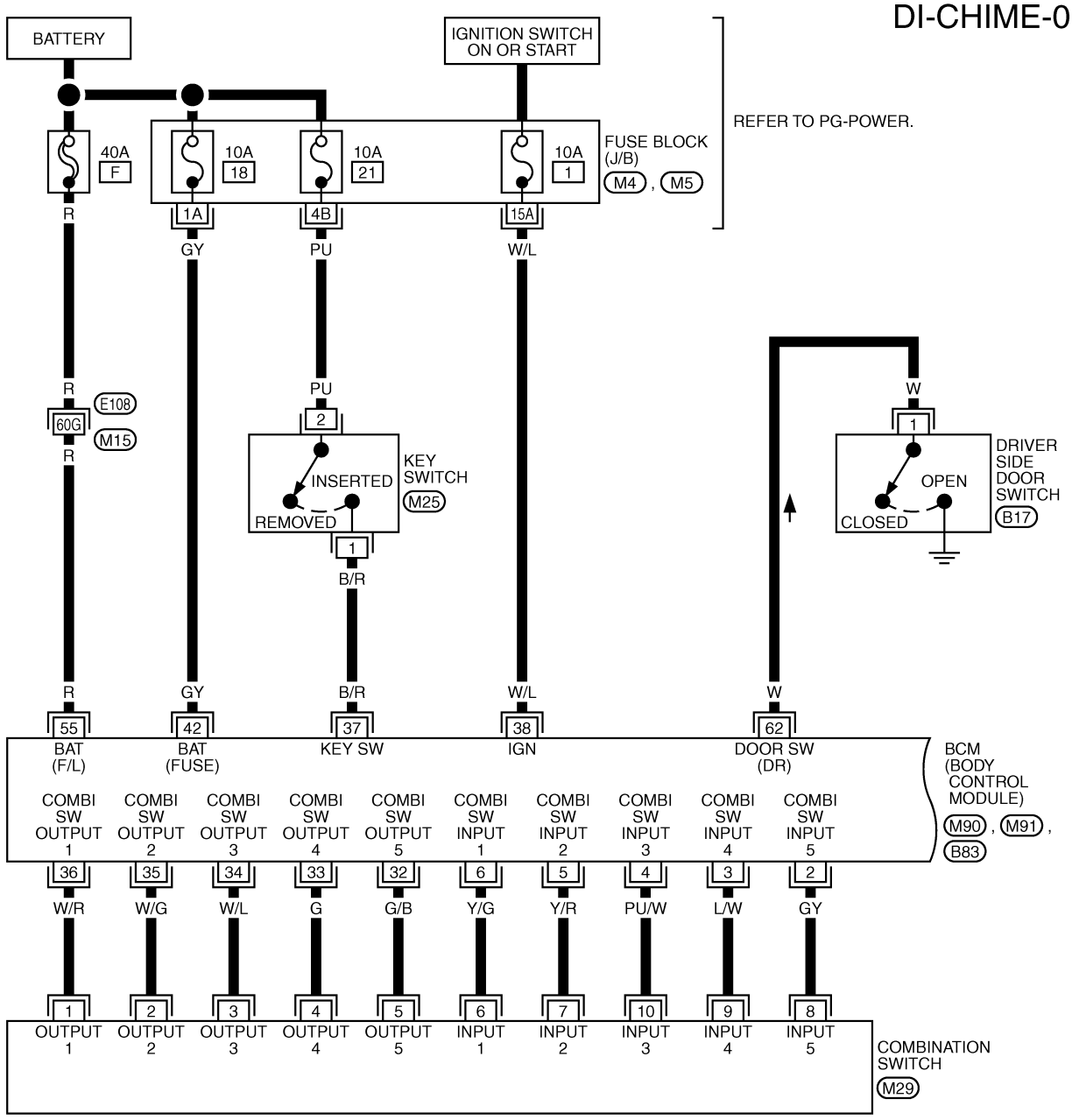


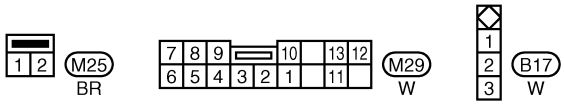
TKWT1846E

Wiring Diagram — CHIME —

AKS0095M

DI-CHIME-01

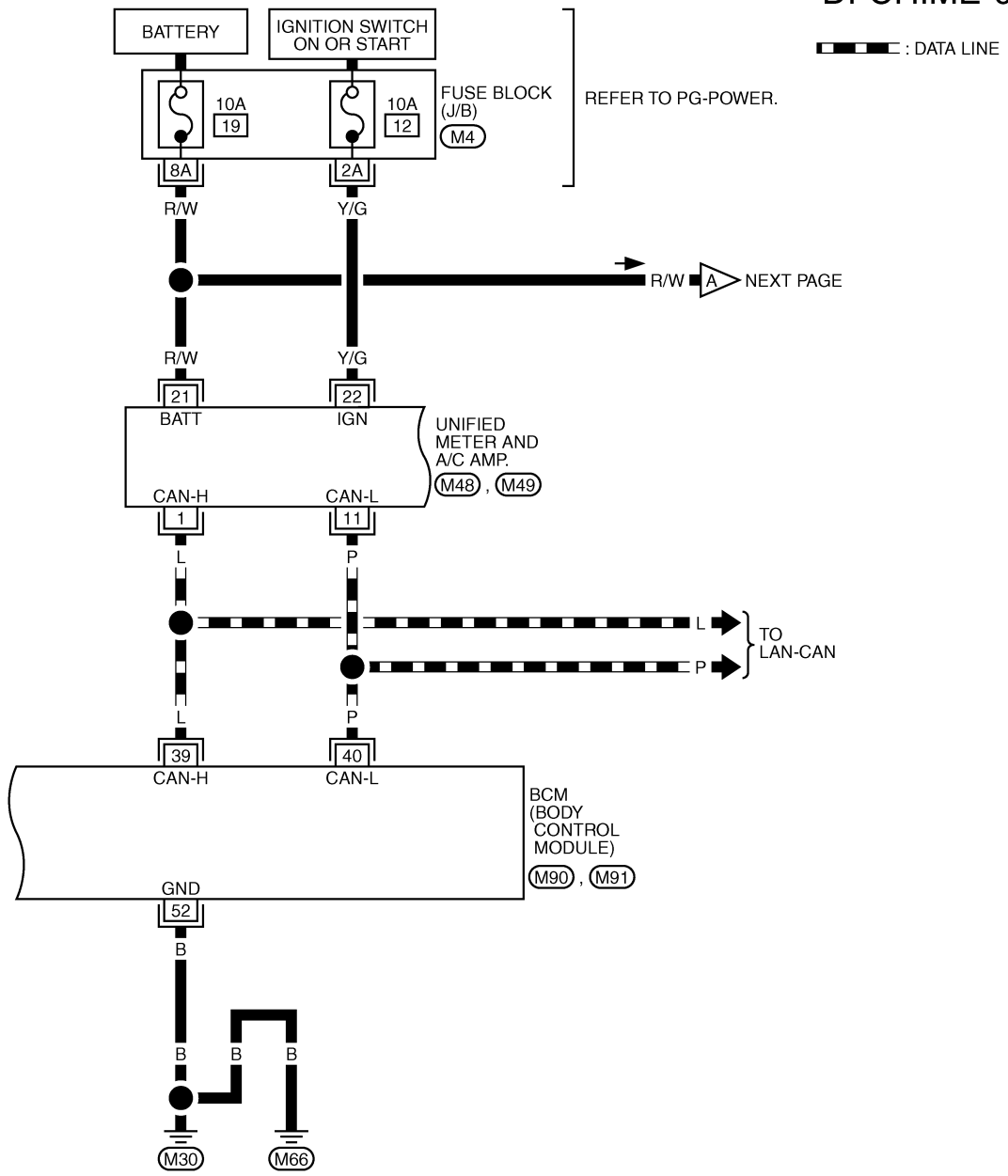


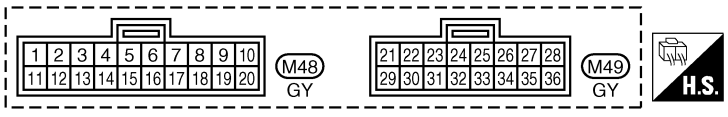


REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)
M90 , M91 , B83 -ELECTRICAL UNITS

TKWT1847E

DI-CHIME-02

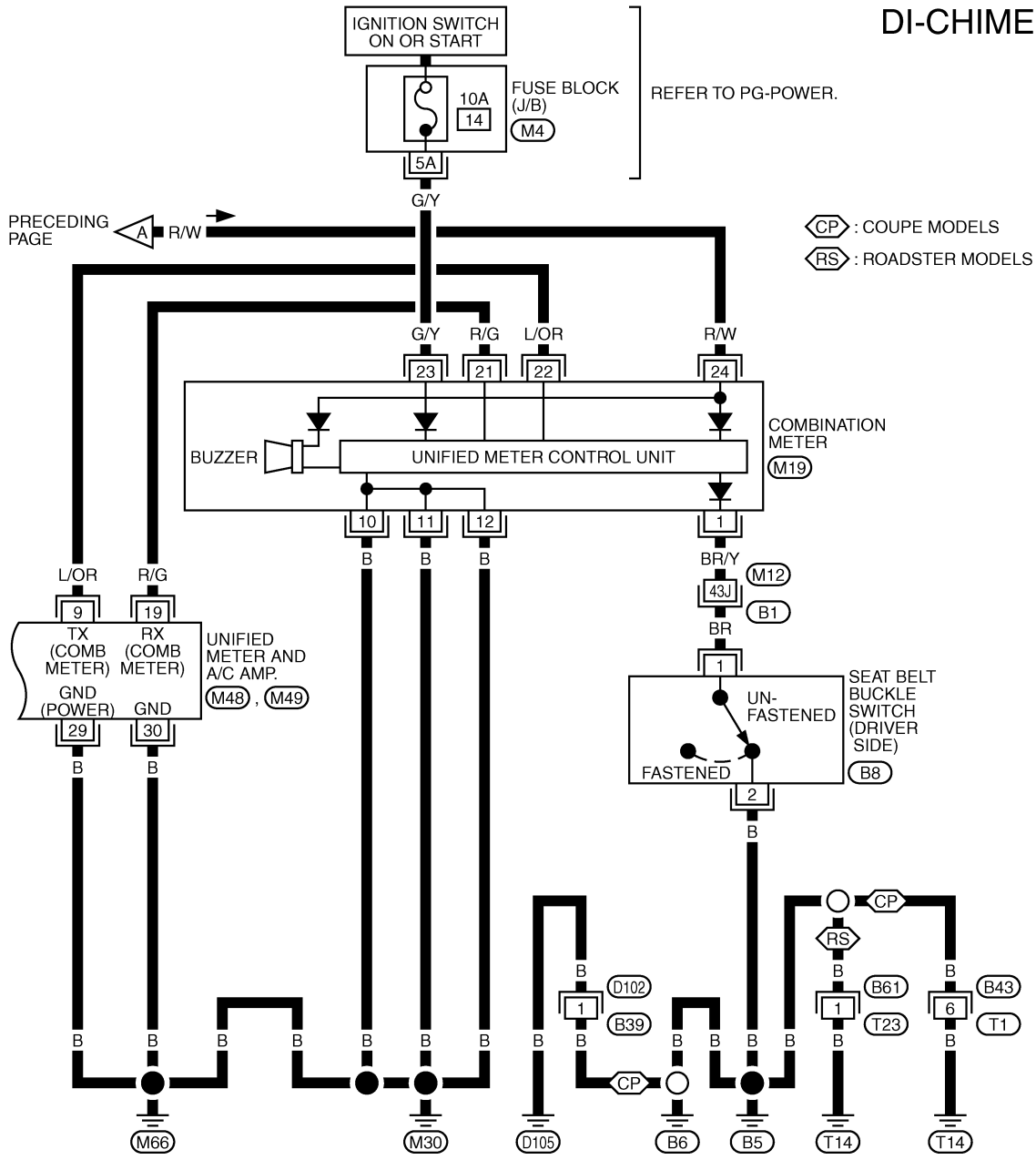


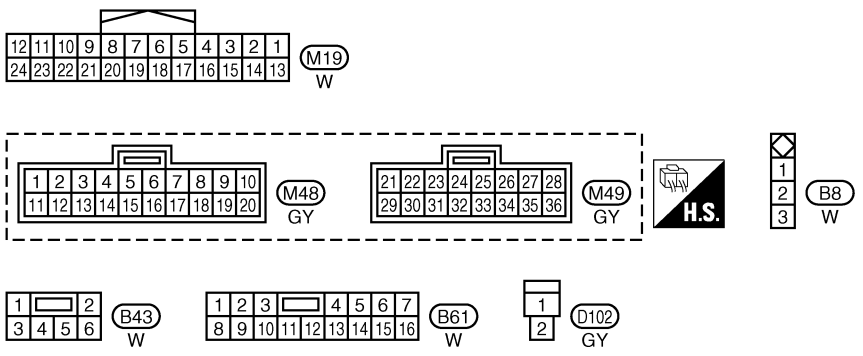


REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M90 , M91 -ELECTRICAL UNITS

TKWT1848E

DI-CHIME-03





REFER TO THE FOLLOWING.

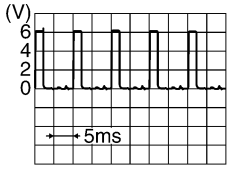
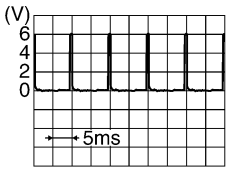
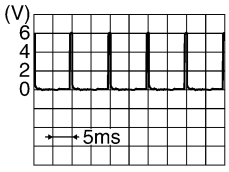
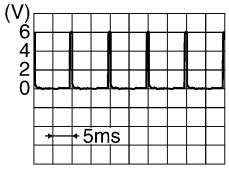
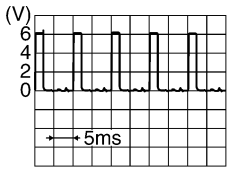
B1 -SUPER MULTIPLE JUNCTION (SMJ)

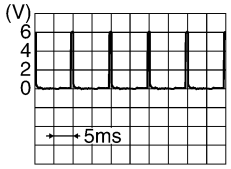
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT1636E

Terminals and Reference Value for BCM

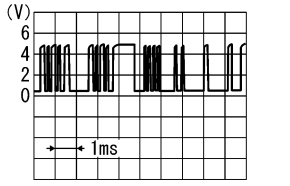
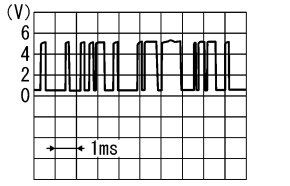
AKS0095O

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
2	GY	Combination switch input 5	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E
3	L/W	Combination switch input 4	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
4	PU/W	Combination switch input 3	ON	Lighting, turn, wiper OFF Wiper dial position 4	SKIA5291E
5	Y/R	Combination switch input 2	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
6	Y/G	Combination switch input 1			
32	G/B	Combination switch output 5	ON	Lighting, turn, wiper OFF Wiper dial position 4	SKIA5291E
33	G	Combination switch output 4	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
34	W/L	Combination switch output 3	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
35	W/G	Combination switch output 2	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
36	W/R	Combination switch output 1			
37	B/R	Key switch signal	OFF	Key is removed.	Approx. 0V
				Key is inserted.	Approx. 12V
38	W/L	Ignition switch (ON)	ON	—	Battery voltage
39	L	CAN H	—	—	—
40	P	CAN L	—	—	—
42	GY	Battery power supply (FUSE)	OFF	—	Battery voltage
52	B	Ground	ON	—	Approx. 0V
55	R	Battery power supply (F/L)	OFF	—	Battery voltage
62	W	Driver side door switch signal	OFF	Door switch is released. (Door switch ON)	Approx. 0V
				Door switch is pushed. (Door switch OFF)	Approx. 5V

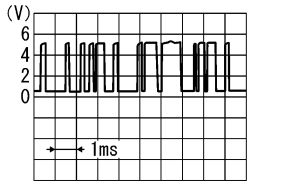
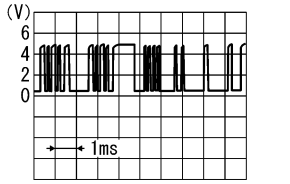
Terminals and Reference Value for Unified Meter and A/C Amp.

AKS0095P

Terminal No.	Wire color	Item	Measuring condition		Reference value (V)
			Ignition switch	Operation or condition	
1	L	CAN H	OFF	—	—
9	L/OR	TX communication line (To combination meter)	ON	—	 SKIA3362E
11	P	CAN L	OFF	—	—
19	R/G	RX communication line (From combination meter)	ON	—	 SKIA3361E
21	R/W	Battery power supply	OFF	—	Battery voltage
22	Y/G	Ignition switch ON or START	ON	—	Battery voltage
29	B	Ground (POWER)	ON	—	Approx. 0
30	B	Ground	ON	—	Approx. 0

Terminals and Reference Value for Combination Meter

AKS0095Q

Terminal No.	Wire color	Item	Measuring condition		Reference value (V)
			Ignition switch	Operation or condition	
1	BR/Y	Seat belt buckle switch (Driver side)	ON	Seat belt is unfastened.	Approx. 0
				Seat belt is fastened.	Approx. 5
10	B	Ground	ON	—	Approx. 0
11					
12					
21	R/G	TX communication line (To unified meter and A/C amp.)	ON	—	 SKIA3361E
22	L/OR	RX communication line (From unified meter and A/C amp.)	ON	—	 SKIA3362E
23	G/Y	Ignition switch ON or START	ON	—	Battery voltage
24	R/W	Battery power supply	OFF	—	Battery voltage

How to Proceed With Trouble Diagnosis

AKS0095R

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to DI-77, "System Description" .
3. Perform the Preliminary Check. Refer to DI-87, "Preliminary Check" .
4. Select “METER A/C AMP” on CONSULT-II, and then perform self-diagnosis of unified meter and A/C amp. Refer to DI-58, "CONSULT-II Function" . When no malfunction detected, go to next step 5. When malfunction detected, go to DI-17, "Symptom Chart 2" in “COMBINATION METER”.
5. Check symptom and repair or replace the cause of malfunction.
6. Does the warning chime operate normally? If so, go to 7. If not, go to 5.
7. INSPECTION END

Preliminary Check

AKS0095S

INSPECTION FOR POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSE AND FUSIBLE LINK

Check for blown BCM fuse and fusible link.

Unit	Power source	Fuse and fusible link No.
BCM	Battery	F
		18
	Ignition switch ON or START	1

OK or NG

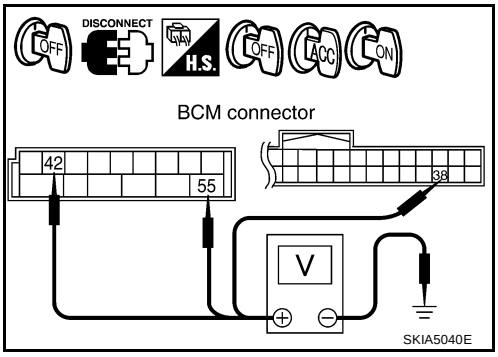
OK >> GO TO 2.

NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Disconnect BCM connector.
2. Check voltage between BCM harness connector and ground.

Terminals			Ignition switch position	
(+)		(–)	OFF	ON
Connector	Terminal (Wire color)			
M91	42 (GY)	Ground	Battery voltage	Battery voltage
	55 (R)			
M90	38 (W/L)		0V	Battery voltage



OK or NG

OK >> GO TO 3.

NG >> Check harness for open between BCM and fuse.

3. CHECK GROUND CIRCUIT

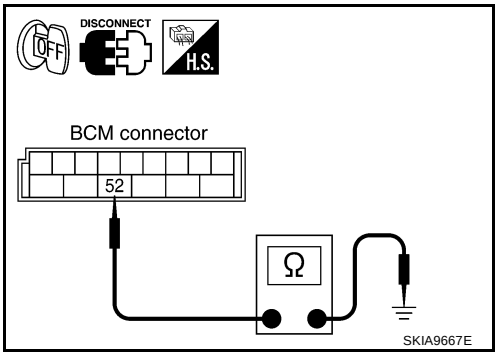
1. Turn ignition switch OFF.
2. Check continuity between BCM harness connector M91 terminal 52 (B) and ground.

Continuity should exist.

OK or NG

OK >> INSPECTION END

NG >> Repair harness or connector.



CONSULT-II Function

AKS0095T

CONSULT-II performs the following functions communicating with the BCM.

DIAGNOSTIC ITEMS DESCRIPTION

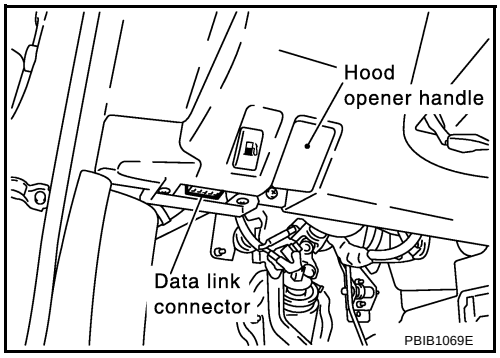
BCM diagnosis position	Diagnosis mode	Description
BUZZER	Data monitor	The input data to the BCM control unit is displayed in real time.
	Active test	Operation of electrical loads can be checked by sending driving signal to them.
BCM	Self-diagnostic	BCM performs self-diagnosis of CAN communication and combination switch.

CONSULT-II BASIC OPERATION PROCEDURE

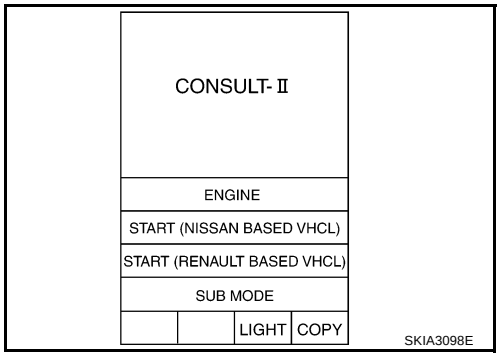
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

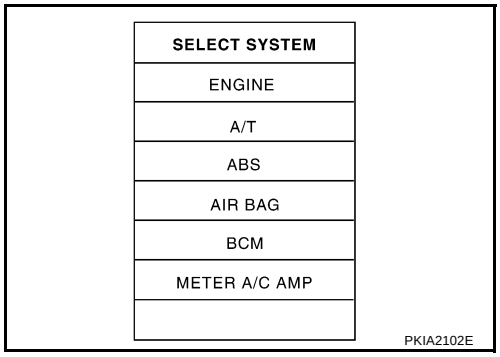
1. With the ignition switch OFF, connect “CONSULT-II” and CONSULT-II CONVERTER” to the data link connector, and turn ignition switch ON.



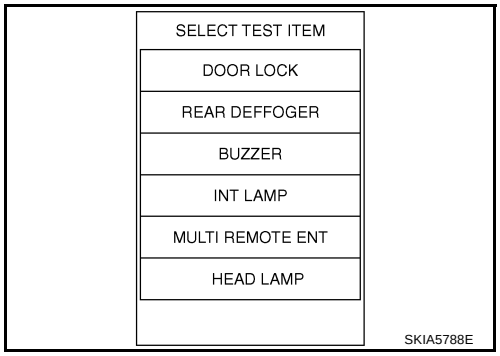
2. Touch “START (NISSAN BASED VHCL)”.



3. Touch “BCM” on “SELECT SYSTEM” screen. If “BCM” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



4. Touch “BUZZER” or “BCM”.
5. Select “DATA MONITOR”, “ACTIVE TEST” or “SELF-DIAG RESULTS”.



DATA MONITOR

Operation Procedure

1. Touch “BUZZER” on “SELECT TEST ITEM” screen.
2. Touch “DATA MONITOR” on “SELECT DIAG MODE” screen.
3. Touch “ALL SIGNALS” or “SELECTION FROM MENU” on “DATA MONITOR” screen.

ALL SIGNALS	Monitors main items.
SELECTION FROM MENU	Selects and monitors items.

4. If “SELECTION FROM MENU” is selected, touch the desired monitor item. If “ALL SIGNALS” is selected, all items required to control are monitored.
5. Touch “START”.
6. During monitoring, touching “RECORD” can start recording the monitored item status.

Data Monitor Item

Monitored item [Unit]	ALL SIGNALS	SELECTION FROM MENU	Contents
IGN ON SW [ON/OFF]	X	X	Indicates [ON/OFF] condition of ignition switch.
KEY ON SW [ON/OFF]	X	X	Indicates [ON/OFF] condition of key switch.
DOOR SW-DR [ON/OFF]	X	X	Indicates [ON/OFF] condition of driver side door switch.
TAIL LAMP SW [ON/OFF]	X	X	Indicates [ON/OFF] condition of lighting switch.
SEAT BELT SW [ON/OFF]	X	X	Indicates [ON/OFF] condition of seat belt switch.

ACTIVE TEST

Operation Procedure

1. Touch “BUZZER” on “SELECT TEST ITEM” screen.
2. Touch “ACTIVE TEST” on “SELECT DIAG MODE” screen.
3. Touch the item to be tested, and check the operation.
4. During the operation check, touching “OFF” deactivates the operation.

Active Test Item

Test item	Malfunction is detected when···
LIGHT WARN ALM	This test is able to check key warning chime operation. Key warning chime sounds for 2 seconds after touching “ON” on CONSULT-II screen.
IGN KEY WARN ALM	This test is able to check light warning chime operation. Light warning chime sounds for 2 seconds after touching “ON” on CONSULT-II screen.
SEAT BELT WARN ALM	This test is able to check seat belt warning chime operation. Seat belt warning chime sounds for 2 seconds after touching “ON” on CONSULT-II screen.

SELF-DIAGNOSTIC RESULTS

Operation Procedure

1. Touch “BCM” on “SELECT TEST ITEM” screen.
2. Touch “SELF-DIAG RESULTS” on “SELECT DIAG MODE” screen.
3. Self-diagnostic results are displayed.

Display Item List

Items to be displayed	CONSULT-II display	Description
CAN communication	CAN communication [U1000]	Malfunction is detected in CAN communication.

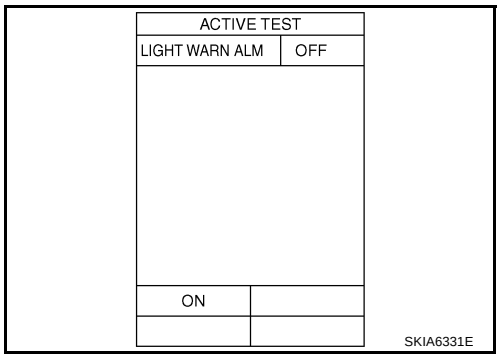
NOTE:
If “CAN communication [U1000]” is indicated, after printing the monitor item, go to “CAN system”. Refer to LAN-3, "Precautions When Using CONSULT-II" .

All Warnings Are Not Operated

AKS0095U

1. CHECK CHIME OPERATION

1. Select “BCM” on CONSULT-II.
2. Select “BUZZER” on CONSULT-II, and then perform “KEY WARN ALM”, “LIGHT WARN ALM” or “SEAT BELT ALM” of “ACTIVE TEST”.



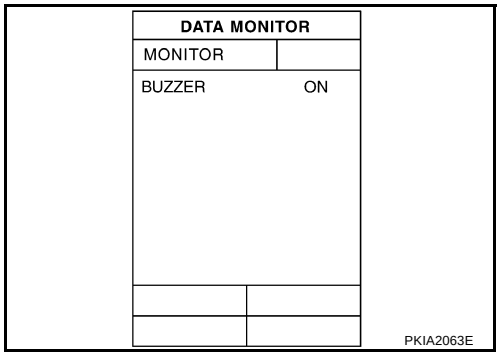
Does chime sound?

YES >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

NO >> GO TO 2.

2. CHECK UNIFIED METER AND A/C AMP. INPUT SIGNAL

1. Select “METER A/C AMP” on CONSULT-II.
2. Operate switches meet the requirements to sounds warning chime with “BUZZER” of “DATA MONITOR” and check operation status.



When meet the requirements to sounds warning chime : BUZZER ON

Except above : BUZZER OFF

OK or NG

OK >> Replace combination meter.

NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

Key Warning Chime and Light Warning Chime Does Not Operate (Seat Belt Warning Chime Does Operate)

AKS0095V

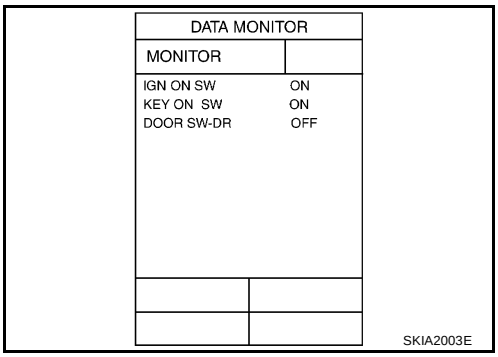
1. CHECK BCM INPUT SIGNAL

With CONSULT-II

With “DATA MONITOR” of “BUZZER”, confirm “DOOR SW-DR” when the driver side door switch is operated.

When driver side door is opened : DOOR SW-DR ON

When driver side door is closed : DOOR SW-DR OFF

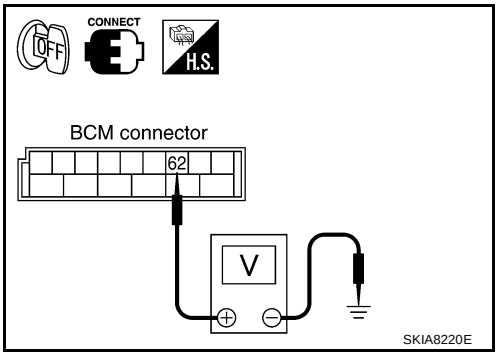


Without CONSULT-II

Check voltage between BCM harness connector B83 terminal 62 (W) and ground.

When driver side door is opened : Approx. 0V

When driver side door is closed : Approx. 5V



OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> GO TO 2.

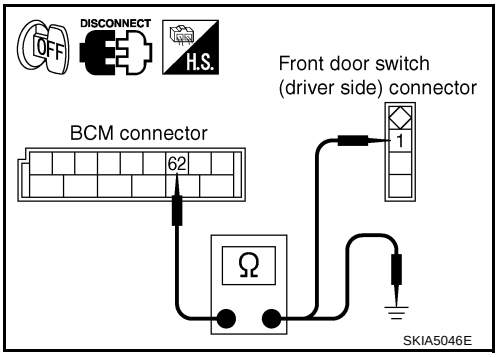
2. CHECK DRIVER SIDE DOOR SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and driver side door switch connector.
3. Check continuity between BCM harness connector B83 terminal 62 (W) and driver side door switch harness connector B17 terminal 1 (W).

   Continuity should exist.

4. Check continuity between BCM harness connector B83 terminal 62 (W) and ground.

   Continuity should not exist.



OK or NG

OK >> GO TO 3.

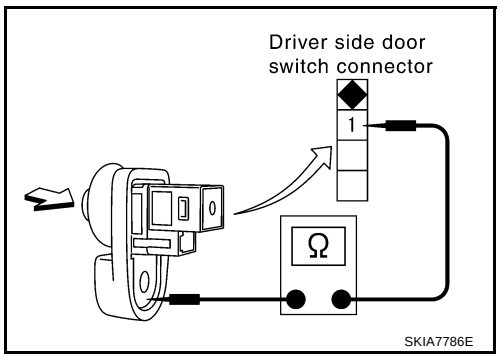
NG >> Repair harness or connector.

3. CHECK DRIVER SIDE DOOR SWITCH

Check driver side door switch.

When driver side door switch is released : **Continuity should exist.**

When driver side door switch is pushed : **Continuity should not exist.**



OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> Replace driver side door switch.

Key Warning Chime Does Not Operate

AKS0095W

1. CHECK FUSE

Check if the key switch 10A fuse [No. 21, located in the fuse block (J/B)] is blown. Refer to DI-81, "Wiring Diagram — CHIME —" .

Is the fuse blown?

YES >> Replace fuse. Be sure to repair the cause of malfunction before installing new fuse.

NO >> GO TO 2.

2. CHECK WARNING CHIME OPERATION

Check the chime under conditions in exception of key warning chime operation.

Does warning chime sound?

YES >> GO TO 3.

NO >> Go to DI-90, "All Warnings Are Not Operated" or DI-91, "Key Warning Chime and Light Warning Chime Does Not Operate (Seat Belt Warning Chime Does Operate)" .

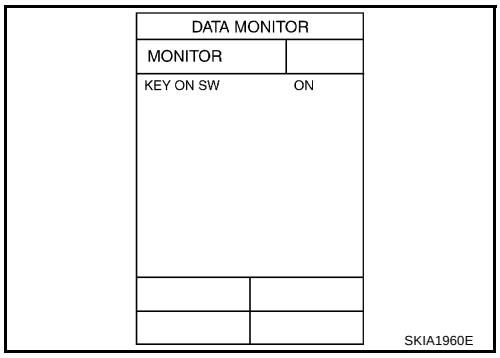
3. CHECK BCM INPUT SIGNAL

With CONSULT-II

1. Select “BCM”.
2. With “DATA MONITOR” of “BUZZER”, confirm “KEY ON SW” when the key is operated.

When key is inserted to ignition key cylinder : **KEY ON SW ON**

When key is removed from ignition key cylinder : **KEY ON SW OFF**

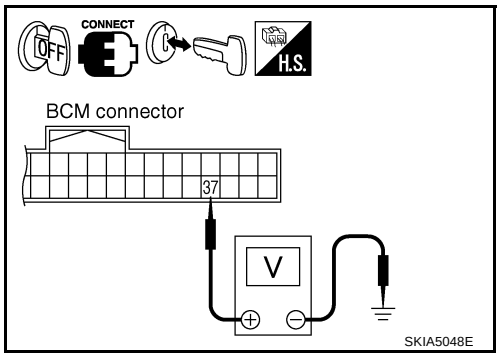


Without CONSULT-II

Check voltage between BCM harness connector M90 terminal 37 (B/R) and ground.

When key is inserted to ignition key cylinder : **Approx. 12V**

When key is removed from ignition key cylinder : **Approx. 0V**



OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

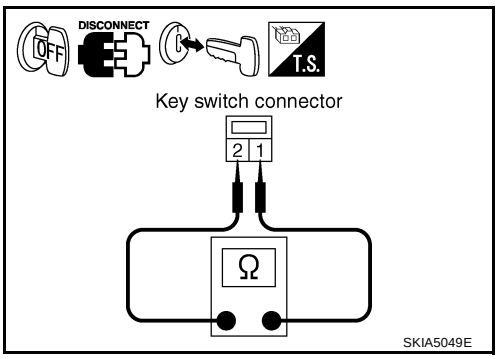
NG >> GO TO 4.

4. CHECK KEY SWITCH (INSERT)

1. Disconnect key switch connector.
2. Check continuity between key switch connector M25 terminals 1 and 2.

When key is inserted to ignition key cylinder : Continuity should exist.

When key is removed from ignition key cylinder : Continuity should not exist.



OK or NG

OK >> GO TO 5.
NG >> Replace key cylinder assembly (key switch).

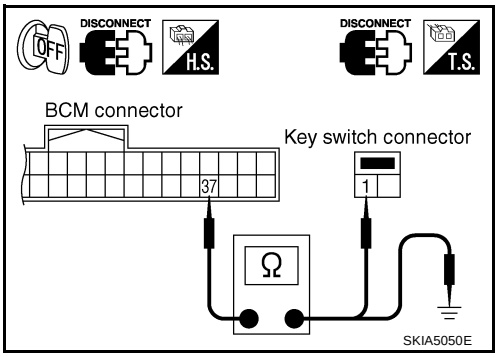
5. CHECK KEY SWITCH CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M90 terminal 37 (B/R) and key switch harness connector M25 terminal 1 (B/R).

Continuity should exist.

3. Check continuity between BCM harness connector M90 terminal 37 (B/R) and ground.

Continuity should not exist.



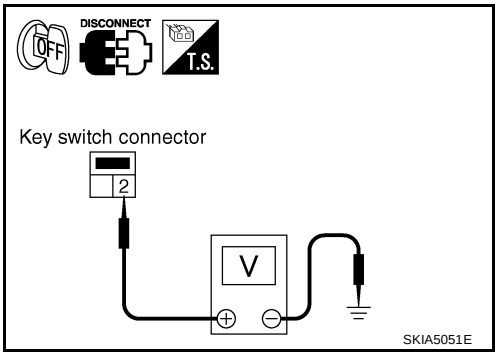
OK or NG

OK >> GO TO 6.
NG >> Repair harness or connector.

6. CHECK KEY SWITCH POWER SUPPLY CIRCUIT

Check voltage between key switch harness connector M25 terminal 2 (PU) and ground.

Battery voltage should exist.



OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Check harness for open or short between key switch and fuse.

Light Warning Chime Does Not Operate

AKS0095X

1. CHECK WARNING CHIME OPERATION

Check the chime under conditions in exception of headlamp warning chime operation.

Does warning chime sound?

YES >> GO TO 2.

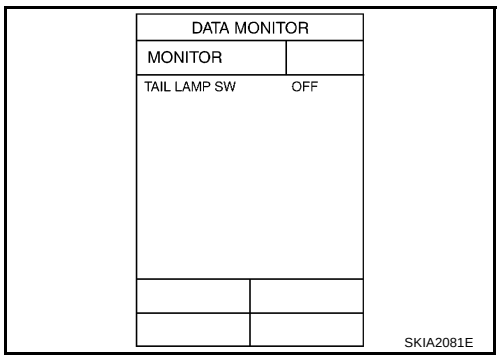
NO >> Go to DI-90, "All Warnings Are Not Operated" or DI-91, "Key Warning Chime and Light Warning Chime Does Not Operate (Seat Belt Warning Chime Does Operate)" .

2. CHECK BCM INPUT SIGNAL

1. Select “BCM” on CONSULT-II.
2. With “DATA MONITOR” of “BUZZER”, confirm “TAIL LAMP SW” when the lighting switch is operated.

When lighting switch is in 1st position : TAIL LAMP SW ON

When lighting switch is OFF : TAIL LAMP SW OFF



OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> Replace lighting switch. Refer to LT-165, "LIGHTING AND TURN SIGNAL SWITCH" .

Seat Belt Warning Chime Does Not Operate

AKS0095Y

1. CHECK WARNING CHIME OPERATION

Check the chime under conditions in exception of seat belt warning chime operation.

Does warning chime sound?

YES >> GO TO 2.

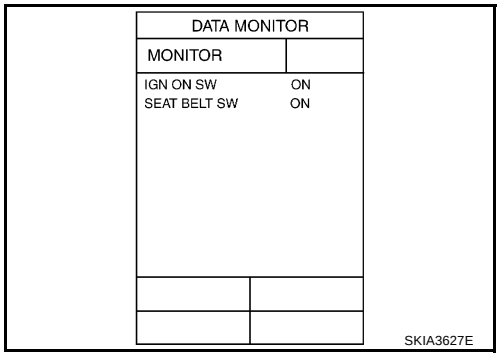
NO >> Go to DI-90, "All Warnings Are Not Operated" .

2. CHECK BCM INPUT SIGNAL

1. Select “BCM” on CONSULT-II.
2. With “DATA MONITOR” of “BUZZER”, confirm “SEAT BELT SW” when the seat belt buckle switch is operated.

When seat belt is fastened : SEAT BELT SW OFF

When seat belt is unfastened : SEAT BELT SW ON



OK or NG

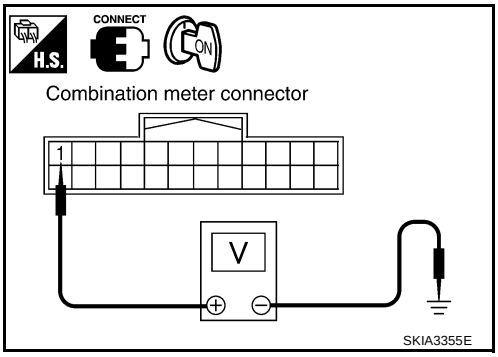
OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> GO TO 3.

3. CHECK COMBINATION METER INPUT SIGNAL

1. Turn ignition switch ON.
2. Check voltage between combination meter harness connector M19 terminal 1 (BR/Y) and ground.

When seat belt is fastened : Approx. 12V
When seat belt is unfastened : Approx. 0V



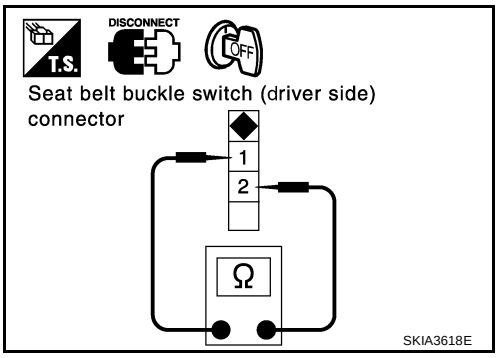
OK or NG

OK >> Replace combination meter.
NG >> GO TO 4.

4. CHECK SEAT BELT BUCKLE SWITCH

1. Turn ignition switch OFF.
2. Disconnect seat belt buckle switch (driver side) connector.
3. Check continuity between seat belt buckle switch (driver side) harness connector B8 terminals 1 and 2.

When seat belt is fastened : Continuity should not exist.
When seat belt is unfastened : Continuity should exist.



OK or NG

OK >> GO TO 5.
NG >> Replace seat belt buckle switch (driver side).

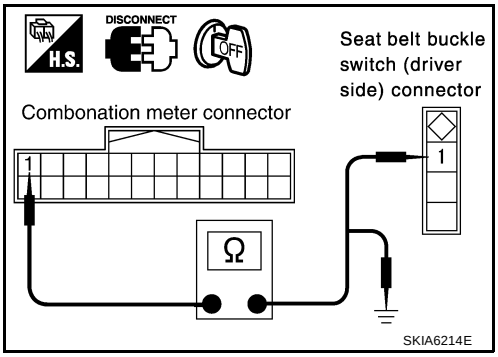
5. CHECK SEAT BELT BUCKLE SWITCH CIRCUIT

1. Disconnect combination meter connector.
2. Check harness continuity between combination meter harness connector M19 terminal 1 (BR/Y) and seat belt buckle switch (driver side) harness connector B8 terminal 1 (BR).

Continuity should exist.

3. Check harness continuity between combination meter harness connector M19 terminal 1 (BR/Y) and ground.

Continuity should not exist.



OK or NG

OK >> Check seat belt buckle switch ground circuit.
NG >> Repair harness or connector.

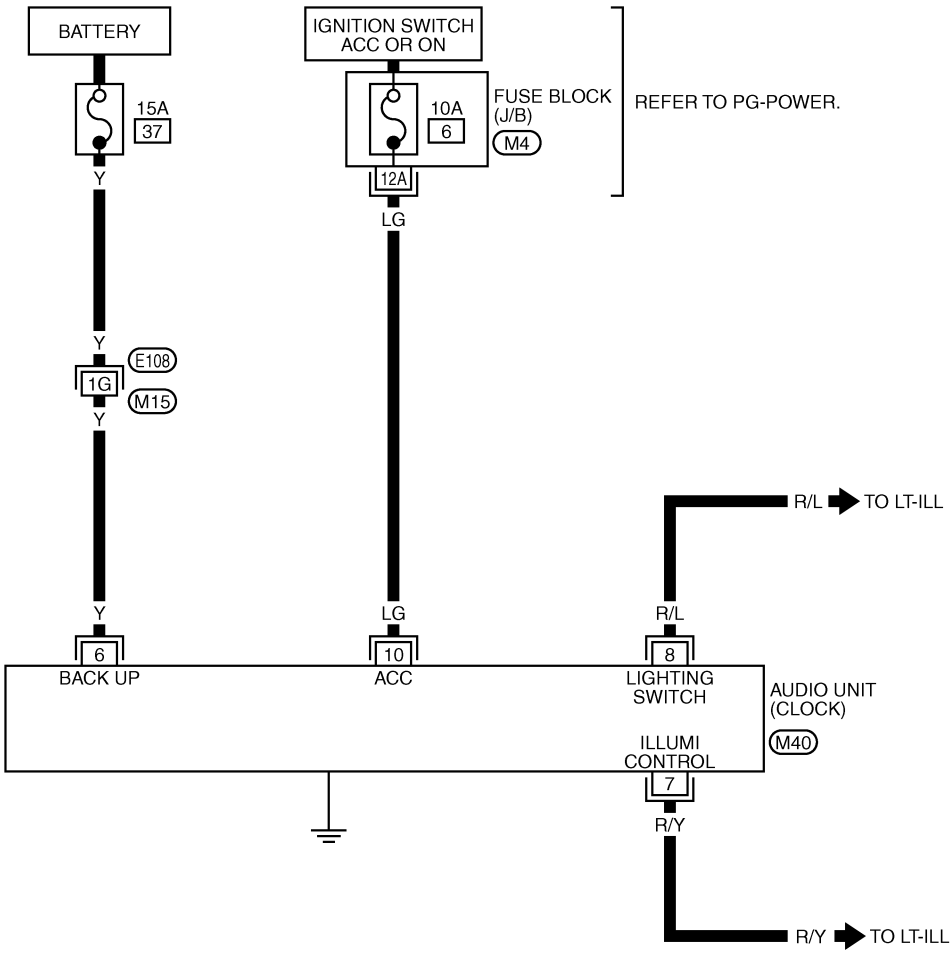
CLOCK

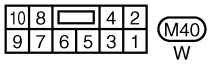
PFP:25820

Wiring Diagram — CLOCK —

AKS0095Z

DI-CLOCK-01





REFER TO THE FOLLOWING.

E108 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT0500E

Description

AKS00960

Audio display indication type digital clock has been adopted, and integrated in electronic tuner radio.

Adjusting The Time

AKS00961

Adjust the time in the following steps:

1. Switch the display to the clock adjusting mode.
   - Type A (Audio without cassette player):
     Keep pressing the DISP button until the clock display starts to flash.
   - Type B (Audio with cassette player):
     Press the RPT button until the clock display starts to flash.
2. Press the SEEK/TRACK button to adjust the hour. Press the TUNE button to adjust the minute.
3. Press the DISP button (Type A) or DISP or RPT button (Type B) to finish the adjustment.

RESETTING

- Press the DISP and TUNE buttons to reset the time to a time signal. (Type A)
- Press the RPT and TUNE buttons to reset the time to a time signal. (Type B)

For example, if these buttons are pressed while the time is between 8:00 and 8:29, the display will be reset to 8:00. If pressed while it is between 8:30 and 8:59, the display will be reset to 9:00. At the same time the display will return to the previous audio mode.

SECTION WW
WIPER, WASHER & HORN

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PRECAUTION

PFP:00011

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

AKS00AC5

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

AKS003RE

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Wiring Diagrams and Trouble Diagnosis

AKS000Y5

When You Read Wiring Diagrams, Refer to the Following:

- Refer to GI-15, "How to Read Wiring Diagrams" .
- Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" for power distribution circuit.

When You Perform Trouble Diagnosis, Refer to the Following:

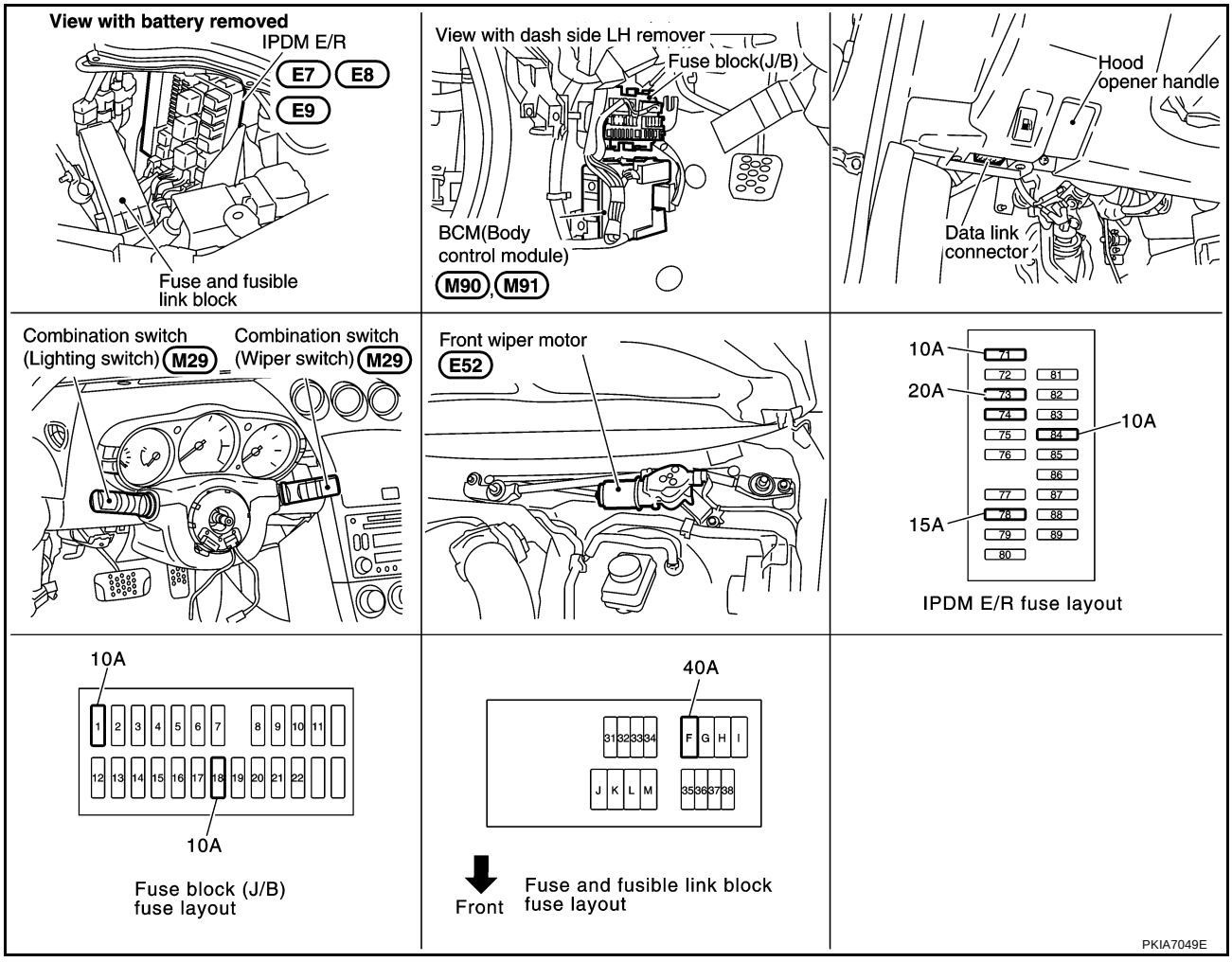
- Refer to GI-11, "How to Follow Trouble Diagnoses" .
- Refer to GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident" .

FRONT WIPER AND WASHER SYSTEM

PFP:28810

Components Parts and Harness Connector Location

AKS000Y6



System Description

AKS000Y7

- All front wiper relays (HI, LO) are included in IPDM E/R.
- Wiper switch (combination switch) is composed of a combination of 5 output terminals and 5 input terminals. Terminal combination status is read by BCM (body control module) when switch is turned ON.
- BCM (body control module) controls front wiper LO, HI, and INT (intermittent) operation.
- IPDM E/R (intelligent power distribution module engine room) operates wiper motor according to CAN communication signals from BCM (body control module).

Power is supplied at all times

- through 40 A fusible link (letter F, located in fusible link block)
- to BCM (body control module) terminal 55
- through 10 A fuse [No.18 located in fuse block (J/B)]
- to BCM (body control module) terminal 42
- through 20 A fuse [No.73 located in IPDM E/R (intelligent power distribution module engine room)]
- to front wiper relay [built in IPDM E/R (intelligent power distribution module engine room)]
- through 15 A fuse [No.78 located in IPDM E/R (intelligent power distribution module engine room)]
- to CPU (central processing unit) [located in IPDM E/R (intelligent power distribution module engine room)]
- through 10 A fuse [No.71 located in IPDM E/R (intelligent power distribution module engine room)]
- to CPU (central processing unit) [located in IPDM E/R (intelligent power distribution module engine room)].

When ignition switch is in ON or START position, power is supplied

- to ignition relay [built in IPDM E/R (intelligent power distribution module engine room)]
- through 10 A fuse [No.1 located in fuse block (J/B)]
- to BCM (body control module) terminal 38
- through ignition relay [built in IPDM E/R (intelligent power distribution module engine room)]
- to front wiper relay [built in IPDM E/R (intelligent power distribution module engine room)]
- to front wiper high relay [built in IPDM E/R (intelligent power distribution module engine room)]
- to CPU (central processing unit) [located in IPDM E/R (intelligent power distribution module engine room)]
- through 10 A fuse [No.84 located in IPDM E/R (intelligent power distribution module engine room)]
- through IPDM E/R (intelligent power distribution module engine room) terminal 44
- to front washer motor terminal 2.

Ground is supplied

- to BCM (body control module) terminal 52
- through grounds M30 and M66,
- to IPDM E/R (intelligent power distribution module engine room) terminals 38 and 60
- through grounds E17, E43 and F152,
- to combination switch (wiper switch) terminal 12
- through grounds M30 and M66.

LOW SPEED WIPER OPERATION

When front wiper switch is in LO position, BCM detect low speed wiper ON signal by BCM wiper switch reading function.
BCM sent front wiper request signal (LO) with CAN communication line

- from BCM terminals 39 and 40
- to IPDM E/R terminals 48 and 49.

When IPDM E/R receives front wiper request signal (LO), it turns ON front wiper relay (built in IPDM E/R), power is supplied

- to front wiper motor terminal 3
- through IPDM E/R terminal 21 and front wiper high relay and front wiper relay.

Ground is supplied

- to front wiper motor terminal 4
- through grounds E17, E43 and F152.

with power and ground is supplied, front wiper motor operates at low speed.

HI SPEED WIPER OPERATION

When front wiper switch is in HI position, BCM detect high speed wiper ON signal by BCM wiper switch reading function.
BCM sent front wiper request signal (HI) with CAN communication line

- from BCM terminals 39 and 40
- to IPDM E/R terminals 48 and 49.

When IPDM E/R receives front wiper request signal (HI), it turns ON front wiper relay (built in IPDM E/R), power is supplied

- to front wiper motor terminal 2
- through IPDM E/R terminal 31 and front wiper high relay and front wiper relay.

Ground is supplied

- to front wiper motor terminal 4
- through grounds E17, E43 and F152.

with power and ground is supplied, front wiper motor operates at high speed.

INTERMITTENT OPERATION

Front wiper motor operates wiper arms one time at low speed at a set interval of wiper volume switch and vehicle speeds, this feature is controlled by BCM and IPDM E/R.
When front wiper switch is in HI position BCM detect high speed wiper ON signal by BCM wiper switch reading function. BCM performs the following operations

- When BCM detects ON/OFF status of intermittent operation dial positions 1, 2, and 3 it determines wiper dial position status. Refer to WW-9, "Wiper Dial Position Setting" .
- BCM calculates operation interval from wiper dial position and vehicle speed signal received from combination meter with CAN communications.
- BCM sends front wiper request signal (INT) to IPDM E/R at calculated operation interval.
- When IPDM E/R receives front wiper request signal (INT), it turns ON internal front wiper relay. It then sends auto-stop signal to BCM, and conducts intermittent front wiper operation.

With power and ground is supplied, rear wiper operates at intermittent.

AUTO STOP OPERATION

With wiper switch turned OFF, wiper motor will continue to operate until wiper arms reach windshield base.
When wiper arms are not located at base of windshield with wiper switch OFF, ground is provided

- from IPDM E/R terminal 21
- to front wiper motor terminal 3, in order to continue wiper motor operation at low speed.

When wiper arms reach base of windshield, front wiper motor terminals 1 and 4 are connected, and Ground is supplied

- to IPDM E/R terminal 32
- through front wiper motor terminals 1 and 4
- through grounds E17, E43 and F152.

Then IPDM E/R sends auto stop operation signal to BCM with CAN communication line.
When BCM receives auto-stop operation signal, BCM sends wiper stop signal to IPDM E/R with CAN communication line.
IPDM E/R stops wiper motor. Wiper motor will then stop wiper arms at STOP position.

WASHER OPERATION

When wiper switch is in front wiper washer position, BCM detect front wiper washer signal by BCM wiper switch reading function. (Refer to WW-6, "COMBINATION SWITCH READING FUNCTION" .)
Combination switch (wiper switch) ground is supplied

- to front washer motor terminal 1
- through combination switch (wiper switch) terminal 11
- to combination switch (wiper switch) terminal 12
- through grounds M30 and M66.

With ground is supplied, front washer motor is operated.
When BCM detects that front washer motor has operated for 0.4 seconds or linger, BCM operates front wiper motor for low speed.
When BCM detects washer switch is OFF, low speed operation cycles approximately 3 times and stops.

MIST OPERATION

When wiper switch is turned to mist position, wiper low speed operation cycles once and then stops.
For additional information about wiper operation under this condition, refer to WW-5, "LOW SPEED WIPER OPERATION" .
If switch is held in mist position, low speed operation continues.

FAIL-SAFE FUNCTION

IPDM E/R includes a fail-safe function to prevent malfunction of electrical components controlled by CAN communications in CAN communications occurs.
When fail-safe status is initiated, IPDM E/R remains in steady unit signals are received.

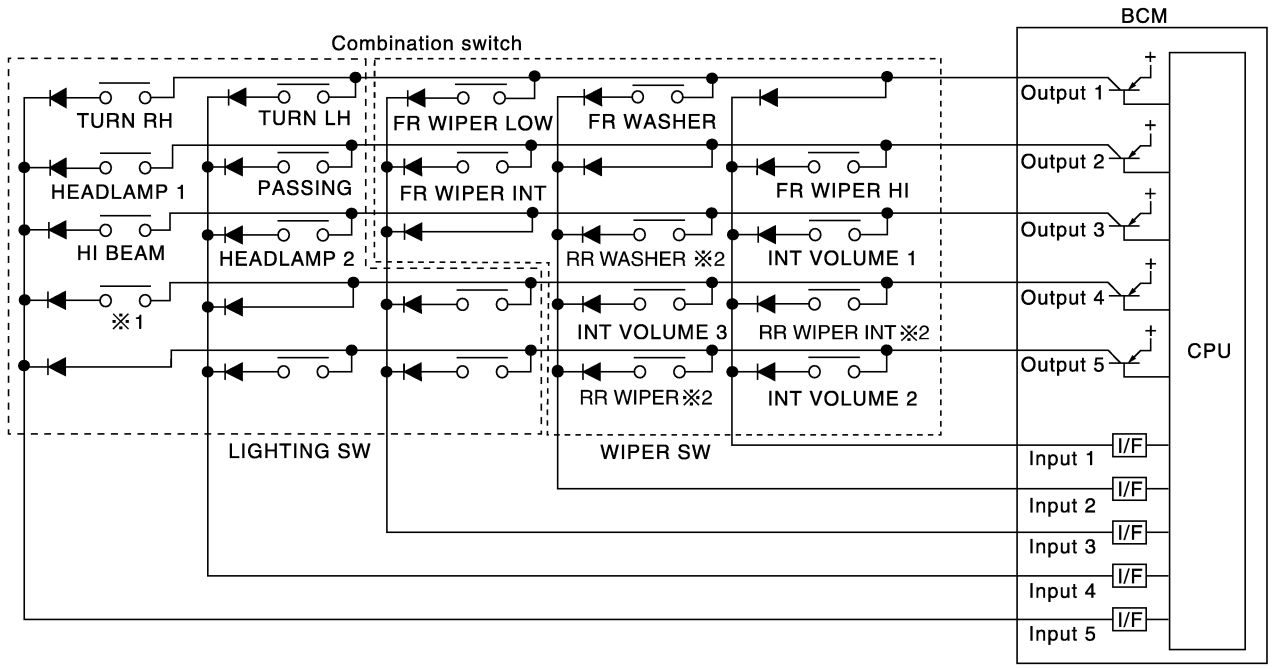
COMBINATION SWITCH READING FUNCTION

Description

- BCM reads combination switch (wiper) status, and controls related systems such as head lamps and wipers, according to the results.
- BCM reads information of a maximum of 20 switches by combining five output terminals (OUTPUT 1-5) and five input terminals (INPUT 1-5).

Operation Description

- BCM activates transistors of output terminals (OUTPUT 1-5) periodically, and allows current to flow in turn.
- If any (1 or more) switches are turned ON, circuit of output terminals (OUTPUT 1-5) and input terminals (INPUT 1-5) becomes active.
- At this time, transistors of output terminals (OUTPUT 1-5) are activated to allow current to flow. When voltage of input terminals (INPUT 1-5) corresponding to that switch changes, interface in BCM detects voltage change, and BCM determines that switch is ON.



※1 : LIGHTING SWITCH 1ST POSITION ※2 : COUPE MODELS

PKIA7241E

BCM - Operation Table of Combination Switches

- BCM reads operation status of combination switch using combinations shown in table below.

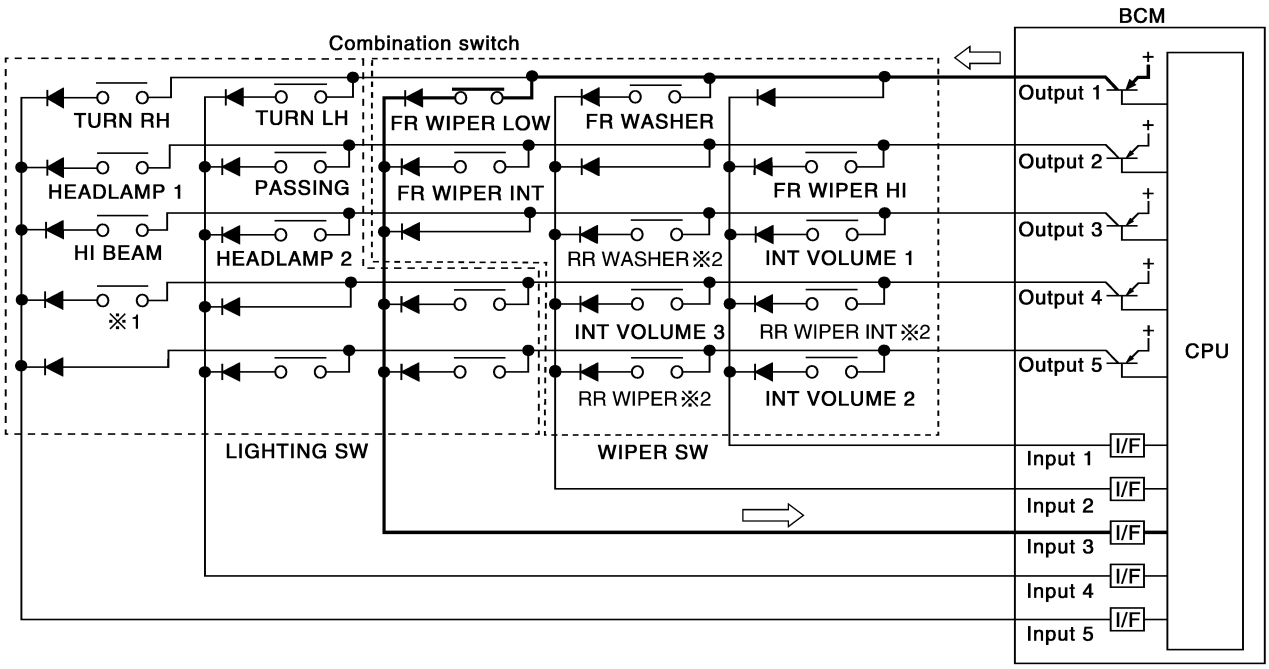
	COMB SW OUTPUT 1		COMB SW OUTPUT 2		COMB SW OUTPUT 3		COMB SW OUTPUT 4		COMB SW OUTPUT 5	
	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
COMB SW INPUT 1	—	—	FR WIPER HI ON	FR WIPER HI OFF	INT VOLUME 1 ON	INT VOLUME 1 OFF	RR WIPER INT ON※	RR WIPER INT OFF※	INT VOLUME 2 ON	INT VOLUME 2 OFF
COMB SW INPUT 2	FR WASHER ON	FR WASHER OFF	—	—	RR WASHER ON ※	RR WASHER OFF ※	INT VOLUME 3 ON	INT VOLUME 3 OFF	RR WIPER ON※	RR WIPER OFF ※
COMB SW INPUT 3	FR WIPER LOW ON	FR WIPER LOW OFF	FR WIPER INT ON	FR WIPER INT OFF	—	—	—	—	—	—
COMB SW INPUT 4	TURN LH ON	TURN LH OFF	PASSING ON	PASSING OFF	HEAD-LAMP 2 ON	HEAD-LAMP 2 OFF	—	—	—	—
COMB SW INPUT 5	TURN RH ON	TURN RH OFF	HEAD-LAMP 1 ON	HEAD-LAMP 1 OFF	HI BEAM ON	HI BEAM OFF	LIGHTING SW (1st) ON	LIGHTING SW (1st) OFF	—	—

※ : COUPE MODELS

PKIA7242E

Sample Operation: (When Wiper Switch Turned ON)

- When wiper switch is turned ON, contact in combination switch turns ON. At this time if OUTPUT 1 transistor is activated, BCM detects that voltage changes in INPUT 3.
- When OUTPUT 1 transistor is ON, BCM detects that voltage changes in INPUT 3, and judges that front wiper low is ON. Then BCM sends front wiper request signal (LO) to IPDM E/R using CAN communication.
- When OUTPUT 1 transistor is activated again, BCM detects that voltage changes in INPUT 3, and recognizes that wiper switch is continuously ON.



※1 : LIGHTING SWITCH 1ST POSITION ※2 : COUPE MODELS

PKIA7243E

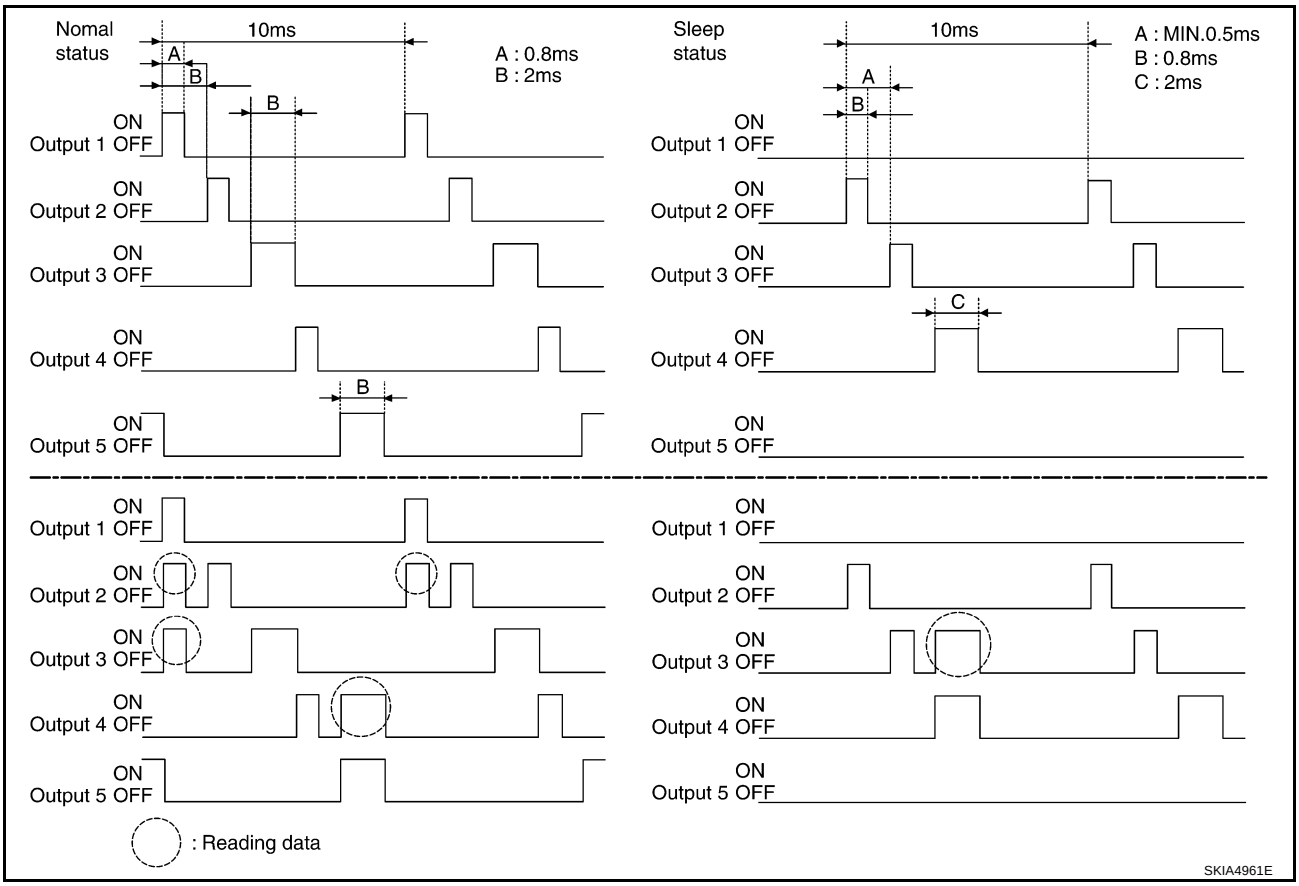
NOTE:
Each OUTPUT terminal transistor is activated at 10 ms intervals. Therefore after switch is turned ON, electrical loads are activated with time delay. But this time delay is so short that it cannot be detected by human senses.

Operation Mode

Combination switch reading function has operation modes shown below.

1. Normal status
   - When BCM is not in sleep status, OUTPUT terminals (1-5) each turn ON-OFF every 10 ms.
2. Sleep status

- When BCM is in sleep status, transistors of OUTPUT (1 and 5) stop the output, and BCM enters low current consumption mode. OUTPUT (2, 3, and 4) turn ON-OFF every 10 ms, and only input from light switch system is accepted.



Intermittent Operation

Wiper intermittent operation delay interval is determined from a combination of 3 switches (intermittent operation dial position 1, intermittent operation dial position 2, and intermittent operation dial position 3) and vehicle speed signal.
During each intermittent operation delay interval, BCM sends front wiper request signal to IPDM E/R.

Wiper Dial Position Setting

Wiper dial position	Intermittent operation interval	Combination switch		
		Intermittent operation dial position 1	Intermittent operation dial position 2	Intermittent operation dial position 3
Wiper dial position 1	Small	ON	ON	ON
Wiper dial position 2		ON	ON	OFF
Wiper dial position 3		ON	OFF	OFF
Wiper dial position 4	↓	OFF	OFF	OFF
Wiper dial position 5		OFF	OFF	ON
Wiper dial position 6		OFF	ON	ON
Wiper dial position 7	Large	OFF	ON	OFF

Example: For wiper dial position 1...
Using combination switch reading function, BCM detects ON/OFF status of intermittent operation dial positions 1, 2, and 3.
When combination switch status is as listed below, BCM determines that it is wiper dial position 1.

- Intermittent operation dial position 1: ON (input 3 and output 1 are conducting.)
- Intermittent operation dial position 2: ON (input 5 and output 1 are conducting.)
- Intermittent operation dial position 3: ON (input 4 and output 2 are conducting.)

BCM determines front wiper intermittent operation delay interval from wiper dial position 1 and vehicle speed, and sends wiper request signal (INT) to IPDM E/R.

CAN Communication System Description

AKS000Y8

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

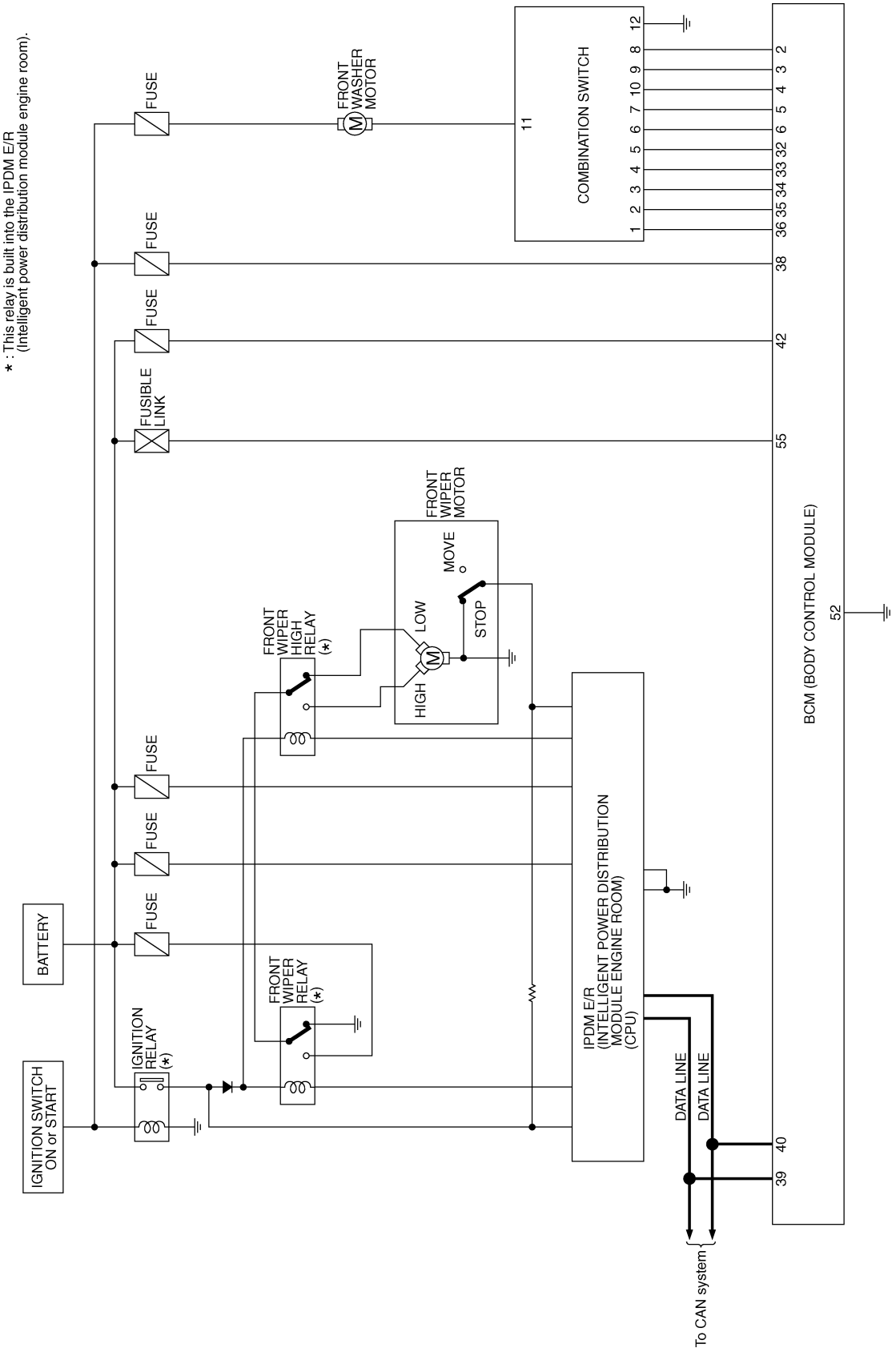
CAN Communication Unit

AKS003M9

Refer to LAN-5, "CAN Communication Unit" .

Schematic

AKS000Y9



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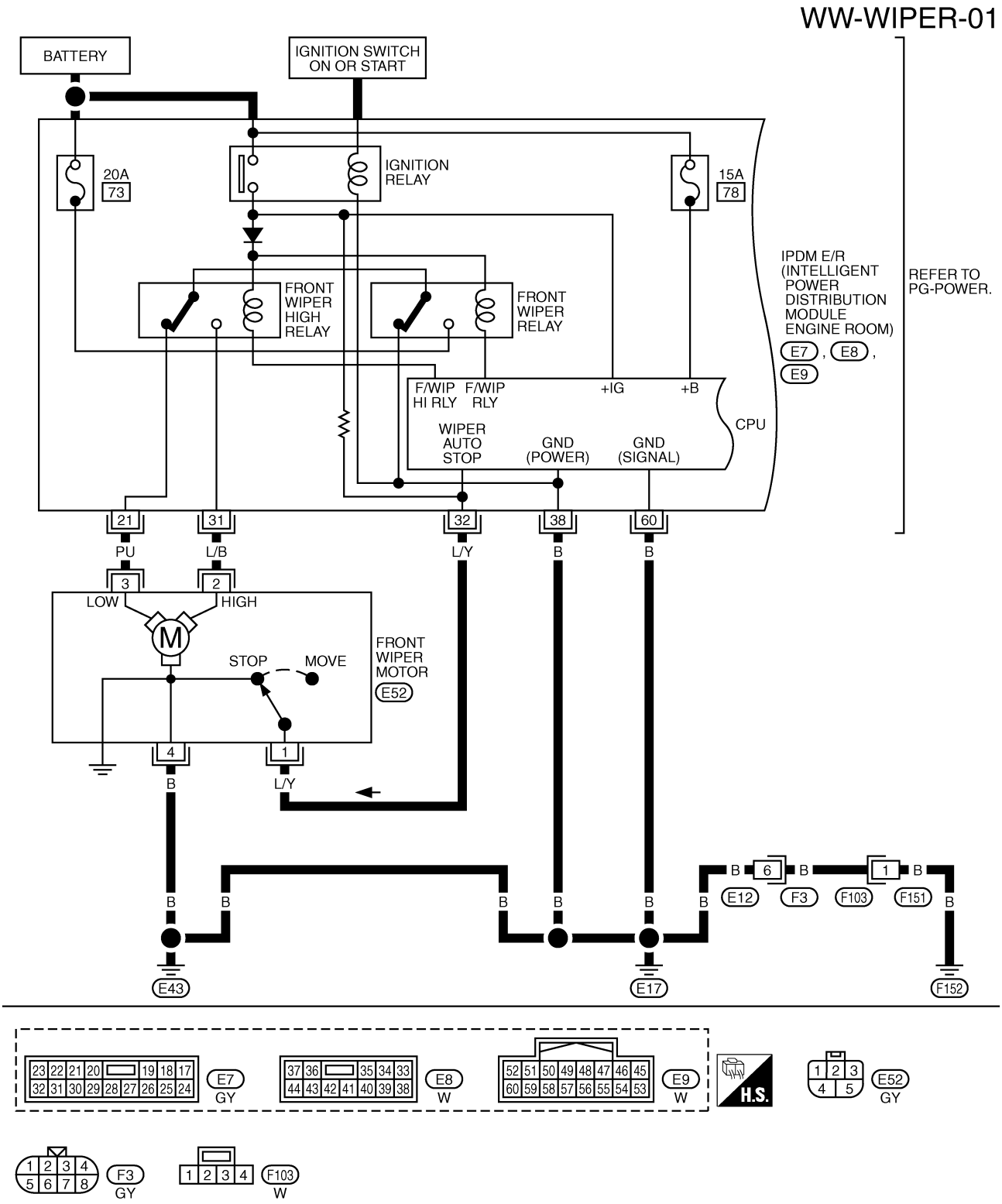
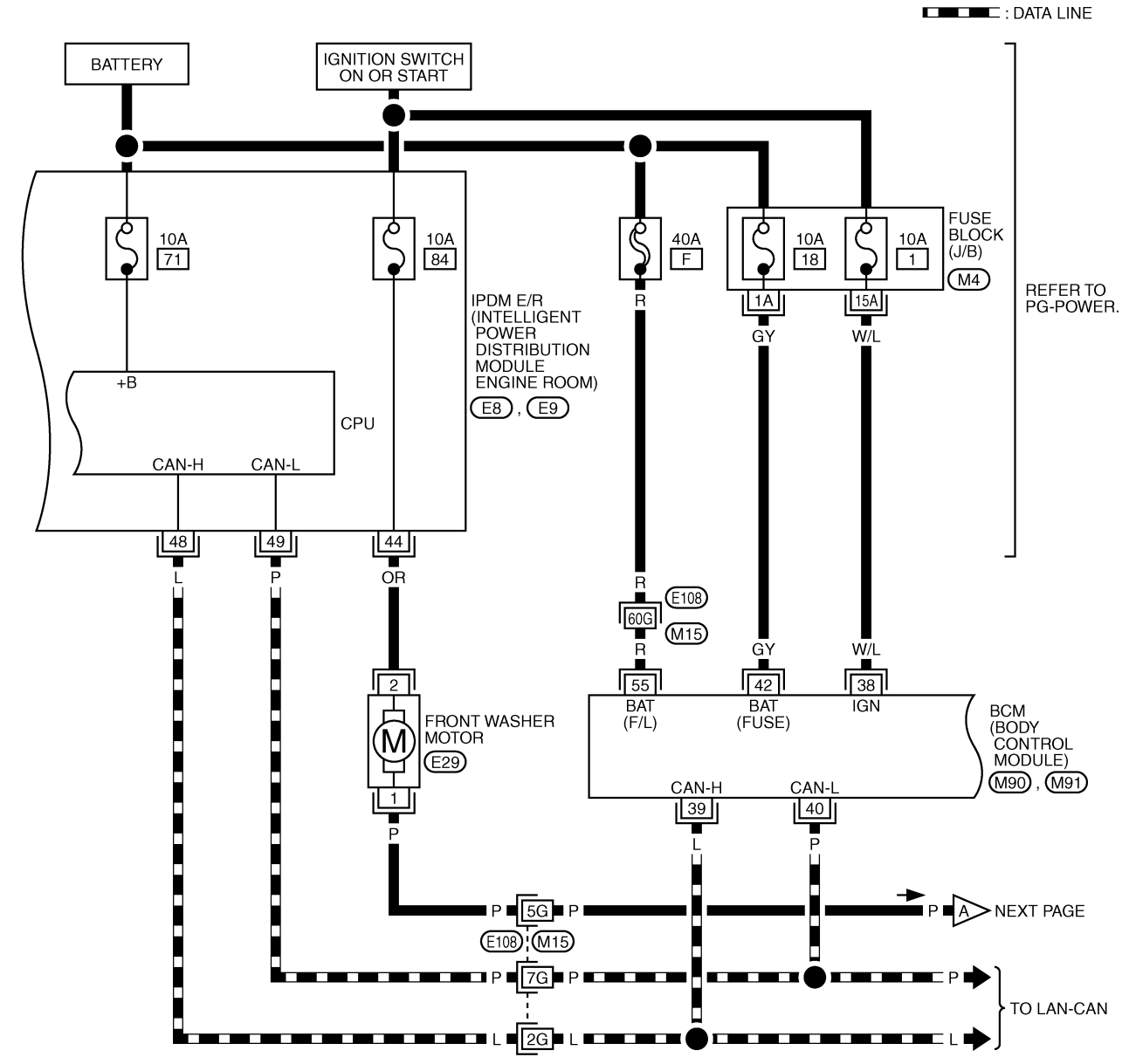
Wiring Diagram — WIPER —

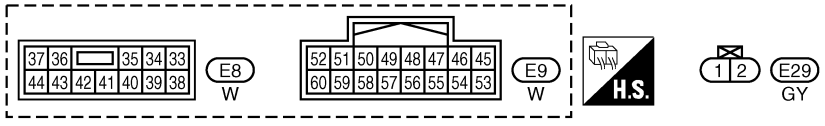
AKS000YA



TKWT1853E

WW-WIPER-02

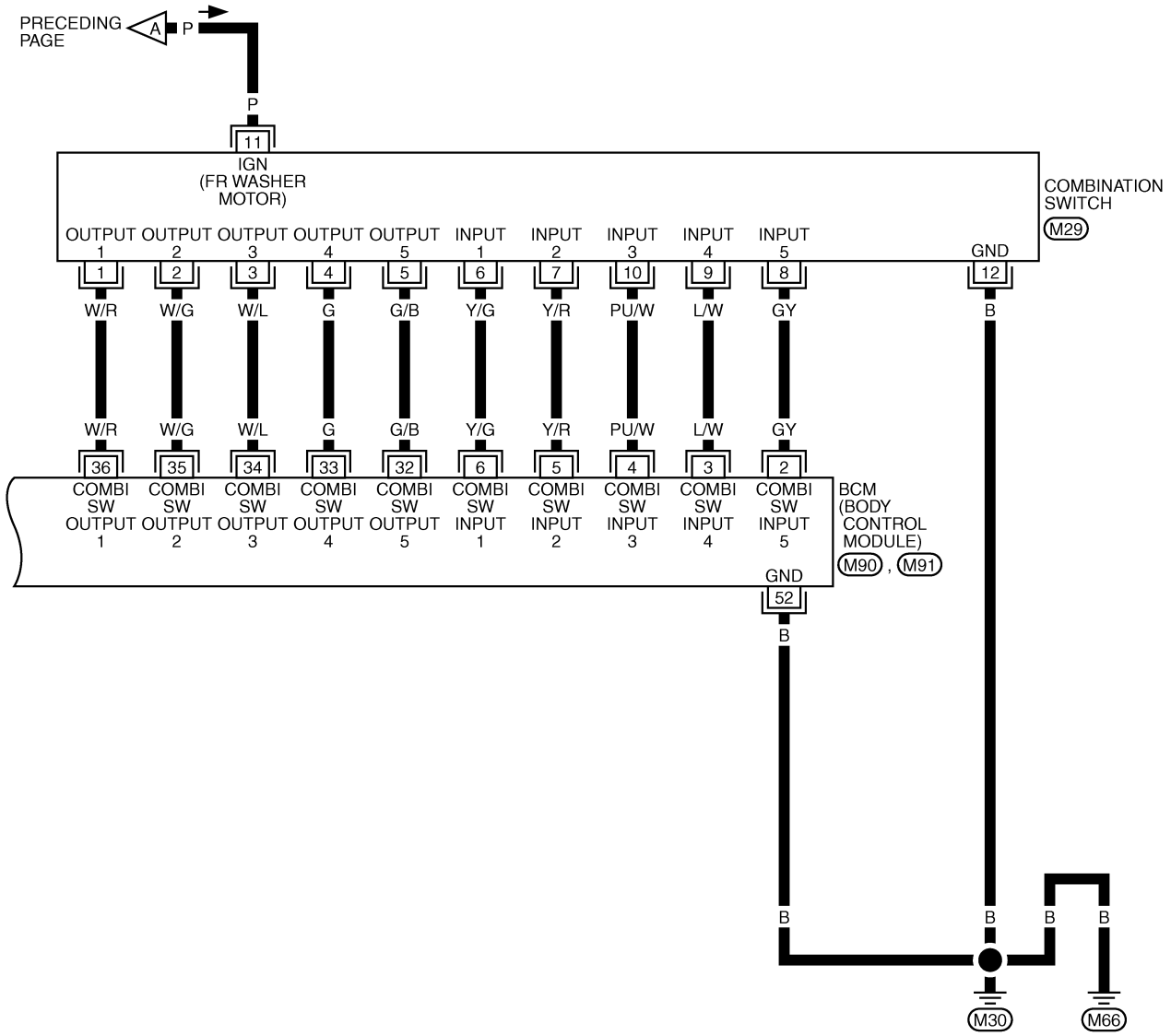


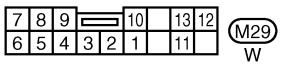


REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M90 , M91 -ELECTRICAL UNITS

TKWT1854E

WW-WIPER-03



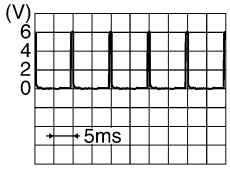
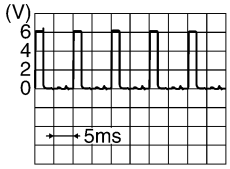
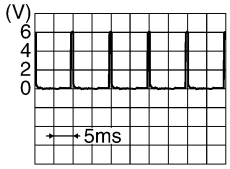
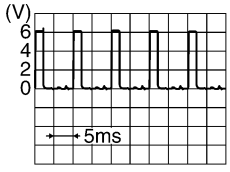
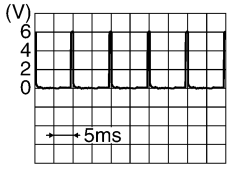
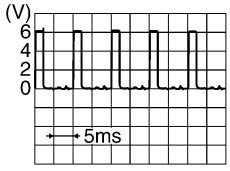


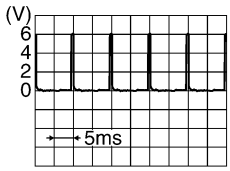
REFER TO THE FOLLOWING.
M90 , M91 -ELECTRICAL UNITS

TKWT1855E

Terminals and Reference Values for BCM

AKS00APG

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
2	GY	Combination switch input 5	ON	● Lighting switch and wiper switch OFF ● Wiper dial position 4	SKIA5291E
3	L/W	Combination switch input 4	ON	● Lighting switch and wiper switch OFF ● Wiper dial position 4	 SKIA5292E
4	PU/W	Combination switch input 3	ON	● Lighting switch and wiper switch OFF ● Wiper dial position 4	 SKIA5291E
5	Y/R	Combination switch input 2	ON	● Lighting switch and wiper switch OFF ● Wiper dial position 4	 SKIA5292E
6	Y/G	Combination switch input 1	ON		
32	G/B	Combination switch output 5	ON	● Lighting switch and wiper switch OFF ● Wiper dial position 4	 SKIA5291E
33	G	Combination switch output 4	ON	● Lighting switch and wiper switch OFF ● Wiper dial position 4	 SKIA5292E
34	W/L	Combination switch output 3	ON	● Lighting switch and wiper switch OFF ● Wiper dial position 4	 SKIA5291E

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
35	W/G	Combination switch output 2	ON	● Lighting switch and wiper switch OFF ● Wiper dial position 4	 SKIA5292E
36	W/R	Combination switch output 1			
38	W/L	Ignition switch (ON)	ON	—	Battery voltage
39	L	CAN– H	—	—	—
40	P	CAN– L	—	—	—
42	GY	Battery power supply	OFF	—	Battery voltage
52	B	Ground	ON	—	Approx. 0V
55	R	Battery power supply	OFF	—	Battery voltage

Terminals and Reference Values for IPDM E/R

AKS00APH

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
21	PU	Low speed signal	ON	Wiper switch	OFF	Approx. 0V
					LO	Battery voltage
31	L/B	High speed signal	ON	Wiper switch	OFF	Approx. 0V
					HI	Battery voltage
32	L/Y	Wiper auto - stop signal	ON	Wiper operating		Battery voltage
				Wiper stopped		Approx. 0V
38	B	Ground	ON	—		Approx. 0V
44	OR	Washer motor power supply	ON	—		Battery voltage
48	L	CAN– H	—	—		—
49	P	CAN– L	—	—		—
60	B	Ground	ON	—		Approx. 0V

How to Proceed With Trouble Diagnosis

AKS00API

1. Confirm the symptoms and customer complaint.
2. Understand operation description and function description. Refer to WW-4, "System Description" .
3. Perform preliminary check. Refer to WW-16, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Does warning chime operate normally? If YES, GO TO 6. If NO, GO TO 4.
6. INSPECTION END

Preliminary Check

AKS00APJ

CHECK POWER SUPPLY AND GROUND CIRCUIT

Inspection Procedure

1. CHECK FUSE

- Check if wiper and washer fuse is blown.

Unit	Power source	Fuse and fusible link No.
Front washer motor	Ignition switch ON or START	84
Front wiper motor, front wiper relay, front wiper HI relay	Battery	73

Unit	Power source	Fuse and fusible link No.
BCM	Battery	F
		18
	Ignition switch ON or START	1

Refer to WW-12, "Wiring Diagram — WIPER —" .

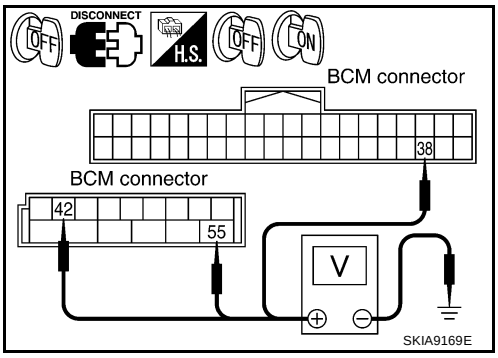
OK or NG

OK >> GO TO 2

NG >> If fuse is blown, be sure to eliminate cause of problem before installing new fuse, Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM harness connector terminal and ground.



Terminals			Ignition switch position	
(+)		(-)	OFF	ON
Connector	Terminal (Wire color)			
M91	42 (GY)	Ground	Battery voltage	Battery voltage
M91	55 (R)		Battery voltage	Battery voltage
M90	38 (W/L)		0V	Battery voltage

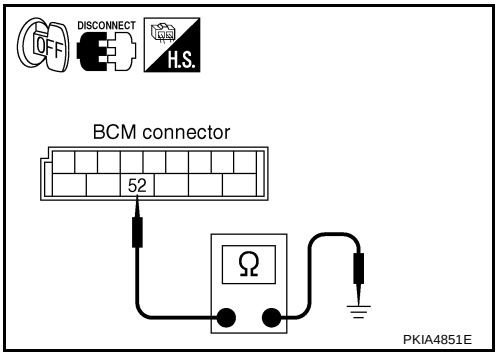
OK or NG

OK >> GO TO 3.

NG >> Check harness for open or short between fuse, fusible link and BCM.

3. CHECK GROUND CIRCUIT

Check continuity between BCM harness connector and ground.



Terminals			Continuity
Connector	Terminal (Wire color)	Ground	
M91	52 (B)		Yes

OK or NG

OK >> INSPECTION END

NG >> Repair harness or connector.

CONSULT-II Functions (BCM)

AKS00APK

CONSULT-II performs the following functions communicating with the BCM.

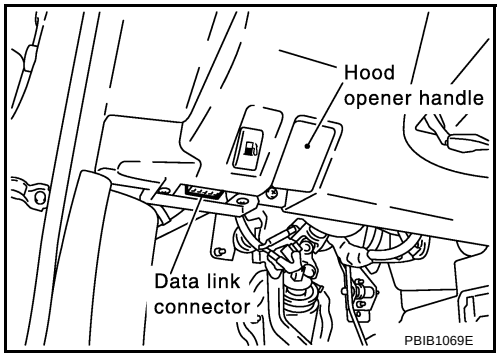
BCM diagnosis position	Check item, Diagnosis mode	Description
Wiper	WORK SUPPORT	Changes the setting for each function.
	DATA MONITOR	Displays BCM input data in real time.
	ACTIVE TEST	Device operation can be checked by applying a drive signal to device.
BCM	CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.

CONSULT-II OPERATION

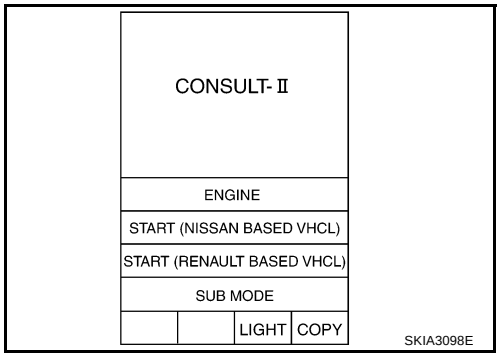
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

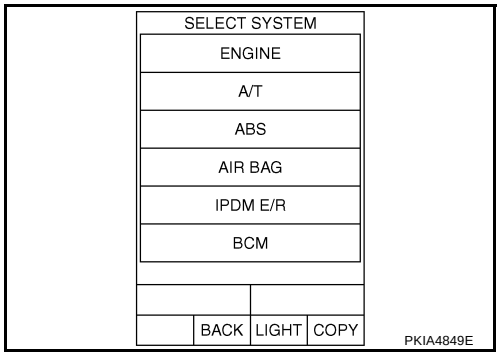
1. With ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to data link connector, then turn ignition switch ON.



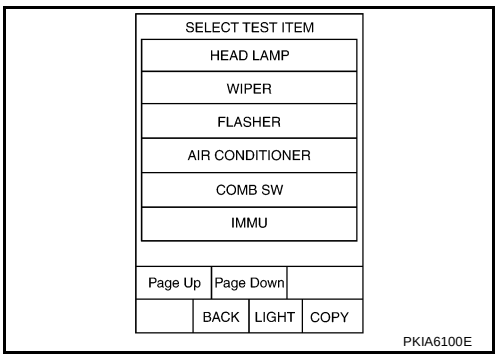
2. Touch “START (NISSAN BASED VHCL)”.



3. Touch “BCM” on “SELECT SYSTEM” screen.
If “BCM” is not indicated, refer to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



4. Touch “WIPER” on “SELET TEST ITEM” screen.



WORK SUPPORT

Operation Procedure

1. Touch “WIPER” on “SELECT TEST ITEM” screen.
2. Touch “WORK SUPPORT” on “SELECT DIAG MODE” screen.
3. Touch “WIPER SPEED SETTING” on “SELECT WORK ITEM” screen.
4. Touch “START”.
5. Touch “CHANGE SETT”.
6. The setting will be changed and “CUSTOMIZING COMPLETED” will be displayed.
7. Touch “END”.

Display Item List

Item	Description	CONSULT-II	Factory setting
WIPER SPEED SETTING	Vehicle speed sousing type wiper control mode can be changed in this mode. Vehicle speed sousing type wiper control mode between two ON/OFF.	ON	×
		OFF	—

DATA MONITOR

Operation Procedure

1. Touch “WIPER” on “SELECT TEST ITEM” screen.
2. Touch “DATA MONITOR” on “SELECT DIAG MODE” screen.
3. Touch either “ALL SIGNALS” or “SELECTION FROM MENU” on “DATA MONITOR” screen.

ALL SIGNALS	Monitors all the items.
SELECTION FROM MENU	Selects and monitors the individual item selected.

4. Touch “START”.
5. When “SELECTION FROM MENU” is selected, touch items to be monitored. When “ALL SIGNALS” is selected, all the items will be monitored.
6. Touch “RECORD” while monitoring, then the status of the monitored item can be recorded. To stop recording, touch “STOP”.

Display Item List

Monitor item [operation or unit]		Display content
IGN ON SW	[ON/OFF]	Displays “ignition switch ON (ON)/Other OFF or ACC (OFF)” status as judged from ignition switch signal.
IGN SW CAN	[ON/OFF]	Displays “ignition switch ON (ON)/Other OFF or ACC (OFF)” status as judged from CAN communication signal.
FR WIPER HI	[ON/OFF]	Displays “FRONT WIPER HI (ON)/Other (OFF)” status as judged from wiper switch signal.
FR WIPER LOW	[ON/OFF]	Displays “FRONT WIPER LOW (ON)/Other (OFF)” status as judged from wiper switch signal.
FR WIPER INT	[ON/OFF]	Displays “FRONT WIPER INT (ON)/Other (OFF)” status as judged from wiper switch signal.
FR WASHER SW	[ON/OFF]	Displays “FRONT WASHER Switch (ON)/Other (OFF)” status as judged from wiper switch signal.
INT VOLUME	[1 - 7]	Displays intermittent operation dial position setting (1 - 7) as judged from wiper switch signal.
FR WIPER STOP	[ON/OFF]	Displays “Stopped (ON)/Operating (OFF)” status as judged from auto-stop signal.

Monitor item [operation or unit]		Display content
VEHICLE SPEED	[km/h]	Displays vehicle speed status as judged from vehicle speed signal.
RR WIPER ON[NOTE 1]	[ON/OFF]	Displays “Rear Wiper ON (ON)/Other (OFF)” status as judged from wiper switch signal.
RR WIPER INT[NOTE 1]	[ON/OFF]	Displays “Rear Wiper INT (ON)/Other (OFF)” status as judged from wiper switch signal.
RR WASHER SW[NOTE 1]	[ON/OFF]	Displays “Rear Washer Switch (ON)/Other (OFF)” status as judged from wiper switch signal.
RR WIPER STOP[NOTE 1]	[ON/OFF]	Displays “Rear Wiper Stop (ON)/Other (OFF)” status, as judged from wiper switch signal.
RR WIPER STP2[NOTE 2]	[OFF]	—

NOTE:
1. Coupe models
2. This item is displayed, but cannot monitor it.

ACTIVE TEST

Operation Procedure

1. Touch “WIPER” on “SELECT TEST ITEM” screen.
2. Touch “ACTIVE TEST” on “SELECT DIAG MODE” screen.
3. Touch item to be tested and check operation of the selected item.
4. During the operation check, touching “BACK” deactivates the operation.

Display Item List

Test item	Display on CONSULT-II screen	Description
Front wiper output	FR WIPER	With a certain operation (OFF, HI, LO, INT), front wiper can be operated.
Rear wiper output[NOTE]	RR WIPER	Rear wiper can be operated by any ON-OFF operation

NOTE:
Coupe models

CONSULT-II Functions (IPDM E/R)

AKS00APL

CONSULT-II performs the following functions communicating with the IPDM E/R.

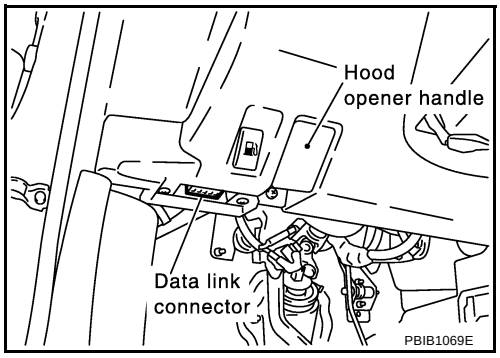
Inspection Item, Diagnosis Mode	Description
SELF–DIAG RESULTS	IPDM E/R performs diagnosis of CAN communication and self–diagnosis.
DATA MONITOR	The input/output data of IPDM E/R is displayed in real time.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
ACTIVE TEST	IPDM E/R sends a drive signal to electronic components to check their operation.

CONSULT-II OPERATION

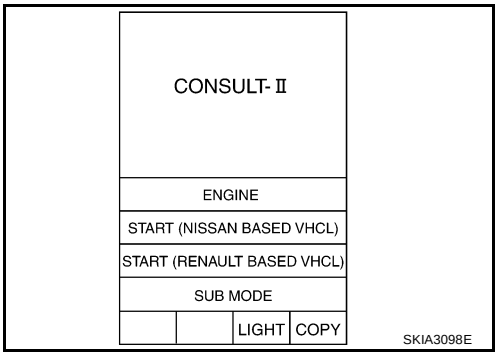
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

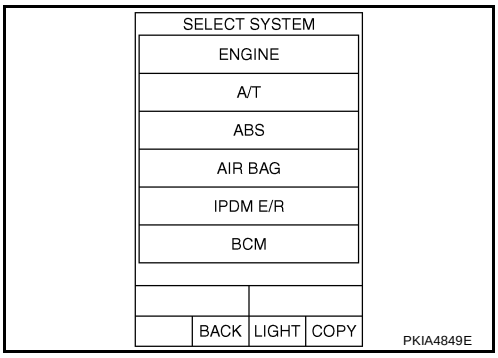
1. With ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to data link connector, then turn ignition switch ON.



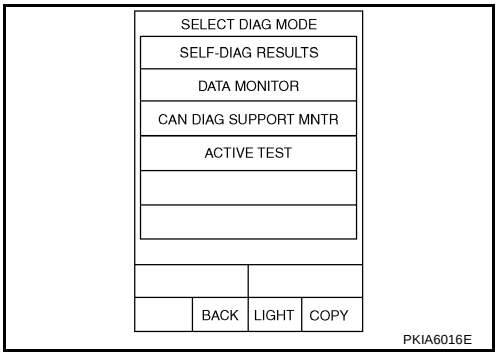
2. Touch “START (NISSAN BASED VHCL)”.



3. Touch “IPDM E/R” on “SELECT SYSTEM” screen.
If “IPDM E/R” is not displayed, print “SELECT SYSTEM” screen, then refer to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



4. Select the desired part to be diagnosed on “SELECT DIAG MODE” screen.



SELF-DIAG RESULTS

Refer to PG-21, "SELF-DIAG RESULTS" .

DATA MONITOR

Operation Procedure

1. Touch “DATA MONITOR” on “SELECT DIAG MODE ” screen.
2. Touch “ALL SIGNALS”, “MAIN SIGNALS” or “SELECTION FROM MENU” on “DATA MONITOR” screen.

ALL SIGNALS	All items will be monitored.
MAIN SIGNALS	Monitor the predetermined item.
SELECTION FROM MENU	Select any item for monitoring.

3. Touch “START”.
4. Touch the required monitoring item on “SELECTION FROM MENU”. In “ALL SIGNALS”, all items are monitored. In “MAIN SIGNALS”, predetermined items are monitored.
5. Touch “RECORD” while monitoring to record the status of the item being monitored. To stop recording, touch “STOP”.

All Signals, Main Signals, Selection From Menu

Item name	CONSULT-II screen display	Display or unit	Monitor item selection			Description
			ALL SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
FR wiper request	FR WIP REQ	STOP/1LO/LO/HI	×	×	×	Signal status input from BCM
Wiper auto stop	WIP AUTO STOP	ACT P/STOP P	×	×	×	Output status of IPDM E/R
Wiper protection	WIP PROT	OFF/Block	×	×	×	Control status of IPDM E/R

NOTE:
Perform monitoring of IPDM E/R data with ignition switch ON. When ignition switch is at ACC, the display may not be correct.

ACTIVE TEST

Operation Procedure

1. Touch “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Touch item to be tested, and check operation.
3. Touch “START”.
4. Touch “STOP” while testing to stop the operation.

Test item	CONSULT-II screen display	Description
Front wiper (HI, LO) output	FR WIPER	With a certain operation (OFF, HI ON, LO ON), front wiper relay (Lo, Hi) can be operated.

Front Wiper Does Not Operate

AKS00APM

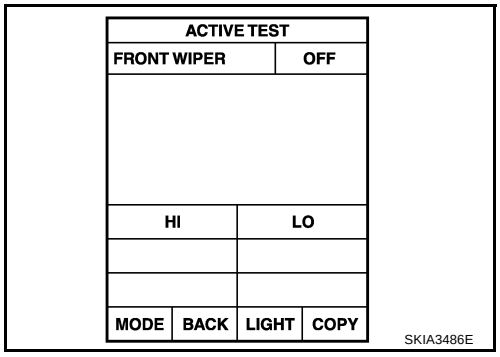
CAUTION:

- **During IPDM E/R fail-safe control, front wipers may not operate. Refer to PG-17, "CAN COMMUNICATION LINE CONTROL" in “PG IPDM E/R” to make sure that it is not in fail-safe status.**

1. ACTIVE TEST

With CONSULT-ll

1. Select “IPDM E/R” by CONSULT-II, and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Select “FRONT WIPER” on “SELECT TEST ITEM” screen.
3. Touch “LO” or “HI” screen.



Without CONSULT-ll

Start up auto active test. Refer to PG-24, "Auto Active Test" .

Does front wiper operate normally?

YES >> GO TO 6.
NO >> GO TO 2.

2. CHECK FUSE

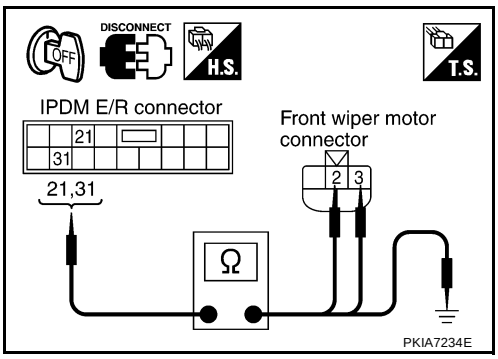
1. Turn ignition switch OFF.
2. Check fuse No.73 of IPDM E/R.

OK or NG

OK >> GO TO 3.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

3. CHECK FRONT WIPER CIRCUIT

1. Disconnect IPDM E/R connector and front wiper motor connector.
2. Check continuity between IPDM E/R harness connector and front wiper motor harness connector terminal.



Terminals				Continuity
IPDM E/R		Front wiper motor		
Connector	Terminal (Wire color)	Connector	Terminal (Wire color)	
E7	21 (PU)	E52	3 (PU)	Yes
	31 (L/B)		2 (L/B)	

3. Check continuity between IPDM E/R harness connector terminal and Ground.

Terminals			Continuity
IPDM E/R		Ground	
Connector	Terminal (Wire color)		
E7	21 (PU)		No
	31 (L/B)		

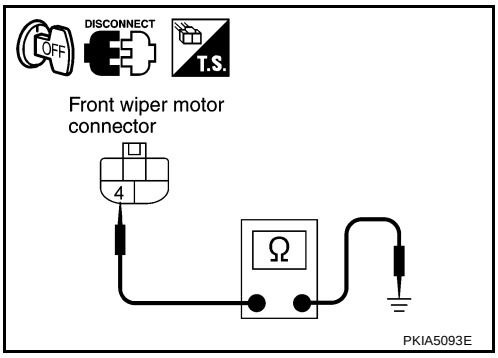
OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK GROUND CIRCUIT

Check continuity between front wiper motor harness connector E52 terminal 4 (B) and ground.

4 (B) – Ground : Continuity should exist.



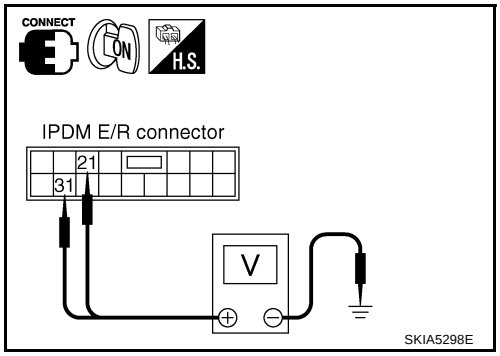
OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK IPDM E/R

With CONSULT-II

1. Connect IPDM E/R connector and front wiper motor connector.
2. Select “IPDM E/R” by CONSULT-II, and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
3. Select “FRONT WIPER” on “SELECT TEST ITEM” screen.
4. Touch “LO” or “HI” screen.
5. Check voltage between IPDM E/R harness connector E7 terminal 21 (PU) or 31 (L/B) and ground while front wiper (HI, LO) is operating.



Terminals			Condition	Voltage
IPDM E/R(+)		(-)		
Connector	Terminal (Wire color)			
E7	21 (PU)	Ground	Stopped	Approx. 0V
			LO operation	Battery voltage
	31 (L/B)		Stopped	Approx. 0V
			HI operation	Battery voltage

Without CONSULT-II

1. Connect IPDM E/R connector and front wiper motor connector.
2. Start up auto active test. Refer to PG-24, "Auto Active Test" .
3. Check voltage between IPDM E/R harness connector E7 terminal 21 (PU) or 31 (L/B) and ground while front wiper (HI, LO) is operating.

Terminals			Condition	Voltage
IPDM E/R(+)		(-)		
Connector	Terminal (Wire color)			
E7	21 (PU)	Ground	Stopped	Approx. 0V
			LO operation	Battery voltage
	31 (L/B)		Stopped	Approx. 0V
			HI operation	Battery voltage

OK or NG

OK >> Replace front wiper motor.
NG >> Replace IPDM E/R.

6. CHECK CIRCUIT BETWEEN COMBINATION SWITCH AND BCM

With CONSULT-II

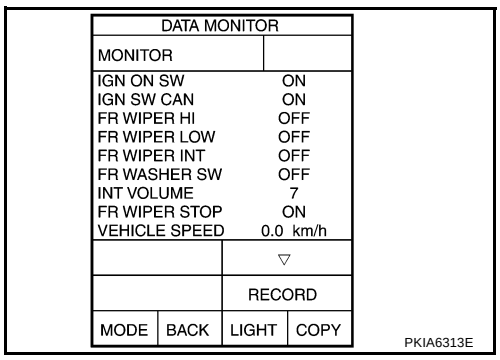
Select “BCM” on CONSULT-II. With “WIPER” on “DATA MONITOR”, confirm that “FR WIPER INT”, “FR WIPER LOW”, and “FR WIPER HI” turn ON-OFF according to wiper switch operation.

Without CONSULT-II

Refer to LT-170, "Combination Switch Inspection" .

OK or NG

OK >> GO TO 7.
NG >> Check wiper Switch. Refer to LT-170, "Combination Switch Inspection" .



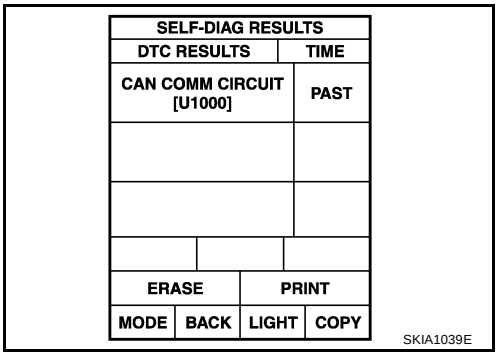
7. CHECK CIRCUIT BETWEEN IPDM E/R AND BCM

Select “BCM” on CONSULT-II, and perform self-diagnosis for “BCM”.

Displayed self-diagnosis results

NO DTC>>Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

CAN COMM CIRCUIT>>Check CAN communication line of BCM. Refer to BCS-16, "CAN Communication Inspection Using CONSULT-II (Self-Diagnosis)" .



Front Wiper Does Not Return to Stop Position

AKS00APN

1. CHECK FRONT WIPER STOP SIGNAL

With CONSULT-II

Select “IPDM E/R” on CONSULT-II. With “DATA MONITOR”, confirm that “WIP AUTO STOP” turns “ACT P” - “STOP P” linked with wiper operation.

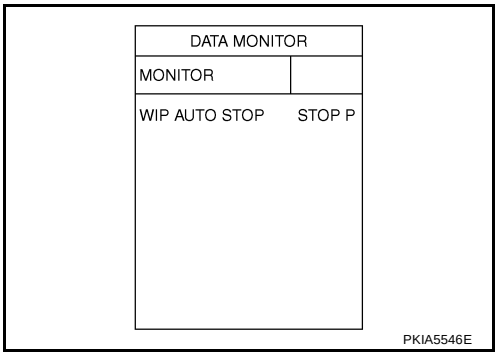
Without CONSULT-II

GO TO 2.

OK or NG

OK >> Replace IPDM E/R.

NG >> GO TO 2.



2. CHECK IPDM E/R

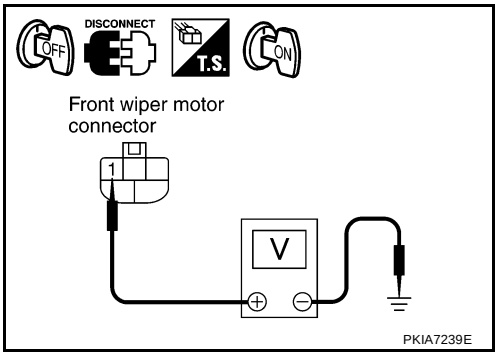
1. Turn ignition switch OFF.
2. Disconnect front wiper motor connector.
3. Turn ignition switch ON.
4. Check voltage between front wiper harness connector E52 terminal 1 (L/Y) and Ground.

1 (L/Y) – Ground : Battery voltage should exist.

OK or NG

OK >> GO TO 4.

NG >> GO TO 3.



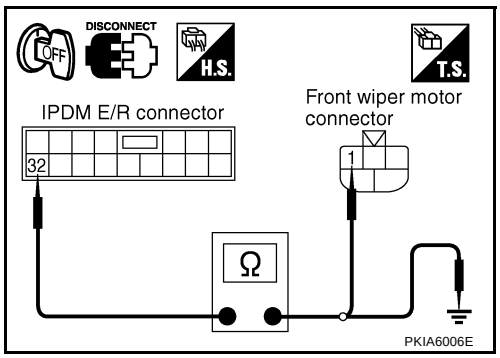
3. CHECK FRONT WIPER AUTO STOP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front wiper motor connector.
3. Check continuity between IPDM E/R harness connector E7 terminal 32 (L/Y) and front wiper motor harness connector E52 terminal 1 (L/Y).

32 (L/Y) – 1 (L/Y) : Continuity should exist.

4. Check continuity between IPDM E/R harness connector E7 terminal 32(L/Y) and Ground.

32 (L/Y) – Ground : Continuity should not exist.



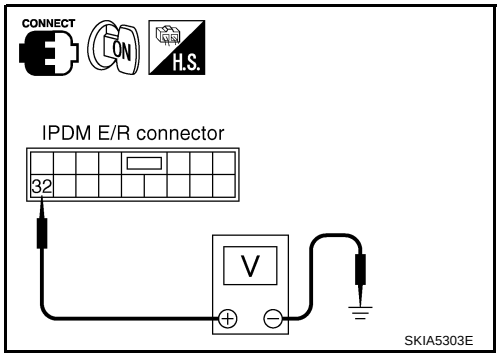
OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.

4. CHECK IPDM E/R

1. Connect IPDM E/R connector and front wiper motor connector.
2. Turn ignition switch ON.
3. Check voltage between IPDM E/R harness connector terminal and ground while front wiper motor is stopped and while it is operating.

Terminals			Condition	Voltage
IPDM E/R (+)		(-)		
Connector	Terminal (Wire color)			
E7	32 (L/Y)	Ground	Wiper stopped	Approx. 0V
			Wiper operating	Battery voltage



OK or NG

OK >> Replace IPDM E/R.
NG >> Replace front wiper motor.

Only Front Wiper Low Does Not Operate

AKS00APO

1. ACTIVE TEST

With CONSULT-II

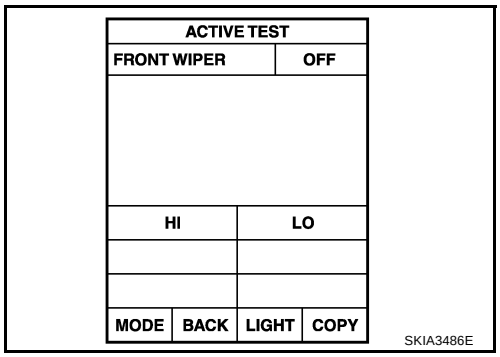
1. Select “IPDM E/R” by CONSULT-II, and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Select “FRONT WIPER” on “SELECT TEST ITEM” screen.
3. Touch “LO” screen.

Without CONSULT-II

Start up auto active test. Refer to PG-24, "Auto Active Test"

Does front wiper operate normally?

YES >> Refer to LT-170, "Combination Switch Inspection" .
NO >> GO TO 2.



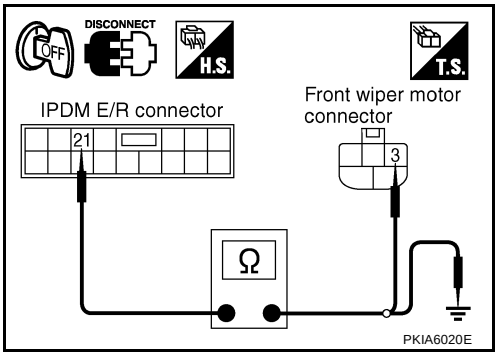
2. CHECK FRONT WIPER MOTOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front wiper motor connector.
3. Check continuity between IPDM E/R harness connector E7 terminal 21 (PU) and front wiper motor harness E52 connector terminal 3 (PU).

21 (PU) – 3 (PU) : Continuity should exist.

4. Check continuity between IPDM E/R harness connector E7 terminal 21 (PU) and ground.

21 (PU) – Ground : Continuity should not exist.



OK or NG

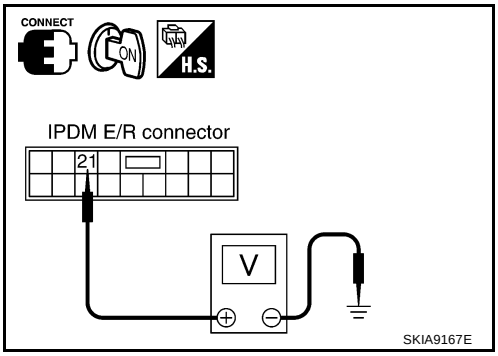
OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK IPDM E/R

With CONSULT-II

1. Connect IPDM E/R connector and front wiper motor connector.
2. Select “IPDM E/R” by CONSULT-II, and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
3. Select “FRONT WIPER” on “SELECT TEST ITEM” screen.
4. Touch “LO” screen.
5. Check voltage between IPDM E/R harness connector E7 terminal 21 (PU) and ground while front wiper LO is operating.

21 (PU) – Ground : Battery voltage should exist.



Without CONSULT-II

1. Connect IPDM E/R connector and front wiper motor connector.
2. Start up auto active test. Refer to PG-24, "Auto Active Test" .
3. Check voltage between IPDM E/R harness connector E7 terminal 21 (PU) and ground while front wiper LO is operating.

21 (PU) – Ground : Battery voltage should exist.

OK or NG

OK >> Replace front wiper motor.
NG >> Replace IPDM E/R.

Only Front Wiper HI Does Not Operate

AKS00APP

1. ACTIVE TEST

With CONSULT-II

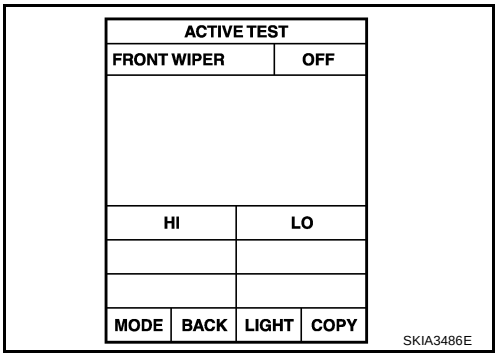
1. Select “IPDM E/R” by CONSULT-II, and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Select “FRONT WIPER” on “SELECT TEST ITEM” screen.
3. Touch “HI” screen.

Without CONSULT-II

Start up auto active test. Refer to PG-24, "Auto Active Test"

Does front wiper operate normally?

YES >> Refer to LT-170, "Combination Switch Inspection" .
NO >> GO TO 2.



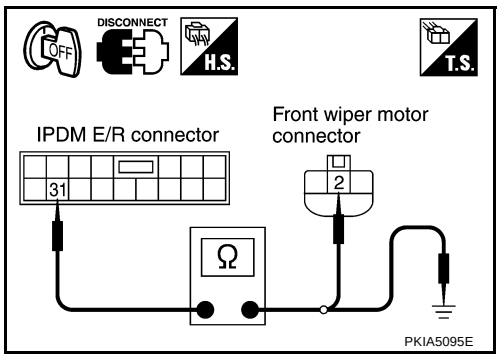
2. CHECK FRONT WIPER MOTOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front wiper motor connector.
3. Check continuity between IPDM E/R harness connector E7 terminal 31 (L/B) and front wiper motor harness E52 connector terminal 2 (L/B).

31 (L/B) – 2 (L/B) : Continuity should exist.

4. Check continuity between IPDM E/R harness connector E7 terminal 31(L/B) and ground.

31 (L/B) – Ground : Continuity should not exist.



OK or NG

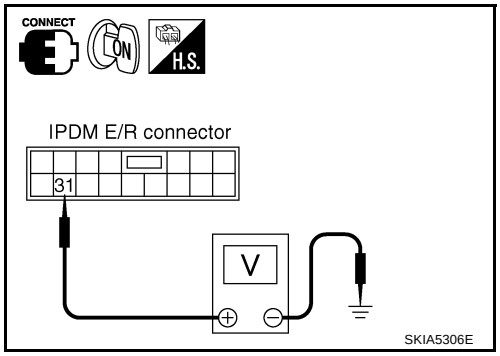
OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK IPDM E/R

With CONSULT-II

1. Connect IPDM E/R connector and front wiper motor connector.
2. Select “IPDM E/R” by CONSULT-II, and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
3. Select “FRONT WIPER” on “SELECT TEST ITEM” screen.
4. Touch “HI” screen.
5. Check voltage between IPDM E/R harness connector E7 terminal 31 (L/B) and ground while front wiper HI is operating.

31 (L/B) - Ground : Battery voltage should exist.



Without CONSULT-II

1. Connect IPDM E/R connector and front wiper motor connector.
2. Start up auto active test. Refer to PG-24, "Auto Active Test" .
3. Check voltage between IPDM E/R harness connector E7 terminal 31 (L/B) and ground while front wiper HI is operating.

31 (L/B) - Ground : Battery voltage should exist.

OK or NG

OK >> Replace front wiper motor.
NG >> Replace IPDM E/R.

Only Front Wiper Intermittent Does Not Operate

AKS00APQ

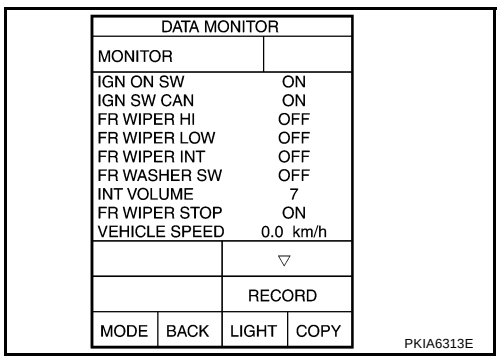
1. CHECK COMBINATION SWITCH

Select “BCM” on CONSULT-II. With “WIPER” data monitor, check that “FR WIPER INT” turns ON-OFF according to operation of wiper switch.

When wiper switch INT position : FR WIPER INT ON

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Replace wiper switch.



Front Wiper Interval Time Is Not Controlled by Vehicle Speed

AKS00APR

1. CHECK FUNCTION OF COMBINATION METER

Confirm that speedometer operates normally.

Does front wiper operate normally?

YES >> GO TO 2.

NO >> Combination meter vehicle speed system malfunction. Refer to DI-18, "Vehicle Speed Signal Inspection" .

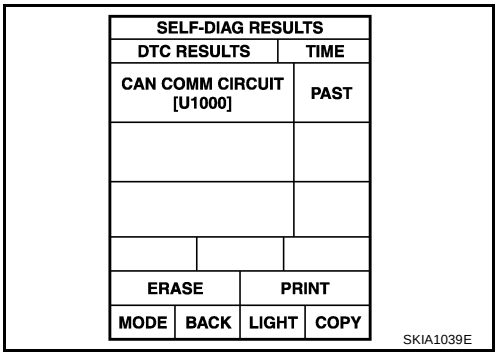
2. CHECK CAN COMMUNICATION BETWEEN BCM AND COMBINATION METER

Select “BCM” on CONSULT-II, and perform self-diagnosis for “BCM”.

Displayed self-diagnosis results

NO DTC>>Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

CAN COMM CIRCUIT>>Check CAN communication line of BCM. Refer to BCS-16, "CAN Communication Inspection Using CONSULT-II (Self-Diagnosis)" .



Front Wiper Intermittent Operation Switch Position Cannot Be Adjusted

AKS00APS

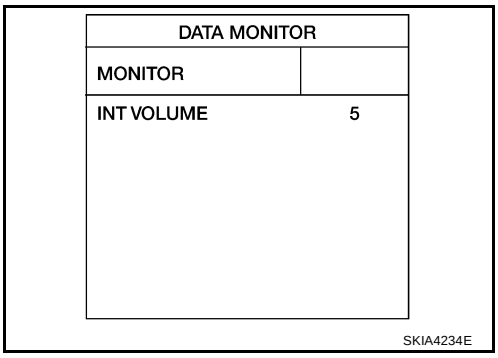
1. CHECK COMBINATION SWITCH INPUT SIGNAL

Select “BCM” on CONSULT-II. With “WIPER” data monitor, make sure “INT VOLUME” changes in order from 1 to 7 according to operation of intermittent switch dial position.

OK or NG

OK >> Replace BCM. Refer to LT-170, "Combination Switch Inspection" .

NG >> Replace wiper switch.



Wipers Do Not Wipe When Front Washer Operates

AKS00APT

1. CHECK CIRCUIT BETWEEN COMBINATION SWITCH AND BCM

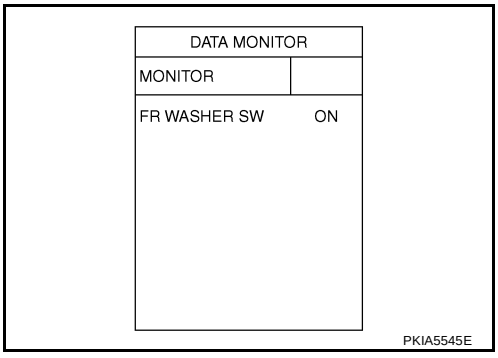
Select “BCM” on CONSULT-II. With “WIPER” on “DATA MONITOR”, make sure “FR WASHER SW” turns ON-OFF according to operation of front washer switch.

When front wiper switch washer position : FR WASHER SW ON

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> Replace wiper switch.



After Front Wipers Operate for 10 Seconds, They Stop for 20 Seconds, and After Repeating the Operations Five Times, They Become Inoperative

AKS00APU

CAUTION:

- **When auto-stop signal has not varied for 10 seconds or longer while IPDM E/R is operating front wipers, IPDM E/R considers that front wipers are locked, and stops wiper output. That causes this symptom.**
- **This status can be checked by “DATA MONITOR” of “IPDM E/R” on which “WIPER PROTECTION” item shows “BLOCK”.**

1. CHECK WIPER MOTOR SIGNAL

With CONSULT-II

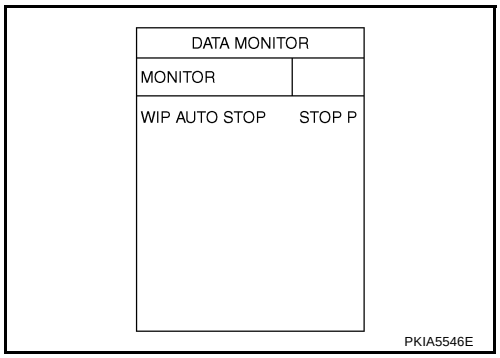
Select “IPDM E/R” by CONSULT-II. With “DATA MONITOR”, confirm that “WIP AUTO STOP” turns “ACT P” - “STOP P” linked with wiper operation.

Without CONSULT-II

GO TO 2.

OK or NG

OK >> Replace IPDM E/R.
NG >> GO TO 2.



2. CHECK WIPER AUTO STOP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front wiper motor connector.
3. Check continuity between IPDM E/R harness connector E7 terminal 32 (L/Y) and front wiper motor harness connector E52 terminal 1 (L/Y).

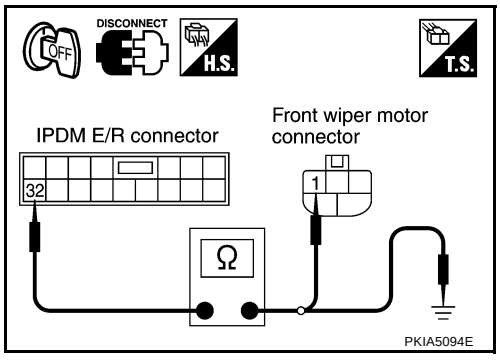
   32 (L/Y) - 1 (L/Y) : Continuity should exist.

4. Check continuity between IPDM E/R harness connector E7 terminal 32 (L/Y) and ground.

   32 (L/Y) - Ground : Continuity should not exist.

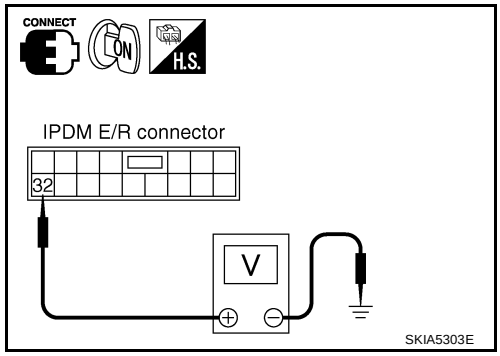
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.



3. CHECK FRONT WIPER MOTOR

1. Connect IPDM E/R connector and front wiper connector.
2. Turn ignition switch ON.
3. Check voltage between IPDM E/R harness connector E7 terminal 32 (L/Y) and ground while front wiper motor is stopped and while it is operating.



Terminals			Condition	Voltage
IPDM E/R (+)		(-)		
Connector	Terminal (Wire color)			
E7	32 (L/Y)	Ground	Wiper stopped	Approx. 0V
			Wiper operating	Battery voltage

OK or NG

OK >> Replace IPDM E/R.
NG >> Replace front wiper motor.

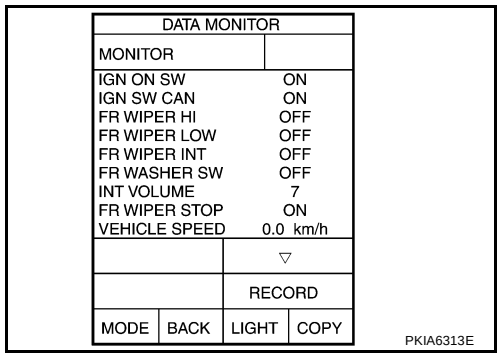
Front Wipers Do Not Stop

AKS00APV

1. CHECK CIRCUIT BETWEEN COMBINATION SWITCH AND BCM

With CONSULT-II
Select “BCM” on CONSULT-II. With “WIPER” on “DATA MONITOR”, confirm that “FR WIPER INT”, “FR WIPER LOW”, “FR WIPER HI”, and “FR WASHER SW” turn ON-OFF according to wiper switch operation.

Without CONSULT-II
Refer to LT-170, "Combination Switch Inspection" .



OK or NG

OK >> Replace IPDM E/R.
NG >> Check wiper Switch. Refer to LT-170, "Combination Switch Inspection" .

Removal and Installation for Front Wiper Arms, Adjustment for Wiper Arms Stop Location

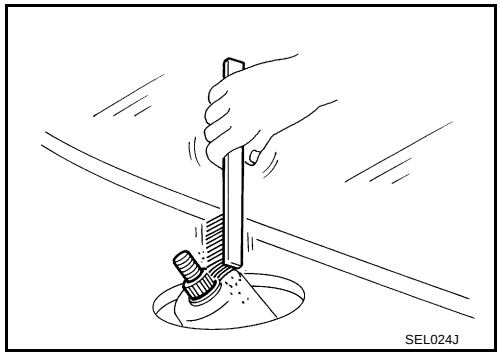
AKS00APW

REMOVAL

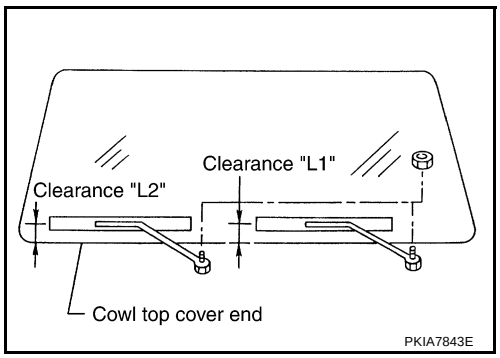
1. Operate front wiper motor, and stop it at the auto stop position.
2. Remove washer tube from washer tube joint.
3. Remove front wiper arm mounting nuts and front wiper arm from vehicle.

INSTALLATION

1. Clean up the pivot area as illustrated. This will reduce possibility of front wiper arm looseness.



2. Prior to front wiper arm installation, turn on wiper switch to operate front wiper motor and then turn it “OFF” (Auto Stop).
3. Push front wiper arm onto pivot shaft, paying attention to blind spline.
4. Attach washer tube to washer tube joint.
5. Lift the blade up and then set it down onto glass surface to set the blade center to clearance “L1” & “L2” immediately before tightening nut.
6. Eject washer fluid. Turn on wiper switch to operate front wiper motor and then turn it “OFF”.
7. Ensure that wiper blades stop within clearance “L1” & “L2”.



Clearance “L1” : 56.4 – 71.4 mm (2.22 – 2.81in)
Clearance “L2” : 29.5 – 44.5 mm (1.16 – 1.75in)

- Tighten front wiper arm nuts to specified torque.

Front wiper arm nuts : 23.6 N·m (2.4 kg-m, 18 ft-lb)

ADJUSTMENT

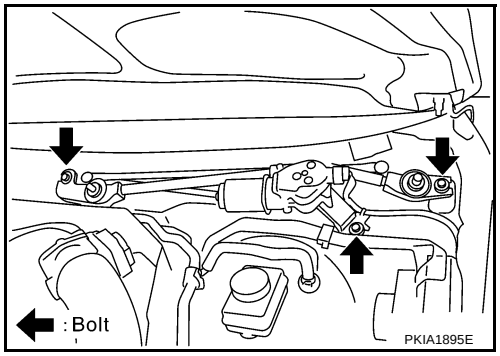
Refer to WW-31, "INSTALLATION" .

Removal and Installation of Front Wiper Motor and Linkage

AKS00APX

REMOVAL

1. Remove front wiper arm. Refer to WW-31, "REMOVAL" .
2. Remove cowl top cover. Refer to EI-20, "COWL TOP" in “EI” section.
3. Remove washer tube.
4. Disconnect front wiper motor connector.
5. Remove front wiper motor and linkage mounting bolts, and remove front wiper motor and linkage.



INSTALLATION

1. Install front wiper motor and linkage to the vehicle.
2. Connect front wiper motor assembly to the connector. Turn wiper switch ON to operate front wiper motor, then turn wiper switch OFF (auto stop).
3. Attach washer tube to washer tube joint.
4. Install cowl top cover. Refer to EI-20, "COWL TOP" in “EI” section.
5. Install front wiper arms. Refer to WW-31, "Removal and Installation for Front Wiper Arms, Adjustment for Wiper Arms Stop Location" .
6. Attach front wiper arm washer tube.

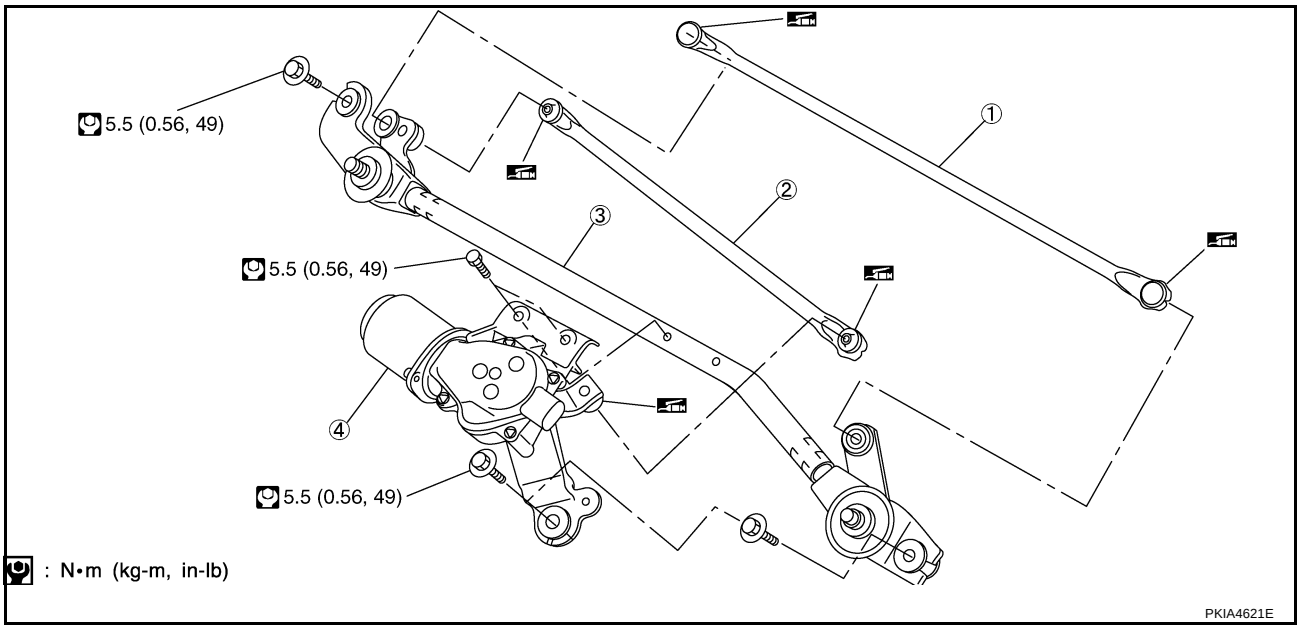
Front wiper motor and linkage mounting bolts : 5.5 N·m (0.56 kg-m, 49 in-lb)

CAUTION:

- **Do not drop front wiper motor or cause it to contact other parts.**
- **Check grease conditions of the motor arm and wiper link joint (at retainer). Apply grease if necessary.**

Disassembly and Assembly Front Wiper Motor and Linkage

AKS00APY



1. Wiper link 1
2. Wiper link 2
3. Wiper frame
4. Front wiper motor

DISASSEMBLY

1. Remove wiper link from wiper frame and motor arm.
2. Remove front wiper motor mounting bolts, and remove front wiper motor from wiper frame.

ASSEMBLY

Paying attention to the work listed below, assemble in reverse order of disassembly.

Wiper motor mounting bolts : 5.5 N·m (0.56 kg-m, 49 in-lb)

Washer Nozzle Adjustment

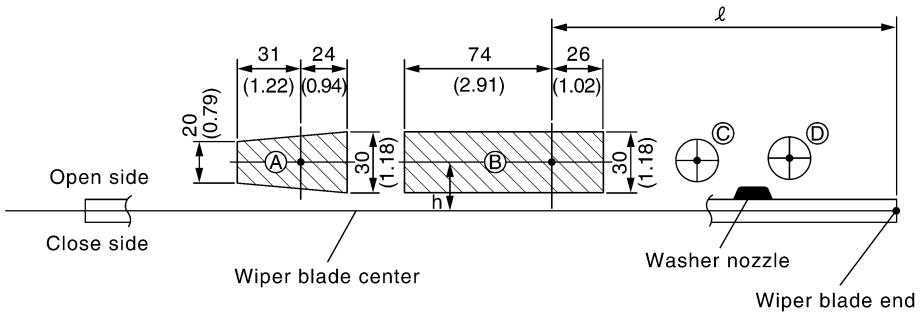
AKS00APZ

1. When wiper blade position is in auto stop condition, remove front wiper motor connector to ensure front wiper arms do not move.
2. Adjust each nozzle position (A, B, E, F, and G) so that spray positions are in the range of shaded parts.

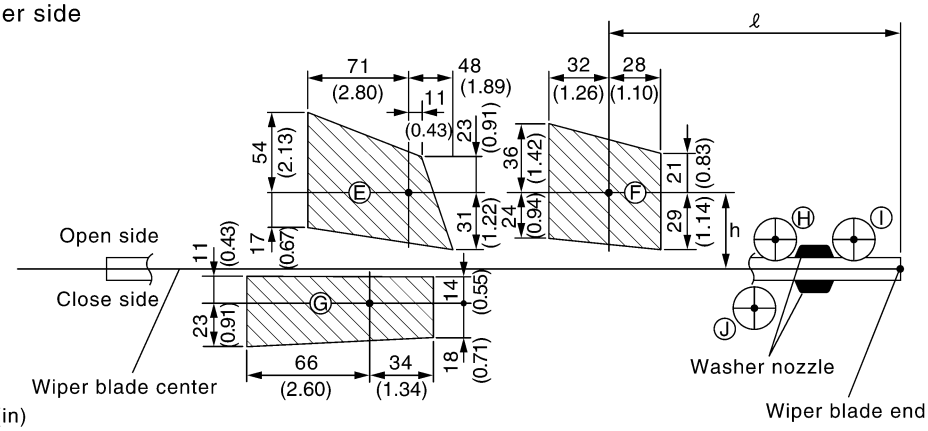
CAUTION:

Only washer nozzles (A, B, E, F, and G) can be adjusted. Washer nozzles (C, D, H, I, and J) cannot be adjusted because of fixed nozzles.

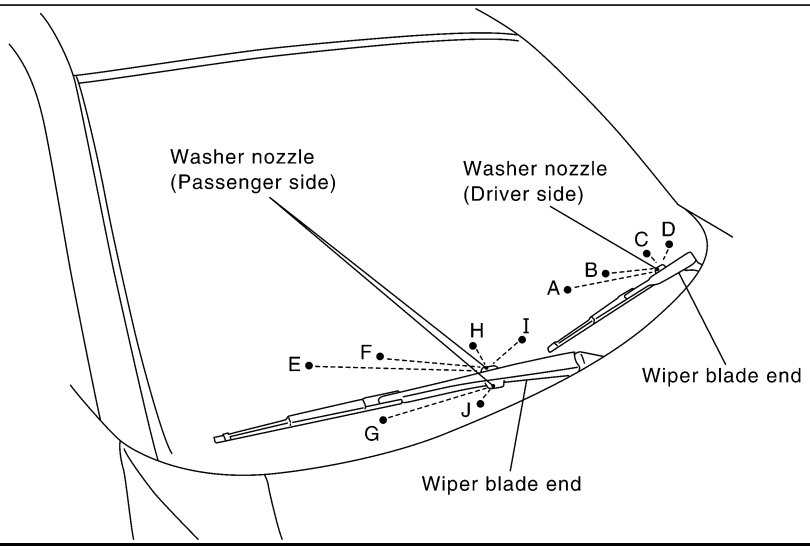
Driver side



Passenger side



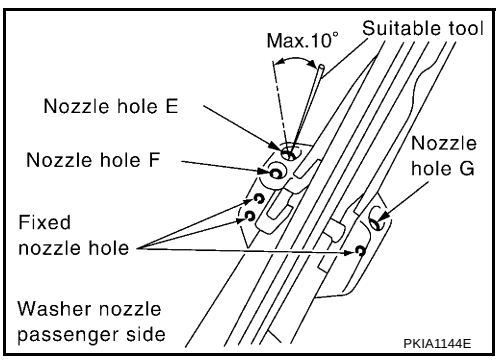
Unit : mm(in)



PKIA1897E

Unit: mm (in)

Spray position	h (height)	ℓ (width)
A	30 (1.18)	282.5 (11.12)
B	20 (0.79)	157.5 (6.20)
(C)	—	—
(D)	—	—
E	70 (2.76)	320 (12.60)
F	35 (1.38)	165 (6.50)
G	–20 (–0.79)	250 (9.84)
(H,I,J)	—	—



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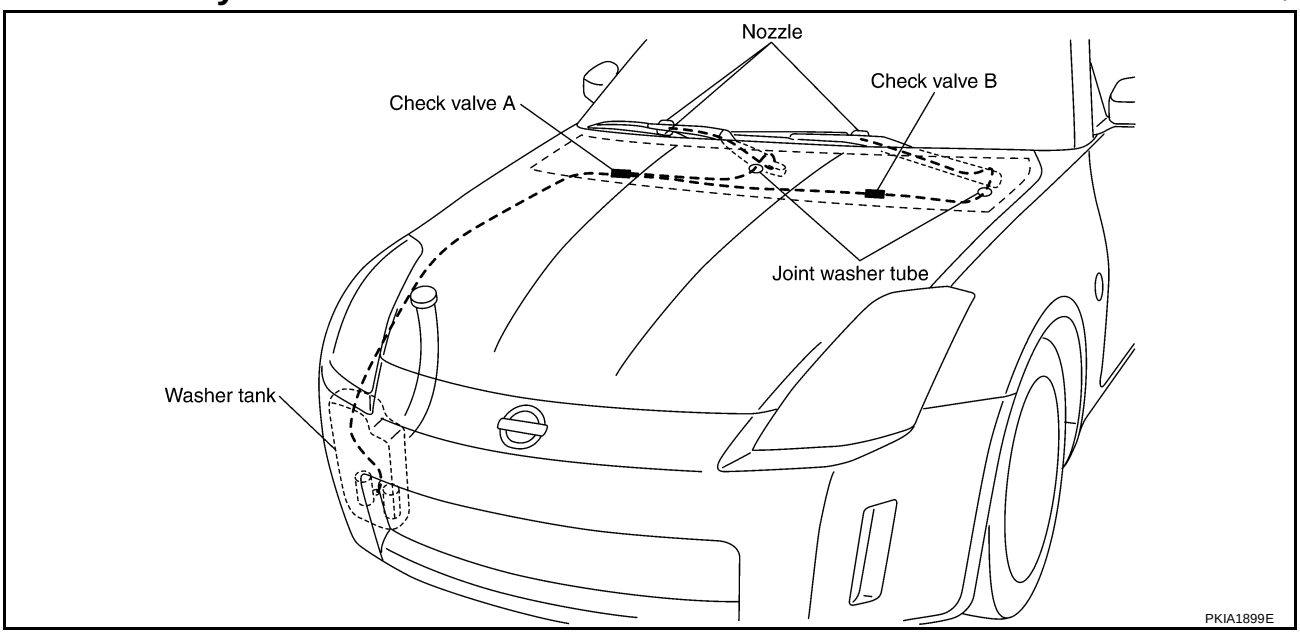
Washer Tube Layout

AKS00AQ0



Removal and Installation for Front Washer Nozzle

AKS00AQ1

Replace wiper arm assembly. Refer to WW-31, "Removal and Installation for Front Wiper Arms, Adjustment for Wiper Arms Stop Location" .

CAUTION:

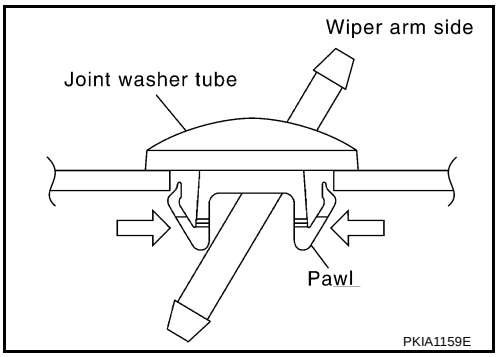
Removal/installation of washer nozzle as a unit must not be done.

Removal and Installation for Front Washer Tube Joint

AKS00AQ2

REMOVAL

1. Remove upwards while pressing pawls on reverse side.
2. Remove washer tube.



INSTALLATION

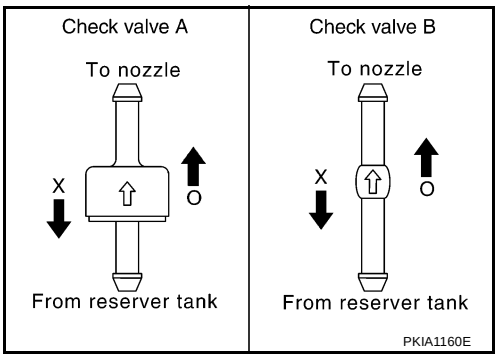
Install in reverse order of removal.

Inspection for Washer Nozzle

AKS00AQ3

CHECK VALVE

Blow air in the injection direction, and check that air flows only one way. Make sure that the reverse direction (inhale) is not possible.

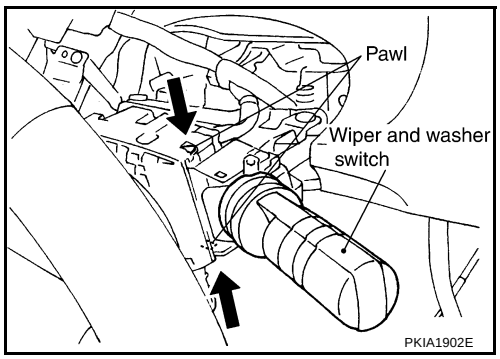


Removal and Installation for Front Wiper and Washer Switch

AKS00AQ4

REMOVAL

1. Remove steering column lower cover and combination meter. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" in “IP” section.
2. Disconnect wiper and washer switch connector.
3. Pull wiper and washer switch toward the passenger door while pressing pawls in direction shown by the arrow in the figure, and remove it from the base.



INSTALLATION

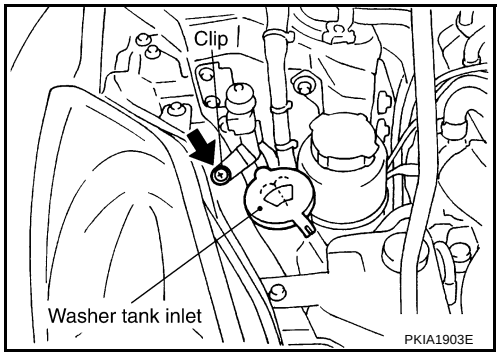
Install in reverse order of removal.

Removal and Installation for Washer Tank

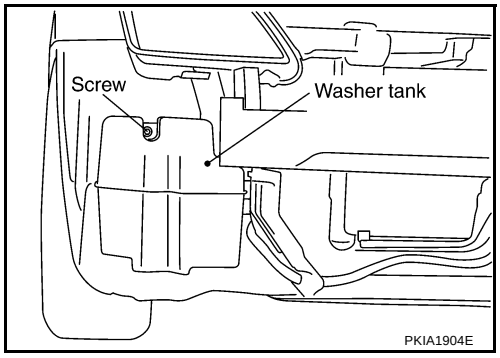
AKS00AQ5

REMOVAL

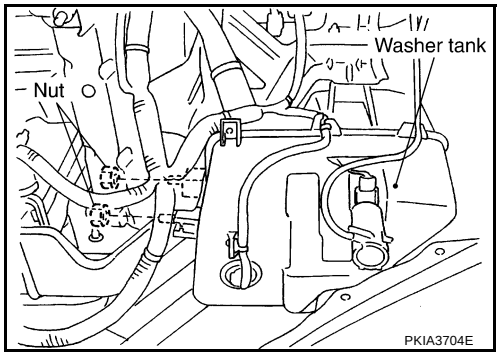
1. Remove clip and pull out washer tank inlet.



2. Remove fender protector. Refer to EI-21, "FENDER PROTECTOR" in “EI” section.
3. Remove front bumper fascia. Refer to EI-14, "FRONT BUMPER" in “EI” section.
4. Disconnect washer pump connector.
5. Remove washer tank mounting screw and nuts.



6. Remove washer tube, and remove washer tank from the vehicle.



INSTALLATION

Note the following, and install in reverse order of removal.

CAUTION:

After installation, add water up to the upper level of washer tank inlet, and check for water leaks.

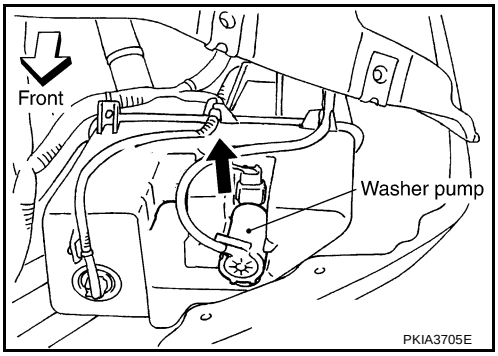
Washer tank mounting screw and nuts : 5.7 N·m (0.58 kg-m, 50 in-lb)

Removal and Installation for Washer Pump

AKS00AQ6

REMOVAL

1. Remove fender protector. Refer to EI-21, "FENDER PROTECTOR" in “EI” section.
2. Disconnect washer pump connector and tube.
3. Pull out washer pump in direction shown by the arrow in the figure. Remove washer pump from washer tank.



INSTALLATION

Paying attention to the following, install in reverse order of removal.

CAUTION:

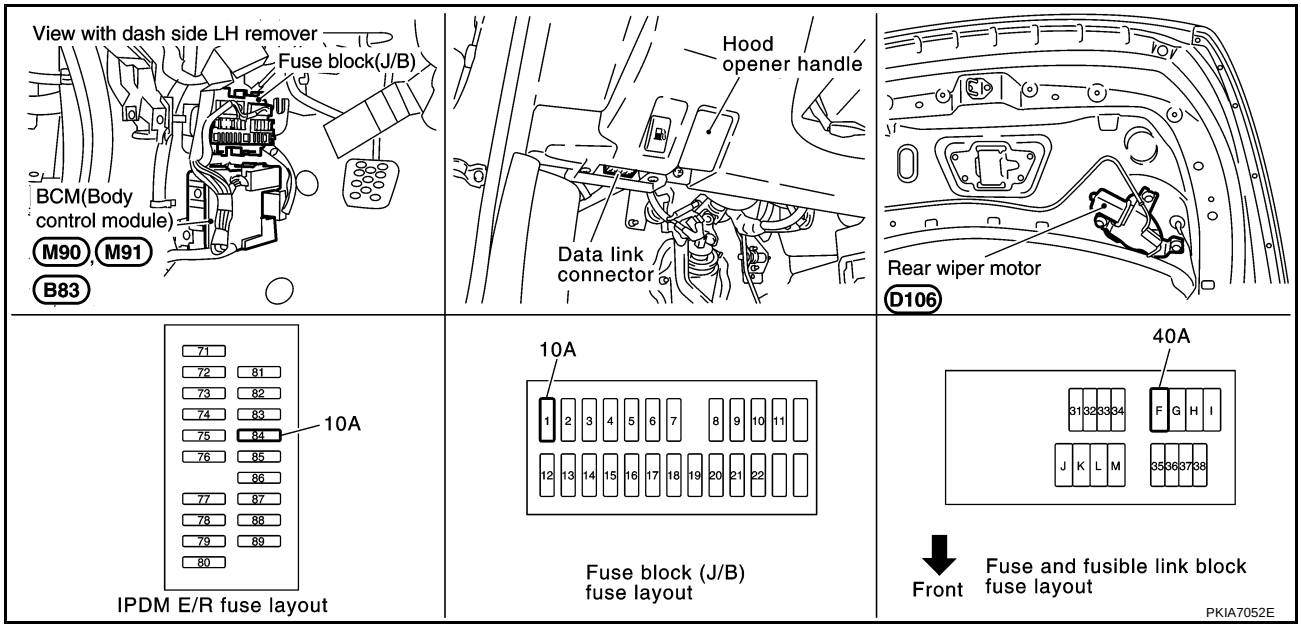
When installing washer pump, there should be no packing twists, etc.

REAR WIPER AND WASHER SYSTEM

PFP:28710

Components Parts and Harness Connector Location

AKS009PS



System Description

AKS009PT

- Wiper switch (combination switch) is composed of a combination of 5 output terminals and 5 input terminals. Terminal combination status is read by BCM when switch is turned ON.
- BCM (body control module) controls rear wiper ON and INT (intermittent) operation.

Power is supplied all time

- through 40 A fusible link (letter F, located in fusible link block)
- to BCM (body control module) terminal 55
- through 10 A fuse [No. 18, located in fuse block (J/B)]
- to BCM (body control module) terminal 42.

When ignition switch is in ON or START position, power is supplied

- through 10 A fuse [No. 1, located in fuse block (J/B)]
- to BCM (body control module) terminal 38
- through 10 A fuse [No. 84, located in IPDM E/R (intelligent power distribution module engine room)]
- to rear washer motor terminal 2.

Ground is supplied

- to BCM (body control module) terminal 52
- through grounds M30 and M66
- to combination switch (wiper switch) terminal 12
- through grounds M30 and M66.

REAR WIPER OPERATION

When wiper switch is in rear wiper ON position, BCM detect rear wiper ON signal by BCM wiper switch reading function.
BCM operate rear wiper motor, power is supplied

- through BCM terminal 70
- to rear wiper motor 4.

Ground is supplied

- to rear wiper motor terminal 1
- through body grounds B5, B6, D105 and T14.

With power and ground is supplied, rear wiper operates.

INTERMITTENT OPERATION

Rear wiper motor operates wiper arms at low speed approximately every 7 seconds.
When wiper switch is in rear wiper INT position, BCM detect rear wiper INT signal by BCM wiper switch reading function. (Refer to WW-6, "COMBINATION SWITCH READING FUNCTION" .)
BCM operate rear wiper motor, power is supplied

- through BCM terminal 70
- to rear wiper motor 4.

Ground is supplied

- to rear wiper motor terminal 1
- through body grounds B5, B6, D105 and T14.

With power and ground is supplied, rear wiper operates at intermittent.

AUTO STOP OPERATION

With rear wiper switch turned OFF, rear wiper motor will continue to operate until wiper arm reaches rear wiper stopper.
Then wiper motor turns the other way and wiper arm moves once until wiper arm reaches stopper.

WASHER OPERATION

When wiper switch is in rear wiper washer position, BCM detect rear wiper washer signal by BCM wiper switch reading function (Refer to WW-6, "COMBINATION SWITCH READING FUNCTION" .), and combination switch (wiper switch) ground is supplied

- to rear washer motor terminal 1
- through combination switch (wiper switch) terminal 13
- to combination switch (wiper switch) terminal 12
- through body grounds M30 and M66.

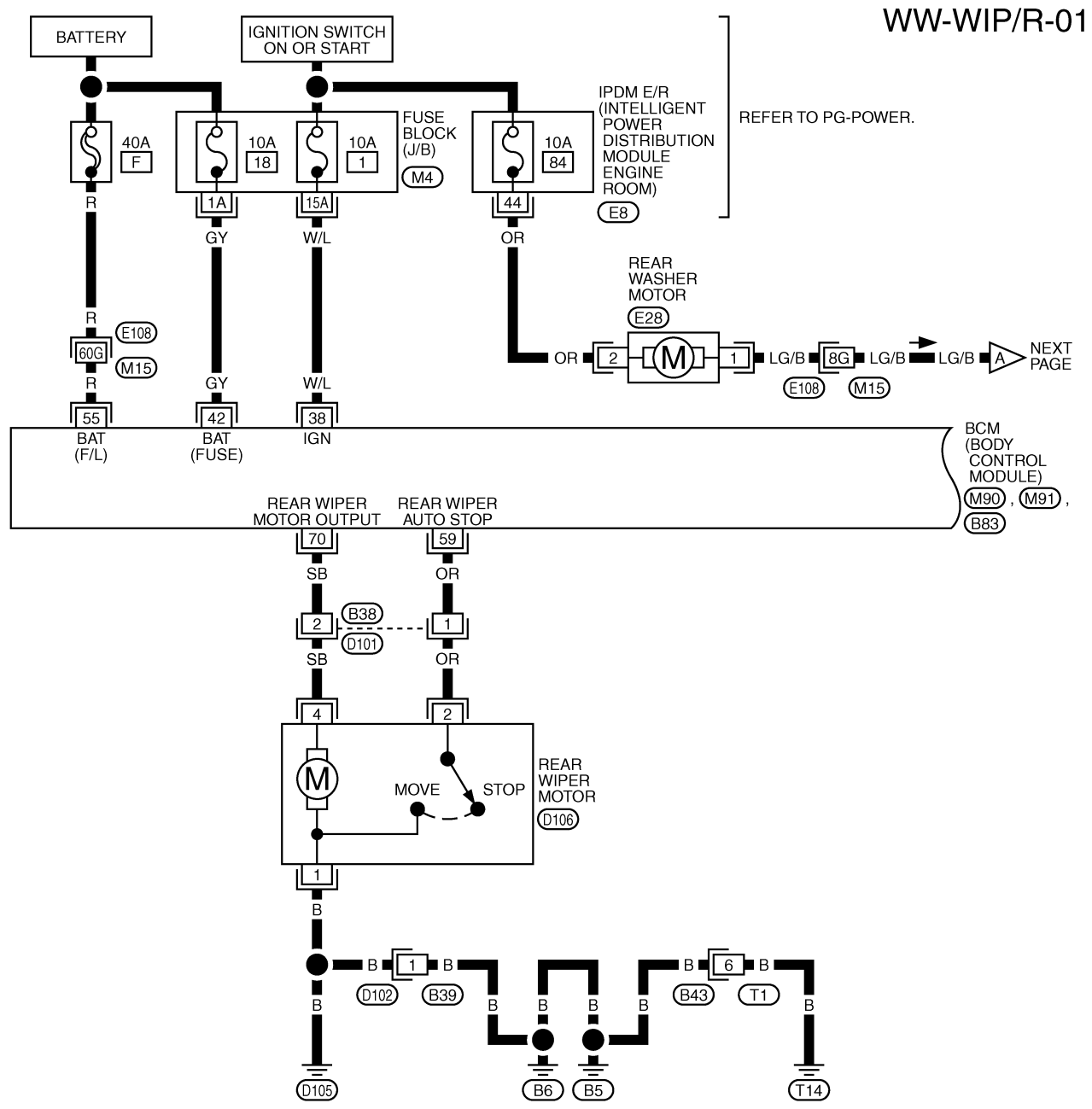
With ground is supplied, rear washer motor is operated.
When BCM detects that rear washer motor has operated for 0.4 seconds or linger, BCM operates rear wiper motor low speed.
When BCM detects washer switch is OFF, low speed operation cycles approximately 3 times and then stops.

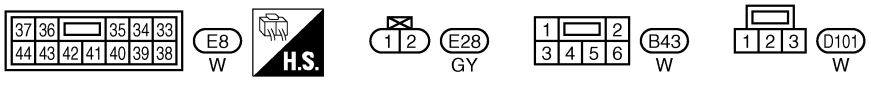
BCM WIPER SWITCH READING FUNCTION

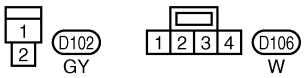
Refer to WW-6, "COMBINATION SWITCH READING FUNCTION" in FRONT WIPER AND WASHER SYSTEM.

Wiring Diagram — WIP/ R —

AKS009PU







REFER TO THE FOLLOWING.

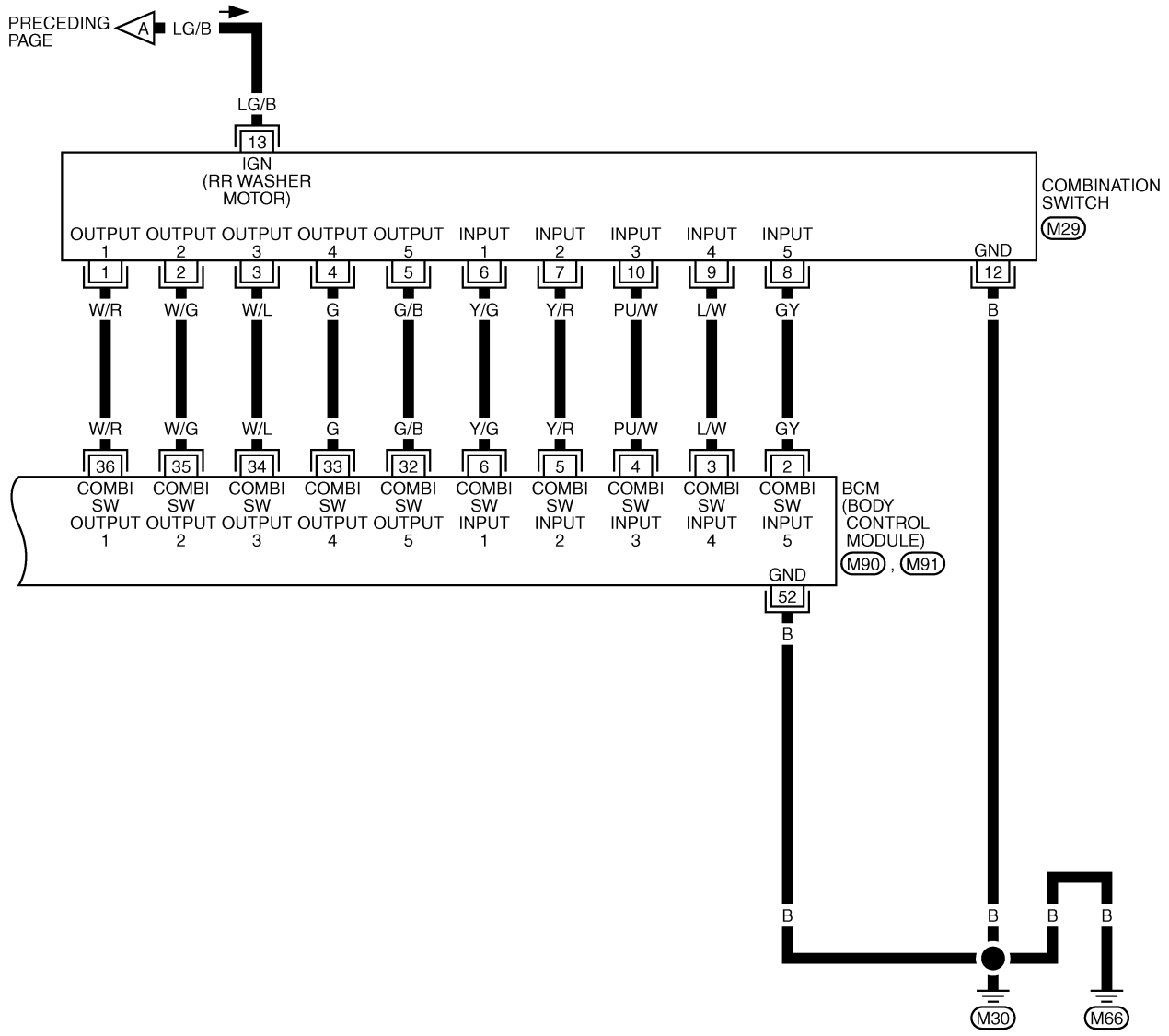
E108 -SUPER MULTIPLE JUNCTION (SMJ)

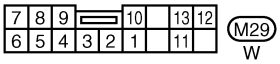
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

M90 , M91 , B83 -ELECTRICAL UNITS

TKWT1856E

WW-WIP/R-02



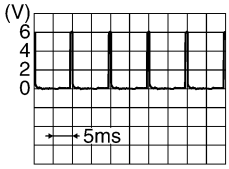
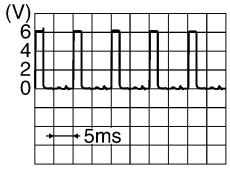
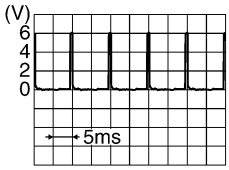
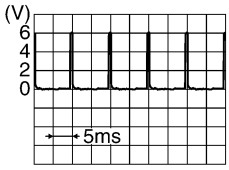
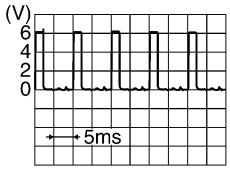


REFER TO THE FOLLOWING.
M90 , M91 -ELECTRICAL UNITS

TKWT1857E

Terminals and Reference Values for BCM

AKS00AQ7

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
2	GY	Combination switch input 5	ON	● Lighting switch and wiper switch OFF ● Wiper dial position 4	SKIA5291E
3	L/W	Combination switch input 4	ON	● Lighting switch and wiper switch OFF ● Wiper dial position 4	 SKIA5292E
4	PU/W	Combination switch input 3	ON	● Lighting switch and wiper switch OFF ● Wiper dial position 4	 SKIA5291E
5	Y/R	Combination switch input 2	ON	● Lighting switch and wiper switch OFF ● Wiper dial position 4	 SKIA5292E
6	Y/G	Combination switch input 1			
32	G/B	Combination switch output 5	ON	● Lighting switch and wiper switch OFF ● Wiper dial position 4	SKIA5291E
33	G	Combination switch output 4	ON	● Lighting switch and wiper switch OFF ● Wiper dial position 4	 SKIA5292E
34	W/L	Combination switch output 3	ON	● Lighting switch and wiper switch OFF ● Wiper dial position 4	 SKIA5291E

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
35	W/G	Combination switch output 2	ON	● Lighting switch and wiper switch OFF ● Wiper dial position 4		SKIA5292E
36	W/R	Combination switch output 1				
38	W/L	Ignition switch (ON)	ON	—		Battery voltage
42	GY	Battery power supply	OFF	—		Battery voltage
52	B	Ground	ON	—		Approx. 0V
55	R	Battery power supply	OFF	—		Battery voltage
59	OR	Rear wiper auto stop signal	ON	Wiper operating		Approx. 0V
				Wiper stopped		Battery voltage
70	SB	Rear wiper motor output signal	ON	Wiper switch	OFF	Approx. 0V
					ON	Battery voltage

How to Proceed With Trouble Diagnosis

AKS009PW

1. Confirm the symptoms and customer complaint.
2. Understand operation description and function description. Refer to WW-38, "System Description" .
3. Perform preliminary check. Refer to WW-43, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Does warning chime operate normally? If YES: GO TO 6. If NO: GO TO 4.
6. INSPECTION END

Preliminary Check

AKS009PX

CHECK POWER SUPPLY AND GROUND CIRCUIT

Inspection Procedure

1. CHECK FUSE

- Check if wiper and washer fuse is blown.

Unit	Power source	Fuse and fusible link No.
Rear washer motor	Ignition ON or START	84
BCM	Ignition ON or START	1
	Battery	F
		18

Refer to WW-40, "Wiring Diagram — WIP/ R —" .

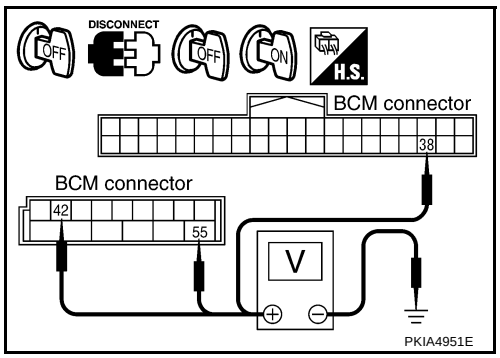
OK or NG

OK >> GO TO 2.

NG >> If fuse is blown, be sure to eliminate cause of problem before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM connector and ground.



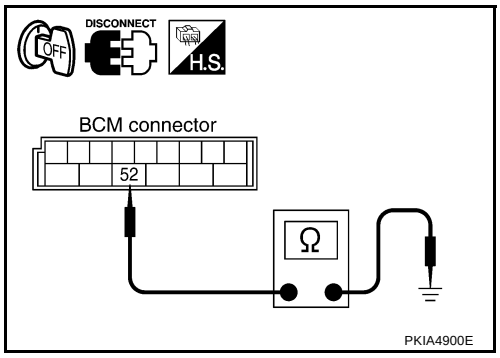
Terminals			Ignition switch position	
(+)		(-)	OFF	ON
Connector	Terminal (Wire color)			
M91	42 (GY)	Ground	Battery voltage	Battery voltage
	55 (R)		Battery voltage	Battery voltage
M90	38 (W/L)		0V	Battery voltage

OK or NG

OK >> GO TO 3.
NG >> Check harness for open or short between BCM and fuse.

3. CHECK GROUND CIRCUIT

Check continuity between BCM and ground.



Terminals			Continuity
Connector	Terminal (Wire color)	Ground	
M91	52 (B)		Yes

OK or NG

OK >> INSPECTION END
NG >> Check harness ground circuit.

CONSULT-II Functions

AKS009PY

CONSULT-II performs the following functions communicating with the BCM.

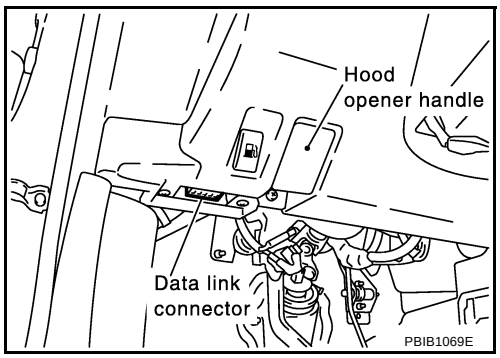
BCM diagnosis position	Check item, Diagnosis mode	Description
Wiper	DATA MONITOR	Displays BCM input data in real time.
	ACTIVE TEST	Device operation can be checked by applying a drive signal to device.

CONSULT-II OPERATION

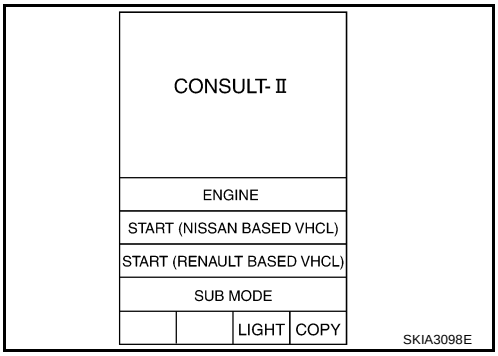
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

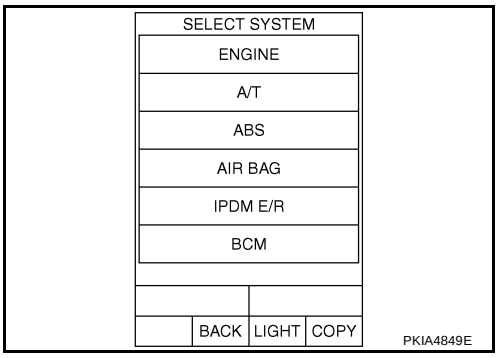
1. With ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to data link connector, then turn ignition switch ON.



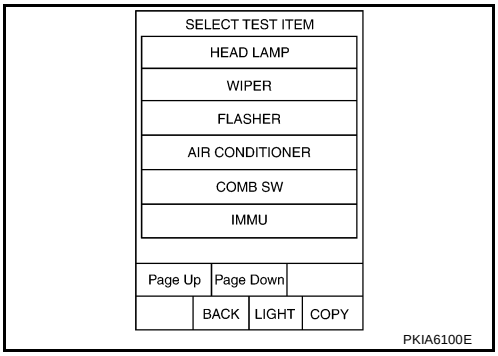
2. Touch “START(NISSAN BASED VHCL)”.



3. Touch “BCM” on “SELECT SYSTEM” screen
If“BCM” is not indicated, refer to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



4. Touch “WIPER” on “SELET TEST ITEM” screen.



DATA MONITOR

Operation Procedure

1. Touch “WIPER” on “SELECT TEST ITEM” screen.
2. Touch “DATA MONITOR” on “SELECT DIAG MODE” screen.
3. Touch either “ALL SIGNALS” or “SELECTION FROM MENU” on “DATA MONITOR” screen.

ALL SIGNALS	All items will be monitored.
SELECTION FROM MENU	Selects and monitors individual items.

4. Touch “START”.
5. When “SELECTION FROM MENU” is selected, touch items to be monitored. When “ALL SIGNALS” is selected, all the items will be monitored.
6. Touch “RECORD” while monitoring, then the status of the monitored item can be recorded. To stop recording, touch “STOP”.

Display Item List

Monitor item [operation or unit]		Display content
IGN ON SW	[ON/OFF]	Displays “ignition switch ON (ON)/Other OFF or ACC (OFF)” status as judged from ignition switch signal.
IGN SW CAN	[ON/OFF]	Displays “ignition switch ON (ON)/Other OFF or ACC (OFF)” status as judged from CAN communication signal.
FR WIPER HI	[ON/OFF]	Displays “FRONT WIPER HI (ON)/Other (OFF)” status as judged from wiper switch signal.

Monitor item [operation or unit]		Display content
FR WIPER LOW	[ON/OFF]	Displays “FRONT WIPER LOW (ON)/Other (OFF)” status as judged from wiper switch signal.
FR WIPER INT	[ON/OFF]	Displays “FRONT WIPER INT (ON)/Other (OFF)” status as judged from wiper switch signal.
FR WASHER SW	[ON/OFF]	Displays “FRONT WASHER Switch (ON)/Other (OFF)” status as judged from wiper switch signal.
INT VOLUME	[1 - 7]	Displays intermittent operation dial position setting (1 - 7) as judged from wiper switch signal.
FR WIPER STOP	[ON/OFF]	Displays “Stopped (ON)/Operating (OFF)” status as judged from auto-stop signal.
VEHICLE SPEED	[km/h]	Displays vehicle speed status as judged from vehicle speed signal.
RR WIPER ON[NOTE 1]	[ON/OFF]	Displays “Rear Wiper ON (ON)/Other (OFF)” status as judged from wiper switch signal.
RR WIPER INT[NOTE 1]	[ON/OFF]	Displays “Rear Wiper INT (ON)/Other (OFF)” status as judged from wiper switch signal.
RR WASHER SW[NOTE 1]	[ON/OFF]	Displays “Rear Washer Switch (ON)/Other (OFF)” status as judged from wiper switch signal.
RR WIPER STOP[NOTE 1]	[ON/OFF]	Displays “Rear Wiper Stop (ON)/Other (OFF)” status, as judged from wiper switch signal.
RR WIPER STP2[NOTE 2]	[OFF]	—

NOTE:
1. Coupe models
2. This item is displayed, but cannot monitor it.

ACTIVE TEST

Operation Procedure

1. Touch “WIPERS” on “SELECT TEST ITEM” screen.
2. Touch “ACTIVE TEST” on “SELECT DIAG MODE” screen.
3. Touch item to be tested and check operation of the selected item.
4. During the operation check, touching “BACK” deactivates the operation.

Display Item List

Test item	Display on CONSULT-II screen	Description
Front wiper output	FR WIPER	With a certain operation (OFF, HI, LO, INT), front wiper can be operated.
Rear wiper output[Note]	RR WIPER	Rear wiper can be operated by any ON-OFF operation

Rear Wiper Does Not Operate

AKS00AQ8

1. CHECK FUSE AND FUSIBLE LINK

Check fuse No.1, 18 and fusible link No. F.

OK or NG

OK >> GO TO 2.
NG >> If fuse or fusible link is blown, be sure to eliminate cause of malfunction before installing new fuse or fusible link, refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

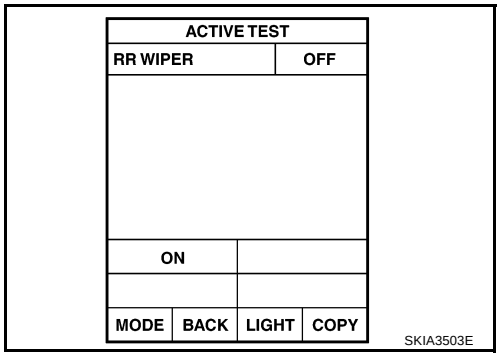
2. ACTIVE TEST

With CONSULT-II

1. Select “BCM” on CONSULT-II, and select “WIPER” on “SELECT SYSTEM” screen.
2. Select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
3. Select “REAR WIPER” on “SELECT TEST ITEM” screen.
4. Confirm that rear wiper operates normally.

Without CONSULT-II

GO TO 3.



Does rear wiper operate normally?

YES >> Refer to LT-170, "Combination Switch Inspection" .
NO >> GO TO 3.

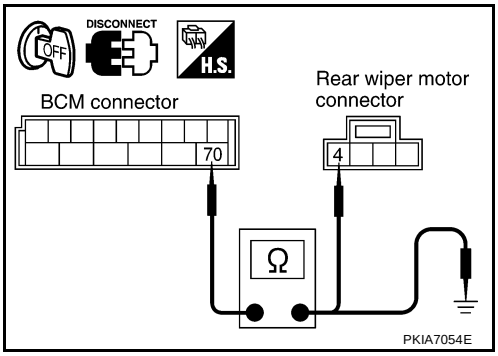
3. CHECK REAR WIPER CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and rear wiper motor connector.
3. Check continuity between BCM harness connector B83 terminals 70 (SB) and rear wiper motor harness connector D106 terminals 4 (SB).

70 (SB) - 4 (SB) : Continuity should exist.

4. Check continuity between BCM harness connector B83 terminals 70 (SB) and ground.

70 (SB) - Ground : Continuity should not exist.



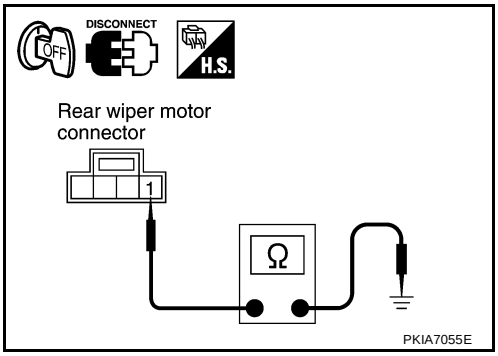
OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK GROUND CIRCUIT

Check continuity between rear wiper motor harness connector D106 terminal 1 (B) and ground.

1 (B) - Ground : Continuity should exist.



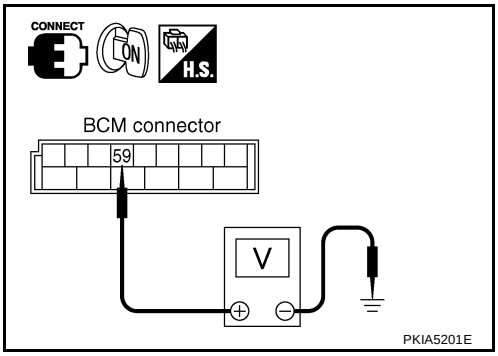
OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK BCM

1. Connect BCM connector and rear wiper motor connector.
2. Turn ignition switch ON.
3. With rear wiper switch ON, check voltage between BCM harness connector B83 terminal 59 (OR) and ground.

Terminals			Condition	Voltage
BCM (+)		(-)		
Connector	Terminal (Wire color)			
B83	59 (OR)	Ground	Wiper stopped	Battery voltage
			Wiper operating	Approx. 0V



OK or NG

OK >> Replace rear wiper motor.
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

Rear Wiper Does Not Return to Stop Position

AKS00AQ9

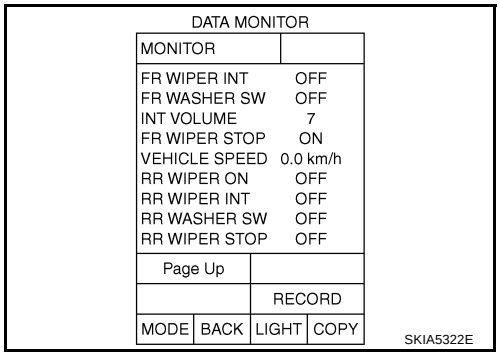
1. CHECK REAR WIPER MOTOR CIRCUIT

With CONSULT-II
Select “BCM” on CONSULT-II. With “WIPER” on “DATA MONITOR”, confirm that “RR WIPER STOP” turns ON-OFF linked with wiper operation.

Without CONSULT-II
GO TO 2.

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> GO TO 2.



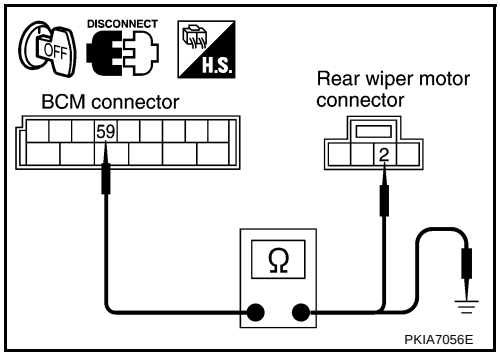
2. CHECK REAR WIPER AUTO STOP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and rear wiper motor connector.
3. Check continuity between BCM harness connector B83 terminal 59 (OR) and rear wiper motor harness connector D106 terminal 2 (OR).

59 (OR) - 2 (OR) : Continuity should exist.

4. Check continuity between BCM harness connector B83 terminal 59 (OR) and ground.

59 (OR) - Ground : Continuity should not exist.

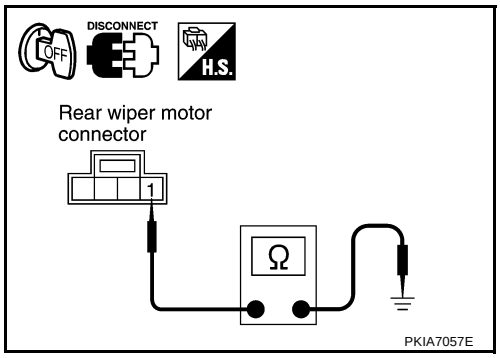


5. Check continuity between rear wiper motor harness connector D106 terminal 1 (B) and ground.

1 (B) - Ground : Continuity should exist.

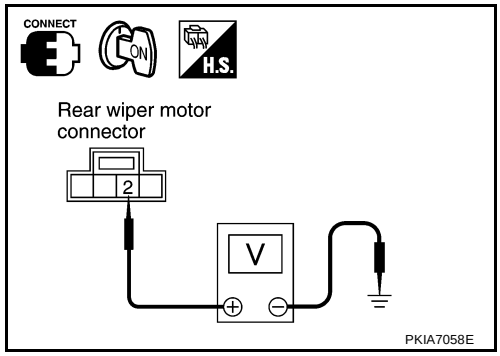
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.



3. CHECK REAR WIPER MOTOR SIGNAL

1. Connect BCM connector and rear wiper motor connector.
2. Turn ignition switch ON.
3. Check voltage between rear wiper motor harness connector terminal and ground while rear wiper motor is stopped and while it is operating.



Terminals			Condition	Voltage
Rear wiper motor (+)		(-)		
Connector	Terminal (Wire color)			
D106	2 (OR)	Ground	Wiper stopped	Battery voltage
			Wiper operating	Approx. 0V

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Replace rear wiper motor.

Only Rear Wiper ON Does Not Operate

AKS00AQA

Refer to LT-170, "Combination Switch Inspection" , and inspect it.

Only Rear Wiper INT Does Not Operate

AKS00AQB

Refer to LT-170, "Combination Switch Inspection" , and inspect it.

Wiper Does Not Wipe When Rear Washer Operates

AKS00AQC

Refer to LT-170, "Combination Switch Inspection" , and inspect it.

Rear Wipers Do Not Stop

AKS00AQD

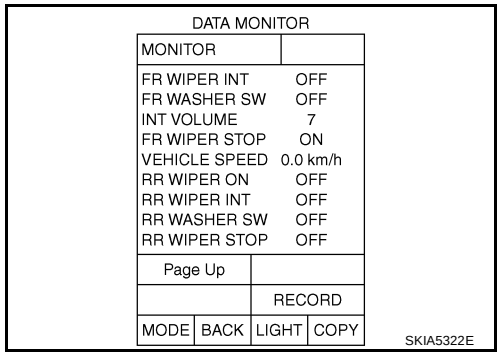
1. CHECK CIRCUIT BETWEEN COMBINATION SWITCH AND BCM

With CONSULT-II
Select “BCM” on CONSULT-II. With “WIPER” on “DATA MONITOR”, confirm that “RR WIPER INT”, “RR WIPER ON”, and “RR WASHER SW” turn ON-OFF according to wiper switch operation.

Without CONSULT-II
Refer to LT-170, "Combination Switch Inspection" .

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Check wiper Switch. Refer to LT-170, "Combination Switch Inspection" .



Removal and Installation for Rear Wiper Arm, Adjustment for Wiper Arms Stop Location

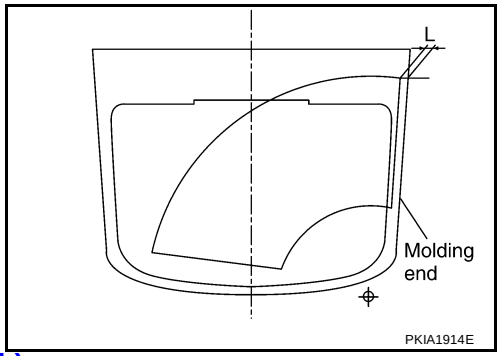
AKS009Q4

1. Prior to wiper arm installation, turn on wiper switch to operate wiper motor and then turn it “OFF” (Auto Stop).
2. Lift blade up and then set it down onto glass surface to set blade center to clearance “L” immediately before tightening nut.
3. Eject washer fluid. Turn on wiper switch to operate wiper motor and then turn it “OFF”.
4. Ensure that wiper blades stop within clearance “L”.

Clearance “L” : 22.5 - 37.5 mm (0.886 - 1.476 in)

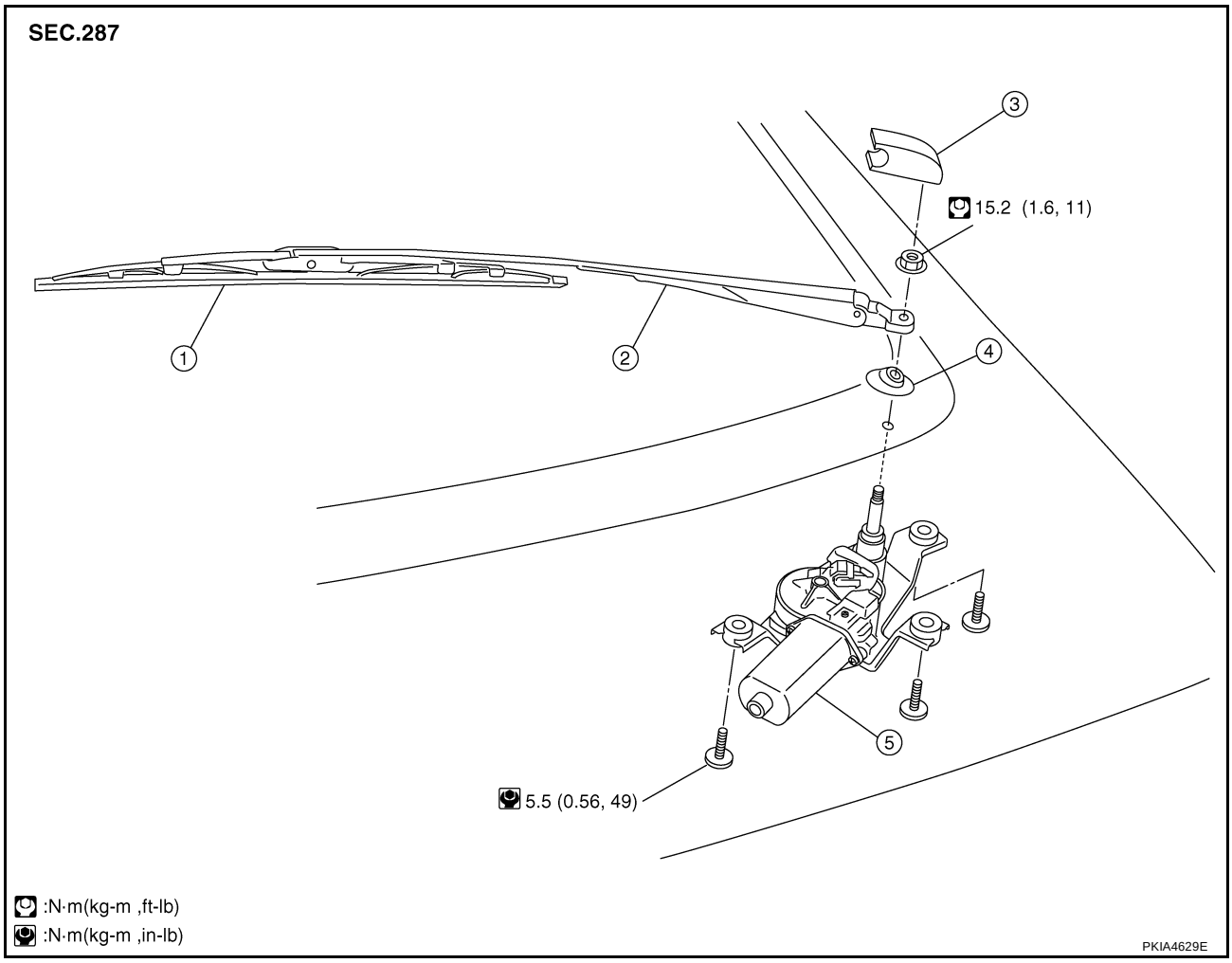
- Tighten wiper arm nuts to specified torque.

Rear wiper : 12.7 - 17.6 N·m (1.3 - 1.7 kg-m, 10 - 12 ft-lb)



Removal and Installation of Rear Wiper Motor

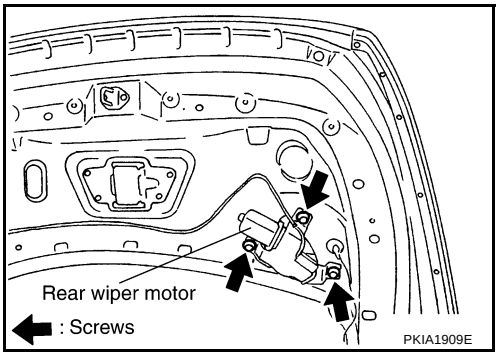
AKS009Q5



1. Wiper blade
2. Wiper arm
3. Cover wiper arm
4. Pivot cap
5. Rear wiper motor

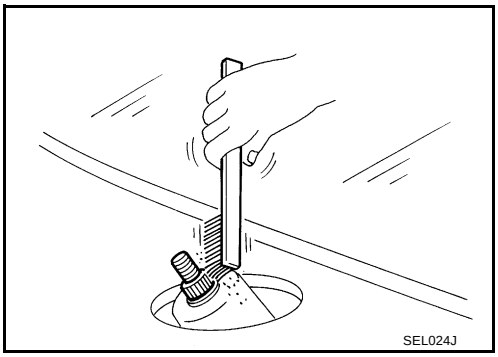
REMOVAL

1. Operate wiper motor, and stop it at auto stop position.
2. Remove cover wiper arm.
3. Remove wiper arm nut, and remove wiper arm from vehicle.
4. Remove pivot cap.
5. Remove back door finisher lower. Refer to EI-47, "BACK DOOR FINISHER" in “EI” section.
6. Remove wiper motor connector.
7. Disconnect rear wiper motor mounting screws and remove rear wiper motor.



INSTALLATION

1. Clean up the pivot area as illustrated. This will reduce possibility of wiper arm looseness.
2. Attach pivot cap.
3. Install rear wiper motor to the vehicle.
4. Connect rear wiper motor to connector. Turn rear wiper switch ON to operate rear wiper motor, then turn wiper switch OFF (auto stop).
5. Install back door finisher lower. Refer to EI-47, "BACK DOOR FINISHER" in “EI” section.
6. Attach wiper arm.



Rear wiper motor mounting screw : 5.5 N·m (0.56 kg-m, 49 in-lb)

CAUTION:

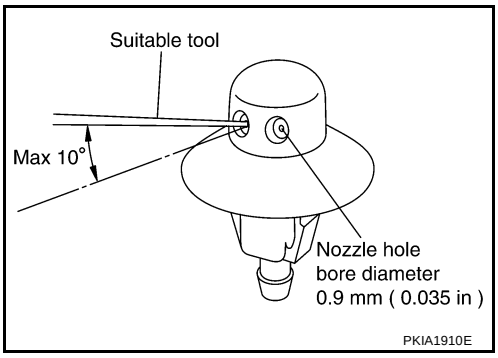
- **Do not drop wiper motor or cause it to contact other parts.**

Washer Nozzle Adjustment

AKS009Q6

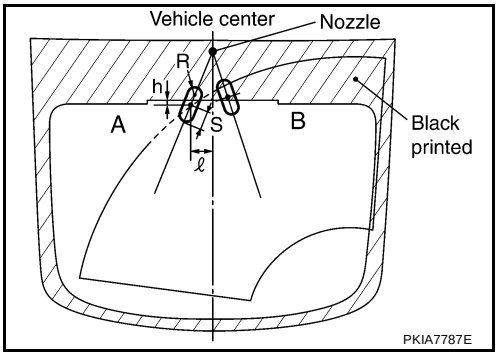
- Adjust washer nozzle with suitable tool as shown in the figure.

Adjustable range : ±10° (In any direction)



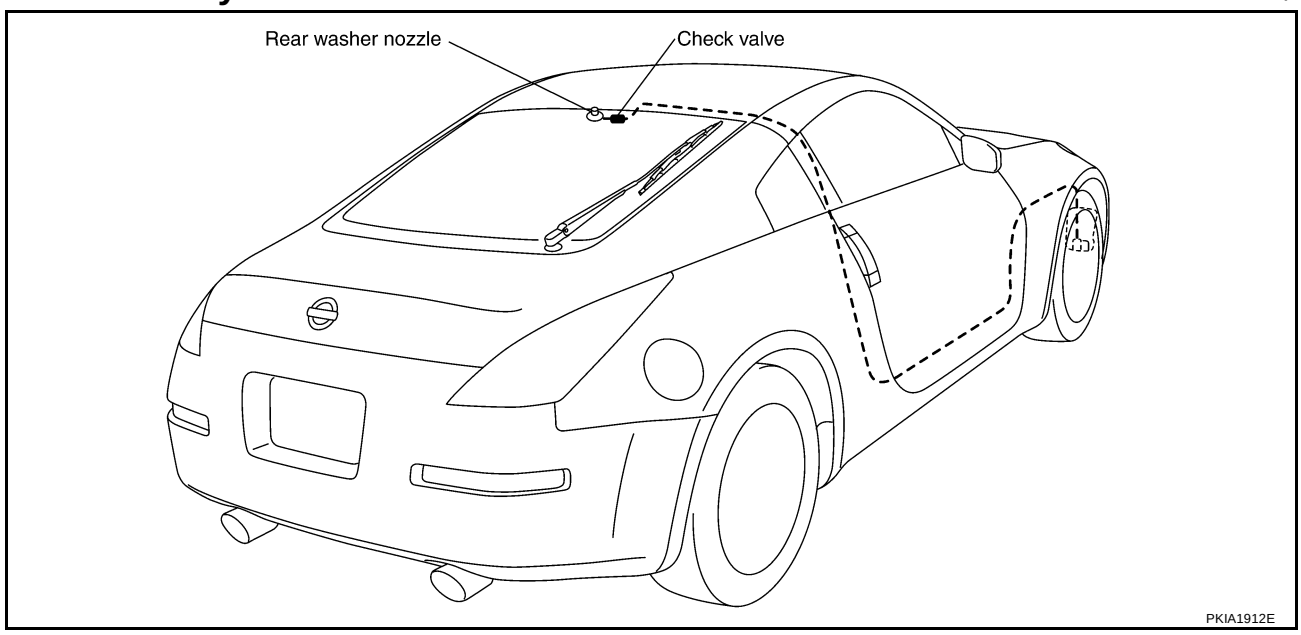
Unit: mm (in)

Spray position	h (height)	ℓ (width)	S	Spray position range
A	30 (1.22)	73 (2.44)	50 (1.97)	30x80
B	12 (0.47)	50 (1.97)	50 (1.97)	30x80



Washer Tube Layout

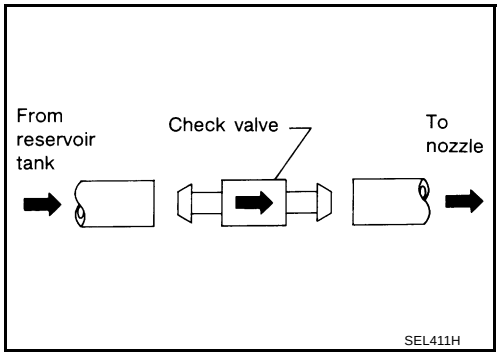
AKS009Q7



Check Valve

AKS009Q8

- A check valve is provided in washer fluid line. Be careful not to connect check valve to washer tube in the wrong direction.



Removal and Installation for Rear Wiper and Washer Switch

AKS009Q9

Refer to WW-36, "Removal and Installation for Front Wiper and Washer Switch" .

Removal and Installation for Washer Tank

AKS009QA

Refer to WW-36, "Removal and Installation for Washer Tank" .

Removal and Installation for Washer Pump

AKS009QB

Refer to WW-37, "Removal and Installation for Washer Pump" .

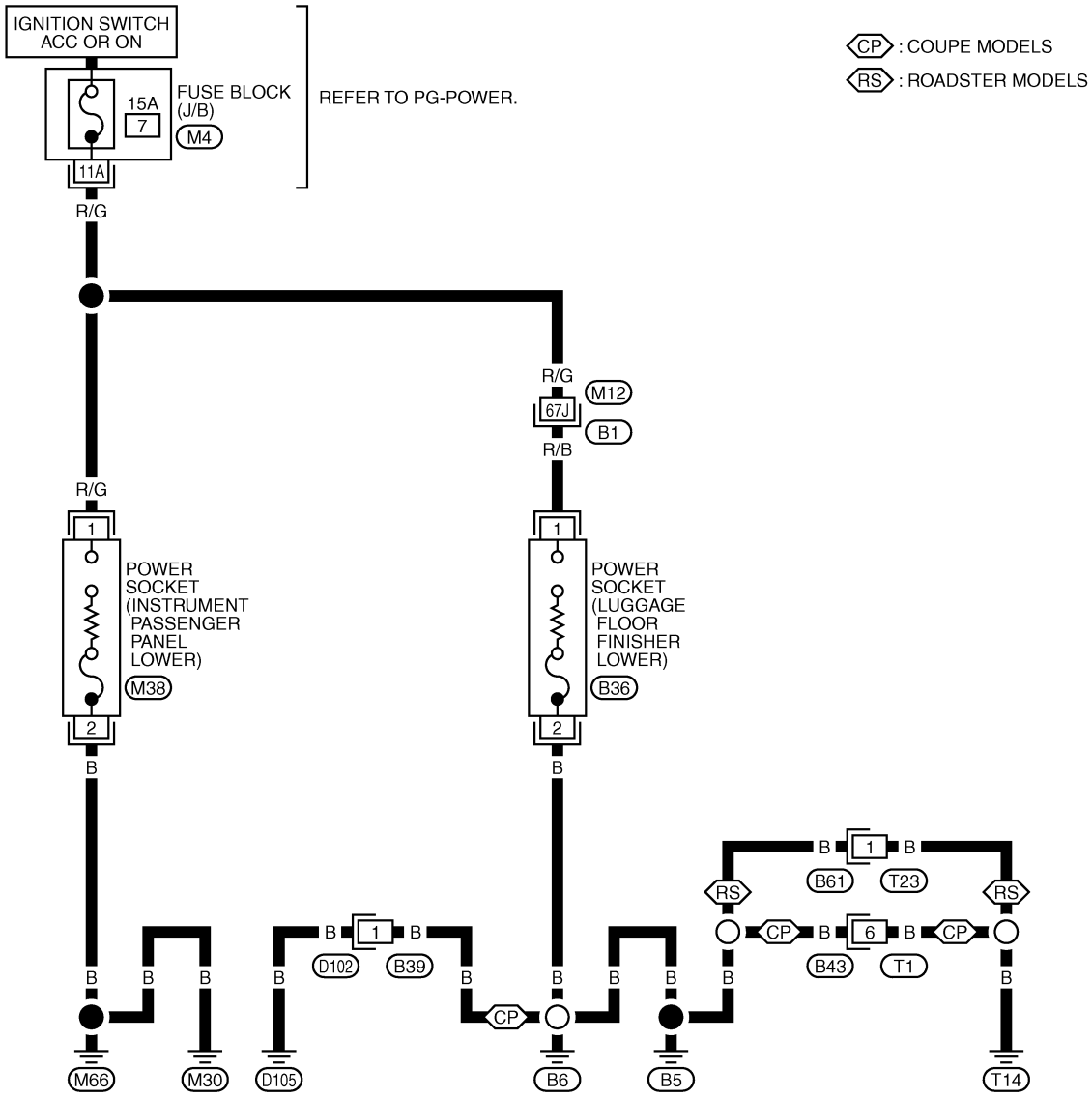
POWER SOCKET

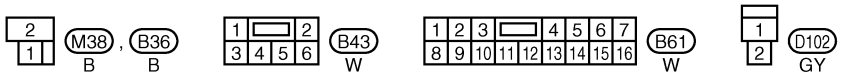
PFP:253A2

Wiring Diagram — P/SCKT —

AKS0033M

WW-P/SCKT-01





REFER TO THE FOLLOWING.

B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

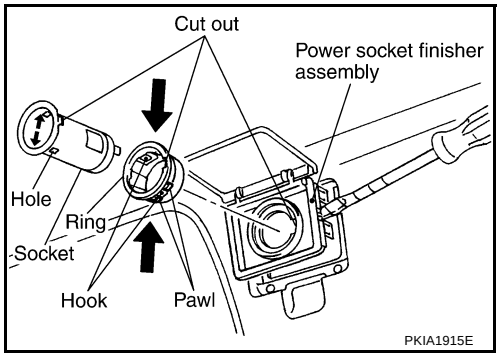
TKWT1718E

Removal and Installation (Luggage Floor Finisher Lower)

AKS0033N

REMOVAL

1. Remove power socket finisher assembly using a clip driver or a suitable tool.
2. Disconnect power socket connector.
3. Remove inner socket from ring. While pressing hook on ring out from square hole.
4. Remove ring from power socket finisher while pressing pawls.



INSTALLATION

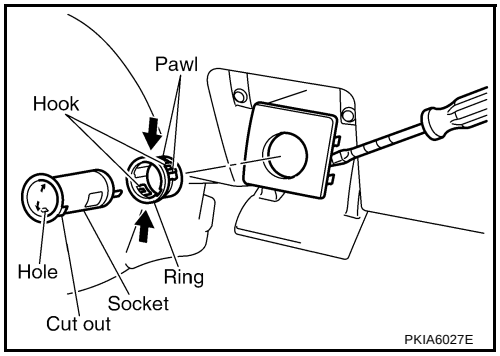
Instal in reverse order of removal.

Removal and Installation (Instrument Passenger Panel Lower)

AKS00A2A

REMOVAL

1. Remove power socket finisher assembly using a clip driver or a suitable tool.
2. Disconnect power socket connector.
3. Remove inner socket from ring. While pressing hook on ring out from square hole.
4. Remove ring from power socket finisher while pressing pawls.



INSTALLATION

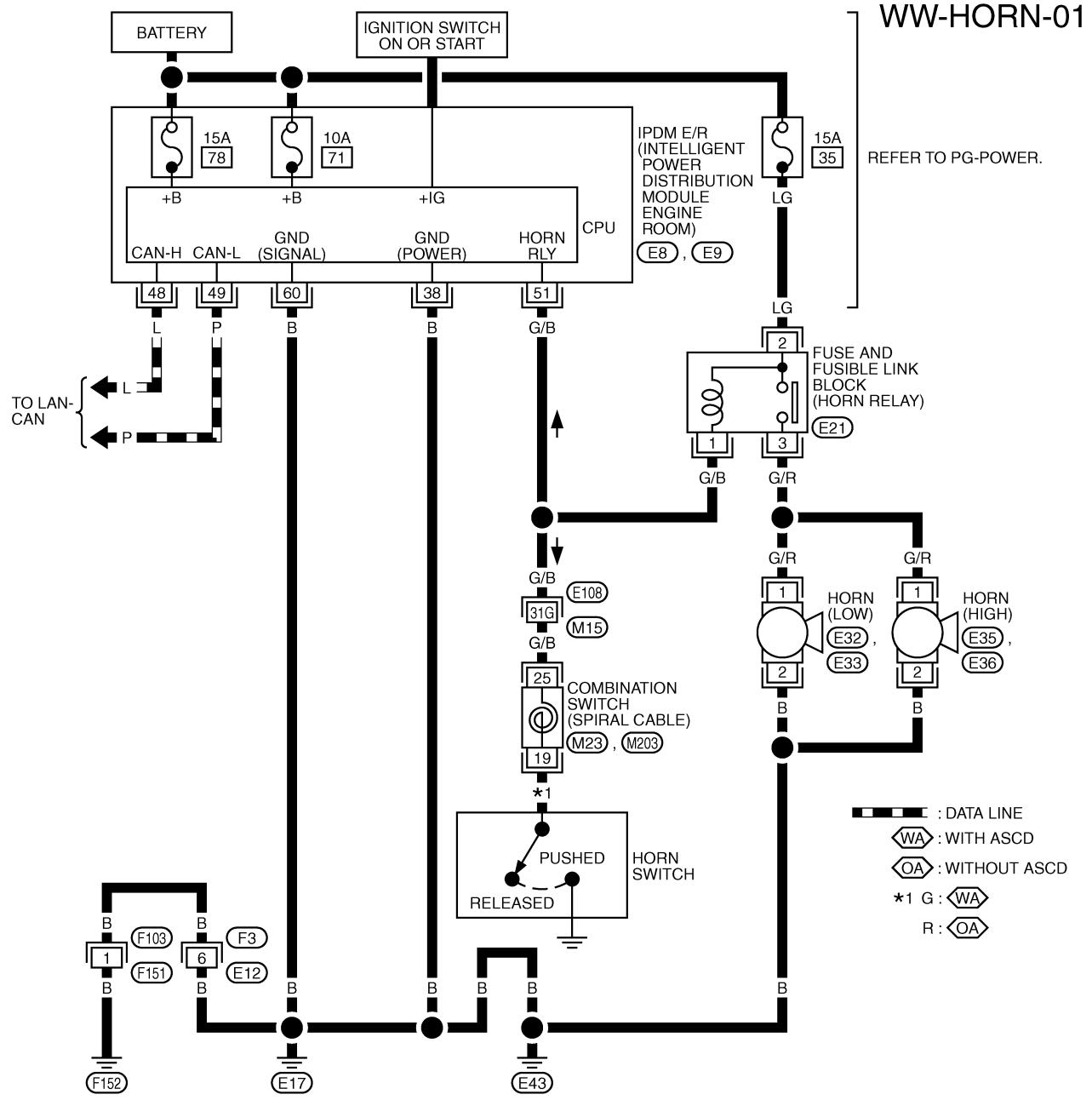
Instal in reverse order of removal.

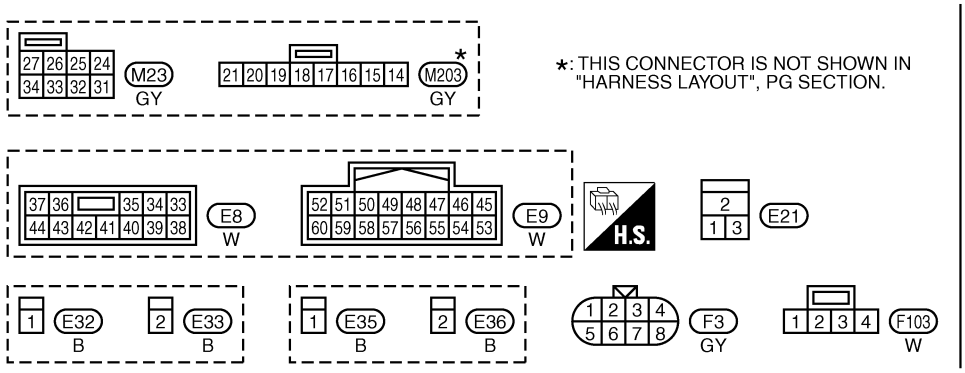
HORN

PFP:25610

Wiring Diagram — HORN —

AKS000Z0





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

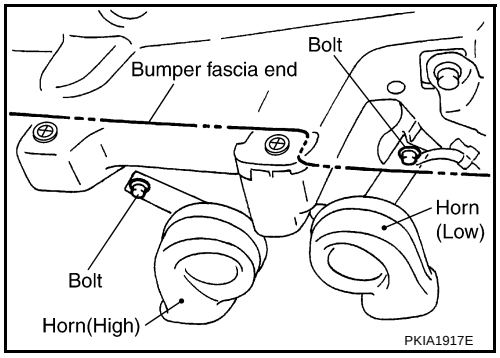
TKWT1858E

Removal and Installation

AKS000Z1

REMOVAL

1. Disconnect all horn connectors.
2. Remove horn mounting bolt and remove horn from vehicle.



INSTALLATION

Tighten horn bolt to specified torque.

Horn mounting bolt : 4.5 N·m (0.46 kg-m, 40 in-lb)

SECTION BCS
BODY CONTROL SYSTEM

CONTENTS

PRECAUTIONS 2
Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER” 2
Precautions for Battery Service 2
BCM (BODY CONTROL MODULE) 3
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COMBINATION SWITCH READING FUNCTION 3
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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

AKS008YT

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

AKS003RC

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

BCM (BODY CONTROL MODULE)

PFP:284B2

System Description

AKS00AV5

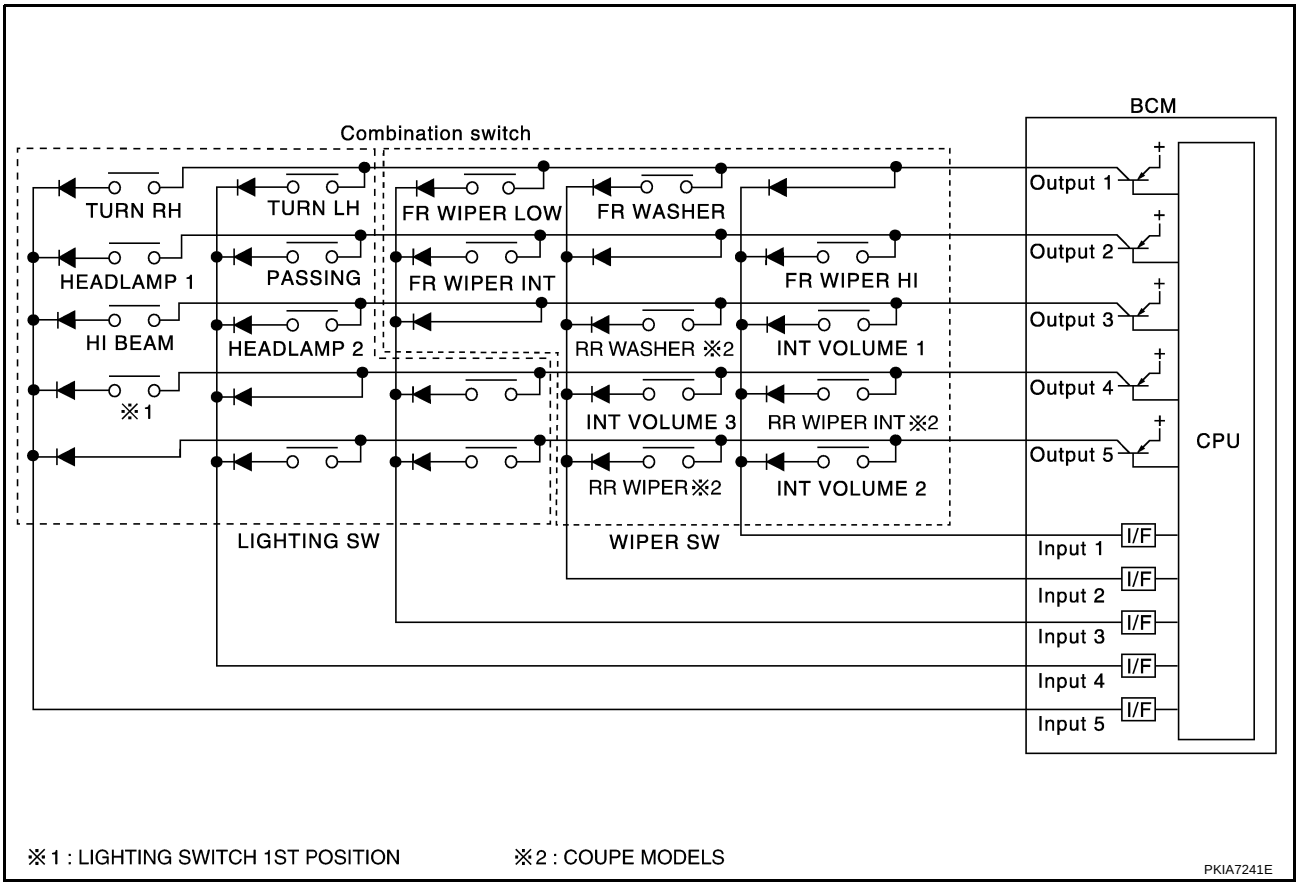
- BCM (Body Control Module) controls the operation of various electrical units installed on the vehicle.

BCM FUNCTION

BCM has combination switch reading function for reading the operation of combination switches (light, wiper washer, turn signal) in addition to a function for controlling the operation of various electrical components. Also it has an interface function allowing it to receive signals from the unified meter and A/C amp., and send signals to ECM using CAN communication.

COMBINATION SWITCH READING FUNCTION

1. Description
   - BCM reads combination switch (light, wiper) status, and controls related systems such as head lamps and wipers, according to the results.
   - BCM reads information of a maximum of 20 switches by combining five output terminals (OUTPUT 1-5) and five input terminals (INPUT 1-5).
2. Operation description
   - BCM activates transistors of output terminals (OUTPUT 1-5) periodically and, allows current to flow in turn.
   - If any (1 or more) switches are turned ON, circuit of output terminals (OUTPUT 1-5) and input terminals (INPUT 1-5) becomes active.
   - At this time, transistors of output terminals (OUTPUT 1-5) are activated to allow current to flow. When voltage of input terminals (INPUT 1-5) corresponding to that switch changes, interface in BCM detects voltage change, and BCM determines that switch is ON.



3. BCM - Operation table of combination switches

- BCM reads operation status of combination switch using combinations shown in table below.

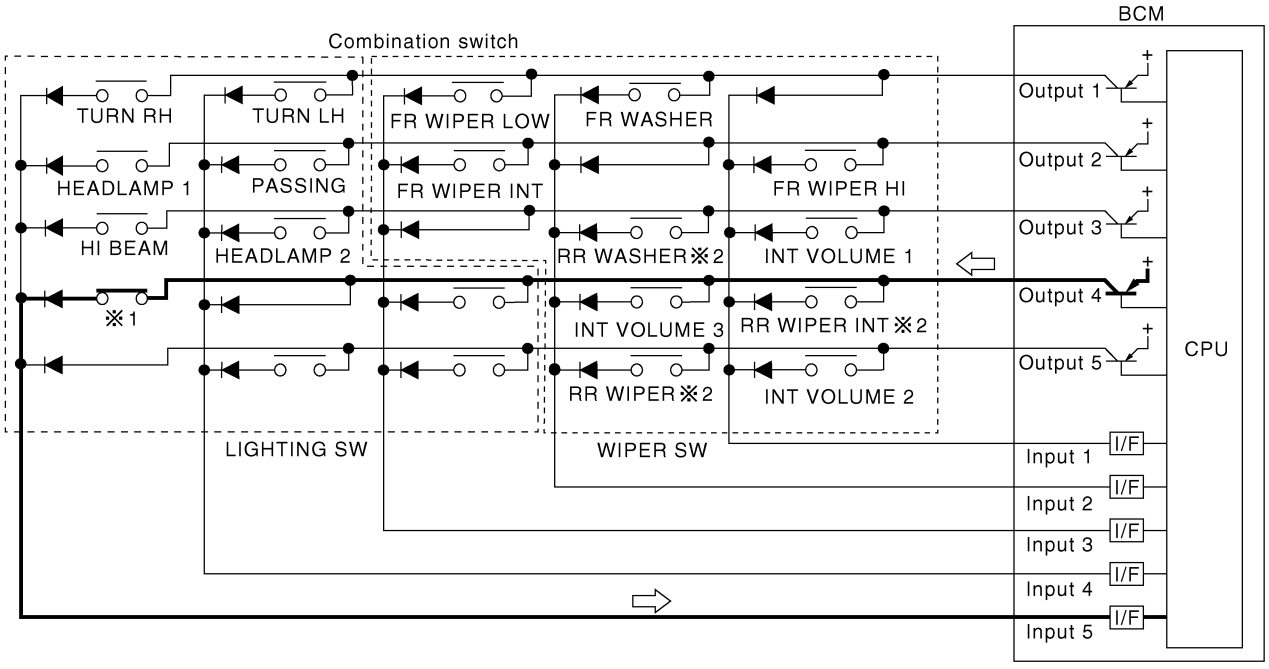
	COMB SW OUTPUT 1		COMB SW OUTPUT 2		COMB SW OUTPUT 3		COMB SW OUTPUT 4		COMB SW OUTPUT 5	
	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
COMB SW INPUT 1	—	—	FR WIPER HI ON	FR WIPER HI OFF	INT VOLUME 1 ON	INT VOLUME 1 OFF	RR WIPER INT ON※	RR WIPER INT OFF※	INT VOLUME 2 ON	INT VOLUME 2 OFF
COMB SW INPUT 2	FR WASHER ON	FR WASHER OFF	—	—	RR WASHER ON※	RR WASHER OFF※	INT VOLUME 3 ON	INT VOLUME 3 OFF	RR WIPER ON※	RR WIPER OFF※
COMB SW INPUT 3	FR WIPER LOW ON	FR WIPER LOW OFF	FR WIPER INT ON	FR WIPER INT OFF	—	—	—	—	—	—
COMB SW INPUT 4	TURN LH ON	TURN LH OFF	PASSING ON	PASSING OFF	HEAD-LAMP 2 ON	HEAD-LAMP 2 OFF	—	—	—	—
COMB SW INPUT 5	TURN RH ON	TURN RH OFF	HEAD-LAMP 1 ON	HEAD-LAMP 1 OFF	HI BEAM ON	HI BEAM OFF	LIGHTING SW (1st) ON	LIGHTING SW (1st) OFF	—	—

※ : COUPE MODELS

PKIA7242E

NOTE:
Headlamp has a dual system switch.

4. Sample operation: (When lighting switch 1st position turned ON)
   - When lighting switch 1st position is turned ON, contact in combination switch turns ON. At this time if OUTPUT 4 transistor is activated, BCM detects that voltage changes in INPUT 5.
   - When OUTPUT 4 transistor is ON, BCM detects that voltage changes in INPUT 5, and judges that lighting switch 1st position is ON. Then BCM sends tail lamp ON signal to IPDM E/R using CAN communication.
   - When OUTPUT 4 transistor is activated again, BCM detects that voltage changes in INPUT 5, and recognizes that lighting switch 1st position is continuously ON.



※1 : LIGHTING SWITCH 1ST POSITION
※2 : COUPE MODELS

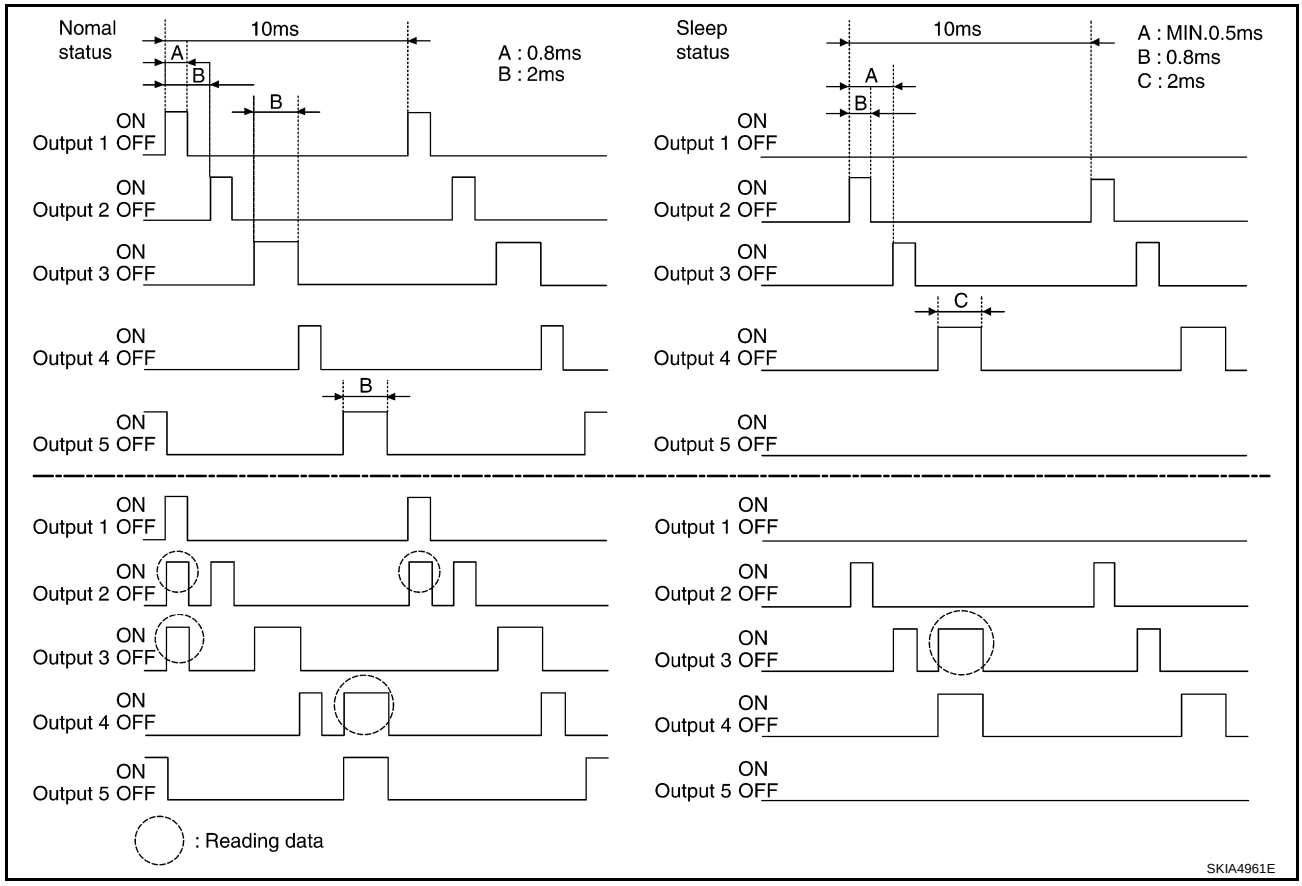
PKIA7617E

NOTE:
Each OUTPUT terminal transistor is activated at 10 ms intervals. Therefore after switch is turned ON, electrical loads are activated with time delay. But this time delay is so short that it cannot be detected by human senses.

5. Operation mode
   - Combination switch reading function has operation modes shown below.

a. Normal status
   - When BCM is not in sleep status, OUTPUT terminals (1-5) each turn ON-OFF every 10 ms.

b. Sleep status
   - When BCM is in sleep status, transistors of OUTPUT 1 and 5 stop the output, and BCM enters low current consumption mode. OUTPUT (2, 3, and 4) turn ON-OFF every 10 ms, and only input from light switch system is accepted.



CAN COMMUNICATION CONTROL

CAN communication allows a high rate of information transmission through the two communication lines (CAN L line, CAN H line) connecting the various control units in the system. Each control unit transmits/receives data but selectively reads required data only. For details of signals that are transmitted/received by BCM via CAN communication, refer to LAN-5, "CAN Communication Unit" .

BCM STATUS CONTROL

BCM changes its status depending on the operation status in order to save power consumption.

1. CAN communication status
   - With ignition switch ON, CAN communicates with other control units normally.
   - Control by BCM is being operated properly.
   - When ignition switch is OFF, switching to sleep mode is possible.
   - Even when ignition switch is OFF, if CAN communication with IPDM E/R and combination meter is active, CAN communication status is active.
2. Sleep transient status
   - This status shuts down CAN communication when ignition switch is turned OFF.
   - It transmits sleep request signal to IPDM E/R and combination meter.
   - Two seconds after CAN communication of all control units stops, CAN communication switches to inactive status.
3. CAN communication inactive status
   - With ignition switch OFF, CAN communication is not active.
   - With ignition switch OFF, control performed only by BCM is active.
   - Three seconds after CAN communication of all control units stops, CAN communication switches to inactive status.
4. Sleep status
   - BCM is activated with low current consumption mode.
   - CAN communication is not active.
   - When CAN communication operation is detected, it switches to CAN communication status.
   - When a state of the following switches changes, it switches to CAN communication state.
   - Key switch
   - Hazard switch
   - Door lock/unlock switch
   - Front door switch (driver side, passenger side)
   - Back door opener switch
   - Combination switch (passing, lighting switch 1st position, Front fog lamp)
   - Key fob (lock/unlock signal)
   - Key cylinder switch
   - When control performed only by BCM is required by switch, it shifts to CAN communication inactive mode.
   - Status of combination switch reading function is changed.

SYSTEMS CONTROLLED BY BCM DIRECTLY

System	Reference
Power door lock	BL-21, "POWER DOOR LOCK SYSTEM"
Remote keyless entry	BL-61, "REMOTE KEYLESS ENTRY SYSTEM"
Power window NOTE 1	GW-18, "POWER WINDOW SYSTEM"
Power seatNOTE	SE-12, "POWER SEAT/FOR COUPE" or SE-15, "POWER SEAT/FOR ROADSTER"
Room lamp timer	LT-211, "INTERIOR ROOM LAMP"
Warning chime	DI-77, "WARNING CHIME"
Rear wiperNOTE 2	WW-38, "REAR WIPER AND WASHER SYSTEM"

NOTE:

1. Power supply only. No system control.
2. COUPE models

SYSTEMS CONTROLLED BY BCM AND IPDM E/R

System	Reference
Panic alarm	BL-61, "REMOTE KEYLESS ENTRY SYSTEM"
Theft warning	BL-129, "VEHICLE SECURITY (THEFT WARNING) SYSTEM"
IVIS (NATS)	BL-158, "NVIS (NISSAN VEHICLE IMMOBILIZER SYSTEM-NATS)"
Headlamp, tail lamp, Battery saver control, day time light system	● LT-7, "HEADLAMP (FOR USA) - XENON TYPE -" ● LT-38, "HEADLAMP (FOR USA) - CONVENTIONAL TYPE -" ● LT-68, "HEADLAMP (FOR CANADA) - XENON TYPE -" ● LT-105, "HEADLAMP (FOR CANADA) - CONVENTIONAL TYPE -"
Front wiper	WW-4, "FRONT WIPER AND WASHER SYSTEM"
Rear window defogger	GW-56, "REAR WINDOW DEFOGGER"

SYSTEMS CONTROLLED BY BCM AND COMBINATION METER

System	Reference
Warning chime	DI-77, "WARNING CHIME"
Turn signal and hazard warning lamps	LT-184, "PARKING, LICENSE PLATE AND TAIL LAMPS"

MAJOR COMPONENTS AND CONTROL SYSTEM

System	Input	Output
Remote control entry system	key fob	● All-door locking actuator ● Turn signal lamp (LH, RH)
Power door lock system	● Power window main switch (door lock and unlock switch) ● Power window sub switch (passenger side) (door lock and unlock switch)	All-door locking actuator
Power supply (IGN) to power window	Ignition power supply	Power window system
Power supply (BAT) to power window and power seat	Battery power supply	Power window system and power seat
Panic alarm	● Key switch ● Key fob	IPDM E/R
Theft warning system	● All-door switch ● Key fob ● Power window main switch (door lock and unlock switch)	● IPDM E/R ● Security indicator lamp
Battery saver control	● Ignition switch ● Combination switch	IPDM E/R
Headlamp	Combination switch	IPDM E/R
Day time light system	● Engine speed signal ● Ignition switch ● Combination switch	IPDM E/R
Tail lamp	Combination switch	IPDM E/R
Turn signal lamp	Combination switch	● Turn signal lamp ● Combination meter
Hazard lamp	Hazard switch	● Turn signal lamp ● Combination meter
Room lamp timer	● Key switch ● key fob ● Power window main switch (door lock and unlock switch) ● Front door switch driver side ● All-door switch	Interior room lamp
Key warning chime	● Key switch ● Front door switch driver side	Combination meter (warning buzzer)
Light warning chime	● Combination switch ● Key switch ● Front door switch driver side	Combination meter (warning buzzer)
Seat belt warning chime	● Combination meter (Seat belt buckle (driver side) switch) ● Ignition switch	Combination meter (warning buzzer)
Vehicle-speed-sensing intermittent wiper	● Combination switch ● Combination meter	IPDM E/R
Rear intermittent wiper[NOTE]	Combination switch	Rear wiper motor
Rear window defogger	● Rear window defogger switch ● Ignition switch	IPDM E/R
A/C switch signal	Unified meter and A/C amp.	ECM
Blower fan switch signal	Unified meter and A/C amp.	ECM

CAN Communication System Description

AKS000Z4

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Modern vehicles are equipped with many electronic control units and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

CAN Communication Unit

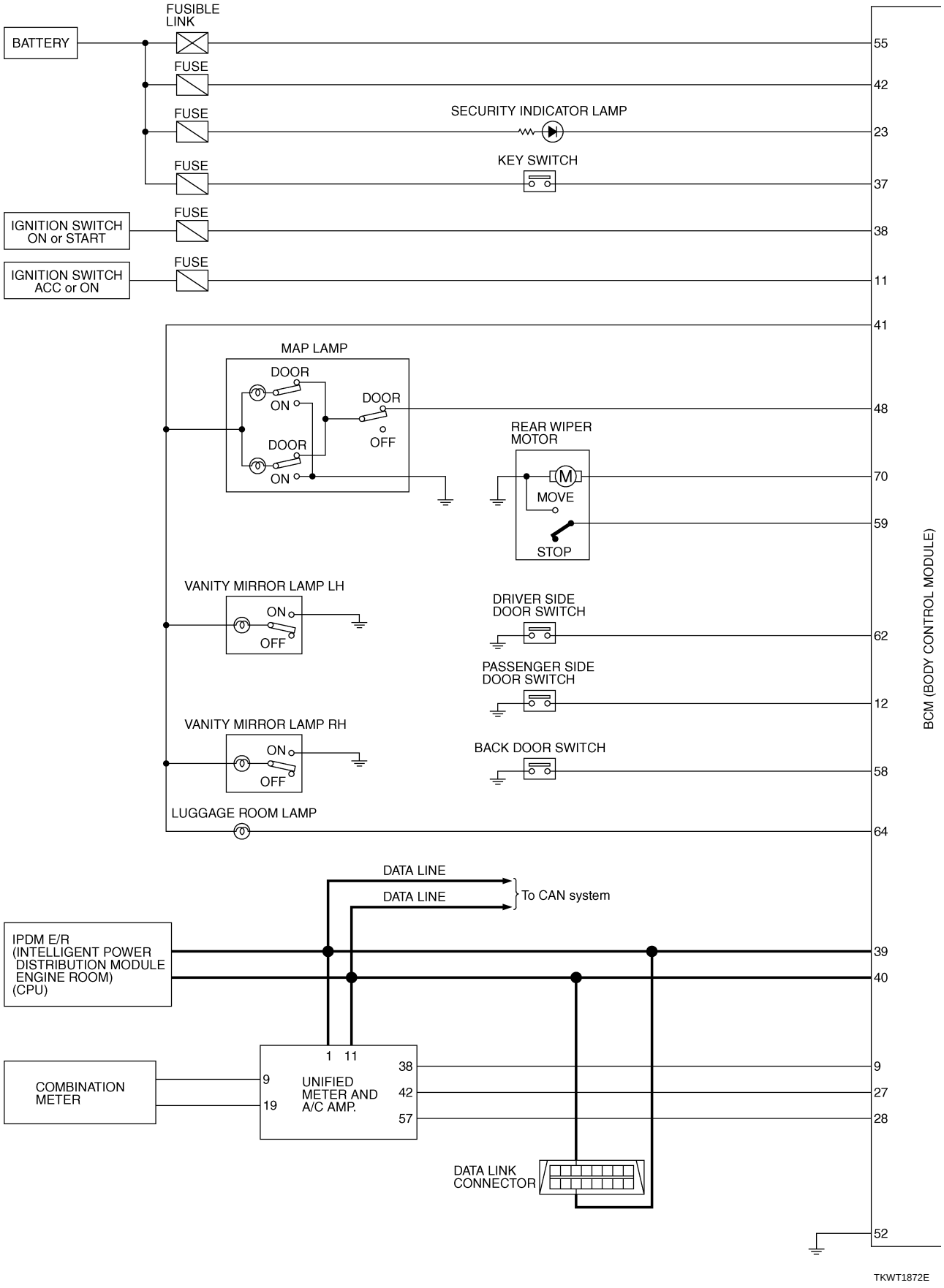
AKS003MH

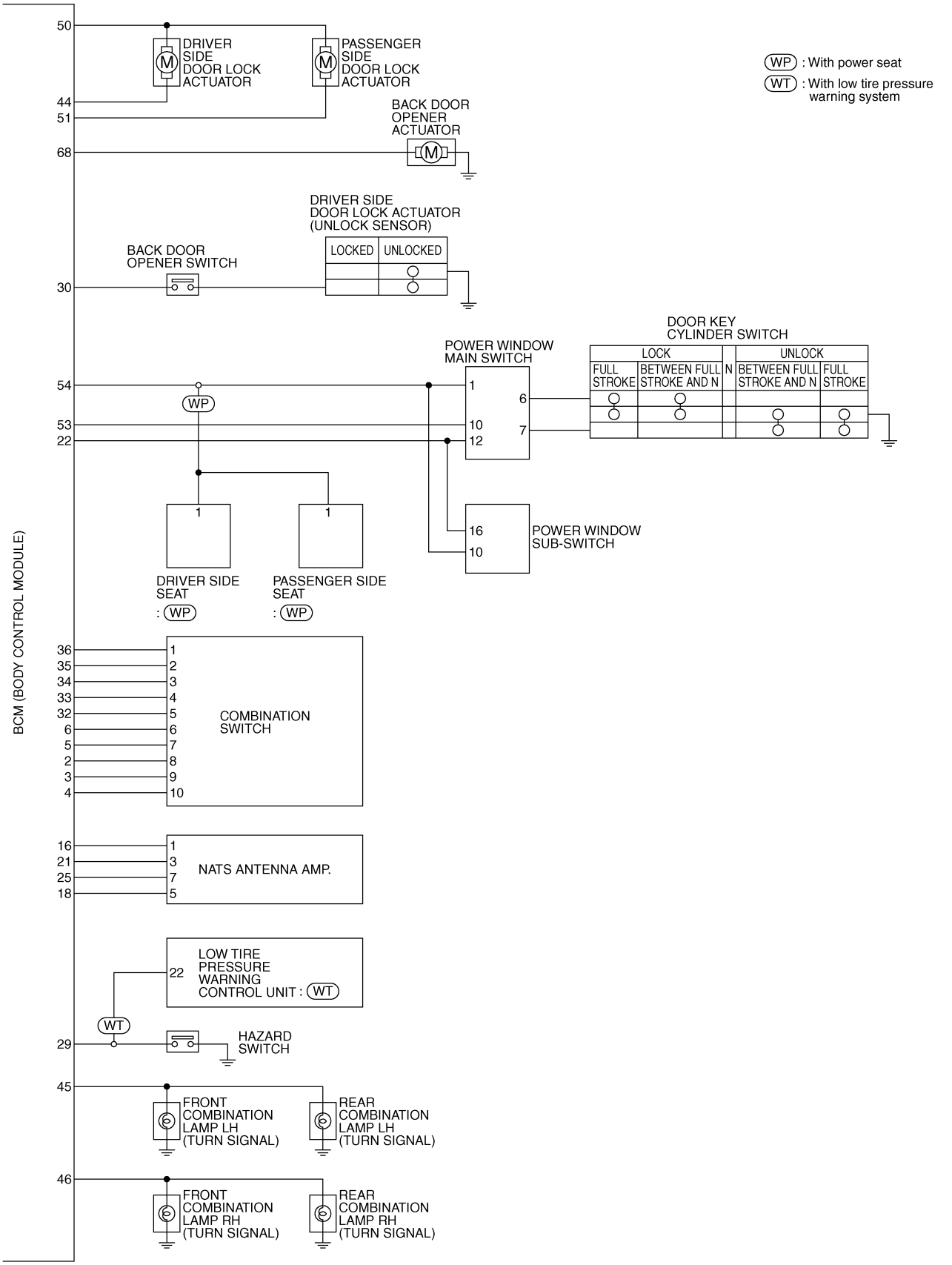
Refer to LAN-5, "CAN Communication Unit" .

Schematic

AKS000Z5

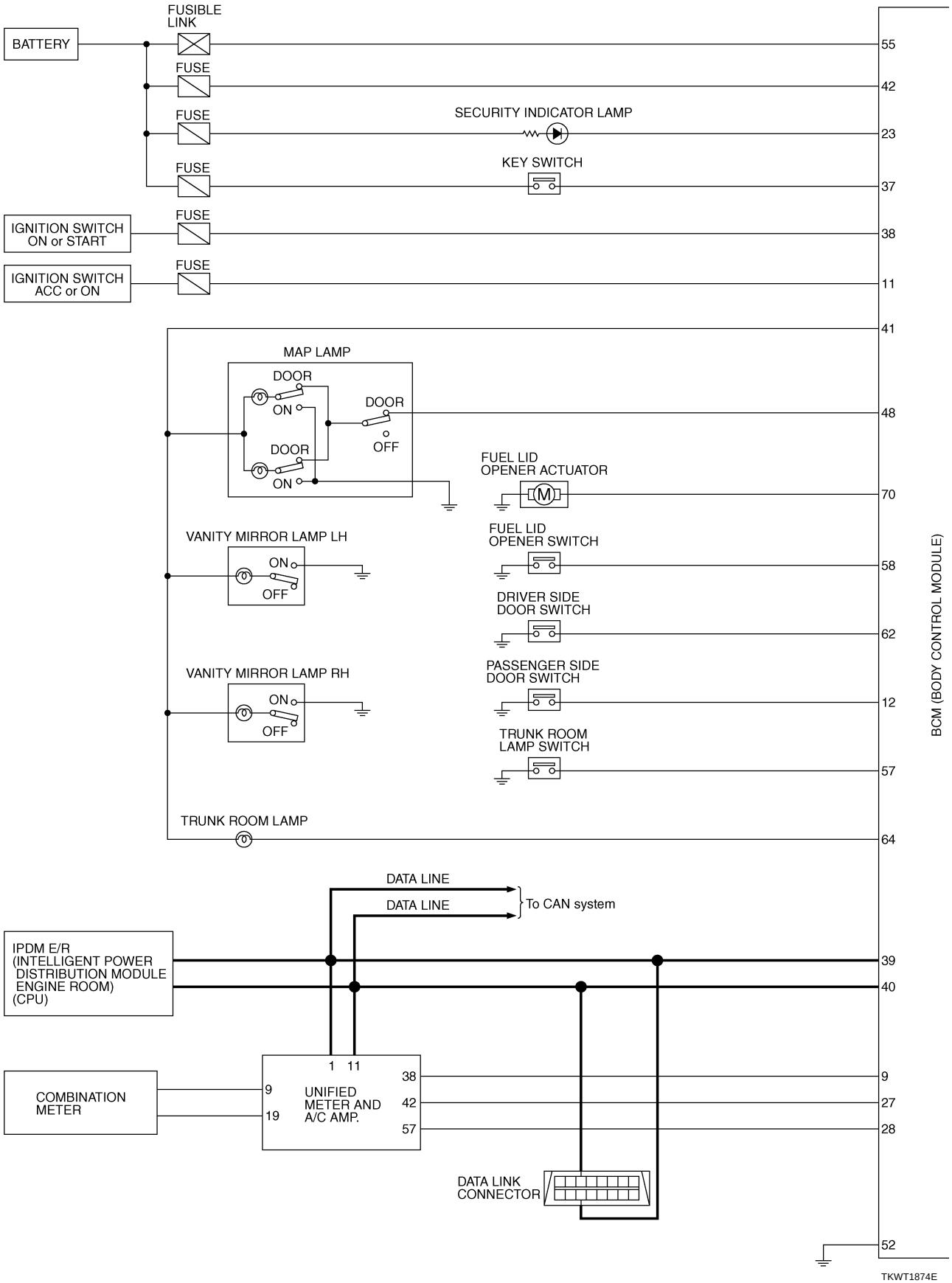
COUPE MODELS

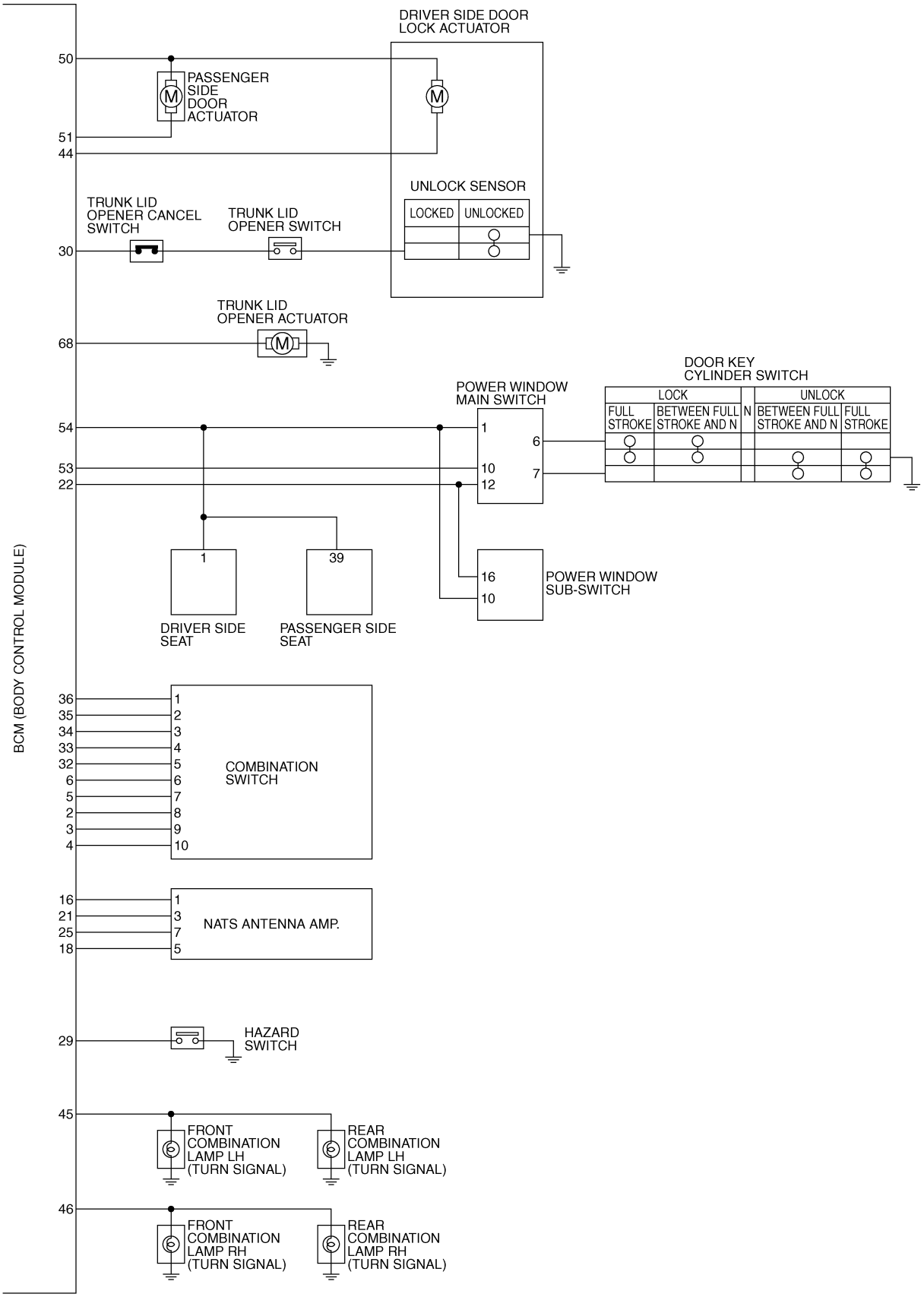



WP : With power seat
WT : With low tire pressure warning system
BCM (BODY CONTROL MODULE)
50
DRIVER SIDE DOOR LOCK ACTUATOR
PASSENGER SIDE DOOR LOCK ACTUATOR
44
51
BACK DOOR OPENER ACTUATOR
68
DRIVER SIDE DOOR LOCK ACTUATOR (UNLOCK SENSOR)
LOCKED
UNLOCKED
BACK DOOR OPENER SWITCH
30
DOOR KEY CYLINDER SWITCH
LOCK
UNLOCK
FULL STROKE
BETWEEN FULL STROKE AND N
N
BETWEEN FULL STROKE AND N
FULL STROKE
POWER WINDOW MAIN SWITCH
54
53
22
WP
1
6
10
7
12
16
10
POWER WINDOW SUB-SWITCH
DRIVER SIDE SEAT : WP
PASSENGER SIDE SEAT : WP
36
35
34
33
32
6
5
2
3
4
COMBINATION SWITCH
16
21
25
18
NATS ANTENNA AMP.
22
LOW TIRE PRESSURE WARNING CONTROL UNIT : WT
WT
29
HAZARD SWITCH
45
FRONT COMBINATION LAMP LH (TURN SIGNAL)
REAR COMBINATION LAMP LH (TURN SIGNAL)
46
FRONT COMBINATION LAMP RH (TURN SIGNAL)
REAR COMBINATION LAMP RH (TURN SIGNAL)

TKWT1873E

ROADSTER MODELS




BCM (BODY CONTROL MODULE)
DRIVER SIDE DOOR LOCK ACTUATOR
50
PASSENGER SIDE DOOR ACTUATOR
51
44
UNLOCK SENSOR
LOCKED
UNLOCKED
TRUNK LID OPENER CANCEL SWITCH
TRUNK LID OPENER SWITCH
30
TRUNK LID OPENER ACTUATOR
68
DOOR KEY CYLINDER SWITCH
LOCK
UNLOCK
FULL STROKE
BETWEEN FULL STROKE AND N
N
BETWEEN FULL STROKE AND N
FULL STROKE
POWER WINDOW MAIN SWITCH
54
53
22
1
6
10
12
7
1
39
DRIVER SIDE SEAT
PASSENGER SIDE SEAT
16
10
POWER WINDOW SUB-SWITCH
36
35
34
33
32
6
5
2
3
4
1
2
3
4
5
6
7
8
9
10
COMBINATION SWITCH
16
21
25
18
1
3
7
5
NATS ANTENNA AMP.
29
HAZARD SWITCH
45
FRONT COMBINATION LAMP LH (TURN SIGNAL)
REAR COMBINATION LAMP LH (TURN SIGNAL)
46
FRONT COMBINATION LAMP RH (TURN SIGNAL)
REAR COMBINATION LAMP RH (TURN SIGNAL)

TKWT1875E

CONSULT-II

AKS00AV6

CONSULT-II performs the following functions with combination of data receiving, command and transmission using the CAN communication line from the BCM.

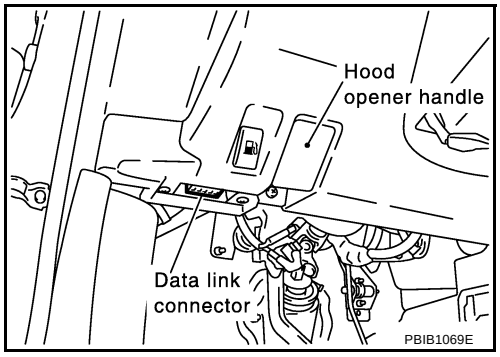
BCM diagnostic test item	Check item, diagnostic test mode	Content
Inspection by part	Work support	Changes setting of each function.
	Self-diagnosis results	BCM performs self-diagnosis of CAN communication.
	Data monitor	Displays the input data of BCM in real time.
	Active test	Gives a drive signal to a load to check the operation.
	CAN diagnostic support monitor	The result of transmit/receive diagnosis of CAN communication can be read.
	ECU part number	ECM part number can be read.

CONSULT–II BASIC OPERATION

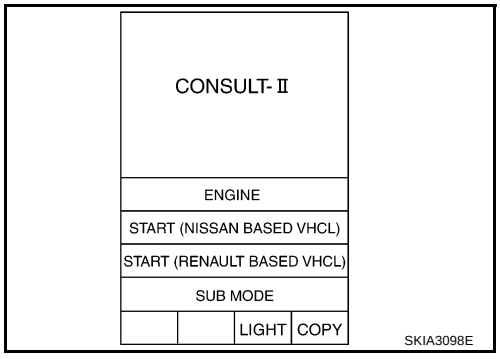
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

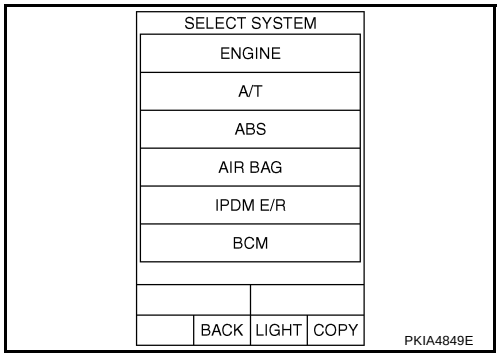
1. With the ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to the data link connector, then turn the ignition switch ON.



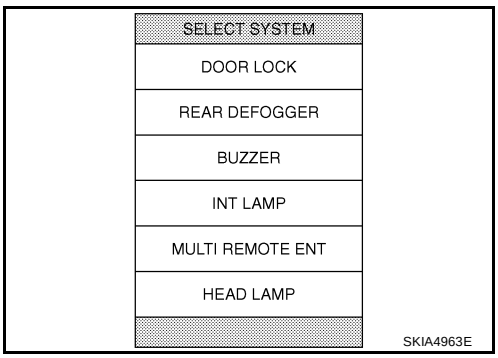
2. Touch “START (NISSAN BASED VHCL)”.



3. Touch “BCM” on “SELECT SYSTEM” screen.
If “BCM” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



4. Select the desired part to be diagnosed on the “SELECT TEST ITEM” screen.



ITEMS OF EACH PART

NOTE:
CONSULT-II will Only display systems the vehicle possesses.

×:Applicable

System and item	CONSULT-II display	Diagnostic test mode (Inspection by part)						
		WORK SUPPORT	SELF–DIAG RESULTS	DATA MONITOR	CAN DIAG SUPPORT MNTR	ECU PART NUMBER	ACTIVE TEST	CONFIGURATION
Power door lock system	DOOR LOCK	×		×			×	
Rear window defogger	REAR DEFOGGER			×			×	
Warning chime	BUZZER			×			×	
Room lamp timer	INT LAMP	×		×			×	
Remotecontrol entry system	MULTI REMOTE ENT	×		×			×	
Headlamp	HEAD LAMP	×		×			×	
Wiper	WIPER			×			×	
Turn signal lamp Hazard lamp	FLASHER			×			×	
Blower fan switch signal A/C switch signal	AIR CONDITONER			×				
Intelligent Key system	INTELLIGENT KEY			×				
Combination switch	COMB SW			×				
BCM	BCM	×	×	×	×	×		×Note
IVIS	IMMU			×			×	
Room lamp battery saver	BATTERY SAVER	×		×			×	
Trunk lid	TRUNK			×			×	
Vehicle security system	THEFT ALM	×		×			×	
Retained power control	RETAINED PWR	×		×			×	
Oil pressure switch	SIGNAL BUFFER			×			×	

NOTE:
This item is indicated, but it is what it does not use.

WORK SUPPORT

Operation Procedure

1. Touch “BCM” on “SELECT TEST ITEM” screen.
2. Touch “WORK SUPPORT” on “SELECT DIAG MODE” screen.
3. Touch item on “SELECT WORK ITEM” screen.
4. Touch “START”.
5. Touch “CHANGE SET”.
6. The setting will be changed and “RESETTING COMPLETED” will be displayed.
7. Touch “END”.

Display Item List

Item	Description
RESET SETTING VALUE	Return a value set with WORK SUPPORT of each system to a default value in factory shipment.

CAN Communication Inspection Using CONSULT-II (Self-Diagnosis)

AKS000Z7

1. SELF-DIAGNOSTIC RESULT CHECK

CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

1. Connect to CONSULT-II, and select “BCM” on “SELECT SYSTEM” screen.
2. Select “BCM control unit ” on “SELECT WORK ITEM” screen, and select “SELF-DIAG RESULTS”.
3. Check display content in self-diagnostic results.

CONSULT-II display code	Diagnosis item
U1000	INITIAL DIAG
	TRANSMIT DIAG
	ECM
	IPDM E/R
	METER / M&A

Contents displayed

No malfunction>>INSPECTION END

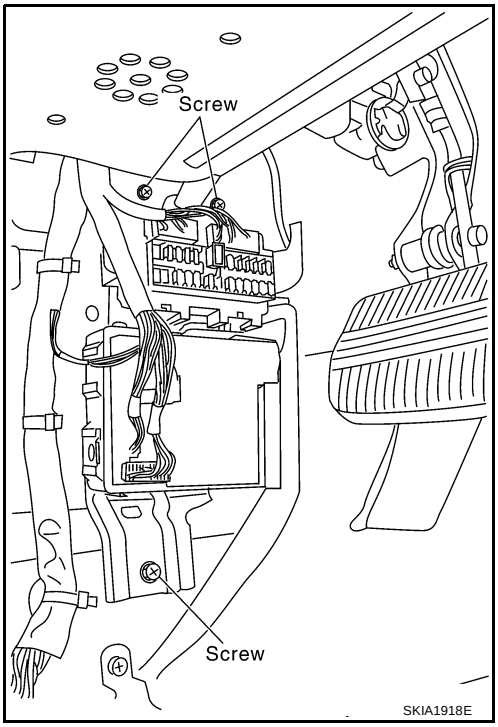
Malfunction in CAN communication system>>After printing the monitor items, go to “CAN System”. Refer to LAN-3, "Precautions When Using CONSULT-II" .

Removal and Installation of BCM

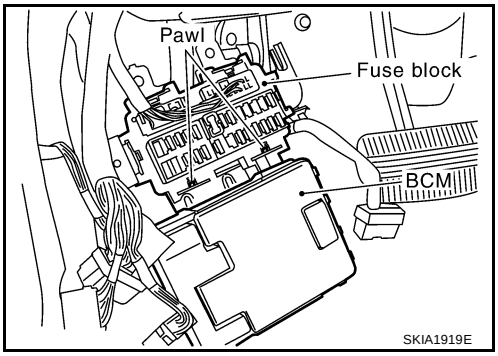
AKS000ZB

REMOVAL

1. Remove the dash side finisher (LH). Refer to EI-35, "BODY SIDE TRIM" in “EI Exterior/Interior.”
2. Disconnect BCM connector.
3. Remove bracket mounting screws (3) to remove BCM and fuse block with bracket.



4. Raise the pawl of fuse block and remove bracket from fuse block to remove BCM.



INSTALLATION

- Install in the reverse order of removal.

SECTION LAN

LAN SYSTEM

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CAN

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BCM Circuit Check 110
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Steering Angle Sensor Circuit Check 111
VDC/TCS/ABS Control Unit Circuit Check 111
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CAN Communication Circuit Check 113
IPDM E/R Ignition Relay Circuit Check 115
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ECM/IPDM E/R INTERNAL CIRCUIT INSPECTION 115

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

AKS00BQM

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

AKS003TZ

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions When Using CONSULT-II

AKS003M4

When connecting CONSULT-II to data link connector, connect them through CONSULT-II CONVERTER.

CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

CHECK POINTS FOR USING CONSULT-II

1. Has CONSULT-II been used without connecting CONSULT-II CONVERTER on this vehicle?

– If YES, GO TO 2.
– If NO, GO TO 5.

2. Is there any indication other than indications relating to CAN communication system in the self-diagnosis results?

– If YES, GO TO 3.
– If NO, GO TO 4.

3. Based on self-diagnosis results unrelated to CAN communication, carry out the inspection.
4. Malfunctions may be detected in self-diagnosis depending on control units carrying out CAN communication. Therefore, erase the self-diagnosis results.
5. Diagnose CAN communication system. Refer to LAN-5, "CAN Communication Unit" .

Precautions For Trouble Diagnosis

AKS000ZD

CAN SYSTEM

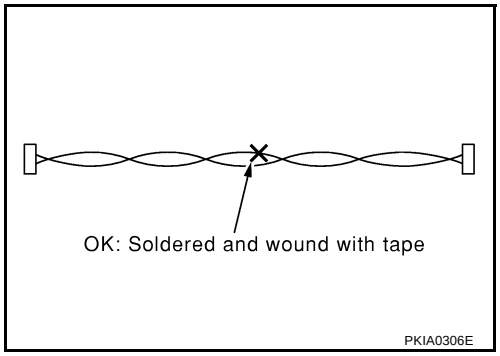
- Do not apply voltage of 7.0 V or higher to the measurement terminals.
- Use the tester with its open terminal voltage being 7.0 V or less.
- Be sure to turn ignition switch off and disconnect negative battery terminal before checking the circuit.

Precautions For Harness Repair

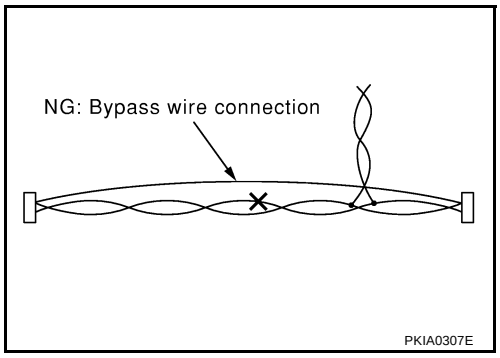
AKS000ZE

CAN SYSTEM

- Solder the repaired parts, and wrap with tape. [Frays of twisted line must be within 110 mm (4.33 in).]



- Do not perform bypass wire connections for the repair parts. (The spliced wire will become separated and the characteristics of twisted line will be lost.)



CAN COMMUNICATION

PFP:23710

System Description

AKS000ZF

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

CAN Communication Unit

AKS00AVB

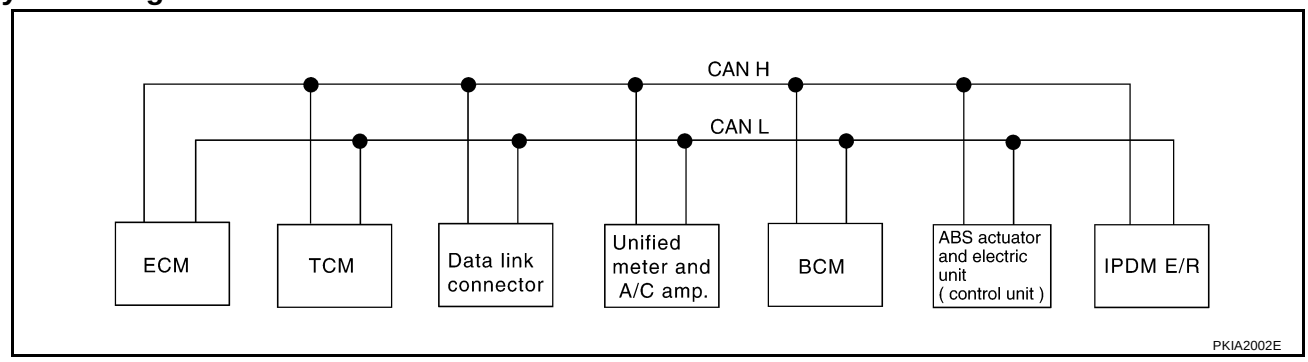
Go to CAN system, when selecting your CAN system type from the following table.

Body type	Roadster		Coupe			
Axle	2WD					
Engine	VQ35DE					
Transmission	A/T	M/T	A/T	M/T		
Brake control	TCS	TCS	TCS	ABS	TCS	VDC
Low tire pressure warning system						×
CAN system type	1	2	1	3	2	4
CAN system trouble diagnosis	LAN-11	LAN-38	LAN-11	LAN-62	LAN-38	LAN-86

×: Applicable

TYPE 1

System Diagram



Input/output Signal Chart

T: Transmit R: Receive

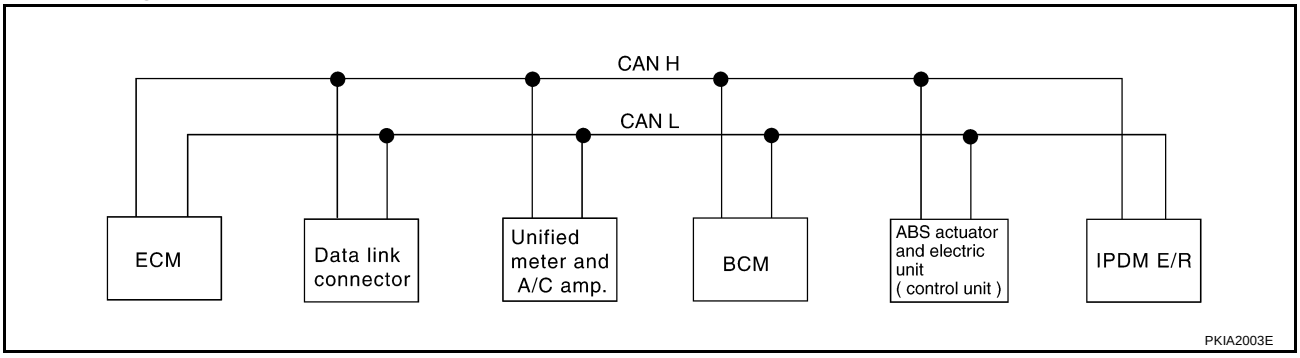
Signals	ECM	TCM	Unified meter and A/C amp.	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Engine speed signal	T	R	R		R	
Engine coolant temperature signal	T		R			
Accelerator pedal position signal	T	R			R	
Closed throttle position signal	T	R				
Wide open throttle position signal	T	R				
Battery voltage signal	T	R				
Stop lamp switch signal		R	T			
Fuel consumption monitor signal	T		R			
A/T self-diagnosis signal	R	T				
A/T CHECK indicator lamp signal		T	R			
A/T position indicator signal		T	R		R	

Signals	ECM	TCM	Unified meter and A/C amp.	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Manual mode gear position signal		T	R			
ABS operation signal		R			T	
A/T shift schedule change demand signal		R			T	
A/C switch signal	R			T		
A/C compressor request signal	T					R
A/C compressor feedback signal	T		R			
Blower fan motor switch signal	R			T		
Cooling fan speed request signal	T					R
Position lights request signal			R	T		R
Low beam request signal				T		R
Low beam status signal	R					T
High beam request signal			R	T		R
High beam status signal	R					T
Day time running light request signal				T		R
Vehicle speed signal			R		T	
	R	R	T	R		
Sleep request 1 signal			R	T		
Sleep request 2 signal				T		R
Wake up request 1 signal			R	T		
Door switch signal			R	T		R
Turn indicator signal			R	T		
Seat belt buckle switch signal			T	R		
Buzzer output signal			R	T		
Fuel level sensor signal	R		T			
Malfunction indicator lamp signal	T		R			
ASCD SET lamp signal	T		R			
ASCD operation signal	T	R				
ASCD CRUISE lamp signal	T		R			
ASCD OD cancel request signal	T	R				
Output shaft revolution signal	R	T				
Turbine revolution signal	R	T				
Front wiper request signal				T		R
Front wiper stop position signal				R		T
Rear window defogger switch signal				T		R
Rear window defogger control signal	R					T
Manual mode signal		R	T			
Not manual mode signal		R	T			
Manual mode shift up signal		R	T			
Manual mode shift down signal		R	T			
Manual mode indicator signal		T	R			
Theft warning horn request signal				T		R
Horn chirp signal				T		R

Signals	ECM	TCM	Unified meter and A/C amp.	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Ignition switch signal				T		R
ABS warning lamp signal			R		T	
TCS OFF indicator lamp signal			R		T	
SLIP indicator lamp signal			R		T	
Brake warning lamp signal			R		T	

TYPE 2

System Diagram



Input/output Signal Chart

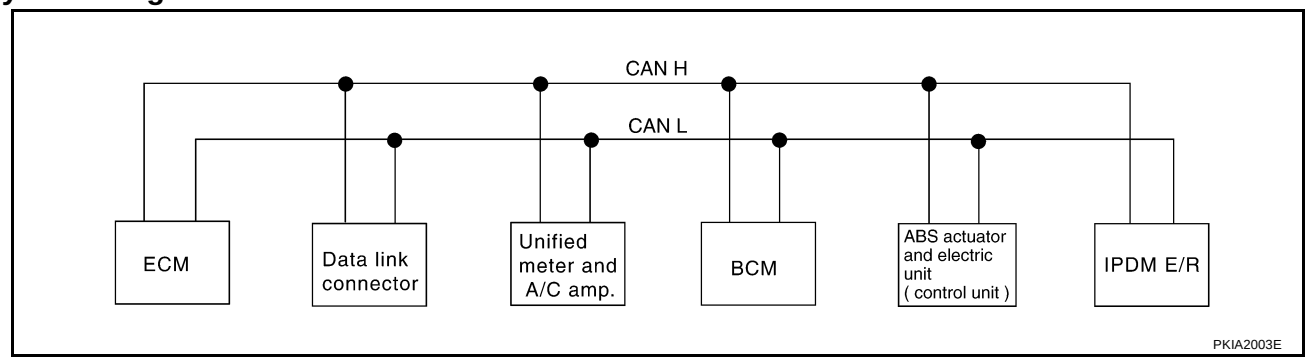
T: Transmit R: Receive

Signals	ECM	Unified meter and A/C amp.	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Engine speed signal	T	R		R	
Engine coolant temperature signal	T	R			
Accelerator pedal position signal	T			R	
Fuel consumption monitor signal	T	R			
A/C switch signal	R		T		
A/C compressor request signal	T				R
A/C compressor feedback signal	T	R			
Blower fan motor switch signal	R		T		
Cooling fan speed request signal	T				R
Position lights request signal		R	T		R
Low beam request signal			T		R
Low beam status signal	R				T
High beam request signal		R	T		R
High beam status signal	R				T
Day time running light request signal			T		R
Vehicle speed signal		R		T	
	R	T	R		
Sleep request 1 signal		R	T		
Sleep request 2 signal			T		R
Wake up request 1 signal		R	T		
Door switch signal		R	T		R
Turn indicator signal		R	T		
Seat belt buckle switch signal		T	R		

Signals	ECM	Unified meter and A/C amp.	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Buzzer output signal		R	T		
Fuel level sensor signal	R	T			
Malfunction indicator lamp signal	T	R			
ASCD SET lamp signal	T	R			
ASCD CRUISE lamp signal	T	R			
Front wiper request signal			T		R
Front wiper stop position signal			R		T
Rear window defogger switch signal			T		R
Rear window defogger control signal	R				T
Theft warning horn request signal			T		R
Horn chirp signal			T		R
Ignition switch signal			T		R
ABS warning lamp signal		R		T	
TCS OFF indicator lamp signal		R		T	
SLIP indicator lamp signal		R		T	
Brake warning lamp signal		R		T	

TYPE 3

System Diagram



Input/output Signal Chart

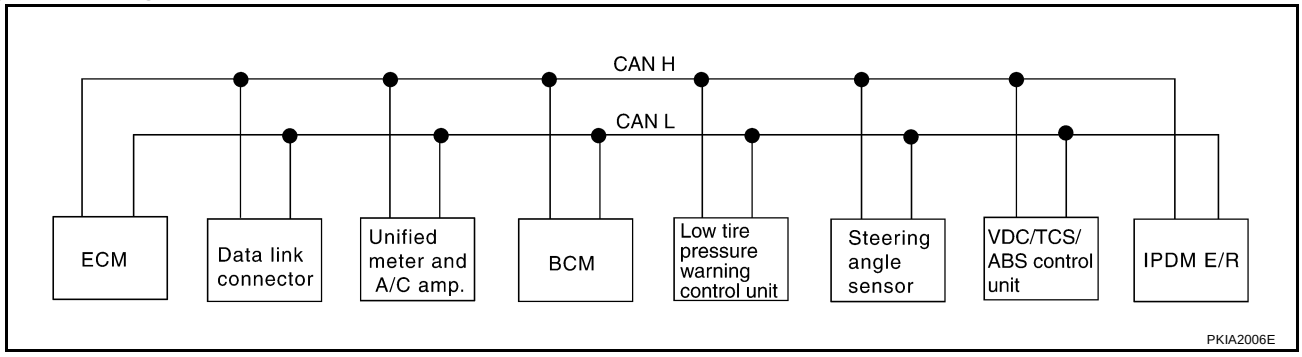
T: Transmit R: Receive

Signals	ECM	Unified meter and A/C amp.	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Engine speed signal	T	R		R	
Engine coolant temperature signal	T	R			
Accelerator pedal position signal	T			R	
Fuel consumption monitor signal	T	R			
A/C switch signal	R		T		
A/C compressor request signal	T				R
A/C compressor feedback signal	T	R			
Blower fan motor switch signal	R		T		
Cooling fan speed request signal	T				R
Position lights request signal		R	T		R
Low beam request signal			T		R
Low beam status signal	R				T

Signals	ECM	Unified meter and A/C amp.	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
High beam request signal		R	T		R
High beam status signal	R				T
Day time running light request signal			T		R
Vehicle speed signal		R		T	
	R	T	R		
Sleep request 1 signal		R	T		
Sleep request 2 signal			T		R
Wake up request 1 signal		R	T		
Door switch signal		R	T		R
Turn indicator signal		R	T		
Seat belt buckle switch signal		T	R		
Buzzer output signal		R	T		
Fuel level sensor signal	R	T			
Malfunction indicator lamp signal	T	R			
ASCD SET lamp signal	T	R			
ASCD CRUISE lamp signal	T	R			
Front wiper request signal			T		R
Front wiper stop position signal			R		T
Rear window defogger switch signal			T		R
Rear window defogger control signal	R				T
Theft warning horn request signal			T		R
Horn chirp signal			T		R
Ignition switch signal			T		R
Tire pressure signal		R			
ABS warning lamp signal		R		T	
Brake warning lamp signal		R		T	

TYPE 4

System Diagram



Input/output Signal Chart

T: Transmit R: Receive

Signals	ECM	Unified meter and A/C amp.	BCM	Low tire pressure warning control unit	Steering angle sensor	VDC/TCS/ ABS control unit	IPDM E/R
Engine speed signal	T	R				R	
Engine coolant temperature signal	T	R					

Signals	ECM	Unified meter and A/C amp.	BCM	Low tire pressure warning control unit	Steering angle sensor	VDC/TCS/ ABS control unit	IPDM E/R
Accelerator pedal position signal	T					R	
Fuel consumption monitor signal	T	R					
A/C switch signal	R		T				
A/C compressor request signal	T						R
A/C compressor feedback signal	T	R					
Blower fan motor switch signal	R		T				
Cooling fan speed request signal	T						R
Position lights request signal		R	T				R
Low beam request signal			T				R
Low beam status signal	R						T
High beam request signal		R	T				R
High beam status signal	R						T
Day time running light request signal			T				R
Vehicle speed signal		R				T	
	R	T	R	R			
Sleep request 1 signal		R	T				
Sleep request 2 signal			T				R
Wake up request 1 signal		R	T				
Door switch signal		R	T				R
Turn indicator signal		R	T				
Seat belt buckle switch signal		T	R				
Buzzer output signal		R	T				
Fuel level sensor signal	R	T					
Malfunction indicator signal	T	R					
ASCD SET lamp signal	T	R					
ASCD CRUISE lamp signal	T	R					
Front wiper request signal			T				R
Front wiper stop position signal			R				T
Rear window defogger switch signal			T				R
Rear window defogger control signal	R						T
Theft warning horn request signal			T				R
Horn chirp signal			T				R
Ignition switch signal			T				R
Steering angle sensor signal					T	R	
Tire pressure signal		R		T			
ABS warning lamp signal		R				T	
VDC OFF indicator lamp signal		R				T	
SLIP indicator lamp signal		R				T	
Brake warning lamp signal		R				T	

CAN SYSTEM (TYPE 1)

PFP:23710

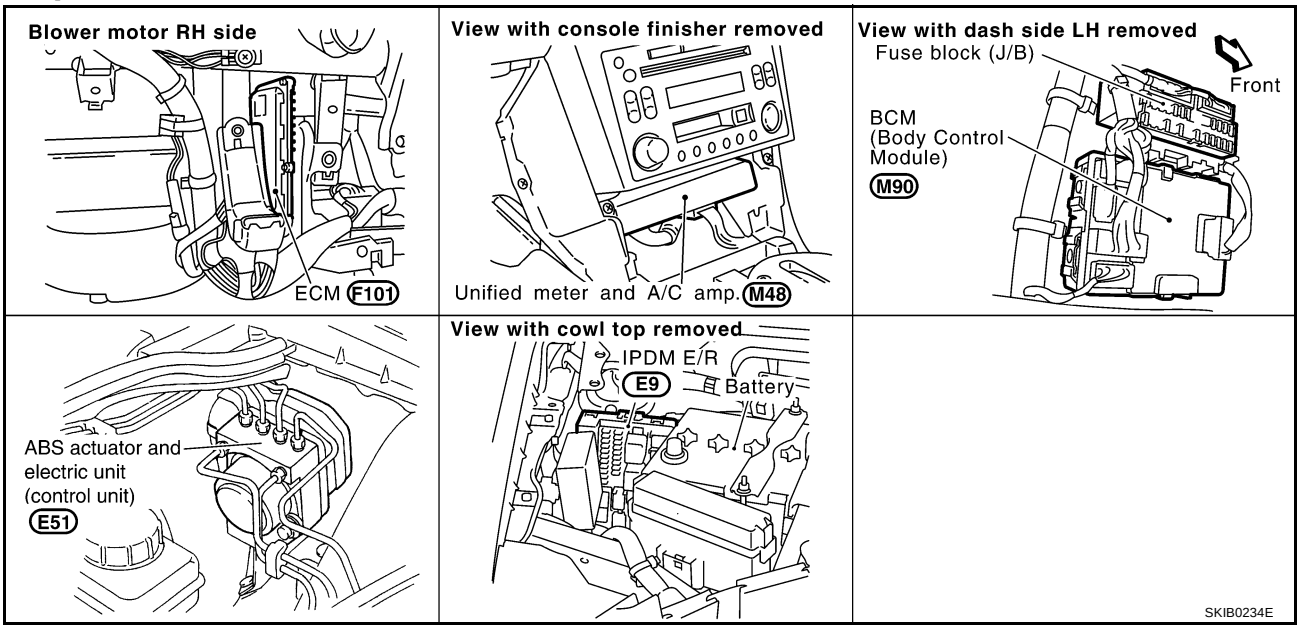
System Description

AKS00A8P

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

Component Parts and Harness Connector Location

AKS00A8Q

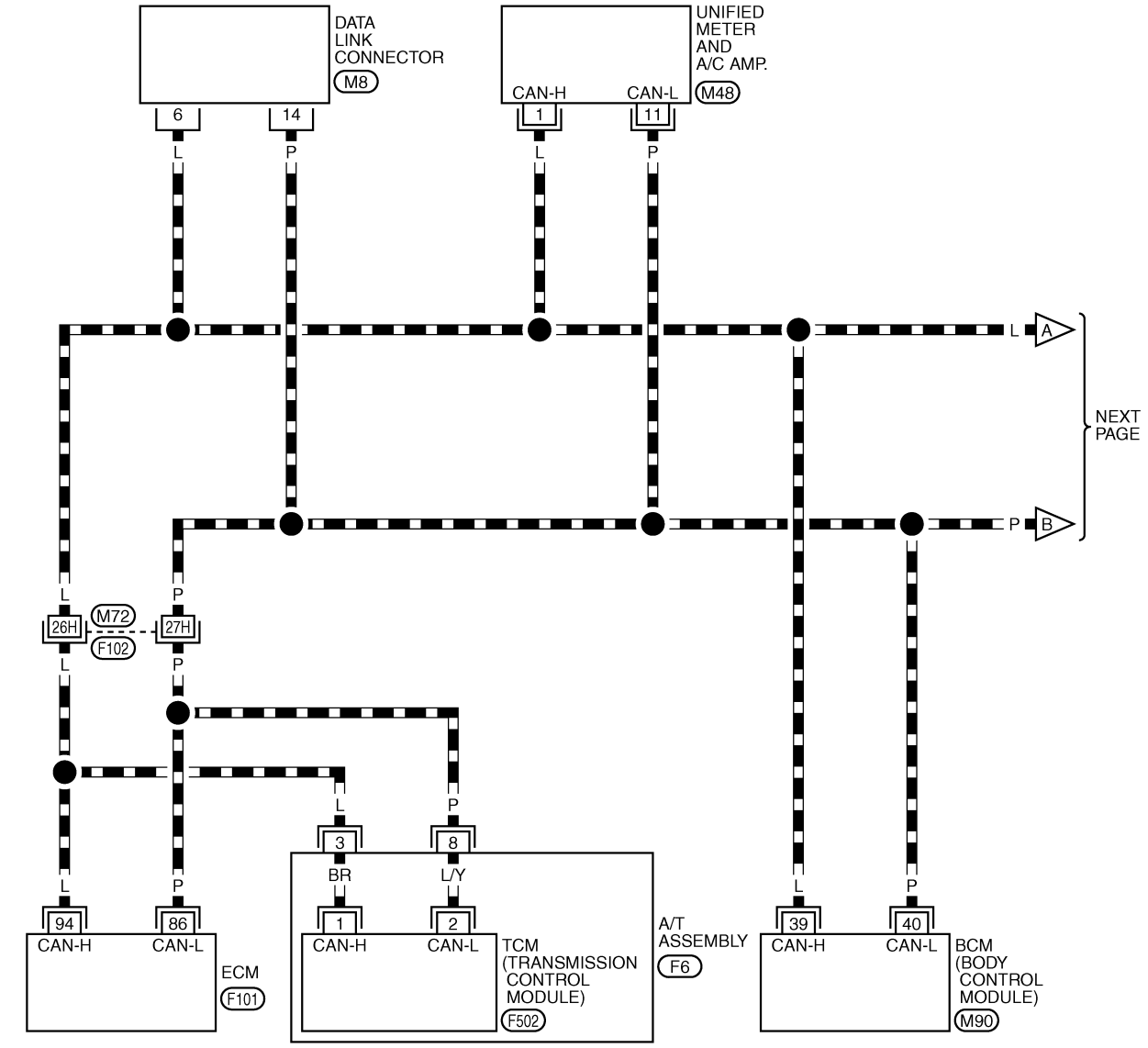


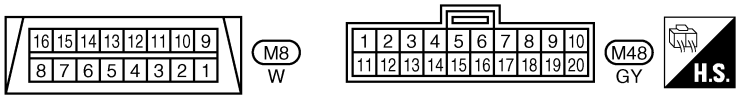
Wiring Diagram — CAN —

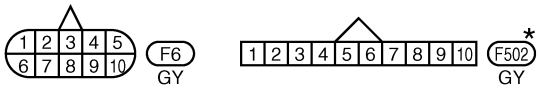
AKS00A8R

LAN-CAN-01

: DATA LINE







*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

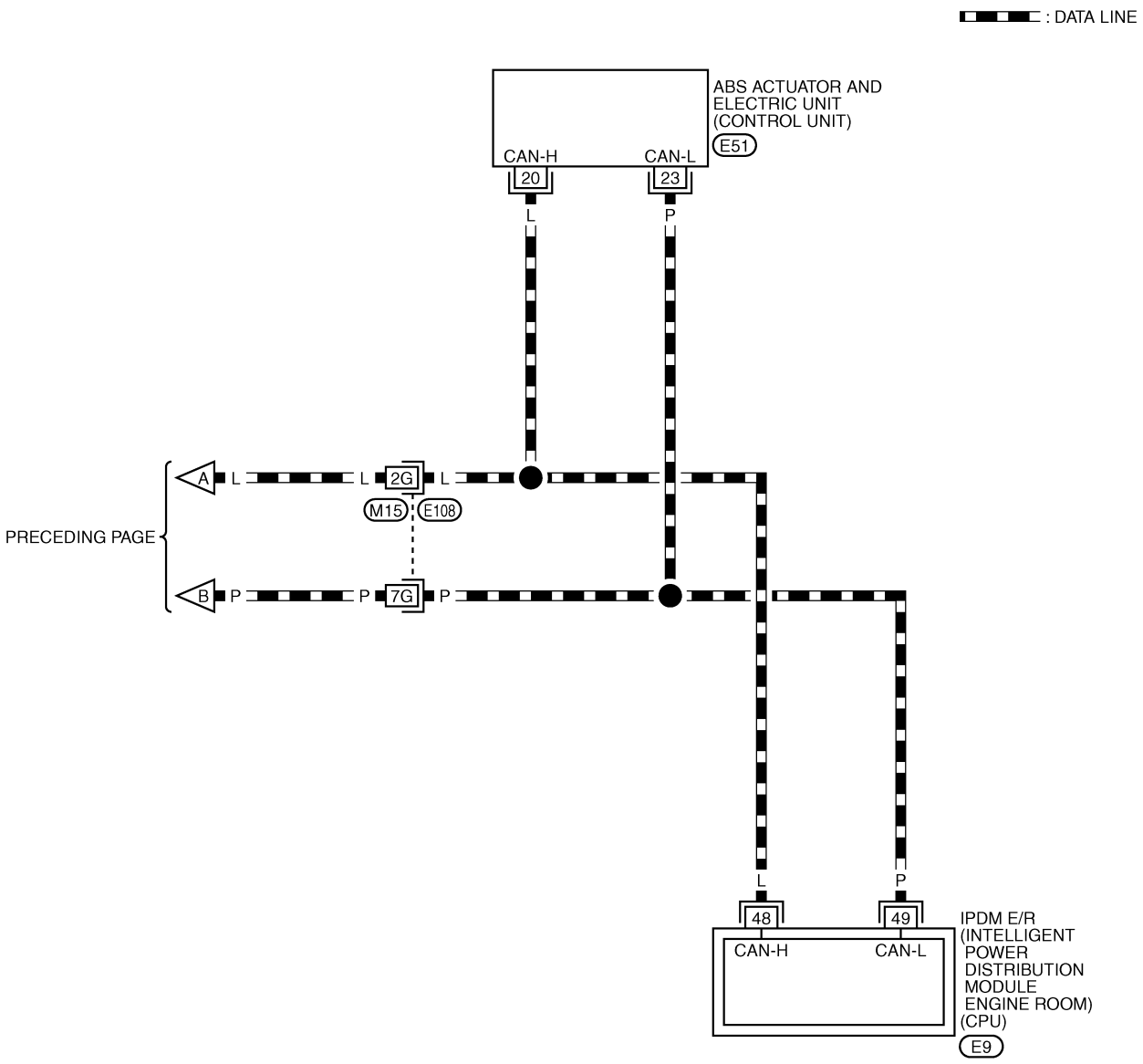
REFER TO THE FOLLOWING.

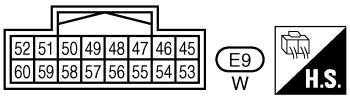
F102 -SUPER MULTIPLE JUNCTION (SMJ)

M90 , F101 -ELECTRICAL UNITS

TKWM1380E

LAN-CAN-02





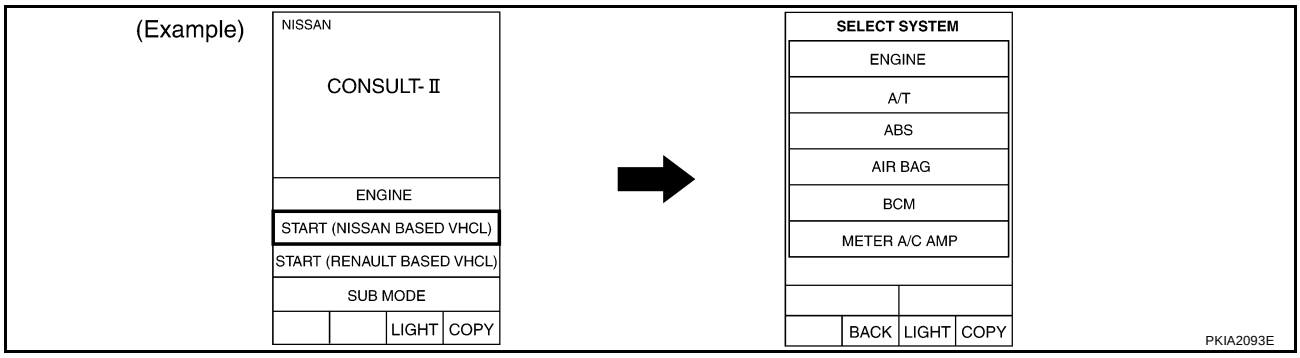
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
E51 -ELECTRICAL UNITS

TKWT1554E

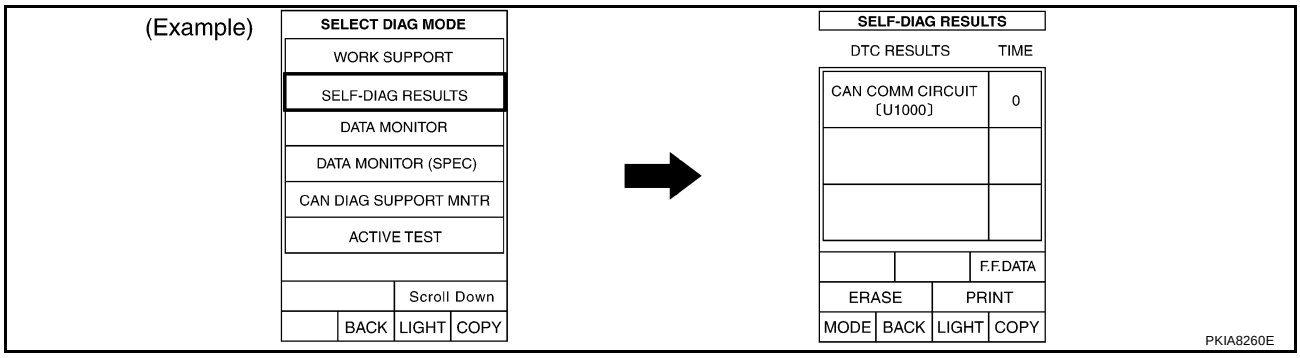
Work Flow

AKS00A8S

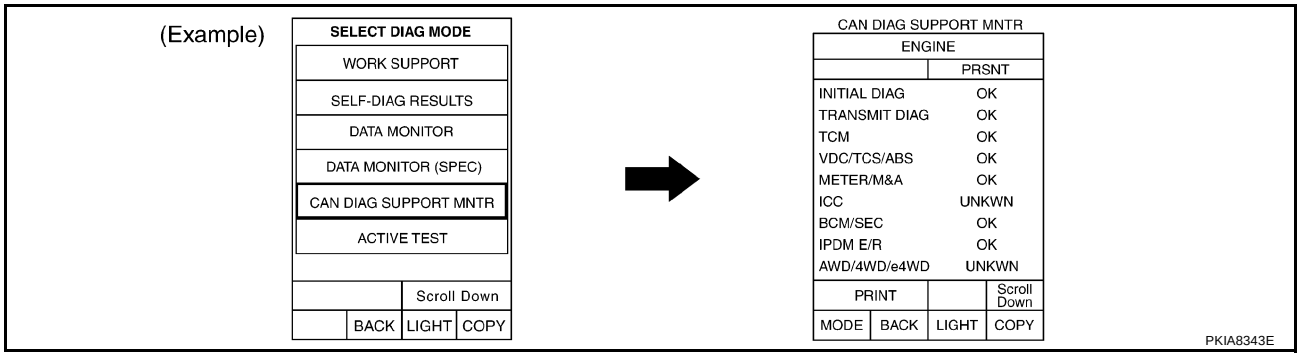
1. When there are no indications of “METER A/C AMP”, “BCM” or “IPDM E/R” on “SELECT SYSTEM” display of CONSULT-II, print the “SELECT SYSTEM”.



2. Print all the data of “SELF-DIAG RESULTS” for “ENGINE”, “A/T”, “METER A/C AMP”, “BCM”, “ABS” and “IPDM E/R” displayed on CONSULT-II.



3. Print all the data of “CAN DIAG SUPPORT MNTR” for “ENGINE”, “A/T”, “METER A/C AMP”, “BCM”, “ABS” and “IPDM E/R” displayed on CONSULT-II.



4. Attach the printed sheet of “SELECT SYSTEM”, “SELF-DIAG RESULTS” and “CAN DIAG SUPPORT MNTR” onto the check sheet. Refer to LAN-15, "CHECK SHEET" .
5. Based on the indications of “SELECT SYSTEM” and the results of “CAN DIAG SUPPORT MNTR”, put marks “v” onto the items with “No indication”, “NG”, or “UNKWN” in the check sheet table. Refer to LAN-15, "CHECK SHEET" .

   NOTE:
   - If “NG” is displayed on “INITIAL DIAG (Initial diagnosis)” as “CAN DIAG SUPPORT MNTR” for the diagnosed control unit, replace the control unit.
   - The “CAN DIAG SUPPORT MNTR” items, which are not in check sheet table, are not related to diagnostic procedure on service manual.
     So it is not necessary to check the status of the “CAN DIAG SUPPORT MNTR” items not in check sheet table.
6. According to the check sheet results (example), start inspection. Refer to LAN-17, "CHECK SHEET RESULTS (EXAMPLE)" .

CHECK SHEET

NOTE:

If “NG” is displayed on “INITIAL DIAG (Initial diagnosis)” as “CAN DIAG SUPPORT MNTR” for the diagnosed control unit, replace the control unit.

Check sheet table

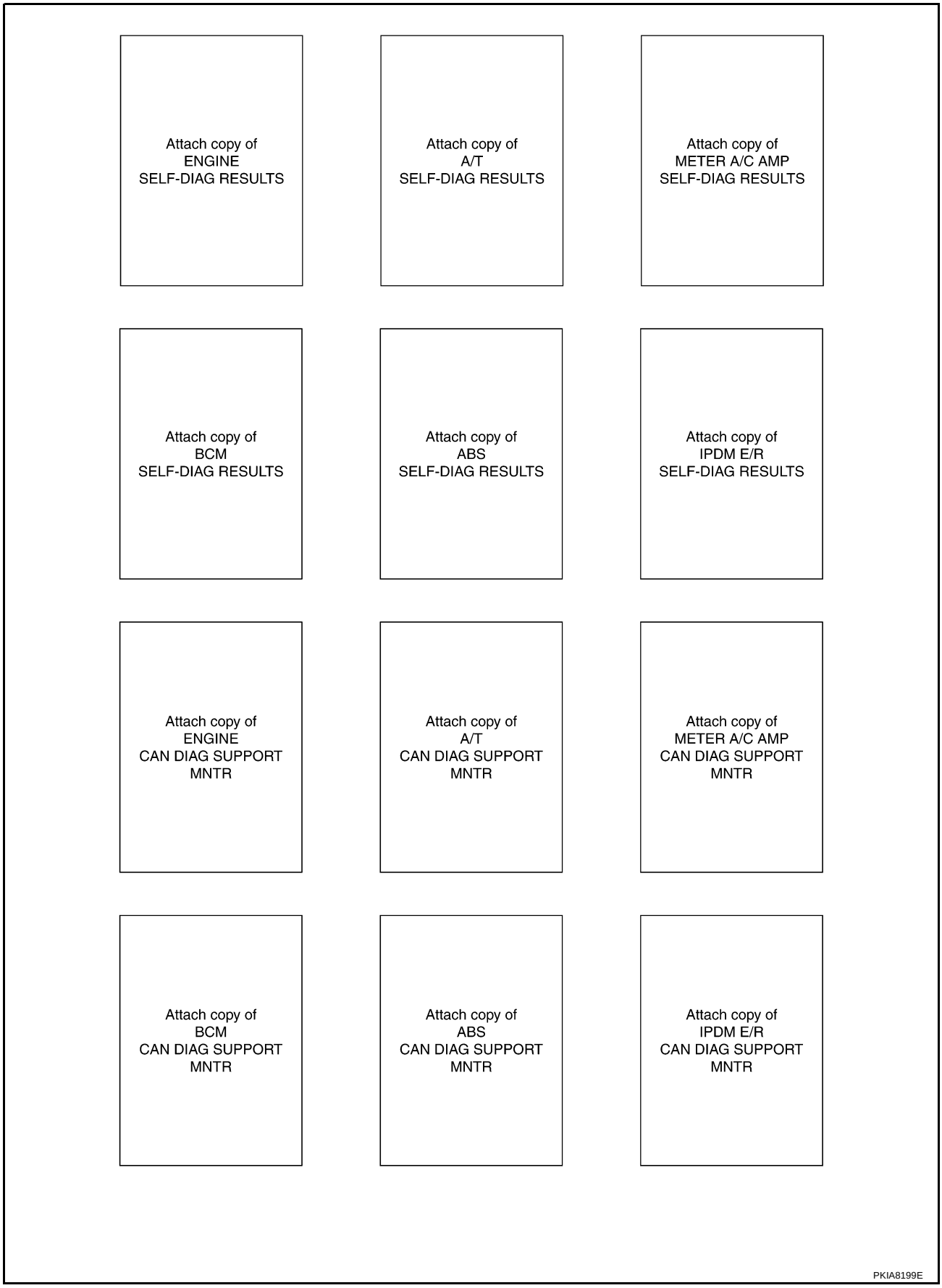
SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR							
		Initial diagnosis	Transmit diagnosis	Receive diagnosis					
				ECM	TCM	METER /M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	UNKWN	UNKWN	UNKWN
A/T	–	NG	UNKWN	UNKWN	–	UNKWN	–	UNKWN	–
METER A/C AMP	No indication	–	UNKWN	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	–	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN	UNKWN	UNKWN	–	–	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	–	UNKWN	–	–

Symptoms :

Attach copy of SELECT SYSTEM

Attach copy of SELECT SYSTEM

PKIA8198E


Attach copy of
ENGINE
SELF-DIAG RESULTS
Attach copy of
A/T
SELF-DIAG RESULTS
Attach copy of
METER A/C AMP
SELF-DIAG RESULTS
Attach copy of
BCM
SELF-DIAG RESULTS
Attach copy of
ABS
SELF-DIAG RESULTS
Attach copy of
IPDM E/R
SELF-DIAG RESULTS
Attach copy of
ENGINE
CAN DIAG SUPPORT
MNTR
Attach copy of
A/T
CAN DIAG SUPPORT
MNTR
Attach copy of
METER A/C AMP
CAN DIAG SUPPORT
MNTR
Attach copy of
BCM
CAN DIAG SUPPORT
MNTR
Attach copy of
ABS
CAN DIAG SUPPORT
MNTR
Attach copy of
IPDM E/R
CAN DIAG SUPPORT
MNTR
PKIA8199E

CHECK SHEET RESULTS (EXAMPLE)

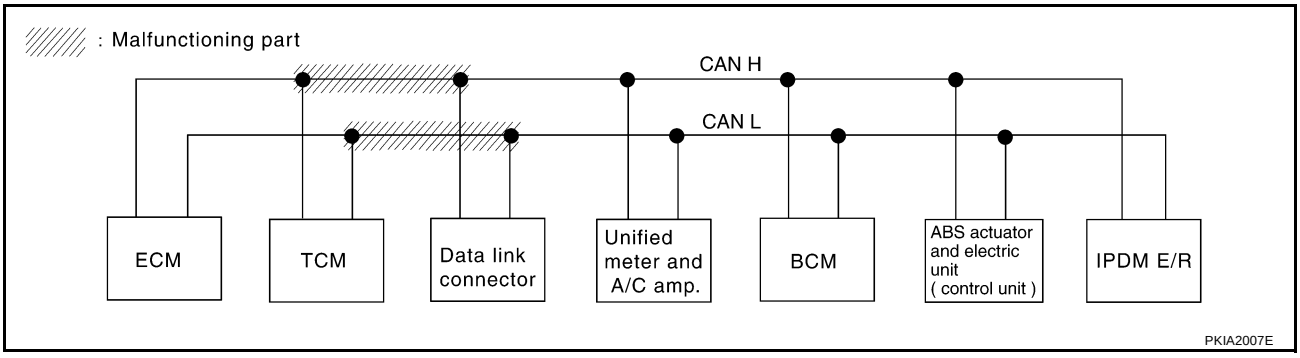
NOTE:
If “NG” is displayed on “INITIAL DIAG (Initial diagnosis)” as “CAN DIAG SUPPORT MNTR” for the diagnosed control unit, replace the control unit.

Case 1

Check harness between TCM and data link connector. Refer to LAN-29, "Circuit Check Between TCM and Data Link Connector"

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR							
		Initial diagnosis	Transmit diagnosis	Receive diagnosis					
				ECM	TCM	METER /M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN ✓	UNKWN ✓	UNKWN ✓	UNKWN ✓
A/T	–	NG	UNKWN	UNKWN	–	UNKWN ✓	–	UNKWN ✓	–
METER A/C AMP	No indication	–	UNKWN	UNKWN ✓	UNKWN ✓	–	UNKWN	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN ✓	–	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN	UNKWN ✓	UNKWN ✓	–	–	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN ✓	–	–	UNKWN	–	–

PKIA8200E



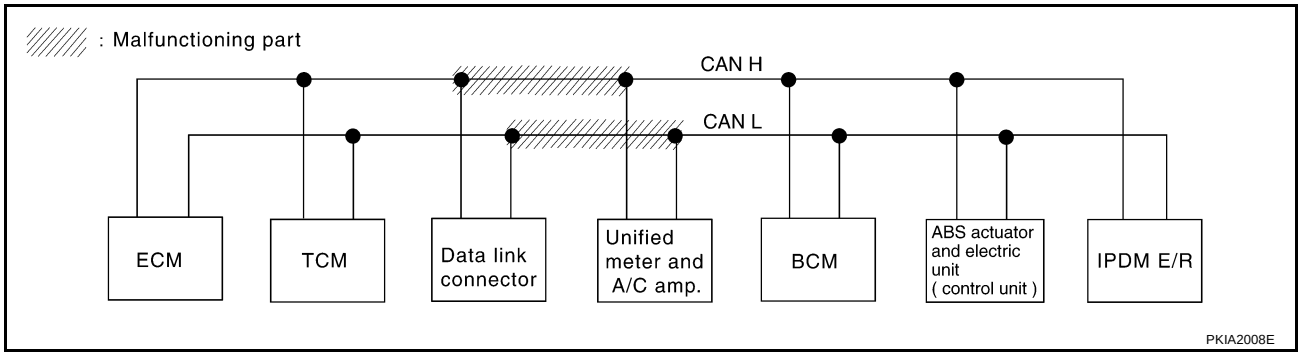
PKIA2007E

Case 2

Check harness between data link connector and unified meter and A/C amp. Refer to LAN-30, "Circuit Check Between Data Link Connector and Unified Meter and A/C Amp." .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR							
		Initial diagnosis	Transmit diagnosis	Receive diagnosis					
				ECM	TCM	METER /M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN ✓	UNKWN ✓	UNKWN ✓	UNKWN ✓
A/T	–	NG	UNKWN	UNKWN	–	UNKWN ✓	–	UNKWN ✓	–
METER A/C AMP	No indication ✓	–	UNKWN	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication ✓	NG	UNKWN	UNKWN	–	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN	UNKWN ✓	UNKWN ✓	–	–	–	–
IPDM E/R	No indication ✓	–	UNKWN	UNKWN	–	–	UNKWN	–	–

PKIA8201E



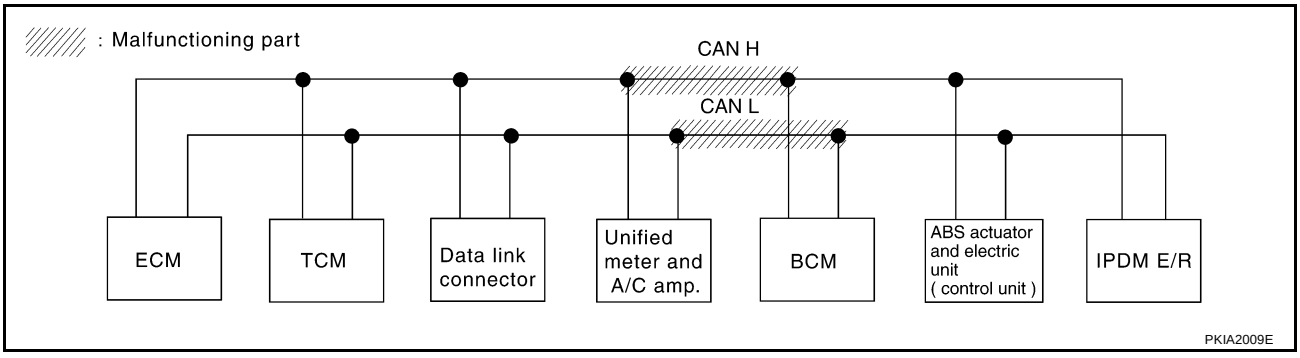
PKIA2008E

Case 3

Check harness between unified meter and A/C amp. and BCM. Refer to LAN-30, "Circuit Check Between Unified Meter and A/C Amp. and BCM" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR							
		Initial diagnosis	Transmit diagnosis	Receive diagnosis					
				ECM	TCM	METER /M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	UNKWN	UNKWN	UNKWN
A/T	–	NG	UNKWN	UNKWN	–	UNKWN	–	UNKWN	–
METER A/C AMP	No indication	–	UNKWN	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	–	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN	UNKWN	UNKWN	–	–	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	–	UNKWN	–	–

PKIA8202E



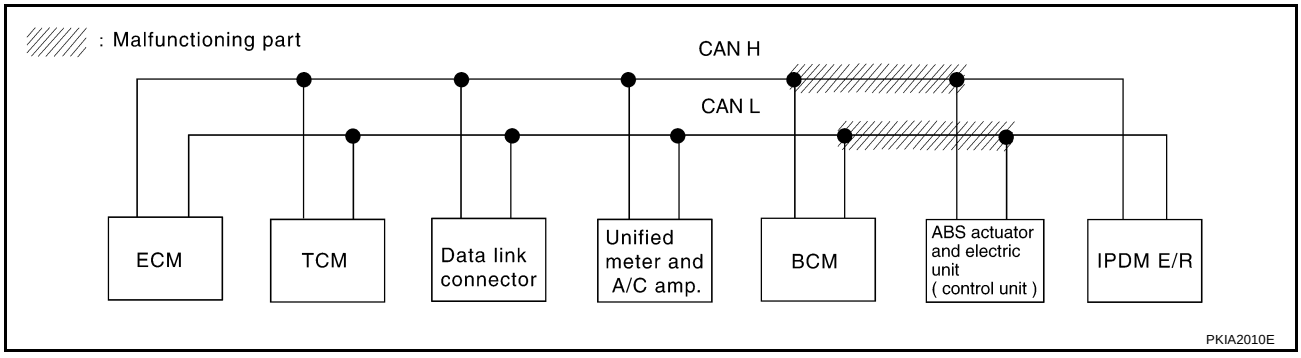
PKIA2009E

Case 4

Check harness between BCM and ABS actuator and electric unit (control unit). Refer to LAN-30, "Circuit Check Between BCM and ABS Actuator and Electric Unit (Control Unit)" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR							
		Initial diagnosis	Transmit diagnosis	Receive diagnosis					
				ECM	TCM	METER /M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	UNKWN	UNKWN	UNKWN
A/T	–	NG	UNKWN	UNKWN	–	UNKWN	–	UNKWN	–
METER A/C AMP	No indication	–	UNKWN	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	–	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN	UNKWN	UNKWN	–	–	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	–	UNKWN	–	–

PKIA8203E



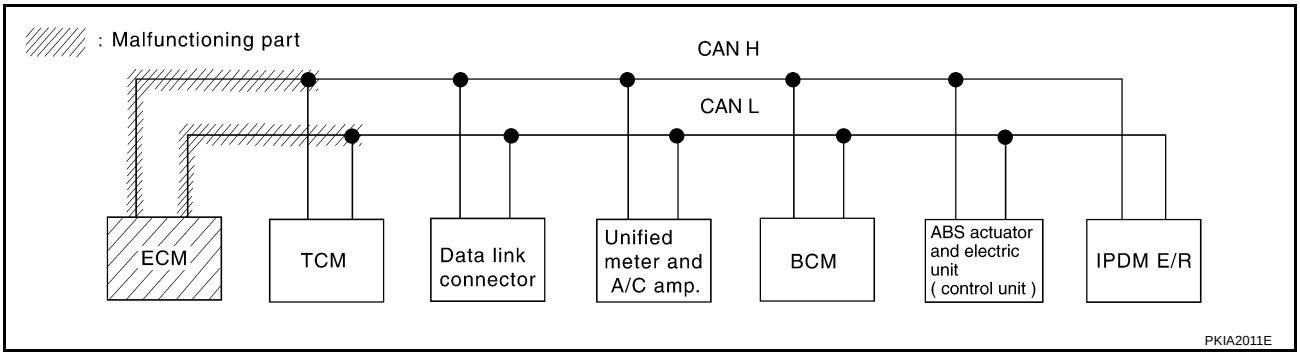
PKIA2010E

Case 5

Check ECM circuit. Refer to LAN-31, "ECM Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR							
		Initial diagnosis	Transmit diagnosis	Receive diagnosis					
				ECM	TCM	METER /M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	—	NG	UNKWN	—	UNKWN	UNKWN	UNKWN	UNKWN	UNKWN
A/T	—	NG	UNKWN	UNKWN	—	UNKWN	—	UNKWN	—
METER A/C AMP	No indication	—	UNKWN	UNKWN	UNKWN	—	UNKWN	UNKWN	—
BCM	No indication	NG	UNKWN	UNKWN	—	UNKWN	—	—	UNKWN
ABS	—	NG	UNKWN	UNKWN	UNKWN	—	—	—	—
IPDM E/R	No indication	—	UNKWN	UNKWN	—	—	UNKWN	—	—

PKIA8204E



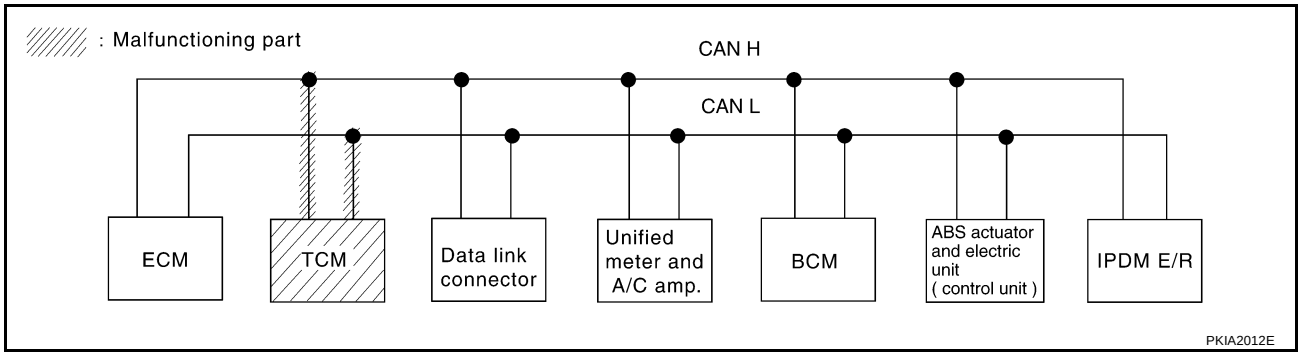
PKIA2011E

Case 6

Check TCM circuit. Refer to LAN-32, "TCM Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR							
		Initial diagnosis	Transmit diagnosis	Receive diagnosis					
				ECM	TCM	METER /M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	—	NG	UNKWN	—	UNKWN	UNKWN	UNKWN	UNKWN	UNKWN
A/T	—	NG	UNKWN	UNKWN	—	UNKWN	—	UNKWN	—
METER A/C AMP	No indication	—	UNKWN	UNKWN	UNKWN	—	UNKWN	UNKWN	—
BCM	No indication	NG	UNKWN	UNKWN	—	UNKWN	—	—	UNKWN
ABS	—	NG	UNKWN	UNKWN	UNKWN	—	—	—	—
IPDM E/R	No indication	—	UNKWN	UNKWN	—	—	UNKWN	—	—

PKIA8205E



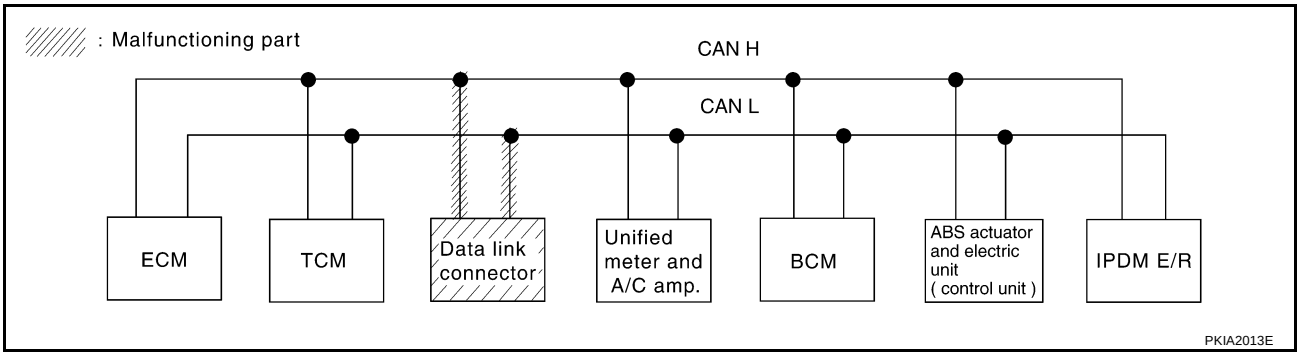
PKIA2012E

Case 7

Check data link connector circuit. Refer to LAN-32, "Data Link Connector Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR							
		Initial diagnosis	Transmit diagnosis	Receive diagnosis					
				ECM	TCM	METER /M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	UNKWN	UNKWN	UNKWN
A/T	–	NG	UNKWN	UNKWN	–	UNKWN	–	UNKWN	–
METER A/C AMP	No indication	–	UNKWN	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	–	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN	UNKWN	UNKWN	–	–	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	–	UNKWN	–	–

PKIA8206E



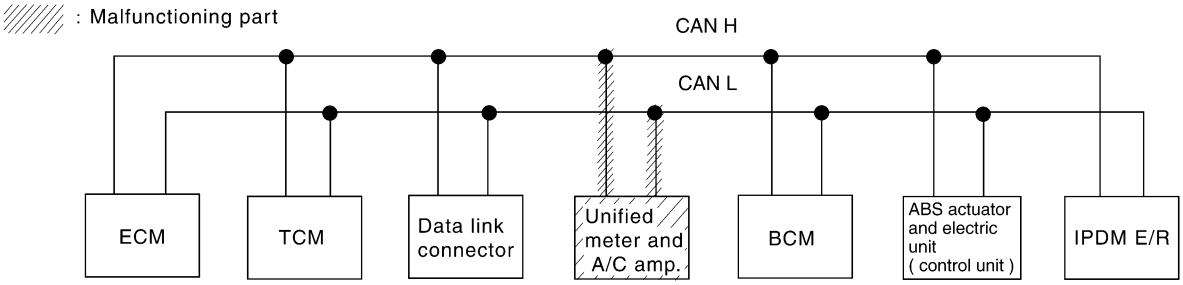
PKIA2013E

Case 8

Check unified meter and A/C amp. circuit. Refer to LAN-33, "Unified Meter and A/C Amp. Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR							
		Initial diagnosis	Transmit diagnosis	Receive diagnosis					
				ECM	TCM	METER /M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	—	NG	UNKWN	—	UNKWN	UNKWN	UNKWN	UNKWN	UNKWN
A/T	—	NG	UNKWN	UNKWN	—	UNKWN	—	UNKWN	—
METER A/C AMP	No indication	—	UNKWN	UNKWN	UNKWN	—	UNKWN	UNKWN	—
BCM	No indication	NG	UNKWN	UNKWN	—	UNKWN	—	—	UNKWN
ABS	—	NG	UNKWN	UNKWN	UNKWN	—	—	—	—
IPDM E/R	No indication	—	UNKWN	UNKWN	—	—	UNKWN	—	—

PKIA8207E



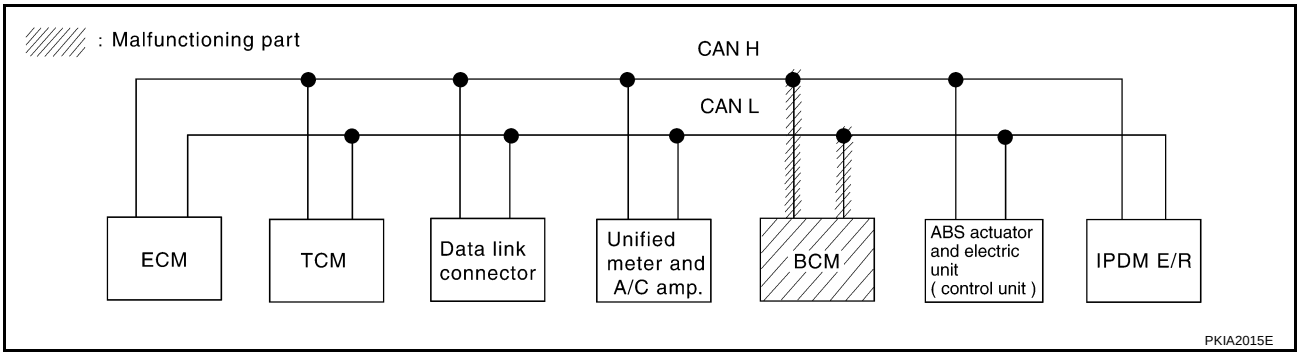
PKIA2014E

Case 9

Check BCM circuit. Refer to LAN-33, "BCM Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR							
		Initial diagnosis	Transmit diagnosis	Receive diagnosis					
				ECM	TCM	METER /M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	—	NG	UNKWN	—	UNKWN	UNKWN	UNKWN	UNKWN	UNKWN
A/T	—	NG	UNKWN	UNKWN	—	UNKWN	—	UNKWN	—
METER A/C AMP	No indication	—	UNKWN	UNKWN	UNKWN	—	UNKWN	UNKWN	—
BCM	No indication	NG	UNKWN	UNKWN	—	UNKWN	—	—	UNKWN
ABS	—	NG	UNKWN	UNKWN	UNKWN	—	—	—	—
IPDM E/R	No indication	—	UNKWN	UNKWN	—	—	UNKWN	—	—

PKIA8208E



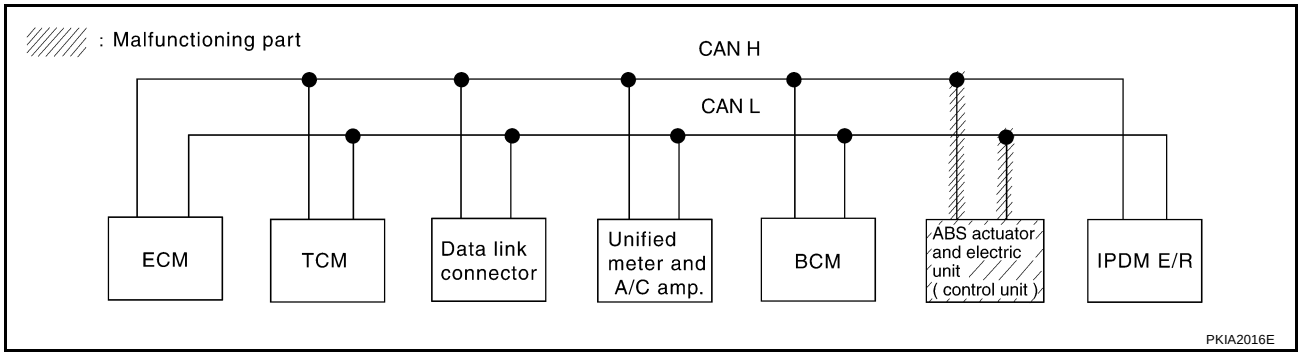
PKIA2015E

Case 10

Check ABS actuator and electric unit (control unit) circuit. Refer to LAN-34, "ABS Actuator and Electric Unit (Control Unit) Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR							
		Initial diagnosis	Transmit diagnosis	Receive diagnosis					
				ECM	TCM	METER /M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	UNKWN	UNKWN ✓	UNKWN
A/T	–	NG	UNKWN	UNKWN	–	UNKWN	–	UNKWN ✓	–
METER A/C AMP	No indication	–	UNKWN	UNKWN	UNKWN	–	UNKWN	UNKWN ✓	–
BCM	No indication	NG	UNKWN	UNKWN	–	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN ✓	UNKWN	UNKWN	–	–	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	–	UNKWN	–	–

PKIA8209E



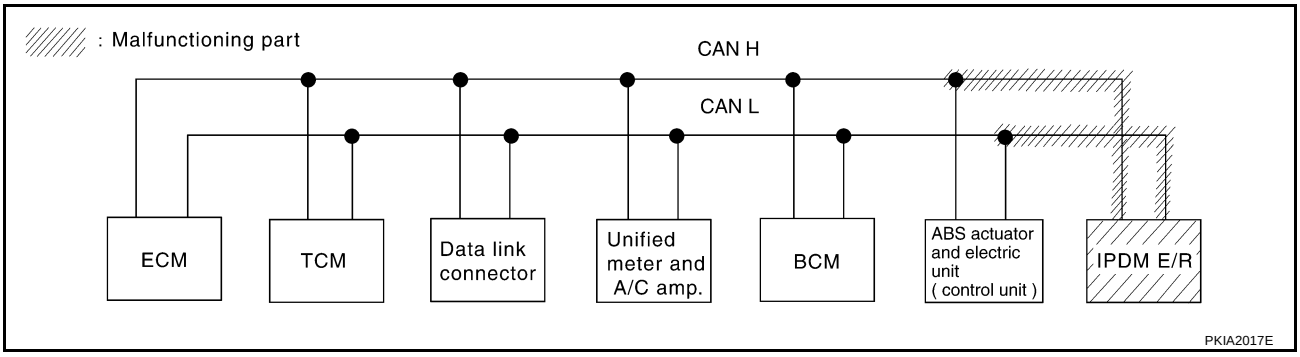
PKIA2016E

Case 11

Check IPDM E/R circuit. Refer to LAN-34, "IPDM E/R Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR							
		Initial diagnosis	Transmit diagnosis	Receive diagnosis					
				ECM	TCM	METER /M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	UNKWN	UNKWN	UNKWN ✓
A/T	–	NG	UNKWN	UNKWN	–	UNKWN	–	UNKWN	–
METER A/C AMP	No indication	–	UNKWN	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	–	UNKWN	–	–	UNKWN ✓
ABS	–	NG	UNKWN	UNKWN	UNKWN	–	–	–	–
IPDM E/R	No indication ✓	–	UNKWN	UNKWN	–	–	UNKWN	–	–

PKIA8210E



PKIA2017E

Case 12

Check CAN communication circuit. Refer to LAN-35, "CAN Communication Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR							
		Initial diagnosis	Transmit diagnosis	Receive diagnosis					
				ECM	TCM	METER /M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN ✓	–	UNKWN ✓	UNKWN ✓	UNKWN ✓	UNKWN ✓	UNKWN ✓
A/T	–	NG	UNKWN	UNKWN ✓	–	UNKWN ✓	–	UNKWN ✓	–
METER A/C AMP	No indication ✓	–	UNKWN	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication ✓	NG	UNKWN	UNKWN	–	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN ✓	UNKWN	UNKWN	–	–	–	–
IPDM E/R	No indication ✓	–	UNKWN	UNKWN	–	–	UNKWN	–	–

PKIA8211E

Case 13

Check IPDM E/R ignition relay circuit continuously sticks “OFF”. Refer to LAN-37, "IPDM E/R Ignition Relay Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR							
		Initial diagnosis	Transmit diagnosis	Receive diagnosis					
				ECM	TCM	METER /M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	—	NG	UNKWN	—	UNKWN	UNKWN	UNKWN	UNKWN	UNKWN
A/T	—	NG	UNKWN	UNKWN	—	UNKWN	—	UNKWN	—
METER A/C AMP	No indication	—	UNKWN	UNKWN	UNKWN	—	UNKWN	UNKWN	—
BCM	No indication	NG	UNKWN	UNKWN	—	UNKWN	—	—	UNKWN
ABS	—	NG	UNKWN	UNKWN	UNKWN	—	—	—	—
IPDM E/R	No indication	—	UNKWN	UNKWN	—	—	UNKWN	—	—

PKIA8212E

Case 14

Check IPDM E/R ignition relay circuit continuously sticks “ON”. Refer to LAN-37, "IPDM E/R Ignition Relay Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR							
		Initial diagnosis	Transmit diagnosis	Receive diagnosis					
				ECM	TCM	METER /M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	—	NG	UNKWN	—	UNKWN	UNKWN	UNKWN	UNKWN	UNKWN
A/T	—	NG	UNKWN	UNKWN	—	UNKWN	—	UNKWN	—
METER A/C AMP	No indication	—	UNKWN	UNKWN	UNKWN	—	UNKWN	UNKWN	—
BCM	No indication	NG	UNKWN	UNKWN	—	UNKWN	—	—	UNKWN
ABS	—	NG	UNKWN	UNKWN	UNKWN	—	—	—	—
IPDM E/R	No indication	—	UNKWN	UNKWN	—	—	UNKWN	—	—

PKIA8213E

Circuit Check Between TCM and Data Link Connector

AKS00A8T

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check following terminals and connector for damage, bend and loose connection (connector side and harness side).

- Harness connector F102
- Harness connector M72

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

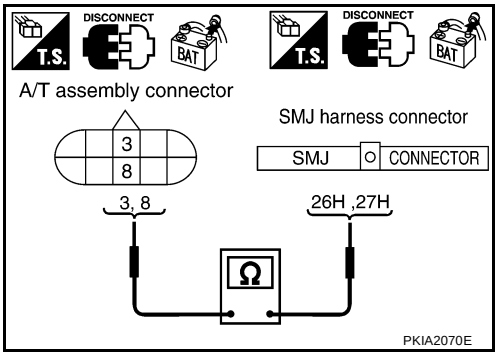
2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect A/T assembly connector and harness connector F102.
2. Check continuity between A/T assembly harness connector F6 terminals 3 (L), 8 (P) and harness connector F102 terminals 26H (L), 27H (P).

3 (L) – 26H (L) : Continuity should exist.
8 (P) – 27H (P) : Continuity should exist.

OK or NG

OK >> GO TO 3.
NG >> Repair harness.



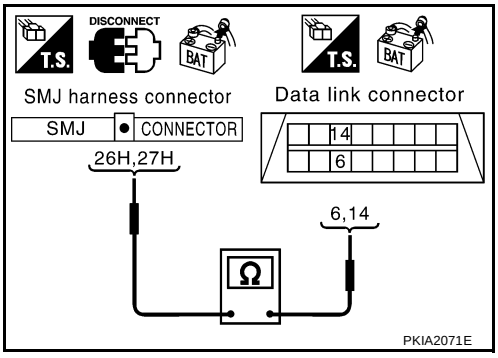
3. CHECK HARNESS FOR OPEN CIRCUIT

Check continuity between harness connector M72 terminals 26H (L), 27H (P) and data link connector M8 terminals 6 (L), 14 (P).

26H (L) – 6 (L) : Continuity should exist.
27H (P) – 14 (P) : Continuity should exist.

OK or NG

OK >> Connect all the connectors and diagnose again. Refer to LAN-14, "Work Flow" .
NG >> Repair harness.



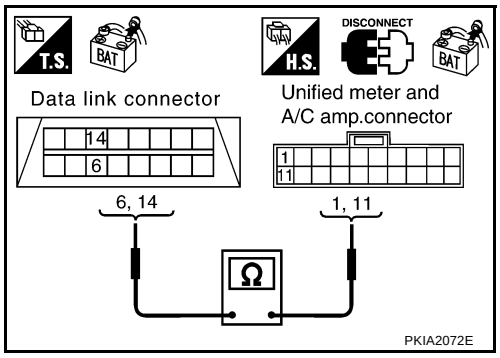
Circuit Check Between Data Link Connector and Unified Meter and A/C Amp.

AKS00A8U

1. CHECK HARNESS FOR OPEN CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Disconnect ECM connector and unified meter and A/C amp. connector.
4. Check continuity between data link connector M8 terminals 6 (L), 14 (P) and unified meter and A/C amp. harness connector M48 terminals 1 (L), 11 (P).

6 (L) – 1 (L) : Continuity should exist.
14 (P) – 11 (P) : Continuity should exist.



OK or NG

OK >> Connect all the connectors and diagnose again. Refer to LAN-14, "Work Flow" .
NG >> Repair harness.

Circuit Check Between Unified Meter and A/C Amp. and BCM

AKS00A8V

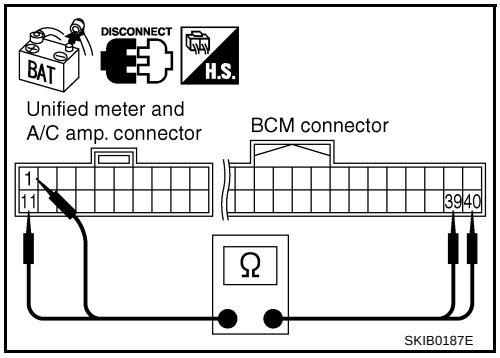
1. CHECK HARNESS FOR OPEN CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Disconnect the following connectors.

- ECM connector
- Unified meter and A/C amp. connector
- BCM connector

4. Check continuity between unified meter and A/C amp. harness connector M48 terminals 1 (L), 11 (P) and BCM harness connector M90 terminals 39 (L), 40 (P).

1 (L) – 39 (L) : Continuity should exist.
11 (P) – 40 (P) : Continuity should exist.



OK or NG

OK >> Connect all the connectors and diagnose again. Refer to LAN-14, "Work Flow" .
NG >> Repair harness.

Circuit Check Between BCM and ABS Actuator and Electric Unit (Control Unit)

AKS00A8W

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check following terminals and connector for damage, bend and loose connection (connector side and harness side).

- Harness connector M15
- Harness connector E108

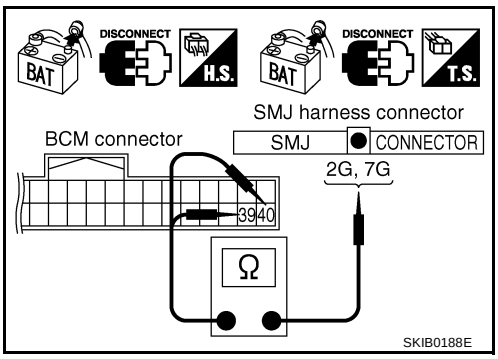
OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect BCM connector and harness connector M15.
2. Check continuity between BCM harness connector M90 terminals 39 (L), 40 (P) and harness connector M15 terminals 2G (L), 7G (P).

39 (L) – 2G (L) : Continuity should exist.
40 (P) – 7G (P) : Continuity should exist.



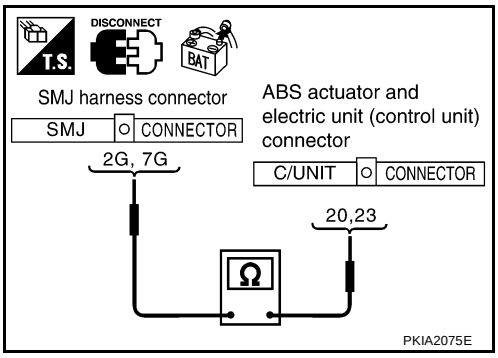
OK or NG

OK >> GO TO 3.
NG >> Repair harness.

3. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check continuity between harness connector E108 terminals 2G (L), 7G (P) and ABS actuator and electric unit (control unit) harness connector E51 terminals 20 (L), 23 (P).

2G (L) – 20 (L) : Continuity should exist.
7G (P) – 23 (P) : Continuity should exist.



OK or NG

OK >> Connect all the connectors and diagnose again. Refer to LAN-14, "Work Flow" .
NG >> Repair harness.

ECM Circuit Check

AKS00A8X

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check terminals and connector of ECM damage, bend and loose connection (control module side and harness side).

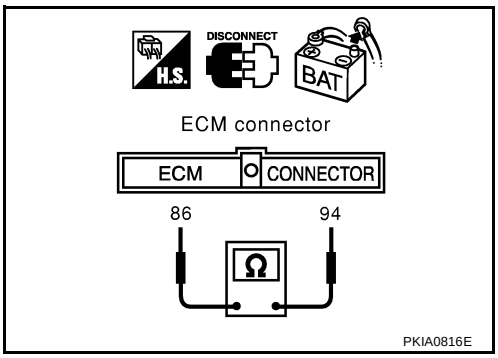
OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ECM connector.
2. Check resistance between ECM harness connector F101 terminals 94 (L) and 86 (P).

94 (L) – 86 (P) : Approx. 108 – 132Ω



OK or NG

OK >> Replace ECM.
NG >> Repair harness between ECM and A/T assembly.

TCM Circuit Check

AKS00A8Y

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check terminals and connector of A/T assembly for damage, bend and loose connection (control module side and harness side).

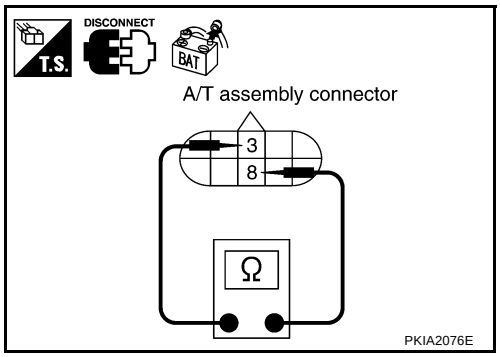
OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect A/T assembly connector.
2. Check resistance between A/T assembly harness connector F6 terminals 3 (L) and 8 (P).

3 (L) – 8 (P) : Approx. 54 – 66Ω



OK or NG

OK >> Replace A/T assembly.
NG >> Repair harness between A/T assembly and harness connector F102.

Data Link Connector Circuit Check

AKS00A8Z

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check terminals and connector of data link connector for damage, bend and loose connection (connector side and harness side).

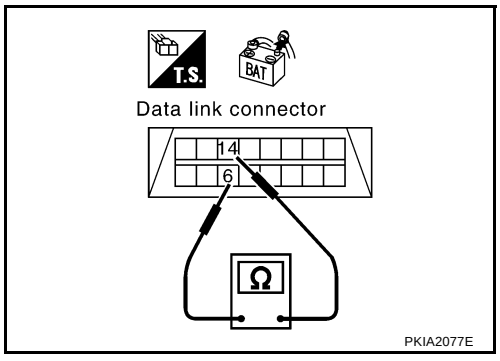
OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

Check resistance between data link connector M8 terminals 6 (L) and 14 (P).

6 (L) – 14 (P) : Approx. 54 – 66Ω



OK or NG

OK >> Diagnose again. Refer to LAN-14, "Work Flow" .
NG >> Repair harness between data link connector and unified meter and A/C amp.

Unified Meter and A/C Amp. Circuit Check

AKS00A90

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check terminals and connector of unified meter and A/C amp. for damage, bend and loose connection (meter side and harness side).

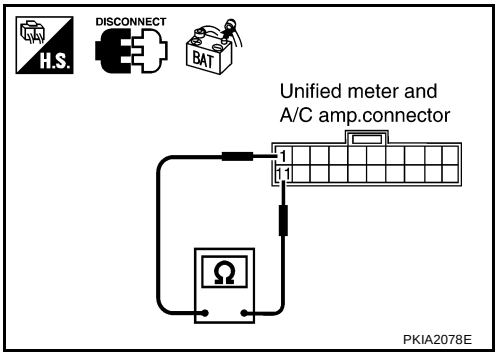
OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect unified meter and A/C amp. connector.
2. Check resistance between unified meter and A/C amp. harness connector M48 terminals 1 (L) and 11 (P).

1 (L) – 11 (P) : Approx. 54 – 66Ω



OK or NG

OK >> Replace unified meter and A/C amp.
NG >> Repair harness between unified meter and A/C amp. and BCM.

BCM Circuit Check

AKS00A91

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check terminals and connector of BCM for damage, bend and loose connection (control module side and harness side).

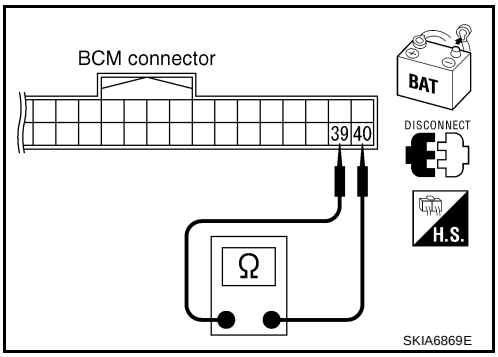
OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect BCM connector.
2. Check resistance between BCM harness connector M90 terminals 39 (L) and 40 (P).

39 (L) – 40 (P) : Approx. 54 – 66Ω



OK or NG

OK >> Replace BCM.
NG >> Repair harness between BCM and harness connector M15.

ABS Actuator and Electric Unit (Control Unit) Circuit Check

AKS00A92

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check terminals and connector of ABS actuator and electric unit (control unit) for damage, bend and loose connection (control unit side and harness side).

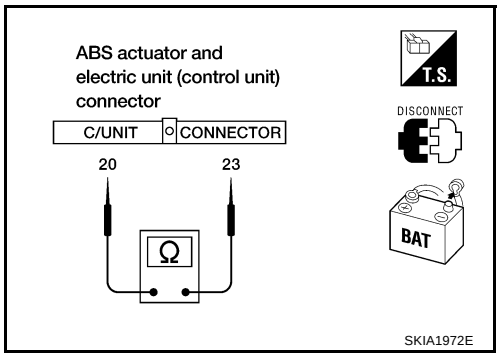
OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check resistance between ABS actuator and electric unit (control unit) harness connector E51 terminals 20 (L) and 23 (P).

20 (L) – 23 (P) : Approx. 54 – 66Ω



OK or NG

OK >> Replace ABS actuator and electric unit (control unit).
NG >> Repair harness between ABS actuator and electric unit (control unit) and IPDM E/R.

IPDM E/R Circuit Check

AKS00A93

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check terminals and connector of IPDM E/R for damage, bend and loose connection (control module side and harness side).

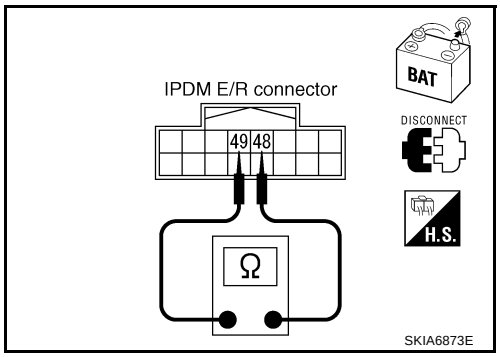
OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect IPDM E/R connector.
2. Check resistance between IPDM E/R harness connector E9 terminals 48 (L) and 49 (P).

48 (L) – 49 (P) : Approx. 108 – 132Ω



OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness between IPDM E/R and ABS actuator and electric unit (control unit).

CAN Communication Circuit Check

AKS00A94

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check following terminals and connector for damage, bend and loose connection (control module side, meter side, control unit side and harness side).

- ECM
- A/T assembly
- Unified meter and A/C amp.
- BCM
- ABS actuator and electric unit (control unit)
- IPDM E/R
- Between ECM and IPDM E/R

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

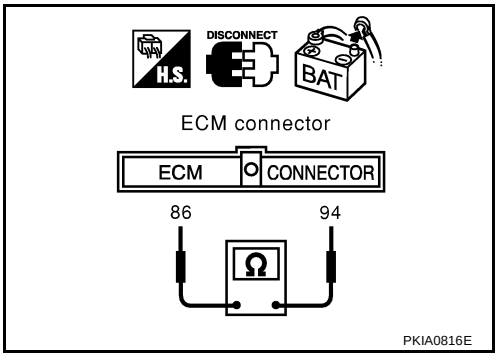
2. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect following connectors.

- ECM connector
- A/T assembly connector
- Harness connector F102

2. Check continuity between ECM harness connector F101 terminals 94 (L) and 86 (P).

94 (L) – 86 (P) : Continuity should not exist.



OK or NG

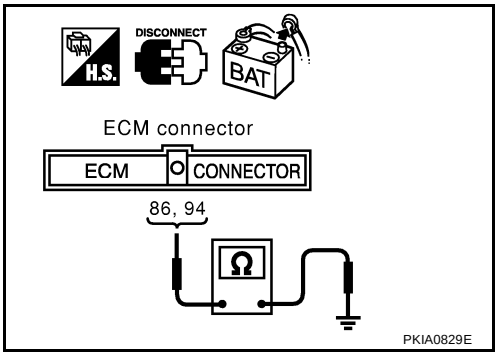
OK >> GO TO 3.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.

- Harness between ECM and A/T assembly
- Harness between ECM and harness connector F102

3. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between ECM harness connector F101 terminals 94 (L), 86 (P) and ground.

94 (L) – ground : Continuity should not exist.
86 (P) – ground : Continuity should not exist.



OK or NG

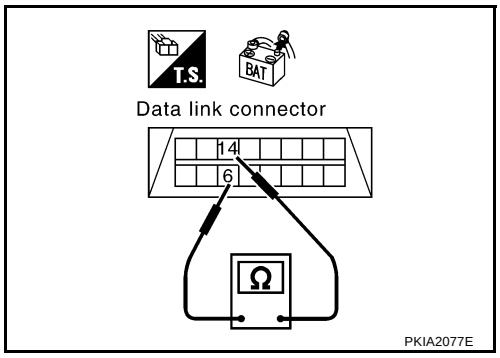
OK >> GO TO 4.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.

- Harness between ECM and A/T assembly
- Harness between ECM and harness connector F102

4. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect following connectors.
- Unified meter and A/C amp. connector
- BCM connector
- Harness connector M15
2. Check continuity between data link connector M8 terminals 6 (L) and 14 (P).

6 (L) – 14 (P) : Continuity should not exist.



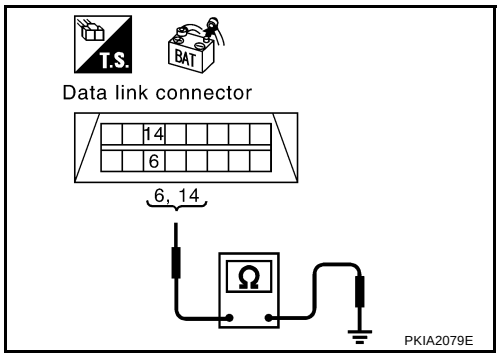
OK or NG

OK >> GO TO 5.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between data link connector and harness connector M72
- Harness between data link connector and unified meter and A/C amp.
- Harness between data link connector and BCM
- Harness between data link connector and harness connector M15

5. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between data link connector M8 terminals 6 (L), 14 (P) and ground.

6 (L) – ground : Continuity should not exist.
14 (P) – ground : Continuity should not exist.



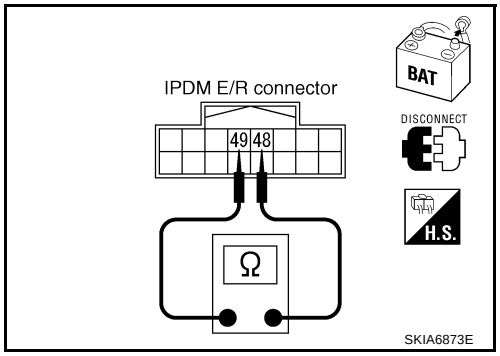
OK or NG

OK >> GO TO 6.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between data link connector and harness connector M72
- Harness between data link connector and unified meter and A/C amp.
- Harness between data link connector and BCM
- Harness between data link connector and harness connector M15

6. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector and IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector E9 terminals 48 (L) and 49 (P).

48 (L) – 49 (P) : Continuity should not exist.



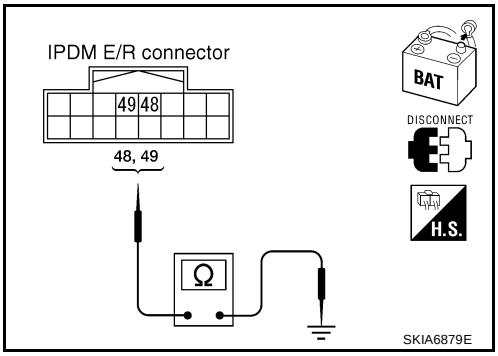
OK or NG

OK >> GO TO 7.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between IPDM E/R and ABS actuator and electric unit (control unit)
- Harness between IPDM E/R and harness connector E108

7. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between IPDM E/R harness connector E9 terminals 48 (L), 49 (P) and ground.

48 (L) – ground : Continuity should not exist.
49 (P) – ground : Continuity should not exist.



OK or NG

OK >> GO TO 8.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between IPDM E/R and ABS actuator and electric unit (control unit)
- Harness between IPDM E/R and harness connector E108

8. ECM/IPDM E/R INTERNAL CIRCUIT INSPECTION

Check components inspection. Refer to LAN-37, "ECM/IPDM E/R INTERNAL CIRCUIT INSPECTION" .

OK or NG

OK >> Connect all the connectors and diagnose again. Refer to LAN-14, "Work Flow" .
NG >> Replace ECM and/or IPDM E/R.

IPDM E/R Ignition Relay Circuit Check

AKS00A95

Check the following. If no malfunction is found, replace the IPDM E/R.

- IPDM E/R power supply circuit. Refer to PG-28, "IPDM E/R Power/Ground Circuit Inspection" .
- Ignition power supply circuit. Refer to PG-11, "IGNITION POWER SUPPLY — IGNITION SW. IN “ON” AND/OR “START”" .

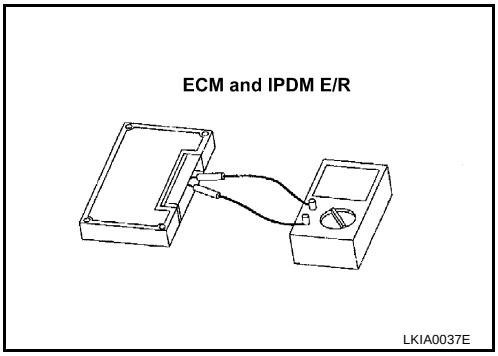
Component Inspection

AKS00A96

ECM/IPDM E/R INTERNAL CIRCUIT INSPECTION

- Remove ECM and IPDM E/R from vehicle.
- Check resistance between ECM terminals 94 and 86.
- Check resistance between IPDM E/R terminals 48 and 49.

Unit	Terminal	Resistance value (Ω) (Approx.)
ECM	94 - 86	108 - 132
IPDM E/R	48 - 49	



CAN SYSTEM (TYPE 2)

PFP:23710

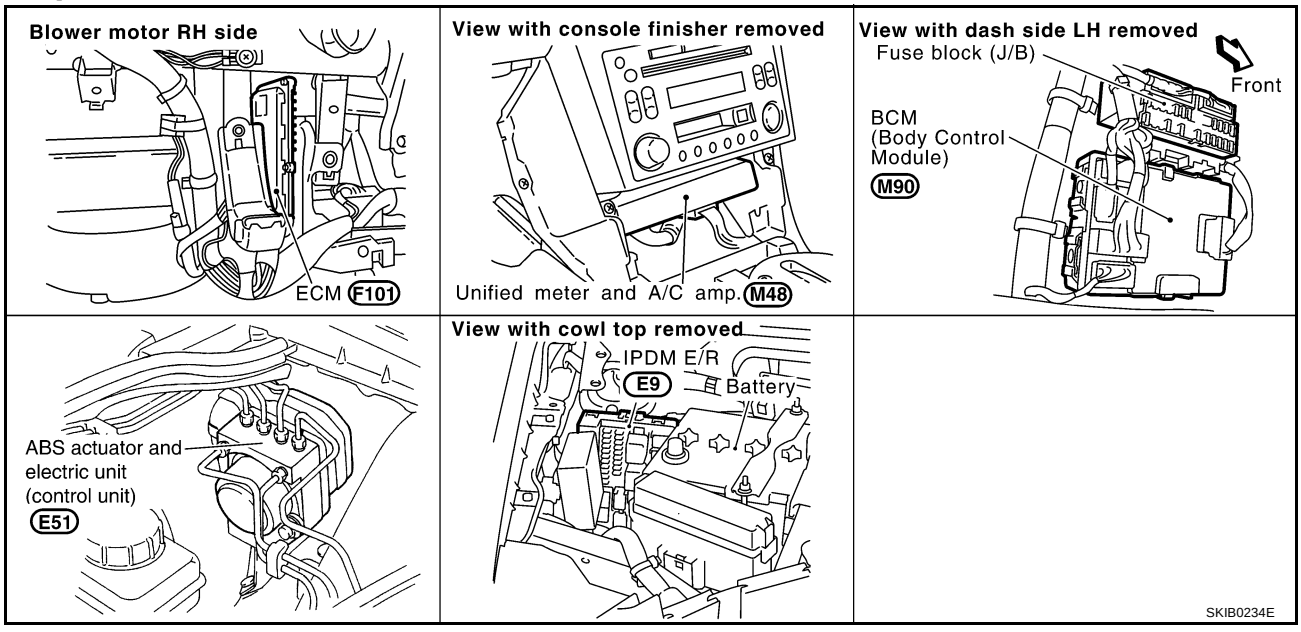
System Description

AKS00A97

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

Component Parts and Harness Connector Location

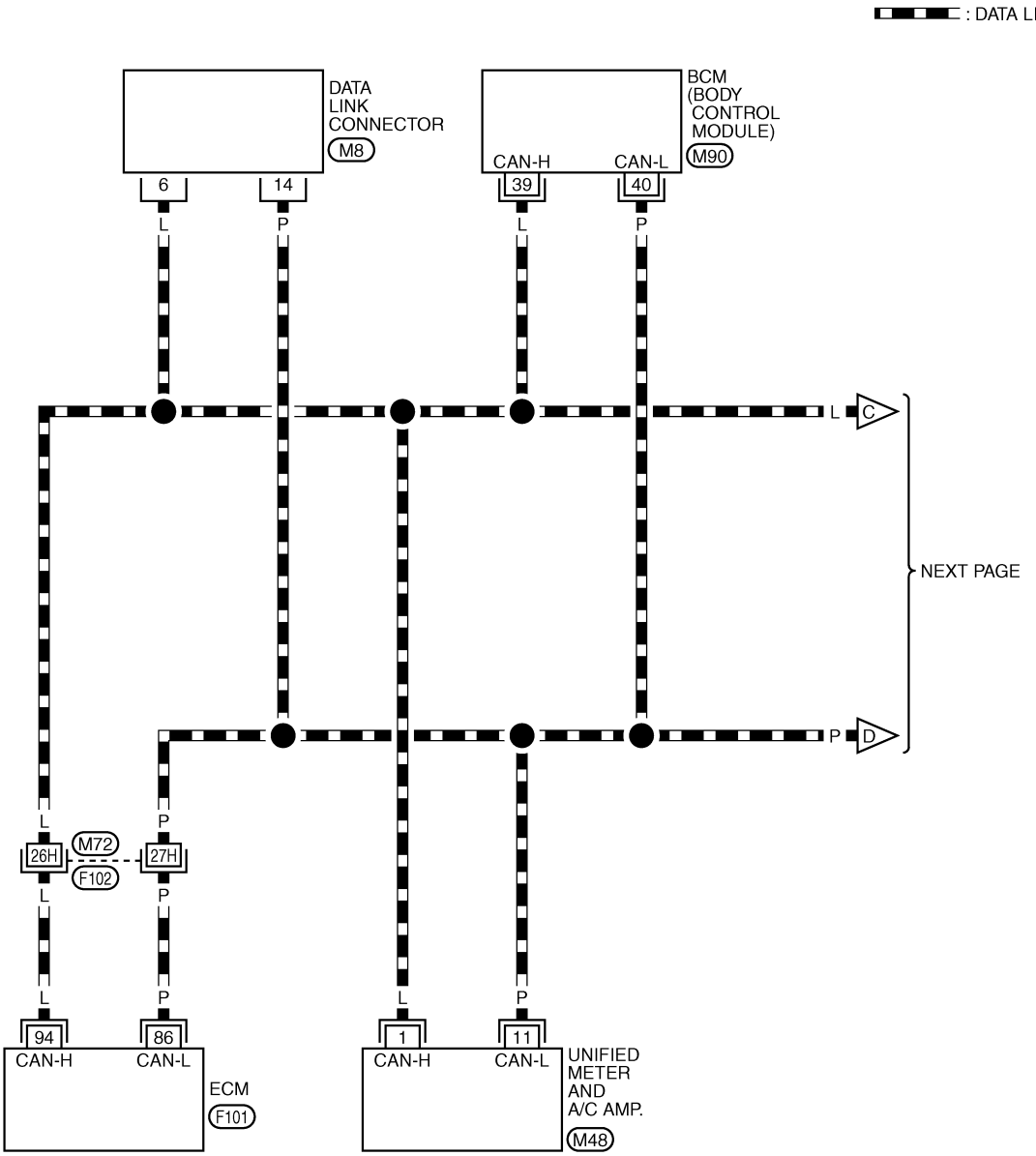
AKS00A98

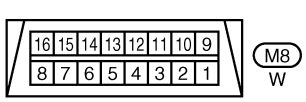


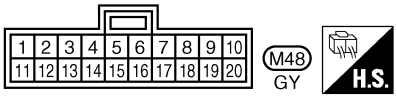
Wiring Diagram — CAN —

AKS00A99

LAN-CAN-03



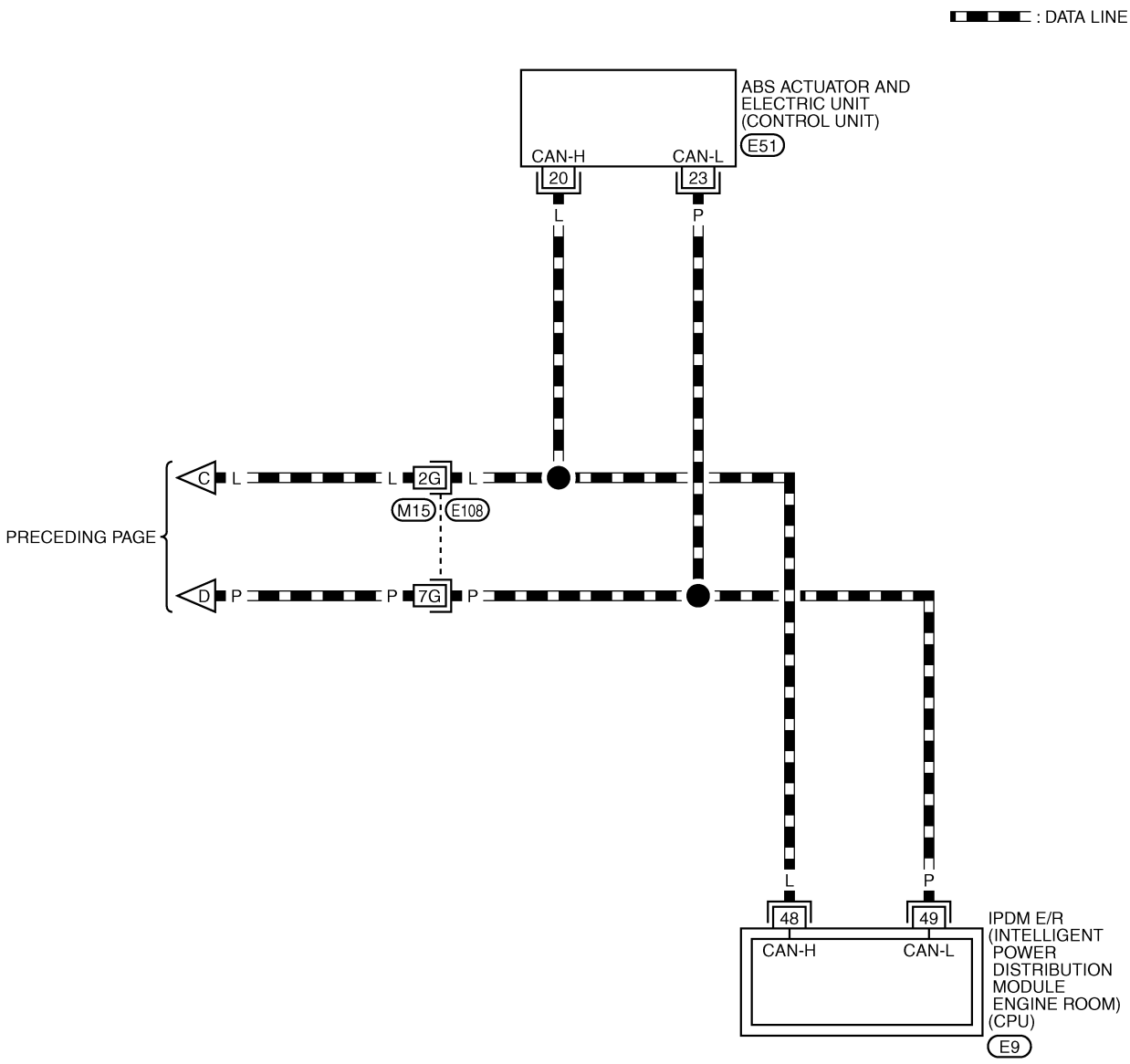


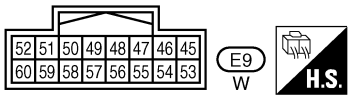


REFER TO THE FOLLOWING.
F102 -SUPER MULTIPLE JUNCTION (SMJ)
M90 , F101 -ELECTRICAL UNITS

TKWT1862E

LAN-CAN-04





REFER TO THE FOLLOWING.

E108 -SUPER MULTIPLE JUNCTION (SMJ)

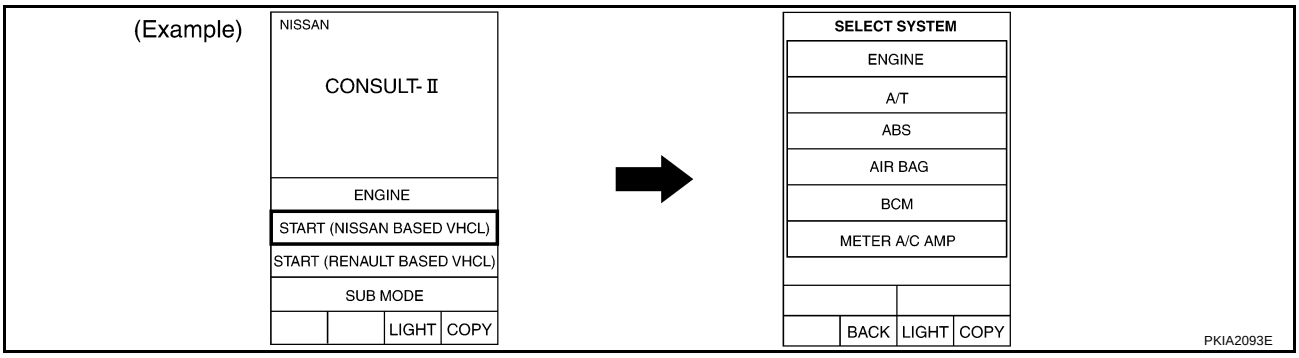
E51 -ELECTRICAL UNITS

TKWT1555E

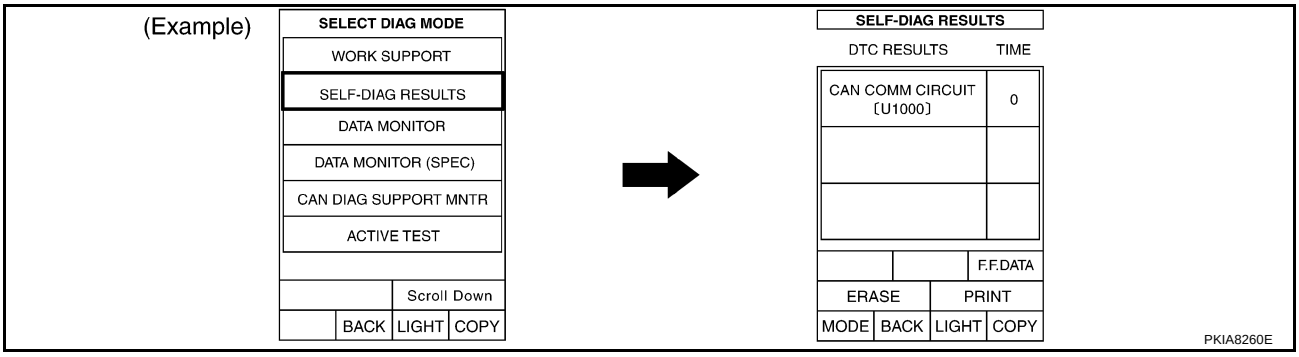
Work Flow

AKS00A9A

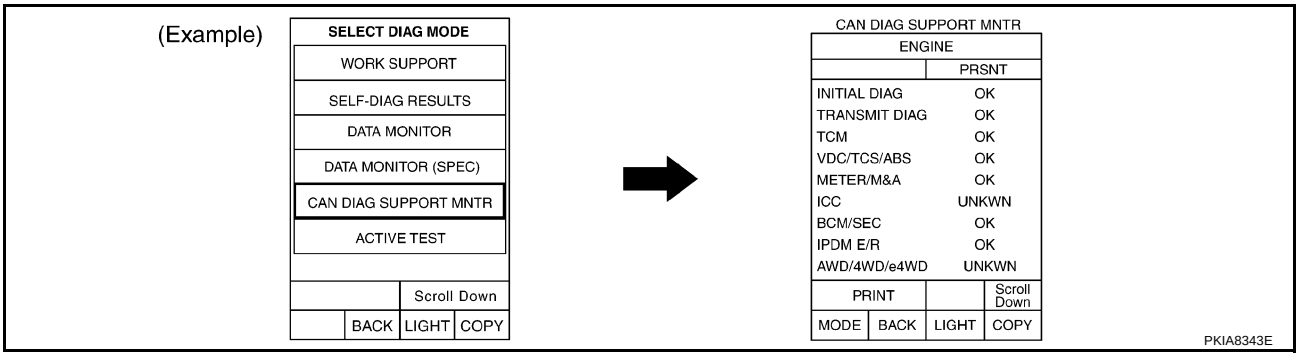
1. When there are no indications of “METER A/C AMP”, “BCM” or “IPDM E/R” on “SELECT SYSTEM” display of CONSULT-II, print the “SELECT SYSTEM”.



2. Print all the data of “SELF-DIAG RESULTS” for “ENGINE”, “METER A/C AMP”, “BCM”, “ABS” and “IPDM E/R” displayed on CONSULT-II.



3. Print all the data of “CAN DIAG SUPPORT MNTR” for “ENGINE”, “METER A/C AMP”, “BCM”, “ABS” and “IPDM E/R” displayed on CONSULT-II.



4. Attach the printed sheet of “SELECT SYSTEM”, “SELF-DIAG RESULTS” and “CAN DIAG SUPPORT MNTR” onto the check sheet. Refer to LAN-42, "CHECK SHEET" .
5. Based on the indications of “SELECT SYSTEM” and the results of “CAN DIAG SUPPORT MNTR”, put marks “v” onto the items with “No indication”, “NG”, or “UNKWN” in the check sheet table. Refer to LAN-42, "CHECK SHEET" .

   NOTE:
   - If “NG” is displayed on “INITIAL DIAG (Initial diagnosis)” as “CAN DIAG SUPPORT MNTR” for the diagnosed control unit, replace the control unit.
   - The “CAN DIAG SUPPORT MNTR” items, which are not in check sheet table, are not related to diagnostic procedure on service manual.
     So it is not necessary to check the status of the “CAN DIAG SUPPORT MNTR” items not in check sheet table.
6. According to the check sheet results (example), start inspection. Refer to LAN-44, "CHECK SHEET RESULTS (EXAMPLE)" .

CHECK SHEET

NOTE:

If “NG” is displayed on “INITIAL DIAG (Initial diagnosis)” as “CAN DIAG SUPPORT MNTR” for the diagnosed control unit, replace the control unit.

Check sheet table

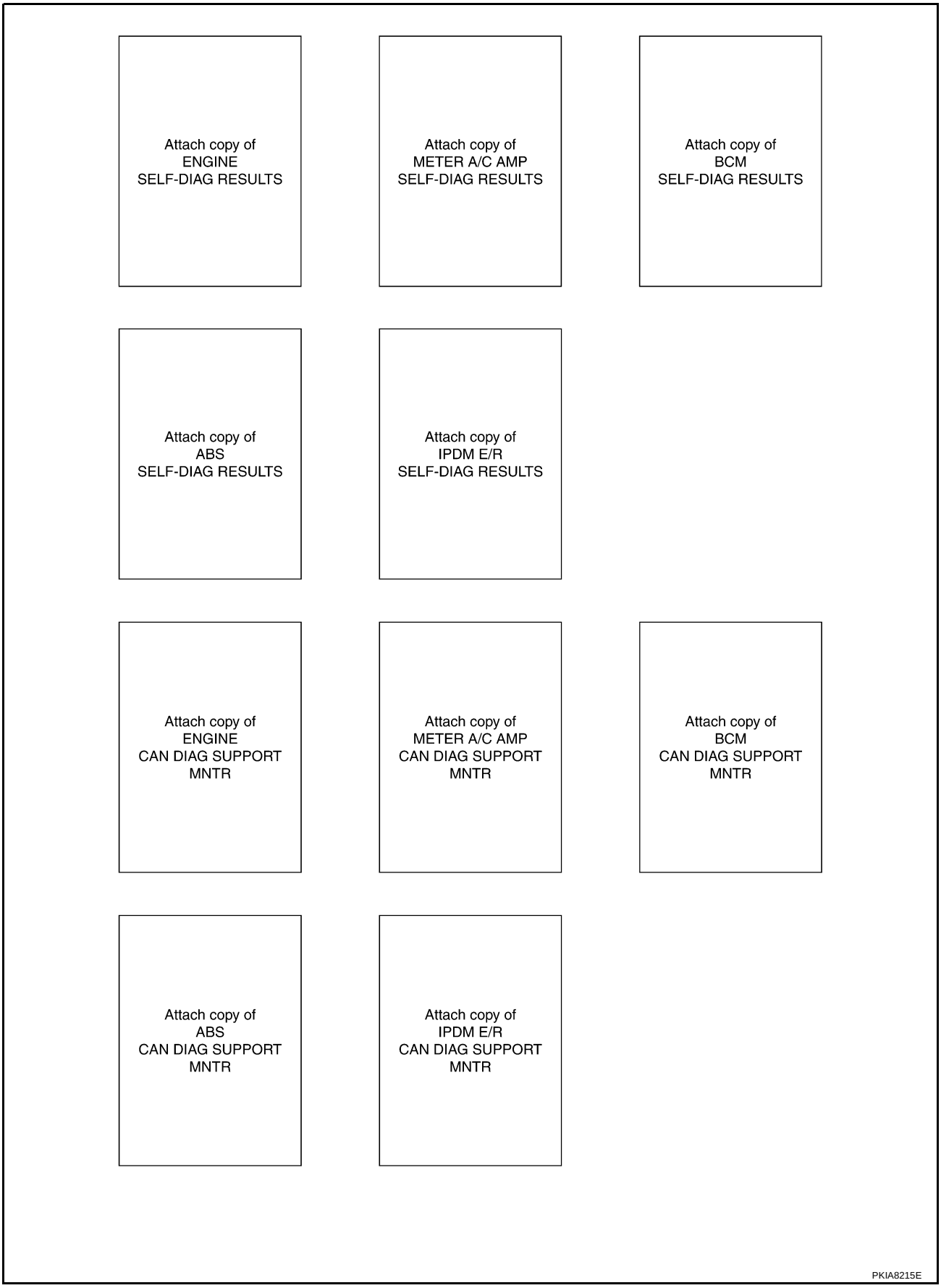
SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	—	NG	UNKWN	—	UNKWN	UNKWN	UNKWN	UNKWN
METER A/C AMP	No indication	—	UNKWN	UNKWN	—	UNKWN	UNKWN	—
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	—	—	UNKWN
ABS	—	NG	UNKWN	UNKWN	—	—	—	—
IPDM E/R	No indication	—	UNKWN	UNKWN	—	UNKWN	—	—

Symptoms :

Attach copy of SELECT SYSTEM

Attach copy of SELECT SYSTEM

PKIA8214E


Attach copy of
ENGINE
SELF-DIAG RESULTS
Attach copy of
METER A/C AMP
SELF-DIAG RESULTS
Attach copy of
BCM
SELF-DIAG RESULTS
Attach copy of
ABS
SELF-DIAG RESULTS
Attach copy of
IPDM E/R
SELF-DIAG RESULTS
Attach copy of
ENGINE
CAN DIAG SUPPORT
MNTR
Attach copy of
METER A/C AMP
CAN DIAG SUPPORT
MNTR
Attach copy of
BCM
CAN DIAG SUPPORT
MNTR
Attach copy of
ABS
CAN DIAG SUPPORT
MNTR
Attach copy of
IPDM E/R
CAN DIAG SUPPORT
MNTR
PKIA8215E

CHECK SHEET RESULTS (EXAMPLE)

NOTE:

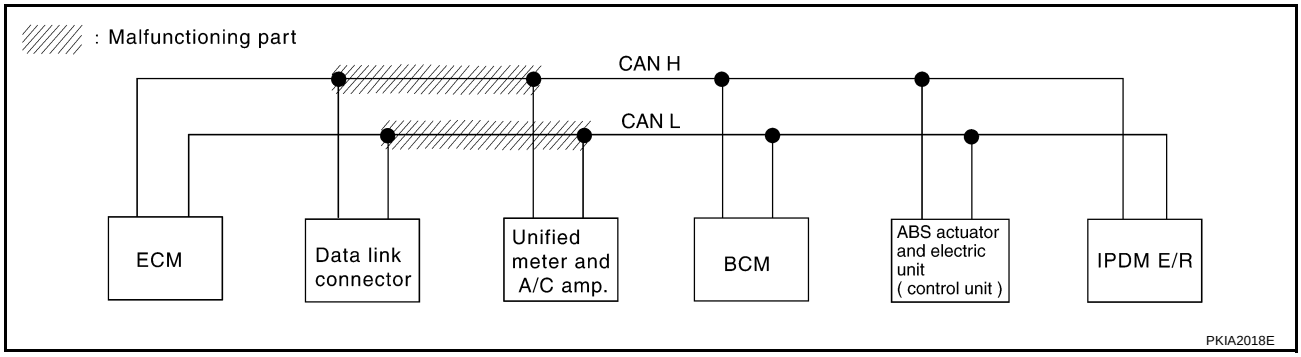
If “NG” is displayed on “INITIAL DIAG (Initial diagnosis)” as “CAN DIAG SUPPORT MNTR” for the diagnosed control unit, replace the control unit.

Case 1

Check harness between data link connector and unified meter and A/C amp. Refer to LAN-54, "Circuit Check Between Data Link Connector and Unified Meter and A/C Amp." .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN ✓	UNKWN ✓	UNKWN ✓	UNKWN ✓
METER A/C AMP	No indication ✓	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication ✓	NG	UNKWN	UNKWN	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN	UNKWN ✓	–	–	–	–
IPDM E/R	No indication ✓	–	UNKWN	UNKWN	–	UNKWN	–	–

PKIA8216E



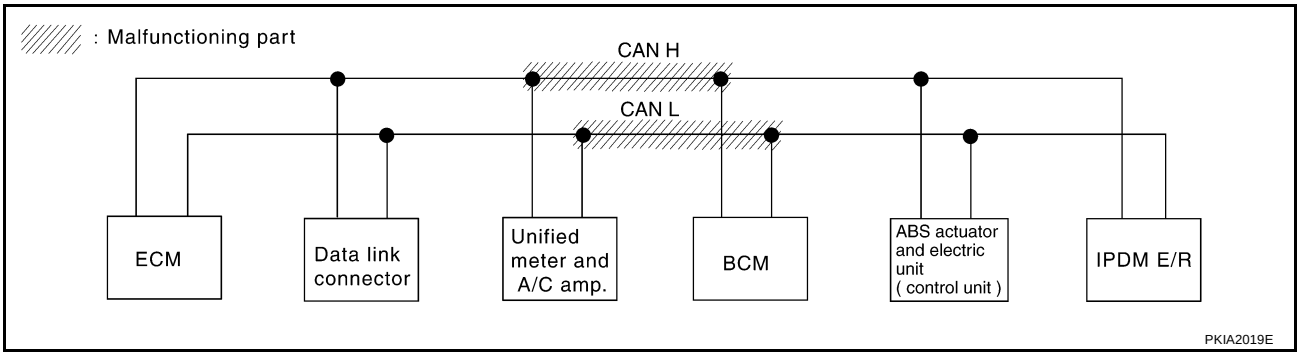
PKIA2018E

Case 2

Check harness between unified meter and A/C amp. and BCM. Refer to LAN-54, "Circuit Check Between Unified Meter and A/C Amp. and BCM" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	UNKWN	UNKWN
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN	UNKWN	–	–	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	UNKWN	–	–

PKIA8217E



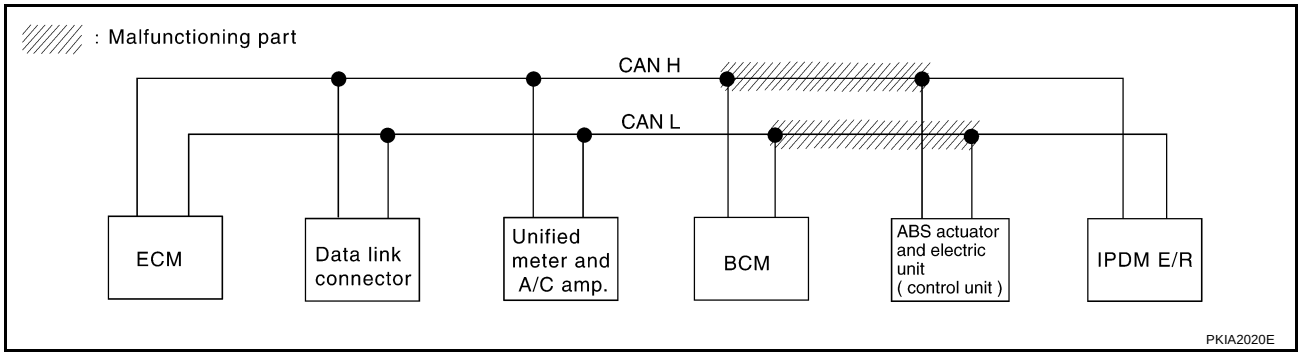
PKIA2019E

Case 3

Check harness between BCM and ABS actuator and electric unit (control unit). Refer to LAN-54, "Circuit Check Between BCM and ABS Actuator and Electric Unit (Control Unit)" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	—	NG	UNKWN	—	UNKWN	UNKWN	UNKWN ✓	UNKWN ✓
METER A/C AMP	No indication	—	UNKWN	UNKWN	—	UNKWN	UNKWN ✓	—
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	—	—	UNKWN ✓
ABS	—	NG	UNKWN	UNKWN ✓	—	—	—	—
IPDM E/R	No indication ✓	—	UNKWN	UNKWN	—	UNKWN	—	—

PKIA8218E



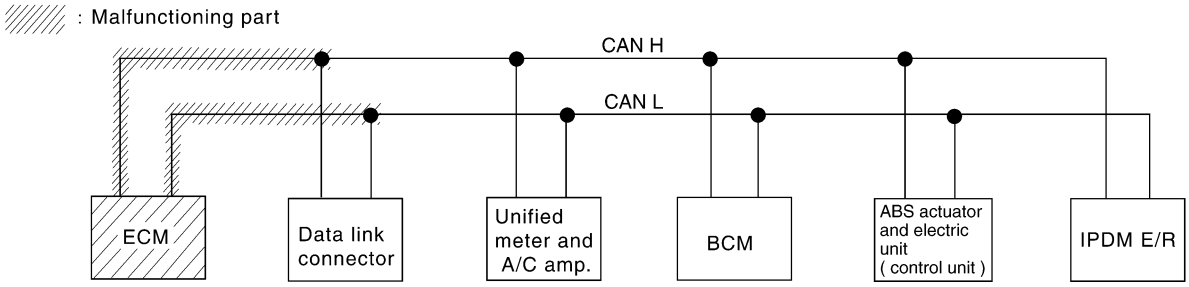
PKIA2020E

Case 4

Check ECM circuit. Refer to LAN-55, "ECM Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN ✓	–	UNKWN ✓	UNKWN ✓	UNKWN ✓	UNKWN ✓
METER A/C AMP	No indication	–	UNKWN	UNKWN ✓	–	UNKWN	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN ✓	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN	UNKWN ✓	–	–	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN ✓	–	UNKWN	–	–

PKIA8219E



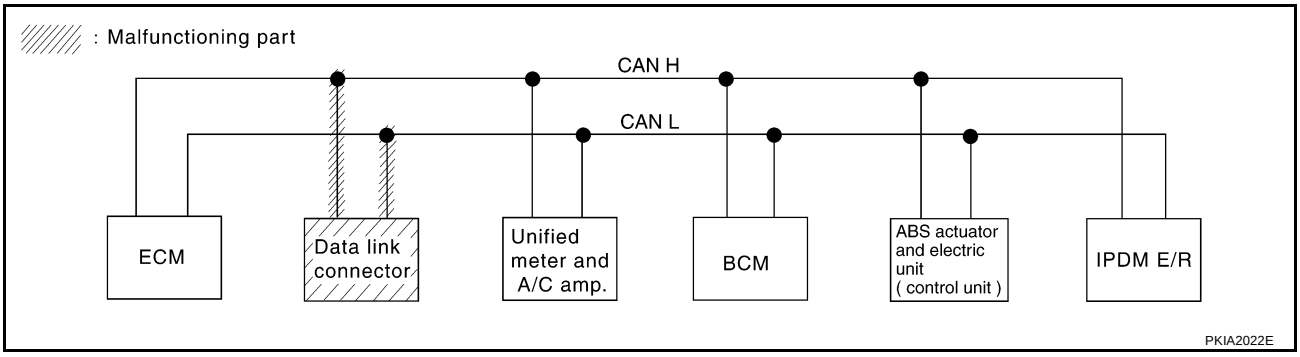
PKIA2021E

Case 5

Check data link connector circuit. Refer to LAN-56, "Data Link Connector Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	UNKWN	UNKWN
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN	UNKWN	–	–	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	UNKWN	–	–

PKIA8220E



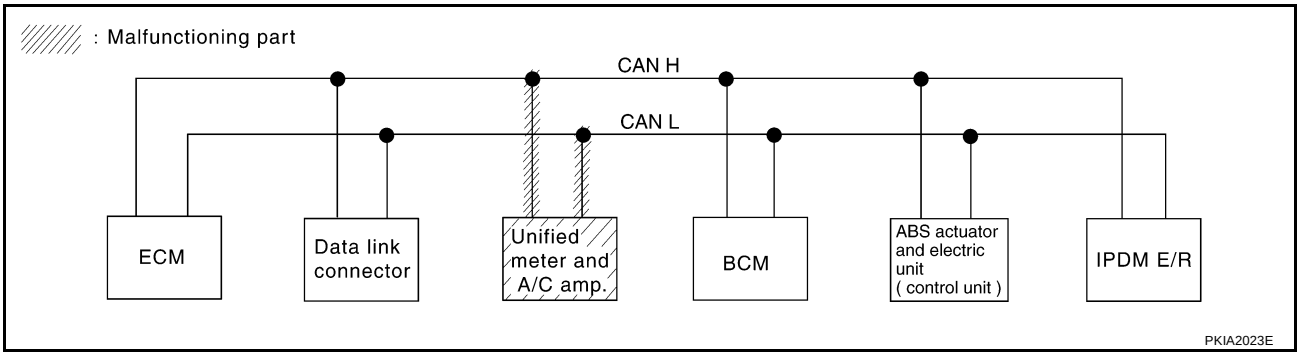
PKIA2022E

Case 6

Check unified meter and A/C amp. circuit. Refer to LAN-56, "Unified Meter and A/C Amp. Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	UNKWN	UNKWN
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN	UNKWN	–	–	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	UNKWN	–	–

PKIA8221E



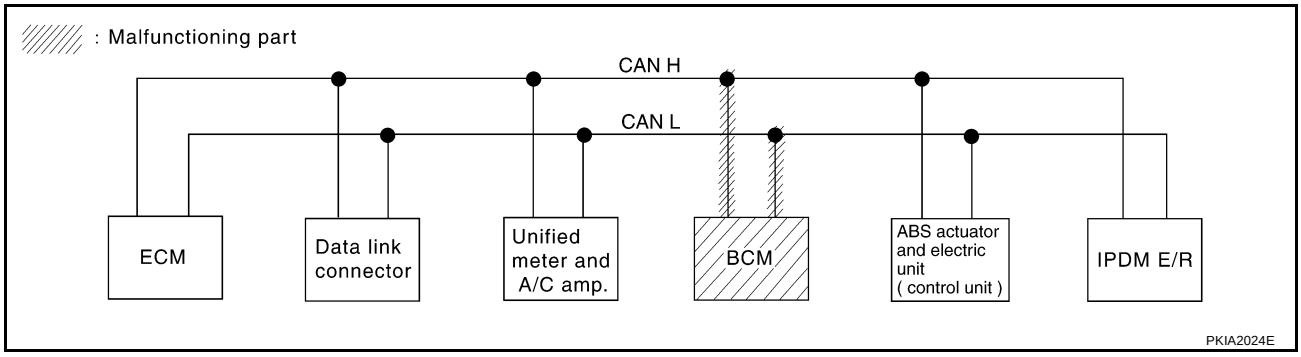
PKIA2023E

Case 7

Check BCM circuit. Refer to LAN-57, "BCM Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	—	NG	UNKWN	—	UNKWN	UNKWN	UNKWN	UNKWN
METER A/C AMP	No indication	—	UNKWN	UNKWN	—	UNKWN	UNKWN	—
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	—	—	UNKWN
ABS	—	NG	UNKWN	UNKWN	—	—	—	—
IPDM E/R	No indication	—	UNKWN	UNKWN	—	UNKWN	—	—

PKIA8222E



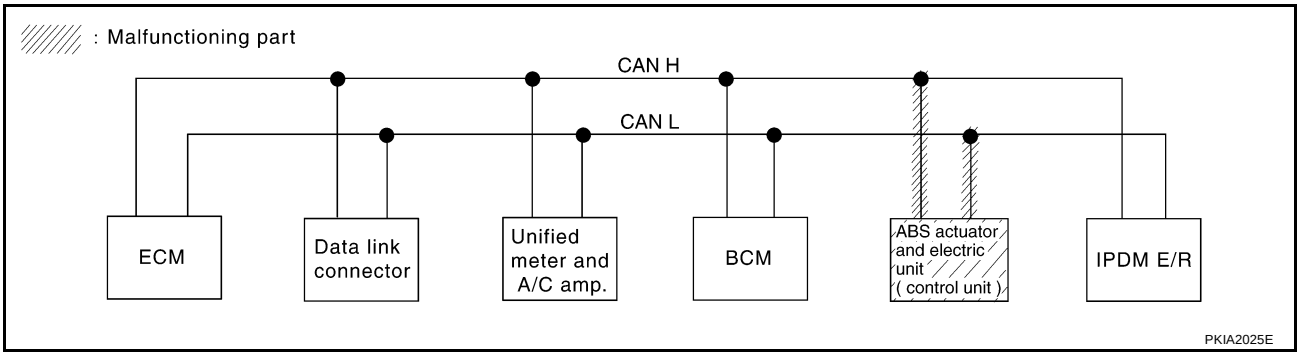
PKIA2024E

Case 8

Check ABS actuator and electric unit (control unit) circuit. Refer to LAN-57, "ABS Actuator and Electric Unit (Control Unit) Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	—	NG	UNKWN	—	UNKWN	UNKWN	UNKWN	UNKWN
METER A/C AMP	No indication	—	UNKWN	UNKWN	—	UNKWN	UNKWN	—
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	—	—	UNKWN
ABS	—	NG	UNKWN	UNKWN	—	—	—	—
IPDM E/R	No indication	—	UNKWN	UNKWN	—	UNKWN	—	—

PKIA8223E



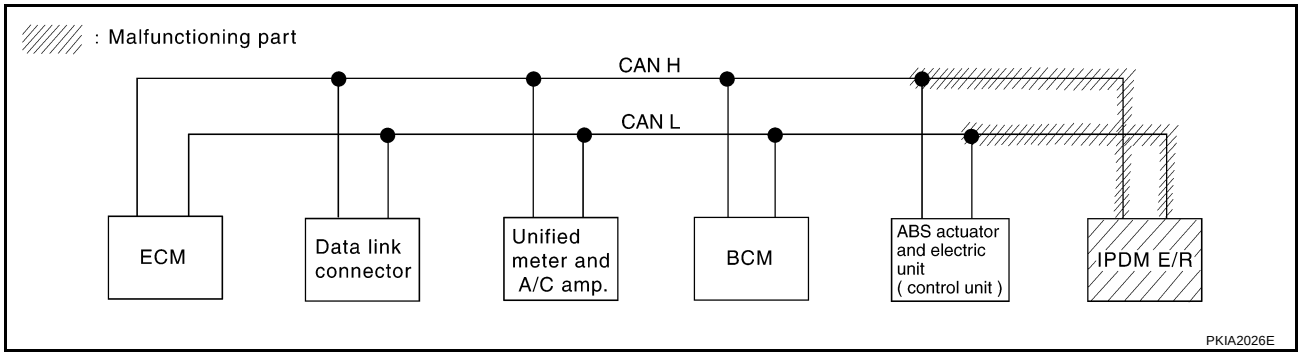
PKIA2025E

Case 9

Check IPDM E/R circuit. Refer to LAN-58, "IPDM E/R Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	UNKWN	UNKWN
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN	UNKWN	–	–	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	UNKWN	–	–

PKIA8224E



PKIA2026E

Case 10

Check CAN communication circuit. Refer to LAN-59, "CAN Communication Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	UNKWN	UNKWN
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN	UNKWN	–	–	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	UNKWN	–	–

PKIA8225E

Case 11

Check IPDM E/R ignition relay circuit continuously sticks “OFF”. Refer to LAN-61, "IPDM E/R Ignition Relay Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	UNKWN	UNKWN
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN	UNKWN	–	–	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	UNKWN	–	–

PKIA8226E

Case 12

Check IPDM E/R ignition relay circuit continuously sticks “ON”. Refer to LAN-61, "IPDM E/R Ignition Relay Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	UNKWN	UNKWN
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN	UNKWN	–	–	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	UNKWN	–	–

PKIA8227E

Circuit Check Between Data Link Connector and Unified Meter and A/C Amp.

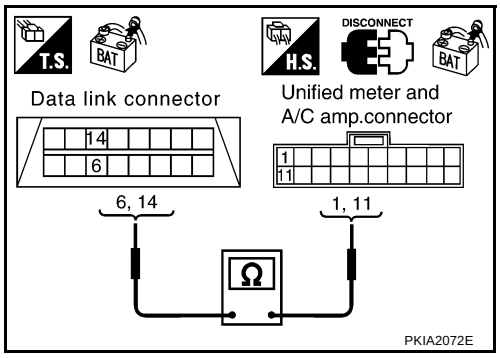
AKS00A9B

1. CHECK HARNESS FOR OPEN CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Disconnect ECM connector and unified meter and A/C amp. connector.
4. Check continuity between data link connector M8 terminals 6 (L), 14 (P) and unified meter and A/C amp. harness connector M48 terminals 1 (L), 11 (P).

6 (L) – 1 (L) : Continuity should exist.

14 (P) – 11 (P) : Continuity should exist.



OK or NG

OK >> Connect all the connectors and diagnose again. Refer to LAN-41, "Work Flow" .

NG >> Repair harness.

Circuit Check Between Unified Meter and A/C Amp. and BCM

AKS00A9C

1. CHECK HARNESS FOR OPEN CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Disconnect the following connectors.

– ECM connector

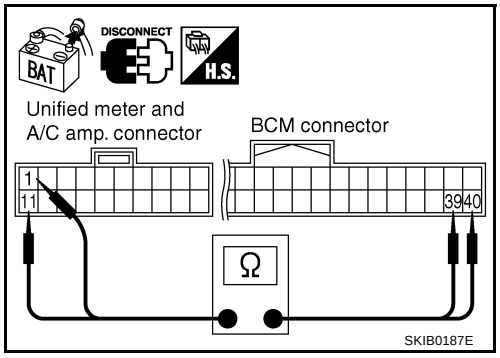
– Unified meter and A/C amp. connector

– BCM connector

4. Check continuity between unified meter and A/C amp. harness connector M48 terminals 1 (L), 11 (P) and BCM harness connector M90 terminals 39 (L), 40 (P).

1 (L) – 39 (L) : Continuity should exist.

11 (P) – 40 (P) : Continuity should exist.



OK or NG

OK >> Connect all the connectors and diagnose again. Refer to LAN-41, "Work Flow" .

NG >> Repair harness.

Circuit Check Between BCM and ABS Actuator and Electric Unit (Control Unit)

AKS00A9D

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check following terminals and connector for damage, bend and loose connection (connector side and harness side).

– Harness connector M15

– Harness connector E108

OK or NG

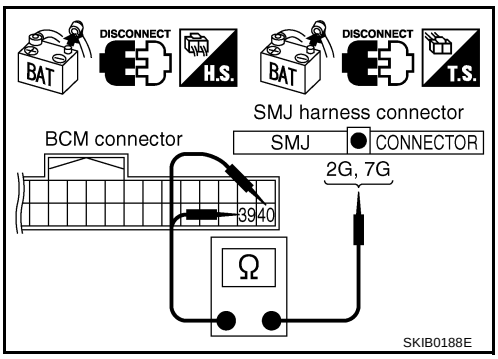
OK >> GO TO 2.

NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect BCM connector and harness connector M15.
2. Check continuity between BCM harness connector M90 terminals 39 (L), 40 (P) and harness connector M15 terminals 2G (L), 7G (P).

39 (L) – 2G (L) : Continuity should exist.
40 (P) – 7G (P) : Continuity should exist.



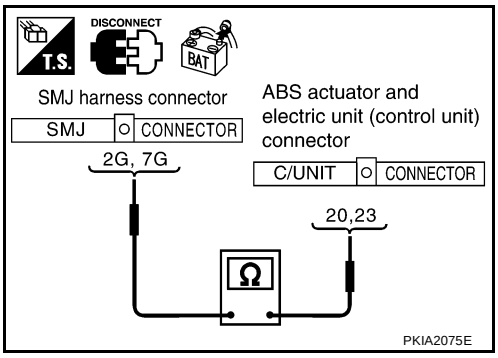
OK or NG

OK >> GO TO 3.
NG >> Repair harness.

3. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check continuity between harness connector E108 terminals 2G (L), 7G (P) and ABS actuator and electric unit (control unit) harness connector E51 terminals 20 (L), 23 (P).

2G (L) – 20 (L) : Continuity should exist.
7G (P) – 23 (P) : Continuity should exist.



OK or NG

OK >> Connect all the connectors and diagnose again. Refer to LAN-41, "Work Flow" .
NG >> Repair harness.

ECM Circuit Check

AKS00A9E

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check following terminals and connector for damage, bend and loose connection (control module side and harness side).

- ECM connector
- Harness connector F102
- Harness connector M72

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

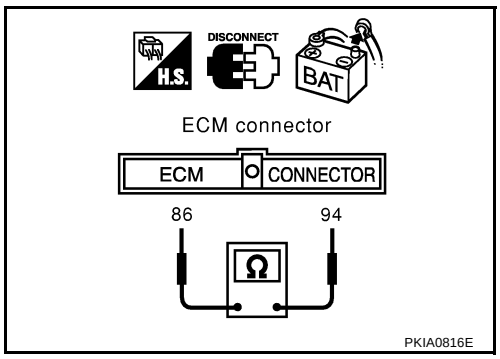
2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ECM connector.
2. Check resistance between ECM harness connector F101 terminals 94 (L) and 86 (P).

94 (L) – 86 (P) : Approx. 108 – 132Ω

OK or NG

OK >> Replace ECM.
NG >> Repair harness between ECM and data link connector.



Data Link Connector Circuit Check

AKS00A9F

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check terminals and connector of data link connector for damage, bend and loose connection (connector side and harness side).

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

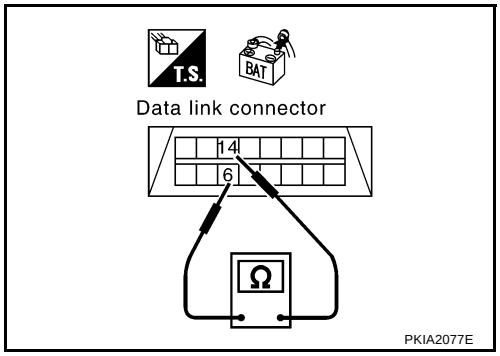
2. CHECK HARNESS FOR OPEN CIRCUIT

Check resistance between data link connector M8 terminals 6 (L) and 14 (P).

6 (L) – 14 (P) : Approx. 54 – 66Ω

OK or NG

OK >> Diagnose again. Refer to LAN-41, "Work Flow" .
NG >> Repair harness between data link connector and unified meter and A/C amp.



Unified Meter and A/C Amp. Circuit Check

AKS00A9G

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check terminals and connector of unified meter and A/C amp. for damage, bend and loose connection (meter side and harness side).

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

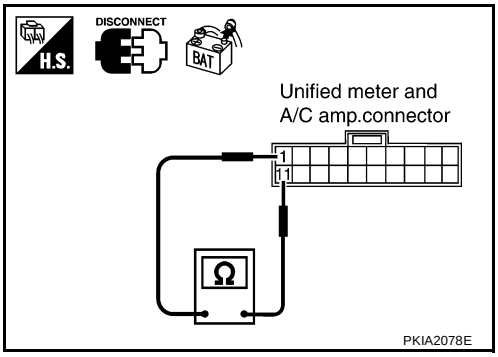
2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect unified meter and A/C amp. connector.
2. Check resistance between unified meter and A/C amp. harness connector M48 terminals 1 (L) and 11 (P).

1 (L) – 11 (P) : Approx. 54 – 66Ω

OK or NG

OK >> Replace unified meter and A/C amp.
NG >> Repair harness between unified meter and A/C amp. and BCM.



BCM Circuit Check

AKS00A9H

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check terminals and connector of BCM for damage, bend and loose connection (control module side and harness side).

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

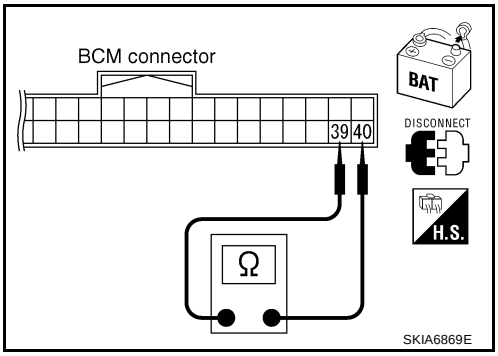
2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect BCM connector.
2. Check resistance between BCM harness connector M90 terminals 39 (L) and 40 (P).

39 (L) – 40 (P) : Approx. 54 – 66Ω

OK or NG

OK >> Replace BCM.
NG >> Repair harness between BCM and harness connector M15.



ABS Actuator and Electric Unit (Control Unit) Circuit Check

AKS00A9I

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check terminals and connector of ABS actuator and electric unit (control unit) for damage, bend and loose connection (control unit side and harness side).

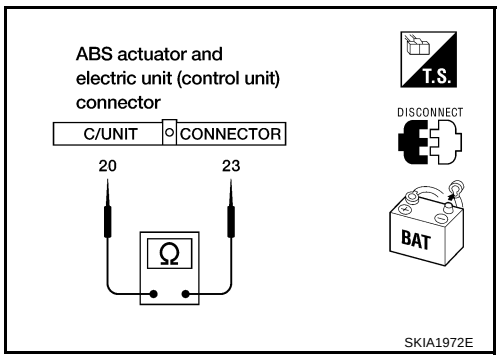
OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check resistance between ABS actuator and electric unit (control unit) harness connector E51 terminals 20 (L) and 23 (P).

20 (L) – 23 (P) : Approx. 54 – 66Ω



OK or NG

OK >> Replace ABS actuator and electric unit (control unit).
NG >> Repair harness between ABS actuator and electric unit (control unit) and IPDM E/R.

IPDM E/R Circuit Check

AKS00A9J

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check terminals and connector of IPDM E/R for damage, bend and loose connection (control module side and harness side).

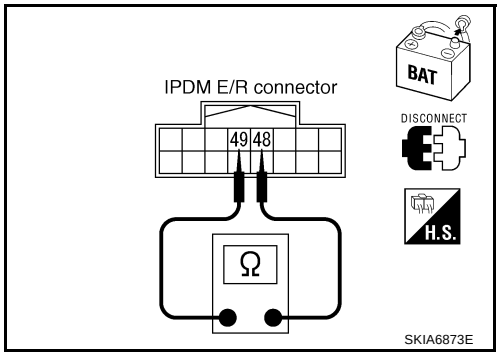
OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect IPDM E/R connector.
2. Check resistance between IPDM E/R harness connector E9 terminals 48 (L) and 49 (P).

48 (L) – 49 (P) : Approx. 108 – 132Ω



OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness between IPDM E/R and ABS actuator and electric unit (control unit).

CAN Communication Circuit Check

AKS00A9K

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check following terminals and connector for damage, bend and loose connection (control module side, meter side, control unit side and harness side).

- ECM
- Unified meter and A/C amp.
- BCM
- ABS actuator and electric unit (control unit)
- IPDM E/R
- Between ECM and IPDM E/R

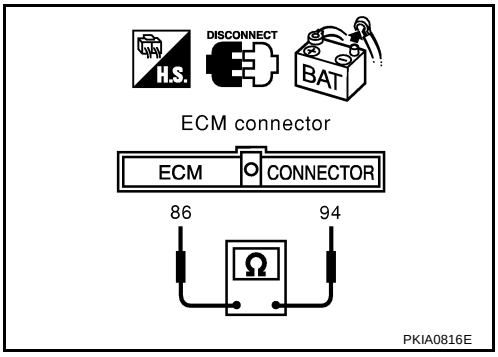
OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect ECM connector and harness connector F102.
2. Check continuity between ECM harness connector F101 terminals 94 (L) and 86 (P).

94 (L) – 86 (P) : Continuity should not exist.



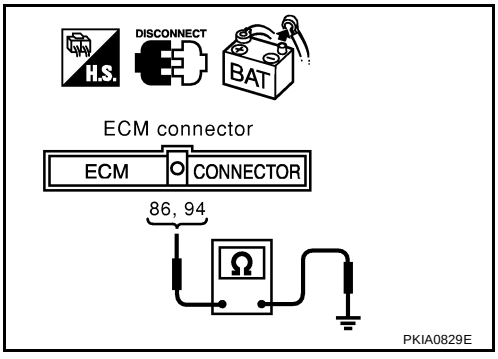
OK or NG

OK >> GO TO 3.
NG >> Repair harness between ECM and harness connector F102.

3. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between ECM harness connector F101 terminals 94 (L), 86 (P) and ground.

94 (L) – ground : Continuity should not exist.
86 (P) – ground : Continuity should not exist.



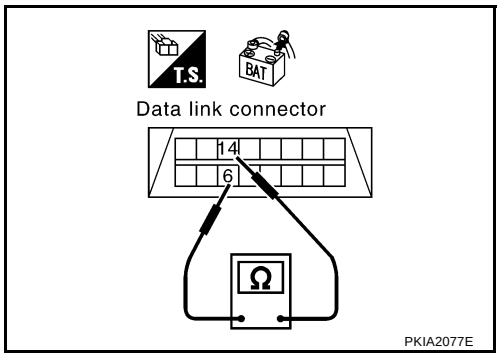
OK or NG

OK >> GO TO 4.
NG >> Repair harness between ECM and harness connector F102.

4. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect following connectors.
- Unified meter and A/C amp. connector
- BCM connector
- Harness connector M15
2. Check continuity between data link connector M8 terminals 6 (L) and 14 (P).

6 (L) – 14 (P) : Continuity should not exist.



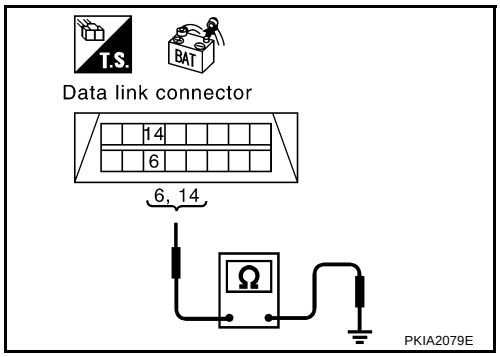
OK or NG

OK >> GO TO 5.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between data link connector and harness connector M72
- Harness between data link connector and unified meter and A/C amp.
- Harness between data link connector and BCM
- Harness between data link connector and harness connector M15

5. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between data link connector M8 terminals 6 (L), 14 (P) and ground.

6 (L) – ground : Continuity should not exist.
14 (P) – ground : Continuity should not exist.



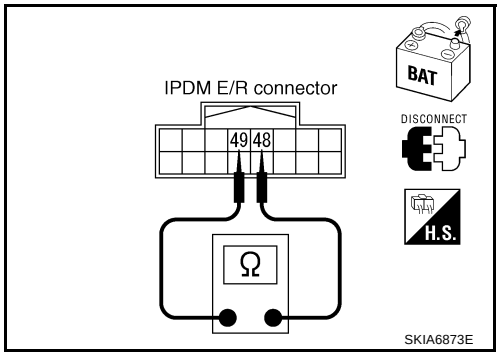
OK or NG

OK >> GO TO 6.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between data link connector and harness connector M72
- Harness between data link connector and unified meter and A/C amp.
- Harness between data link connector and BCM
- Harness between data link connector and harness connector M15

6. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector and IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector E9 terminals 48 (L) and 49 (P).

48 (L) – 49 (P) : Continuity should not exist.



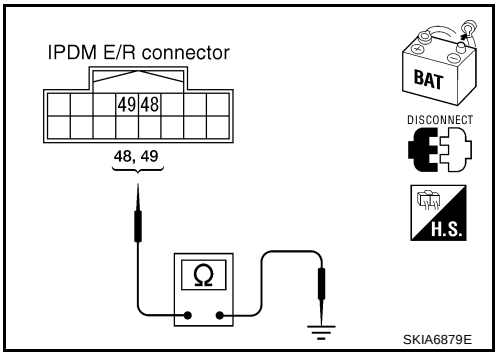
OK or NG

OK >> GO TO 7.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between IPDM E/R and ABS actuator and electric unit (control unit)
- Harness between IPDM E/R and harness connector E108

7. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between IPDM E/R harness connector E9 terminals 48 (L), 49 (P) and ground.

48 (L) – ground : Continuity should not exist.
49 (P) – ground : Continuity should not exist.



OK or NG

OK >> GO TO 8.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between IPDM E/R and ABS actuator and electric unit (control unit)
- Harness between IPDM E/R and harness connector E108

8. ECM/IPDM E/R INTERNAL CIRCUIT INSPECTION

Check components inspection. Refer to LAN-61, "ECM/IPDM E/R INTERNAL CIRCUIT INSPECTION" .

OK or NG

OK >> Connect all the connectors and diagnose again. Refer to LAN-41, "Work Flow" .
NG >> Replace ECM and/or IPDM E/R.

IPDM E/R Ignition Relay Circuit Check

AKS00A9L

Check the following. If no malfunction is found, replace the IPDM E/R.

- IPDM E/R power supply circuit. Refer to PG-28, "IPDM E/R Power/Ground Circuit Inspection" .
- Ignition power supply circuit. Refer to PG-11, "IGNITION POWER SUPPLY — IGNITION SW. IN “ON” AND/OR “START”" .

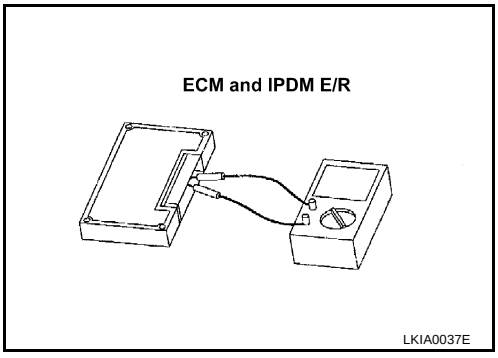
Component Inspection

AKS00A9M

ECM/IPDM E/R INTERNAL CIRCUIT INSPECTION

- Remove ECM and IPDM E/R from vehicle.
- Check resistance between ECM terminals 94 and 86.
- Check resistance between IPDM E/R terminals 48 and 49.

Unit	Terminal	Resistance value (Ω) (Approx.)
ECM	94 - 86	108 - 132
IPDM E/R	48 - 49	



CAN SYSTEM (TYPE 3)

PFP:23710

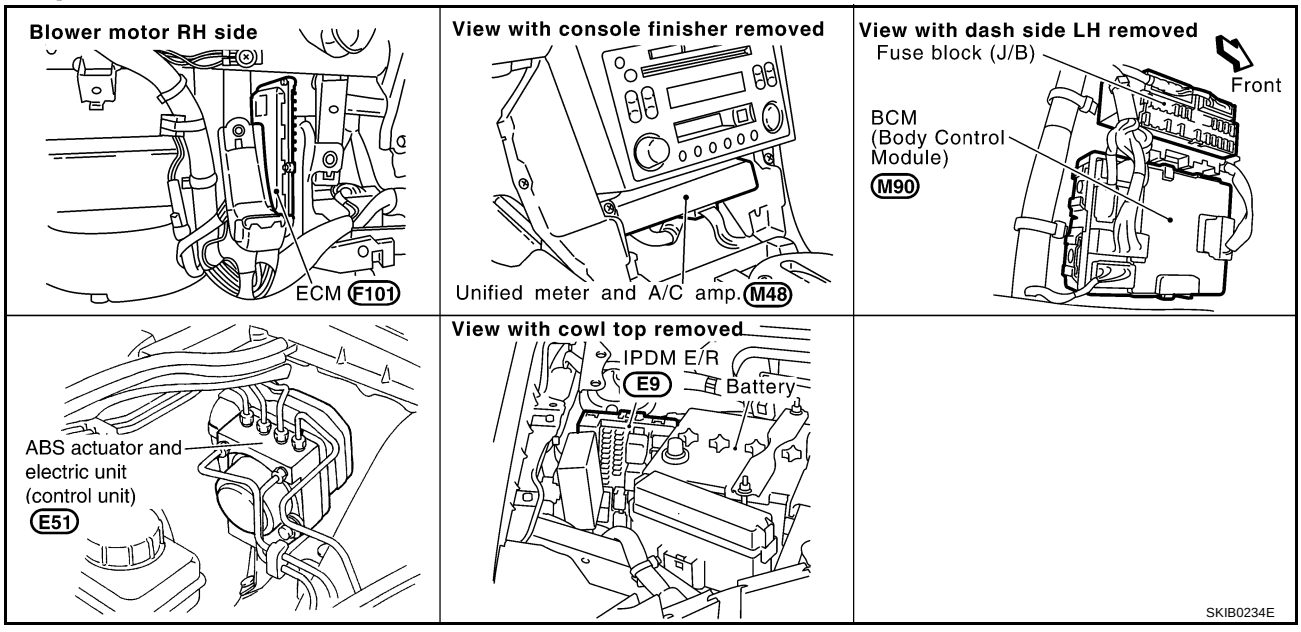
System Description

AKS009DC

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

Component Parts and Harness Connector Location

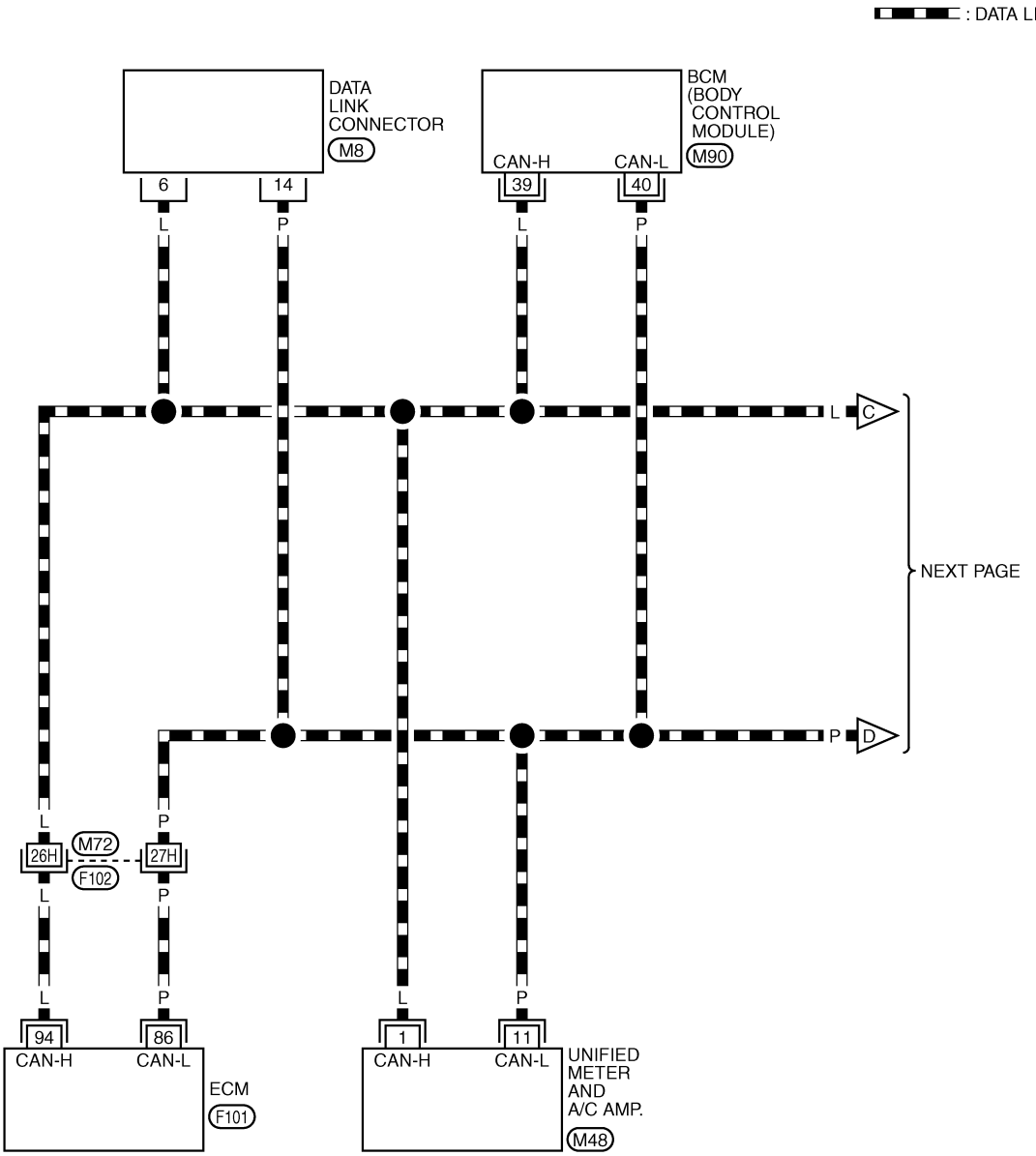
AKS009DD

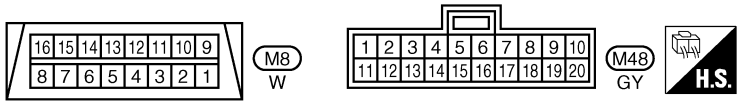


Wiring Diagram — CAN —

AKS009DE

LAN-CAN-03

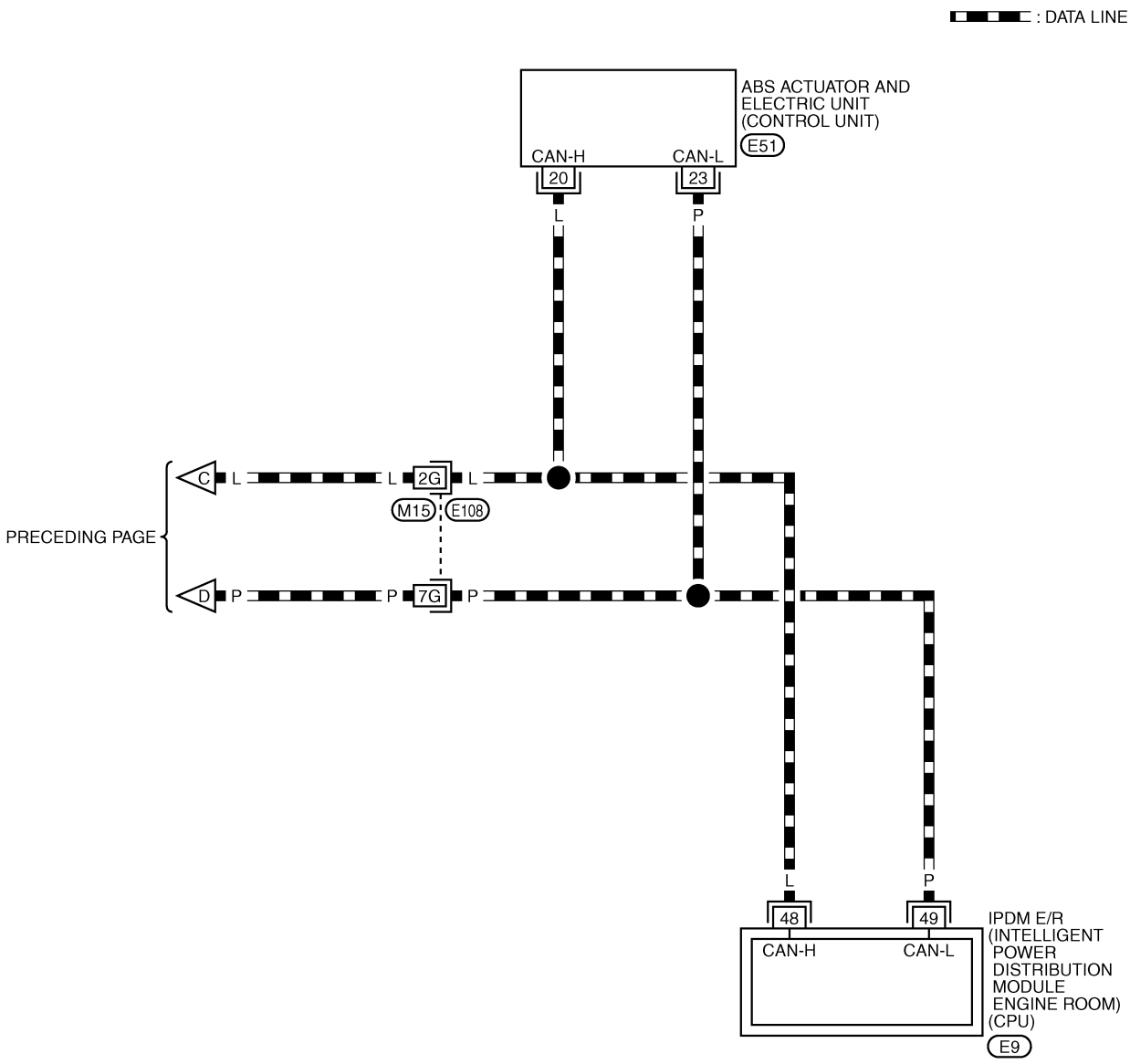


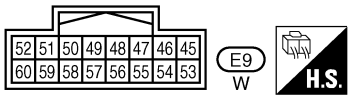


REFER TO THE FOLLOWING.
F102 -SUPER MULTIPLE JUNCTION (SMJ)
M90 , F101 -ELECTRICAL UNITS

TKWT1862E

LAN-CAN-04





REFER TO THE FOLLOWING.

E108 -SUPER MULTIPLE JUNCTION (SMJ)

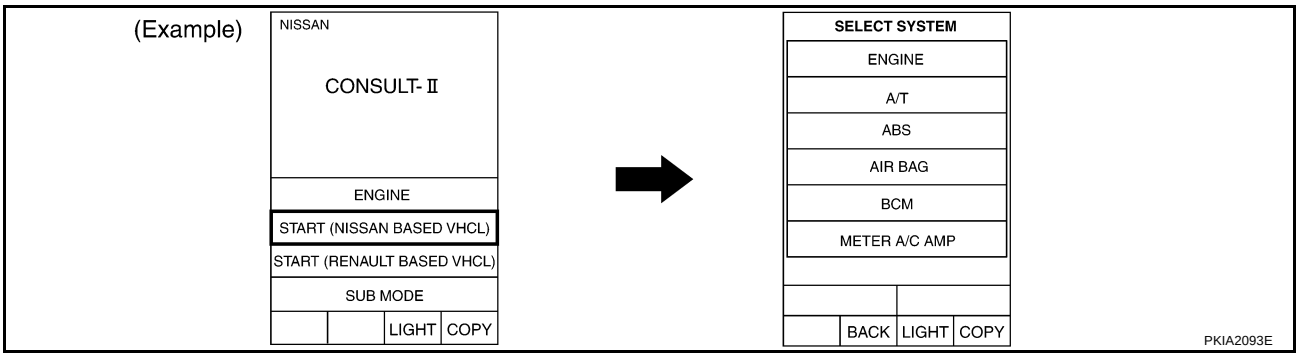
E51 -ELECTRICAL UNITS

TKWT1555E

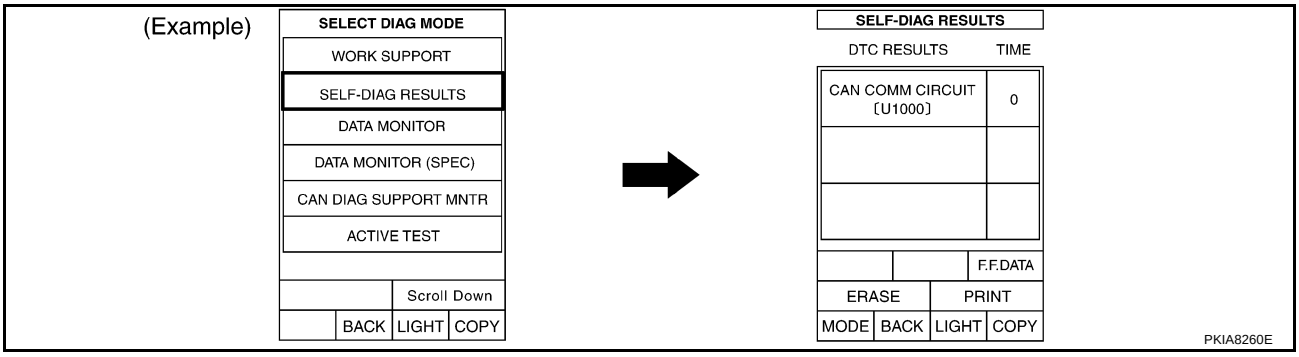
Work Flow

AKS00A9N

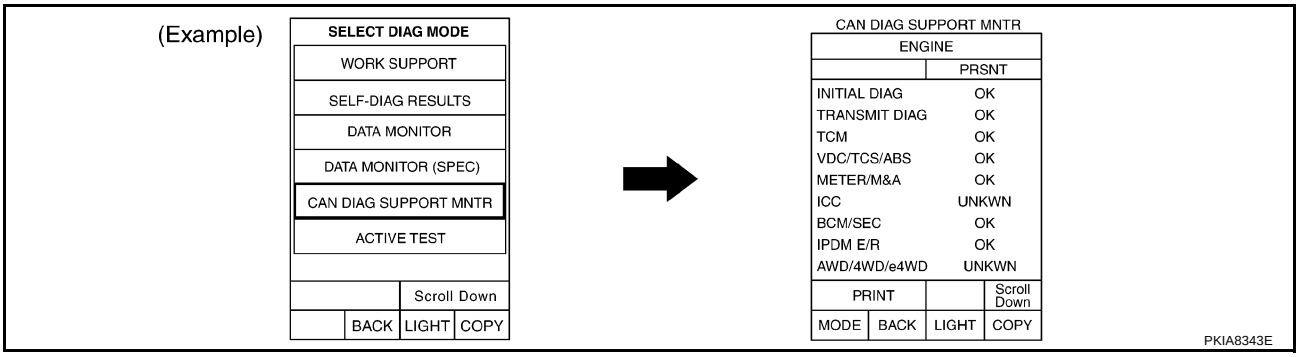
1. When there are no indications of “METER A/C AMP”, “BCM” or “IPDM E/R” on “SELECT SYSTEM” display of CONSULT-II, print the “SELECT SYSTEM”.



2. Print all the data of “SELF-DIAG RESULTS” for “ENGINE”, “METER A/C AMP”, “BCM”, “ABS” and “IPDM E/R” displayed on CONSULT-II.



3. Print all the data of “CAN DIAG SUPPORT MNTR” for “ENGINE”, “METER A/C AMP”, “BCM”, “ABS” and “IPDM E/R” displayed on CONSULT-II.



4. Attach the printed sheet of “SELECT SYSTEM”, “SELF-DIAG RESULTS” and “CAN DIAG SUPPORT MNTR” onto the check sheet. Refer to LAN-66, "CHECK SHEET" .
5. Based on the indications of “SELECT SYSTEM” and the results of “CAN DIAG SUPPORT MNTR”, put marks “v” onto the items with “No indication”, “NG”, or “UNKWN” in the check sheet table. Refer to LAN-66, "CHECK SHEET" .

   NOTE:
   - If “NG” is displayed on “INITIAL DIAG (Initial diagnosis)” as “CAN DIAG SUPPORT MNTR” for the diagnosed control unit, replace the control unit.
   - The “CAN DIAG SUPPORT MNTR” items, which are not in check sheet table, are not related to diagnostic procedure on service manual.
     So it is not necessary to check the status of the “CAN DIAG SUPPORT MNTR” items not in check sheet table.
6. According to the check sheet results (example), start inspection. Refer to LAN-68, "CHECK SHEET RESULTS (EXAMPLE)" .

CHECK SHEET

NOTE:

If “NG” is displayed on “INITIAL DIAG (Initial diagnosis)” as “CAN DIAG SUPPORT MNTR” for the diagnosed control unit, replace the control unit.

Check sheet table

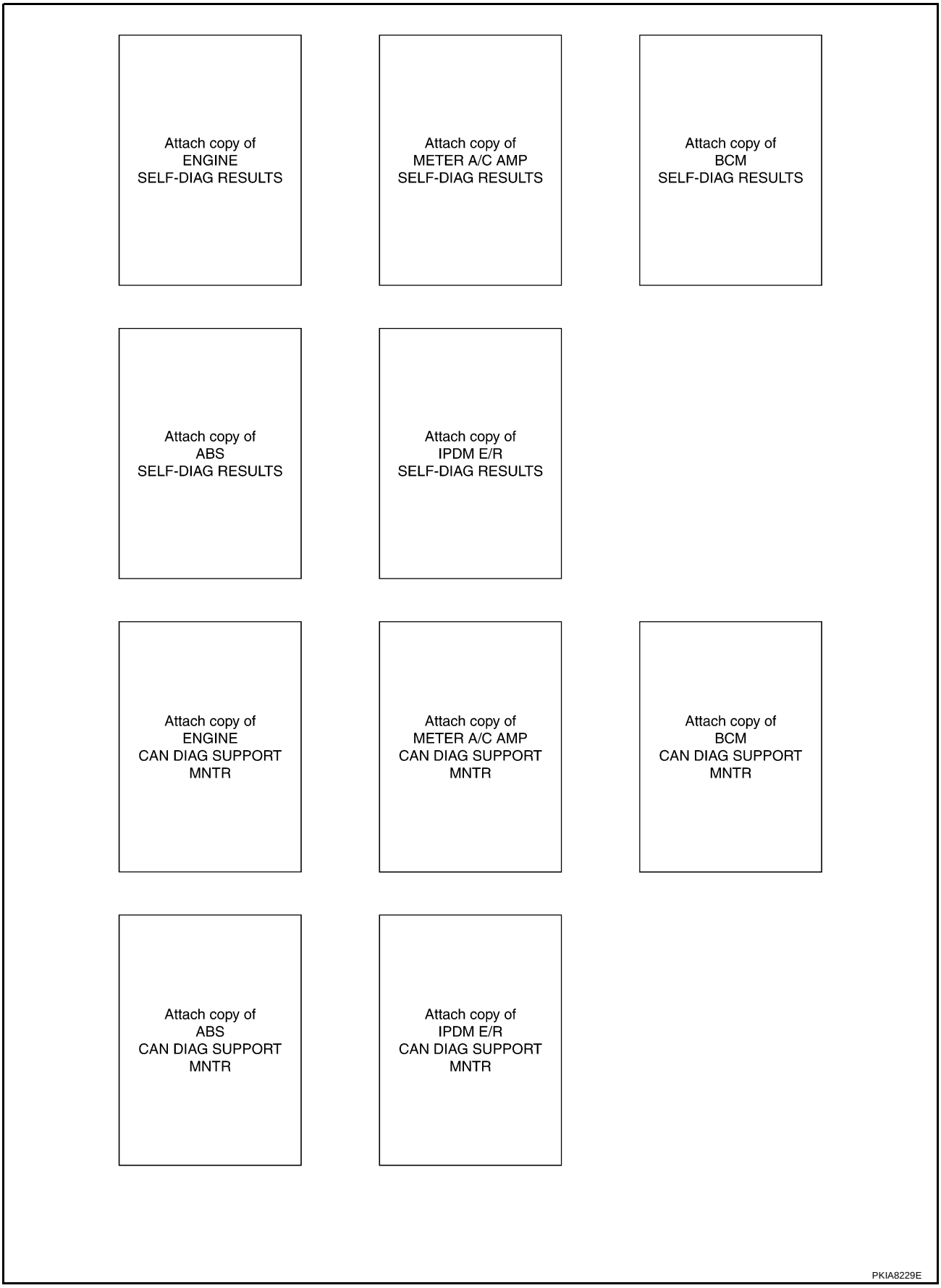
SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	—	NG	UNKWN	—	UNKWN	UNKWN	—	UNKWN
METER A/C AMP	No indication	—	UNKWN	UNKWN	—	UNKWN	UNKWN	—
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	—	—	UNKWN
ABS	—	NG	UNKWN	UNKWN	—	—	—	—
IPDM E/R	No indication	—	UNKWN	UNKWN	—	UNKWN	—	—

Symptoms :

Attach copy of SELECT SYSTEM

Attach copy of SELECT SYSTEM

PKIA8228E


Attach copy of
ENGINE
SELF-DIAG RESULTS
Attach copy of
METER A/C AMP
SELF-DIAG RESULTS
Attach copy of
BCM
SELF-DIAG RESULTS
Attach copy of
ABS
SELF-DIAG RESULTS
Attach copy of
IPDM E/R
SELF-DIAG RESULTS
Attach copy of
ENGINE
CAN DIAG SUPPORT
MNTR
Attach copy of
METER A/C AMP
CAN DIAG SUPPORT
MNTR
Attach copy of
BCM
CAN DIAG SUPPORT
MNTR
Attach copy of
ABS
CAN DIAG SUPPORT
MNTR
Attach copy of
IPDM E/R
CAN DIAG SUPPORT
MNTR
PKIA8229E

CHECK SHEET RESULTS (EXAMPLE)

NOTE:

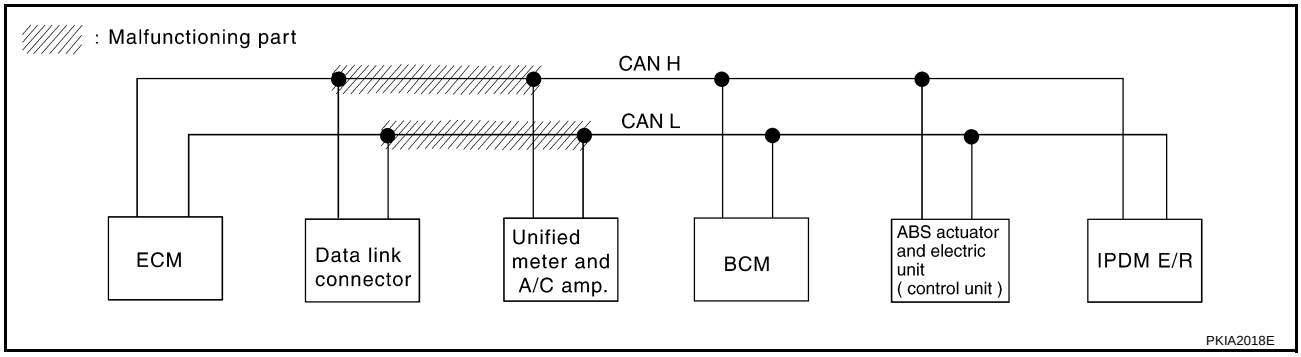
If “NG” is displayed on “INITIAL DIAG (Initial diagnosis)” as “CAN DIAG SUPPORT MNTR” for the diagnosed control unit, replace the control unit.

Case 1

Check harness between data link connector and unified meter and A/C amp. Refer to LAN-78, "Circuit Check Between Data Link Connector and Unified Meter and A/C Amp." .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN ✓	UNKWN ✓	–	UNKWN ✓
METER A/C AMP	No indication ✓	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication ✓	NG	UNKWN	UNKWN	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN	UNKWN ✓	–	–	–	–
IPDM E/R	No indication ✓	–	UNKWN	UNKWN	–	UNKWN	–	–

PKIA8230E



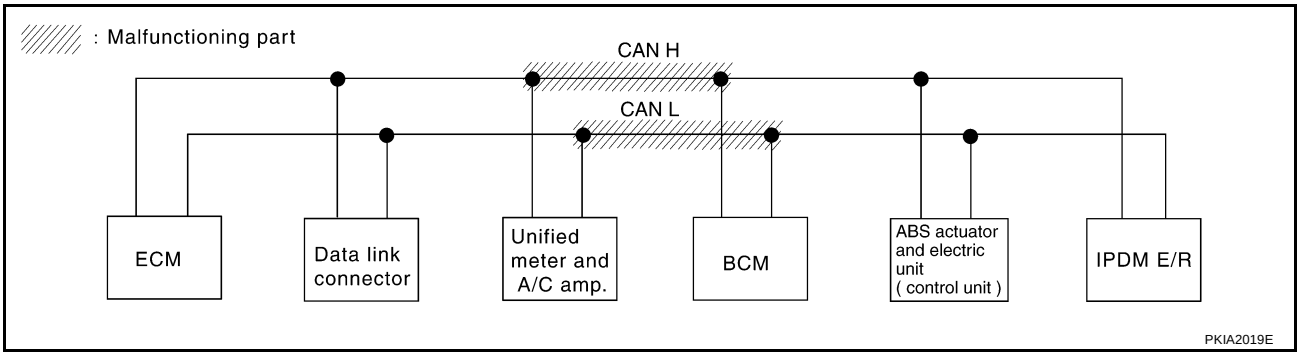
PKIA2018E

Case 2

Check harness between unified meter and A/C amp. and BCM. Refer to LAN-78, "Circuit Check Between Unified Meter and A/C Amp. and BCM" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	–	UNKWN
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN	UNKWN	–	–	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	UNKWN	–	–

PKIA8231E



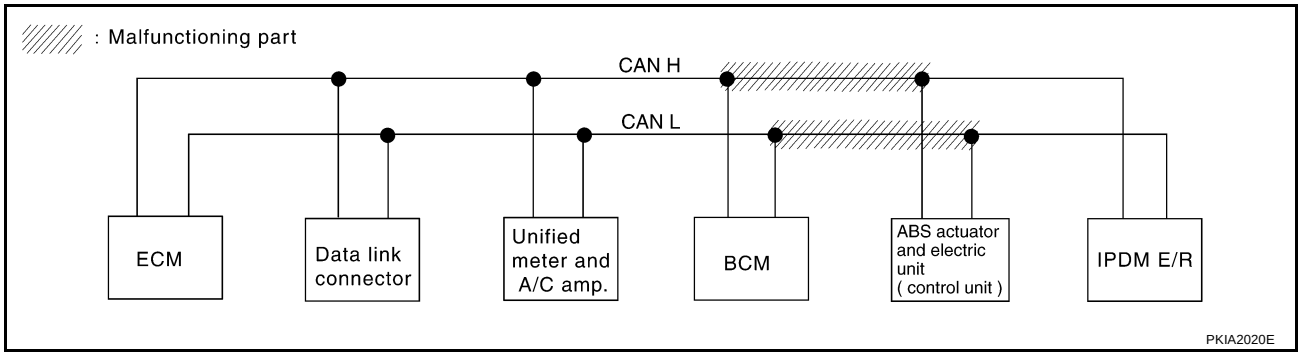
PKIA2019E

Case 3

Check harness between BCM and ABS actuator and electric unit (control unit). Refer to LAN-78, "Circuit Check Between BCM and ABS Actuator and Electric Unit (Control Unit)" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	–	UNKWN
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN	UNKWN	–	–	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	UNKWN	–	–

PKIA8232E



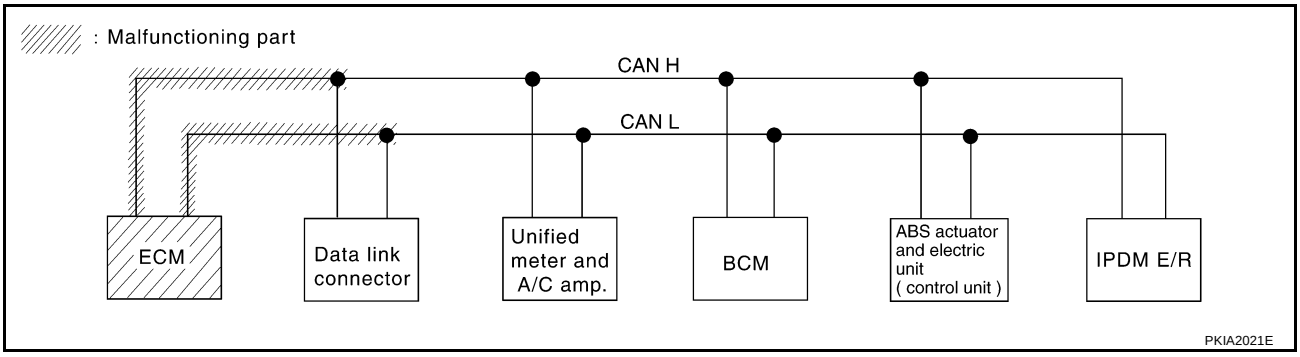
PKIA2020E

Case 4

Check ECM circuit. Refer to LAN-79, "ECM Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN ✓	–	UNKWN ✓	UNKWN ✓	–	UNKWN ✓
METER A/C AMP	No indication	–	UNKWN	UNKWN ✓	–	UNKWN	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN ✓	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN	UNKWN ✓	–	–	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN ✓	–	UNKWN	–	–

PKIA8233E



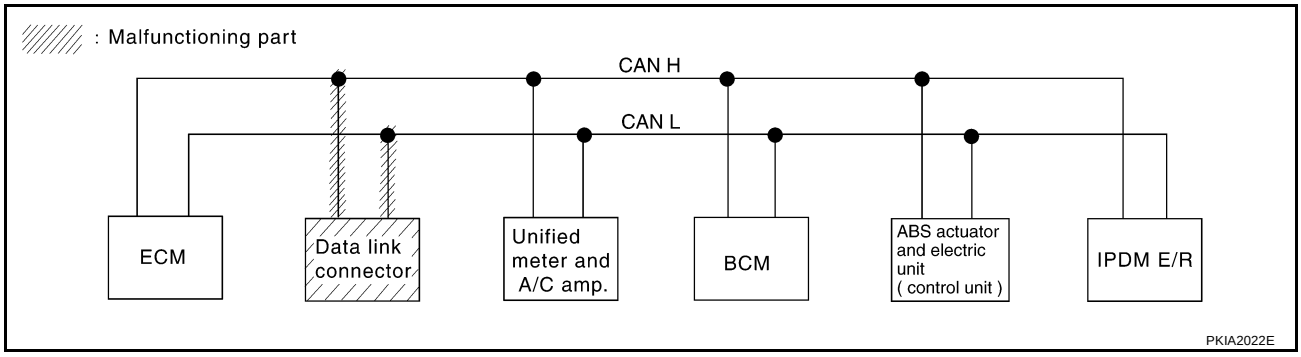
PKIA2021E

Case 5

Check data link connector circuit. Refer to LAN-80, "Data Link Connector Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	–	UNKWN
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN	UNKWN	–	–	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	UNKWN	–	–

PKIA8234E



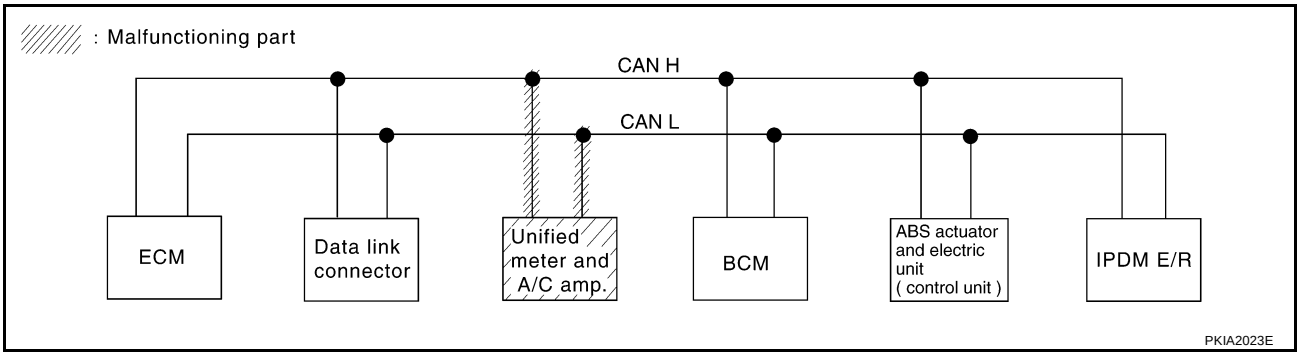
PKIA2022E

Case 6

Check unified meter and A/C amp. circuit. Refer to LAN-80, "Unified Meter and A/C Amp. Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	–	UNKWN
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN	UNKWN	–	–	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	UNKWN	–	–

PKIA8235E



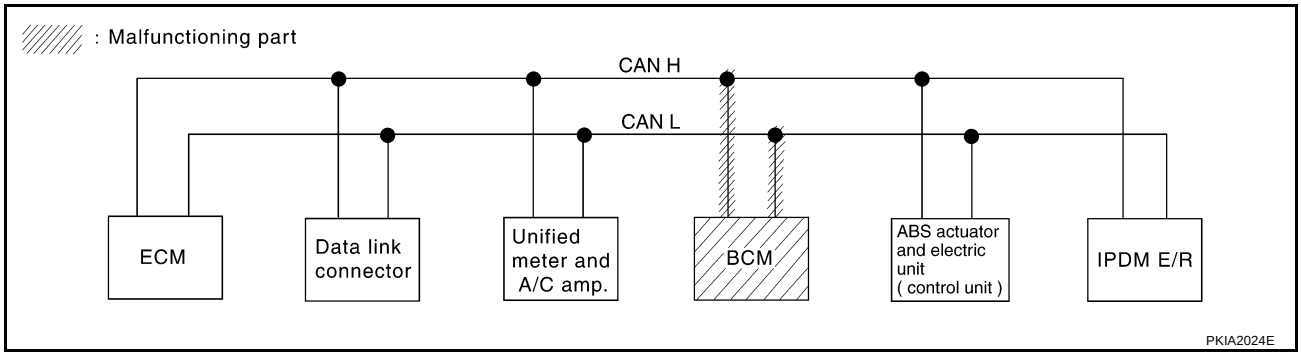
PKIA2023E

Case 7

Check BCM circuit. Refer to LAN-81, "BCM Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	–	UNKWN
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN	UNKWN	–	–	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	UNKWN	–	–

PKIA8236E



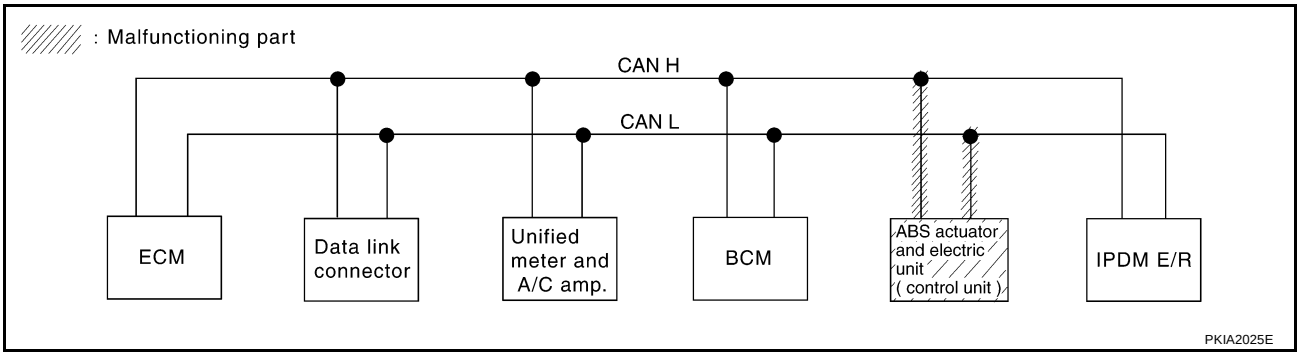
PKIA2024E

Case 8

Check ABS actuator and electric unit (control unit) circuit. Refer to LAN-81, "ABS Actuator and Electric Unit (Control Unit) Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	—	NG	UNKWN	—	UNKWN	UNKWN	—	UNKWN
METER A/C AMP	No indication	—	UNKWN	UNKWN	—	UNKWN	UNKWN	—
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	—	—	UNKWN
ABS	—	NG	UNKWN	UNKWN	—	—	—	—
IPDM E/R	No indication	—	UNKWN	UNKWN	—	UNKWN	—	—

PKIA8237E



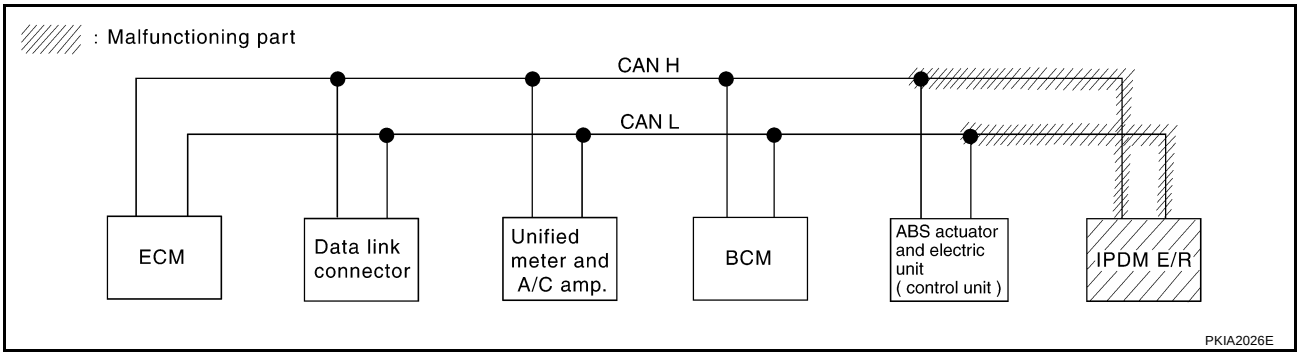
PKIA2025E

Case 9

Check IPDM E/R circuit. Refer to LAN-82, "IPDM E/R Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	–	UNKWN ✓
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	UNKWN ✓
ABS	–	NG	UNKWN	UNKWN	–	–	–	–
IPDM E/R	No indication ✓	–	UNKWN	UNKWN	–	UNKWN	–	–

PKIA8238E



PKIA2026E

Case 10

Check CAN communication circuit. Refer to LAN-83, "CAN Communication Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN ✓	–	UNKWN ✓	UNKWN ✓	–	UNKWN ✓
METER A/C AMP	No indication ✓	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication ✓	NG	UNKWN	UNKWN	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN ✓	UNKWN	–	–	–	–
IPDM E/R	No indication ✓	–	UNKWN	UNKWN	–	UNKWN	–	–

PKIA8239E

Case 11

Check IPDM E/R ignition relay circuit continuously sticks “OFF”. Refer to LAN-85, "IPDM E/R Ignition Relay Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	–	UNKWN
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN	UNKWN	–	–	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	UNKWN	–	–

PKIA8240E

Case 12

Check IPDM E/R ignition relay circuit continuously sticks “ON”. Refer to LAN-85, "IPDM E/R Ignition Relay Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR						
		Initial diagnosis	Transmit diagnosis	Receive diagnosis				
				ECM	METER/M&A	BCM/SEC	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	–	UNKWN
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	UNKWN
ABS	–	NG	UNKWN	UNKWN	–	–	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	UNKWN	–	–

PKIA8241E

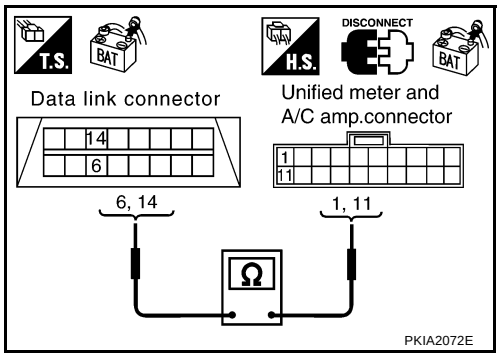
Circuit Check Between Data Link Connector and Unified Meter and A/C Amp.

AKS00A9O

1. CHECK HARNESS FOR OPEN CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Disconnect ECM connector and unified meter and A/C amp. connector.
4. Check continuity between data link connector M8 terminals 6 (L), 14 (P) and unified meter and A/C amp. harness connector M48 terminals 1 (L), 11 (P).

6 (L) – 1 (L) : Continuity should exist.
14 (P) – 11 (P) : Continuity should exist.



OK or NG

OK >> Connect all the connectors and diagnose again. Refer to LAN-65, "Work Flow" .
NG >> Repair harness.

Circuit Check Between Unified Meter and A/C Amp. and BCM

AKS00A9P

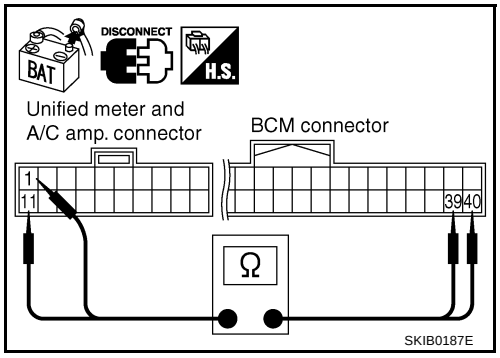
1. CHECK HARNESS FOR OPEN CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Disconnect the following connectors.

- ECM connector
- Unified meter and A/C amp. connector
- BCM connector

4. Check continuity between unified meter and A/C amp. harness connector M48 terminals 1 (L), 11 (P) and BCM harness connector M90 terminals 39 (L), 40 (P).

1 (L) – 39 (L) : Continuity should exist.
11 (P) – 40 (P) : Continuity should exist.



OK or NG

OK >> Connect all the connectors and diagnose again. Refer to LAN-65, "Work Flow" .
NG >> Repair harness.

Circuit Check Between BCM and ABS Actuator and Electric Unit (Control Unit)

AKS00A9Q

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check following terminals and connector for damage, bend and loose connection (connector side and harness side).

- Harness connector M15
- Harness connector E108

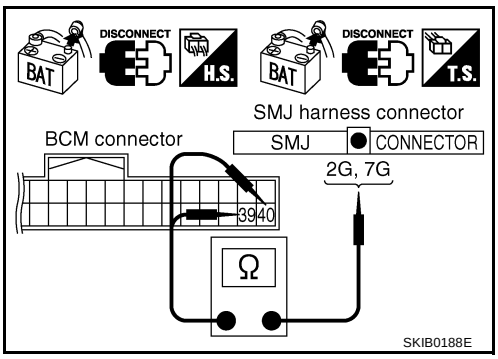
OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect BCM connector and harness connector M15.
2. Check continuity between BCM harness connector M90 terminals 39 (L), 40 (P) and harness connector M15 terminals 2G (L), 7G (P).

39 (L) – 2G (L) : Continuity should exist.
40 (P) – 7G (P) : Continuity should exist.



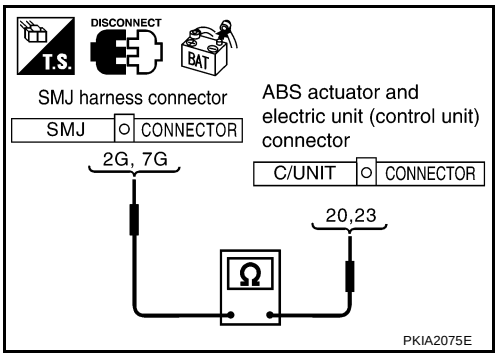
OK or NG

OK >> GO TO 3.
NG >> Repair harness.

3. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check continuity between harness connector E108 terminals 2G (L), 7G (P) and ABS actuator and electric unit (control unit) harness connector E51 terminals 20 (L), 23 (P).

2G (L) – 20 (L) : Continuity should exist.
7G (P) – 23 (P) : Continuity should exist.



OK or NG

OK >> Connect all the connectors and diagnose again. Refer to LAN-65, "Work Flow" .
NG >> Repair harness.

ECM Circuit Check

AKS00A9R

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check following terminals and connector for damage, bend and loose connection (control module side and harness side).

- ECM connector
- Harness connector F102
- Harness connector M72

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

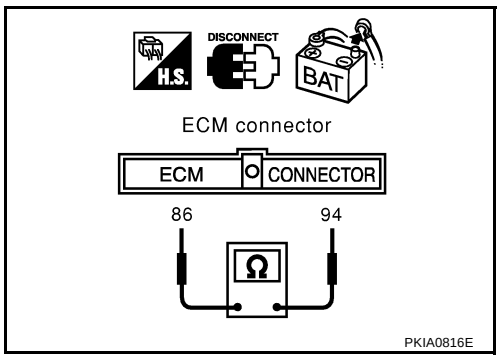
2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ECM connector.
2. Check resistance between ECM harness connector F101 terminals 94 (L) and 86 (P).

94 (L) – 86 (P) : Approx. 108 – 132Ω

OK or NG

OK >> Replace ECM.
NG >> Repair harness between ECM and data link connector.



Data Link Connector Circuit Check

AKS00A9S

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check terminals and connector of data link connector for damage, bend and loose connection (connector side and harness side).

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

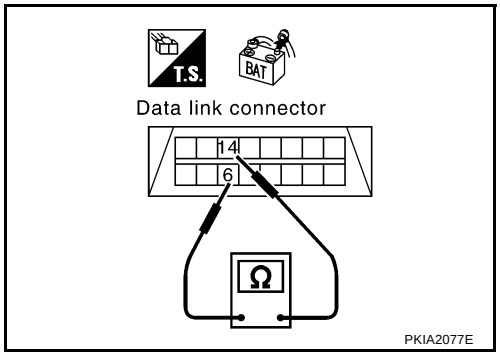
2. CHECK HARNESS FOR OPEN CIRCUIT

Check resistance between data link connector M8 terminals 6 (L) and 14 (P).

6 (L) – 14 (P) : Approx. 54 – 66Ω

OK or NG

OK >> Diagnose again. Refer to LAN-65, "Work Flow" .
NG >> Repair harness between data link connector and unified meter and A/C amp.



Unified Meter and A/C Amp. Circuit Check

AKS00A9T

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check terminals and connector of unified meter and A/C amp. for damage, bend and loose connection (meter side and harness side).

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

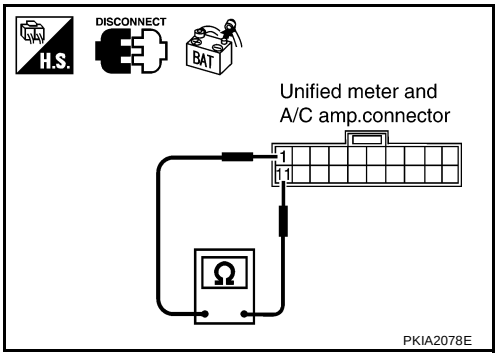
2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect unified meter and A/C amp. connector.
2. Check resistance between unified meter and A/C amp. harness connector M48 terminals 1 (L) and 11 (P).

1 (L) – 11 (P) : Approx. 54 – 66Ω

OK or NG

OK >> Replace unified meter and A/C amp.
NG >> Repair harness between unified meter and A/C amp. and BCM.



BCM Circuit Check

AKS00A9U

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check terminals and connector of BCM for damage, bend and loose connection (control module side and harness side).

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

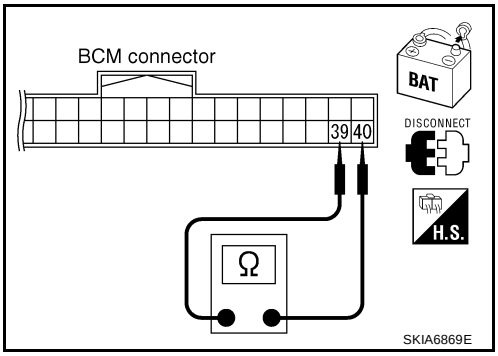
2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect BCM connector.
2. Check resistance between BCM harness connector M90 terminals 39 (L) and 40 (P).

39 (L) – 40 (P) : Approx. 54 – 66Ω

OK or NG

OK >> Replace BCM.
NG >> Repair harness between BCM and harness connector M15.



ABS Actuator and Electric Unit (Control Unit) Circuit Check

AKS00A9V

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check terminals and connector of ABS actuator and electric unit (control unit) for damage, bend and loose connection (control unit side and harness side).

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

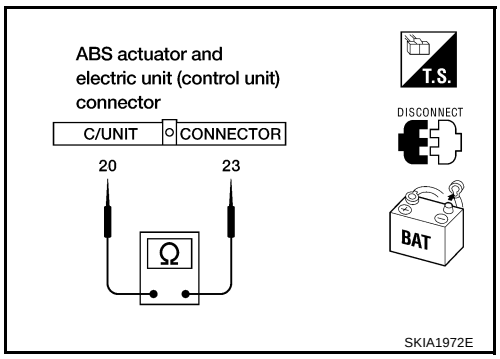
2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check resistance between ABS actuator and electric unit (control unit) harness connector E51 terminals 20 (L) and 23 (P).

20 (L) – 23 (P) : Approx. 54 – 66Ω

OK or NG

OK >> Replace ABS actuator and electric unit (control unit).
NG >> Repair harness between ABS actuator and electric unit (control unit) and IPDM E/R.



IPDM E/R Circuit Check

AKS00A9W

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check terminals and connector of IPDM E/R for damage, bend and loose connection (control module side and harness side).

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

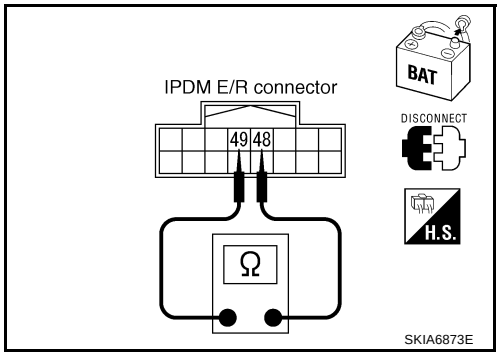
2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect IPDM E/R connector.
2. Check resistance between IPDM E/R harness connector E9 terminals 48 (L) and 49 (P).

48 (L) – 49 (P) : Approx. 108 – 132Ω

OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness between IPDM E/R and ABS actuator and electric unit (control unit).



CAN Communication Circuit Check

AKS00A9X

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check following terminals and connector for damage, bend and loose connection (control module side, meter side, control unit side and harness side).

- ECM
- Unified meter and A/C amp.
- BCM
- ABS actuator and electric unit (control unit)
- IPDM E/R
- Between ECM and IPDM E/R

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

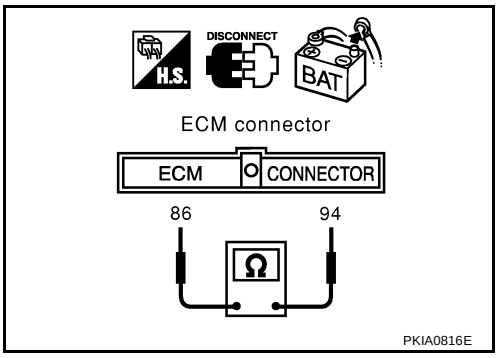
2. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect ECM connector and harness connector F102.
2. Check continuity between ECM harness connector F101 terminals 94 (L) and 86 (P).

94 (L) – 86 (P) : Continuity should not exist.

OK or NG

OK >> GO TO 3.
NG >> Repair harness between ECM and harness connector F102.



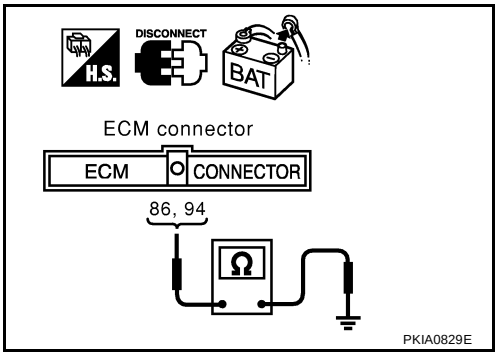
3. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between ECM harness connector F101 terminals 94 (L), 86 (P) and ground.

94 (L) – ground : Continuity should not exist.
86 (P) – ground : Continuity should not exist.

OK or NG

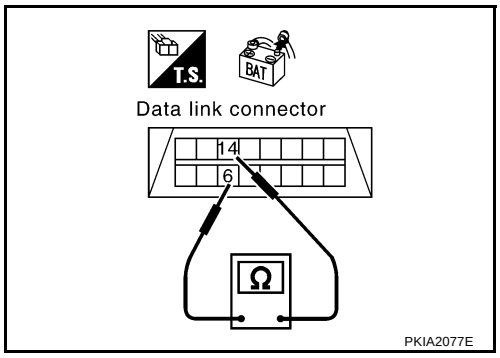
OK >> GO TO 4.
NG >> Repair harness between ECM and harness connector F102.



4. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect following connectors.
- Unified meter and A/C amp. connector
- BCM connector
- Harness connector M15
2. Check continuity between data link connector M8 terminals 6 (L) and 14 (P).

6 (L) – 14 (P) : Continuity should not exist.



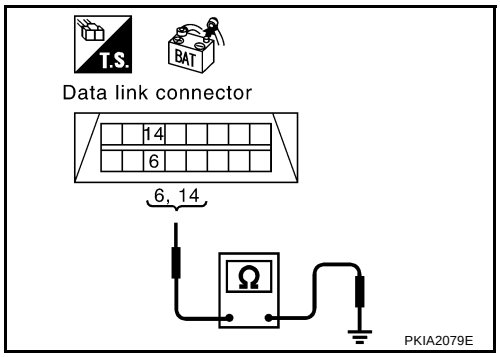
OK or NG

OK >> GO TO 5.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between data link connector and harness connector M72
- Harness between data link connector and unified meter and A/C amp.
- Harness between data link connector and BCM
- Harness between data link connector and harness connector M15

5. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between data link connector M8 terminals 6 (L), 14 (P) and ground.

6 (L) – ground : Continuity should not exist.
14 (P) – ground : Continuity should not exist.



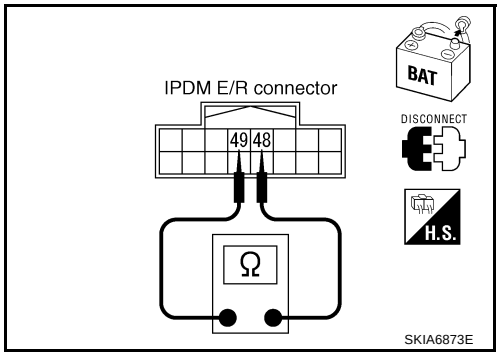
OK or NG

OK >> GO TO 6.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between data link connector and harness connector M72
- Harness between data link connector and unified meter and A/C amp.
- Harness between data link connector and BCM
- Harness between data link connector and harness connector M15

6. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector and IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector E9 terminals 48 (L) and 49 (P).

48 (L) – 49 (P) : Continuity should not exist.



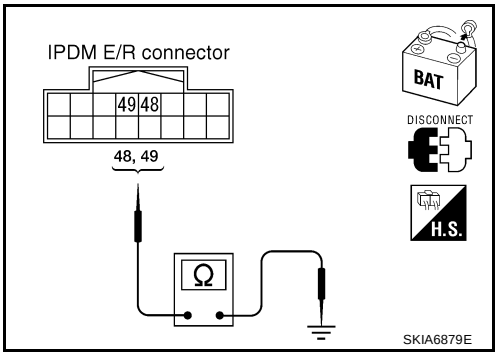
OK or NG

OK >> GO TO 7.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between IPDM E/R and ABS actuator and electric unit (control unit)
- Harness between IPDM E/R and harness connector E108

7. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between IPDM E/R harness connector E9 terminals 48 (L), 49 (P) and ground.

48 (L) – ground : Continuity should not exist.
49 (P) – ground : Continuity should not exist.



OK or NG

OK >> GO TO 8.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between IPDM E/R and ABS actuator and electric unit (control unit)
- Harness between IPDM E/R and harness connector E108

8. ECM/IPDM E/R INTERNAL CIRCUIT INSPECTION

Check components inspection. Refer to LAN-85, "ECM/IPDM E/R INTERNAL CIRCUIT INSPECTION" .

OK or NG

OK >> Connect all the connectors and diagnose again. Refer to LAN-65, "Work Flow" .
NG >> Replace ECM and/or IPDM E/R.

IPDM E/R Ignition Relay Circuit Check

AKS00A9Y

Check the following. If no malfunction is found, replace the IPDM E/R.

- IPDM E/R power supply circuit. Refer to PG-28, "IPDM E/R Power/Ground Circuit Inspection" .
- Ignition power supply circuit. Refer to PG-11, "IGNITION POWER SUPPLY — IGNITION SW. IN “ON” AND/OR “START”" .

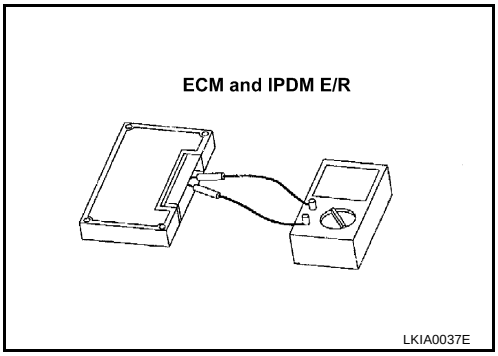
Component Inspection

AKS00A9Z

ECM/IPDM E/R INTERNAL CIRCUIT INSPECTION

- Remove ECM and IPDM E/R from vehicle.
- Check resistance between ECM terminals 94 and 86.
- Check resistance between IPDM E/R terminals 48 and 49.

Unit	Terminal	Resistance value (Ω) (Approx.)
ECM	94 - 86	108 - 132
IPDM E/R	48 - 49	



CAN SYSTEM (TYPE 4)

PFP:23710

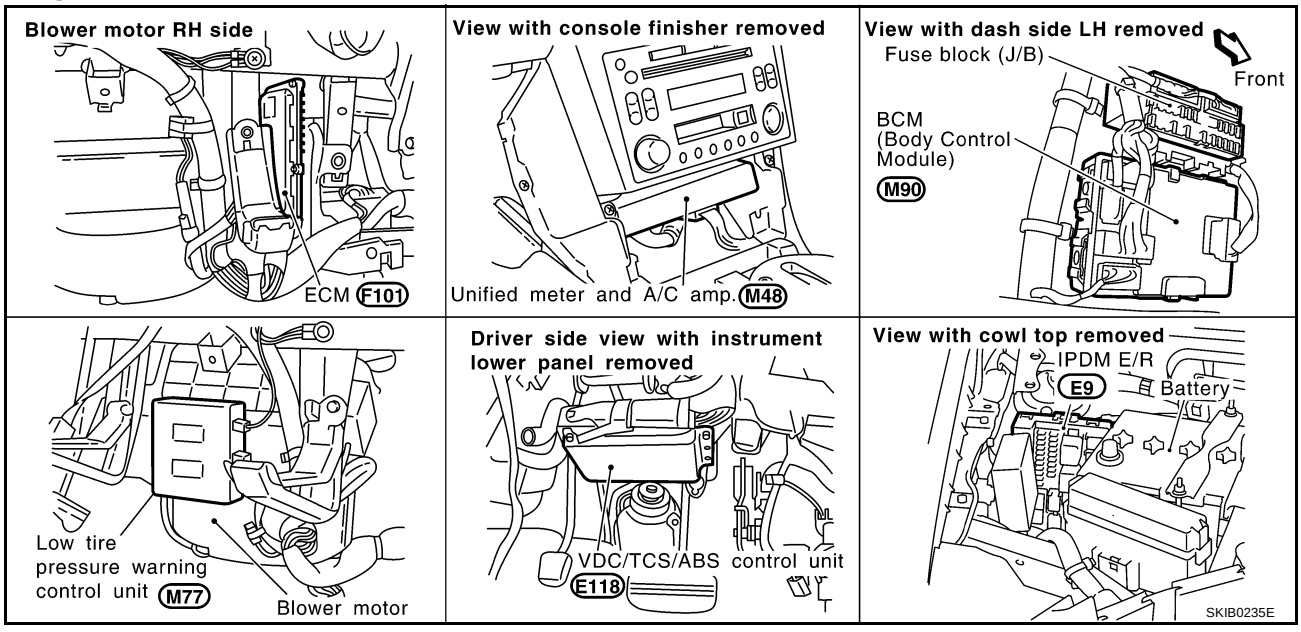
System Description

AKS009DT

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

Component Parts and Harness Connector Location

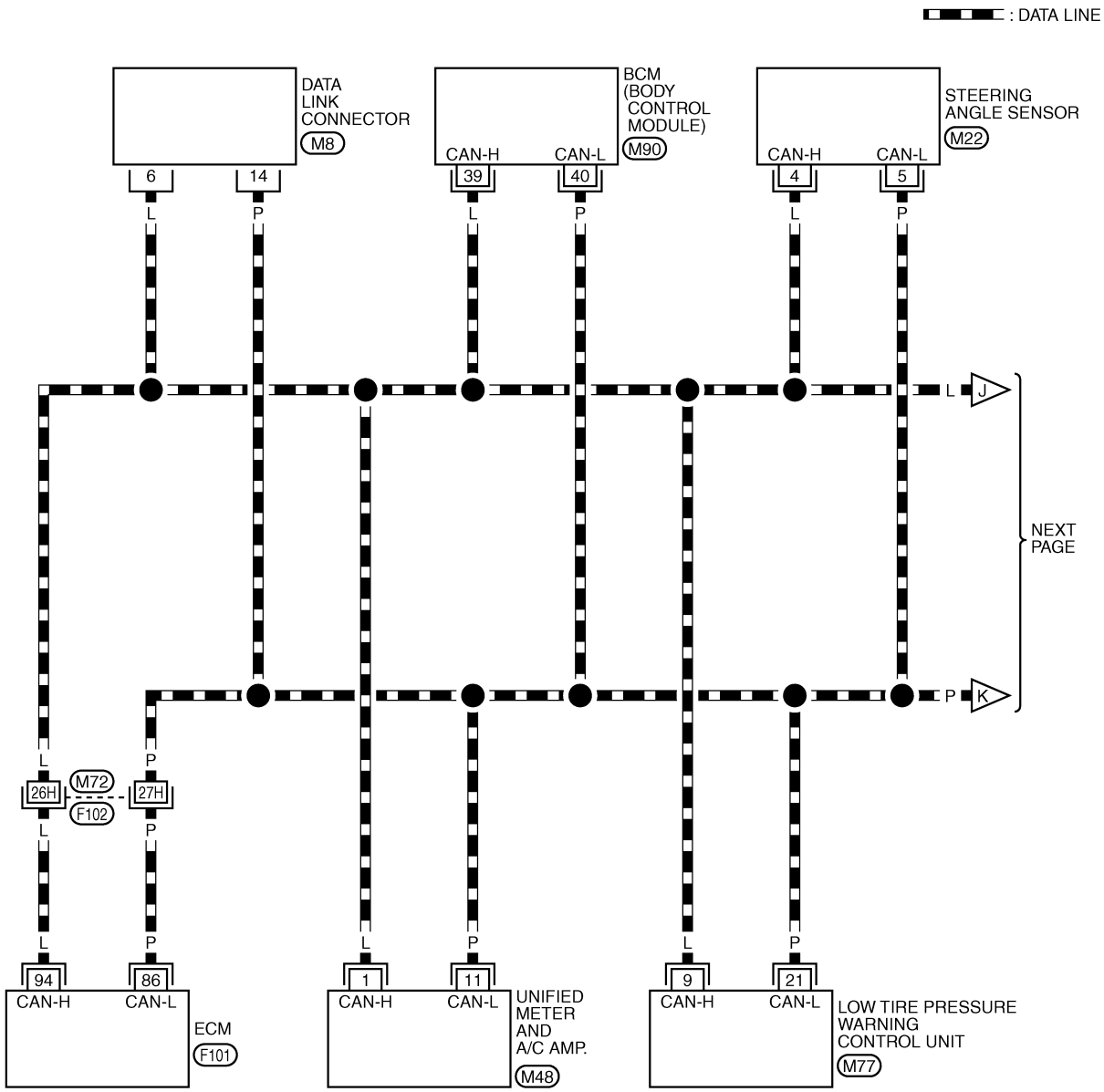
AKS009DU

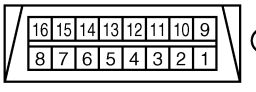


Wiring Diagram — CAN —

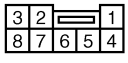
AKS009DV

LAN-CAN-05

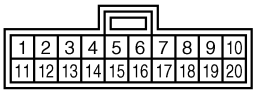




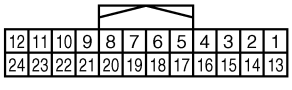
M8
W



M22
W



M48
GY

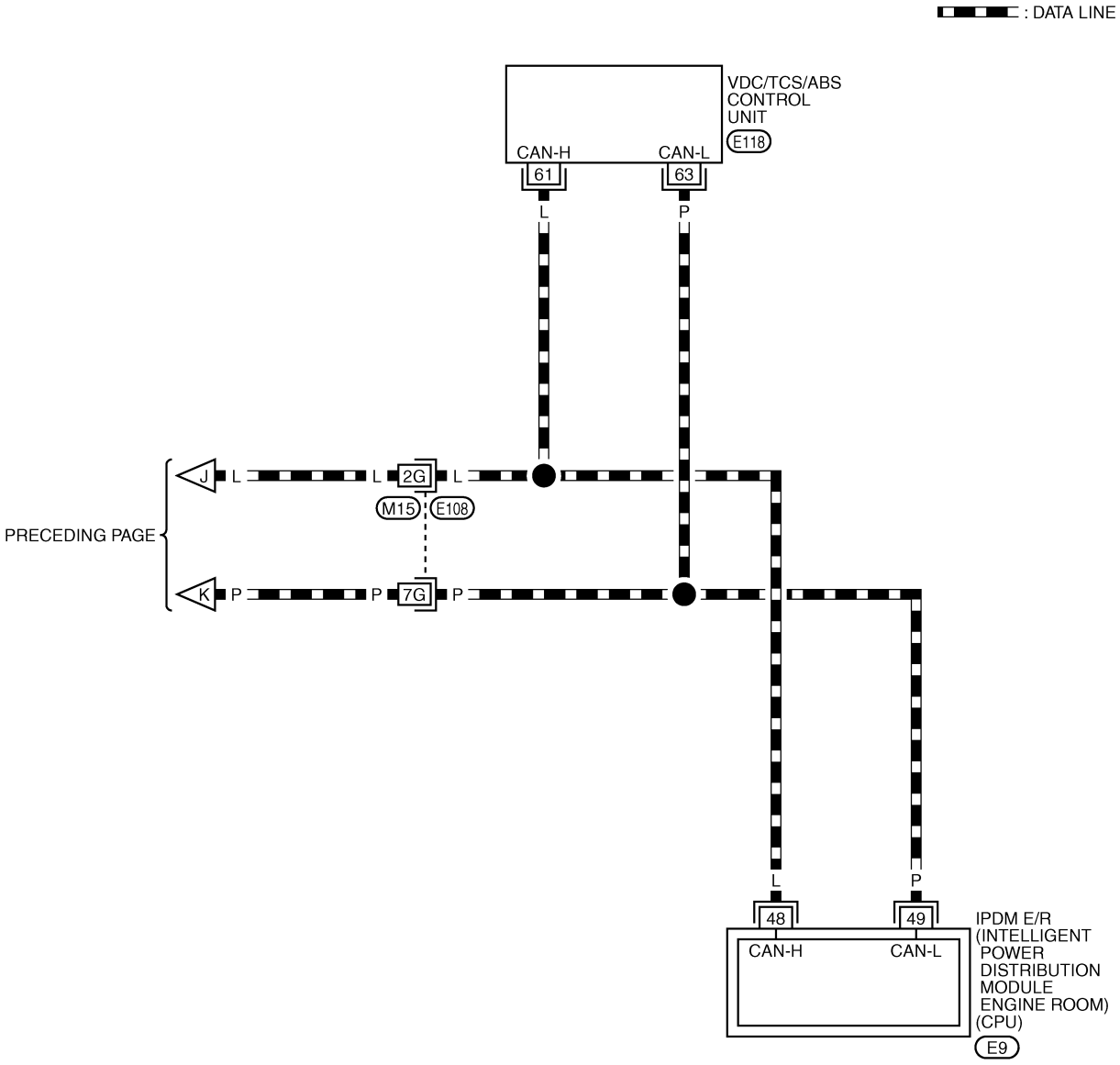


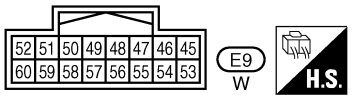
M77
W

REFER TO THE FOLLOWING.
F102 -SUPER MULTIPLE JUNCTION (SMJ)
M90 , F101 -ELECTRICAL UNITS

TKWT1868E

LAN-CAN-06





REFER TO THE FOLLOWING.

E108 -SUPER MULTIPLE JUNCTION (SMJ)

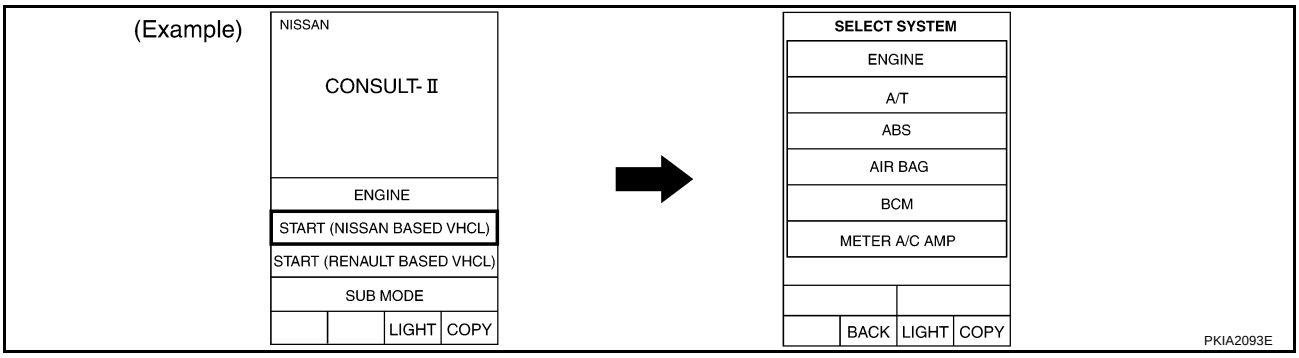
E118 -ELECTRICAL UNITS

TKWT1558E

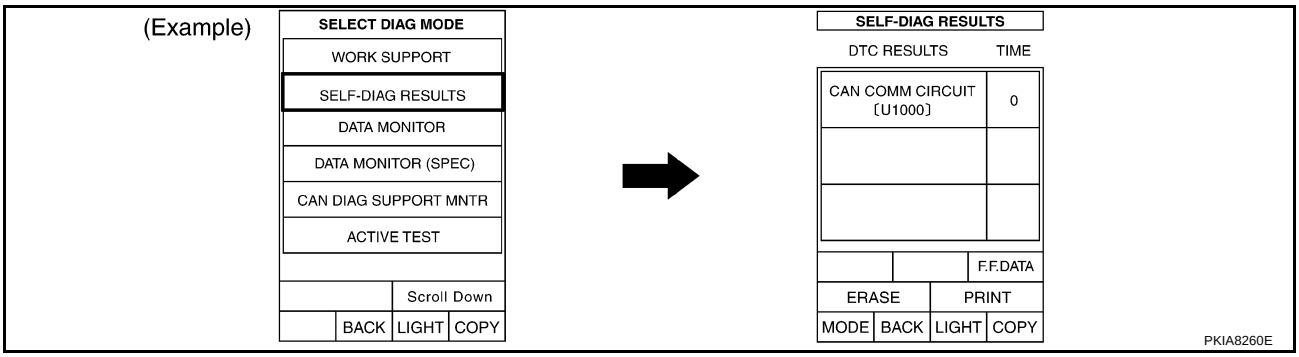
Work Flow

AKS00AA0

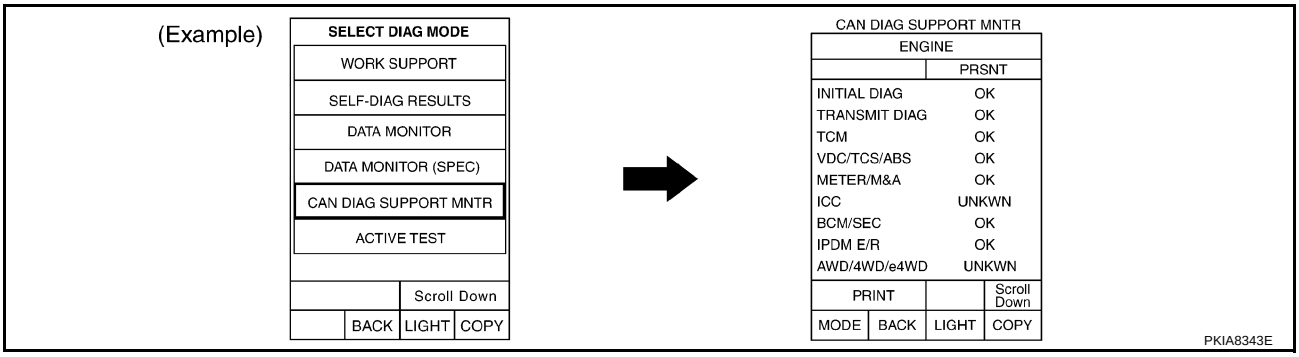
1. When there are no indications of “METER A/C AMP”, “BCM”, “AIR PRESSURE MONITOR” or “IPDM E/R” on “SELECT SYSTEM” display of CONSULT-II, print the “SELECT SYSTEM”.



2. Print all the data of “SELF-DIAG RESULTS” for “ENGINE”, “METER A/C AMP”, “BCM”, “AIR PRESSURE MONITOR”, “ABS” and “IPDM E/R” displayed on CONSULT-II.



3. Print all the data of “CAN DIAG SUPPORT MNTR” for “ENGINE”, “METER A/C AMP”, “BCM”, “AIR PRESSURE MONITOR”, “ABS” and “IPDM E/R” displayed on CONSULT-II.



4. Attach the printed sheet of “SELECT SYSTEM”, “SELF-DIAG RESULTS” and “CAN DIAG SUPPORT MNTR” onto the check sheet. Refer to LAN-90, "CHECK SHEET" .
5. Based on the indications of “SELECT SYSTEM” and the results of “CAN DIAG SUPPORT MNTR”, put marks “v” onto the items with “No indication”, “NG”, or “UNKWN” in the check sheet table. Refer to LAN-90, "CHECK SHEET" .

   NOTE:
   - If “NG” is displayed on “CANINITIAL DIAG (Initial diagnosis)” as “CAN DIAG SUPPORT MNTR” for the diagnosed control unit, replace the control unit.
   - The “CAN DIAG SUPPORT MNTR” items, which are not in check sheet table, are not related to diagnostic procedure on service manual.
     So it is not necessary to check the status of the “CAN DIAG SUPPORT MNTR” items not in check sheet table.
6. According to the check sheet results (example), start inspection. Refer to LAN-92, "CHECK SHEET RESULTS (EXAMPLE)" .

CHECK SHEET

NOTE:

If “NG” is displayed on “INITIAL DIAG (Initial diagnosis)” as “CAN DIAG SUPPORT MNTR” for the diagnosed control unit, replace the control unit.

Check sheet table

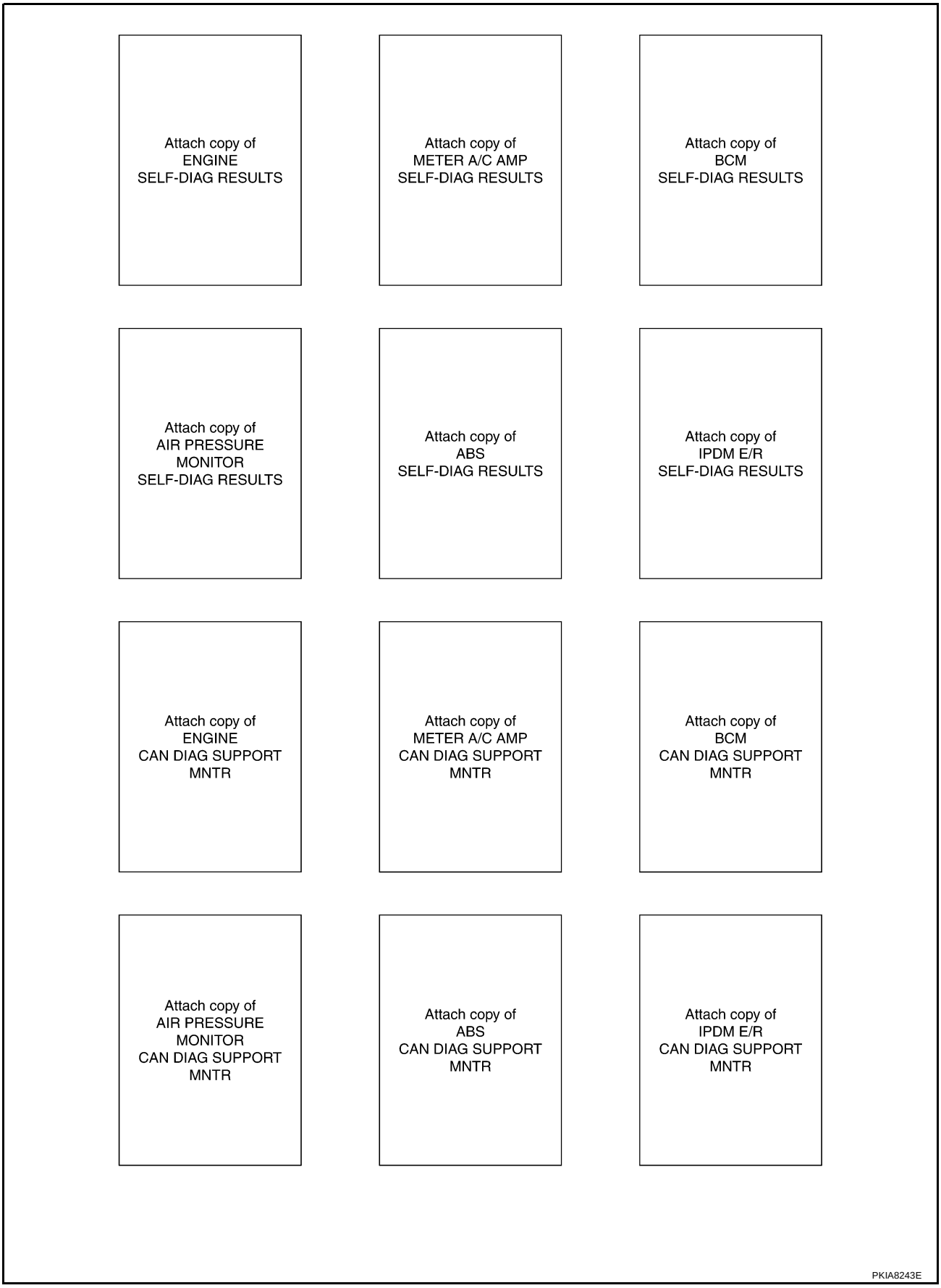
SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR								
		Initial diagnosis	Transmit diagnosis	Receive diagnosis						
				ECM	METER /M&A	BCM/SEC	TIRE-P	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	—	NG	UNKWN	—	UNKWN	UNKWN	—	—	UNKWN	UNKWN
METER A/C AMP	No indication	—	UNKWN	UNKWN	—	UNKWN	UNKWN	—	UNKWN	—
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	—	—	—	—	UNKWN
AIR PRESSURE MONITOR	No indication	NG	UNKWN	—	UNKWN	—	—	—	—	—
ABS	—	NG	UNKWN	UNKWN	—	—	—	UNKWN	—	—
IPDM E/R	No indication	—	UNKWN	UNKWN	—	UNKWN	—	—	—	—

Symptoms :

Attach copy of SELECT SYSTEM

Attach copy of SELECT SYSTEM

PKIA8242E


Attach copy of
ENGINE
SELF-DIAG RESULTS
Attach copy of
METER A/C AMP
SELF-DIAG RESULTS
Attach copy of
BCM
SELF-DIAG RESULTS
Attach copy of
AIR PRESSURE
MONITOR
SELF-DIAG RESULTS
Attach copy of
ABS
SELF-DIAG RESULTS
Attach copy of
IPDM E/R
SELF-DIAG RESULTS
Attach copy of
ENGINE
CAN DIAG SUPPORT
MNTR
Attach copy of
METER A/C AMP
CAN DIAG SUPPORT
MNTR
Attach copy of
BCM
CAN DIAG SUPPORT
MNTR
Attach copy of
AIR PRESSURE
MONITOR
CAN DIAG SUPPORT
MNTR
Attach copy of
ABS
CAN DIAG SUPPORT
MNTR
Attach copy of
IPDM E/R
CAN DIAG SUPPORT
MNTR
PKIA8243E

CHECK SHEET RESULTS (EXAMPLE)

NOTE:

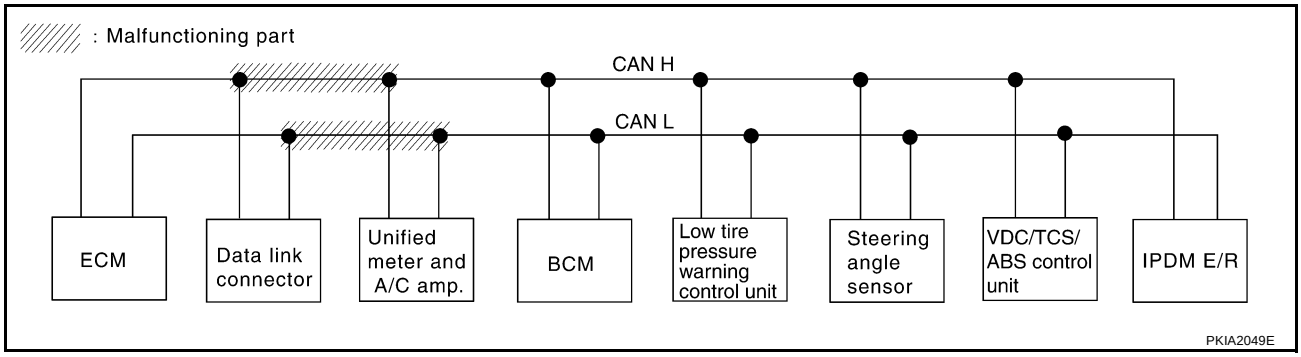
If “NG” is displayed on “INITIAL DIAG (Initial diagnosis)” as “CAN DIAG SUPPORT MNTR” for the diagnosed control unit, replace the control unit.

Case 1

Check harness between data link connector and unified meter and A/C amp. Refer to LAN-106, "Circuit Check Between Data Link Connector and Unified Meter and A/C Amp." .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR								
		Initial diagnosis	Transmit diagnosis	Receive diagnosis						
				ECM	METER /M&A	BCM/SEC	TIRE-P	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN ✓	UNKWN ✓	–	–	UNKWN ✓	UNKWN ✓
METER A/C AMP	No indication ✓	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–	UNKWN	–
BCM	No indication ✓	NG	UNKWN	UNKWN	UNKWN	–	–	–	–	UNKWN
AIR PRESSURE MONITOR	No indication ✓	NG	UNKWN	–	UNKWN	–	–	–	–	–
ABS	–	NG	UNKWN	UNKWN ✓	–	–	–	UNKWN	–	–
IPDM E/R	No indication ✓	–	UNKWN	UNKWN	–	UNKWN	–	–	–	–

PKIA8244E



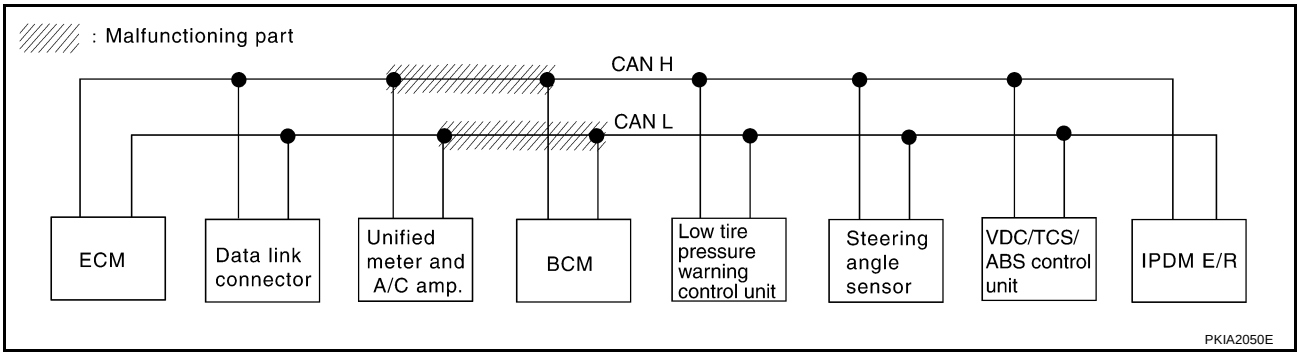
PKIA2049E

Case 2

Check harness between unified meter and A/C amp. and BCM. Refer to LAN-106, "Circuit Check Between Unified Meter and A/C Amp. and BCM" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR								
		Initial diagnosis	Transmit diagnosis	Receive diagnosis						
				ECM	METER /M&A	BCM/SEC	TIRE-P	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	–	–	UNKWN	UNKWN
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	–	–	UNKWN
AIR PRESSURE MONITOR	No indication	NG	UNKWN	–	UNKWN	–	–	–	–	–
ABS	–	NG	UNKWN	UNKWN	–	–	–	UNKWN	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	UNKWN	–	–	–	–

PKIA8245E



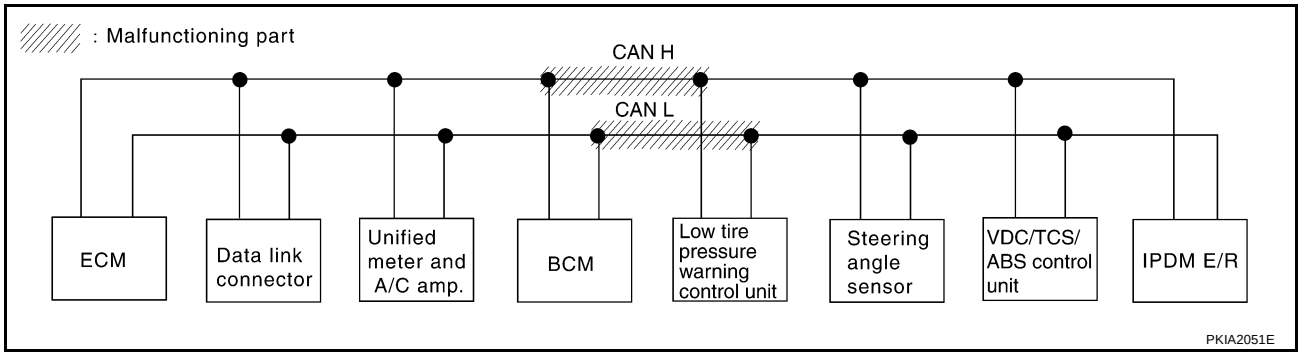
PKIA2050E

Case 3

Check harness between BCM and Low Tire Pressure Warning Control Unit. Refer to LAN-107, "Circuit Check Between BCM and Low Tire Pressure Warning Control Unit" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR								
		Initial diagnosis	Transmit diagnosis	Receive diagnosis						
				ECM	METER /M&A	BCM/SEC	TIRE-P	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	–	–	UNKWN	UNKWN
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	–	–	UNKWN
AIR PRESSURE MONITOR	No indication	NG	UNKWN	–	UNKWN	–	–	–	–	–
ABS	–	NG	UNKWN	UNKWN	–	–	–	UNKWN	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	UNKWN	–	–	–	–

PKIA8246E



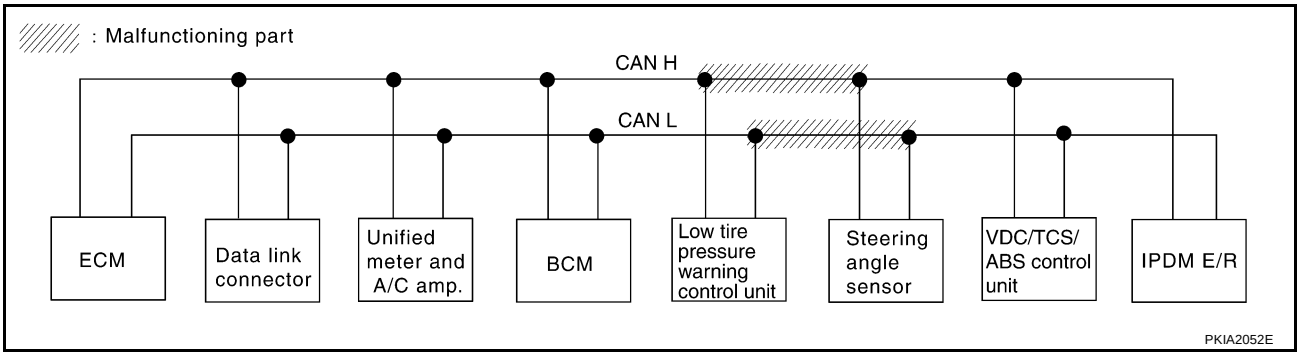
PKIA2051E

Case 4

Check harness between Low Tire Pressure Warning Control Unit and steering angle sensor. Refer to LAN-107, "Circuit Check Between Low Tire Pressure Warning Control Unit and Steering Angle Sensor" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR								
		Initial diagnosis	Transmit diagnosis	Receive diagnosis						
				ECM	METER /M&A	BCM/SEC	TIRE-P	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	–	–	UNKWN ✓	UNKWN ✓
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–	UNKWN ✓	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	–	–	UNKWN ✓
AIR PRESSURE MONITOR	No indication	NG	UNKWN	–	UNKWN	–	–	–	–	–
ABS	–	NG	UNKWN	UNKWN ✓	–	–	–	UNKWN	–	–
IPDM E/R	No indication ✓	–	UNKWN	UNKWN	–	UNKWN	–	–	–	–

PKIA8247E



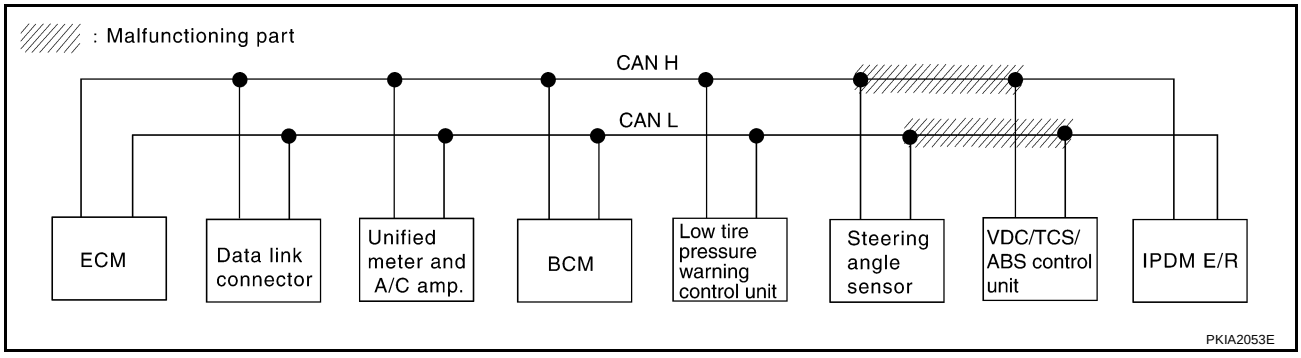
PKIA2052E

Case 5

Check harness between steering angle sensor and VDC/TCS/ABS control unit. Refer to LAN-108, "Circuit Check Between Steering Angle Sensor and VDC/TCS/ABS Control Unit" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR								
		Initial diagnosis	Transmit diagnosis	Receive diagnosis						
				ECM	METER /M&A	BCM/SEC	TIRE-P	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	–	–	UNKWN	UNKWN
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	–	–	UNKWN
AIR PRESSURE MONITOR	No indication	NG	UNKWN	–	UNKWN	–	–	–	–	–
ABS	–	NG	UNKWN	UNKWN	–	–	–	UNKWN	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	UNKWN	–	–	–	–

PKIA8248E



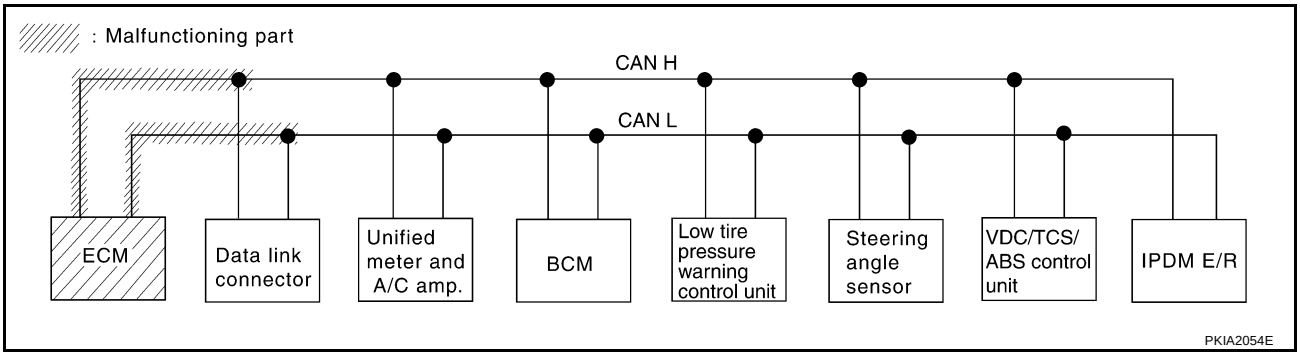
PKIA2053E

Case 6

Check ECM circuit. Refer to LAN-108, "ECM Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR								
		Initial diagnosis	Transmit diagnosis	Receive diagnosis						
				ECM	METER /M&A	BCM/SEC	TIRE-P	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	–	–	UNKWN	UNKWN
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	–	–	UNKWN
AIR PRESSURE MONITOR	No indication	NG	UNKWN	–	UNKWN	–	–	–	–	–
ABS	–	NG	UNKWN	UNKWN	–	–	–	UNKWN	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	UNKWN	–	–	–	–

PKIA8249E



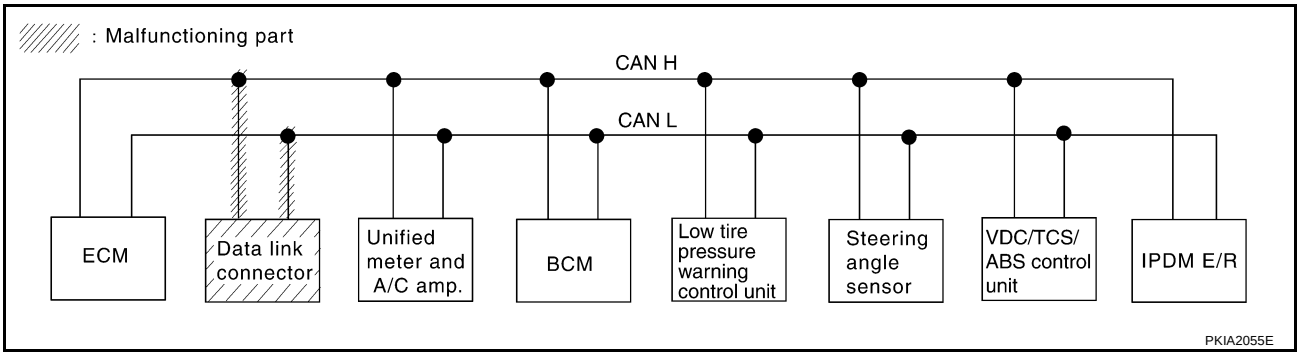
PKIA2054E

Case 7

Check data link connector circuit. Refer to LAN-109, "Data Link Connector Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR								
		Initial diagnosis	Transmit diagnosis	Receive diagnosis						
				ECM	METER /M&A	BCM/SEC	TIRE-P	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	–	–	UNKWN	UNKWN
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	–	–	UNKWN
AIR PRESSURE MONITOR	No indication	NG	UNKWN	–	UNKWN	–	–	–	–	–
ABS	–	NG	UNKWN	UNKWN	–	–	–	UNKWN	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	UNKWN	–	–	–	–

PKIA8250E



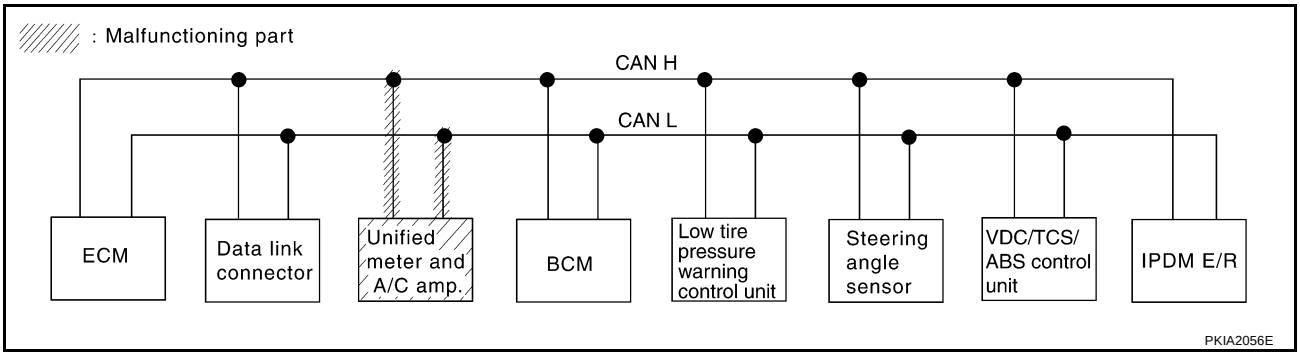
PKIA2055E

Case 8

Check unified meter and A/C amp. circuit. Refer to LAN-109, "Unified Meter and A/C Amp. Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR								
		Initial diagnosis	Transmit diagnosis	Receive diagnosis						
				ECM	METER /M&A	BCM/SEC	TIRE-P	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN ✓	UNKWN	–	–	UNKWN	UNKWN
METER A/C AMP	No indication ✓	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN ✓	–	–	–	–	UNKWN
AIR PRESSURE MONITOR	No indication	NG	UNKWN	–	UNKWN ✓	–	–	–	–	–
ABS	–	NG	UNKWN	UNKWN	–	–	–	UNKWN	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	UNKWN	–	–	–	–

PKIA8251E



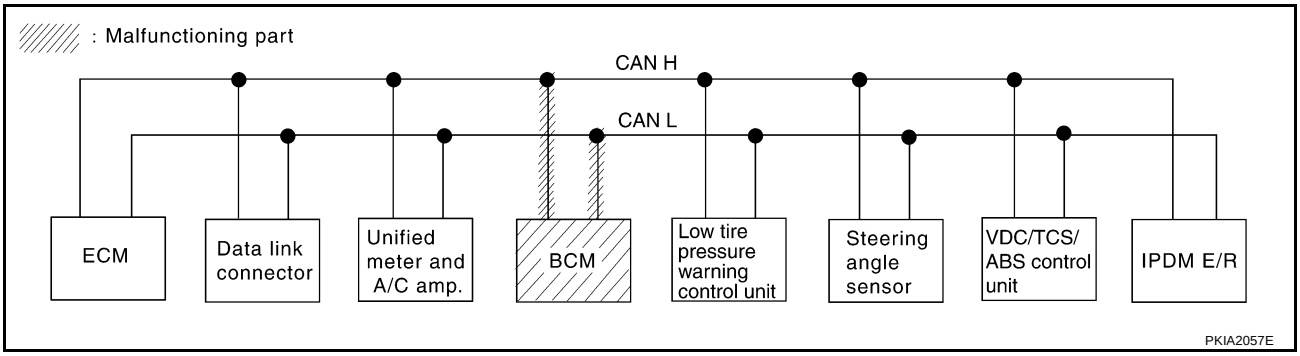
PKIA2056E

Case 9

Check BCM circuit. Refer to LAN-110, "BCM Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR								
		Initial diagnosis	Transmit diagnosis	Receive diagnosis						
				ECM	METER /M&A	BCM/SEC	TIRE-P	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	–	–	UNKWN	UNKWN
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	–	–	UNKWN
AIR PRESSURE MONITOR	No indication	NG	UNKWN	–	UNKWN	–	–	–	–	–
ABS	–	NG	UNKWN	UNKWN	–	–	–	UNKWN	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	UNKWN	–	–	–	–

PKIA8252E



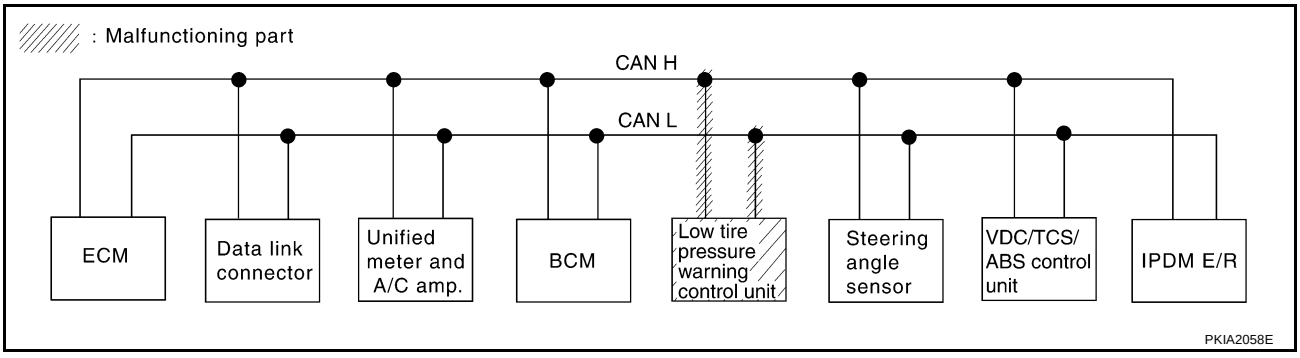
PKIA2057E

Case 10

Check Low Tire Pressure Warning Control Unit circuit. Refer to LAN-110, "Low Tire Pressure Warning Control Unit Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR								
		Initial diagnosis	Transmit diagnosis	Receive diagnosis						
				ECM	METER /M&A	BCM/SEC	TIRE-P	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	–	–	UNKWN	UNKWN
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN ✓	–	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	–	–	UNKWN
AIR PRESSURE MONITOR	No indication ✓	NG	UNKWN	–	UNKWN	–	–	–	–	–
ABS	–	NG	UNKWN	UNKWN	–	–	–	UNKWN	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	UNKWN	–	–	–	–

PKIA8253E



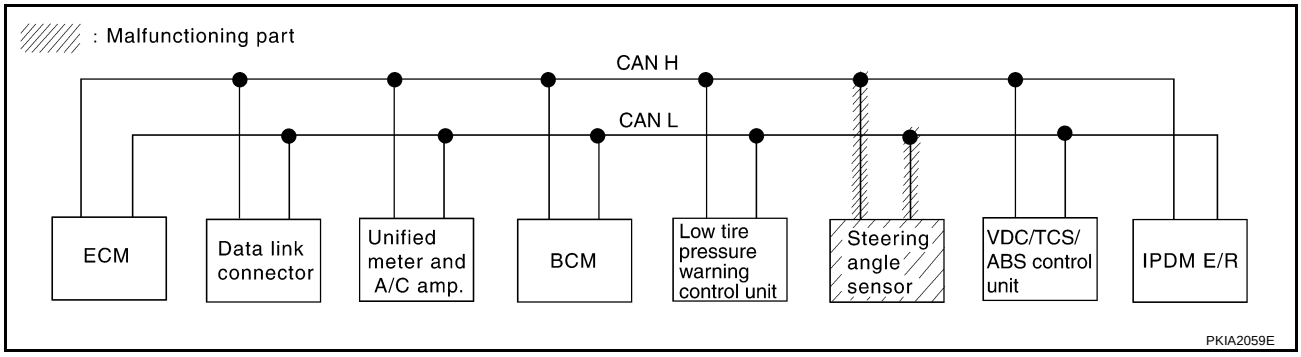
PKIA2058E

Case 11

Check steering angle sensor circuit. Refer to LAN-111, "Steering Angle Sensor Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR								
		Initial diagnosis	Transmit diagnosis	Receive diagnosis						
				ECM	METER /M&A	BCM/SEC	TIRE-P	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	—	NG	UNKWN	—	UNKWN	UNKWN	—	—	UNKWN	UNKWN
METER A/C AMP	No indication	—	UNKWN	UNKWN	—	UNKWN	UNKWN	—	UNKWN	—
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	—	—	—	—	UNKWN
AIR PRESSURE MONITOR	No indication	NG	UNKWN	—	UNKWN	—	—	—	—	—
ABS	—	NG	UNKWN	UNKWN	—	—	—	UNKWN	—	—
IPDM E/R	No indication	—	UNKWN	UNKWN	—	UNKWN	—	—	—	—

PKIA8254E



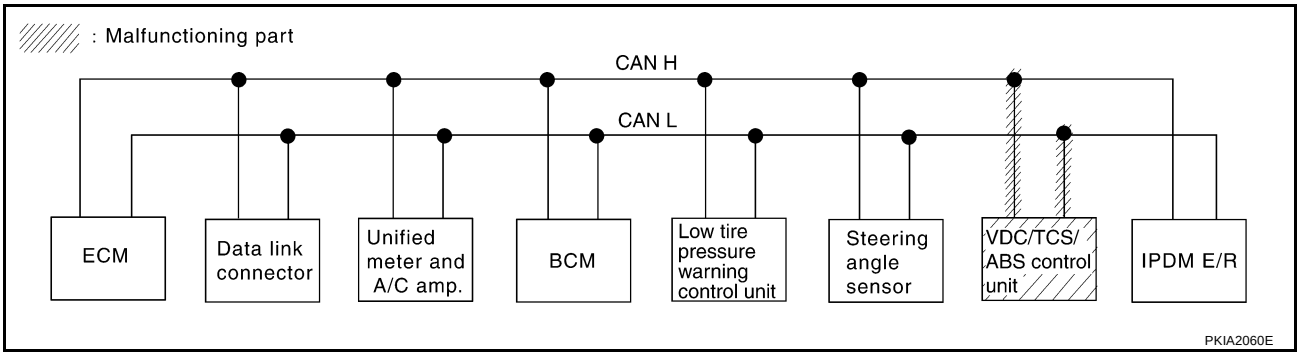
PKIA2059E

Case 12

Check VDC/TCS/ABS control unit circuit. Refer to LAN-111, "VDC/TCS/ABS Control Unit Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR								
		Initial diagnosis	Transmit diagnosis	Receive diagnosis						
				ECM	METER /M&A	BCM/SEC	TIRE-P	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	—	NG	UNKWN	—	UNKWN	UNKWN	—	—	UNKWN	UNKWN
METER A/C AMP	No indication	—	UNKWN	UNKWN	—	UNKWN	UNKWN	—	UNKWN	—
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	—	—	—	—	UNKWN
AIR PRESSURE MONITOR	No indication	NG	UNKWN	—	UNKWN	—	—	—	—	—
ABS	—	NG	UNKWN	UNKWN	—	—	—	UNKWN	—	—
IPDM E/R	No indication	—	UNKWN	UNKWN	—	UNKWN	—	—	—	—

PKIA8255E



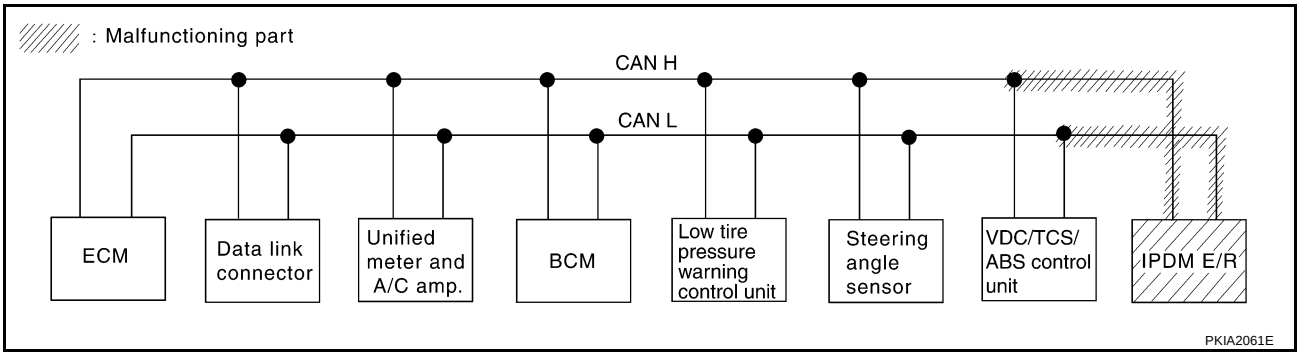
PKIA2060E

Case 13

Check IPDM E/R circuit. Refer to LAN-112, "IPDM E/R Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR								
		Initial diagnosis	Transmit diagnosis	Receive diagnosis						
				ECM	METER /M&A	BCM/SEC	TIRE-P	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	–	–	UNKWN	UNKWN
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	–	–	UNKWN
AIR PRESSURE MONITOR	No indication	NG	UNKWN	–	UNKWN	–	–	–	–	–
ABS	–	NG	UNKWN	UNKWN	–	–	–	UNKWN	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	UNKWN	–	–	–	–

PKIA8256E



PKIA2061E

Case 14

Check CAN communication circuit. Refer to LAN-113, "CAN Communication Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR								
		Initial diagnosis	Transmit diagnosis	Receive diagnosis						
				ECM	METER /M&A	BCM/SEC	TIRE-P	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	–	NG	UNKWN	–	UNKWN	UNKWN	–	–	UNKWN	UNKWN
METER A/C AMP	No indication	–	UNKWN	UNKWN	–	UNKWN	UNKWN	–	UNKWN	–
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	–	–	–	–	UNKWN
AIR PRESSURE MONITOR	No indication	NG	UNKWN	–	UNKWN	–	–	–	–	–
ABS	–	NG	UNKWN	UNKWN	–	–	–	UNKWN	–	–
IPDM E/R	No indication	–	UNKWN	UNKWN	–	UNKWN	–	–	–	–

PKIA8257E

Case 15

Check IPDM E/R ignition relay circuit continuously sticks “OFF”. Refer to LAN-115, "IPDM E/R Ignition Relay Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR								
		Initial diagnosis	Transmit diagnosis	Receive diagnosis						
				ECM	METER /M&A	BCM/SEC	TIRE-P	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	—	NG	UNKWN	—	UNKWN	UNKWN	—	—	UNKWN ✓	UNKWN
METER A/C AMP	No indication	—	UNKWN	UNKWN	—	UNKWN	UNKWN	—	UNKWN ✓	—
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	—	—	—	—	UNKWN
AIR PRESSURE MONITOR	No indication	NG	UNKWN	—	UNKWN	—	—	—	—	—
ABS	—	NG	UNKWN	UNKWN	—	—	—	UNKWN	—	—
IPDM E/R	No indication	—	UNKWN	UNKWN	—	UNKWN	—	—	—	—

PKIA8258E

Case 16

Check IPDM E/R ignition relay circuit continuously sticks “ON”. Refer to LAN-115, "IPDM E/R Ignition Relay Circuit Check" .

SELECT SYSTEM screen		CAN DIAG SUPPORT MNTR								
		Initial diagnosis	Transmit diagnosis	Receive diagnosis						
				ECM	METER /M&A	BCM/SEC	TIRE-P	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	—	NG	UNKWN	—	UNKWN	UNKWN	—	—	UNKWN	UNKWN
METER A/C AMP	No indication	—	UNKWN	UNKWN	—	UNKWN	UNKWN	—	UNKWN	—
BCM	No indication	NG	UNKWN	UNKWN	UNKWN	—	—	—	—	UNKWN
AIR PRESSURE MONITOR	No indication	NG	UNKWN	—	UNKWN	—	—	—	—	—
ABS	—	NG	UNKWN	UNKWN ✓	—	—	—	UNKWN ✓	—	—
IPDM E/R	No indication	—	UNKWN	UNKWN	—	UNKWN	—	—	—	—

PKIA8259E

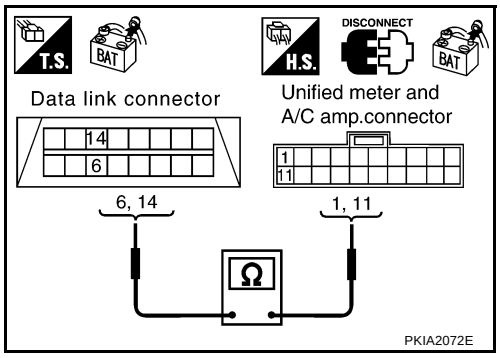
Circuit Check Between Data Link Connector and Unified Meter and A/C Amp.

AKS00AA1

1. CHECK HARNESS FOR OPEN CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Disconnect ECM connector and unified meter and A/C amp. connector.
4. Check continuity between data link connector M8 terminals 6 (L), 14 (P) and unified meter and A/C amp. harness connector M48 terminals 1 (L), 11 (P).

6 (L) – 1 (L) : Continuity should exist.
14 (P) – 11 (P) : Continuity should exist.



OK or NG

OK >> Connect all the connectors and diagnose again. Refer to LAN-89, "Work Flow" .
NG >> Repair harness.

Circuit Check Between Unified Meter and A/C Amp. and BCM

AKS00AA2

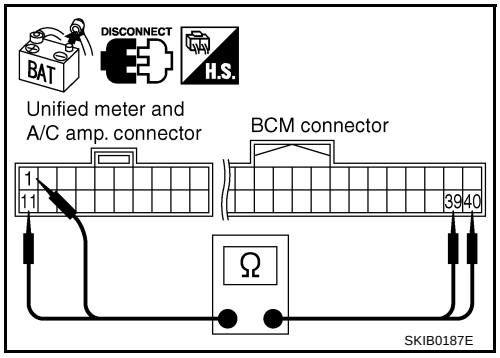
1. CHECK HARNESS FOR OPEN CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Disconnect the following connectors.

- ECM connector
- Unified meter and A/C amp. connector
- BCM connector

4. Check continuity between unified meter and A/C amp. harness connector M48 terminals 1 (L), 11 (P) and BCM harness connector M90 terminals 39 (L), 40 (P).

1 (L) – 39 (L) : Continuity should exist.
11 (P) – 40 (P) : Continuity should exist.



OK or NG

OK >> Connect all the connectors and diagnose again. Refer to LAN-89, "Work Flow" .
NG >> Repair harness.

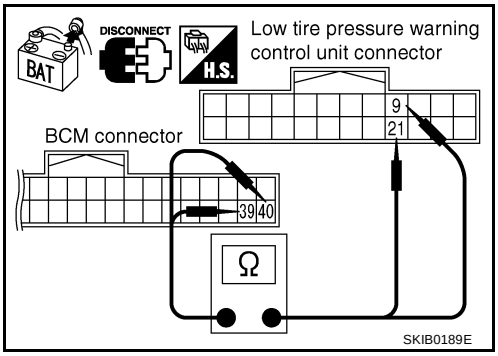
Circuit Check Between BCM and Low Tire Pressure Warning Control Unit

AKS009DZ

1. CHECK HARNESS FOR OPEN CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Disconnect the following connectors.
- ECM connector
- BCM connector
- Low tire pressure warning control unit connector
4. Check continuity between BCM harness connector M90 terminals 39 (L), 40 (P) and low tire pressure warning control unit harness connector M77 terminals 9 (L), 21 (P).

39 (L) – 9 (L) : Continuity should exist.
40 (P) – 21 (P) : Continuity should exist.



OK or NG

OK >> Connect all the connectors and diagnose again. Refer to LAN-89, "Work Flow" .

NG >> Repair harness.

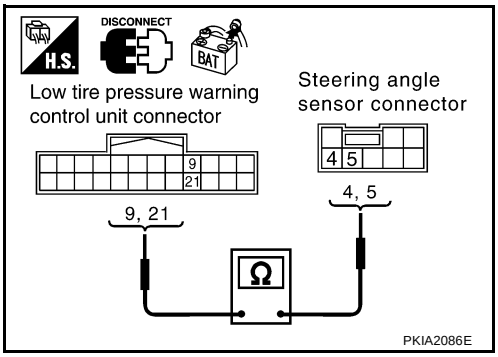
Circuit Check Between Low Tire Pressure Warning Control Unit and Steering Angle Sensor

AKS009E0

1. CHECK HARNESS FOR OPEN CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Disconnect the following connectors.
- ECM connector
- Low tire pressure warning control unit connector
- Steering angle sensor connector
4. Check continuity between Low tire pressure warning control unit harness connector M77 terminals 9 (L), 21 (P) and steering angle sensor harness connector M22 terminals 4 (L), 5 (P).

9 (L) – 4 (L) : Continuity should exist.
21 (P) – 5 (P) : Continuity should exist.



OK or NG

OK >> Connect all the connectors and diagnose again. Refer to LAN-89, "Work Flow" .

NG >> Repair harness.

Circuit Check Between Steering Angle Sensor and VDC/TCS/ABS Control Unit

AKS00AA3

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check following terminals and connector for damage, bend and loose connection (connector side and harness side).

- Harness connector M15
- Harness connector E108

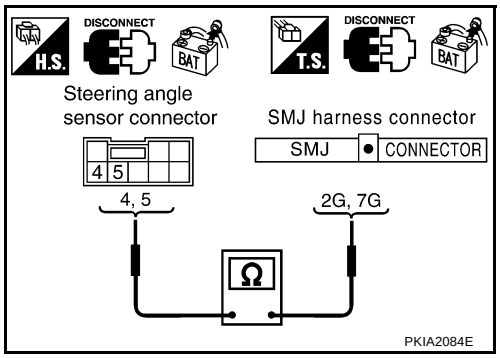
OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect steering angle sensor connector and harness connector M15.
2. Check continuity between steering angle sensor harness connector M22 terminals 4 (L), 5 (P) and harness connector M15 terminals 2G (L), 7G (P).

4 (L) – 2G (L) : Continuity should exist.
5 (P) – 7G (P) : Continuity should exist.



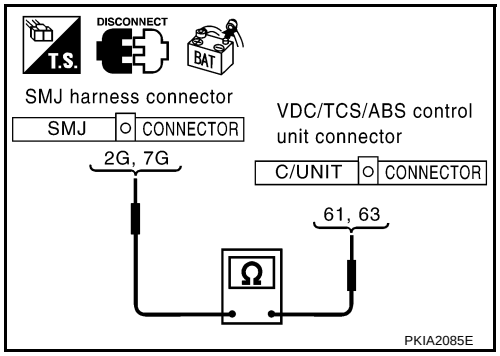
OK or NG

OK >> GO TO 3.
NG >> Repair harness.

3. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect VDC/TCS/ABS control unit connector.
2. Check continuity between harness connector E108 terminals 2G (L), 7G (P) and VDC/TCS/ABS control unit harness connector E118 terminals 61 (L), 63 (P).

2G (L) – 61 (L) : Continuity should exist.
7G (P) – 63 (P) : Continuity should exist.



OK or NG

OK >> Connect all the connectors and diagnose again. Refer to LAN-89, "Work Flow" .
NG >> Repair harness.

ECM Circuit Check

AKS00AA4

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check following terminals and connector for damage, bend and loose connection (control module side and harness side).

- ECM connector
- Harness connector F102
- Harness connector M72

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

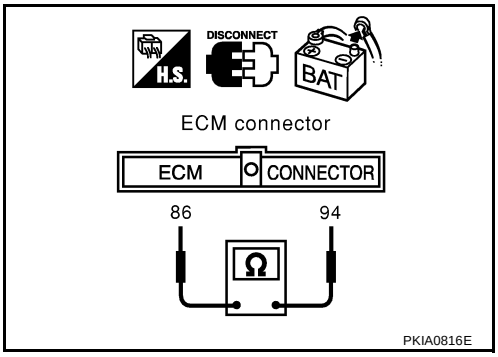
2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ECM connector.
2. Check resistance between ECM harness connector F101 terminals 94 (L) and 86 (P).

94 (L) – 86 (P) : Approx. 108 – 132Ω

OK or NG

OK >> Replace ECM.
NG >> Repair harness between ECM and data link connector.



Data Link Connector Circuit Check

AKS00AA5

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check terminals and connector of data link connector for damage, bend and loose connection (connector side and harness side).

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

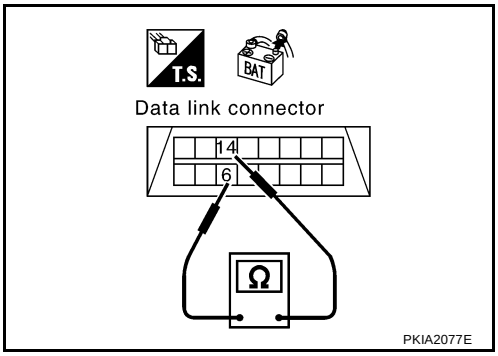
2. CHECK HARNESS FOR OPEN CIRCUIT

Check resistance between data link connector M8 terminals 6 (L) and 14 (P).

6 (L) – 14 (P) : Approx. 54 – 66Ω

OK or NG

OK >> Diagnose again. Refer to LAN-89, "Work Flow" .
NG >> Repair harness between data link connector and unified meter and A/C amp.



Unified Meter and A/C Amp. Circuit Check

AKS00AA6

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check terminals and connector of unified meter and A/C amp. for damage, bend and loose connection (meter side and harness side).

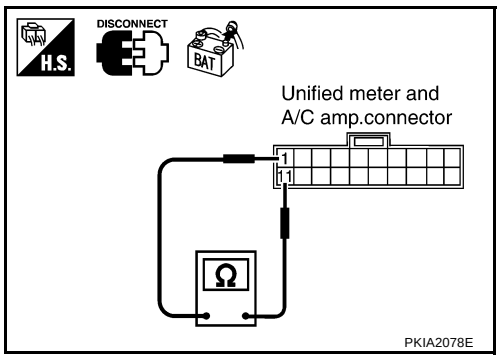
OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect unified meter and A/C amp. connector.
2. Check resistance between unified meter and A/C amp. harness connector M48 terminals 1 (L) and 11 (P).

1 (L) – 11 (P) : Approx. 54 – 66Ω



OK or NG

OK >> Replace unified meter and A/C amp.
NG >> Repair harness between unified meter and A/C amp. and BCM.

BCM Circuit Check

AKS00AA7

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check terminals and connector of BCM for damage, bend and loose connection (control module side and harness side).

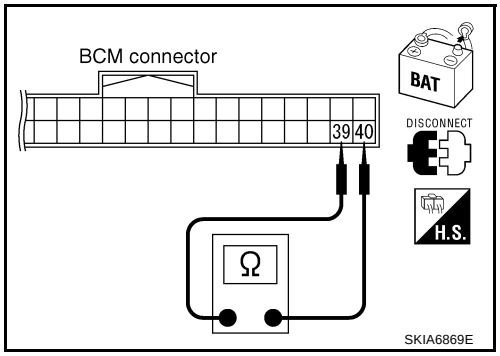
OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect BCM connector.
2. Check resistance between BCM harness connector M90 terminals 39 (L) and 40 (P).

39 (L) – 40 (P) : Approx. 54 – 66Ω



OK or NG

OK >> Replace BCM.
NG >> Repair harness between BCM and steering angle sensor.

Low Tire Pressure Warning Control Unit Circuit Check

AKS009E6

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check terminals and connector of low tire pressure warning control unit for damage, bend and loose connection (control unit side and harness side).

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

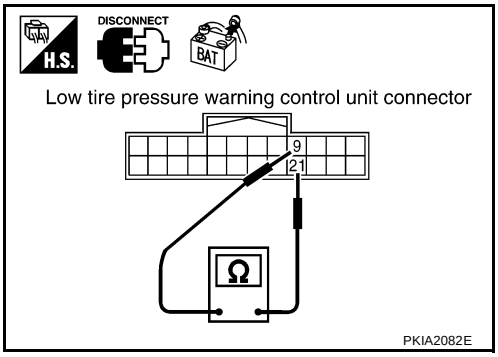
2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect low tire pressure warning control unit connector.
2. Check resistance between low tire pressure warning control unit harness connector M77 terminals 9 (L) and 21 (P).

9 (L) – 21 (P) : Approx. 54 – 66Ω

OK or NG

OK >> Replace low tire pressure warning control unit.
NG >> Repair harness between low tire pressure warning control unit and steering angle sensor.



Steering Angle Sensor Circuit Check

AKS00AA8

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check terminals and connector of steering angle sensor for damage, bend and loose connection (sensor side and harness side).

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

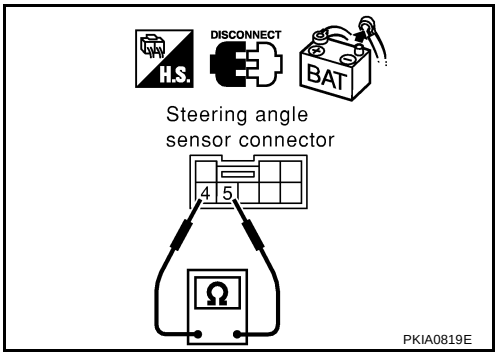
2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect steering angle sensor connector.
2. Check resistance between steering angle sensor harness connector M22 terminals 4 (L) and 5 (P).

4 (L) – 5 (P) : Approx. 54 – 66Ω

OK or NG

OK >> Replace steering angle sensor.
NG >> Repair harness between steering angle sensor and harness connector M15.



VDC/TCS/ABS Control Unit Circuit Check

AKS00AA9

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check terminals and connector of VDC/TCS/ABS control unit for damage, bend and loose connection (control unit side and harness side).

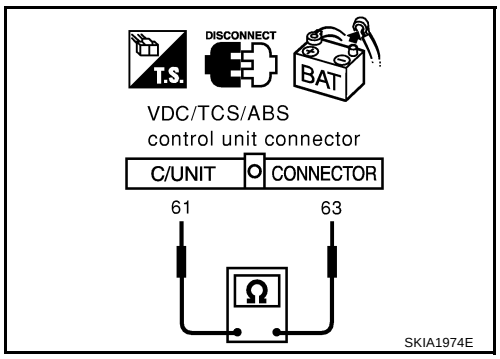
OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect VDC/TCS/ABS control unit connector.
2. Check resistance between VDC/TCS/ABS control unit harness connector E118 terminals 61 (L) and 63 (P).

61 (L) – 63 (P) : Approx. 54 – 66Ω



OK or NG

OK >> Replace VDC/TCS/ABS control unit.
NG >> Repair harness between VDC/TCS/ABS control unit and IPDM E/R.

IPDM E/R Circuit Check

AKS00AAA

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check terminals and connector of IPDM E/R for damage, bend and loose connection (control module side and harness side).

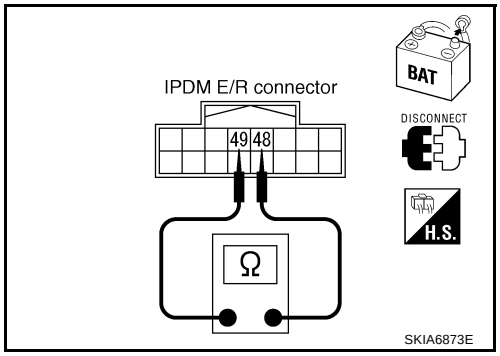
OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect IPDM E/R connector.
2. Check resistance between IPDM E/R harness connector E9 terminals 48 (L) and 49 (P).

48 (L) – 49 (P) : Approx. 108 – 132Ω



OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness between IPDM E/R and VDC/TCS/ABS control unit.

CAN Communication Circuit Check

AKS00AAB

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the negative battery terminal.
3. Check following terminals and connector for damage, bend and loose connection (control module side, meter side, sensor side, control unit side and harness side).

- ECM
- Unified meter and A/C amp.
- BCM
- Low tire pressure warning control unit
- Steering angle sensor
- VDC/TCS/ABS control unit
- IPDM E/R
- Between ECM and IPDM E/R

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

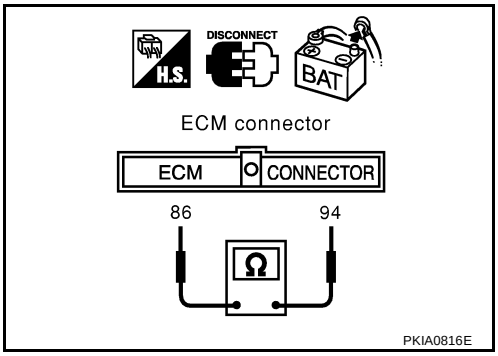
2. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect ECM connector and harness connector F102.
2. Check continuity between ECM harness connector F101 terminals 94 (L) and 86 (P).

94 (L) – 86 (P) : Continuity should not exist.

OK or NG

OK >> GO TO 3.
NG >> Repair harness between ECM and harness connector F102.



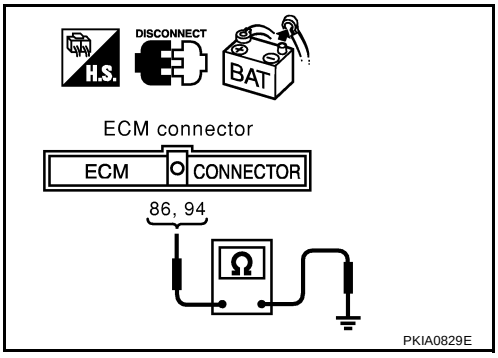
3. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between ECM harness connector F101 terminals 94 (L), 86 (P) and ground.

94 (L) – ground : Continuity should not exist.
86 (P) – ground : Continuity should not exist.

OK or NG

OK >> GO TO 4.
NG >> Repair harness between ECM and harness connector F102.

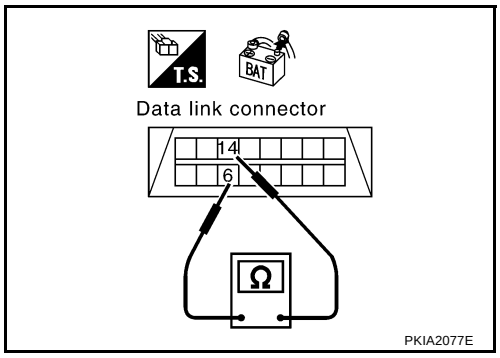


4. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect following connectors.
- Unified meter and A/C amp. connector
- BCM connector
- Low tire pressure warning control unit connector
- Steering angle sensor connector
- Harness connector M15

2. Check continuity between data link connector M8 terminals 6 (L) and 14 (P).

6 (L) – 14 (P) : Continuity should not exist.



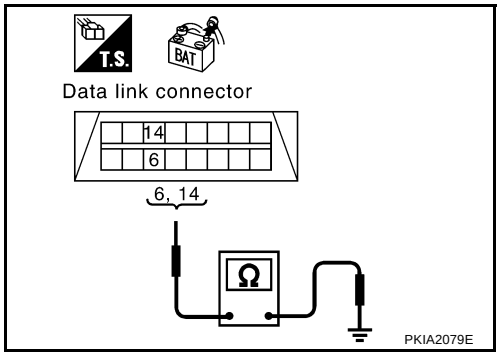
OK or NG

OK >> GO TO 5.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between data link connector and harness connector M72
- Harness between data link connector and unified meter and A/C amp.
- Harness between data link connector and BCM
- Harness between data link connector and low tire pressure warning control unit
- Harness between data link connector and steering angle sensor
- Harness between data link connector and harness connector M15

5. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between data link connector M8 terminals 6 (L), 14 (P) and ground.

6 (L) – ground : Continuity should not exist.
14 (P) – ground : Continuity should not exist.



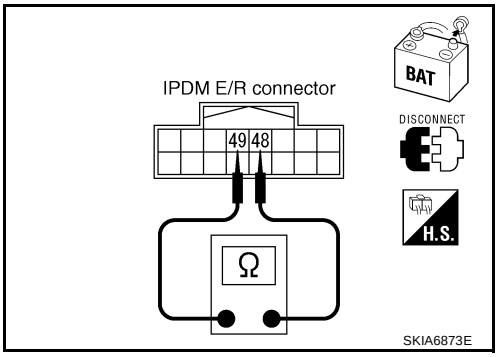
OK or NG

OK >> GO TO 6.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between data link connector and harness connector M72
- Harness between data link connector and unified meter and A/C amp.
- Harness between data link connector and BCM
- Harness between data link connector and low tire pressure warning control unit
- Harness between data link connector and steering angle sensor
- Harness between data link connector and harness connector M15

6. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect VDC/TCS/ABS control unit connector and IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector E9 terminals 48 (L) and 49 (P).

48 (L) – 49 (P) : Continuity should not exist.



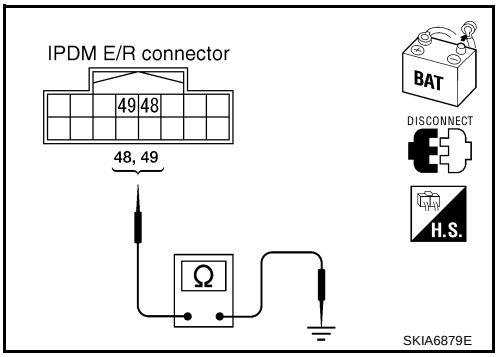
OK or NG

OK >> GO TO 7.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between IPDM E/R and VDC/TCS/ABS control unit
- Harness between IPDM E/R and harness connector E108

7. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between IPDM E/R harness connector E9 terminals 48 (L), 49 (P) and ground.

48 (L) – ground : Continuity should not exist.
49 (P) – ground : Continuity should not exist.



OK or NG

OK >> GO TO 8.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between IPDM E/R and VDC/TCS/ABS control unit
- Harness between IPDM E/R and harness connector E108

8. ECM/IPDM E/R INTERNAL CIRCUIT INSPECTION

Check components inspection. Refer to LAN-115, "ECM/IPDM E/R INTERNAL CIRCUIT INSPECTION" .

OK or NG

OK >> Connect all the connectors and diagnose again. Refer to LAN-89, "Work Flow" .
NG >> Replace ECM and/or IPDM E/R.

IPDM E/R Ignition Relay Circuit Check

AKS00AAC

Check the following. If no malfunction is found, replace the IPDM E/R.

- IPDM E/R power supply circuit. Refer to PG-28, "IPDM E/R Power/Ground Circuit Inspection" .
- Ignition power supply circuit. Refer to PG-11, "IGNITION POWER SUPPLY — IGNITION SW. IN “ON” AND/OR “START”" .

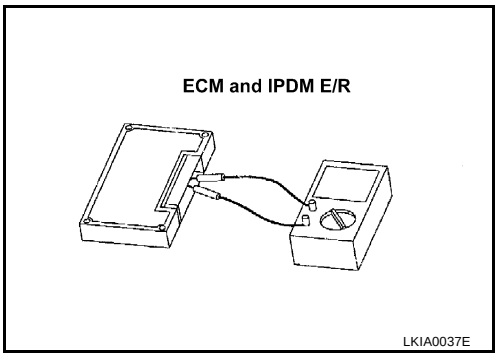
Component Inspection

AKS00AAD

ECM/IPDM E/R INTERNAL CIRCUIT INSPECTION

- Remove ECM and IPDM E/R from vehicle.
- Check resistance between ECM terminals 94 and 86.
- Check resistance between IPDM E/R terminals 48 and 49.

Unit	Terminal	Resistance value (Ω) (Approx.)
ECM	94 - 86	108 - 132
IPDM E/R	48 - 49	



SECTION AV

AUDIO VISUAL, NAVIGATION & TELEPHONE SYSTEM

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

AKS008YS

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

AKS003RI

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Wiring Diagrams and Trouble Diagnosis

AKS0010F

When reading wiring diagrams, refer to the following:

- GI-15, "How to Read Wiring Diagrams"
- PG-4, "POWER SUPPLY ROUTING CIRCUIT"

When performing trouble diagnosis, refer to the following:

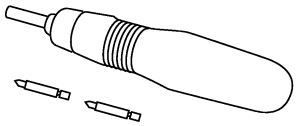
- GI-11, "HOW TO FOLLOW TEST GROUPS IN TROUBLE DIAGNOSES"
- GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident"

PREPARATION

PFP:00002

Commercial Service Tools

AKS0010G

Tool name	Description
Power tool  PBIC0191E	Loosening bolts and nuts

AUDIO

PFP:28111

System Description

AKS0010H

BASE SYSTEM FOR COUPE MODELS

Refer to Owner's Manual for audio system operating instructions.
Power is supplied at all times

- through 15A fuse [No. 37, located in the fuse and fusible link box]
- to audio unit terminal 6.

With the ignition switch in the ACC or ON position, power is supplied

- through 10A fuse [No. 6, located in the fuse block (J/B)]
- to audio unit terminal 10.

Ground is supplied through the case of the audio unit.
When of audio switch is pushed, audio signals are supplied

- through audio unit terminals 1, 2, 3, 4, 13, 14, 15 and 16
- to terminals 1 and 2 of driver door speaker and passenger door speaker
- to terminals 1 and 2 of rear speaker LH and RH
- to terminals 1 and 2 of tweeter (driver side) and tweeter (passenger side).

BASE SYSTEM FOR ROADSTER MODELS

Refer to Owner's Manual for audio system operating instructions.
Power is supplied at all times

- through 15A fuse [No. 37, located in the fuse and fusible link box]
- to audio unit terminal 6.

With the ignition switch in the ACC or ON position, power is supplied

- through 10A fuse [No. 6, located in the fuse block (J/B)]
- to audio unit terminal 10.

Ground is supplied through the case of the audio unit.
When of audio switch is pushed, audio signals are supplied

- through audio unit terminals 1, 2, 3, 4, 13, 14, 15 and 16
- to terminals 1 and 2 of driver door speaker and passenger door speaker
- to terminals 1 and 2 of rear speaker LH and RH
- to terminals 1 and 2 of tweeter (driver side) and tweeter (passenger side).

BOSE SYSTEM FOR COUPE MODELS

CD auto changer (built into audio unit) operation is controlled by audio unit.
Refer to Owner's Manual for audio system operating instructions.
Power is supplied at all times

- through 15A fuse [No. 37, located in the fuse and fusible link box]
- to audio unit terminal 6
- to BOSE speaker amp. terminal 11 and
- to option connector for satellite radio receiver terminal 1,
- through 15A fuse [No. 17, located in the fuse block (J/B)]
- to woofer amp. terminal 8.

With the ignition switch in the ACC or ON position, power is supplied

- through 10A fuse [No. 6, located in the fuse block (J/B)]
- to audio unit terminal 10 and
- to option connector for satellite radio receiver terminal 6,
- through audio unit terminal 12
- to BOSE speaker amp. terminal 41,
- through BOSE speaker amp. terminal 32
- to woofer amp. terminal 6.

Ground is supplied through the case of the audio unit.

Ground is also supplied
- to BOSE speaker amp. terminal 27 and
- to woofer amp. terminal 7
- through body ground B5, B6,D105 and T14.

When audio switch is pushed, audio signals are supplied
- through audio unit terminals 1, 2, 3, 4, 13, 14, 15 and 16
- to BOSE speaker amp. terminals 33, 34, 35, 36, 37, 38, 39 and 40.

Audio signals are amplified by the BOSE speaker amp.
The amplified audio signals are supplied
- through BOSE speaker amp. terminals 12, 19, 20, 21, 22, 23, 24, 25, 26 and 28
- to terminals 1 and 2 of driver door speaker and passenger door speaker
- to terminals 1 and 2 of rear speaker LH and RH
- to terminals 1 and 2 of tweeter (driver side) and tweeter (passenger side)
- to terminals 1 and 2 of woofer amp.

Audio signals are amplified by the woofer amp.
The amplified audio signals are supplied
- through woofer amp. terminals 3 and 4
- to terminals 1 and 2 of woofer.

BOSE SYSTEM FOR ROADSTER MODELS

CD auto changer (built into audio unit) operation is controlled by audio unit.
Refer to Owner's Manual for audio system operating instructions.
Power is supplied at all times
- through 15A fuse [No. 37, located in the fuse and fusible link box]
- to audio unit terminal 6 and
- to BOSE speaker amp. terminal 11,
- through 15A fuse [No. 17, located in the fuse block (J/B)]
- to woofer amp. terminal 8.

With the ignition switch in the ACC or ON position, power is supplied
- through 10A fuse [No. 6, located in the fuse block (J/B)]
- to audio unit terminal 10,
- through audio unit terminal 12
- to BOSE speaker amp. terminal 41,
- through BOSE speaker amp. terminal 32
- to woofer amp. terminal 6.

Ground is supplied through the case of the audio unit.
Ground is also supplied
- to BOSE speaker amp. terminal 27 and
- to woofer amp. terminal 7
- through body ground B5, B6 and T14.

When audio switch is pushed, audio signals are supplied
- through audio unit terminals 1, 2, 3, 4, 13, 14, 15 and 16
- to BOSE speaker amp. terminals 33, 34, 35, 36, 37, 38, 39 and 40.

Audio signals are amplified by the BOSE speaker amp.
The amplified audio signals are supplied
- through BOSE speaker amp. terminals 12, 19, 20, 21, 22, 23, 24, 25, 26 and 28
- to terminals 1 and 2 of driver door speaker and passenger door speaker
- to terminals 1 and 2 of rear speaker LH and RH
- to terminals 1 and 2 of tweeter (driver side) and tweeter (passenger side)
- to terminals 1 and 2 of woofer amp.

Audio signals are amplified by the woofer amp.

The amplified audio signals are supplied

- through woofer amp. terminals 3 and 4
- to terminals 1 and 2 of woofer.

AUDIOPILOT™ System

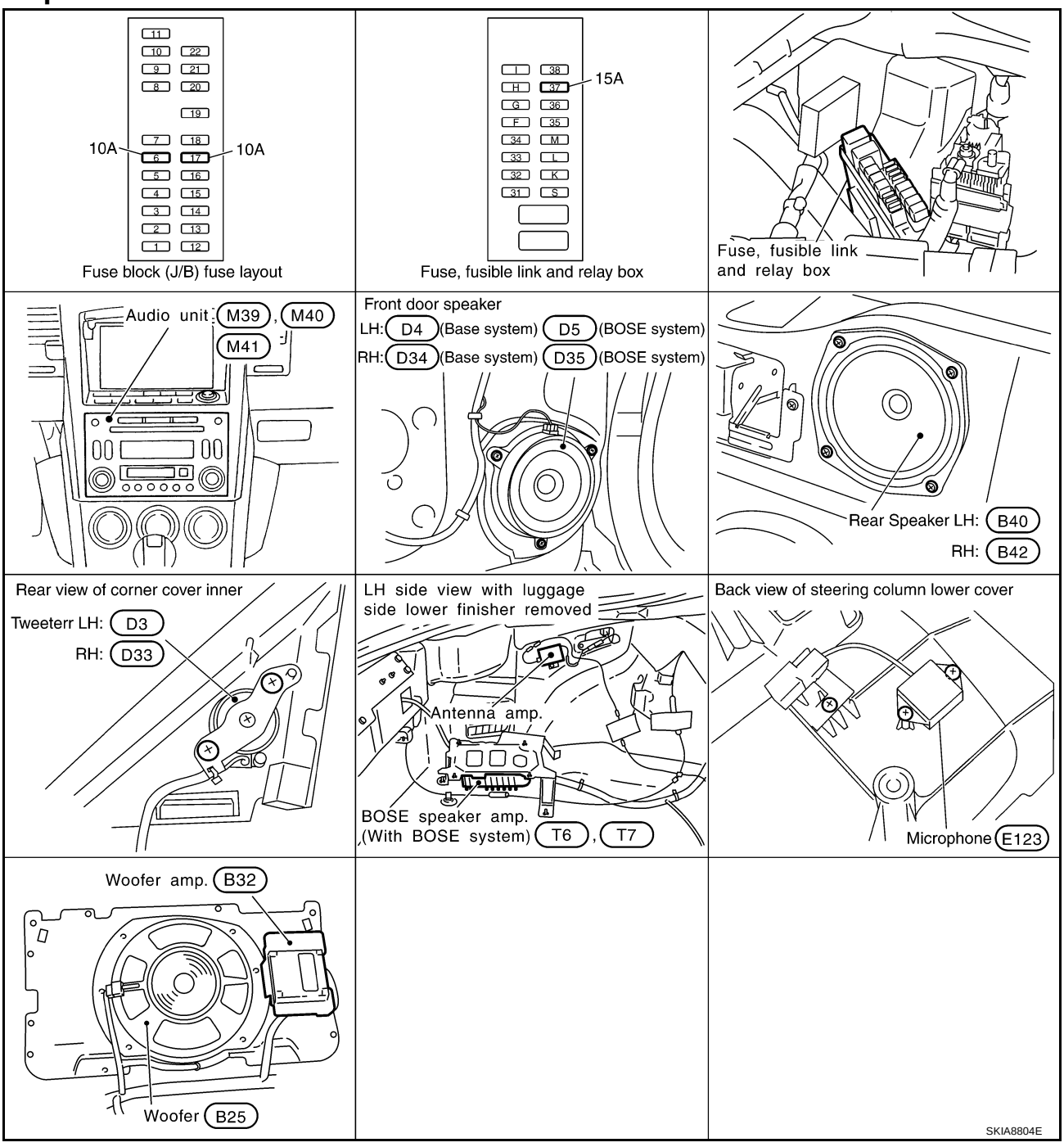
AUDIOPILOT™ is the sound improving system that picks up any noises or the sound of music coming into the vehicle by a microphone under the steering, and that the BOSE speaker amp. revises the frequency feature of music at real time in response to the frequency feature of the noise while driving and listening to music.

- If low frequency area noise from vehicle is loud, it adjusts low frequency element of music to be bigger than vehicle noise.
- If high frequency area noise from vehicle is loud, it adjusts high frequency element of music to be bigger than vehicle noise.
- If vehicle noise is smaller than the setting volume, correction is not performed.

This eliminates vehicle noise when listening to music.

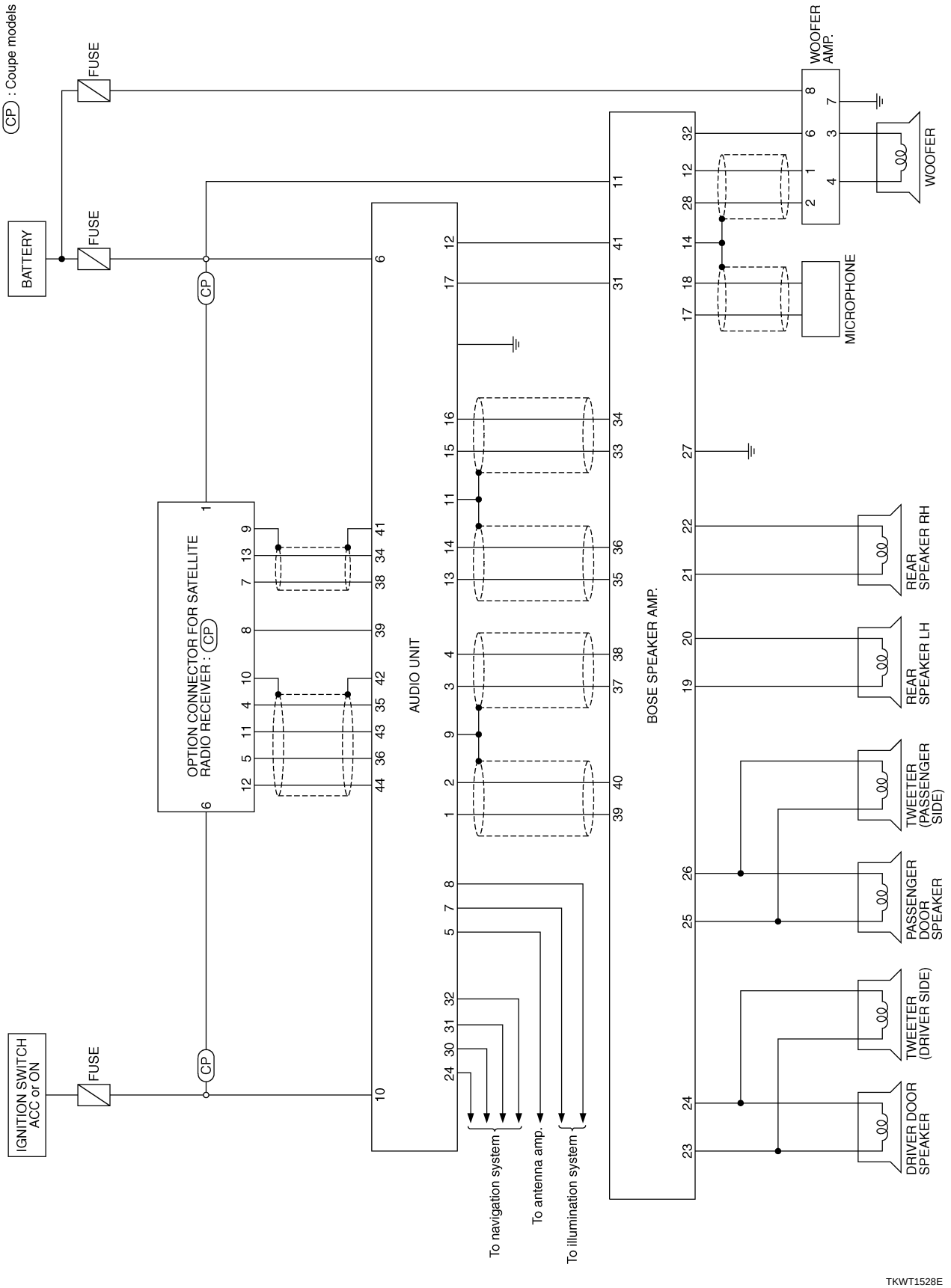
Component Parts and Harness Connector Location

AKS00995



Schematic
BOSE SYSTEM

AKS0010I



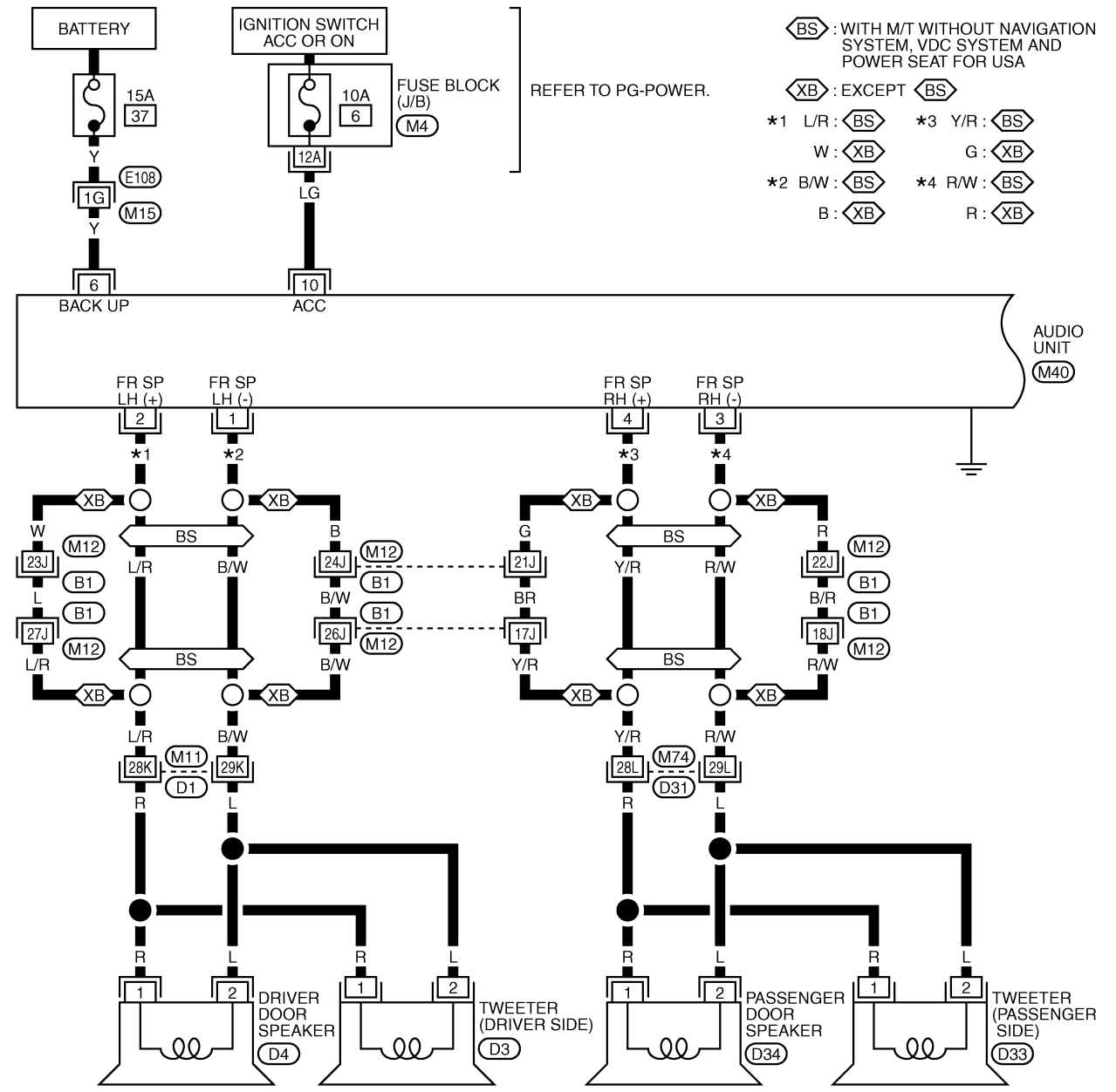
TKWT1528E

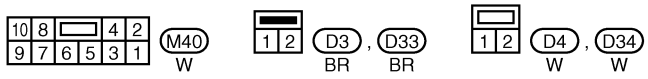
Wiring Diagram — AUDIO —

AKS0010J

BASE SYSTEM FOR COUPE MODELS

AV-AUDIO-01





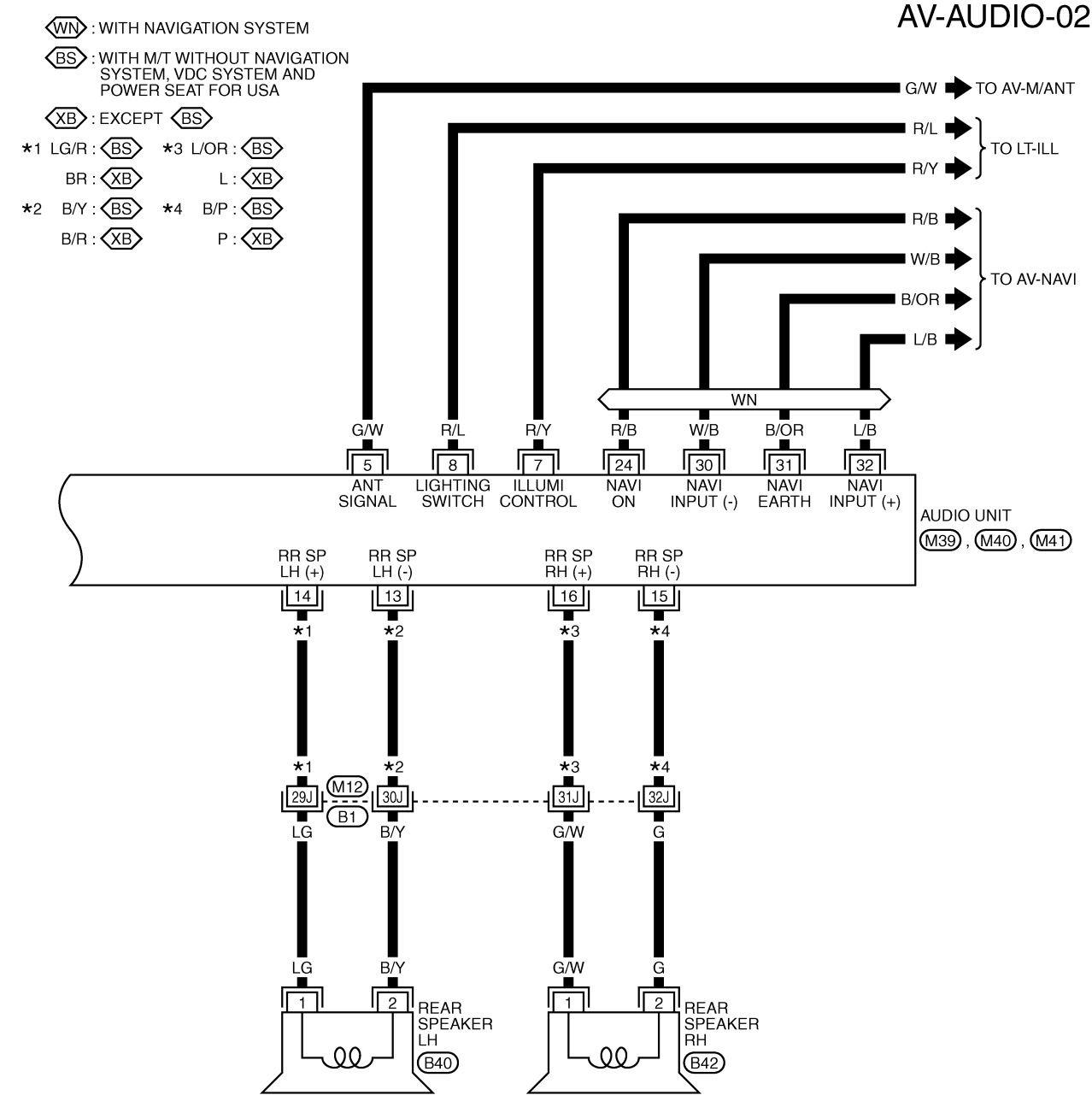
REFER TO THE FOLLOWING.

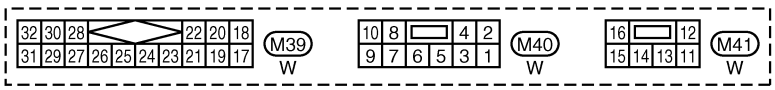
E108 , B1 , D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

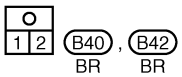
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT1524E

AV-AUDIO-02





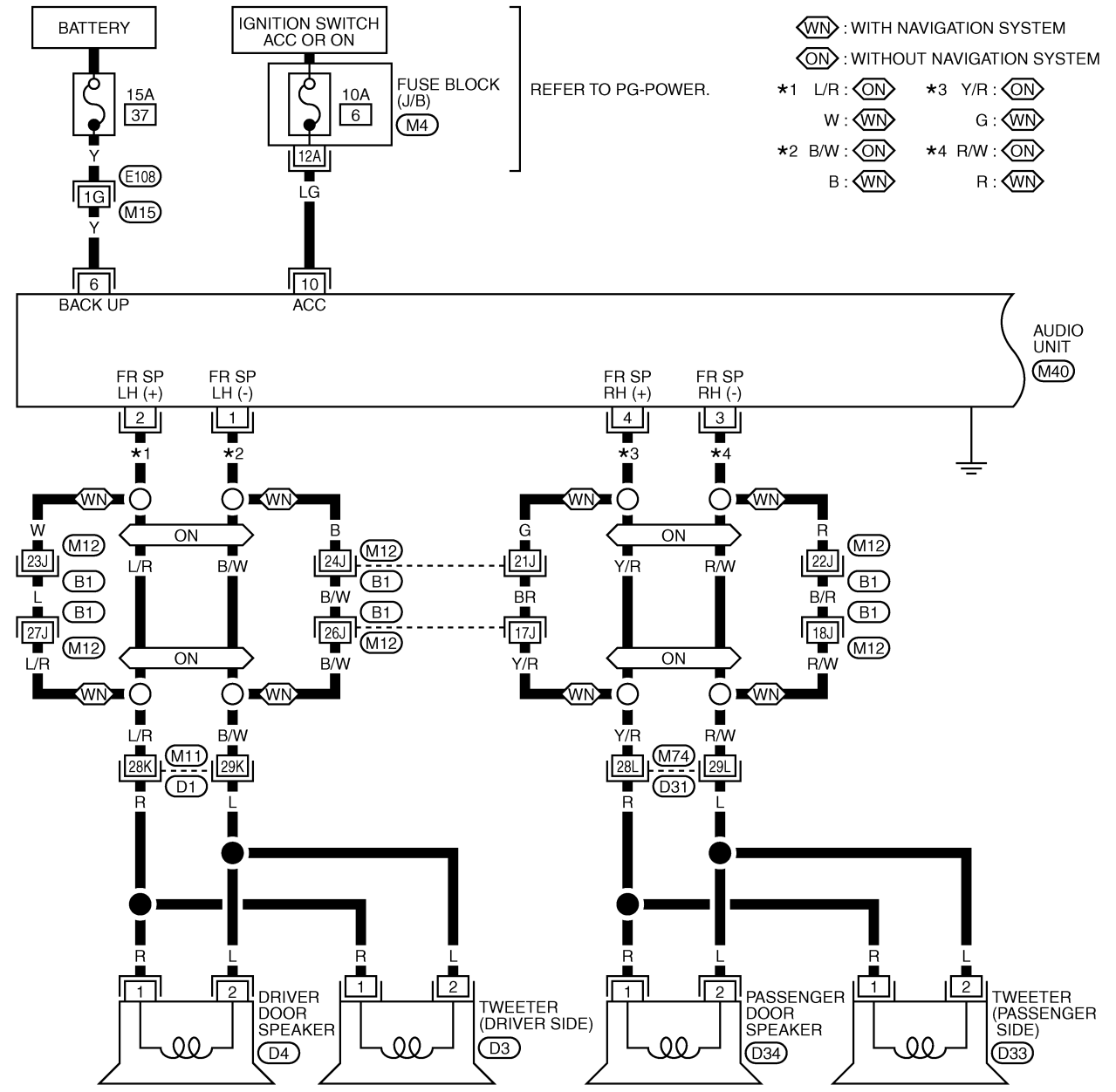


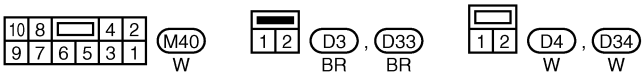
REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT1525E

BASE SYSTEM FOR ROADSTER MODELS

AV-AUDIO-03





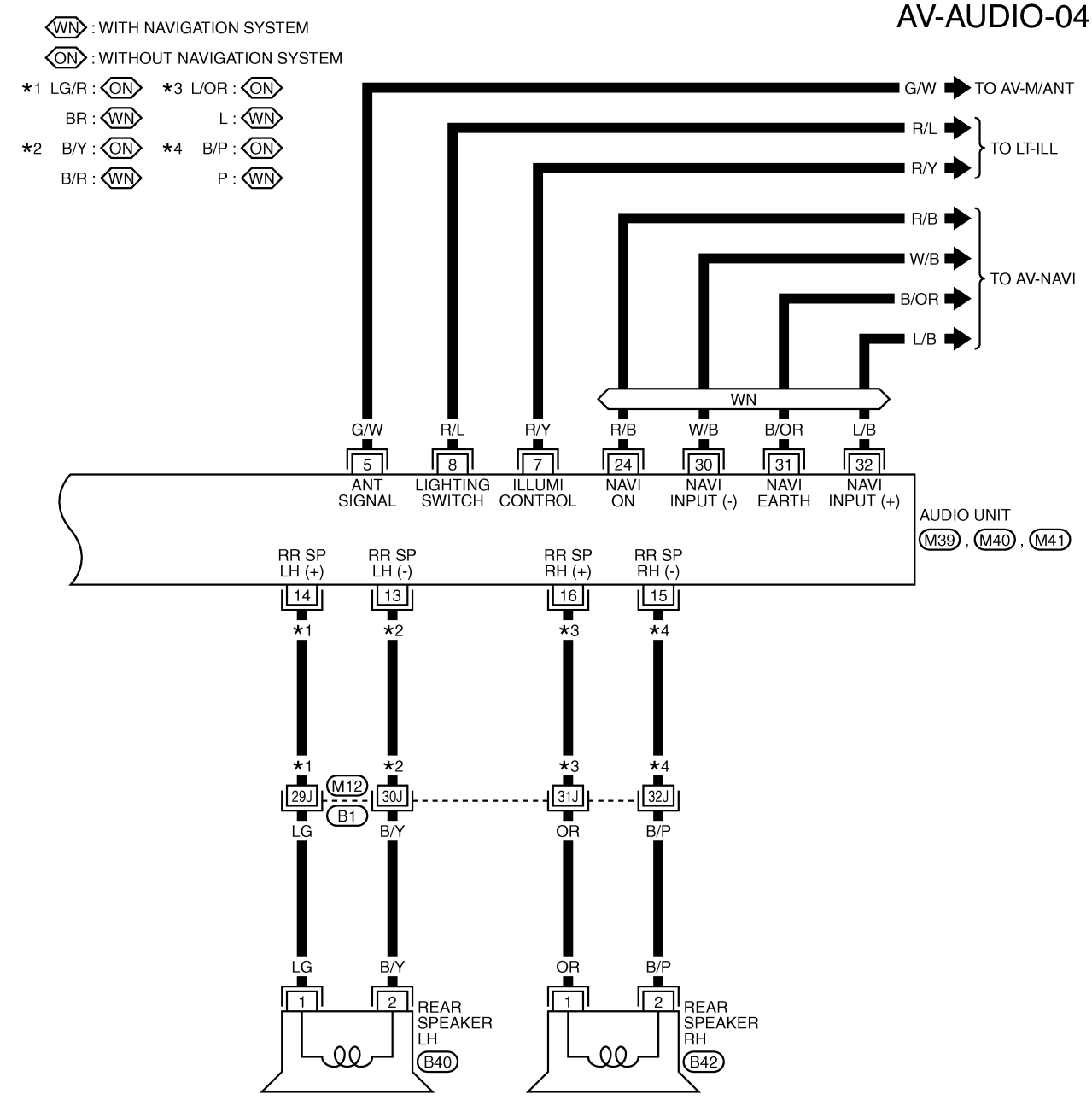
REFER TO THE FOLLOWING.

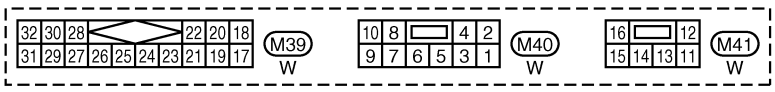
E108 , B1 , D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

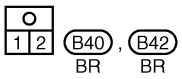
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT1526E

AV-AUDIO-04





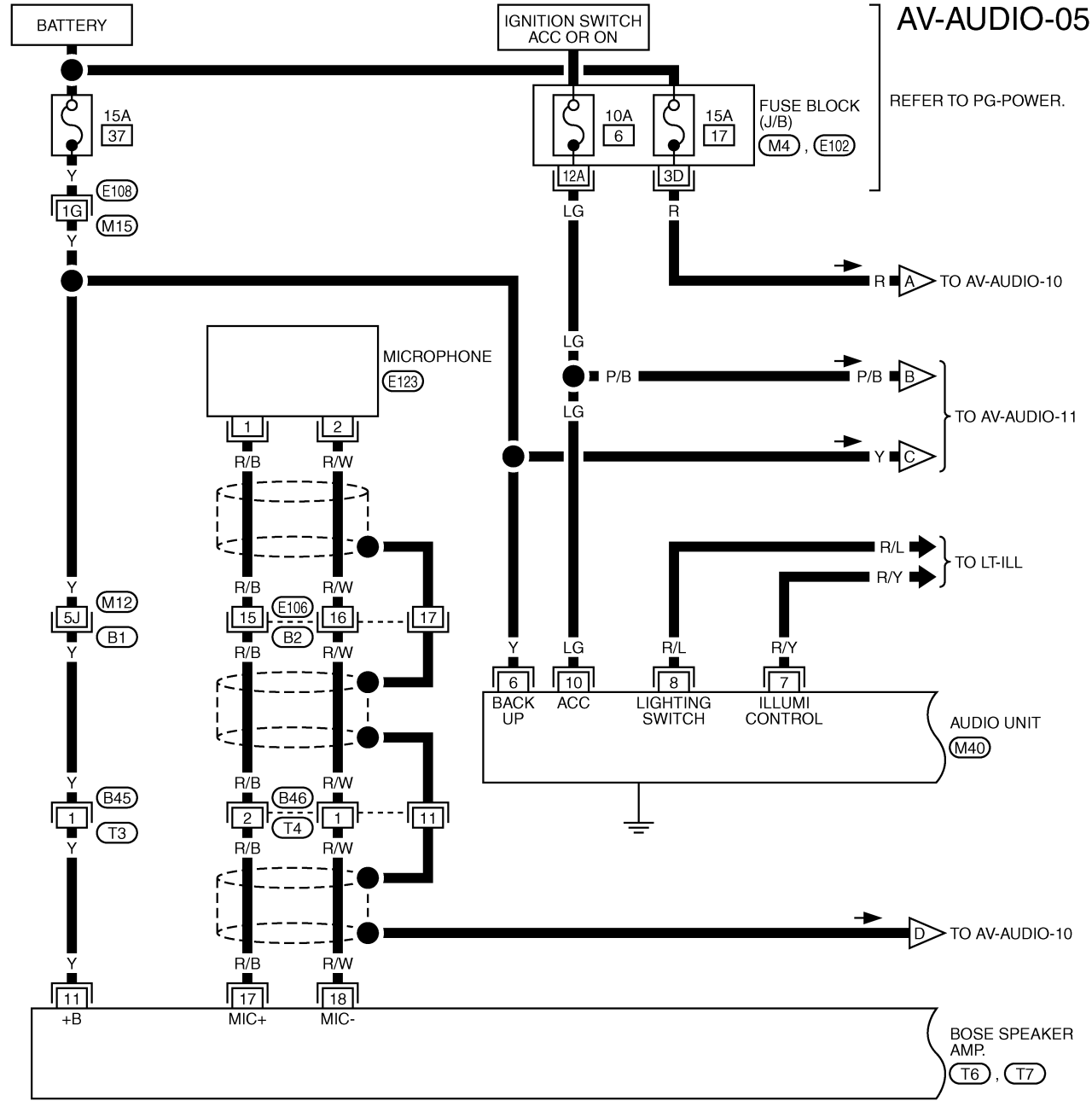


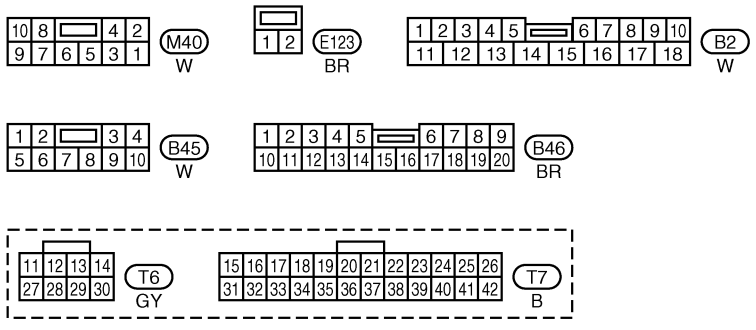
REFER TO THE FOLLOWING.

B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT1527E

BOSE SYSTEM FOR COUPE MODELS

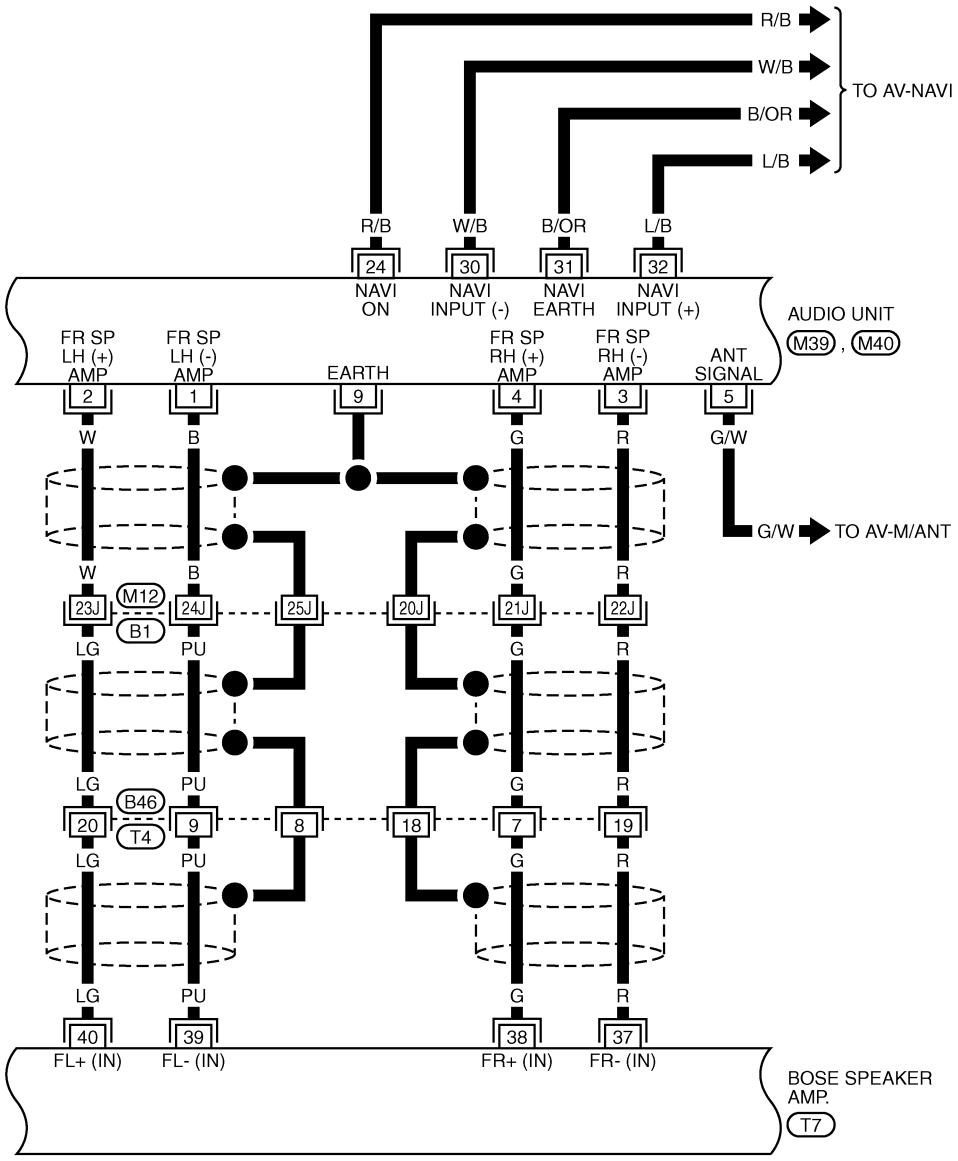


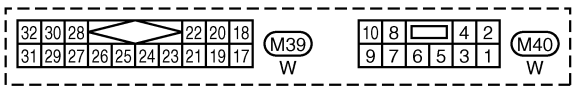


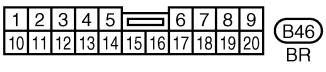
REFER TO THE FOLLOWING.
E108, B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4, E102 -FUSE BLOCK-JUNCTION BOX (J/B)

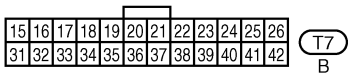
TKWT1529E

AV-AUDIO-06







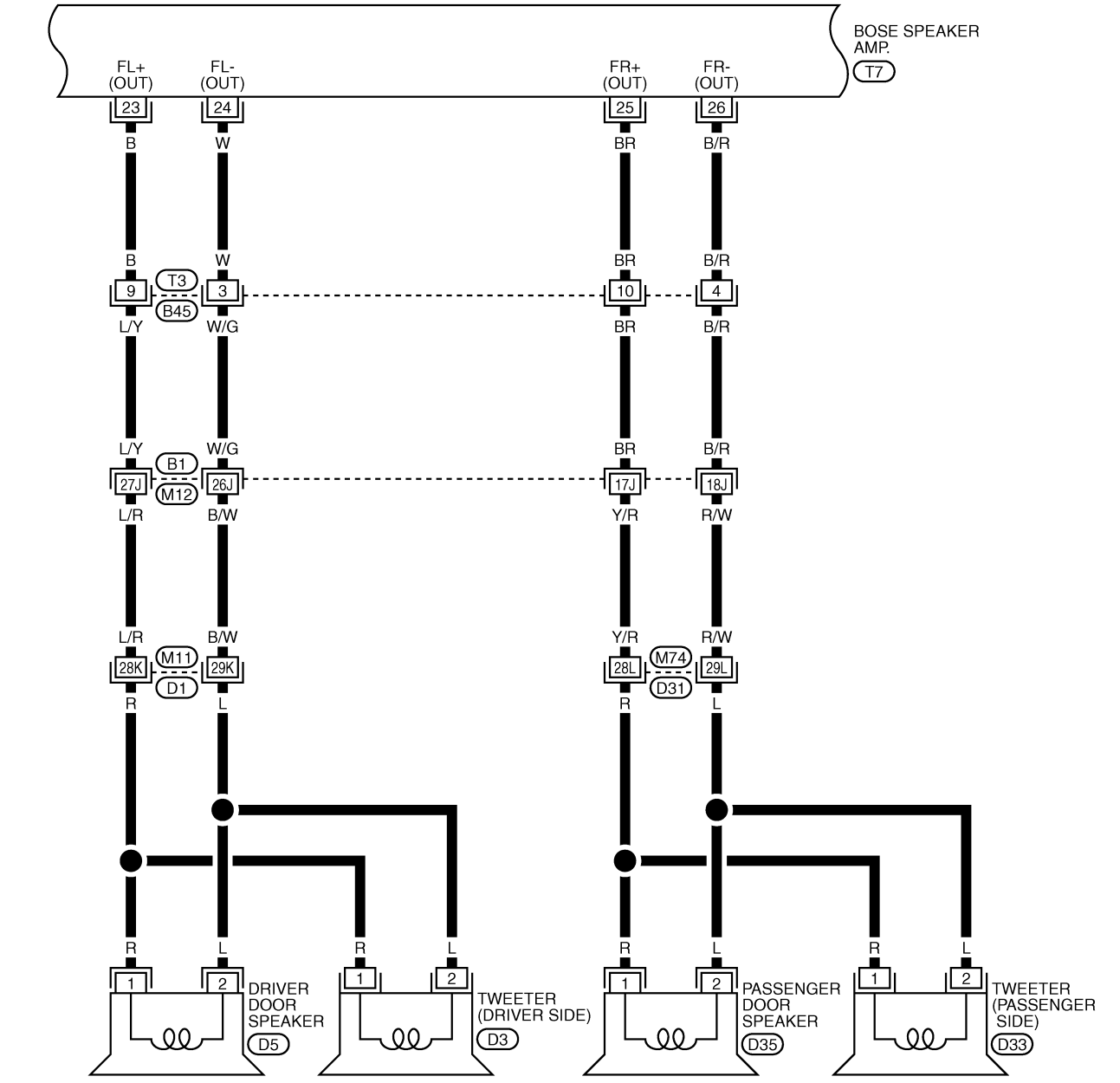


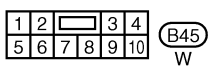
REFER TO THE FOLLOWING.

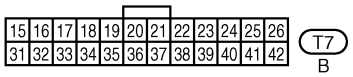
B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT1530E

AV-AUDIO-07



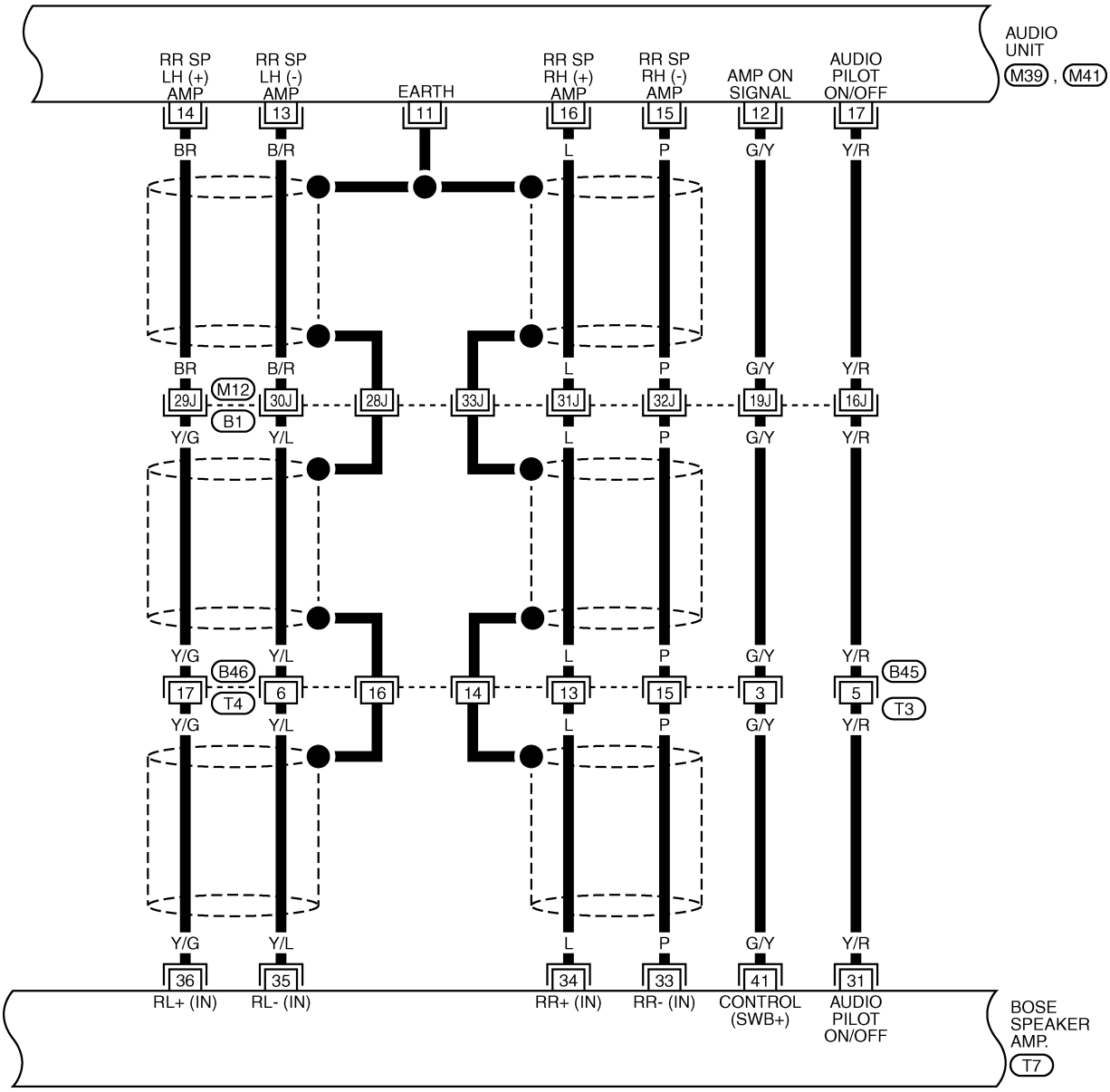


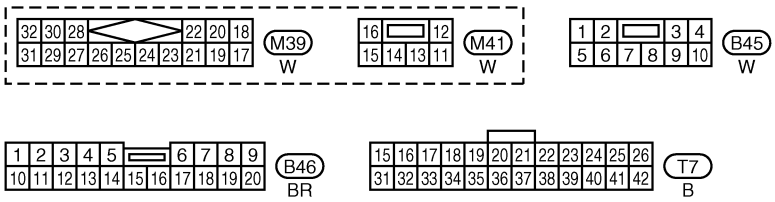


REFER TO THE FOLLOWING.
B1 , D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT1531E

AV-AUDIO-08



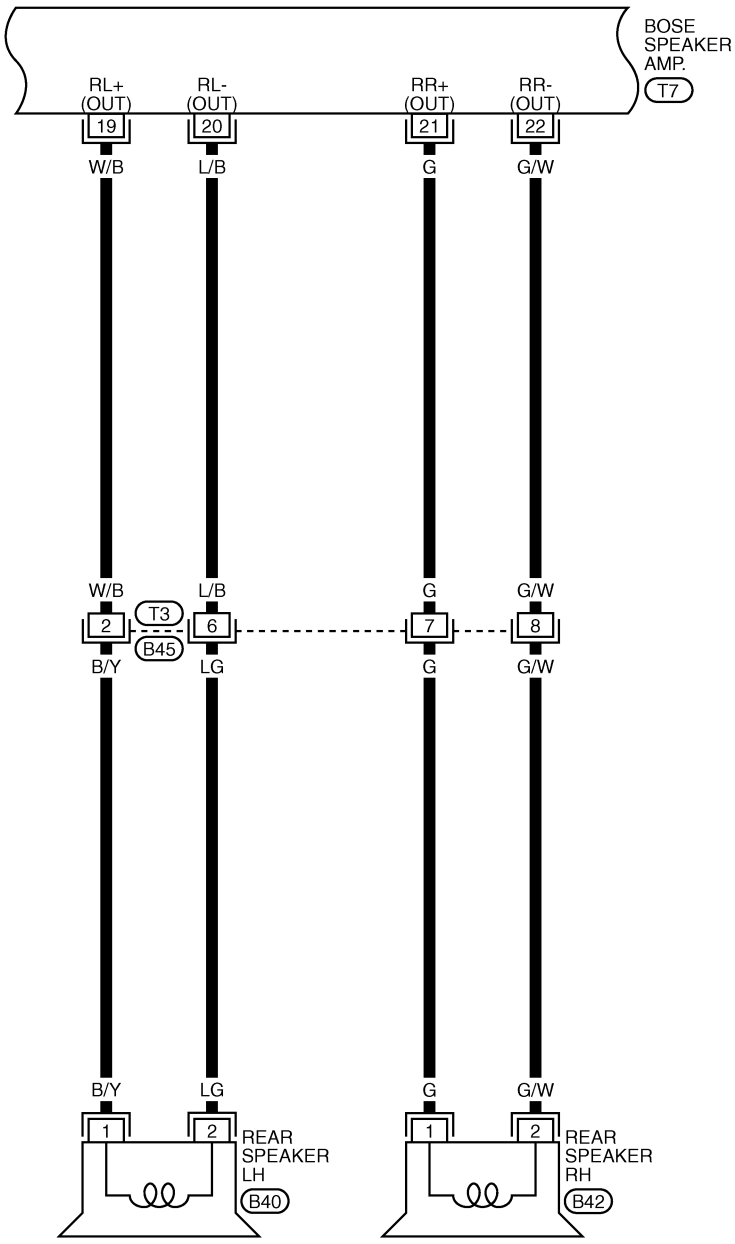


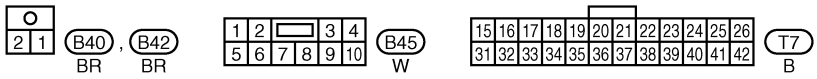
REFER TO THE FOLLOWING.

B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT1878E

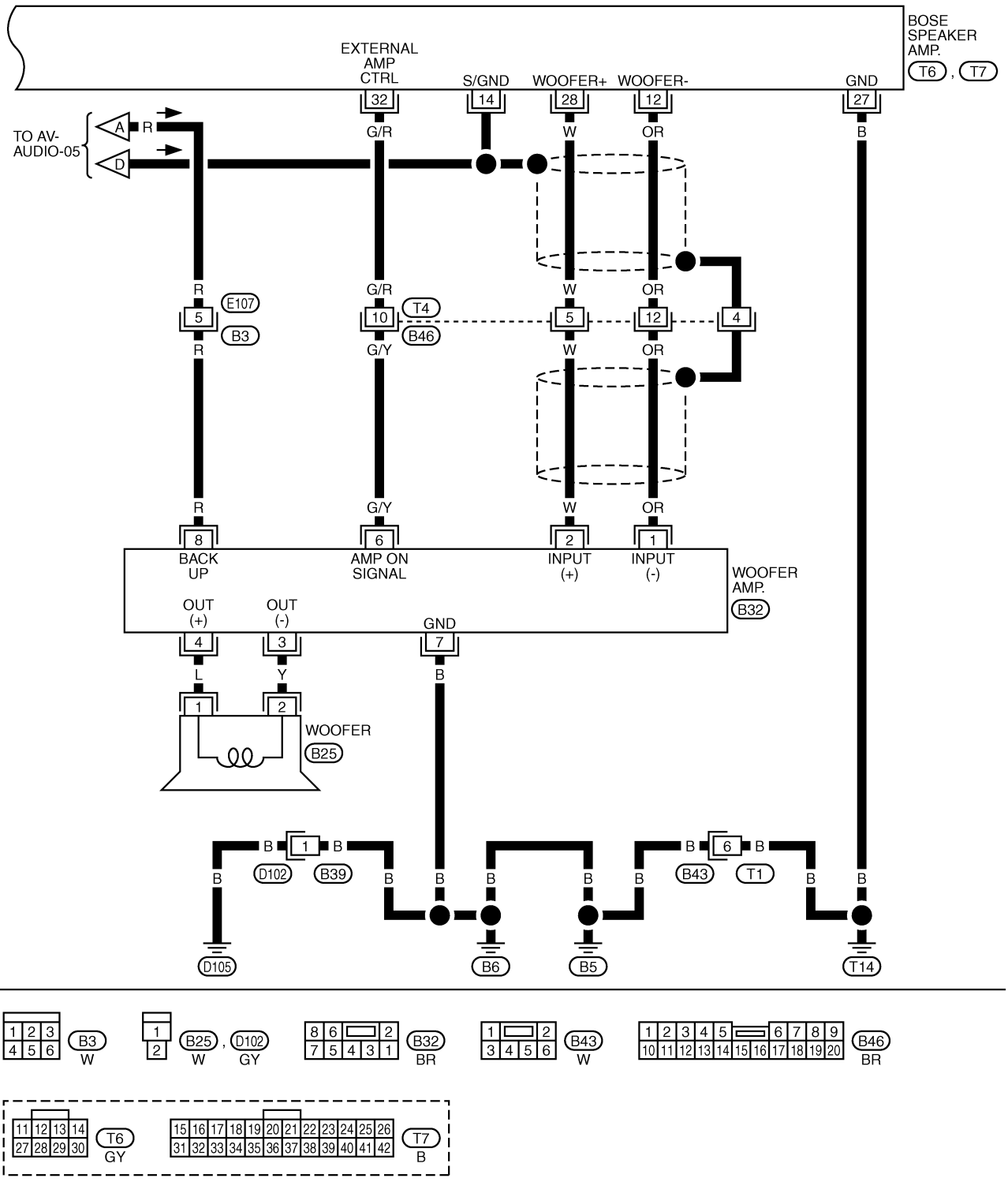
AV-AUDIO-09





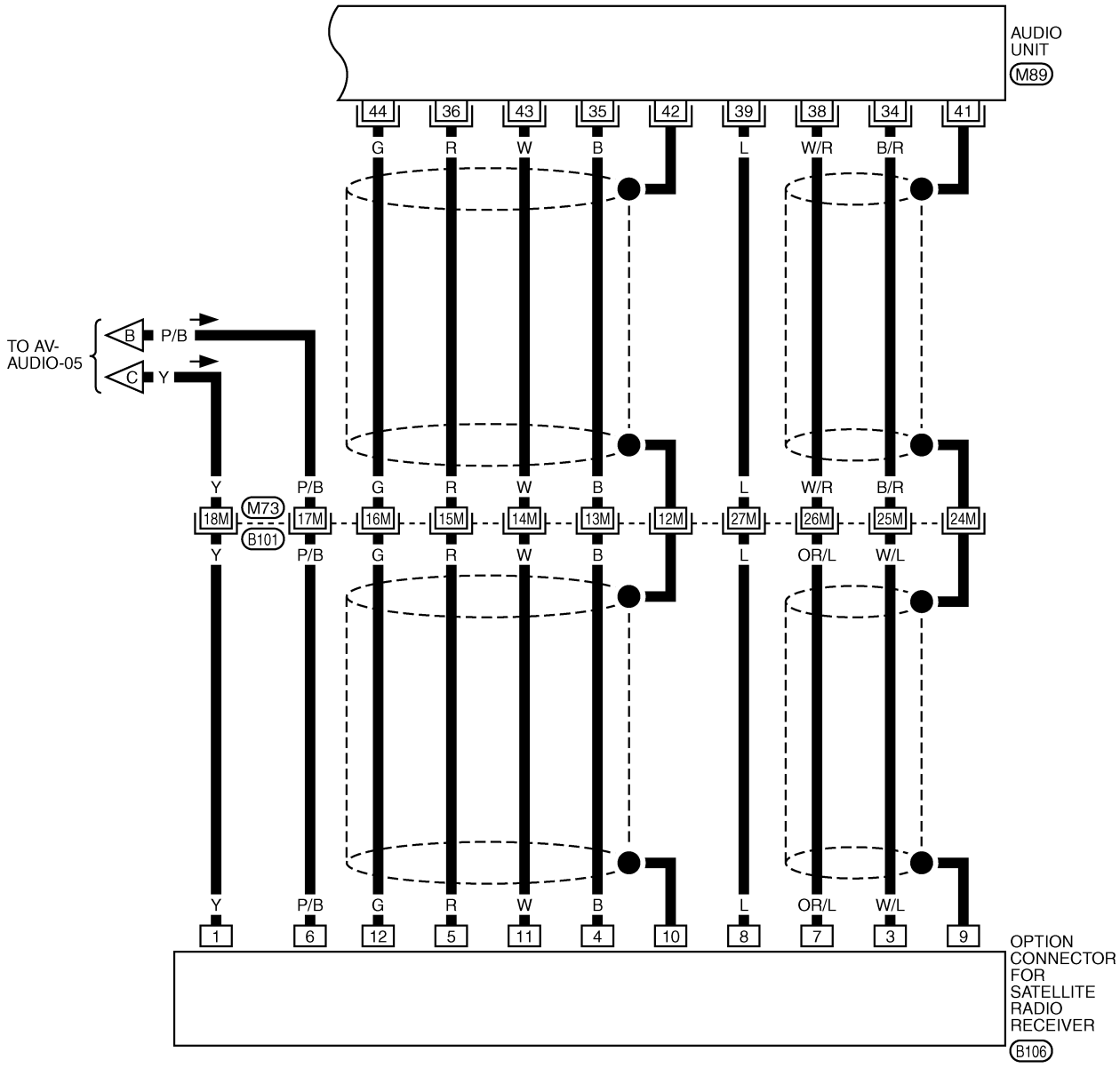
TKWT1533E

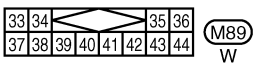
AV-AUDIO-10

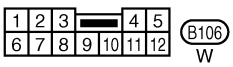


TKWT1534E

AV-AUDIO-11



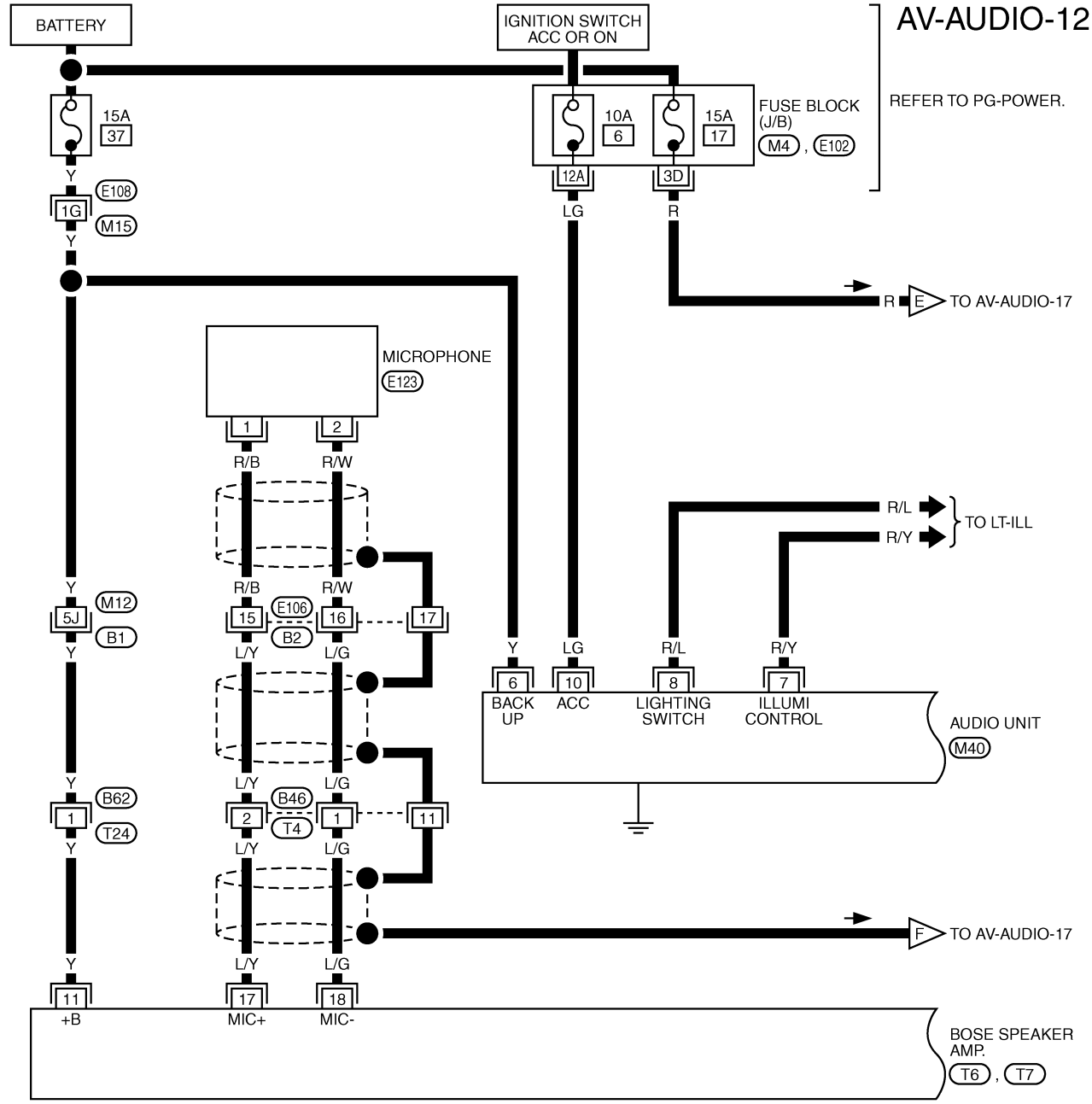


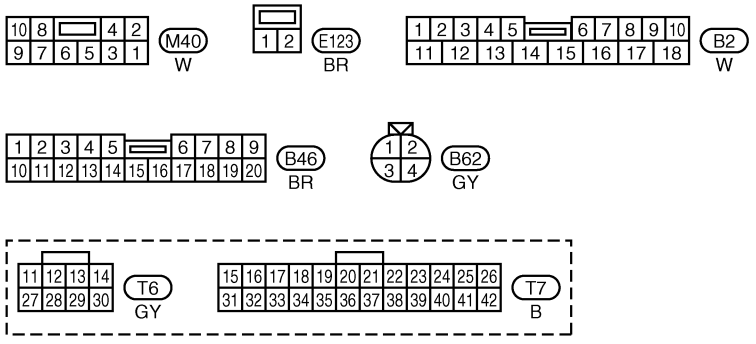


REFER TO THE FOLLOWING.
B101 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT1535E

BOSE SYSTEM FOR ROADSTER MODELS

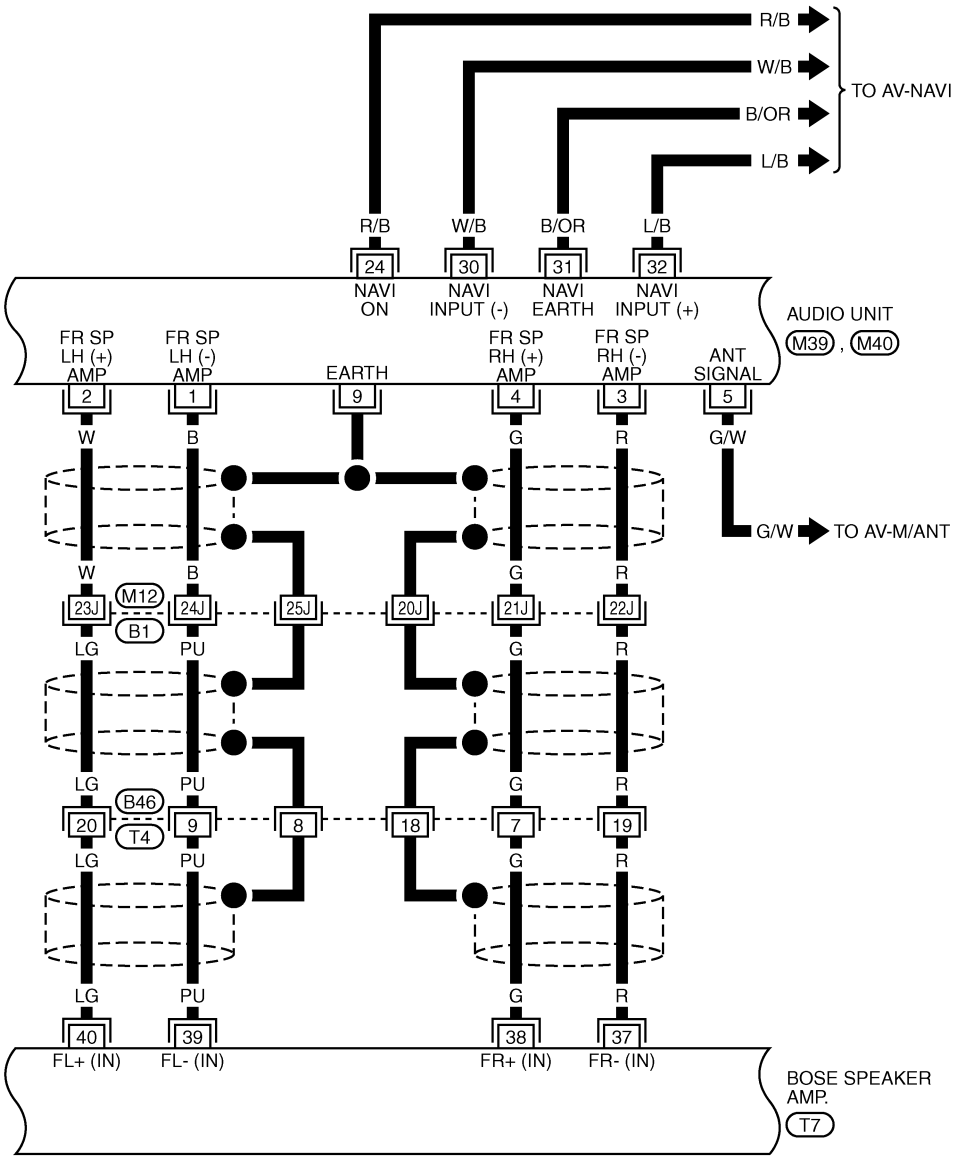


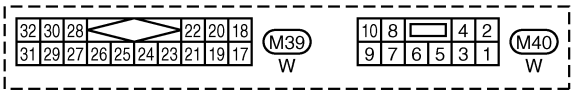


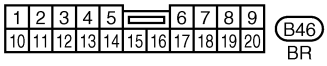
REFER TO THE FOLLOWING.
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , E102 -FUSE BLOCK-JUNCTION BOX (J/B)

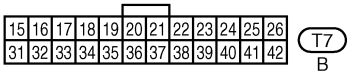
TKWT1536E

AV-AUDIO-13





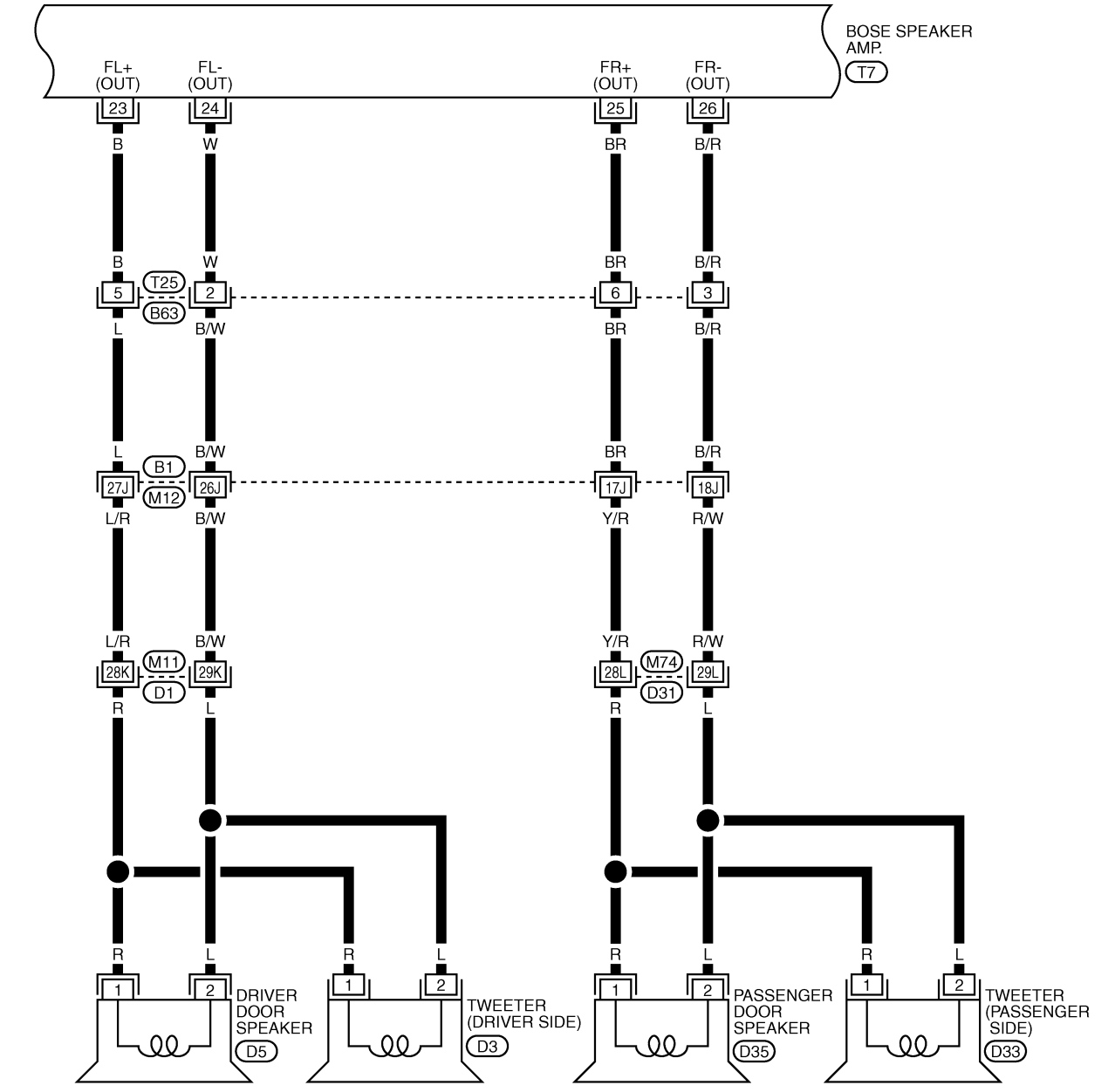


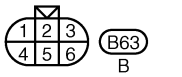


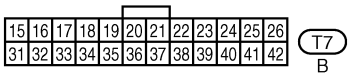
REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT1537E

AV-AUDIO-14



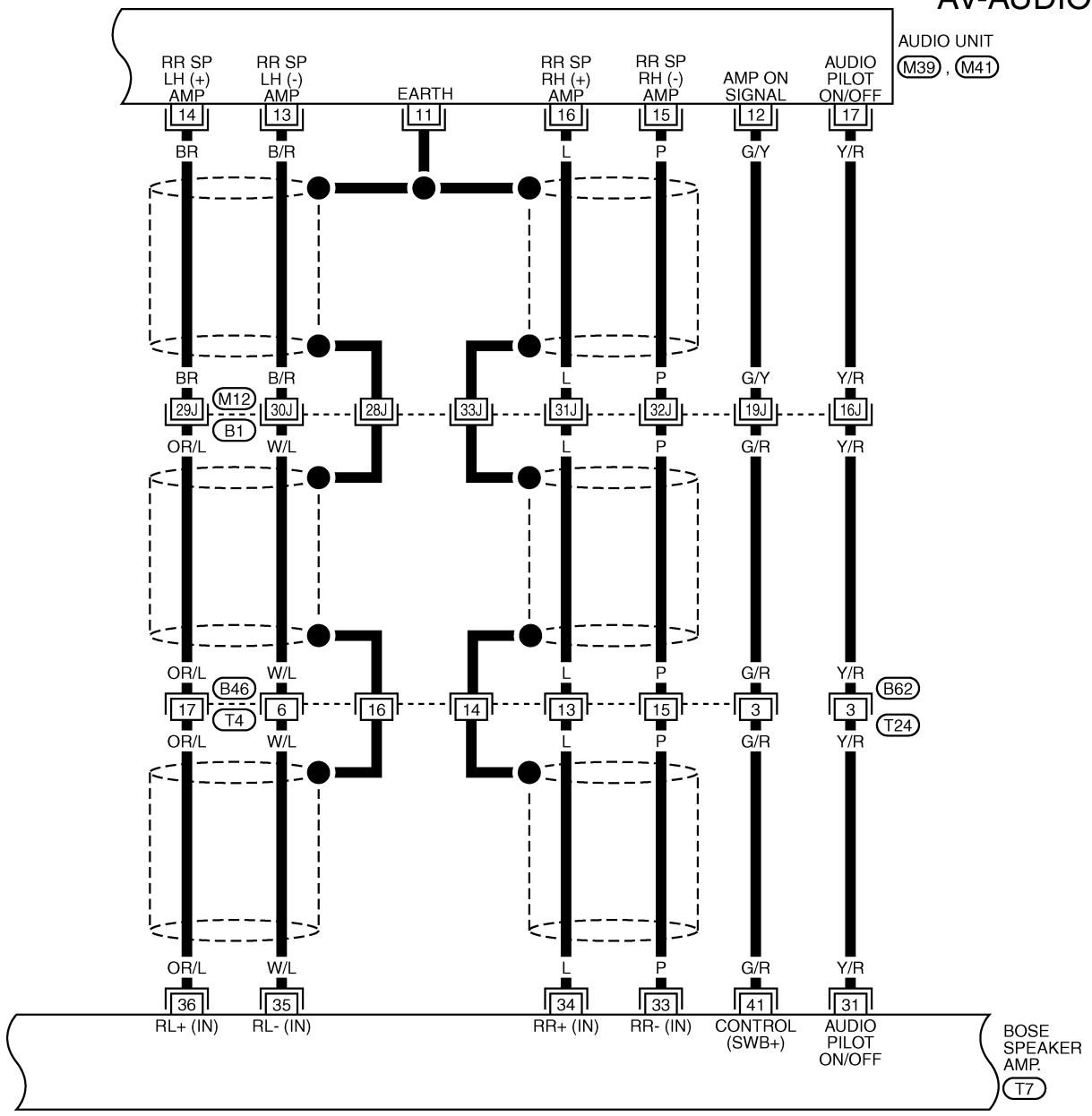


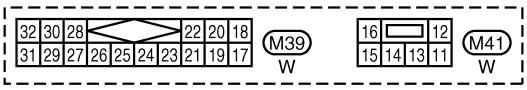


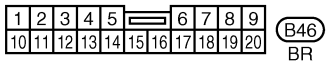
REFER TO THE FOLLOWING.
B1 , D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

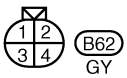
TKWT1538E

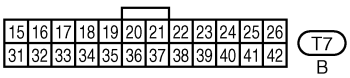
AV-AUDIO-15







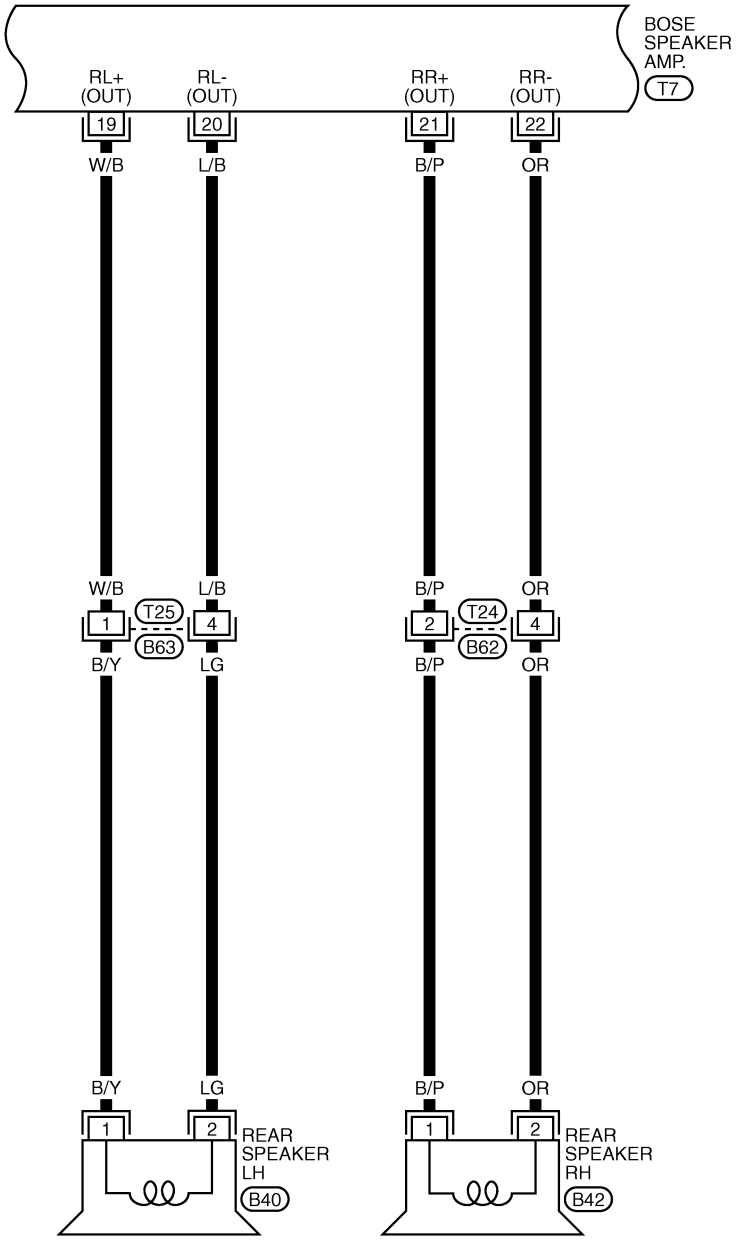


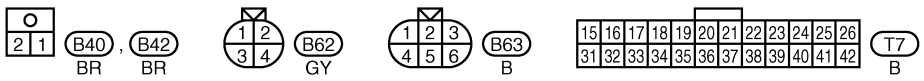


REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT1879E

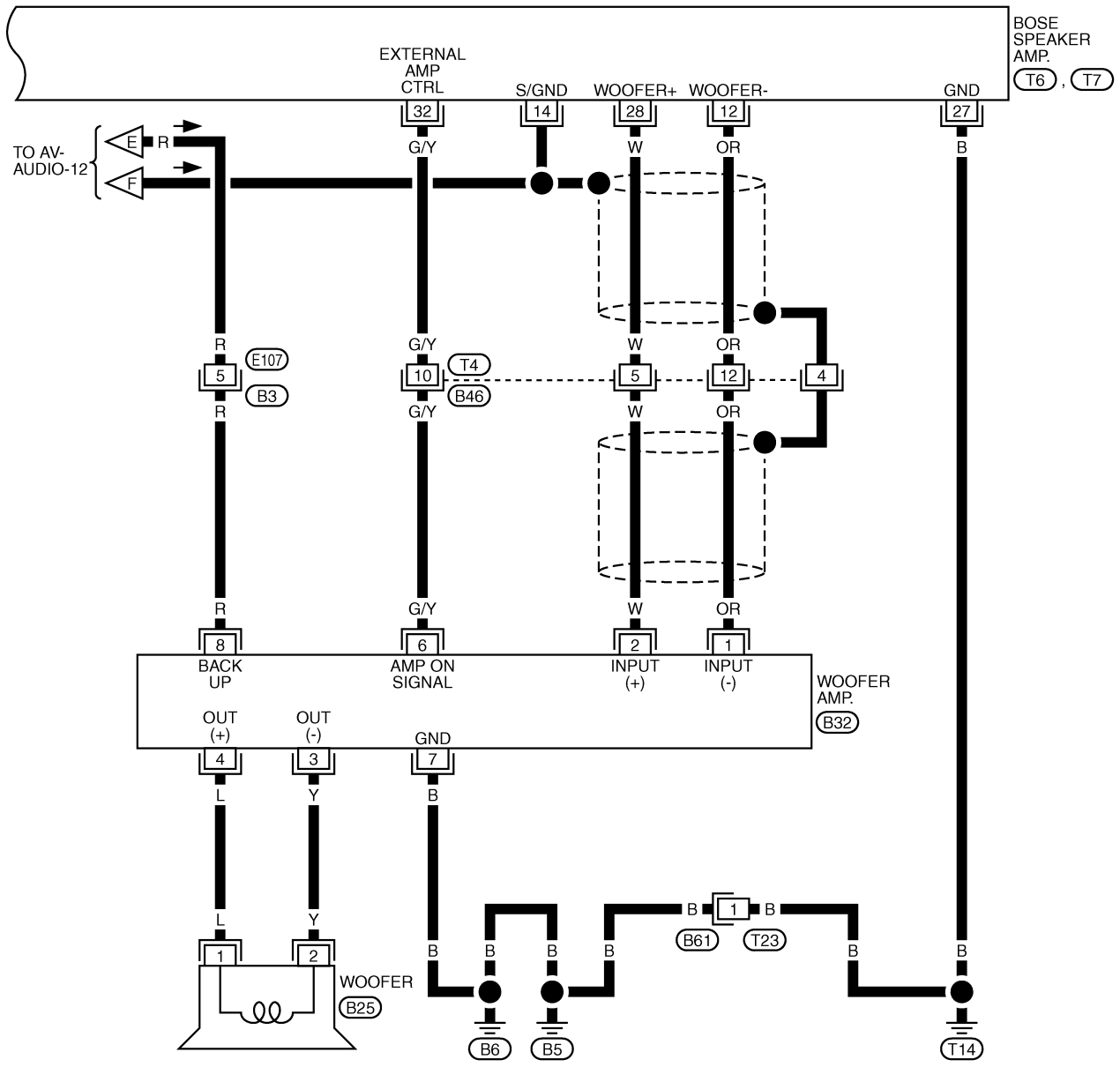
AV-AUDIO-16

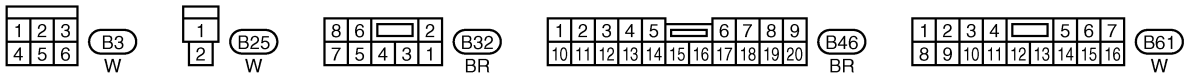


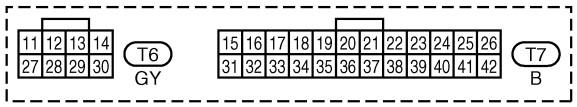


TKWT1540E

AV-AUDIO-17



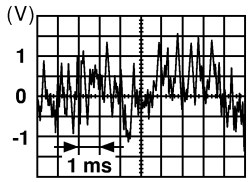
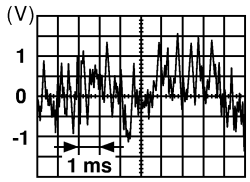
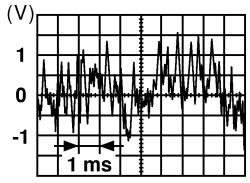
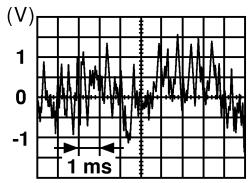




TKWT1541E

Terminals and Reference Value for Audio Unit for Base System

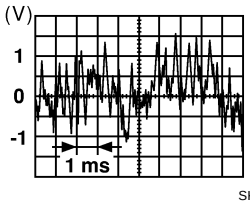
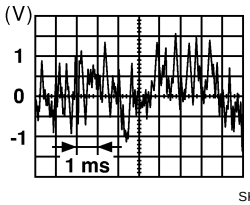
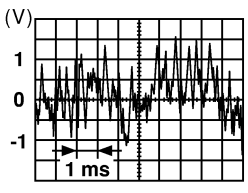
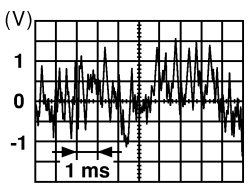
AKS0010K

Terminal (Wire color) +	Terminal (Wire color) –	Item	Signal input/ output	Condition: Ignition switch	Condition: Operation	Reference value	Example of symptom
2 (L/R)*1 (W)*2	1 (B/W)*1 (B)*2	Audio sound signal front LH	Output	ON	Receive audio signal	 SKIA0177E	No sound from driver door speaker and tweeter (driver side).
4 (Y/R)*1 (G)*2	3 (R/W)*1 (R)*2	Audio sound signal front RH	Output	ON	Receive audio signal	 SKIA0177E	No sound from passenger door speaker and tweeter (passenger side).
5 (G/W)	Ground	Antenna signal	Output	ON	–	Approx. 12V	Antenna amp. does not work properly.
6 (Y)	Ground	Battery power supply	Input	OFF	–	Battery voltage	System does not work properly.
7 (R/Y)	Ground	Illumination control signal	Input	ON	Illumination control switch is operated by lighting switch in ON position	Changes between approx. 0 and approx. 12V	Audio unit illumination can not be controlled.
8 (R/L)	Ground	Lighting switch signal	Input	ON	Lighting switch is ON	Approx. 12V	Audio unit illumination does not come on when lighting switch is ON.
					Lighting switch is OFF	Approx. 0V	
10 (LG)	Ground	ACC power supply	Input	ACC	–	Battery voltage	System does not work properly.
14 (LG/R)*1 (BR)*2	13 (B/Y)*1 (B/R)*2	Audio sound signal rear LH	Output	ON	Receive audio signal	 SKIA0177E	No sound from rear speaker LH.
16 (L/OR)*1 (L)*2	15 (B/P)*1 (P)*2	Audio sound signal rear RH	Output	ON	Receive audio signal	 SKIA0177E	No sound from rear speaker RH.

- *1: Coupe models with M/T without navigation system, VDC system and power seat for USA, or Roadster models without navigation system
- *2: Except *1

Terminals and Reference Value for Audio Unit for BOSE System

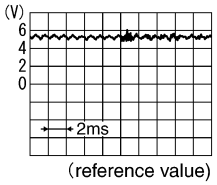
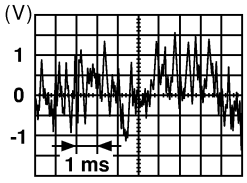
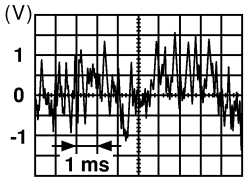
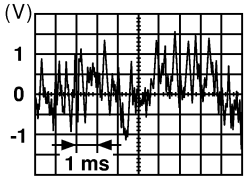
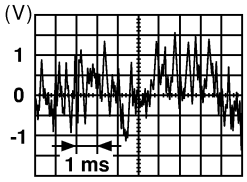
AKS0010L

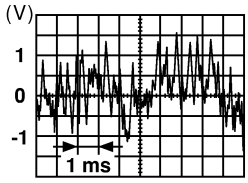
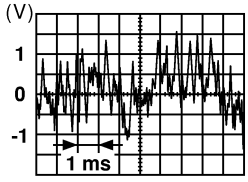
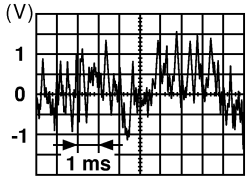
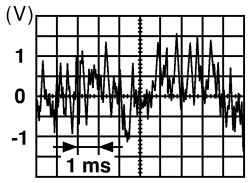
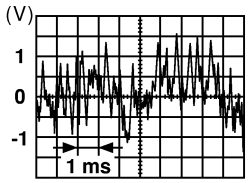
Terminal (Wire color) +	Terminal (Wire color) –	Item	Signal input/ output	Condition: Ignition switch	Condition: Operation	Reference value	Example of symptom
2 (W)	1 (B)	Audio sound signal front LH	Output	ON	Receive audio signal	 SKIA0177E	No sound from driver door speaker and tweeter (driver side).
4 (G)	3 (R)	Audio sound signal front RH	Output	ON	Receive audio signal	 SKIA0177E	No sound from passenger door speaker and tweeter (passenger side).
5 (G/W)	Ground	Antenna signal	Output	ON	–	Approx. 12V	Antenna amp. does not work properly.
6 (Y)	Ground	Battery power supply	Input	OFF	–	Battery voltage	System does not work properly.
7 (R/Y)	Ground	Illumination control signal	Input	ON	Illumination control switch is operated by lighting switch in ON position	Changes between approx. 0 and approx. 12V	Audio unit illumination can not be controlled.
8 (R/L)	Ground	Lighting switch signal	Input	ON	Lighting switch is ON	Approx. 12V	Audio unit illumination does not come on when lighting switch is ON.
					Lighting switch is OFF	Approx. 0V	
9	Ground	Shield	–	ON	–	Approx. 0V	–
10 (LG)	Ground	ACC power supply	Input	ACC	–	Battery voltage	System does not work properly.
11	Ground	Shield	–	ON	–	Approx. 0V	–
12 (G/Y)	Ground	Amp. ON signal	Output	ON	–	Approx. 12V	BOSE speaker amp. does not work properly.
14 (BR)	13 (B/R)	Audio sound signal rear LH	Output	ON	Receive audio signal	 SKIA0177E	No sound from rear speaker LH.
16 (L)	15 (P)	Audio sound signal rear RH	Output	ON	Receive audio signal	 SKIA0177E	No sound from rear speaker RH.

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value	Example of symptom
+	–			Ignition switch	Operation		
17 (Y/R)	Ground	AUDIOPILOT™ ON/ OFF signal	Output	ON	Turn AUDIOPILOT™ OFF	Approx. 7.5V	AUDIOPILOT™ does not operate properly.
					Turn AUDIOPILOT™ ON	Approx. 0V	

Terminals and Reference Value for BOSE Speaker Amp.

AKS0010M

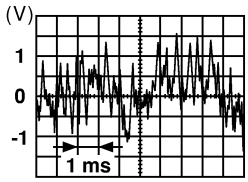
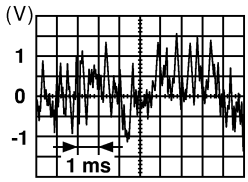
Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value	Example of symptom
+	–			Ignition switch	Operation		
11 (Y)	Ground	Battery power supply	Input	ON	–	Battery voltage	BOSE speaker amp. does not work properly.
14	Ground	Shield	–	ON	–	Approx. 0V	–
17 (R/B)*1 (L/Y)*2	18 (R/W)*1 (L/G)*2	Microphone signal	Input	ON	Microphone test operate	 (reference value) PKIA2104E	AUDIOPILOT™ does not operate properly
19 (W/B)	20 (L/B)	Audio sound signal rear LH	Output	ON	Receive audio signal	 SKIA0177E	No sound from rear speaker LH.
21 (G)*1 (B/P)*2	22 (G/W)*1 (OR)*2	Audio sound signal rear RH	Output	ON	Receive audio signal	 SKIA0177E	No sound from rear speaker RH.
23 (B)	24 (W)	Audio sound signal front LH	Output	ON	Receive audio signal	 SKIA0177E	No sound from driver door speaker and tweeter (driver side).
25 (BR)	26 (B/R)	Audio sound signal front RH	Output	ON	Receive audio signal	 SKIA0177E	No sound from passenger door speaker and tweeter (passenger side).
27 (B)	Ground	Ground	–	ON	–	Approx. 0V	–

Terminal (Wire color) +	Terminal (Wire color) –	Item	Signal input/ output	Condition: Ignition switch	Condition: Operation	Reference value	Example of symptom
28 (W)	12 (OR)	Audio sound signal woofer	Output	ON	Receive audio signal	 SKIA0177E	No sound from woofer.
31 (Y/R)	Ground	AUDIOPILOT™ ON/ OFF signal	Input	ON	Turn AUDIOPILOT™ OFF	Approx. 7.5V	AUDIOPILOT™ does not operate properly.
					Turn AUDIOPILOT™ ON	Approx. 0V	
32 (G/R)*1 (G/Y)*2	Ground	External amp. control signal	Output	ON	–	Approx. 12V	Woofer amp. does not work properly.
34 (L)	33 (P)	Audio sound signal rear RH	Input	ON	Receive audio signal	 SKIA0177E	No sound from rear speaker RH.
36 (Y/G)*1 (OR/L)*2	35 (Y/L)*1 (W/L)*2	Audio sound signal rear LH	Input	ON	Receive audio signal	 SKIA0177E	No sound from rear speaker LH.
38 (G)	37 (R)	Audio sound signal front RH	Input	ON	Receive audio signal	 SKIA0177E	No sound from passenger door speaker and tweeter (passenger side).
40 (LG)	39 (PU)	Audio sound signal front LH	Input	ON	Receive audio signal	 SKIA0177E	No sound from driver door speaker and tweeter (driver side).
41 (G/Y)*1 (G/R)*2	Ground	Control signal (SWB+)	Input	ON	–	Approx. 12V	BOSE speaker amp. does not work properly.

*1: Coupe models
*2: Roadster models

Terminals and Reference Value for Woofer Amp.

AKS009RD

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value	Example of symptom
+	–			Ignition switch	Operation		
2 (W)	1 (OR)	Audio sound signal woofer	Input	ON	Receive audio signal	 SKIA0177E	No sound from woofer.
4 (L)	3 (Y)	Audio sound signal woofer	Output	ON	Receive audio signal	 SKIA0177E	No sound from woofer.
6 (G/Y)	Ground	Amp. ON signal	Input	ON	–	Approx. 12V	Woofer amp. does not work properly.
7 (B)	Ground	Ground	–	ON	–	Approx. 0V	–
8 (R)	Ground	Battery power supply	Input	OFF	–	Battery voltage	Woofer amp. does not work properly.

Trouble Diagnosis

AKS0010P

The majority of the audio malfunctions are the result of outside causes (bad CD/cassette, electromagnetic interference, etc.). Check the symptoms below to diagnose the malfunction.

PROBLEM WITH RADIO, TAPE AND CD (BASE SYSTEM)

Symptom	Check item	Possible cause
Inoperative	● Make sure that the ignition switch is in the ACC position.	● Audio unit ● Audio unit power supply circuit. Refer to AV-36, "Power Supply Circuit Inspection" .
No sound	● Make sure that the volume is not turned down. ● Make sure that the balance and fader control knobs are centered.	● Open or short in harness between audio unit and speaker ● Speaker ● Audio unit
Poor sound	● Make sure that the bass and treble adjustment is centered.	● Audio unit ● Speaker
Noisy	–	● Audio unit ● Each electrical equipment

PROBLEM WITH RADIO, TAPE AND CD (BOSE SYSTEM)

Symptom	Check item	Possible cause
Inoperative	● Make sure that the ignition switch is in the ACC position.	● Audio unit ● Audio unit power supply circuit. Refer to AV-36, "Power Supply Circuit Inspection" .
No sound	● Make sure that the volume is not turned down. ● Make sure that the balance and fader control knobs are centered.	● BOSE speaker amp. power supply and ground circuit. Refer to AV-36, "Power Supply Circuit Inspection" . ● Open or short in harness between audio unit and BOSE speaker amp. ● Open or short in harness between BOSE speaker amp. and speaker ● Audio unit ● BOSE speaker amp. ● Speaker
Woofer does not sound	–	● Woofer amp. power supply and ground circuit. Refer to AV-36, "Power Supply Circuit Inspection" . ● Open or short in harness between woofer amp. and woofer ● Open or short in harness between BOSE speaker amp. and woofer amp. ● Woofer amp. ● Woofer
Poor sound	● Make sure that the bass and treble adjustment is centered.	● Audio unit ● BOSE speaker amp. ● Speaker
Noisy	–	● Audio unit ● BOSE speaker amp. ● Each electrical equipment

FOR RADIO ONLY

Symptom	Check item	Possible cause
No sound	● Make sure that the radio is tuned to a station's frequency.	● Audio unit ● Antenna feeder ● Antenna amp. ON signal ● Antenna amp. ● Antenna
Noisy	● Make sure that the radio is tuned to a station's frequency. ● Make sure that the signal of the received station is not weak. ● Check whether or not the malfunction occurs only in a particular area. (Note)	● Audio unit ● Antenna feeder ● Antenna amp. ON signal ● Antenna amp. ● Antenna ● Noise prevention parts ● Each electrical equipment ● Wire harness of each piece of electrical equipment
Selected radio stations stored in memory are deleted	–	● Audio unit

NOTE:
This is noise resulting from variations in field strength, such as fading noise and multi-path noise, or external noise from trains and other sources. It is not a malfunction.

- Fading noise: This noise occurs because of variations in the field strength in a narrow range due to mountains or buildings blocking the signal.
- Multi-path noise: This noise results from the waves sent directly from the broadcast station arriving at the antenna at a different time from the waves which reflect off of mountains or buildings.

FOR CASSETTE PLAYER ONLY

Symptom	Check item	Possible cause
Cassette tape cannot be inserted	● Make sure that a cassette tape is not already inserted. ● Make sure that the cassette has no deformation or other malfunction.	● Cassette tape ● Audio unit
Cassette tape cannot be ejected	● Make sure that the cassette has no deformation or other malfunction. ● Make sure that the cassette tape does not sag.	
Auto reverse does not work, or the tape direction changes in the middle of play	● There is a problem with tape winding. Check that there is no slack or other malfunction. ● Make sure that an old cassette tape is not being used.	
There is much noise	● Check that the cassette tape itself does not have a lot of noise, or that the tape does not have a low recording level.	
The sound is not clear	● Make sure that the tune is recorded on tape with Dolby B NR OFF and played with Dolby B NR ON. ● Make sure that the sound quality of the cassette tape itself is not poor.	
Sound fluctuates/tape speed not correct	● Make sure that there is no tape winding problem, sagging, stretching, or other malfunction. ● Make sure that there is no problem with the recording speed of the cassette tape.	
No sound	● Make sure that the cassette tape has been recorded on.	

FOR CD ONLY

Symptom	Check item	Possible cause
CD cannot be inserted	● Make sure that a CD is not already inserted.	● CD ● Audio unit
CD cannot be ejected	–	
The CD cannot be played	● Make sure that the CD is not upside down. ● Make sure that there is no dirt, damage, or water on the disc.	
The sound skips, stops suddenly, or is distorted	● Make sure that there is no dirt, damage, or water on the disc. ● Make sure that the trouble is not due to strong vibration.	

Noise Inspection

AKS0010Q

The vehicle itself can be a source of noise if noise prevention parts or electrical equipment is malfunction. Check if noise is caused and/or changed by engine speed, ignition switch turned to each position, and operation of each piece of electrical equipment, and determine the cause.

NOTE:
The source of the noise can be found easily by listening to the noise while removing the fuses of electrical components, one by one.

TYPE OF NOISE AND POSSIBLE CAUSE

Symptom		Check item
Occurs only when engine is ON	A continuous growling noise occurs. The speed of the noise varies with changes in the engine speed.	● Ignition condenser
	A whistling noise occurs while the engine speed is high. A booming noise occurs while the engine is running and the lighting switch is ON.	● Alternator
The occurrence of the noise is linked with the operation of the fuel pump		● Fuel pump condenser
Noise only occurs when various electrical components are operating	A cracking or snapping sound occurs with the operation of various switches.	● Relay malfunction, radio malfunction
	The noise occurs when various motors are operating.	● Motor case ground ● Motor
The noise occurs constantly, not just under certain conditions		● Poor ground of antenna amplifier or antenna feeder line
A cracking or snapping sound occurs while the vehicle is being driven, especially when it is vibrating excessively		● Ground wire of body parts ● Ground due to incorrect installation of parts ● Wiring connections or a short circuit

Power Supply Circuit Inspection

AKS0010R

1. CHECK FUSE

Make sure that the following fuses of the audio unit, BOSE speaker amp. and woofer amp. are not blown.

Unit	Signal	Fuse No.
Audio unit	Battery power supply	37
	Ignition switch ACC or ON	6
BOSE speaker amp.	Battery power supply	37
Woofer amp.	Battery power supply	17

OK or NG

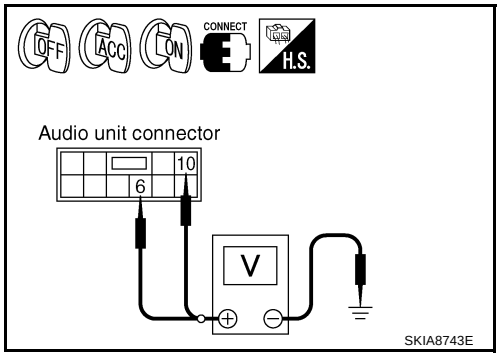
OK >> GO TO 2.

NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

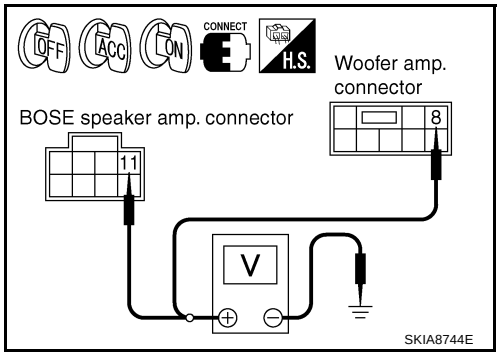
1. Check voltage between audio unit harness connector terminals and ground.

Unit	Terminals (+) Connector	Terminals (+) Terminal (Wire color)	Terminals (–)	OFF	ACC	ON
Audio unit	M40	6 (Y)	Ground	Battery voltage	Battery voltage	Battery voltage
		10 (LG)	Ground	0 V	Battery voltage	Battery voltage



2. Check voltage between BOSE speaker amp., woofer amp. harness connector terminals and ground (BOSE system).

Unit	Terminals (+) Connector	Terminals (+) Terminal (Wire color)	Terminals (–)	OFF	ACC	ON
BOSE speaker amp.	T6	11 (Y)	Ground	Battery voltage	Battery voltage	Battery voltage
Woofer amp.	B32	8 (R)				



OK or NG

OK >> ● INSPECTION END (Base system)
● GO TO 3 (BOSE system).

NG >> Repair harness or connector.

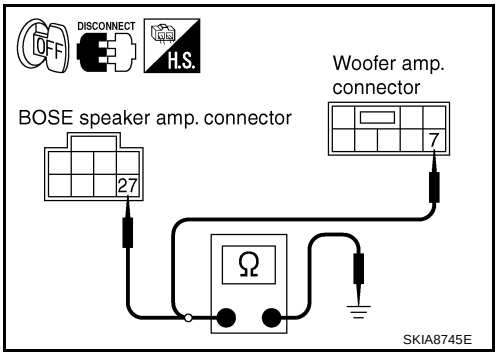
3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BOSE speaker amp. connector and woofer amp. connector.
3. Check continuity between BOSE speaker amp. harness connector T6 terminal 27 (B) and ground.

27 – Ground : Continuity should exist.

4. Check continuity between woofer amp. harness connector B32 terminal 7 (B) and ground.

7 – Ground : Continuity should exist.



OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

AUDIOPILOT™ Does Not Work

AKS0030W

1. CHECK AUDIO UNIT

Check AUDIOPILOT™ turns ON.

OK or NG

OK >> GO TO 2.
NG >> Turn AUDIOPILOT™ ON.

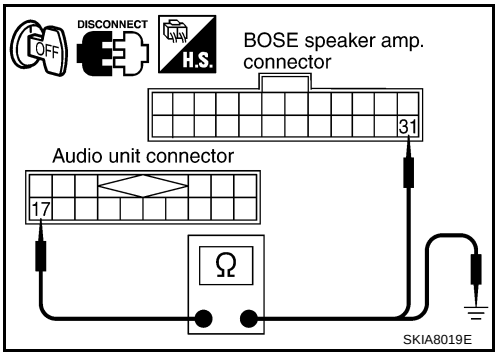
2. CHECK HARNESS

1. Turn ignition switch OFF.
2. Disconnect audio unit connector and BOSE speaker amp. connector.
3. Check continuity between audio unit harness connector M39 terminal 17 (Y/R) and BOSE speaker amp. harness connector T7 terminal 31 (Y/R).

17 – 31 : Continuity should exist.

4. Check continuity between audio unit harness connector M39 terminal 17 (Y/R) and ground.

17 – Ground : Continuity should not exist.

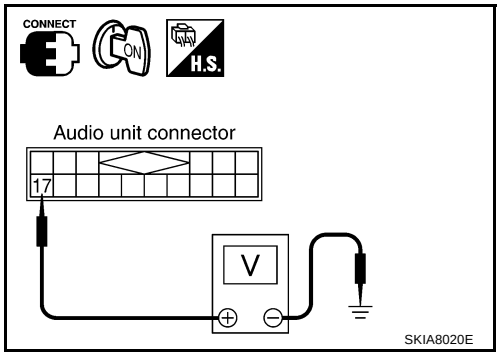


OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK AUDIOPILOT™ SIGNAL

1. Connect audio unit connector and BOSE speaker amp. connector.
2. Turn ignition switch ON.
3. Check voltage between audio unit harness connector terminals and ground.



Terminals			Condition	Voltage
(+)		(–)		
Connector	Terminal (Wire color)			
M39	17 (Y/R)	Ground	Turn AUDIOPILOT™ OFF	Approx. 7.5V
			Turn AUDIOPILOT™ ON	Approx. 0V

OK or NG

OK >> GO TO 4.
NG >> Replace audio unit.

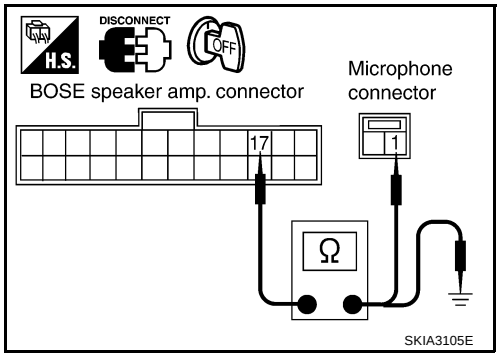
4. CHECK 1: MICROPHONE CIRCUIT

1. Turn ignition switch OFF
2. Disconnect BOSE speaker amp. connector and microphone connector.
3. Check continuity between BOSE speaker amp. harness connector T7 terminal 17 (R/B for Coupe models, L/Y for Roadster models) and microphone harness connector E123 terminal 1 (R/B).

17 – 1 : Continuity should exist.

4. Check continuity between BOSE speaker amp. harness connector T7 terminal 17 (R/B for Coupe models, L/Y for Roadster models) and ground.

17 – Ground : Continuity should not exist.



OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

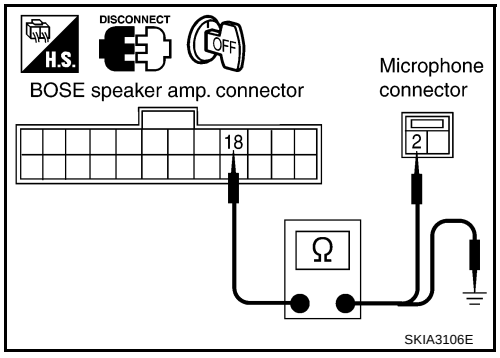
5. CHECK 2: MICROPHONE CIRCUIT

1. Check continuity between BOSE speaker amp. harness connector T7 terminal 18 (R/W for Coupe models, L/G for Roadster models) and microphone harness connector E123 terminal 2 (R/W).

18 – 2 : Continuity should exist.

2. Check continuity between BOSE speaker amp. harness connector T7 terminal 18 (R/W for Coupe models, L/G for Roadster models) and ground.

18 – Ground : Continuity should not exist.

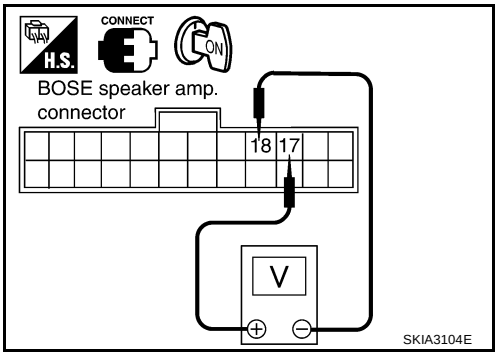


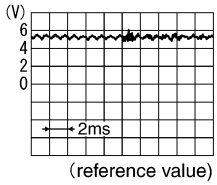
OK or NG

OK >> GO TO 6.
NG >> Repair harness or connector.

6. CHECK MICROPHONE SIGNAL

1. Connect BOSE speaker amp. connector and microphone connector.
2. Turn ignition switch ON.
3. Check signal between BOSE speaker amp. harness connector T7 terminal 17 (R/B for Coupe models, L/Y for Roadster models) and 18 (R/W for Coupe models, L/G for Roadster models) with CONSULT-ll or oscilloscope, when inputting some sounds (voice, etc.) toward the microphone.



Terminals				Condition	Reference signal
(+)		(–)			
Connector	Terminal (Wire color)	Connector	Terminal (Wire color)		
T7	17 (*1)	T7	18 (*2)	Inputting some sounds (voice, etc.) toward the microphone	

(reference value)

PKIA2104E

*1: Coupe models (R/B), Roadster models (L/Y)
*2: Coupe models (R/W), Roadster models (L/G)

Does the voltage signal change with sounds?

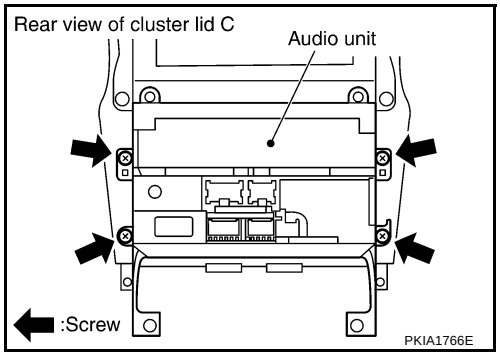
YES >> Replace BOSE speaker amp.
NO >> Replace microphone.

Removal and Installation of Audio Unit (Base system)

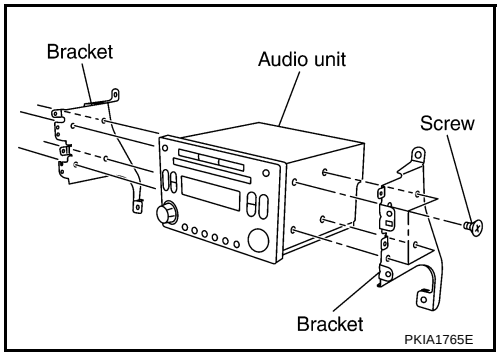
AKS002ZS

REMOVAL

1. Remove cluster lid C. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove screws (4), and remove audio unit.



3. Remove screws (8), and remove bracket.



INSTALLATION

Install in the reverse order of removal.

Locking CD Auto Changer Mechanism (Audio unit of BOSE system)

AKS0010U

CAUTION:

- **Prior to removing a malfunctioning CD auto changer unit (Audio unit of BOSE system) that will be shipped for repair, the changer mechanism MUST BE LOCKED to prevent the mechanism from being damaged during shipping.**
- **If a CD is jammed or unable to be removed from the unit, do NOT lock the changer mechanism. If the unit is to be shipped for repair, carefully package the unit to prevent vibration and shock.**

DAMPER LOCK PROCEDURE

1. Eject and remove any CDs from the audio unit (BOSE system).
2. Turn ignition switch OFF. Wait until audio unit (BOSE system) display is off and mechanism stops moving (mechanism sound stops).
3. Press any one of the disc selection buttons once. When a display shows on the audio unit (BOSE system), press the same disc selection button again within 5 seconds.
   - The changer mechanism will lock itself within 10 seconds.
4. After mechanism stops moving (mechanism sound stops), open the driver and passenger window, and then disconnect negative battery cable.

CAUTION:

After the battery cables are disconnected, do not open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.

NOTE:

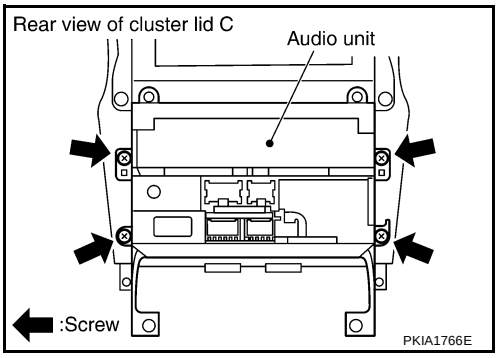
After installing a new or remanufactured audio unit (BOSE system), switching the audio unit (BOSE system) ON will automatically unlock the mechanism. A special unlocking procedure is not required.

Removal and Installation of Audio Unit (BOSE system)

AKS0010V

REMOVAL

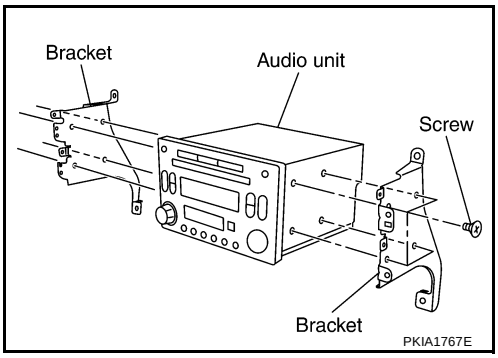
1. Perform damper lock operation. Refer to AV-40, "Locking CD Auto Changer Mechanism (Audio unit of BOSE system)" .
2. Remove cluster lid C. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
3. Remove screws (4), and remove audio unit.



4. Remove screws (8), and remove bracket.

CAUTION:

- **When carrying audio unit body, do not touch internal mechanism access from cassette tape slot.**
- **Be careful not to allow foreign matter from cassette tape slot.**



INSTALLATION

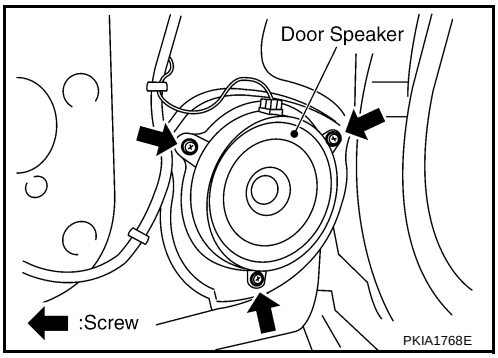
Install in the reverse order of removal.

Removal and Installation of Door Speaker

AKS0010Y

REMOVAL

1. Remove door finisher. Refer to EI-33, "Removal and Installation" .
2. Remove screws (3) and remove door speaker.



INSTALLATION

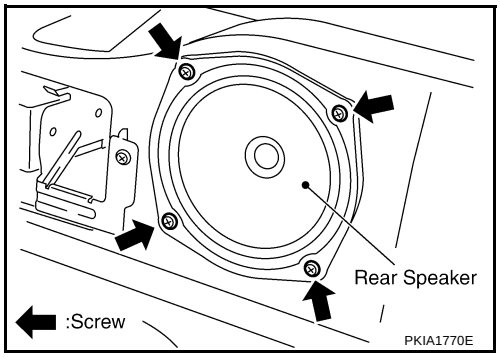
Install in the reverse order of removal.

Removal and Installation of Rear Speaker

AKS002ZT

REMOVAL

1. Remove luggage floor finisher upper (front) in case of Coupe models, and refer to EI-39, "Removal and Installation (for Coupe Models)" , and remove luggage floor finisher upper in case of Roadster models, and refer to EI-41, "Removal and Installation (for Roadster Models)" .
2. Remove screws (4) and remove rear speaker.



INSTALLATION

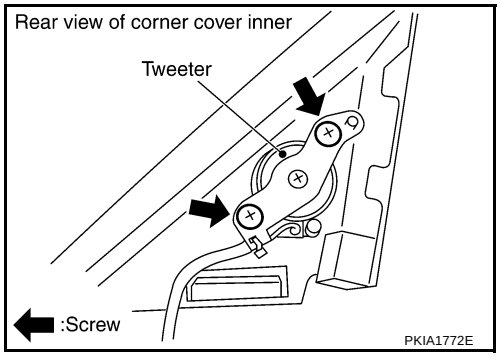
Install in the reverse order of removal.

Removal and Installation of Tweeter

AKS00110

REMOVAL

1. Remove corner cover inner. Refer to GW-83, "Removal and Installation" .
2. Remove screws (2), and remove tweeter from corner cover inner.



INSTALLATION

Install in the reverse order of removal.

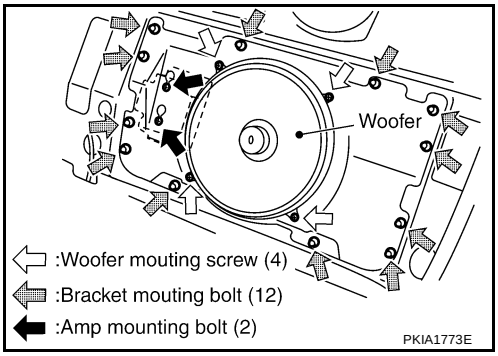
Removal and Installation of Woofer and Woofer Amp. (BOSE System)

AKS00111

REMOVAL

Woofer Assembly

1. Remove luggage floor finisher lower in case of Coupe models, and refer to EI-39, "Removal and Installation (for Coupe Models)" , and remove luggage floor finisher lower in case of Roadster models, and refer to EI-41, "Removal and Installation (for Roadster Models)" .
2. Remove woofer mounting screws (4), and remove woofer.
3. Remove bracket mounting bolts (12), and remove bracket.
4. Remove woofer amp. mounting bolts (2), and remove woofer amp. from bracket.



Woofer or Woofer Amp. Only

1. Remove luggage floor finisher mask in case of Coupe models, and refer to EI-39, "Removal and Installation (for Coupe Models)" , and remove luggage floor finisher mask in case of Roadster models, and refer to EI-41, "Removal and Installation (for Roadster Models)" .
2. Remove woofer mounting screws (4), and remove woofer.
3. Remove woofer amp. mounting bolts (2), and remove woofer amp. from bracket.

INSTALLATION

Install in the reverse order of removal, taking care of the following point.

Bracket mounting bolt:

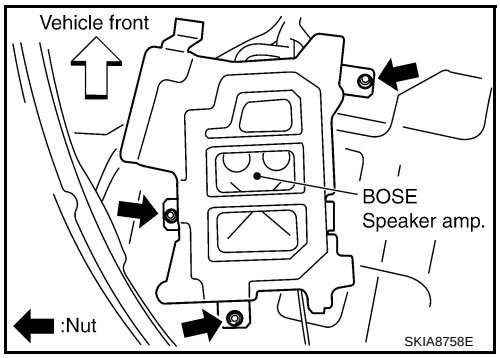
: 9 N·m (0.92 kg-m, 80 in-lb)

Removal and Installation of BOSE Speaker Amp.

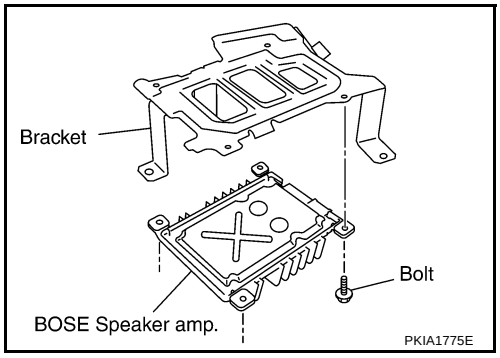
AKS00112

REMOVAL

1. Remove trunk side box in case of Coupe models, and refer to EI-39, "Removal and Installation (for Coupe Models)" , and remove trunk side box in case of Roadster models, and refer to EI-48, "Removal and Installation (for Roadstar Models)" .
2. Remove luggage floor carpet and spare tire cover in case of Coupe models, and refer to EI-39, "Removal and Installation (for Coupe Models)" , and remove trunk floor carpet and spare tire cover in case of Roadster models, and refer to EI-48, "Removal and Installation (for Roadstar Models)" .
3. Remove nuts (3), and remove BOSE speaker amp. from trunk room floor.



4. Remove bolts (4), and remove bracket.



INSTALLATION

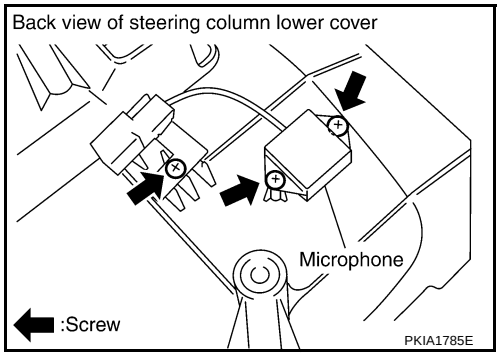
Install in the reverse order of removal.

Removal and Installation of Microphone

AKS00376

REMOVAL

1. Remove steering column lower cover. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove screws (3), and remove microphone.



INSTALLATION

Install in the reverse order of removal.

AUDIO ANTENNA

PFP:28200

System Description

AKS00113

With the ignition switch in ACC or ON, power is supplied

- through 10A fuse [No. 6, located in the fuse block (J/B)]
- to audio unit terminal 10.

Ground is supplied through the case of the antenna amp.
When the radio switch is turned ON, antenna signal is supplied

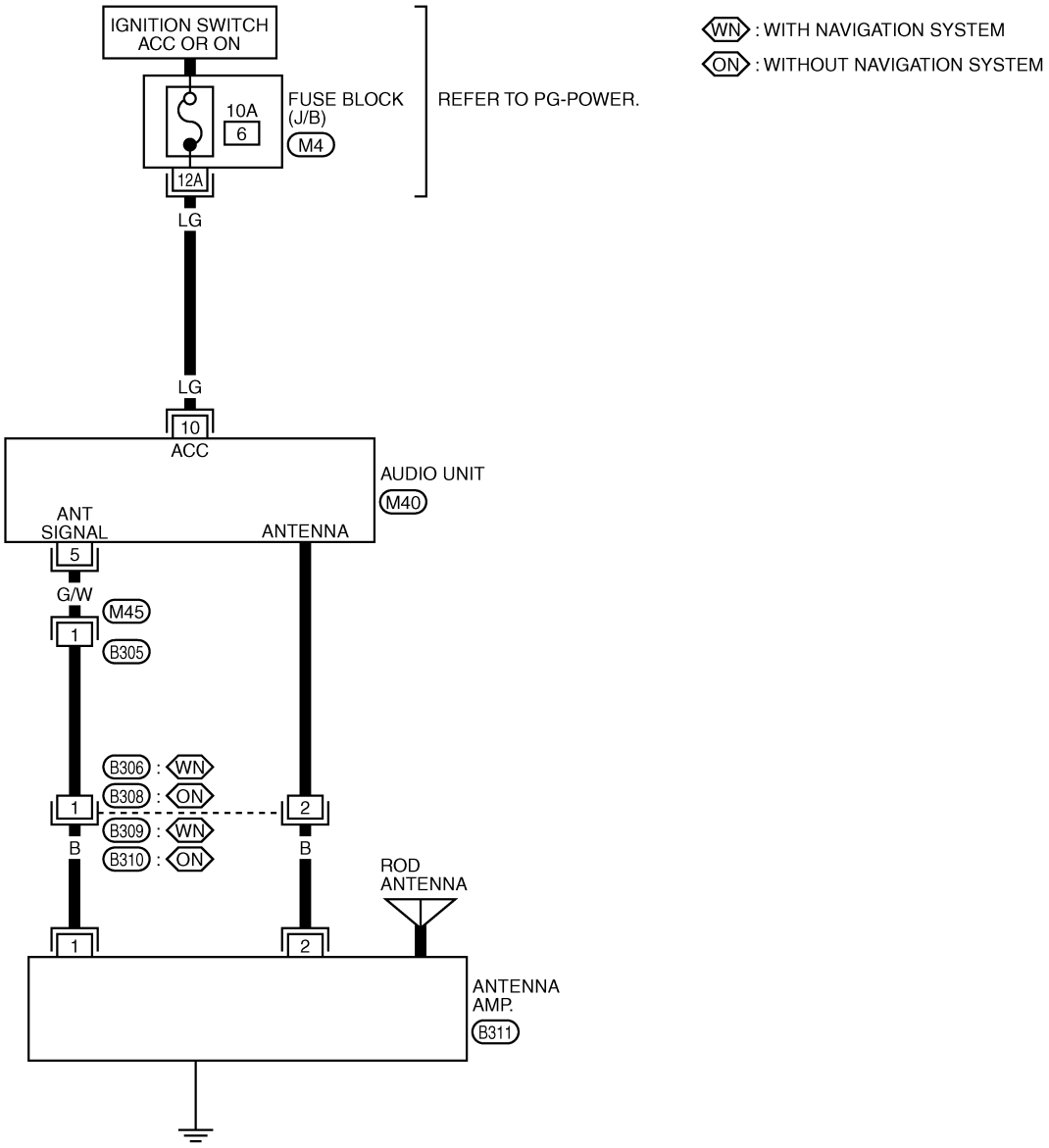
- through audio unit terminal 5
- to antenna amp. terminal 1.

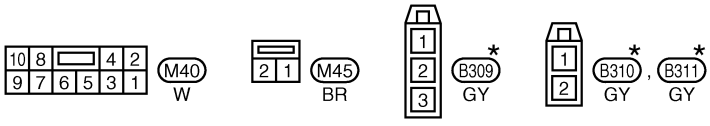
Then the antenna amp. is activated.
The amplified radio signals are supplied to the audio unit through the antenna amp.

Wiring Diagram — M/ANT —

AKS00114

AV-M/ANT-01





∗: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

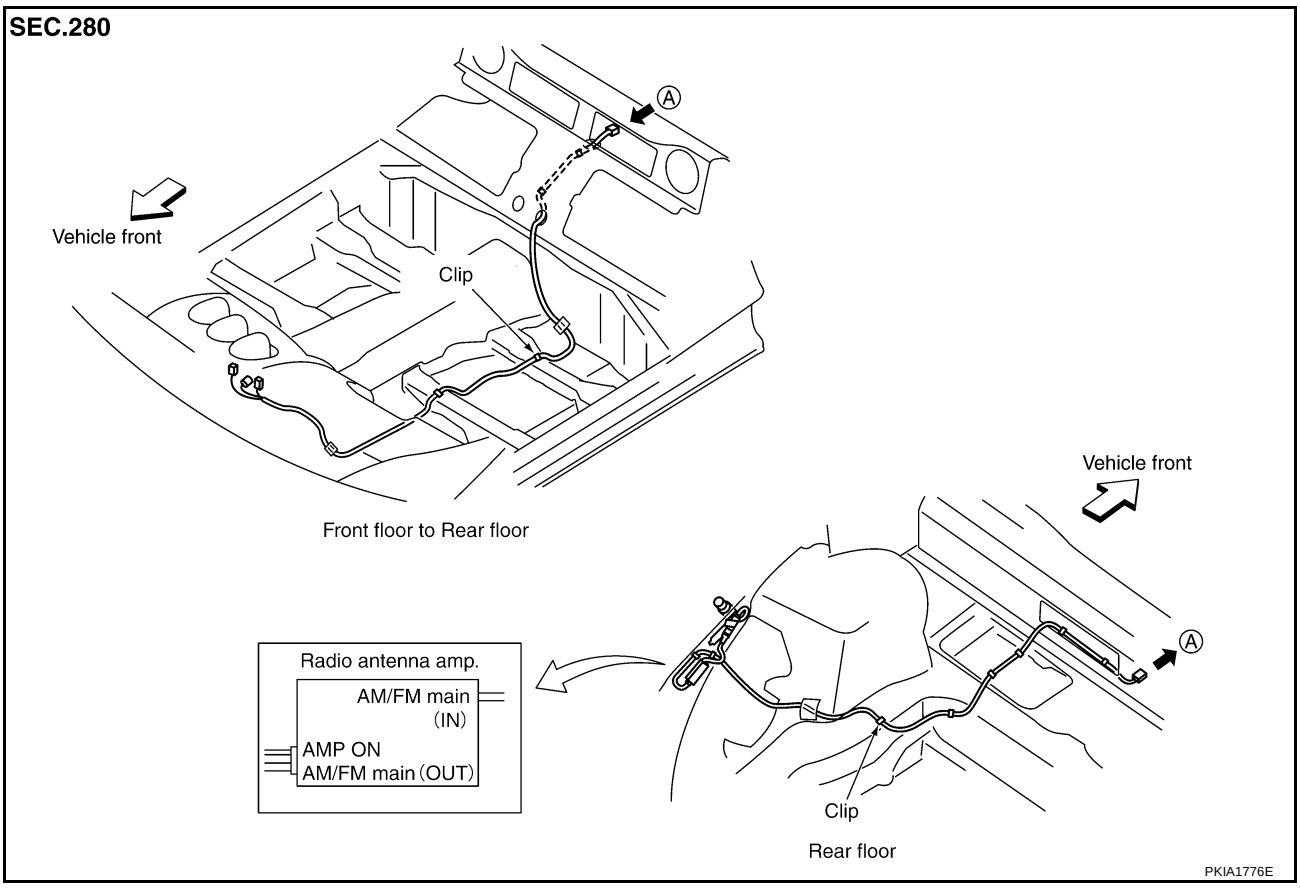
REFER TO THE FOLLOWING.

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT0509E

Location of Antenna

AKS00115

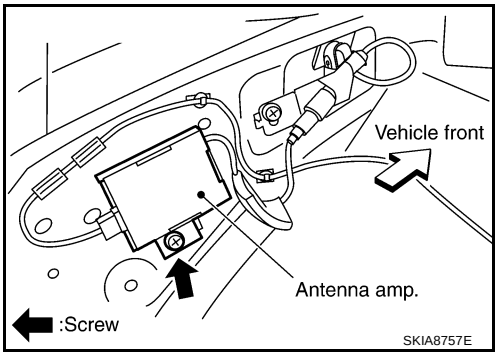


Removal and Installation of Antenna Amp.

AKS002ZY

REMOVAL

1. Remove luggage side finisher lower (LH) in case of Coupe models, and refer to EI-39, "Removal and Installation (for Coupe Models)" , and remove trunk front finisher in case of Roadster models, and refer to EI-48, "Removal and Installation (for Roadstar Models)" .
2. Remove luggage floor carpet and spare tire cover in case of Coupe models, and refer to EI-39, "Removal and Installation (for Coupe Models)" , and remove trunk floor carpet and spare tire cover in case of Roadster models, and refer to EI-48, "Removal and Installation (for Roadstar Models)" .
3. Remove screw (1) and remove antenna amp.

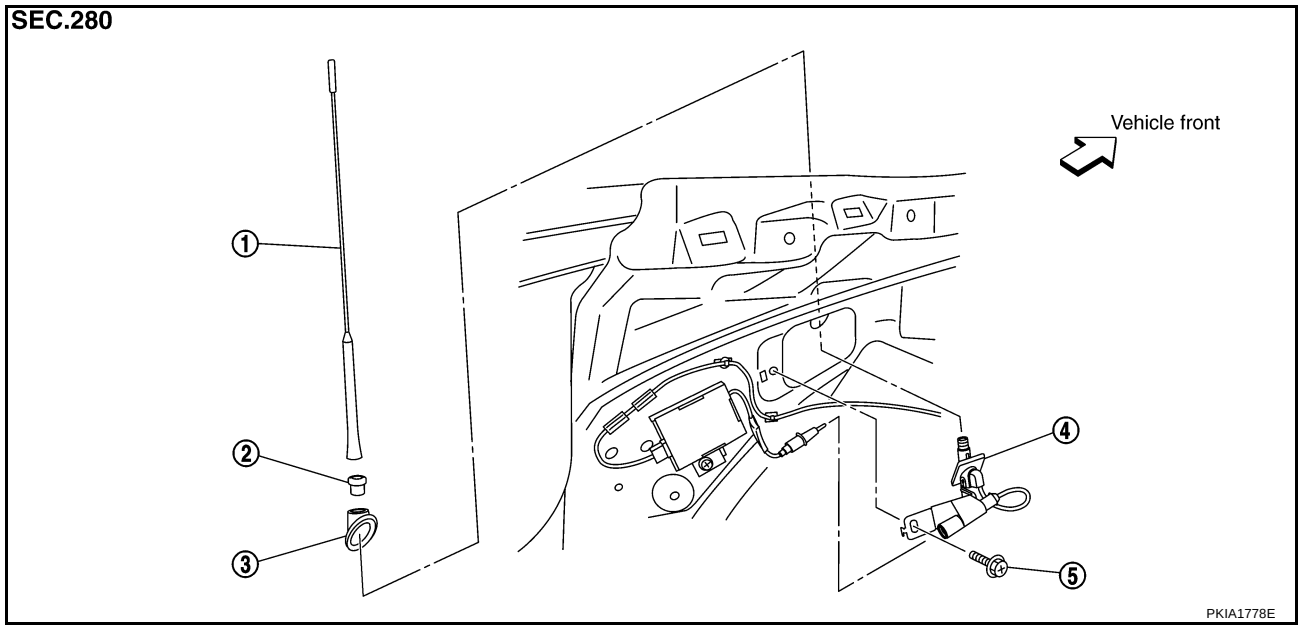


INSTALLATION

Install in the reverse order of removal.

Removal and Installation of Antenna

AKS002ZZ



1. Antenna rod
2. Antenna nut
3. Antenna base
4. Antenna assembly
5. Screw

REMOVAL

1. Remove luggage side finisher lower (LH) in case of Coupe models, and refer to EI-39, "Removal and Installation (for Coupe Models)" , and remove trunk front finisher in case of Roadster models, and refer to EI-48, "Removal and Installation (for Roadstar Models)" .
2. Remove antenna rod and remove antenna nut.
3. Disconnect antenna amp. plug.
4. Remove screw and remove antenna assembly.
5. Remove antenna base.

INSTALLATION

Install in the reverse order of removal.

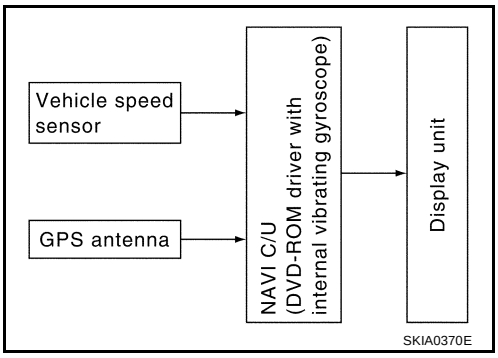
NAVIGATION SYSTEM

PFP:25915

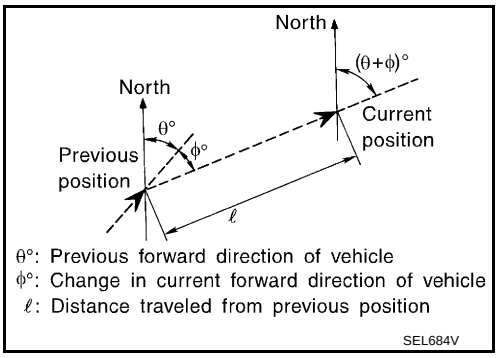
System Description

AKS00117

T he navigation system periodically calculates the vehicle's current position according to the following three signals: Travel distance of the vehicle as determined by the vehicle speed sensor, turning angle of the vehicle as determined by the gyroscope (angular velocity sensor), and the direction of vehicle travel as determined by the GPS antenna (GPS information).
The current position of the vehicle is then identified by comparing the calculated vehicle position with map data read from the map DVD-ROM, which is stored in the DVD-ROM drive (map-matching), and indicated on the screen with a current-location mark.



By comparing the vehicle position detection results found by the GPS and by map-matching, more accurate vehicle position data can be used.
The current vehicle position will be calculated by detecting the distance the vehicle moved from the previous calculation point and its direction.



TRAVEL DISTANCE

Travel distance calculations are based on the vehicle speed sensor input signal. Therefore, the calculation may become incorrect as the tires wear down. To prevent this, an automatic distance fine adjustment function has been adopted.

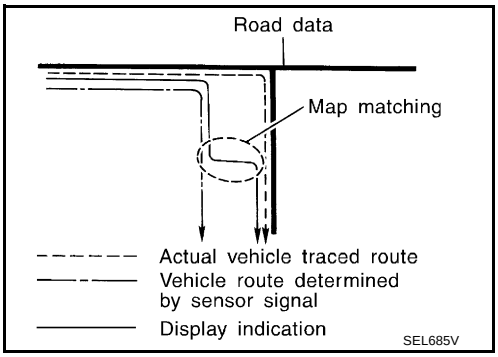
TRAVEL DIRECTION

Change in the travel direction of the vehicle is calculated by a gyroscope (angular velocity sensor) and a GPS antenna (GPS information). As the gyroscope and GPS antenna have both merit and demerit, input signals from them are prioritized in each situation. However, this order of priority may change in accordance with more detailed travel conditions so that the travel direction is detected more accurately.

Type	Advantage	Disadvantage
Gyroscope (angular velocity sensor)	● Can detect the vehicle's turning angle quite accurately.	● Direction errors may accumulate when the vehicle is driven for long distances without stopping.
GPS antenna (GPS information)	● Can detect the vehicle's travel direction (North/South/East/West).	● Correct direction cannot be detected when the vehicle speed is low.

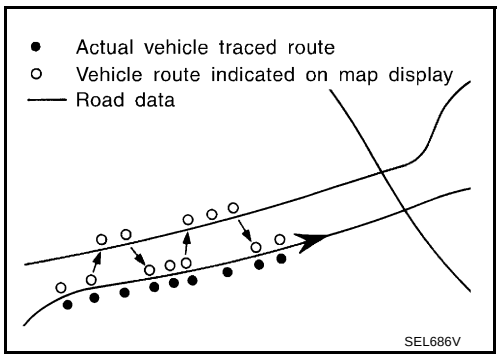
MAP-MATCHING

Map-matching is a function that repositions the vehicle on the road map when a new location is judged to be the most accurate. This is done by comparing the current vehicle position, calculated by the method described in the position detection principle, with the road map data around the vehicle, read from the map DVD-ROM stored in the DVD-ROM drive.
Therefore, the vehicle position may not be corrected after the vehicle is driven over a certain distance or time in which GPS information is hard to receive. In this case, the current-location mark on the display must be corrected manually.

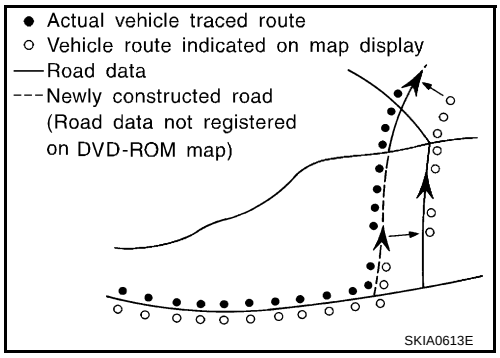


CAUTION:
The road map data is based on data stored in the map DVD-ROM.

- In map-matching, alternative routes to reach the destination will be shown and prioritized, after the road on which the vehicle is currently driven has been judged and the current-location mark has been repositioned.
  If there is an error in distance and/or direction, the alternative routes will be shown in different order of priority, and the wrong road can be avoided.
  If two roads are running in parallel, they are of the same priority. Therefore, the current-location mark may appear on either of them alternately, depending on maneuvering of the steering wheel and configuration of the road.

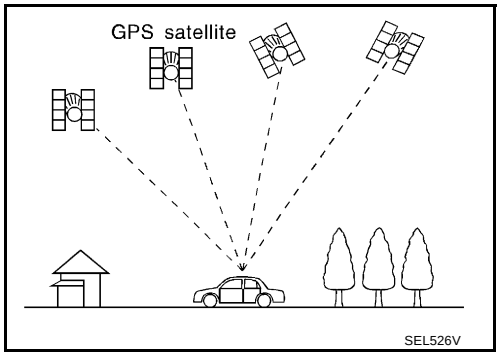


- Map-matching does not function correctly when the road on which the vehicle is driving is new and not recorded in the map DVD-ROM, or when the road pattern stored in the map data and the actual road pattern are different due to repair.
  When driving on a road not present in the map, the map-matching function may find another road and position the current-location mark on it. Then, when the correct road is detected, the current-location mark may leap to it.
- Effective range for comparing the vehicle position and travel direction calculated by the distance and direction with the road data read from the map DVD-ROM is limited. Therefore, when there is an excessive gap between the current vehicle position and the position on the map, correction by map-matching is not possible.



GPS (GLOBAL POSITIONING SYSTEM)

GPS (Global Positioning System) has been developed and controlled by the US Department of Defense. The system utilizes GPS satellite (NAVSTAR), sending out radio waves while flying on an orbit around the earth at the height of approx. 21,000 km (13,000miles).
The GPS receiver calculates the vehicle's position in three dimensions (latitude/longitude/altitude) according to the time lag of the radio waves received from four or more GPS satellites (three-dimensional positioning). If radio waves were received only from three GPS satellites, the GPS receiver calculates the vehicle's position in two dimensions (latitude/longitude), utilizing the altitude data calculated previously by using radio waves from four or more GPS satellites (two-dimensional positioning).



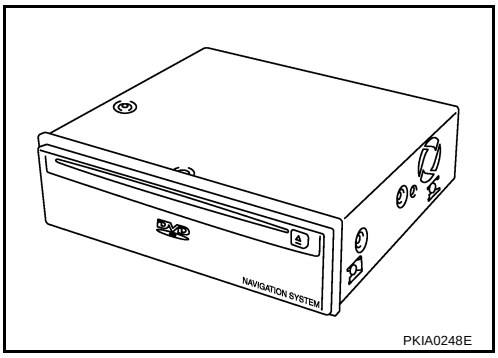
Accuracy of the GPS will deteriorate under the following conditions.

- In two-dimensional positioning, the GPS accuracy will deteriorate when the altitude of the vehicle position changes.
- There may be an error of approximately 100m (300ft) in position detected by three-dimensional positioning, which is more accurate than two-dimensional positioning. The accuracy can be even lower depending on the arrangement of the GPS satellites utilized for the positioning.
- Position detection is not possible when the vehicle is in an area where radio waves from the GPS satellite do not reach, such as in a tunnel, parking lot in a building, and under an elevated highway. Radio waves from the GPS satellites may not be received when some object is located over the GPS antenna.
- Position correction by GPS is not available while the vehicle is stopped.

COMPONENT DESCRIPTION

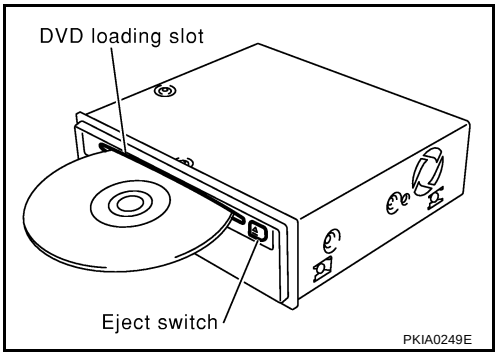
NAVI Control Unit

- The gyro (angular speed sensor) and the DVD-ROM drive are built-in units that control the navigation functions.
- Signals are received from the gyro, the vehicle speed sensor, and the GPS antenna. Vehicle location is determined by combining this data with the data contained in the DVD-ROM map. Locational information is shown on LCD(liquid crystal display) screen.



DVD-ROM Drive

Maps, traffic control regulations, and other pertinent information can be easily read from the DVD-ROM disc.



Map DVD-ROM

- The map DVD-ROM has maps, traffic control regulations, and other pertinent information.
- To improve DVD-ROM map matching and route determination functions, the DVD-ROM uses an exclusive Nissan format. Therefore, the use of a DVD-ROM provided by other manufacturers cannot be used.

Gyro (Angular Speed Sensor)

- The oscillator gyro sensor is used to detect changes in vehicle steering angle.
- The gyro is built into the NAVI control unit.

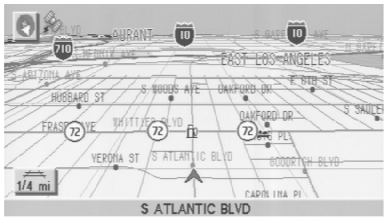
BIRD VIEW™

The BIRD VIEW™ provides a detailed and easily seen display of road conditions covering the vehicle's immediate to distant area.

- MAP DISPLAY

SKIA0542E

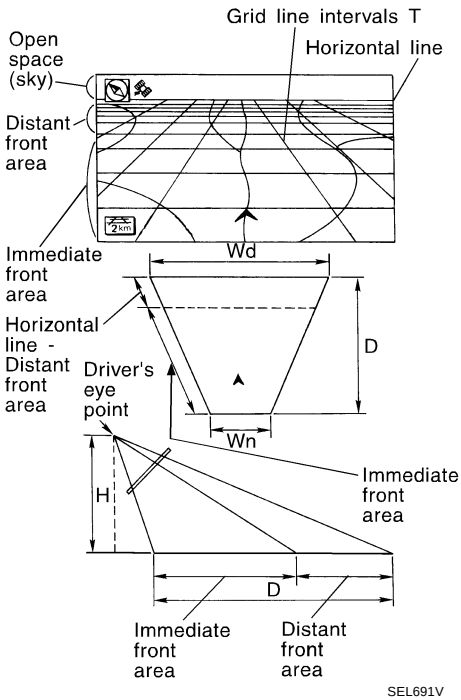
- BIRD VIEW™



SKIA0544E

Description

- Display area: Trapezoidal representation showing approximate distances (Wn, D, and Wd).
- Ten horizontal grid lines indicate display width while six vertical grid lines indicate display depth and direction.
- Drawing line area shows open space, depth, and immediate front area. Each area is to a scale of approximately 5:6:25.
- Pushing the “ZOOM IN” button during operation displays the scale change and the view point height on the left side of the screen.
  The height of the view point increases or decreases when “ZOOM” or “WIDE” is selected with the joystick.

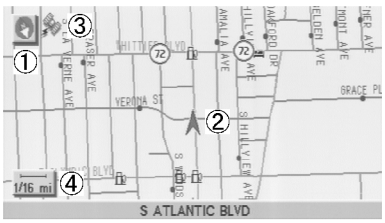


SEL691V

MAP DISPLAY

Function of each icon is as follows:

1. Azimuth indication.
2. Position marker.
   - The tip of the arrow shows the current position. The shaft of the arrow indicates the direction in which the vehicle is traveling.
3. GPS reception signal (indicates current reception conditions).
4. Distance display (shows the distance in a reduced scale).



SKIA0545E

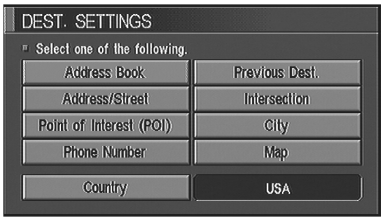
FUNCTION OF NAVI SWITCH

Display with Pushed “DEST” Switch

- Easy Mode

SKIA2045E

- Expert Mode



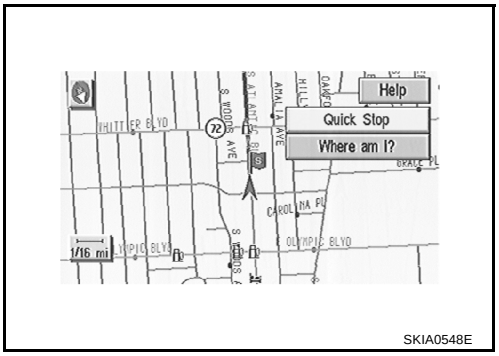
SKIA2046E

The function of each icon is as follows:

Icon	MODE		Description
	Easy	Expert	
Address Book		×	Favorite place can be saved to memory.
Address/Street	×	×	The destination can be searched from the address.
Point of Interest (POI)	×	×	The destination of favorite facility can be searched.
Previous Dest.		×	The previous ten destinations stored in memory are displayed.
Intersection		×	The destination can be searched from the intersection.
City		×	The destination can be searched from city name.
Map		×	The destination can be searched from the map.
Phone Number		×	When two or more countries are included in one DVD-ROM, the destination can be searched for under the country name.
Home	×		Sets the home as a destination.
Help	×		Explanation of Navigational functions appear on the Display.

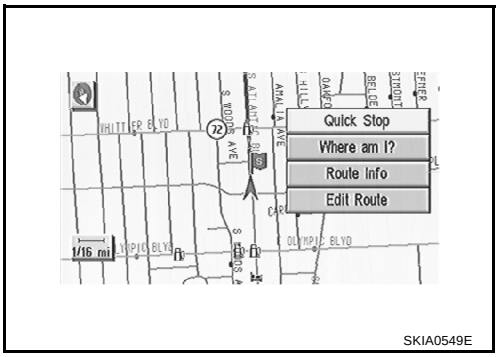
Display with Pushed “ROUTE” Switch

- Easy Mode



SKIA0548E

- Expert Mode



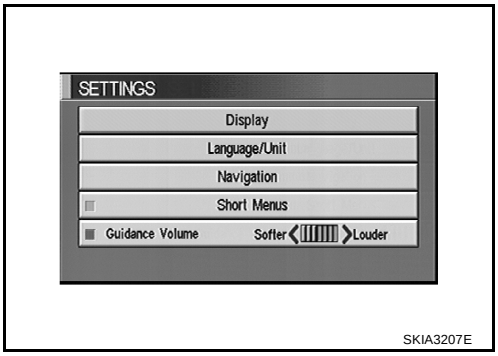
SKIA0549E

The function of each icon is as follows:

Icon	MODE		Description
	Easy	Expert	
Quick Stop	×	×	The selected facility is set as the destination or waypoint. (Route guidance has been turned OFF or the destination has been reached)
Where am I?	×	×	Next, current and previous street names can be displayed.
Route Info.*		×	The following items can be set. ● Complete Route ● Turn List ● Route Simulation (Displayed only when the destination area has been set.)
Edit Route*		×	Change the destination or add the transit points of the route set in the route guide. (Displayed only when the automatic reroute function has been turned OFF and the recommended route is not followed.)
Help	×		Explanation of Navigational functions appear on the Display.

*: When destinations have been entered, route guidance has been turned OFF or destination has been reached, “Route Info.” and “Edit Route” are not displayed.

Display with Pushed “SETTING” Switch



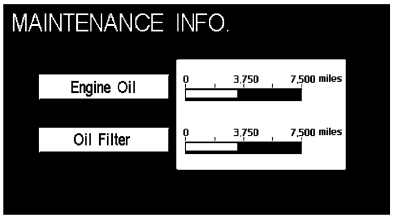
The function of each icon is as follows:

Icon	Description
Display	Settings of display can be performed.
Language/Unit	Settings of Language or unit can be performed.
Navigation	Settings and adjusting of navigation can be performed.
Short Menus	Easy Mode and Expert Easy Mode can be switched.
Guidance Volume	The volume and/or on/off of voice prompt can be controlled by the joystick.
Help (only easy mode)	Explanation of Navigational Functions Appear on the Display.

Display with Pushed ″INFO″ Switch

Push “INFO” switch to display maintenance information.

- Engine Oil and Oil Filter are displayed as Maintenance information.



SKIA4634E

Display Setting

How To Perform Navigation Setting

1. Start the engine.
2. Push “SETTING” switch.
3. Select “Display”.

- Brightness, contrast, or map background setting can be changed.
- Display sleep mode ON/OFF can be switched.
- Display sleep mode timer can be set.

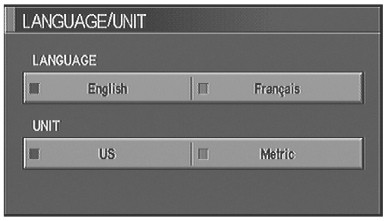
SKIA2064E

Language Setting

How To Perform Navigation Setting

1. Start the engine.
2. Push “SETTING” switch.
3. Select “Language”.

- Language setting can be switched.
- Unit setting can be changed.

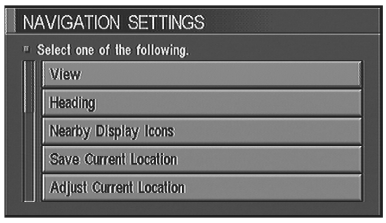


SKIA2065E

Navigation Setting

How To Perform Navigation Setting

1. Start the engine.
2. Push “SETTING” switch.
3. Select “Navigation”.



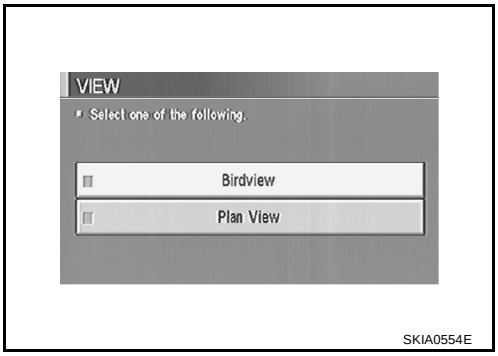
SKIA2048E

Application Items

Icon	Description	Reference page
View	Map display mode can be switched.	AV-57
Heading	Heading of the map display can be customized for either north heading or the actual driving direction of the vehicle.	AV-57
Nearby Display Icons	Icons of facilities can be displayed. Facilities to be displayed can be selected from the variety selections.	AV-58
Save Current Location	Current vehicle location can be registered in Address Book.	AV-58
Adjust Current Location	Current location of position marker can be adjusted. Direction of position marker also can be calibrated when heading direction of the vehicle on the display is not matched with the actual direction.	AV-58
Auto Re-route ON/OFF	ON/OFF of Auto Re-route can be switched.	AV-59
Avoid Area Setting	A particular area can be avoided when routing.	AV-59
Button Tone/Beep Response	Button tone can be selected ON/OFF.	AV-59
Clear Memory	Address Book, Previous destination or Avoid area can be deleted.	AV-59
Edit Address Book	Address Book can be edited.	AV-60
GPS Information	The GPS data includes longitude, latitude and altitude (distance above sea level) of the present vehicle position, and current date and time for the area in which the vehicle is being driven. Also indicated are the GPS reception conditions and the GPS satellite position.	AV-60
Quick Stop Customer Setting	One facility of your selection can be added to your Quick Stop.	AV-60
Set Average speed	Average vehicle speed can be set to calibrate estimated journey time for the destination.	AV-60
Tracking	Tracking to the present vehicle position can be displayed.	AV-61

“VIEW” MODE

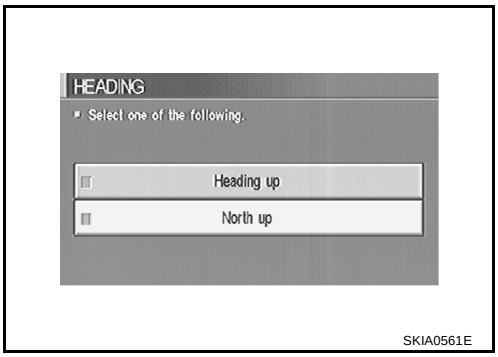
1. Select “Bird view™” or “Plan view” icon.
   - To open the map screen display with Bird View™, select “Bird View™”.
   - To open the map screen display with Plan View, select “Plan View”.



SKIA0554E

“HEADING” MODE

- To display North up, select “North up”.
- To display the car heading up, select “Heading up”.



SKIA0561E

“NEARBY DISPLAY ICONS” MODE

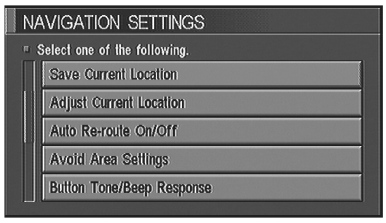
- Select an icon to display on the map screen.

SKIA0562E

“SAVE CURRENT LOCATION” MODE

- The current vehicle location can be registered in “Address Book”.

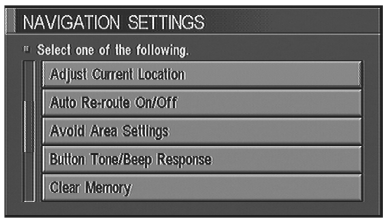
  NOTE:
  “Address Book” can store 50 items max.



SKIA2050E

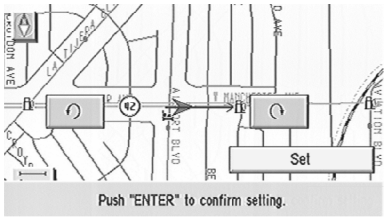
“ADJUST CURRENT LOCATION” MODE

1. Select an icon “right” or “left” to calibrate the heading direction. (Arrow marks will rotate corresponding to the calibration key.)



SKIA2049E

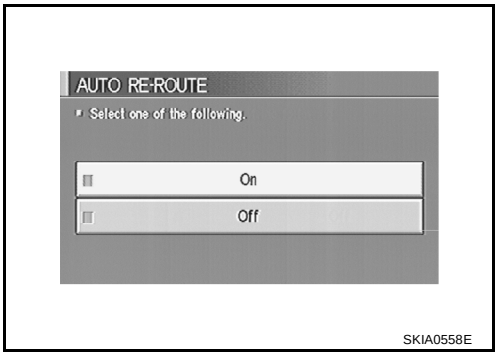
2. Select “Set”. Then the vehicle mark will be matched to the arrow mark.



SKIA0564E

“AUTO RE-ROUTE” MODE

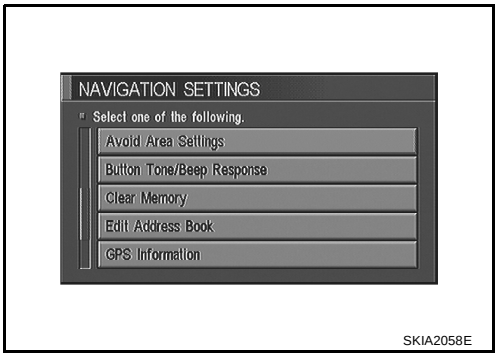
- To Perform the auto re-route of route, select “On”.
- Not to Perform the auto re-route of route, select “Off”.



SKIA0558E

“AVOID AREA SETTING” MODE

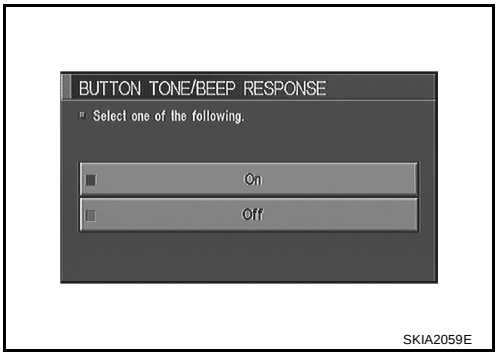
- Areas to avoid can be registered.



SKIA2058E

“BUTTON TONE/BEEP RESPONSE” MODE

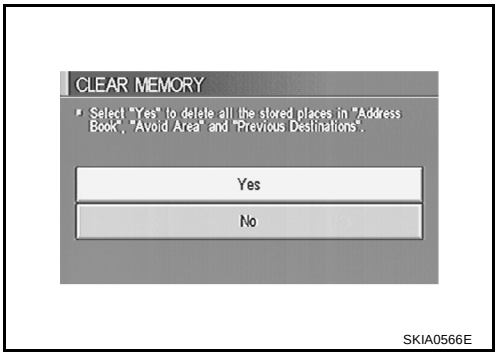
- If beep is required, select “On”.
- If no beep is required, select “Off”.



SKIA2059E

“CLEAR MEMORY” MODE

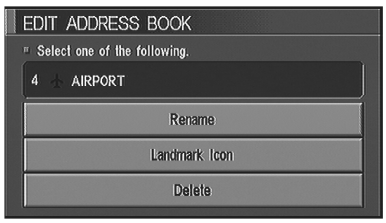
- To delete all the stored places in “Address Book”, “Avoid Area” and “Previous Dest”, select “Yes”.



SKIA0566E

“EDIT ADDRESS BOOK” MODE

- Edit the items registered in Address Book.

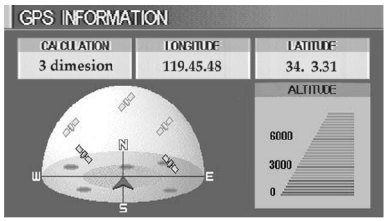


SKIA2057E

“GPS INFORMATION” MODE

- Latitude, longitude, altitude, astrometric state, and satellite location are displayed as GPS information.

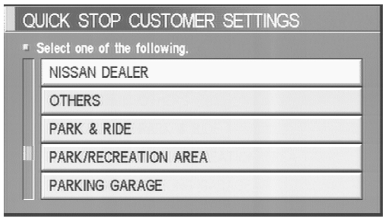
  NOTE:
  Altitude is displayed only in three-dimensional status.



SKIA0555E

“QUICK STOP CUSTOMER SETTING” MODE

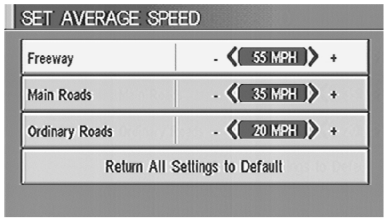
- Select a category for the “Quick Stop” menu.



SKIA3567E

“SET AVERAGE SPEED” MODE

- Set the average vehicle speed to calibrate the estimated journey time for the destination.
- Set three items; “Freeway”, “Main Roads”, and “Ordinary Roads”.

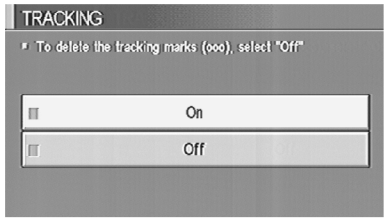


SKIA0565E

“TRACKING” MODE

- To leave no trail on the map, select “Off”.
- To leave a trail in the map, select “On”.

NOTE:
When a trail display is turned OFF, trail data is erased from the memory.

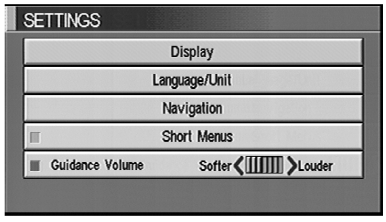


SKIA0559E

GUIDE VOLUME SETTING

Description

Following voice guidance setting can be changed.



SKIA3207E

Activation/Deactivation Setting

- The voice prompt can be turned on/off by Pushing the “Guidance Volume” button.

Voice Volume Setting

- Volume of the voice can be controlled by bending the joystick to left/right.

Precautions for NAVI Control Unit Replacement

AKS00118

- When replacing the NAVI control unit, eject the map DVD-ROM before disconnecting the battery.
- The NAVI control unit has the following information stored in its memory. Record the memory contents before replacing the control unit, and input them in the new unit as necessary.

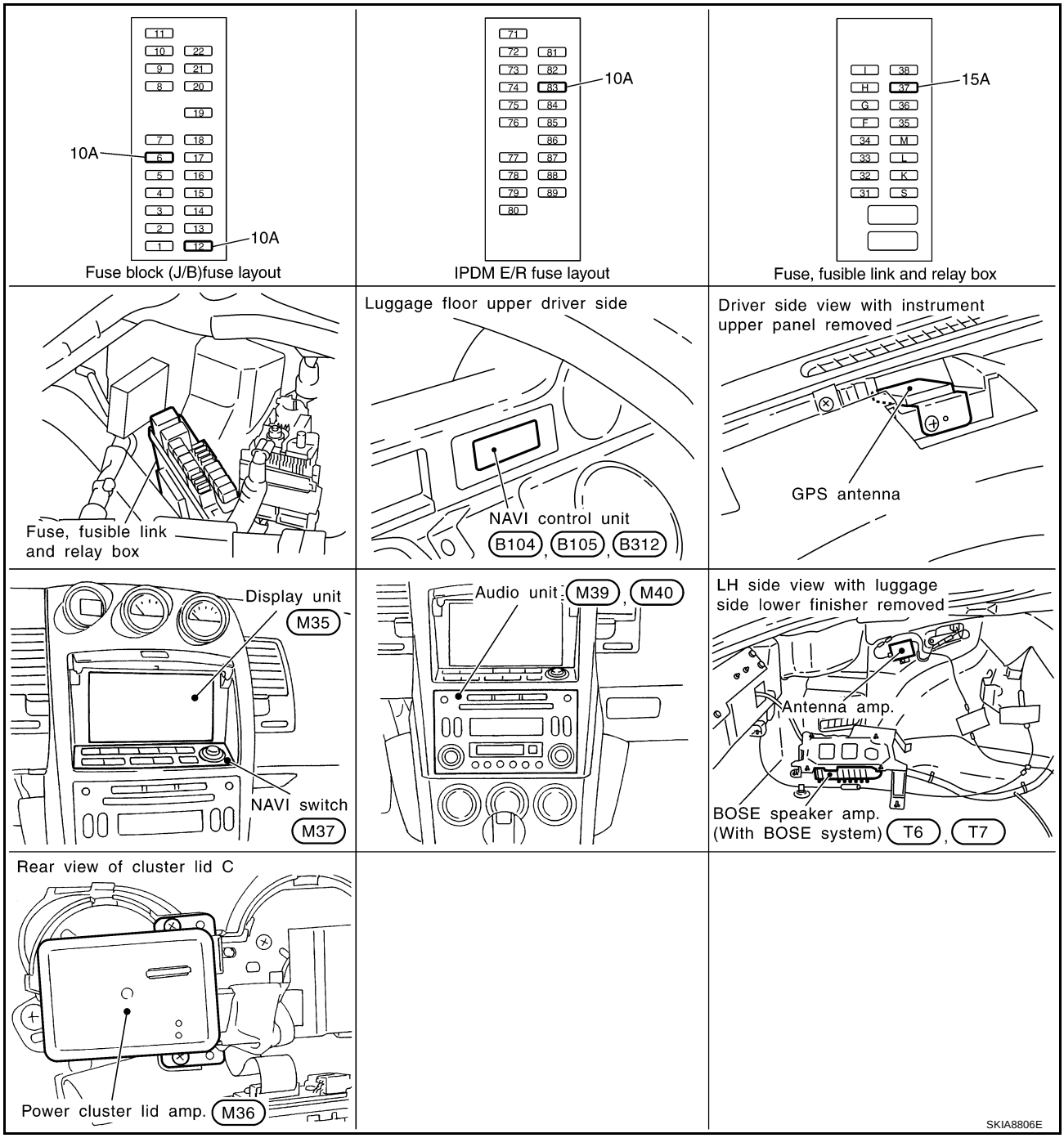
<Image quality>
- **Brightness of light when ON/OFF**
- **Dimming switching**
- **Display color switching**

<Navigation mode>
- **Latest status (map screen/bird view™, reduced scale, rotation angle of map screen, route guide ON/OFF, track ON/OFF, etc.)**
- **Current position**
- **Destination, passing point 1 - 5**
- **Registered places, their names, etc.**

NOTE:
Only removing the battery does not erase the memory.

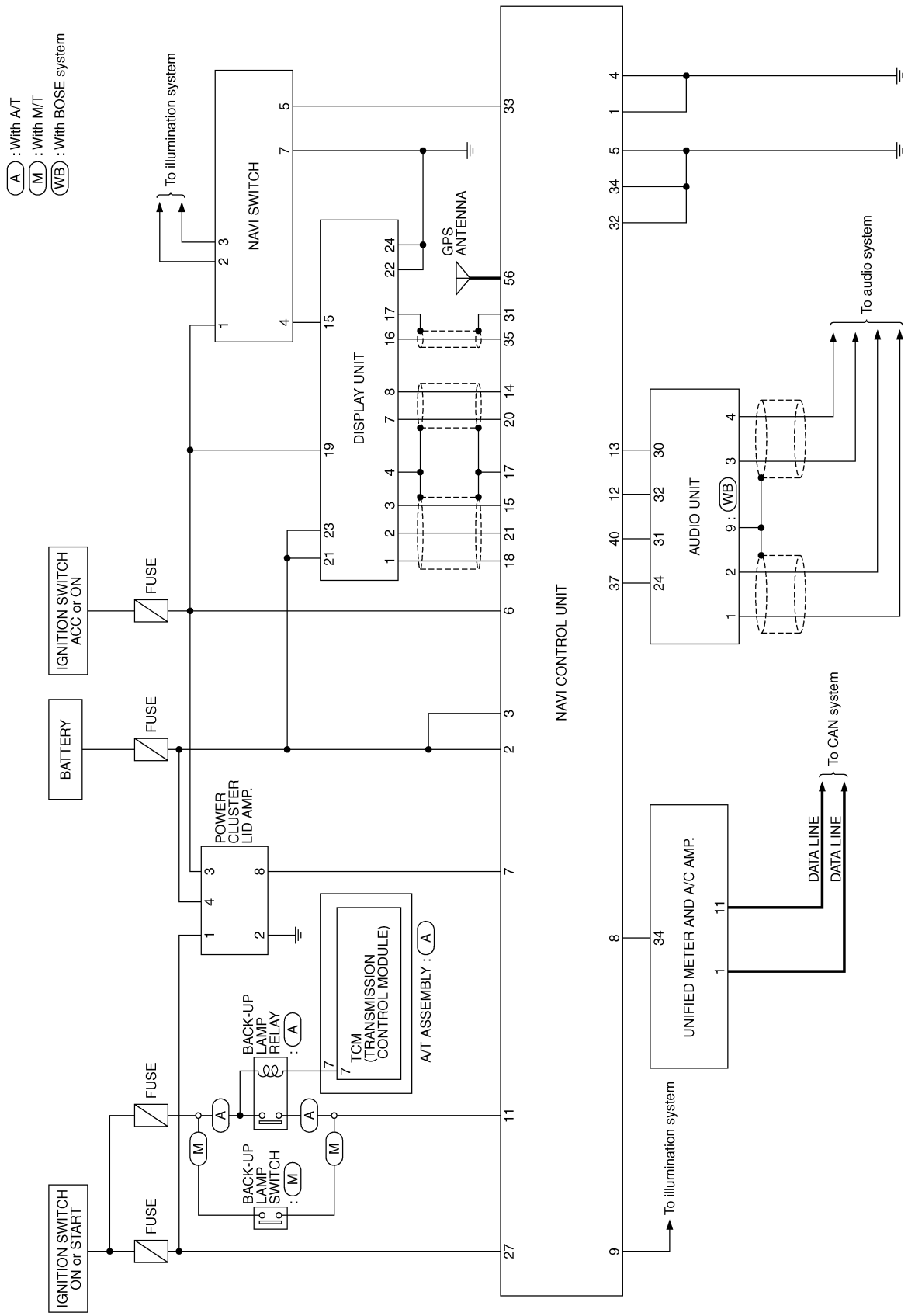
Component Parts and Harness Connector Location

AKS00119



Schematic

AKS0011A

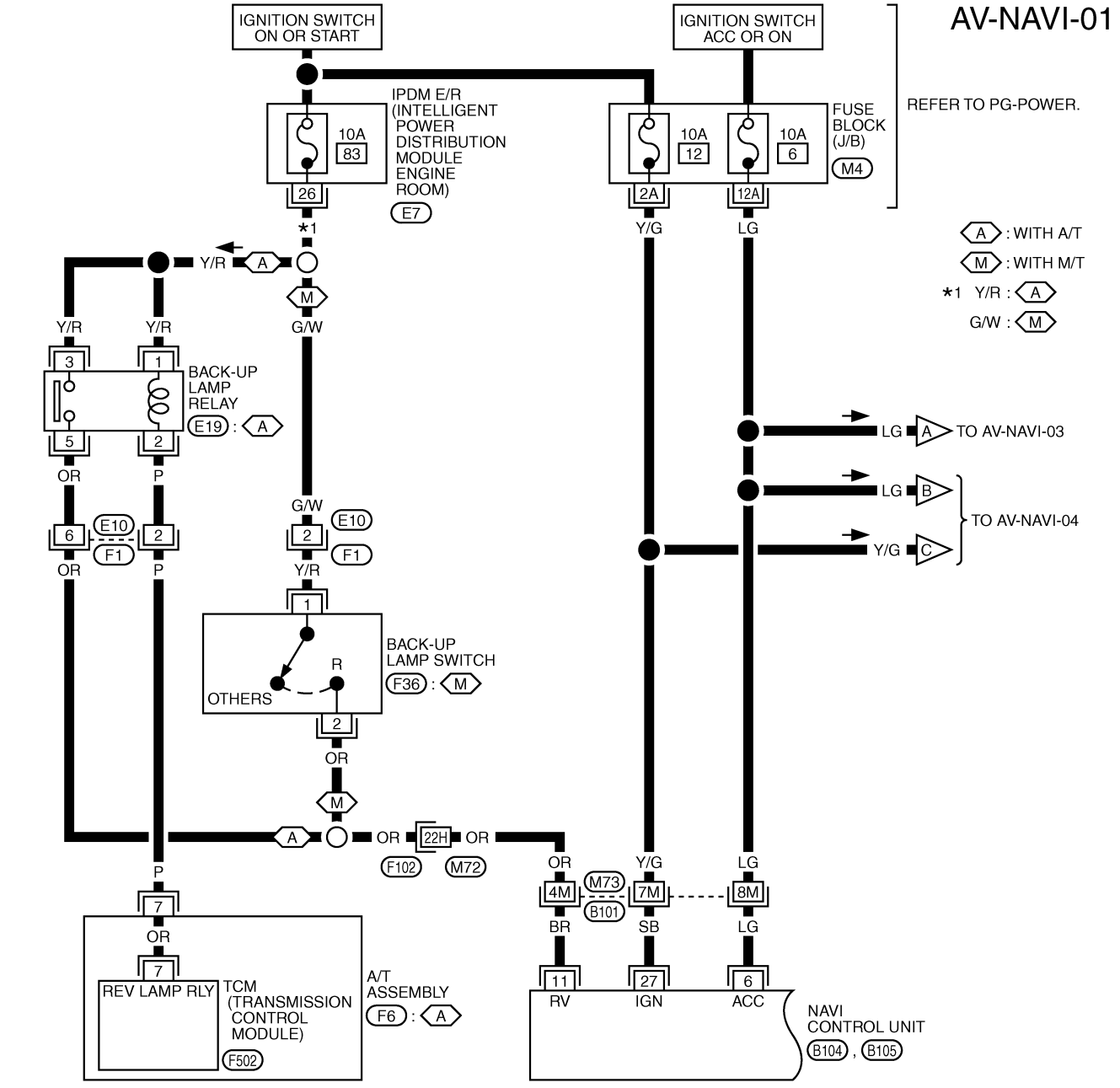


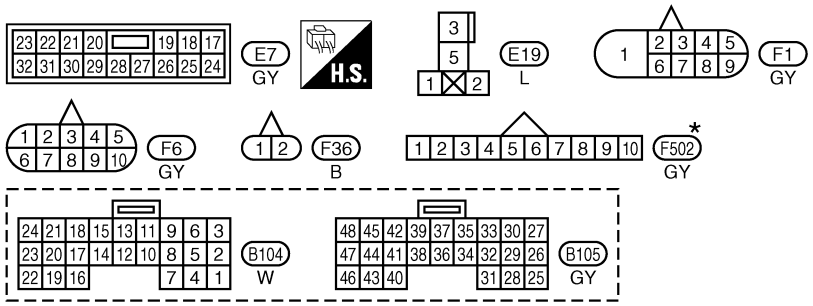
TKWM1322E

Wiring Diagram — NAVI —

AKS0011B

FOR COUPE MODELS





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

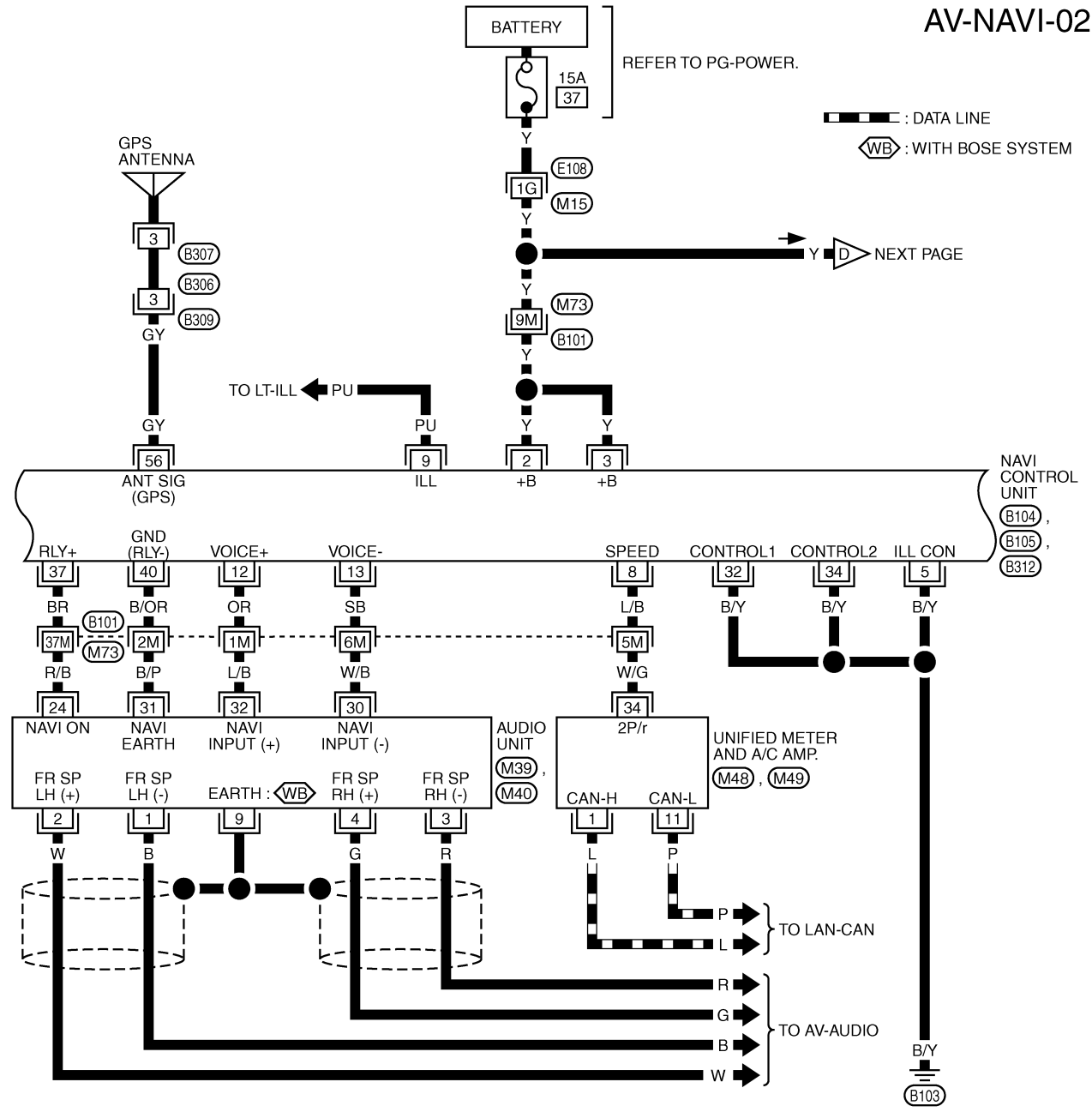
REFER TO THE FOLLOWING.

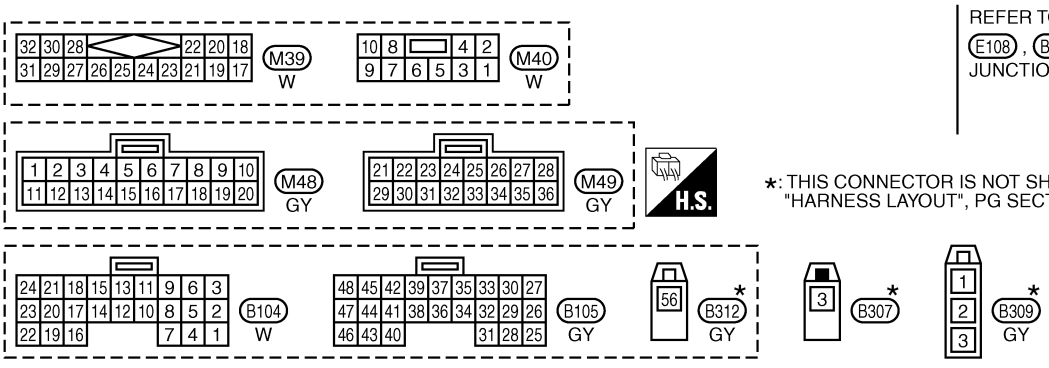
F102 , B101 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWM1323E

AV-NAVI-02



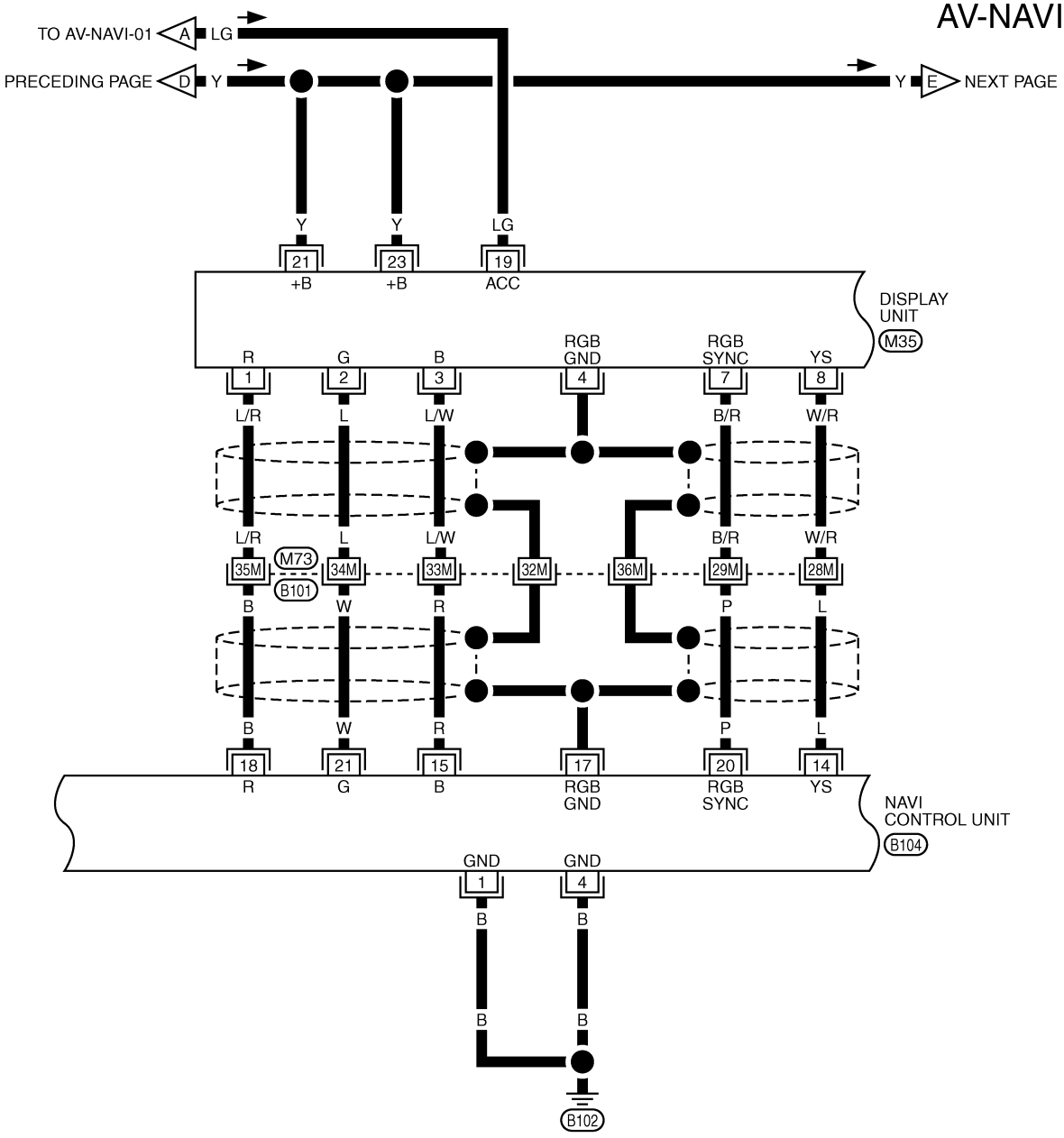


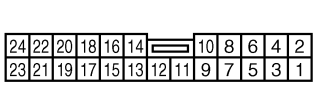
REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)

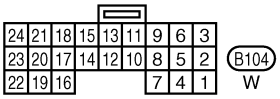
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT1545E

AV-NAVI-03





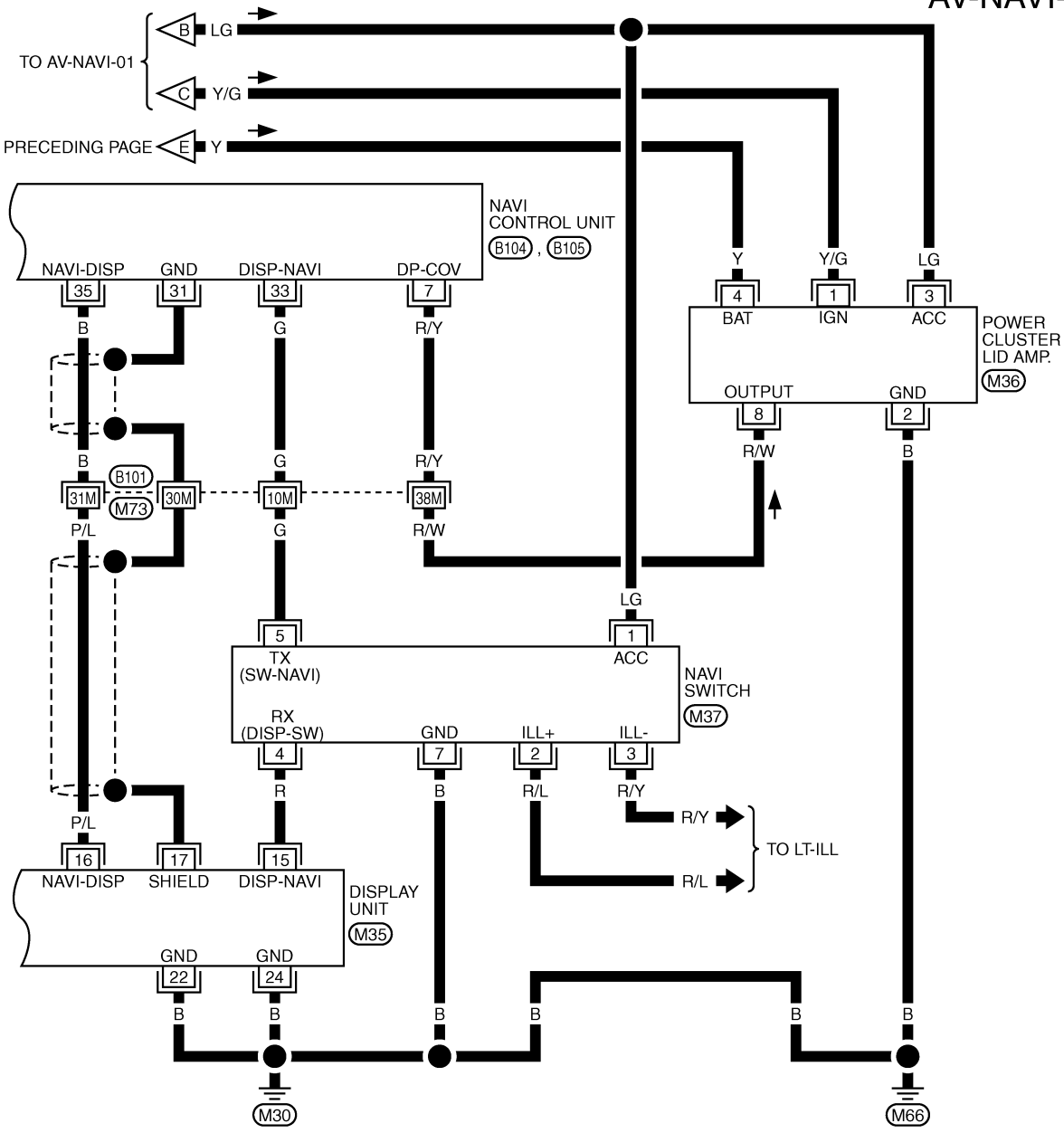


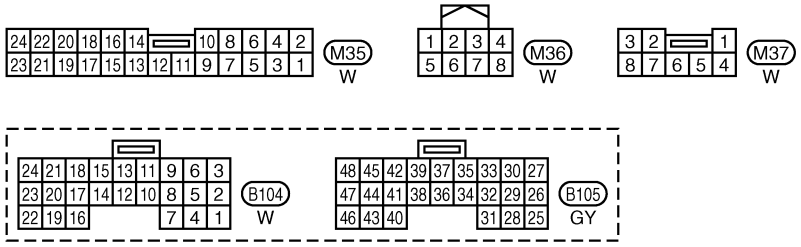
REFER TO THE FOLLOWING.

B101 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT1546E

AV-NAVI-04

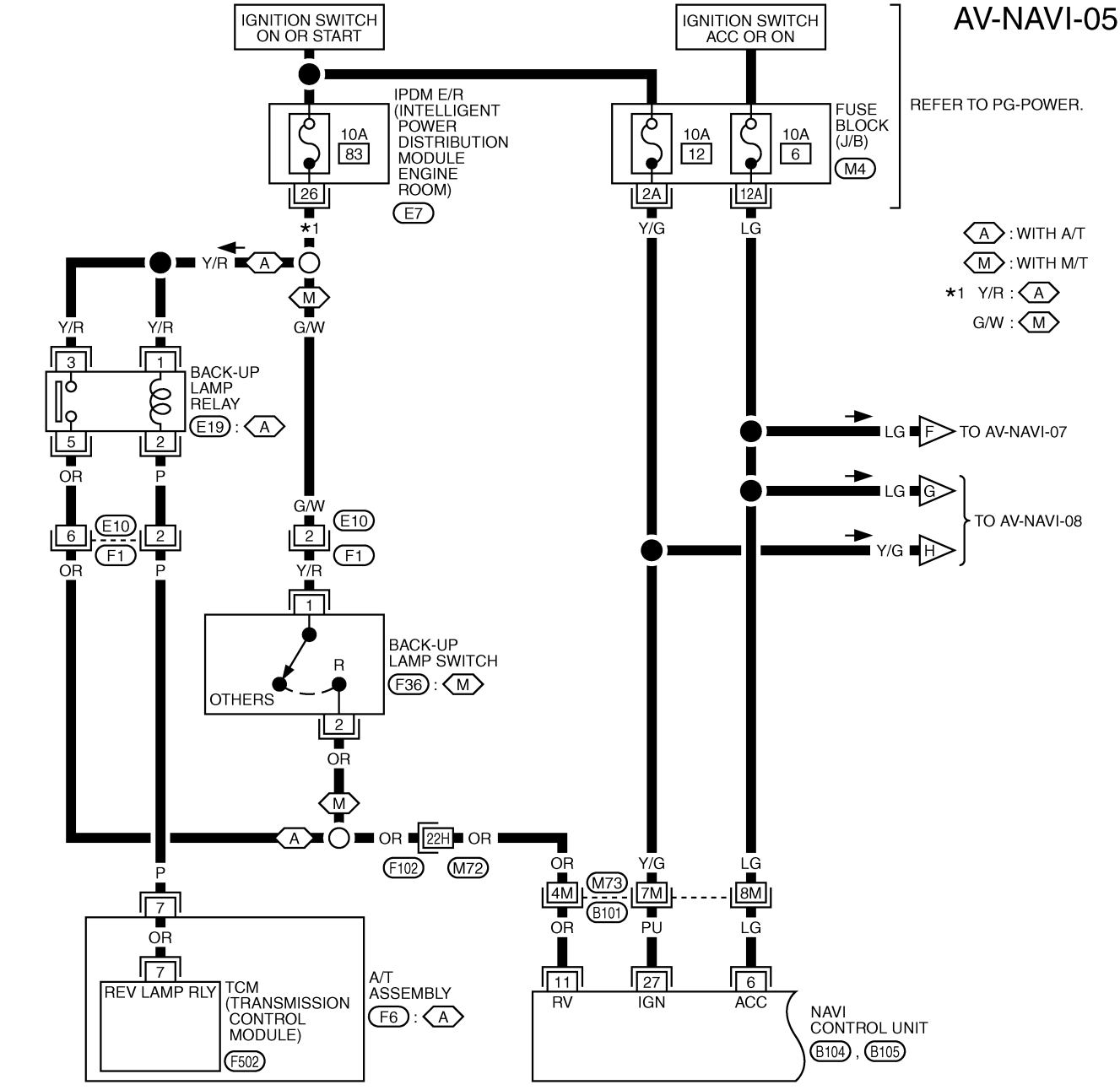


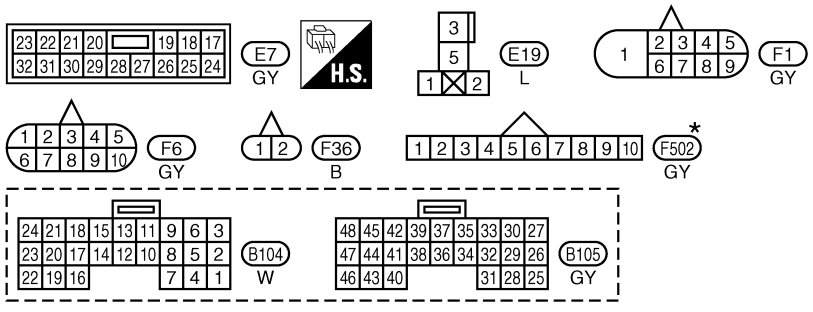


REFER TO THE FOLLOWING.
B101 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT1547E

FOR ROADSTER MODELS

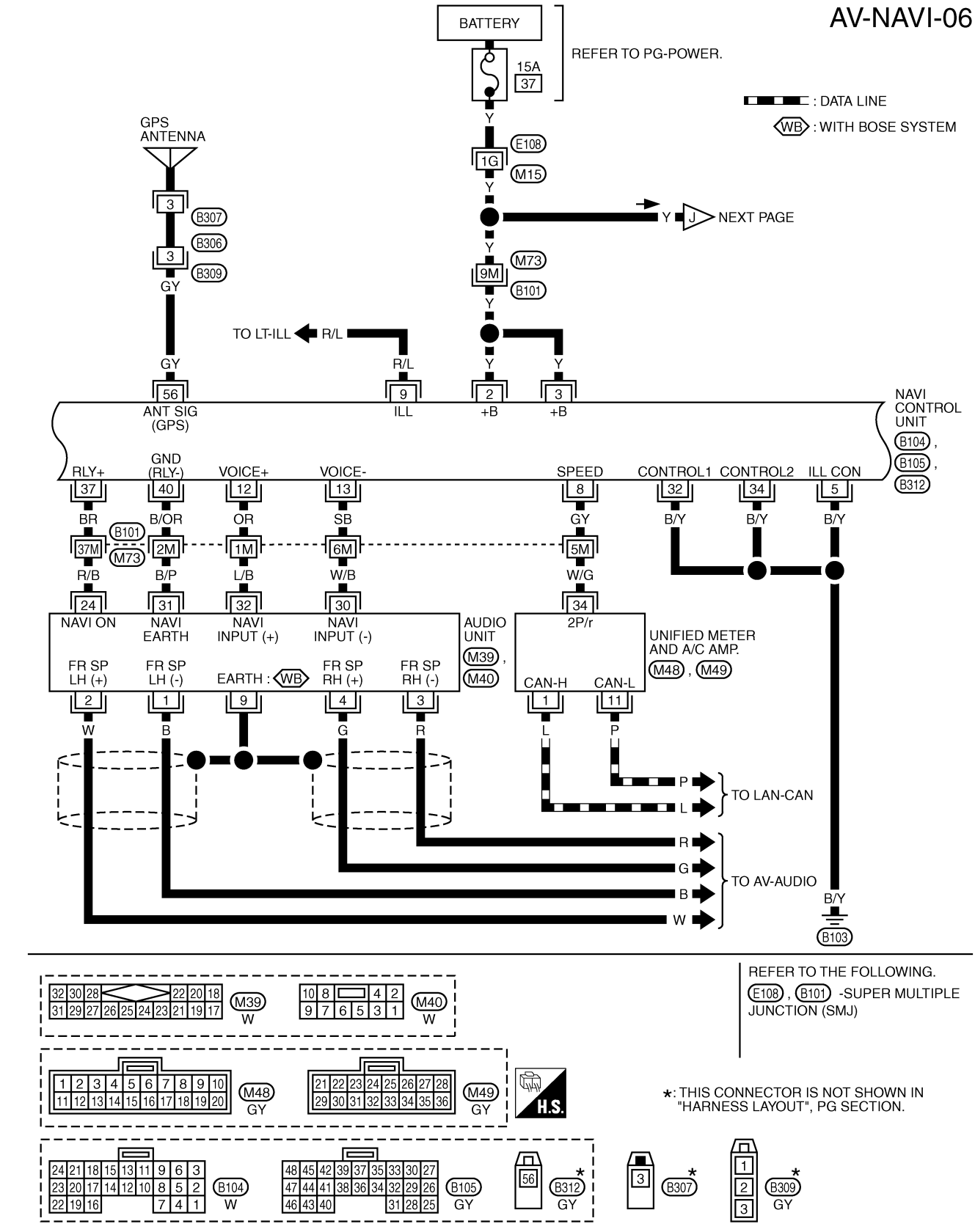




REFER TO THE FOLLOWING.
F102 , B101 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

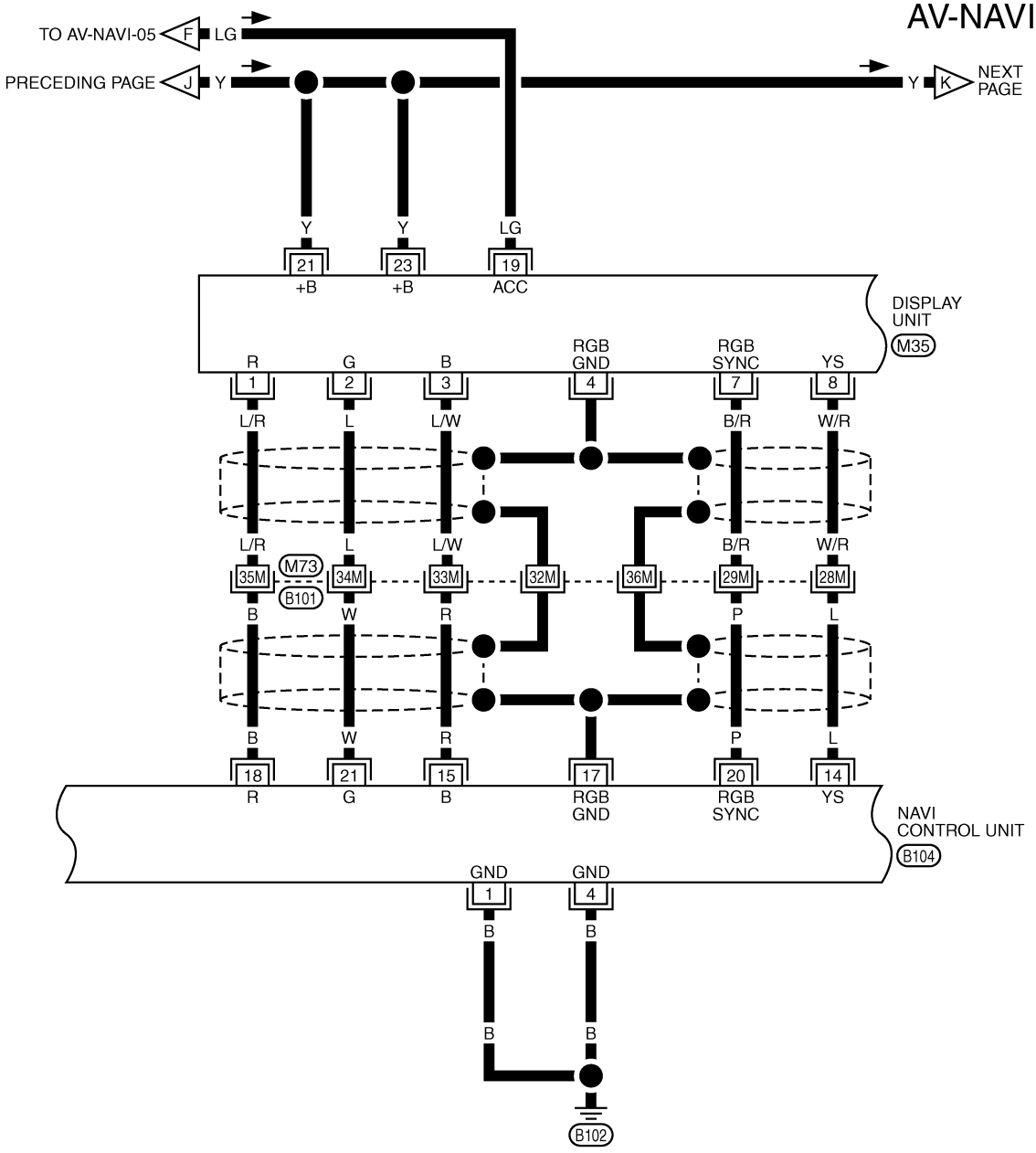
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

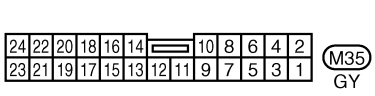
TKWM1324E

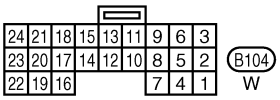

AV-NAVI-06
BATTERY
15A
37
REFER TO PG-POWER.
: DATA LINE
WB : WITH BOSE SYSTEM
GPS ANTENNA
E108
1G
M15
Y
NEXT PAGE
J
M73
9M
B101
B307
B306
B309
TO LT-ILL
R/L
GY
56
ANT SIG (GPS)
9
ILL
2
+B
3
+B
NAVI CONTROL UNIT
B104 , B105 , B312
RLY+
GND (RLY-)
VOICE+
VOICE-
SPEED
CONTROL1
CONTROL2
ILL CON
37
40
12
13
8
32
34
5
BR
B/OR
OR
SB
GY
B/Y
B/Y
B/Y
B101
37M
M73
2M
1M
6M
5M
R/B
B/P
L/B
W/B
W/G
24
31
32
30
34
NAVI ON
NAVI EARTH
NAVI INPUT (+)
NAVI INPUT (-)
2P/r
AUDIO UNIT
M39 , M40
UNIFIED METER AND A/C AMP.
M48 , M49
FR SP LH (+)
FR SP LH (-)
EARTH : WB
FR SP RH (+)
FR SP RH (-)
CAN-H
CAN-L
2
1
9
4
3
1
11
W
B
G
R
L
P
P
L
TO LAN-CAN
R
G
B
W
TO AV-AUDIO
B/Y
B103
M39
W
M40
W
M48
GY
M49
GY
H.S.
B104
W
B105
GY
56
B312
GY
3
B307
1
2
3
B309
GY
REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT1549E

AV-NAVI-07





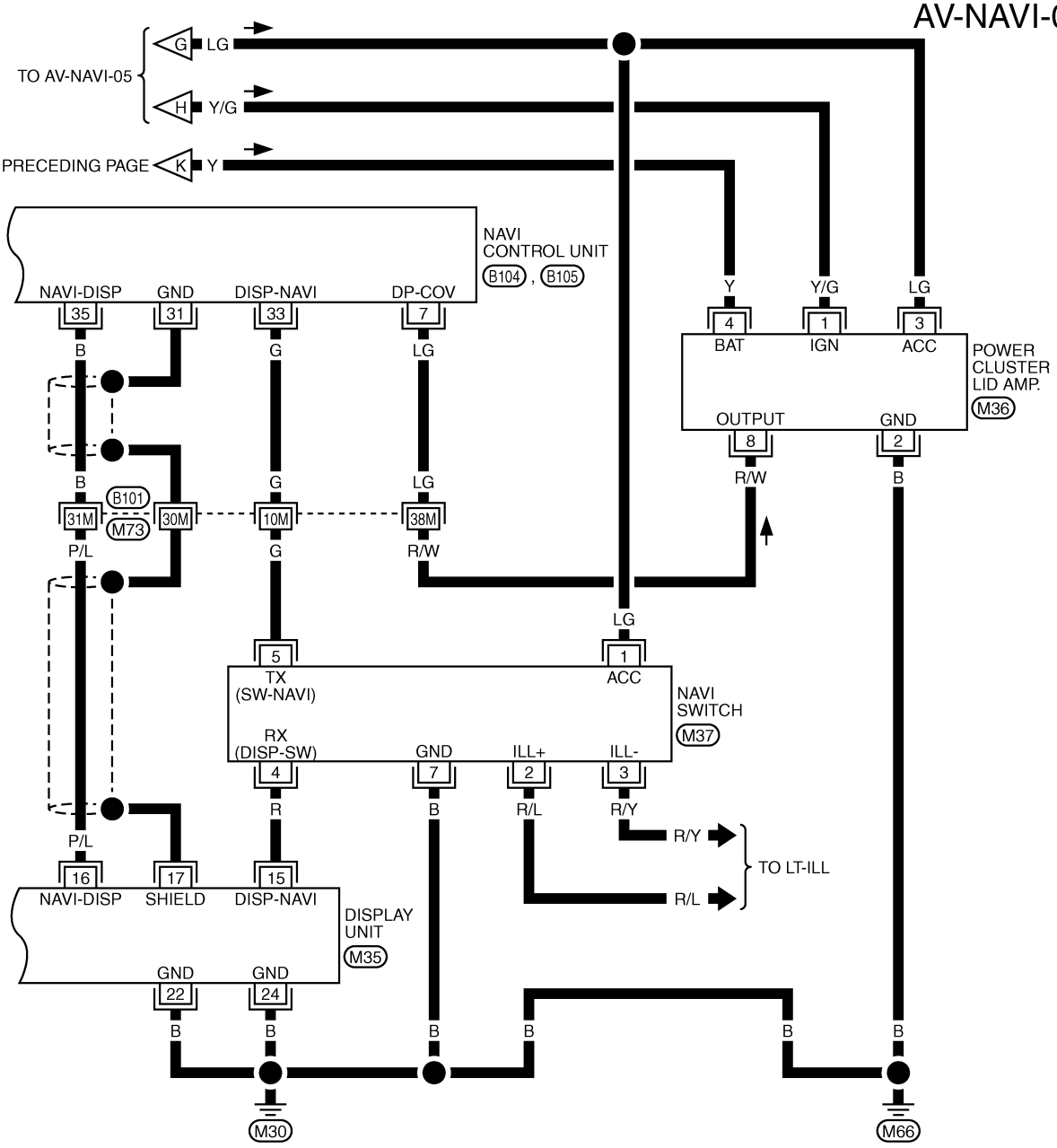


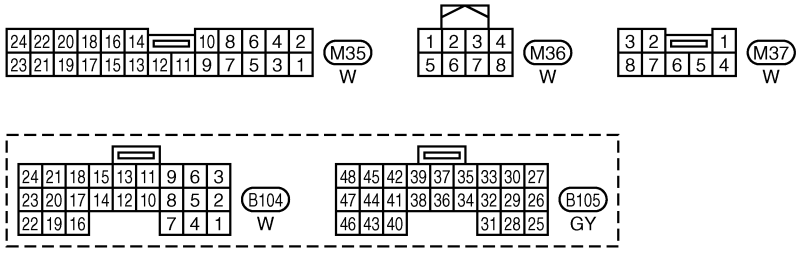
REFER TO THE FOLLOWING.

B101 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT1550E

AV-NAVI-08





REFER TO THE FOLLOWING.
B101 -SUPER MULTIPLE JUNCTION (SMJ)

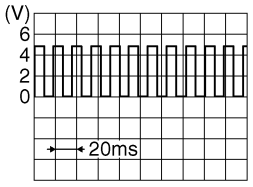
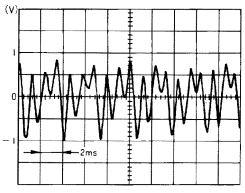
TKWT1551E

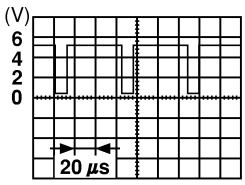
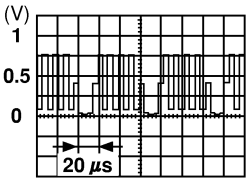
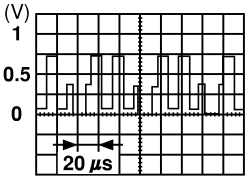
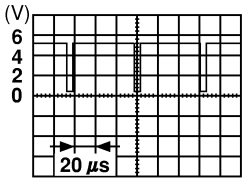
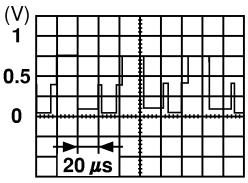
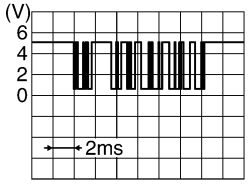
Terminals and Reference Value for NAVI Control Unit

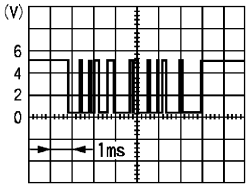
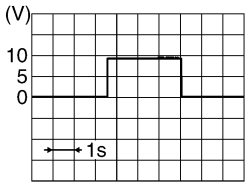
AKS0011D

- Measure using circuit tester and oscilloscope.
- Measure with connector connected unless otherwise specified.

  CAUTION:
  Confirm voltage between negative terminal on each unit and ground is approximately 0V.
- If ignition switch ON is required in measurement condition, measure with engine running to prevent battery discharge.

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value	Example of symptom
(+)	(–)			Ignition switch	Operation		
1 (B)	Ground	Ground	–	ON	–	Approx. 0V	–
2 (Y)	Ground	Battery power supply	Input	OFF	–	Battery voltage	System does not work properly.
3 (Y)							
4 (B)	Ground	Ground	–	ON	–	Approx. 0V	–
5 (B/Y)	Ground	Ground	–	ON	–	Approx. 0V	–
6 (LG)	Ground	ACC power supply	Input	ACC	–	Battery voltage	System does not work properly.
7 (R/Y)*1 (LG)*2	Ground	Display cover ON signal	Input	ON	Display cover is opened	Approx. 5V	Display does not work properly.
					Except for above	Approx. 0V	
8 (L/B)*1 (GY)*2	Ground	Vehicle speed signal (2-pulse)	Input	ON	When vehicle speed is approx. 40 km/h (25 MPH)	 SKIA6649J	Navigation current-location mark does not indicate the correct position.
9 (PU)*1 (R/L)*2	Ground	Illumination signal	Input	ON	Lighting switch is ON	Approx. 12V	Screen does not switch to night-time mode after the lighting switch is turned ON.
					Lighting switch is OFF	Approx. 0V	
11(BR)*1 (OR)*2	Ground	Reverse signal	Input	ON	Select R-position	Approx. 12V	The navigation current-location mark moves strangely when the vehicle is moving backwards.
					Other position	Approx. 0V	
12 (OR)	13 (SB)	Voice guide signal	Output	ON	Push the “VOICE” switch.	 SKIA0171J	Only route guide and operation guide are not heard.

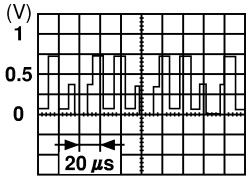
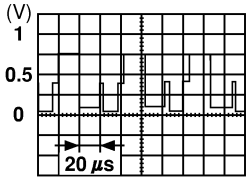
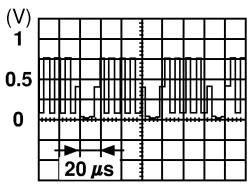
Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value	Example of symptom
(+)	(–)			Ignition switch	Operation		
14 (L)	17	RGB area signal	Output	ON	–	 SKIA0162E	Screen is not shown.
15 (R)	17	RGB signal (B: blue)	Output	ON	Select “Color bar” of CONFIRMATION/ ADJUSTMENT function	 SKIA0167E	Screen looks yellowish.
17	Ground	Ground (RGB)	–	ON	–	Approx. 0V	–
18 (B)	17	RGB signal (R: red)	Output	ON	Select “Color bar” of CONFIRMATION/ ADJUSTMENT function	 SKIA0165E	Screen looks bluish.
20 (P)	17	RGB synchronizing signal	Output	ON	–	 SKIA0164E	Screen is rolling.
21 (W)	17	RGB signal (G: green)	Output	ON	Select “Color bar” of CONFIRMATION/ ADJUSTMENT function	 SKIA0166E	Screen looks reddish.
27 (SB)[*1] (PU)[*2]	Ground	Ignition signal	Input	ON	–	Battery voltage	Navigation current-location mark does not indicate the correct position.
31	Ground	Ground	–	ON	–	Approx. 0V	–
32 (B/Y)	Ground	Ground	–	ON	–	Approx. 0V	–
33 (G)	Ground	Communication signal (DISP-NAVI)	Input	ON	–	 SKIB0231E	Screen is not shown.

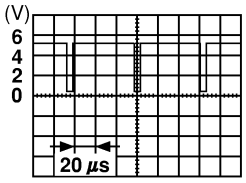
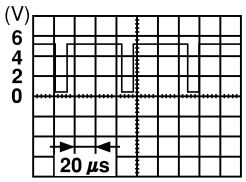
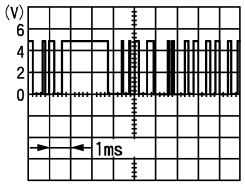
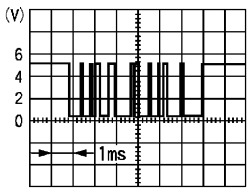
Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value	Example of symptom
(+)	(–)			Ignition switch	Operation		
34 (B/Y)	Ground	Ground	–	ON	–	Approx. 0V	–
35 (B)	31	Communication signal (NAVI-DISP)	Output	ON	–	 SKIA0832E	Screen is not shown.
37 (BR)	Ground	Voice guide ON signal	Output	ON	Push the “VOICE” switch	 SKIB0232E	Only route guide and operation guide are not heard.
40 (B/OR)	Ground	Ground	–	ON	–	Approx. 0V	–
56 (GY)	Ground	GPS antenna signal	Input	ON	Connector is not connected.	Approx. 5V	Navigation system GPS correction is not possible.

*1 : Coupe models
*2 : Roadster models

Terminals and Reference Value for Display Unit

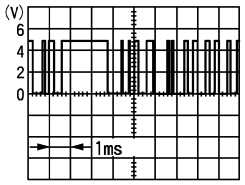
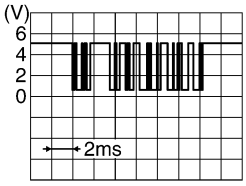
AKS0011E

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value	Example of symptom
(+)	(–)			Ignition switch	Operation		
1 (L/R)	4	RGB signal (R: red)	Input	ON	Select “Color bar” of CONFIRMATION/ ADJUSTMENT function.	 SKIA0165E	Screen looks bluish.
2 (L)	4	RGB signal (G: green)	Input	ON	Select “Color bar” of CONFIRMATION/ ADJUSTMENT function.	 SKIA0166E	Screen looks reddish.
3 (L/W)	4	RGB signal (B: blue)	Input	ON	Select “Color bar” of CONFIRMATION/ ADJUSTMENT function.	 SKIA0167E	Screen looks yellowish.
4	Ground	RGB Ground	–	ON	–	Approx. 0V	–

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value	Example of symptom
(+)	(–)			Ignition switch	Operation		
7 (B/R)	4	RGB synchronizing signal	Input	ON	–	 SKIA0164E	Screen is rolling.
8 (W/R)	4	RGB area signal	Input	ON	–	 SKIA0162E	Screen is not shown.
15 (R)	Ground	Communication signal (DISP-NAVI)	Output	ON	–	 SKIA0835E	Screen is not shown.
16 (P/L)	17	Communication signal (NAVI-DISP)	Input	ON	–	 SKIA0832E	Screen is not shown.
17	Ground	Shield	–	ON	–	Approx. 0V	–
19 (LG)	Ground	ACC power supply	Input	ACC	–	Battery voltage	System does not work properly.
21 (Y)	Ground	Battery power supply	Input	OFF	–	Battery voltage	System does not work properly.
22 (B)	Ground	Ground	–	ON	–	Approx. 0V	–
23 (Y)	Ground	Battery power supply	Input	OFF	–	Battery voltage	System does not work properly.
24 (B)	Ground	Ground	–	ON	–	Approx. 0V	–

Terminals and Reference Value for NAVI Switch

AKS0011F

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value	Example of symptom
(+)	(–)			Ignition switch	Operation		
1 (LG)	Ground	ACC power supply	Input	ACC	–	Battery voltage	Screen is not shown.
2 (R/L)	Ground	Illumination signal (+)	Input	ON	Lighting switch is ON	Approx. 12V	NAVI switch illumination does not come on when lighting switch is ON.
					Lighting switch is OFF	Approx. 0V	
3 (R/Y)	Ground	Illumination signal (–)	Input	ON	Illumination control switch is operated by lighting switch in ON position	Changes between approx. 0 and approx. 12V	NAVI switch illumination can not be controlled.
4 (R)	Ground	Communication signal (DISP-SW)	Input	ON	–	 SKIA0835E	Screen is not shown.
5 (G)	Ground	Communication signal (SW-NAVI)	Output	ON	–	 SKIB0231E	Screen is not shown.
7 (B)	Ground	Ground	–	ON	–	Approx. 0V	–

Self-Diagnosis Function

AKS0011G

DESCRIPTION

- Diagnosis function consists of the self-diagnosis mode performed automatically and the CONFIRMATION/ ADJUSTMENT mode operated manually.
- Self-diagnosis mode checks for connections between the units constituting this system, analyzes each individual unit at the same time, and displays the results on the LCD screen.
- CONFIRMATION/ADJUSTMENT mode is used to perform trouble diagnosis that require operation and judgment by an operator (trouble that cannot be automatically judged by the system), to check/change the set value, and to display the History of Errors of the navigation system.

DIAGNOSIS ITEM

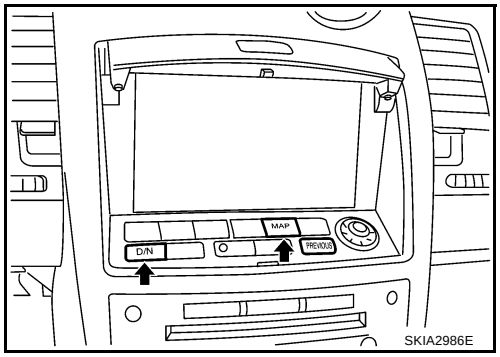
Mode			Description
Self-diagnosis			● NAVI Control unit diagnosis (DVD-ROM drive will not be diagnosed when no map DVD-ROM is in it.). ● Performs diagnosis of each unit and connections between control unit and GPS antenna, as well as between control unit and each unit.
CONFIRMATION/ ADJUSTMENT	Display diagnosis		Color tone and shading of the screen can be checked by the display of a color bar and a gray scale.
	Vehicle signals		Analyzes the following vehicle signals: Vehicle speed signal, light signal, ignition switch signal, and reverse signal.
	Navigation	Display Longitude & Latitude	Display the map. Use the joystick to adjust position. Longitude and latitude will be displayed.
		Speed Calibration	Under ordinary conditions, the navigation system distance measuring function will automatically compensate for minute decreases in wheel and tire diameter caused by tire wear or low pressure. Speed calibration immediately restores system accuracy in cases such as when distance calibration is needed because of the use of tire chains in inclement weather.
		Angle adjustment	Corrects difference between actual turning angle of a vehicle and turning angle of the car mark on the display.
		Initialize Location	This mode is for initializing the current location. Use when the vehicle is transported a long distance on a trailer, etc.
	History of Errors		Diagnosis results previously stored in the memory (before turning ignition switch ON) are displayed in this mode. Time and location when/where the errors occurred are also displayed.

Self-Diagnosis Mode

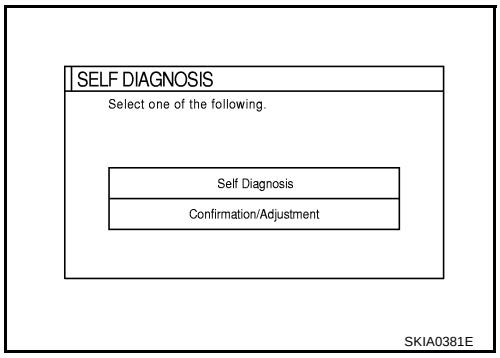
AKS0011H

OPERATION PROCEDURE

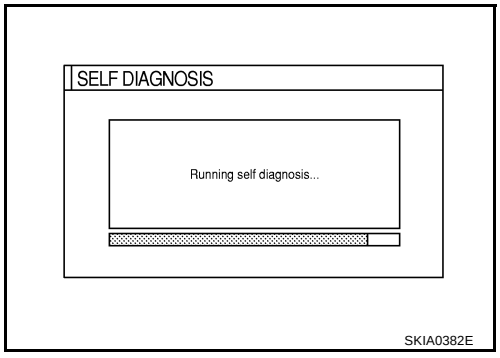
1. Start the engine.
2. Push and hold “MAP” and “D/N” switches simultaneously for 5 seconds or more.
   - Push the “PREVIOUS” switch and the initial system screen will be shown.



3. The initial trouble diagnosis screen will be shown, and items “SELF-DIAGNOSIS” and “CONFIRMATION/ADJUSTMENT” will become selective.

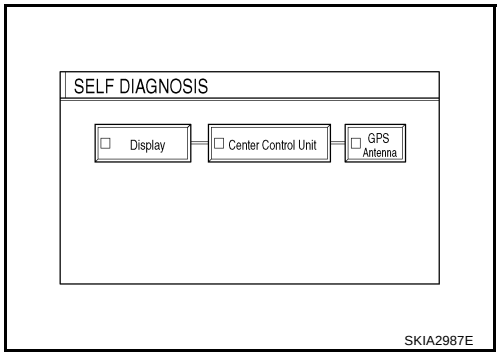


4. Perform self-diagnosis by selecting the “SELF-DIAGNOSIS”.
   - Self-diagnosis subdivision screen will be shown and the operation enters the self-diagnosis mode.
   - A bar graph shown below the self-diagnosis subdivision screen indicates progress of the diagnosis.



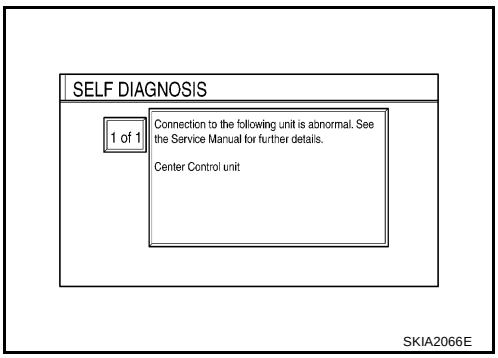
5. On the “Self diagnosis” screen, each unit name will be colored according to the diagnosis result, as follows.

   Green : No malfunctioning.
   Yellow : Cannot be judged by self-diagnosis results.
   Red : Unit is malfunctioning.
   Gray : Diagnosis has not been done.



   - If several malfunctions are present in a unit, color of its switch on the screen will be either red, yellow, or gray, determined by the malfunction of the highest priority.
   - Lines between control unit and display or GPS antenna are green or yellow based on diagnosis results.
   - Lines between control unit and units other than those above are gray regardless of diagnosis results.

6. Select a switch on the “Self diagnosis” screen and comments for the diagnosis results will be shown.
   - When the switch is green, the following comment will be shown. “Self-diagnosis was successful. Further diagnosis and adjustments are recommended. Follow the “confirmation and adjustments” menu or refer to the service manual.”.
   - When the switch is yellow, the following comment will be shown. “Connection to the following unit is abnormal. See the service manual for further details”.
   - When the switch is red, the following comment will be shown. “Center Control Unit is abnormal”.
   - When the switch is gray, the following comment will be shown. “Self-diagnosis for DVD-ROM DRIVER of NAVI was not conducted because no DVD-ROM was available.”.



SELF–DIAGNOSIS RESULT

Quick Reference Table

1. Select an applicable diagnosis No. in the diagnosis result quick reference table.
2. Find estimated malfunctioning system in the diagnosis No. table and perform check by referring to the AV communication line wiring diagram. Refer to AV-64, "Wiring Diagram — NAVI —" .
3. Turn ignition switch to OFF and perform self-diagnosis again.

Screen switch				Diagnosis No.
Switch color	Center Control unit*1	Display	GPS antenna	
Red	×			1
Gray	×			2
Yellow	×			3
	×			4
	×		×	5
	×	×	×	6

*1: Center Control unit =NAVI control unit

CAUTION:

- **If display has any error, self-diagnosis cannot start.**
- **If AV communication between display and NAVI control unit has any error, self-diagnosis cannot start.**

Self–diagnosis Codes

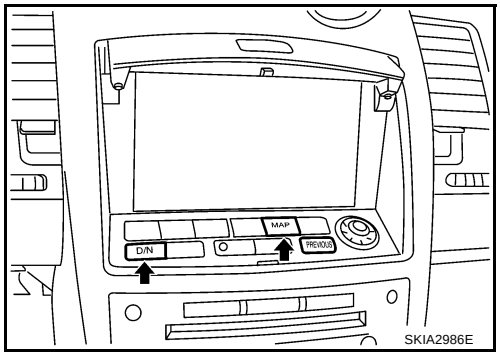
Diagnosis No.	Possible cause
1	NAVI control unit malfunction
2	NAVI control unit judged no map DVD-ROM is inserted.
3	When “DVD-ROM error. Please check disc.” is shown. 1. Eject map DVD-ROM and check if it is compatible with the system. 2. Check ejected DVD-ROM for dirt, damage, and warpage. 3. If no error is found, insert a known good map DVD-ROM of the same type and perform self-diagnosis again. If same result is shown, the NAVI control unit is malfunctioning. If result is normal, the map DVD-ROM is malfunctioning.
4	If “Error found in DVD-ROM or DVD-ROM driver in control unit. Please perform diagnosis in accordance with service manual” is shown, carry out same inspection as diagnosis No. 3.
5	GPS antenna system 1. Visually check for a broken wire in the GPS antenna coaxial cable. 2. Disconnect the GPS antenna connector and check that approximately 5V is supplied from NAVI control unit. If not, the NAVI control unit is inoperative. If the voltage is supplied, replace the GPS antenna and perform self-diagnosis again. If the same result is shown, the NAVI control unit is inoperative.
6	AV communication line circuit malfunction. ● Check for short circuit in AV communication line. Refer to AV-93, "Screen is Not Shown" . ● If no error is found during the above checks, communication circuit in NAVI control unit has a malfunction.

CONFIRMATION/ADJUSTMENT Mode

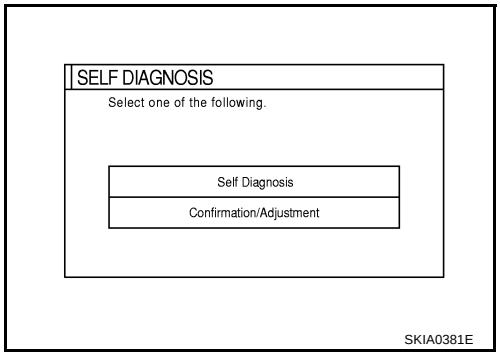
AKS0011I

OPERATION PROCEDURE

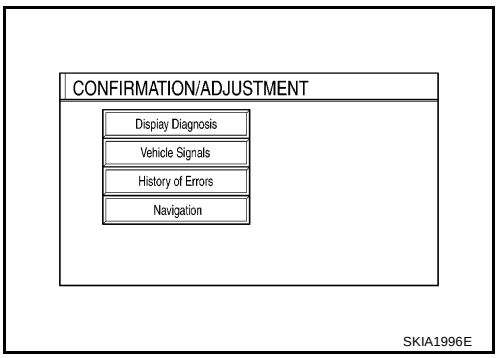
1. Start the engine.
2. Push and hold “MAP” and “D/N” switches simultaneously for 5 seconds or more.
   - Push the “PREVIOUS” switch and the initial system screen will be shown.



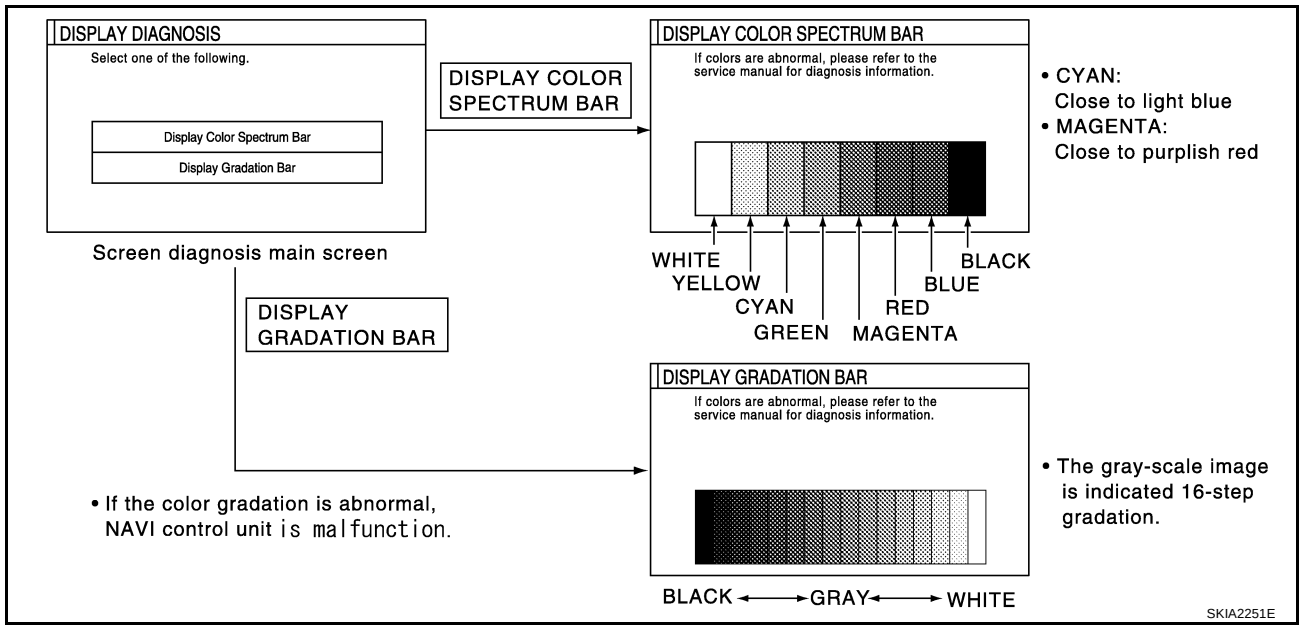
3. The initial trouble diagnosis screen will be shown, and items “SELF-DIAGNOSIS” and “CONFIRMATION/ADJUSTMENT” will become selective.



4. When “CONFIRMATION/ADJUSTMENT” is selected on the initial trouble diagnosis screen, the operation will enter the CONFIRMATION/ADJUSTMENT mode. In this mode, check and adjustment of each item will become possible.
5. Select each switch on “CONFIRMATION/ADJUSTMENT” screen to display the relevant diagnosis screen.



DISPLAY DIAGNOSIS



CAUTION:

When Display Color Spectrum Bar screen is completed after “PREV” switch is Pushed, the screen color changes once. This is normal.

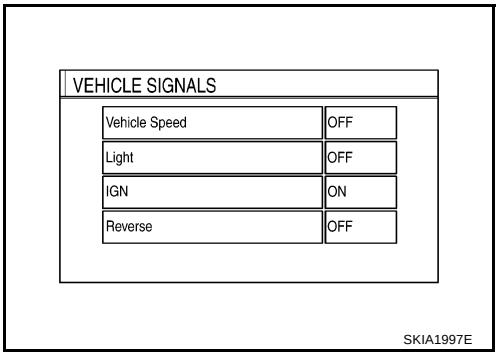
- When RGB signal error occurred in the RGB system, tone of the color bar will change as follows.

  R (red) signal error : Screen looks bluish.
  G (green) signal error : Screen looks reddish.
  B (blue) signal error : Screen looks yellowish.

- When the color of the screen looks unusual, refer to AV-99, "Color of Image is Not Proper" .

VEHICLE SIGNALS

- A comparison check can be made of each actual vehicle signal and the signals recognized by the system.



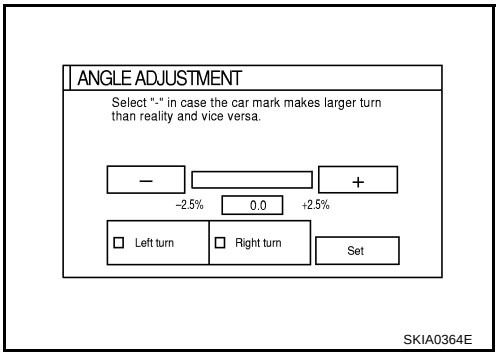
Diagnosis item	Display	Condition	Remarks
Vehicle speed	ON	Vehicle speed > 0 km/h (0 MPH)	Changes in indication may be delayed by approx. 1.5 seconds. This is normal.
	OFF	Vehicle speed = 0 km/h (0 MPH)	
	–	Ignition switch in ACC position	
Lights	ON	Lighting switch ON	–
	OFF	Lighting switch OFF	
IGN	ON	Ignition switch ON	–
	OFF	Ignition switch ACC	
Reverse	ON	Selector lever in R-position	Changes in indication may be delayed by approx. 1.5 seconds. This is normal.
	OFF	Selector lever in other than R-position	
	–	Ignition switch in ACC position	

- If vehicle speed is NG, refer to AV-90, "Vehicle Speed Signal Check" .
- If light is NG, refer to AV-91, "Illumination Signal Check" .
- If IGN is NG, refer to AV-91, "Ignition Signal Check" .
- If reverse is NG, refer to AV-92, "Reverse Signal Check" .

NAVIGATION

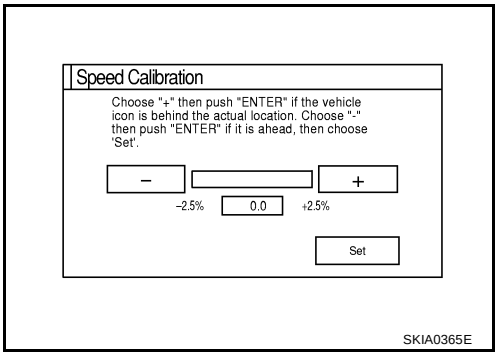
Angle Adjustment

- Adjusts turning angle output detected by the gyroscope.

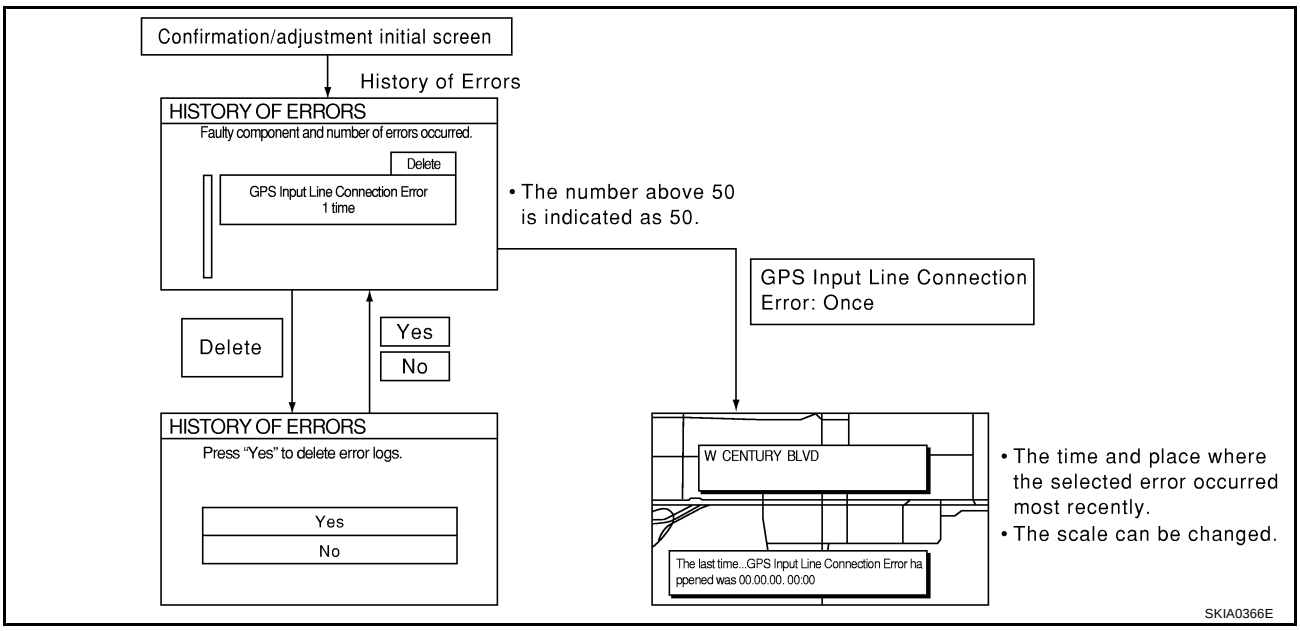


Speed Calibration

- During normal driving, distance error caused by tire wear and tire pressure change is automatically adjusted for by the automatic distance correction function. This function, on the other hand, is for immediate adjustment, in cases such as driving with tire chain fitted on tires.



HISTORY OF ERRORS



DIAGNOSIS BY HISTORY OF ERRORS

The "Self-diagnosis" results indicate whether an error occurred during the period from when the ignition switch is turned to ON until "Self-diagnosis" is completed.
If an error occurred before the ignition switch was turned to ON and does not occur again until the "Self-diagnosis" is completed, the diagnosis result will be judged normal. Therefore, those errors in the past, which cannot be found by the "Self-diagnosis", must be found by diagnosing the "History of Errors".
The History of Errors displays the time and place of the most recent occurrence of that error. However, take note of the following points.

- Correct time of the error occurrence may not be displayed when the GPS antenna substrate within the NAVI control unit has malfunctioned.
- Place of the error occurrence is represented by the position of the current-location mark at the time when the error occurred. If the current-location mark has deviated from the correct position, then the place of the error occurrence may be located correctly.
- The maximum number of occurrences which can be stored is 50. For the 51st and later occurrences, the displayed number remains 50.

When a reproducible malfunction occurred but its cause cannot be identified because several errors are present, record the item, number and place (longitude/latitude) of error occurrence (or delete the History of Errors), then turn ignition switch from OFF to ON to reproduce the malfunction. Check the History of Errors to find the items which show an increased number of occurrences, and diagnose the item.

Error item	Possible causes Action/symptom	Example of symptom
Gyro sensor disconnected	Communications malfunction between NAVI control unit and internal gyro ● Perform self-diagnosis. ● When the NAVI control unit is judged normal by self-diagnosis, the symptom may be intermittent, caused by strong radio interference.	● Navigation location detection performance has deteriorated. (Angular velocity cannot be detected.)
GPS disconnected	Communication error between NAVI control unit and internal GPS substrate ● Perform self-diagnosis. ● When the NAVI control unit is judged normal by self-diagnosis, the symptom may be intermittent, caused by strong radio interference.	● Navigation location detection performance has deteriorated. (Location correction using GPS is not performed.) ● GPS receiving status remains gray.
GPS transmission cable malfunction	Malfunctioning transmission wires to NAVI control unit and internal GPS substrate ● Perform self-diagnosis. ● When the NAVI control unit is judged normal by self-diagnosis, the symptom may be intermittent, caused by strong radio interference.	● During self-diagnosis, GPS diagnosis is not performed.
GPS input line connection error	Malfunctioning receiving wires to NAVI control unit and internal GPS substrate ● Perform self-diagnosis. ● When the NAVI control unit is judged normal by self-diagnosis, the symptom may be intermittent, caused by strong radio interference.	● Navigation location detection performance has deteriorated. (Location correction using GPS is not performed.) ● GPS receiving status remains gray.
GPS TCX0 over GPS TCX0 under	Oscillating frequency of the GPS substrate frequency synchronizing oscillation circuit exceeded (or below) the specification ● Perform self-diagnosis. ● When the NAVI control unit is judged normal by self-diagnosis, the symptom may be intermittent, caused by strong radio interference, or the control unit may have been subjected to excessively high or low temperatures.	● Navigation location detection performance has deteriorated. (Location correction using GPS is not performed.) ● GPS receiving status remains gray.
GPS ROM malfunction GPS RAM malfunction	Contents of ROM (or RAM) in GPS substrate are malfunctioning. ● Perform self-diagnosis. ● When the NAVI control unit is judged normal by self-diagnosis, the symptom may be intermittent, caused by strong radio interference.	● Location detection accuracy of the navigation system will deteriorate, depending on the malfunctioning area in the memory, because GPS cannot make correct positioning. (Location correction using GPS is not performed.)
GPS RTC malfunction	Clock IC in GPS substrate is malfunctioning. ● Perform self-diagnosis. ● When the NAVI control unit is judged normal by self-diagnosis, the symptom may be intermittent, caused by strong radio interference.	● Correct time may not be displayed. ● After the power is turned on, the system always takes some time until GPS positioning becomes possible. (The GPS receiver starts positioning without re-collecting the whole satellite information when it judged the data stored in the receiver is correct.) ● Correct time of error occurrence may not be stored in the ″History of Errors″.
GPS antenna disconnected	Malfunctioning connection between GPS substrate in NAVI control unit and GPS antenna. ● Perform self-diagnosis. ● When connection between NAVI control unit and GPS antenna is judged normal by self-diagnosis, the symptom may be intermittent, caused by impact or vibration.	● Navigation location detection performance has deteriorated. (Location correction using GPS is not performed.) ● GPS receiving status remains gray.

Error item	Possible causes Action/symptom	Example of symptom
Low voltage of GPS	The power voltage supplied to the GPS circuit board has decreased.	● Navigation location detection performance has deteriorated. (Location correction using GPS is not performed.) ● GPS receiving status remains gray.
	● Perform self-diagnosis. ● When connection between NAVI control unit and GPS antenna is judged normal by self-diagnosis, the symptom may be intermittent, caused by impact or vibration.	
DVD-ROM Malfunction DVD-ROM Read error DVD-ROM Response Error	Malfunctioning NAVI control unit	–
	Dedicated map DVD-ROM is in the system, but the data cannot be read.	● The map of a particular location cannot be displayed. ● Specific guidance information cannot be displayed. ● Map display is slow. ● Guidance information display is slow. ● System has been affected by vibration.
	● Is map DVD-ROM damaged, warped, or dirty? – If damaged or warped, the map DVD-ROM is malfunctioning. – If dirty, wipe the DVD-ROM clean with a soft cloth. ● Perform self-diagnosis. ● When NAVI control unit is judged normal by self-diagnosis, the symptom is judged intermittent, caused by vibration.	

Power Supply and Ground Circuit Check for NAVI Control Unit

AKS0011J

1. CHECK FUSE

Make sure that the following fuses of the NAVI control unit are not blown.

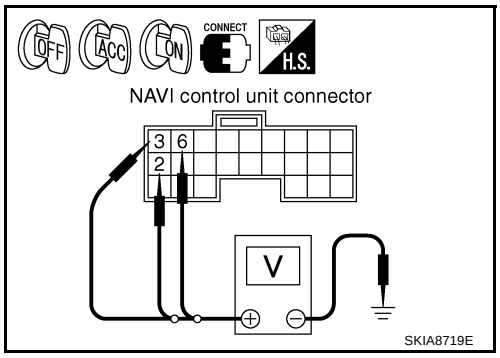
Unit	Signal	Fuse No.
NAVI control unit	Battery power supply	37
	Ignition switch ACC or ON	6

OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

Check voltage between NAVI control unit harness connector terminals and ground.



Terminals (+) Connector	Terminals (+) Terminal (Wire color)	Terminals (–)	OFF	ACC	ON
B104	2 (Y)	Ground	Battery voltage	Battery voltage	Battery voltage
	3 (Y)		Battery voltage	Battery voltage	Battery voltage
	6 (LG)		0V	Battery voltage	Battery voltage

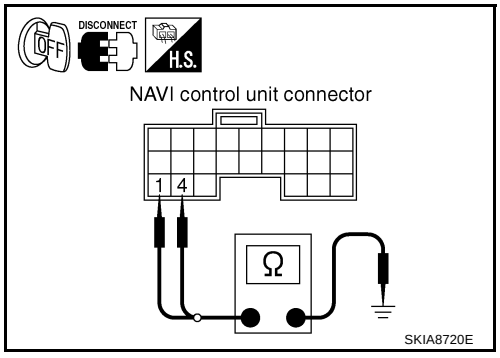
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect NAVI control unit connector.
3. Check continuity between NAVI control unit harness connector B104 terminals 1 (B), 4 (B) and ground.

1, 4 – Ground : Continuity should exist.



OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

Power Supply and Ground Circuit Check for Display Unit

AKS0011K

1. CHECK FUSE

Make sure that the following fuses of the display unit are not blown.

Unit	Signal	Fuse No.
Display unit	Battery power supply	37
	Ignition switch ACC or ON	6

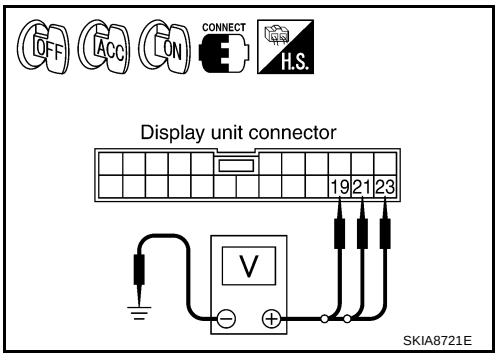
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

Check voltage between display unit harness connector terminals and ground.

Terminals			OFF	ACC	ON
(+)		(–)			
Connector	Terminal (Wire color)				
M35	21 (Y)	Ground	Battery voltage	Battery voltage	Battery voltage
	23 (Y)		Battery voltage	Battery voltage	Battery voltage
	19 (LG)		0V	Battery voltage	Battery voltage



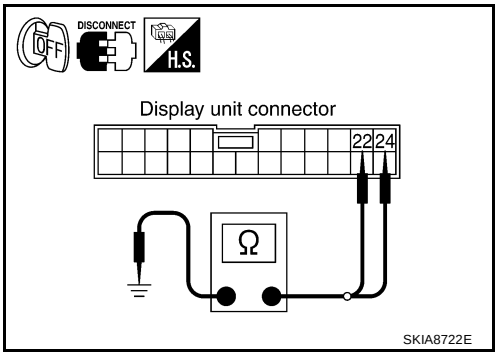
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect display unit connector.
3. Check continuity between display unit harness connector M35 terminals 22 (B), 24 (B) and ground.

22, 24 – Ground : Continuity should exist.



OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

Power Supply and Ground Circuit Check for NAVI Switch

AKS003LT

1. CHECK FUSE

Make sure that the following fuses of the NAVI switch are not blown.

Unit	Signal	Fuse No.
NAVI switch	Ignition switch ACC or ON	6

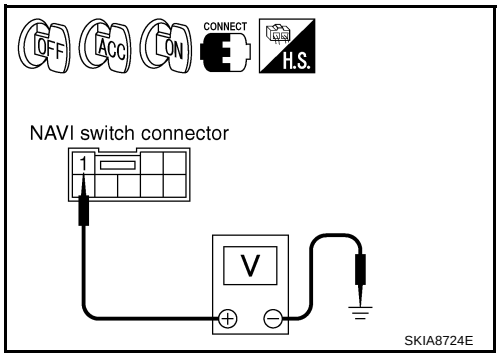
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

Check voltage between NAVI switch harness connector terminal and ground.

Terminals			OFF	ACC	ON
(+)		(–)			
Connector	Terminal (Wire color)				
M37	1 (LG)	Ground	0V	Battery voltage	Battery voltage



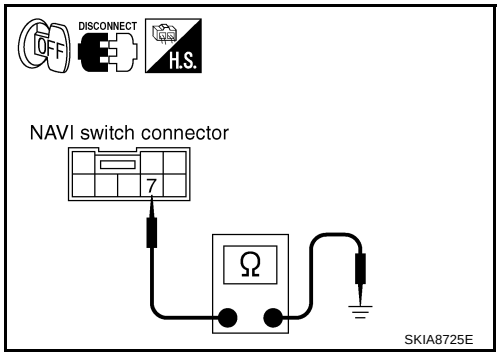
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect NAVI switch connector.
3. Check continuity between NAVI switch harness connector M37 terminal 7 (B) and ground.

7 – Ground : Continuity should exist.



OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

Power Supply and Ground Circuit Check for Power Cluster Lid Amp.

AKS009K4

1. CHECK FUSE

Make sure that the following fuses of the power cluster lid amp. are not blown.

Unit	Signal	Fuse No.
Power cluster lid amp.	Battery power supply	37
	Ignition switch ACC or ON	6
	Ignition switch ON or START	12

OK or NG

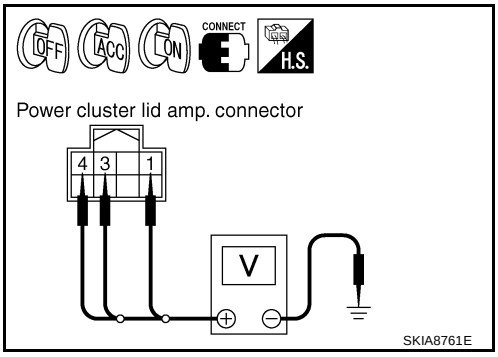
OK >> GO TO 2.

NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

Check voltage between power cluster lid amp. harness connector terminals and ground.

Terminals			OFF	ACC	ON
(+)		(–)			
Connector	Terminal (Wire color)				
M36	4 (Y)	Ground	Battery voltage	Battery voltage	Battery voltage
	3 (LG)		0V	Battery voltage	Battery voltage
	1 (Y/G)		0V	0V	Battery voltage



OK or NG

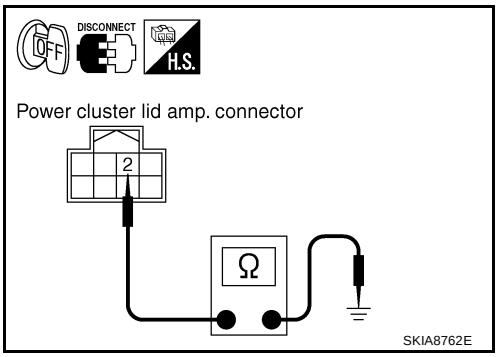
OK >> GO TO 3.

NG >> Repair harness or connector.

3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power cluster lid amp. connector.
3. Check continuity between power cluster lid amp. harness connector M36 terminal 2 (B) and ground.

2 – Ground : Continuity should exist.



OK or NG

OK >> INSPECTION END

NG >> Repair harness or connector.

Vehicle Speed Signal Check

AKS0011L

1. CHECK SPEEDOMETER FUNCTION

Does speedometer is operated normally?

Yes or No

Yes >> GO TO 2.

No >> Check combination meter trouble diagnosis. Refer to DI-18, "Vehicle Speed Signal Inspection" in “COMBINATION METERS”.

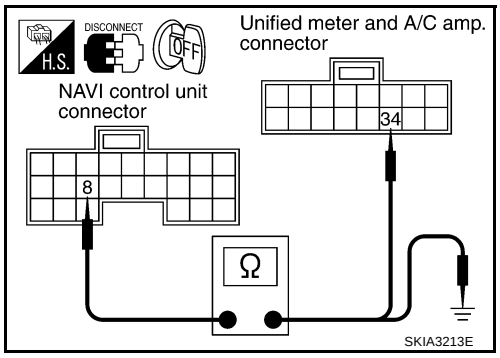
2. CHECK HARNESS

1. Turn ignition switch OFF.
2. Disconnect NAVI control unit connector and unified meter and A/C amp. connector.
3. Check continuity between NAVI control unit harness connector B104 terminal 8 (L/B for Coupe models, GY for Roadster models) and unified meter and A/C amp. harness connector M49 terminal 34 (W/G).

   8 – 34 : Continuity should exist.

4. Check continuity between NAVI control unit harness connector B104 terminal 8 (L/B for Coupe models, GY for Roadster models) and ground.

   8 – Ground : Continuity should not exist.



OK or NG

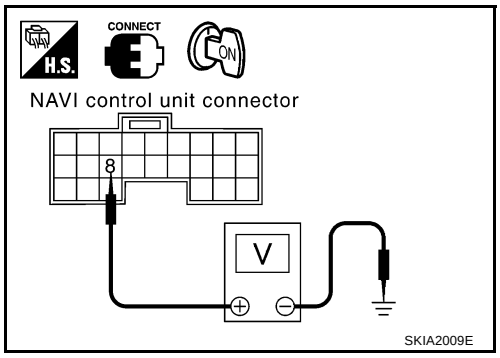
OK >> GO TO 3.

NG >> Repair harness or connector.

3. CHECK NAVI CONTROL UNIT

1. Connect NAVI control unit connector.
2. Turn ignition switch ON.
3. Check voltage between NAVI control unit harness connector B104 terminal 8 (L/B for Coupe models, GY for Roadster models) and ground.

   8 – Ground : Approx. 5V



OK or NG

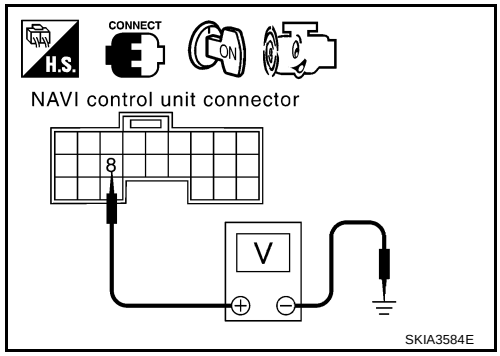
OK >> GO TO 4.

NG >> Replace NAVI control unit.

4. CHECK VEHICLE SPEED SIGNAL

1. Connect unified meter and A/C amp. connector.
2. Start engine and drive vehicle at more than 40 km/h (25MPH).
3. Check signal between NAVI control unit harness connector B104 terminal 8 (L/B for Coupe models, GY for Roadster models) and ground with CONSULT-II or oscilloscope.

8 – Ground **: Refer to AV-72, "Terminals and Reference Value for NAVI Control Unit" .**



OK or NG

OK >> INSPECTION END
NG >> Replace unified meter and A/C amp. Refer to DI-61, "Removal and Installation of Unified Meter and A/C Amp." .

Illumination Signal Check

AKS0011M

1. CHECK TAIL LAMP OPERATION

When lighting switch turned 1st or 2nd position, does tail lamp illuminate?

Yes or No

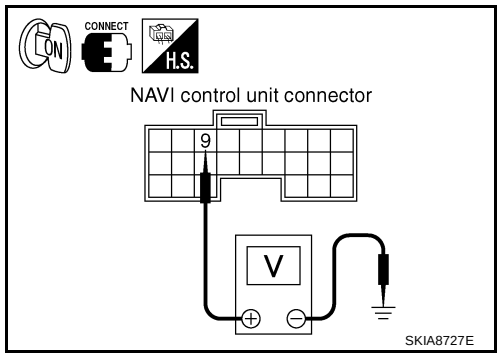
Yes >> GO TO 2.
No >> Go to tail lamp trouble diagnosis. Refer to LT-196, "Parking, License Plate and Tail Lamps Do Not Illuminate" .

2. CHECK ILLUMINATION SIGNAL

Check voltage between NAVI control unit harness connector terminal and ground.

Terminals			Lighting switch position	Voltage
(+)		(–)		
Connector	Terminal (Wire color)			
B104	9 (*1)	Ground	ON	Approx. 12V
			OFF	Approx. 0V

*1: Coupe models (PU) , Roadster models (R/L)



OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

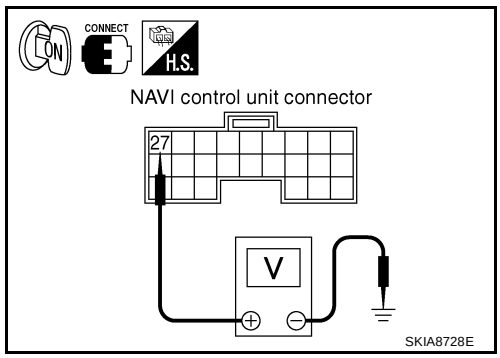
Ignition Signal Check

AKS0011N

1. CHECK IGNITION SIGNAL

1. Turn ignition switch ON.
2. Check voltage between NAVI control unit harness connector B105 terminal 27 (SB for Coupe models, PU for Roadster models) and ground.

27 – Ground **: Battery voltage**



OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

Reverse Signal Check

AKS0011O

1. CHECK REVERSE LAMP

1. Turn ignition switch ON.
2. With the A/T selector lever in R-position, does “R” in the shift position indicator come on?

YES or NO

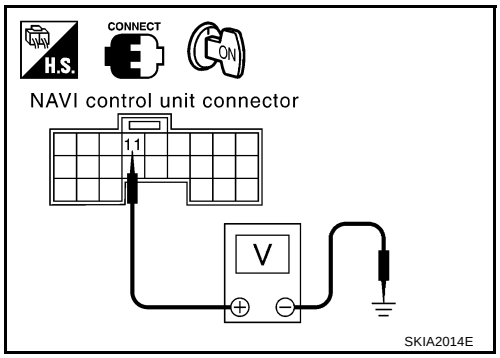
YES >> GO TO 2.
NO >> Check “BACK-UP LAMP” system. Refer to LT-179, "BACK-UP LAMP"

2. CHECK REVERSE SIGNAL

1. Shift the A/T selector lever in R-position.
2. Check voltage between NAVI control unit harness connector terminal and ground.

Terminals			A/T selector lever position	Voltage (V)
(+)		(–)		
Connector	Terminal (Wire color)			
B104	11 (*1)	Ground	R-position	Approx. 12V
			Other than R-position	Approx. 0

*1:Coupe models (BR) , Roadster models (OR)



OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

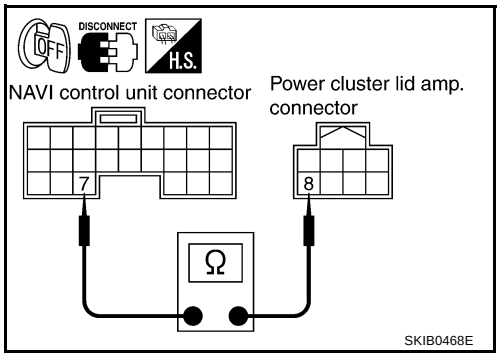
When Display Cover is Closed, Display is Stay On

AKS00322

1. CHECK HARNESS

1. Turn ignition switch OFF.
2. Disconnect NAVI control unit connector and power cluster lid amp. connector.
3. Check continuity between NAVI control unit harness connector B104 terminal 7 (R/Y for Coupe models, LG for Roadster models) and power cluster lid amp. harness connector M36 terminal 8 (R/W).

7 – 8 : Continuity should exist.



OK or NG

OK >> GO TO 2.
NG >> Repair harness or connector.

2. CHECK POWER CLUSTER LID AMP.

1. Turn ignition switch OFF.
2. Replace power cluster lid amp.

Does the system operate normally?

YES >> INSPECTION END
NO >> Replace cluster lid D.

Screen is Not Shown

AKS003LU

1. CHECK BEEP SOUND

Check if beep sound is heard twice under the following conditions.

- ten seconds after ignition switch is turned on.
- when MAP switch and D/N switch are pressed simultaneously for five seconds.

Is the beep sound heard?

YES >>
- Go to 2 if beep sound is heard twice only ten seconds after ignition switch is turned on.
- Go to 6 if beep sound is heard only when MAP switch and D/N switch are pushed simultaneously for five seconds.
- Go to 9 if beep sound is heard twice under both conditions.

NO >> GO TO 13.

2. CHECK NAVI SWITCH POWER SUPPLY AND GROUND CIRCUIT

Check NAVI switch power supply and ground circuit. Refer to AV-88, "Power Supply and Ground Circuit Check for NAVI Switch" .

OK or NG

OK >> GO TO 3.
NG >> Repair malfunctioning parts.

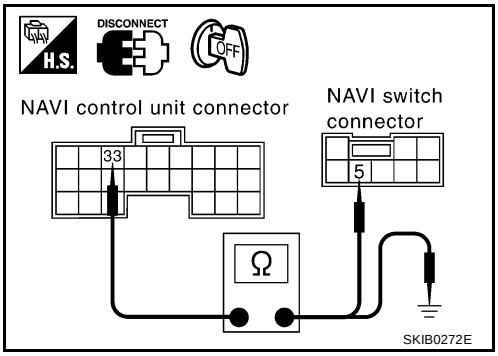
3. CHECK COMMUNICATION LINE

1. Turn ignition switch OFF.
2. Disconnect NAVI control unit connector, display unit connector and NAVI switch connector.
3. Check continuity between NAVI control unit harness connector B105 terminal 33 (G) and NAVI switch harness connector M37 terminal 5 (G).

33 – 5 : Continuity should exist.

4. Check continuity between NAVI control unit harness connector B105 terminal 33 (G) and ground.

33 – Ground : Continuity should not exist.



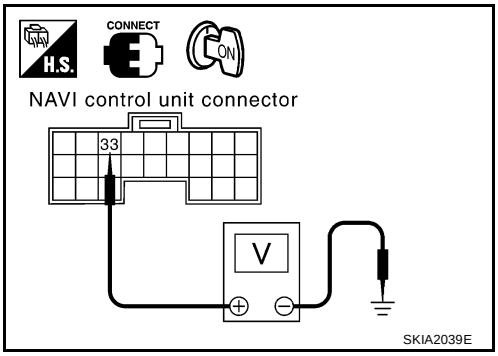
OK or NG

OK >> GO TO 4.
NG >> Rapair harness or connector.

4. CHECK NAVI CONTROL UNIT

1. Connect NAVI control unit connector.
2. Turn ignition switch ON.
3. Check voltage between NAVI control unit harness connector B105 terminal 33 (G) and ground.

33 – Ground : Approx. 4V



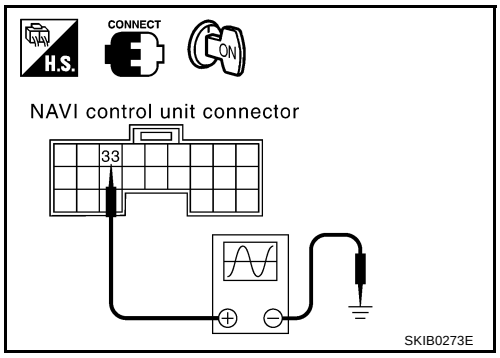
OK or NG

OK >> GO TO 5.
NG >> Replace NAVI control unit.

5. CHECK COMMUNICATION SIGNAL (SW-NAVI)

1. Turn ignition switch OFF.
2. Connect display unit connector and NAVI switch connector.
3. Turn ignition switch ON.
4. Check signal between NAVI control unit harness connector B105 terminal 33 (G) and ground with CONSULT-II or oscilloscope.

33 – Ground **: Refer to AV-72, "Terminals and Reference Value for NAVI Control Unit" .**



OK or NG

OK >> Replace NAVI control unit.
NG >> Replace NAVI switch.

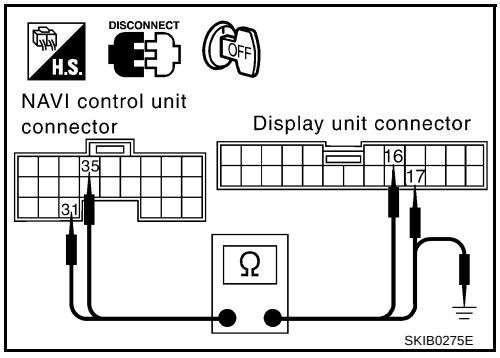
6. CHECK COMMUNICATION LINE

1. Turn ignition switch OFF.
2. Disconnect NAVI control unit connector, display unit connector and NAVI switch connector.
3. Check continuity between NAVI control unit harness connector B105 terminals 35 (B), 31 and display unit harness connector M35 terminals 16 (P/L), 17.

35 – 16 **: Continuity should exist.**
31 – 17 **: Continuity should exist.**

4. Check continuity between NAVI control unit harness connector B105 terminal 35 (B) and ground.

35 – Ground **: Continuity should not exist.**



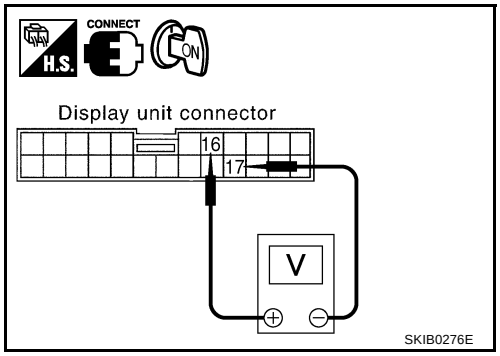
OK or NG

OK >> GO TO 7.
NG >> Repair harness or connector.

7. CHECK DISPLAY UNIT

1. Connect display unit connector.
2. Turn ignition switch ON.
3. Check voltage between display unit harness connector M35 terminals 16 (P/L) and 17.

16 – 17 **: Approx. 4.2V**



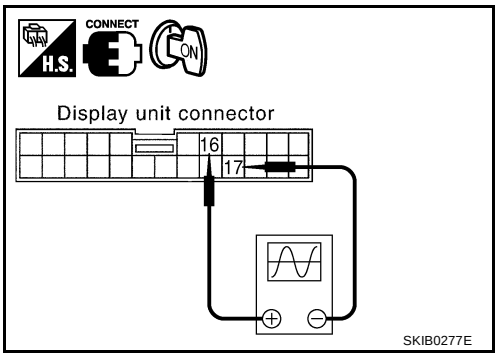
OK or NG

OK >> GO TO 8.
NG >> Replace display unit.

8. CHECK COMMUNICATION SIGNAL (NAVI-DISP)

1. Turn ignition switch OFF.
2. Connect NAVI switch connector and NAVI control unit connector.
3. Turn ignition switch ON.
4. Check signal between display unit harness connector M35 terminals 16 (P/L) and 17 with CONSULT-II or oscilloscope.

16 – 17 **: Refer to AV-74, "Terminals and Reference Value for Display Unit" .**



OK or NG

OK >> Replace display unit.
NG >> Replace NAVI control unit.

9. CHECK DISPLAY UNIT POWER SUPPLY AND GROUND CIRCUIT

Check display unit power supply and ground circuit. Refer to AV-87, "Power Supply and Ground Circuit Check for Display Unit" .

OK or NG

OK >> GO TO 10.
NG >> Repair malfunctioning parts.

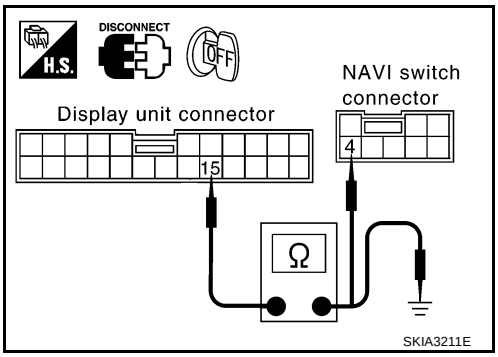
10. CHECK COMMUNICATION LINE

1. Turn ignition switch OFF.
2. Disconnect display unit connector, NAVI switch connector and NAVI control unit connector.
3. Check continuity between display unit harness connector M35 terminal 15 (R) and NAVI switch harness connector M37 terminal 4 (R).

15 – 4 **: Continuity should exist.**

4. Check continuity between display unit harness connector M35 terminal 15 (R) and ground.

15 – Ground **: Continuity should not exist.**



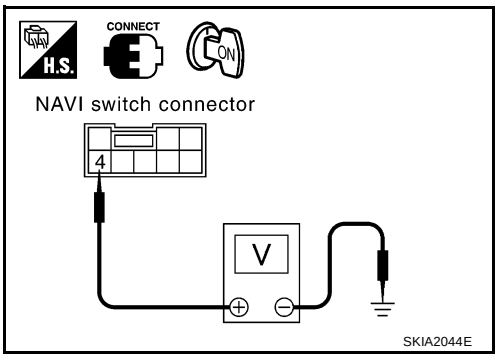
OK or NG

OK >> GO TO 11.
NG >> Repair harness or connector.

11. CHECK NAVI SWITCH

1. Connect NAVI switch connector.
2. Turn ignition switch ON.
3. Check voltage between NAVI switch harness connector M37 terminal 4 (R) and ground.

4 – Ground **: Approx. 4.7V**



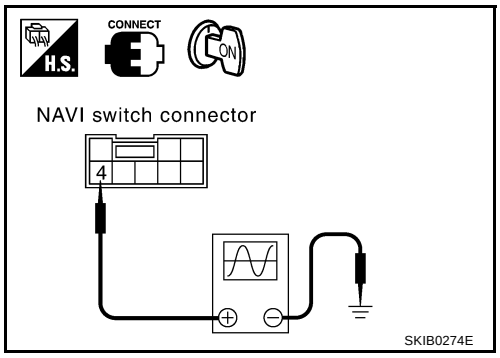
OK or NG

OK >> GO TO 12.
NG >> Replace NAVI switch.

12. CHECK COMMUNICATION SIGNAL (DISP-SW)

1. Turn ignition switch OFF.
2. Connect display unit connector and NAVI control unit connector.
3. Turn ignition switch ON.
4. Check signal between NAVI switch harness connector M37 terminal 4 (R) and ground with CONSULT-II or oscilloscope.

4 – Ground **: Refer to AV-76, "Terminals and Reference Value for NAVI Switch" .**



OK or NG

OK >> Replace NAVI switch.
NG >> Replace display unit.

13. CHECK NAVI CONTROL UNIT POWER SUPPLY AND GROUND CIRCUIT

Check NAVI control unit power supply and ground circuit. Refer to AV-86, "Power Supply and Ground Circuit Check for NAVI Control Unit" .

OK or NG

OK >> GO TO 14.
NG >> Repair malfunctioning parts.

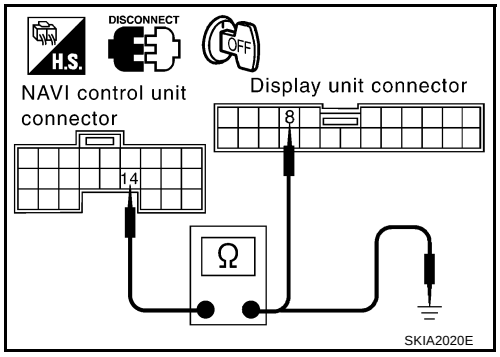
14. CHECK HARNESS

1. Turn ignition switch OFF.
2. Disconnect NAVI control unit connector and display unit connector.
3. Check continuity between NAVI control unit harness connector B104 terminal 14 (L) and display unit harness connector M35 terminal 8 (W/R).

14 – 8 **: Continuity should exist.**

4. Check continuity between NAVI control unit harness connector B104 terminal 14 (L) and ground.

14 – Ground **: Continuity should not exist.**



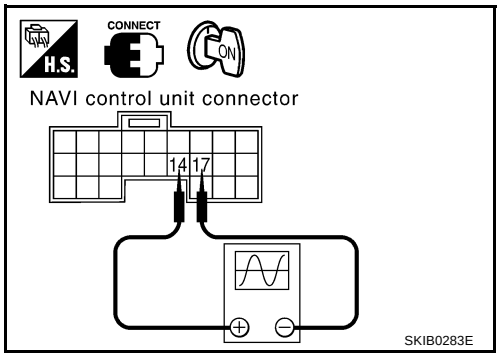
OK or NG

OK >> GO TO 15.
NG >> Repair harness or connector.

15. CHECK RGB AREA SIGNAL

1. Connect NAVI control unit connector and display unit connector.
2. Turn ignition switch ON.
3. Check signal between NAVI control unit harness connector B104 terminals 14 (L) and 17 with CONSULT-II or oscilloscope.

14 – 17 **: Refer to AV-72, "Terminals and Reference Value for NAVI Control Unit" .**



OK or NG

OK >> GO TO 16.
NG >> Replace NAVI control unit.

16. CHECK DISPLAY UNIT

Check if brightness of screen changes when D/N switch on AV switch is turned on after turning on ignition switch.

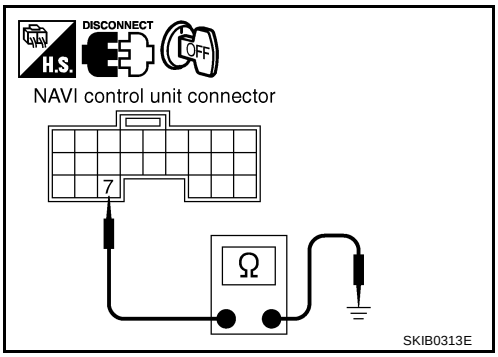
Does brightness of screen change?

OK >> GO TO 17.
NG >> Replace display unit.

17. CHECK HARNESS

1. Turn ignition switch OFF.
2. Disconnect NAVI control unit connector and power cluster lid amp. connector.
3. Check continuity between NAVI control unit harness connector B104 terminal 7 (R/Y for Coupe models, LG for Roadster models) and ground.

7 – Ground : Continuity should not exist.



OK or NG

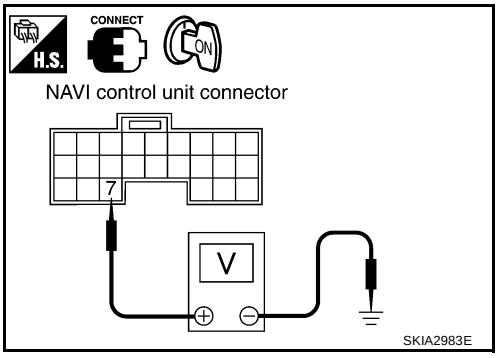
OK >> GO TO 18.
NG >> Repair harness or connector.

18. CHECK NAVI CONTROL UNIT INPUT SIGNAL

1. Connect NAVI control unit connector and power cluster lid amp. connector.
2. Turn ignition switch ON.
3. Check voltage between NAVI control unit harness connector terminal and ground.

Connector	Terminal (Wire color)	Condition	Voltage (V)
B104	7 (*1)	Display cover is opened	Approx. 5
		Except for above	Approx. 0

*1 : Coupe models (R/Y), Roadster models (LG)



OK or NG

OK >> GO TO 19.
NG >> Replace NAVI control unit.

19. CHECK POWER CLUSTER LID AMP.

1. Turn ignition switch OFF.
2. Replace power cluster lid amp.

Does the system operate normally?

OK >> INSPECTION END
NG >> Replace cluster lid D.

Lid Does Not Move

AKS009K5

1. CHECK POWER CLUSTER LID AMP. POWER SUPPLY AND GROUND

Check power cluster lid amp. power supply and ground circuit. Refer to AV-89, "Power Supply and Ground Circuit Check for Power Cluster Lid Amp." .

OK or NG

OK >> GO TO 2.
NG >> Repair malfunctioning parts.

2. CHECK POWER CLUSTER LID AMP.

1. Turn ignition switch OFF.
2. Replace power cluster lid amp.

Does the system operate normally?

YES >> INSPECTION END
NO >> Replace cluster lid D.

Color of Image is Not Proper

AKS0011Q

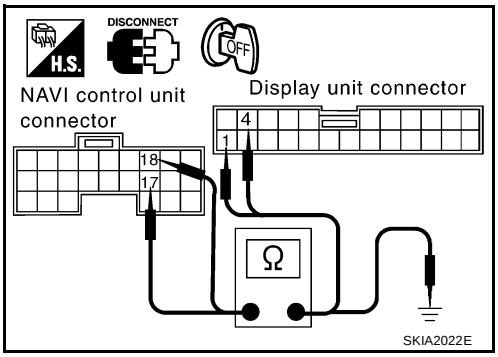
1. CHECK RGB HARNESS

1. Turn ignition switch OFF.
2. Disconnect NAVI control unit connector and display unit connector.
3. Check continuity as following.

- **When the screen looks bluish**

Terminals				Continuity
NAVI control unit		Display unit		
Connector	Terminal (Wire color)	Connector	Terminal (Wire color)	
B104	18 (B)	M35	1 (L/R)	Yes
	17		4	

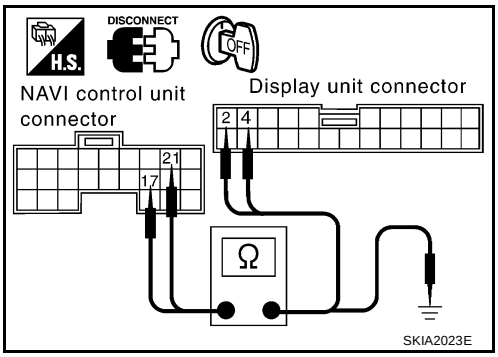
Terminals			Continuity
NAVI control unit		Ground	
Connector	Terminal (Wire color)		
B104	18 (B)		No
	17		



- **When the screen looks reddish**

Terminals				Continuity
NAVI control unit		Display unit		
Connector	Terminal (Wire color)	Connector	Terminal (Wire color)	
B104	21 (W)	M35	2 (L)	Yes
	17		4	

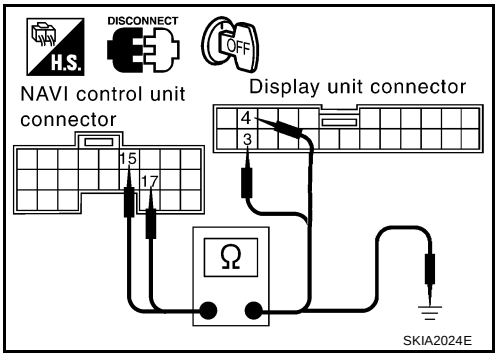
Terminals			Continuity
NAVI control unit		Ground	
Connector	Terminal (Wire color)		
B104	21 (W)		No
	17		



- **When the screen looks yellowish**

Terminals				Continuity
NAVI control unit		Display unit		
Connector	Terminal (Wire color)	Connector	Terminal (Wire color)	
B104	15 (R)	M35	3 (L/W)	Yes
	17		4	

Terminals			Continuity
NAVI control unit		Ground	
Connector	Terminal (Wire color)		
B104	15 (R)		No
	17		

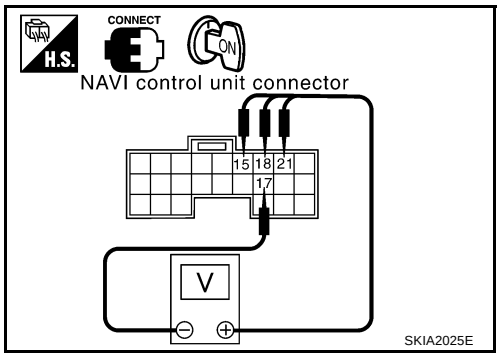


OK or NG

OK >> GO TO 2.
NG >> Repair harness or connector.

2. CHECK RGB SIGNAL

1. Connect NAVI control unit connector and display unit connector.
2. Turn ignition switch ON.
3. Display “Color bar” by “CONFIRMATION/ADJUSTMENT” mode.
4. Check the following with CONSULT-II or oscilloscope.



- **When the screen looks bluish.**
  Check signal between NAVI control unit harness connector B104 terminals 18 (B) and 17.

  18 – 17 **: Refer to AV-72, "Terminals and Reference Value for NAVI Control Unit" .**

- **When the screen looks reddish.**
  Check signal between NAVI control unit harness connector B104 terminals 21 (W) and 17.

  21 – 17 **: Refer to AV-72, "Terminals and Reference Value for NAVI Control Unit" .**

- **When the screen looks yellowish.**
  Check signal between NAVI control unit harness connector B104 terminals 15 (R) and 17.

  15 – 17 **: Refer to AV-72, "Terminals and Reference Value for NAVI Control Unit" .**

OK or NG

OK >> Replace display unit.
NG >> Replace NAVI control unit.

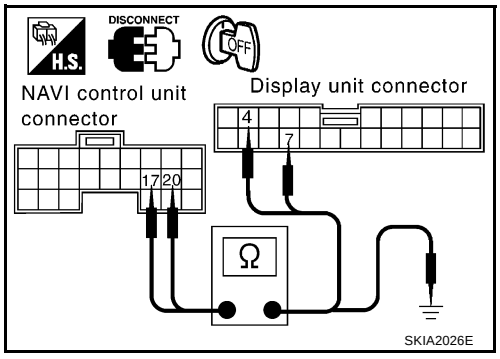
Screen is Rolling

AKS0011R

1. CHECK RGB SYNCHRONIZING CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect NAVI control unit connector and display unit connector.
3. Check continuity between NAVI control unit harness connector B104 terminals 20 (P), 17 and display unit harness connector M35 terminals 7 (B/R), 4.

   20 – 7 **: Continuity should exist.**
   17 – 4 **: Continuity should exist.**



4. Check continuity between NAVI control unit harness connector B104 terminal 20 (P) and ground.

   20 – Ground **: Continuity should not exist.**

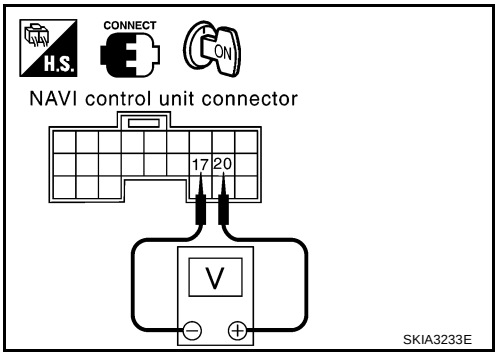
OK or NG

OK >> GO TO 2.
NG >> Repair harness or connector.

2. CHECK RGB SYNCHRONIZING SIGNAL

1. Connect NAVI control unit connector and display unit connector.
2. Turn ignition switch ON.
3. Check signal between NAVI control unit harness connector B104 terminals 20 (P) and 17 with CONSULT-II or oscilloscope.

20 – 17	**: Refer to AV-72, "Terminals and Reference Value for NAVI Control Unit" .**



OK or NG

OK >> Replace display unit.
NG >> Replace NAVI control unit.

Guide Sound is Not Heard

AKS0011S

1. CHECK VOICE GUIDE SETTING.

- While driving in the dark pink route, voice guide does not operate.

  NOTE:
  Voice guide is only available at intersections that satisfy certain conditions (indicated by ● on the map). Therefore, guidance may not be given even when the route on the map changes direction.

- Is volume setting not switched ON?

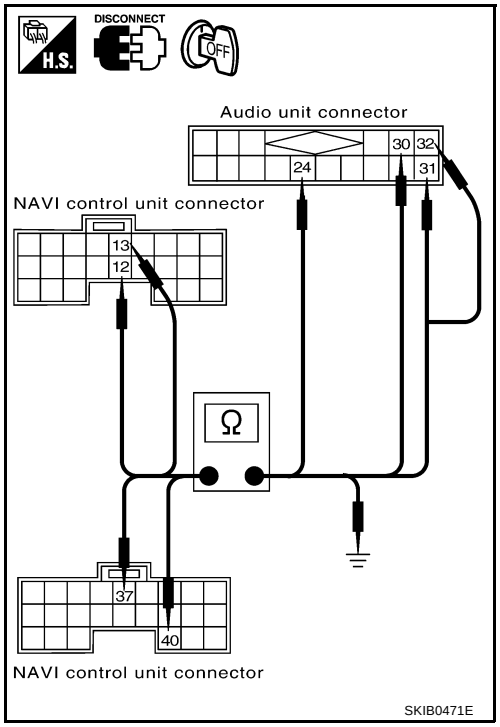
YES or NO

YES >> GO TO 2.
NO >> Switch the setting ON and turn the volume up.

2. CHECK VOICE GUIDE HARNESS

1. Turn ignition switch OFF.
2. Disconnect NAVI control unit connector and audio unit connector.
3. Check continuity between NAVI control unit harness connector terminals and audio unit harness connector terminals.

Terminals				Continuity
NAVI control unit		Audio unit		
Connector	Terminal (Wire color)	Connector	Terminal (Wire color)	
B104	12 (OR)	M39	32 (L/B)	Yes
	13 (SB)		30 (W/B)	
B105	37 (BR)		24 (R/B)	
	40 (B/OR)		31 (B/P)	



4. Check continuity between NAVI control unit harness connector terminals and ground.

Terminals			Continuity
NAVI control unit			
Connector	Terminal (Wire color)		
B104	12 (OR)	Ground	No
	13 (SB)		
B105	37 (BR)		
	40 (B/OR)		

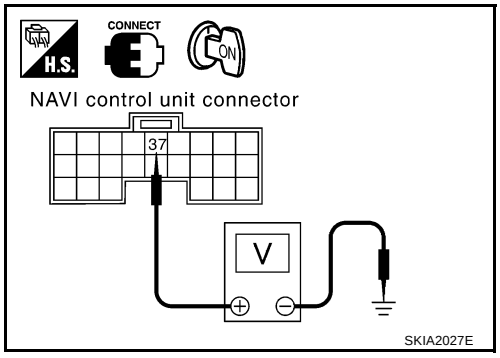
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK VOICE GUIDE ON SIGNAL

1. Connect NAVI control unit connector and audio unit connector.
2. Turn ignition switch ON.
3. Push “VOICE” switch.
4. Check signal between NAVI control unit harness connector B105 terminal 37 (BR) and ground with CONSULT-II or oscilloscope.

37 – Ground **: Refer to AV-72, "Terminals and Reference Value for NAVI Control Unit" .**



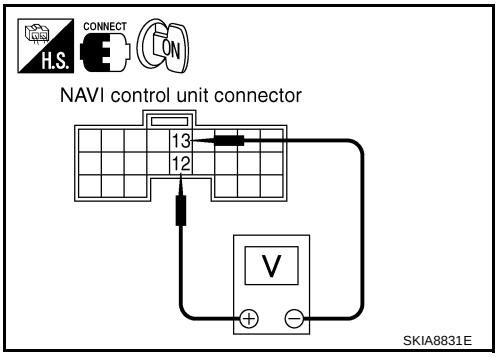
OK or NG

OK >> GO TO 4.
NG >> Replace NAVI control unit.

4. CHECK VOICE GUIDE SIGNAL

1. Push the “VOICE” switch.
2. Check signal between NAVI control unit harness connector B104 terminals 12 (OR) and 13 (SB) with CONSULT-II or oscilloscope.

12 – 13	**: Refer to AV-72, "Terminals and Reference Value for NAVI Control Unit" .**



OK or NG

OK >> Replace audio unit.
NG >> Replace NAVI control unit.

The Position of The Current-Location Mark is Not Correct

AKS00120

1. SELF-DIAGNOSIS

Perform self-diagnosis function. Refer to AV-78, "Self-Diagnosis Mode" .

OK or NG

OK >> GO TO 2.
NG >> Check the applicable parts.

2. HISTORY OF ERRORS DIAGNOSIS

Was any error stored in AV-83, "HISTORY OF ERRORS" of the “CONFIRMATION/ADJUSTMENT” mode?

YES or NO

YES >> AV-83, "HISTORY OF ERRORS".
NO >> AV-104, "Driving Test".

Radio Wave From The GPS Satellite is Not Received

AKS00121

1. CHECK ENVIRONMENT

Check if any metal object that intercepts radio waves or an object that emits radio waves (such as a portable phone) is located near the GPS antenna. Check if the vehicle is shielded by a building.

OK or NG

OK >> ● System is normal.
The GPS antenna may not be able to receive radio waves from the GPS satellite if it is shielded by metal object or an object emitting radio waves is placed near it.
NG >> GO TO 2.

2. SELF-DIAGNOSIS

Perform self-diagnosis function. Refer to AV-78, "Self-Diagnosis Mode" .

OK or NG

OK >> Replace GPS antenna.
NG >> Check the applicable parts.

Driving Test

AKS00122

1. DRIVING TEST 1

1. Scroll the map screen to display the area to make correction. Push “ENTER” and select “CURRENT LOCATION CORRECTION”.
2. Correct direction of the vehicle mark.
3. Perform the distance correction of the “CONFIRMATION/ADJUSTMENT” mode.

   NOTE:
   Normally, adjustment is not necessary because this system has automatic distance correction function. However, when a tire chain is fitted, adjustment in accordance with the tire diameter ratio must be made.
4. Are symptoms applicable to the AV-105, "Example of Symptoms Judged Not Malfunction" present after driving the vehicle?

YES or NO

YES >> Limit of the location detection capacity of the navigation system
NO >> GO TO 2.

2. DRIVING TEST 2

- Did any problem occur when the proper test in the following test patterns is performed?
- Test pattern
  Driving test finds the difference between the symptoms monitored with and without each sensor.
  - Test pattern 1: Test method with no GPS location correction
    Disconnect the GPS antenna connector connected to the NAVI control unit. Accurately adjust the current position and the direction, then drive the vehicle.
  - Test pattern 2: Test method with no map-matching
    Accurately adjust the current position and the direction. Eject the map DVD-ROM from the NAVI control unit with the ignition switch turned to OFF, then drive the vehicle. After driving, insert the map DVD-ROM back in the unit, display the track of the vehicle on the map screen and compare it with the actual road configuration.
- Sample tests
  - <To determine if the current-location mark skips at the same position, if so, whether it is caused by map-matching or by GPS>
    Perform test pattern 1.
  - <To determine if the pattern of streets displayed is correct or not>
    Perform test pattern 1 and 2.
    Compare the track of the vehicle on the map screen and the actual road configuration. For fairly accurate tracking, plotting shall be made every several hundred meters.
  - <When the distance is adjusted accurately>
    Perform test pattern 1 and 2.
    Drive on a road of which distance is accurately known (by utilizing distance posts on a highway). Calculate the rate of change (increased/decreased) of the distance by comparing with the actual distance.
    Correction = A/B
    A: Distance shown on the screen
    B: Actual distance

YES or NO

YES >>
- If adjustment is insufficient, perform adjustment again.
- If any error is found in the map, please let us know.
- Replace NAVI control unit.

NO >> Limit of the location detection capacity of the navigation system

Example of Symptoms Judged Not Malfunction

AKS00123

BASIC OPERATION

Symptom	Cause	Remedy
No image is shown.	Display brightness adjustment is set fully to DARK side.	Adjust the display brightness.
No guide sound is heard. Audio guide volume is too low or too high.	Volume control is set to OFF, MIN or MAX.	Adjust the audio guide volume.
	Audio guidance is not available while the vehicle is driving on a dark pink route.	System is not malfunction.
Screen is too dark. Motion of the image is too slow.	Temperature inside the vehicle is low.	Wait until the temperature inside the vehicle reaches the proper temperature.
Small black or bright spots appear on the screen.	Symptom peculiar to a liquid crystal display.	System is not malfunction.

VEHICLE MARK

Symptom	Cause	Remedy
Map screen and bird view ™Name of the place vary with the screen.	Some thinning of the character data is done to prevent the display becoming to complex. In some cases and in some locations, the display contents may differ. The same place name, street name, etc. may not be displayed every time on account of the data processing.	System is not malfunction.
Vehicle mark is not positioned correctly.	Vehicle is transferred by ferry or by towing after its ignition switch is turned to OFF.	Drive the vehicle for a while in the GPS satellite signal receiving condition.
Screen will not switch to nighttime mode after the lighting switch is turned ON.	The daytime screen is selected by the ″SWITCH SCREENS″ when the last time the screen dimming setting is done. Switching between daytime/nighttime screen may be inhibited by the automatic illumination adjustment function.	Perform screen dimming and select the nighttime screen by “SWITCH SCREENS”.
Map screen will not scroll in accordance with the vehicle travel.	Current location is not displayed.	Push “MAP” switch to display the current location.
Vehicle mark will not be shown.	Current location is not displayed.	Push “MAP” switch to display the current location.
Accuracy indicator (GPS satellite mark) on the map screen stays gray.	GPS satellite signal is intercepted because the vehicle is in or behind a building.	Move the vehicle out to an open space.
	GPS satellite signal cannot be received because an obstacle is placed on top of the display.	Do not place anything in the center on top of the display.
	GPS satellites are located badly.	Wait until the location becomes better.
Vehicle location accuracy is low.	Accuracy indicator (GPS satellite mark) on the map screen stays gray.	Current location is not determined.
	Vehicle speed setting by the vehicle speed pulse has been deviated (advanced or retarded) from the actual vehicle speed because tire chain is fitted or the system has been used on another vehicle.	Drive the vehicle for a while [for approx. 30 minutes at approx. 30 km/h (19 MPH)] and the deviation will be automatically adjusted. If advancement or retard still occur, perform the distance adjustment by “CONFIRMATION/ADJUSTMENT” mode of diagnosis function.
	Map data has error or omission. (Vehicle mark is always deviated to the same position.)	As a rule, an updated map DVD-ROM will be released once a year.

DESTINATION, PASSING POINTS, AND MENU ITEMS CANNOT BE SELECTED/SET

Symptom	Cause	Remedy
Destination cannot be set.	Destination to be set is on an highway.	Set the destination on an ordinary road.
Passing point is not searched when re-searching the route.	The vehicle has already passed the passing point, or the system judged so.	To include the passing points that have been passed into the route again, set the route again.
Route information will not be displayed.	Route searching has not been done.	Set the destination and perform route searching.
	Vehicle mark is not on the recommended route.	Drive on the recommended route.
	Route guide is turned OFF.	Turn the route guide ON.
	Route information is not available on the dark pink route.	System is not malfunction.
After the route searching, no guide sign will appear as the vehicle goes near the entrance/exit to the toll road.	Vehicle mark is not on the recommended route. (On the display, only guide signs related to the recommended route will be shown.)	Drive on the recommended route.
Automatic route searching is not possible.	Vehicle is driving on a highway (gray route), or no recommended route is available.	Drive on a road to be searched. Or re-search the route manually. In this case, however, the whole route will be searched.
Performed automatic detour search (or detour search). However, the result is the same as that of the previous search.	Performed search with every conditions considered. However, the result is the same as that of the previous search.	System is not malfunction.
Passing points cannot be set.	More than five passing points were set.	Passing points can be set up to five. To stop at more than five points, perform sharing in several steps.
When setting the route, the starting point cannot be selected.	The current vehicle location is always set as the starting point of a route.	System is not malfunction.
Some menu items cannot be selected.	The vehicle is being driven.	Stop the vehicle at a safe place and then operate the system.

VOICE GUIDE

Symptom	Cause	Remedy
Voice guide will not operate.	Note: Voice guide is only available at intersections that satisfy certain conditions (indicated by ● on the map). Therefore, guidance may not be given even when the route on the map changes direction.	System is not malfunction.
	The vehicle is not on the recommended route.	Return to the recommended route or re-search the route.
	Voice guide is turned OFF.	Turn the voice guide ON.
	Route guide is turned OFF.	Turn the route guide ON.
Voice guide does not match the actual road pattern.	Voice guide may vary with the direction to which the vehicle is turn and the connection of the road to other roads.	Drive in conformity to the actual traffic rules.

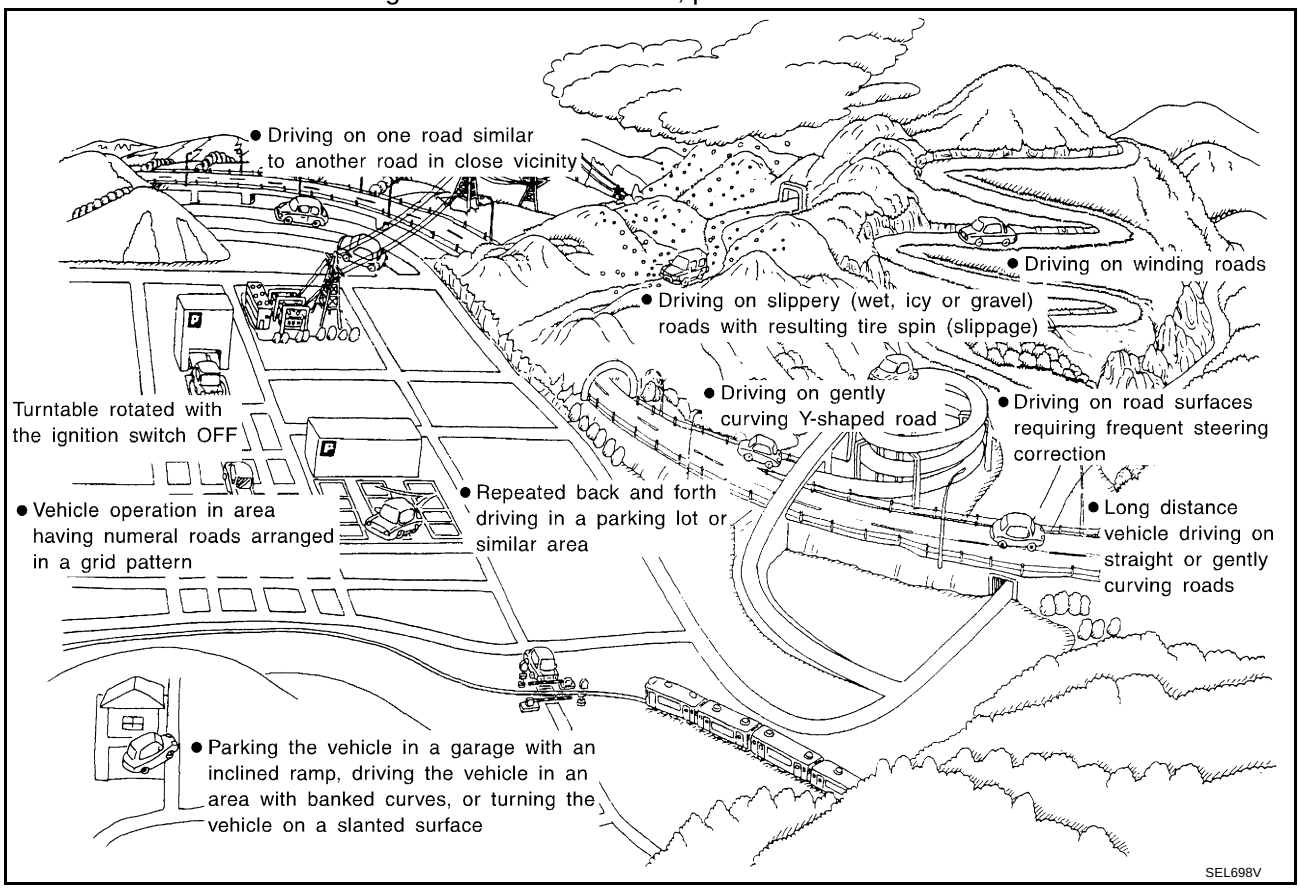
ROUTE SEARCHING

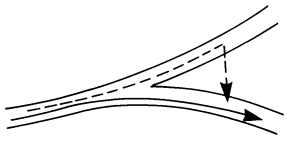
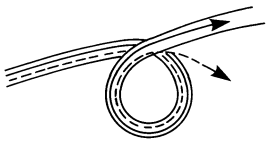
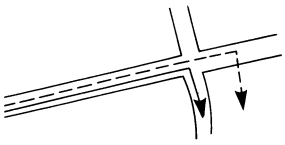
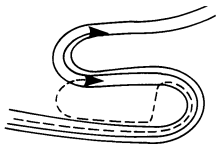
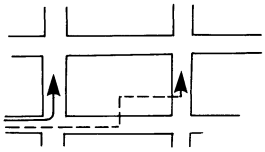
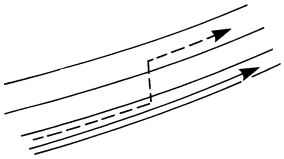
Symptom	Cause	Remedy
No route is shown.	No road to be searched is found around the destination.	Find wider road (orange road or wider) nearby and reset the destination and passing points onto it. Take care of the traveling direction when there are separate up and down roads.
	Starting point and the destination are too close.	Set the destination at more distant point.
	Conditional traffic regulation (day of the week/ time of the day) is set at the area around the current position or the destination.	Turn the time-regulating search conditions OFF. Turn “Avoid regulation time” in the search conditions OFF.
Indicated route is intermittent.	In some areas, highways (gray routes) are not used for the search(Note) Therefore, the route to the current position or the passing points may be intermittent.	System is not malfunction.
When the vehicle has passed the recommended route, it is deleted from the screen.	A recommended route is controlled by each section. When the vehicle has passed the passing point 1, then the map data from the starting point up to the passing point 1 will be deleted. (The data may remain undeleted in some area.)	System is not malfunction.
Detouring route is recommended.	In some areas, highways (gray routes) are not used for the search. (Note). Therefore, detour route may be recommended.	Set the route closer to the basic route (gray route).
	A detour route may be shown when some traffic regulation (one-way traffic, etc.) is set at the area around the starting point or the destination.	Slightly move the starting point or the destination, or set the passing point on the route of your choice.
	In the area where highways (gray routes) are used for the search, left turn has priority around the current position and the destination (passing points). For this reason, the recommended route may be detouring.	System is not malfunction.
Landmarks on the map do not match the actual ones.	This can be happen due to omission or error in the map data.	As a rule, an updated map DVD-ROM will be released once a year. Wait until the latest map has become available.
Recommended route is far from the starting point, passing points, and destination.	Starting point, passing points, and destination of the route guide were set far from the desired points because route searching data around these area were not stored.	Reset the destination onto the road nearby. If this road is one of the highways (gray routes), an ordinary road nearby may be displayed as the recommended route.

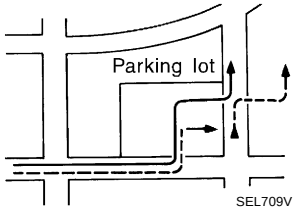
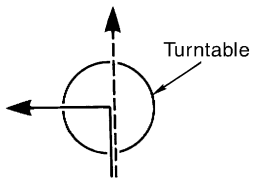
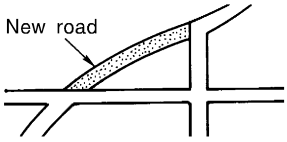
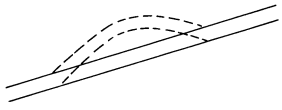
NOTE:
Except for the ordinance-designated cities and the prefectural capitals (Applicable areas may be changed in the updated map disc.)

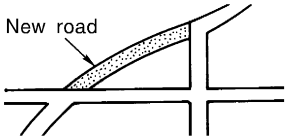
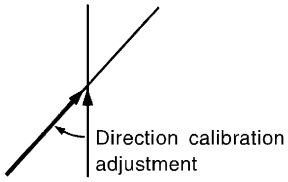
EXAMPLES OF CURRENT-LOCATION MARK DISPLACEMENT

Vehicle's travel amount is calculated by reading its travel distance and turning angle. Therefore, if the vehicle is driven in the following manner, an error will occur in the vehicle's current location display. If correct location has not been restored after driving the vehicle for a while, perform location correction.



Cause (condition)		Driving condition	Remarks (correction, etc.)
Road configuration	Y-intersections  ELK0192D	At a Y intersection or similar gradual division of roads, error the direction of travel deduced by the sensor may result in the current-location mark appearing on the wrong road.	If after travelling about 10 km (6 miles) the correct location has not been restored, perform location correction and, if necessary, direction correction.
	Spiral roads  ELK0193D	When driving on a large, continuous spiral road (such as loop bridge), turning angle error is accumulated and the vehicle mark may deviate from the correct location.	
	Straight roads  ELK0194D	When driving on a long, straight road and slow curve without stopping, map-matching does not work effectively enough and distance errors may accumulate. As a result, the vehicle mark may deviate from the correct location when the vehicle turned at a corner.	
	Zigzag roads  ELK0195D	When driving on a zigzag road, the map may be matched to other roads in the similar direction nearby at every turn, and the vehicle mark may deviate from the correct location.	
	Roads laid out in a grid pattern  ELK0196D	When driving at where roads are laid out in a grid pattern, where many roads are running in the similar direction nearby, the map may be matched to them by mistake and the vehicle mark may deviate from the correct location.	
	Parallel roads  ELK0197D	When two roads are running in parallel (such as highway and sideway), the map may be matched to the other road by mistake and the vehicle mark may deviate from the correct location.	

Cause (condition)		Driving condition	Remarks (correction, etc.)
Place	In a parking lot  SEL709V	When driving in a parking lot, or other location where there are no roads on the map, matching may place the vehicle mark on a nearby road. When the vehicle returns to the road, the vehicle mark may have deviated from the correct location. When driving in circle or turning the steering wheel repeatedly, direction errors accumulate, and the vehicle mark may deviate from the correct location.	If after travelling about 10 km (6 miles) the correct location has not been restored, perform location correction and, if necessary, direction correction.
	Turn table  SEL710V	When the ignition switch is OFF, the navigation system cannot get the signal from the gyroscope (angular speed sensor). Therefore, the displayed direction may be wrong and the correct road may not be easily returned to after rotating the vehicle on a turntable with the ignition OFF.	
	Slippery roads	On snow, wet roads, gravel, or other roads where tires may slip easily, accumulated mileage errors may cause the vehicle mark to deviate from the correct road.	
	Slopes	When parking in sloped garages, when travelling on banked roads, or in other cases where the vehicle turns when tilted, an error in the turning angle will occur, and the vehicle mark may deviate from the road.	
Map data	Road not displayed on the map screen  SEL699V	When driving on new roads or other roads not displayed on the map screen, map matching does not function correctly and matches the location to a nearby road. When the vehicle returns to a road which is on the map, the vehicle mark may deviate from the correct road.	
	Different road pattern (Changed due to repair)  ELK0201D	If the road pattern stored in the map data and the actual road pattern are different, map matching does not function correctly and matches the location to a nearby road. The vehicle mark may deviate from the correct road.	
Vehicle	Use of tire chains	When tire chains are used, the mileage is not correctly detected, and the vehicle mark may deviate from the correct road.	Drive the vehicle for a while. If the distance is still deviated, adjust it by using the distance adjustment function. (If the tire chain is removed, recover the original value.)

Cause (condition)		Driving condition	Remarks (correction, etc.)
Precautions for driving	Just after the engine is started	If the vehicle is driven off just after the engine is started when the gyroscope (angular speed sensor) correction is not completed, the vehicle can lose its direction and may have deviated from the correct location.	Wait for a short while before driving after starting the engine.
	Continuous driving without stopping	When driving long distances without stopping, direction errors may accumulate, and the current-location mark may deviate from the correct road.	Stop and adjust the orientation.
	Abusive driving	Spinning the wheels or engaging in other kinds of abusive driving may result in the system being unable to perform correct detection, and may cause the vehicle mark to deviate from the correct road.	If after travelling about 10 km (6 miles) the correct location has not been restored, perform location correction and, if necessary, direction correction.
How to correct location	Position correction accuracy  SEL699V	If the accuracy of location settings is poor, accuracy may be reduced when the correct road cannot be found, particularly in places where there are many roads.	Enter in the road displayed on the screen with an accuracy of approx. 1 mm. **NOTE:** Whenever possible, use detailed map for the correction.
	Direction when location is corrected  SEL702V	If the accuracy of location settings during correction is poor, accuracy may be reduced afterwards.	Perform direction correction.

THE CURRENT POSITION MARK SHOWS A POSITION WHICH IS COMPLETELY WRONG

In the following cases, the current-location mark may appear on completely different position in the map depending on the GPS satellite signal receiving conditions. In this case, perform location correction and direction correction.

- When location correction has not been done
  - If the receiving conditions of the GPS satellite signal is poor, if the current-location mark becomes out of place, it may move to a completely different location and not come back if location correction is not done. The position will be corrected if the GPS signal can be received.
- When the vehicle has traveled by ferry, or when the vehicle has been being towed
  - Because calculation of the current location cannot be done when travelling with the ignition OFF, for example when traveling by ferry or when being towed, the location before travel is displayed. If the precise location can be detected with GPS, the location will be corrected.

THE CURRENT POSITION MARK JUMPS

In the following cases, the current-location mark may appear to jump as a result of automatic correction of the current location.

- When map matching has been done
  - If the current location and the current-location mark are different when map matching is done, the current-location mark may seem to jump. At this time, the location may be ″corrected″ to the wrong road or to a location which is not on a road.
- When GPS location correction has been done
  - If the current location and the current-location mark are different when the location is corrected using GPS measurements, the current-location mark may seem to jump. At this time, the location may be ″corrected″ to a location which is not on a road.

THE CURRENT LOCATION MARK IS IN A RIVER OR THE SEA

The navigation system moves the current location mark with no distinction between land and rivers or sea. If the location mark is somehow out of place, it may appear that the vehicle is driving in a river or the sea.

WHEN DRIVING ON THE SAME ROAD, SOMETIMES THE CURRENT-LOCATION MARK IS IN THE RIGHT PLACE AND SOMETIMES IT IS THE WRONG PLACE

The conditions of the GPS antenna (GPS data) and gyroscope (angular speed sensor) change gradually. Depending on the road traveled and the operation of the steering wheel, the location detection results will be different. Therefore, even on a road on which the location has never been wrong, conditions may cause the vehicle mark to deviate.

LOCATION CORRECTION BY MAP MATCHING IS SLOW

- The map matching function needs to refer to the data of the surrounding area. It is necessary to drive some distance for the function to work.
- Because map matching operates on this principle, when there are many roads running in similar directions in the surrounding area, no matching determination may be made. The location may not be corrected until some special feature is found.

ALTHOUGH THE GPS RECEIVING DISPLAY IS GREEN, THE VEHICLE MARK DOES NOT RETURN TO THE CORRECT LOCATION

- The GPS accuracy has an error of about 100 m (300 ft). In some cases the current-location mark may not be on the correct street, even when GPS location-correction is done.
- The navigation system compares the results of GPS location detection with the results from map-matching location detection. The one which is determined to have higher accuracy is used.
- GPS location correction may not be performed when the vehicle is stopped.

THE NAME OF THE CURRENT PLACE IS NOT DISPLAYED

The current place name may not be displayed if there are no place names displayed on the map screen.

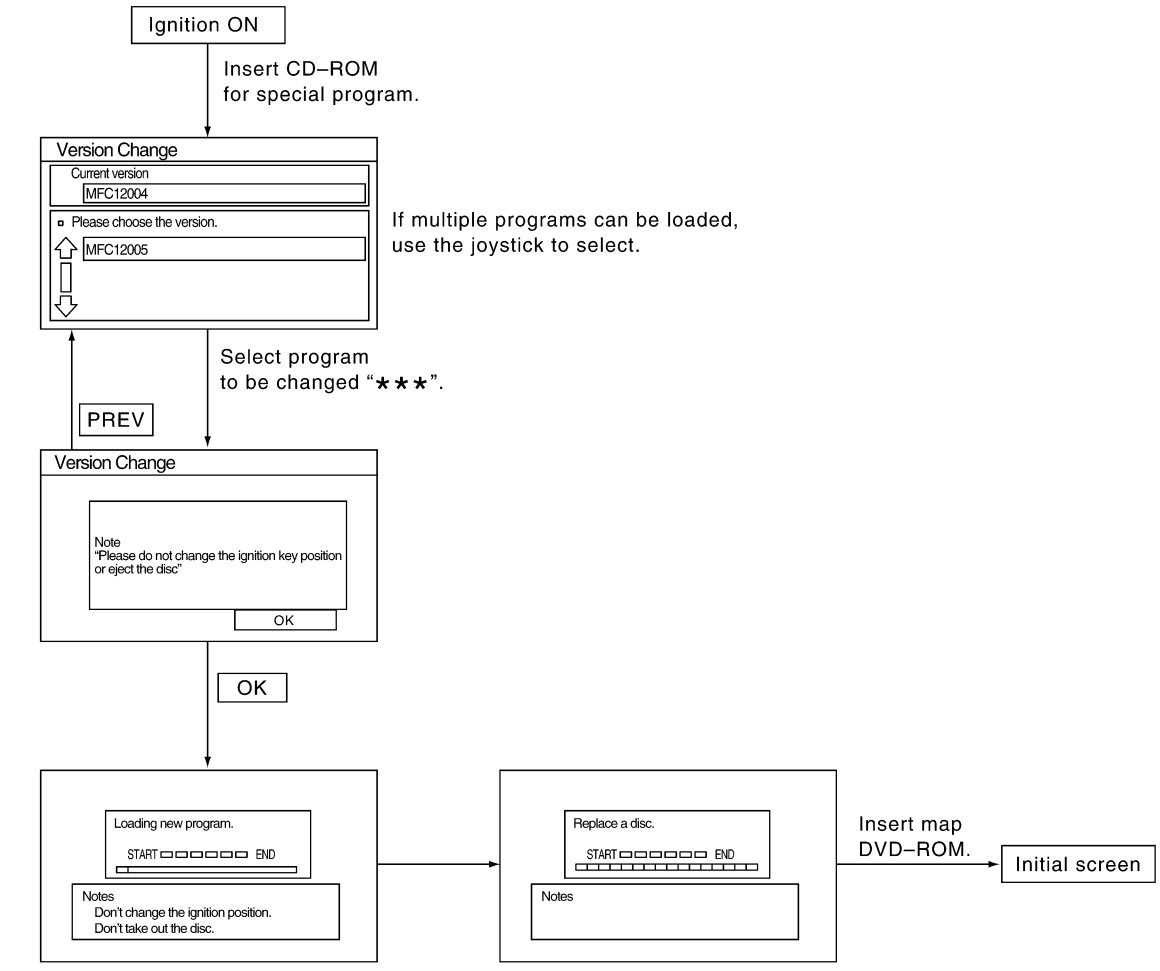
CONTENTS OF THE DISPLAY DIFFER FOR THE BIRD VIEW™ AND THE (FLAT) MAP SCREEN.

Difference of the Bird View™ Screen From The Flat Map Screen Are As Follows

- The current place name displays names which are primarily in the direction of vehicle travel.
- The amount of time before the vehicle travel or turn angle is updated on the screen is longer than for the (flat) map display.
- The conditions for display of place names, roads, and other data are different for nearby areas and for more distant areas.
- Some thinning of the character data is done to prevent the display becoming to complex. In some cases and in some locations, the display contents may differ.
- The same place name, street name, etc. may be displayed multiple times.

Program Loading

AKS00124



NOTE: Always load a program with the engine running.

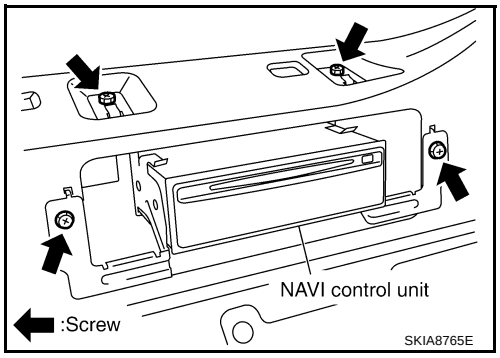
SKIA2165E

Removal and Installation of NAVI Control Unit

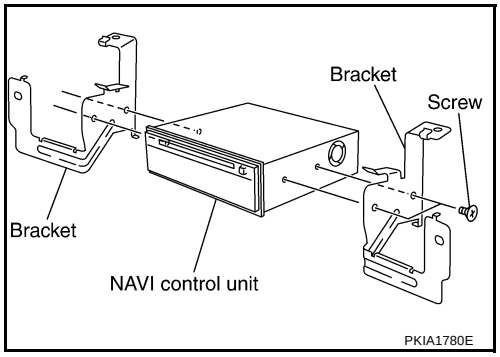
AKS00125

REMOVAL

1. Remove luggage floor finisher upper (front) in case of Coupe models, and refer to EI-39, "Removal and Installation (for Coupe Models)" , and remove luggage floor finisher upper in case of Roadster models, and refer to EI-41, "Removal and Installation (for Roadster Models)" .
2. Remove screws (4) and remove NAVI control unit.



3. Remove screws (4) and remove bracket.



INSTALLATION

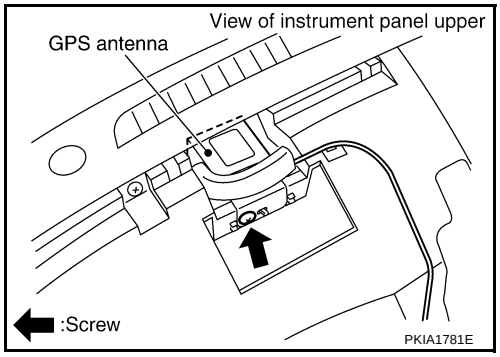
Install in the reverse order of removal.

Removal and Installation of GPS Antenna

AKS00126

REMOVAL

1. Remove instrument driver panel upper. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove screw (1) and remove GPS antenna.



INSTALLATION

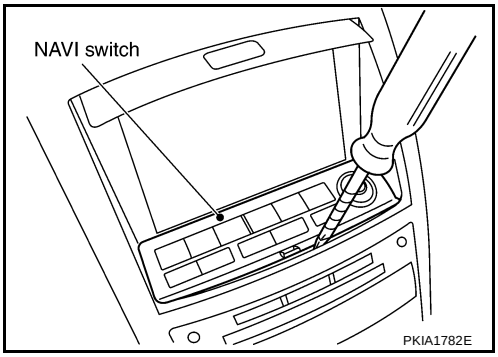
Install in the reverse order of removal.

Removal and Installation of NAVI Switch

AKS00127

REMOVAL

1. Insert cloth-covered driver into gaps between NAVI switch and cluster lid C, and remove NAVI switch.
2. Disconnect connector, and remove.



INSTALLATION

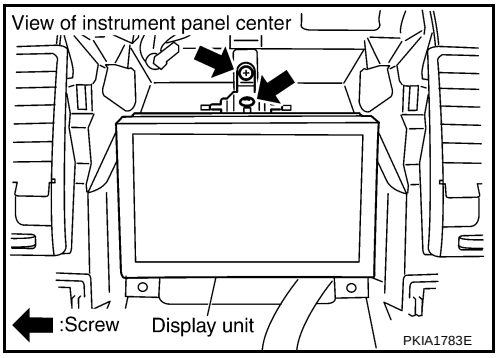
Install in the reverse order of removal.

Removal and Installation of Display Unit

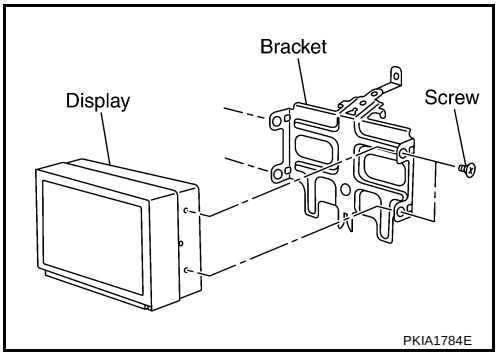
AKS00128

REMOVAL

1. Remove cluster lid C. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove screws (2) and remove display unit.



3. Remove screws (4), and remove bracket.



INSTALLATION

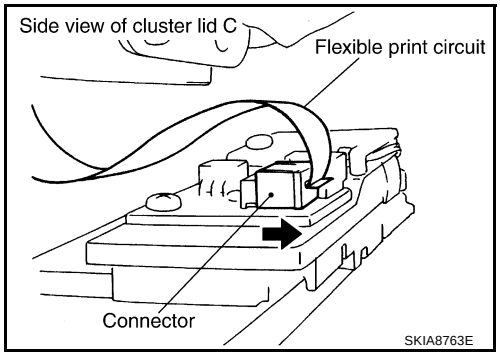
Install in the reverse order of removal.

Removal and Installation of Power Cluster Lid Amp.

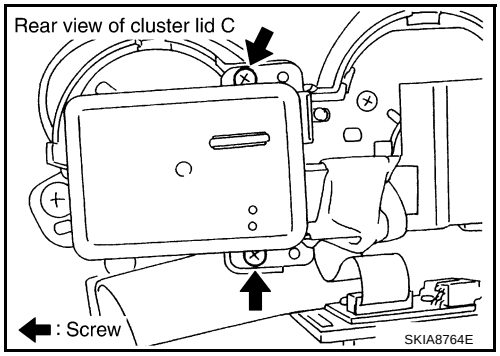
AKS009M2

REMOVAL

1. Remove cluster lid C. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Shift a connector in a direction of an arrow of a right illustration and pull out a flexible print circuit.



3. Remove screws (2), and remove power cluster lid amp.



INSTALLATION

Install in the reverse order of removal.

SECTION ACS
AUTO CRUISE CONTROL SYSTEM

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AUTOMATIC SPEED CONTROL DEVICE (ASCD)

PFP:18930

Description

AKS0012A

Regarding the information for ASCD system, refer to EC-687, "AUTOMATIC SPEED CONTROL DEVICE (ASCD)" .

SECTION PG

POWER SUPPLY, GROUND & CIRCUIT ELEMENTS

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PRECAUTIONS

PFP:00001

Precautions for Battery Service

AKS00AV9

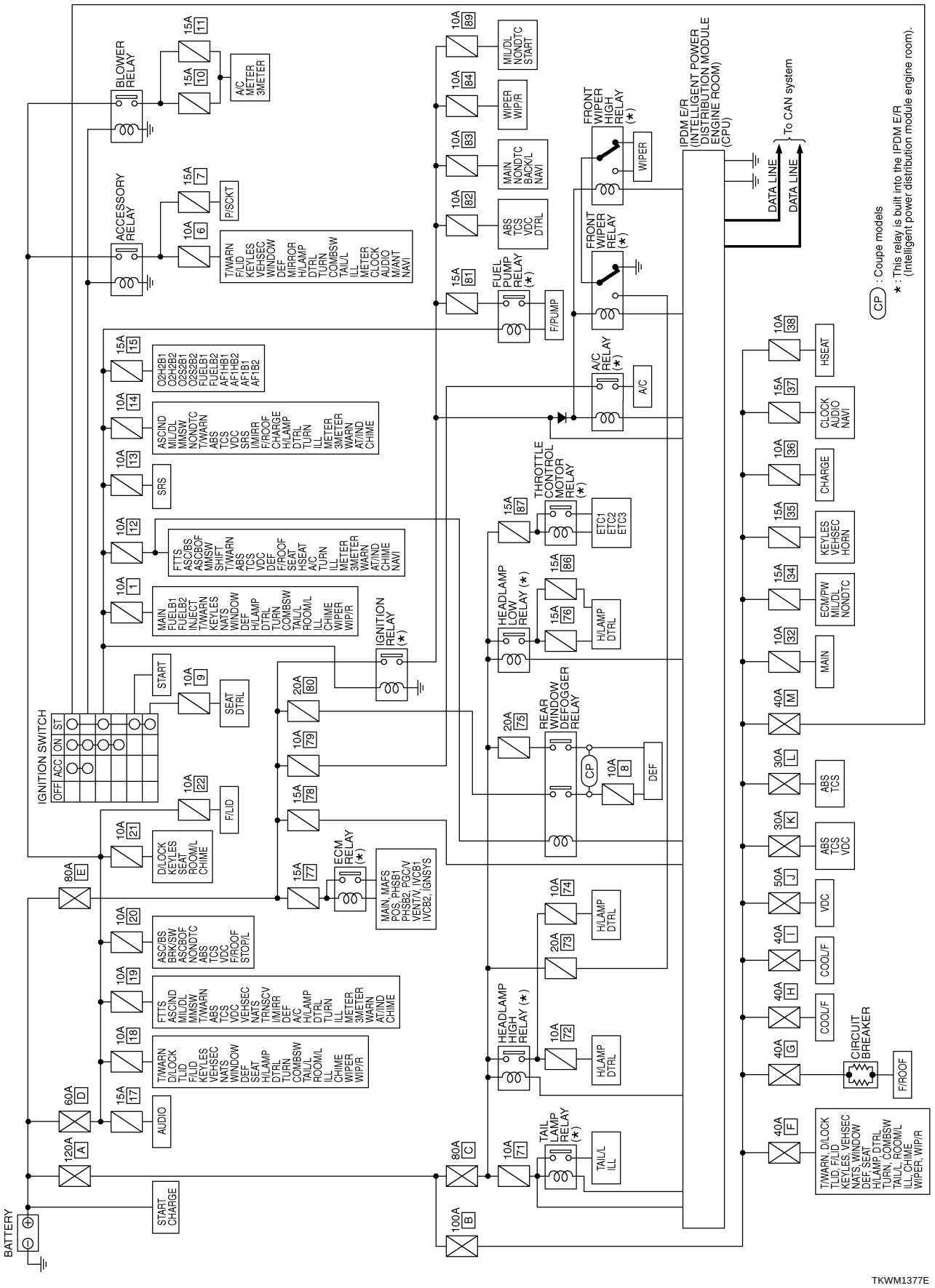
Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

POWER SUPPLY ROUTING CIRCUIT

PFP:24110

Schematic

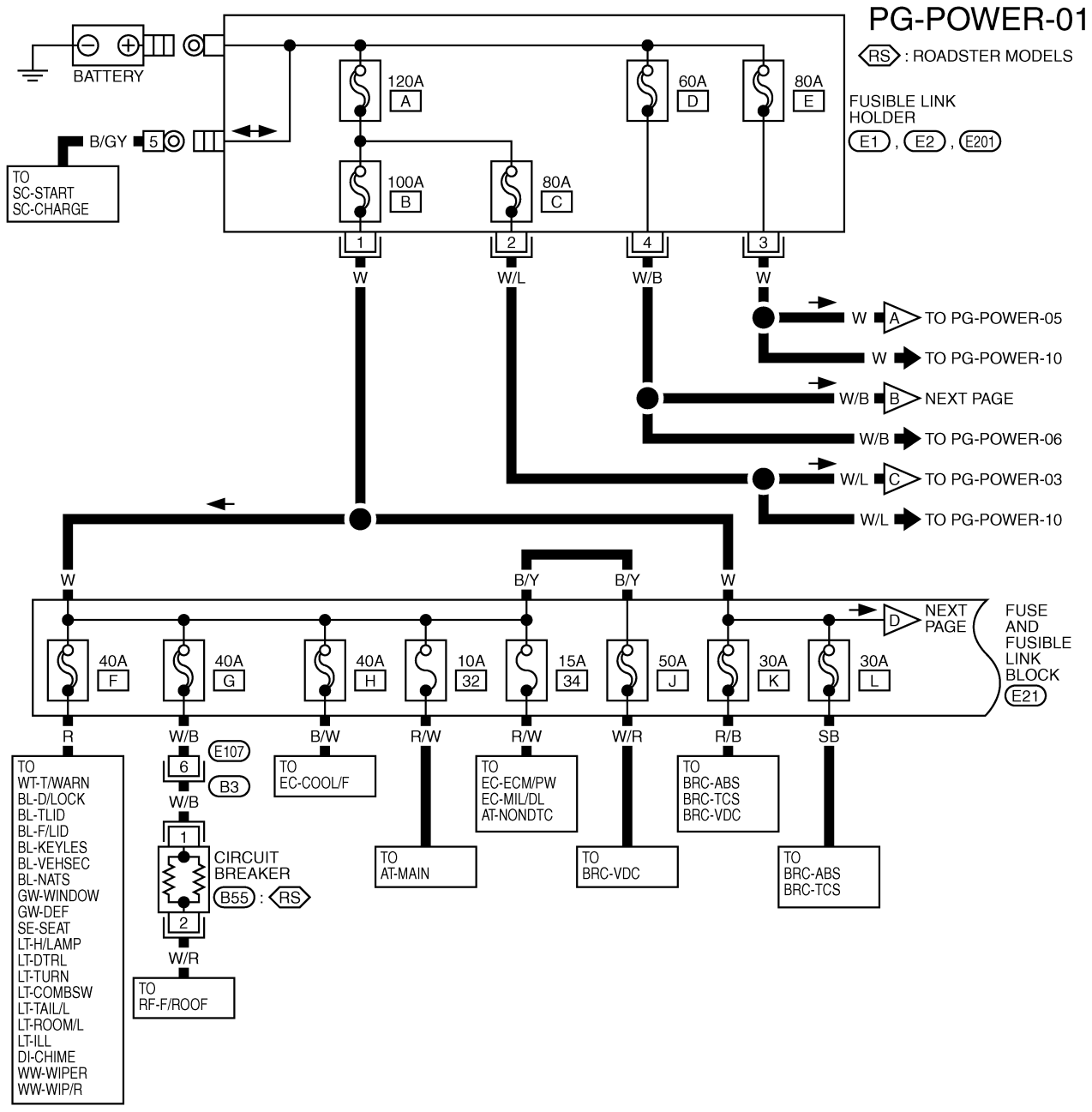
AKS0012B

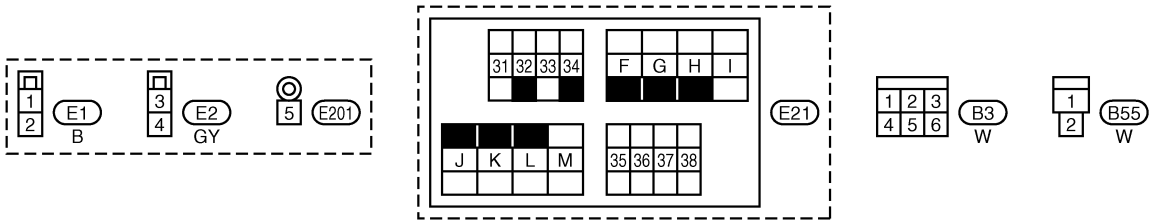


Wiring Diagram — POWER —

AKS0012C

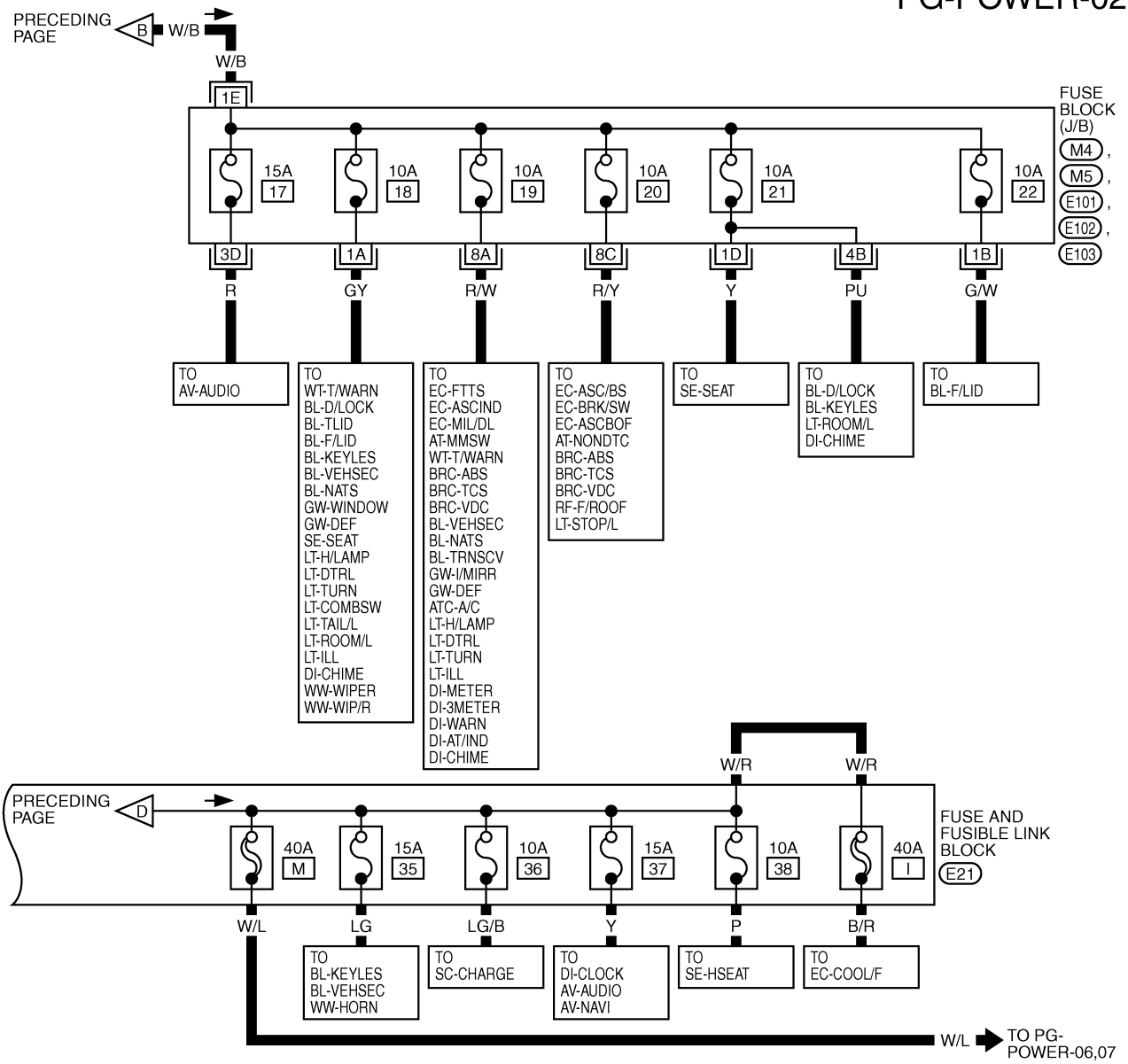
BATTERY POWER SUPPLY — IGNITION SW. IN ANY POSITION

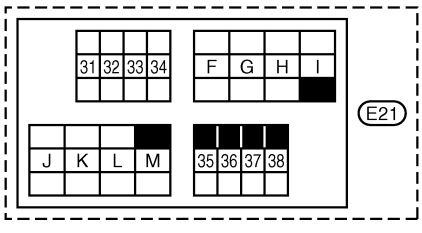




TKWB0267E

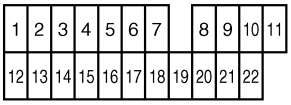
PG-POWER-02





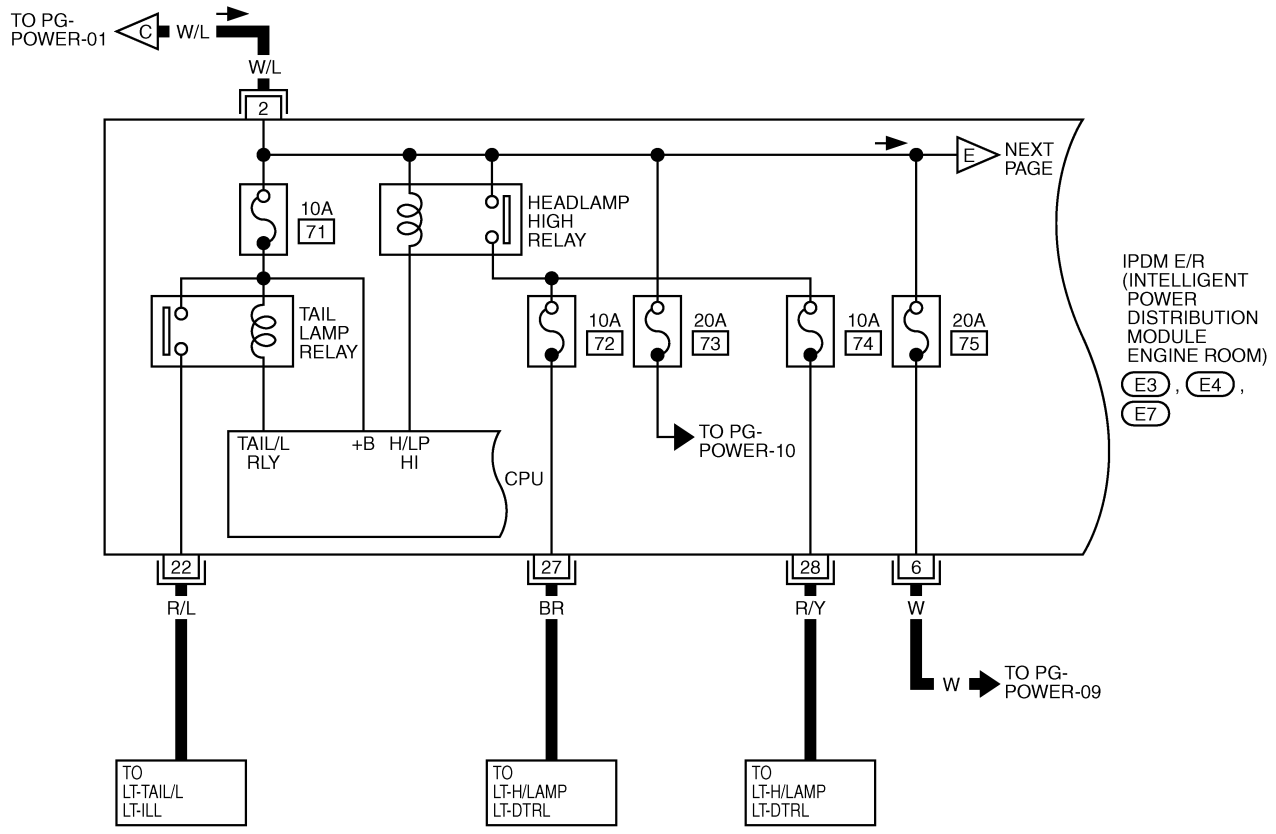
REFER TO THE FOLLOWING.

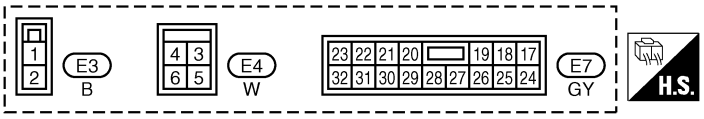
M4, M5, E101, E102, E103 -FUSE BLOCK-JUNCTION BOX (J/B)



TKWM1378E

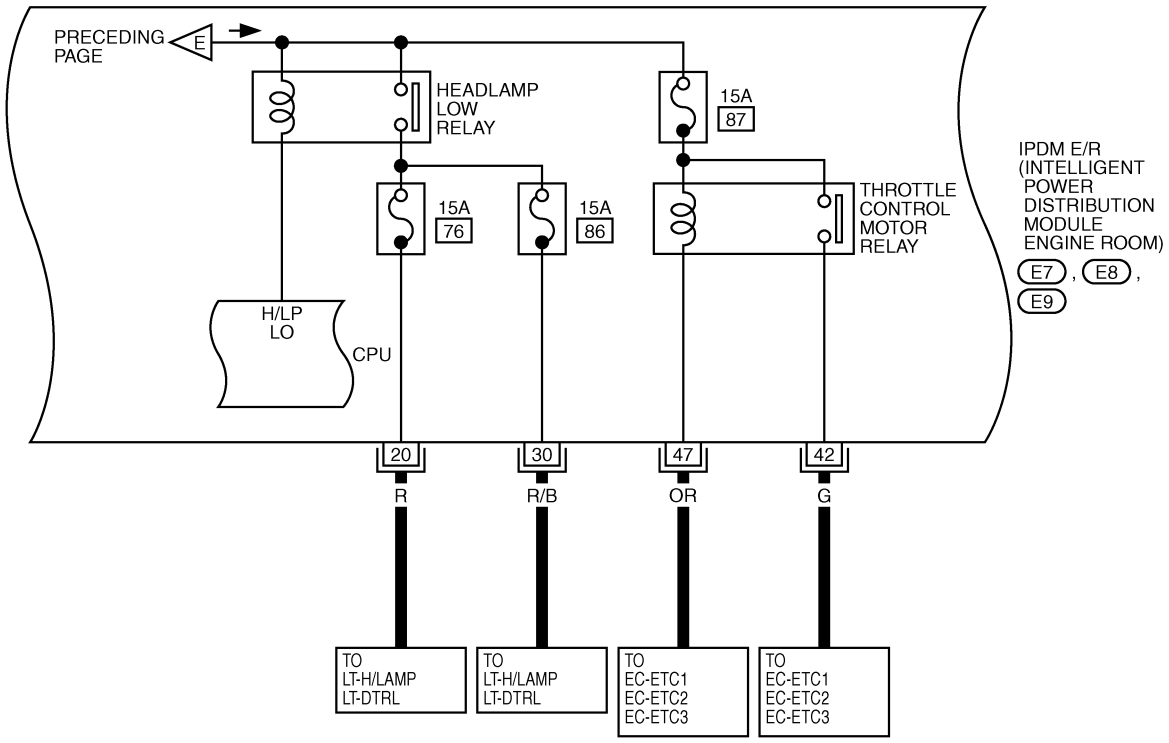
PG-POWER-03

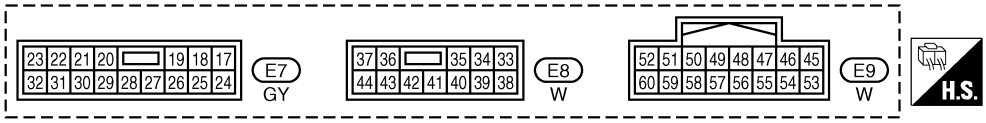




TKWT1642E

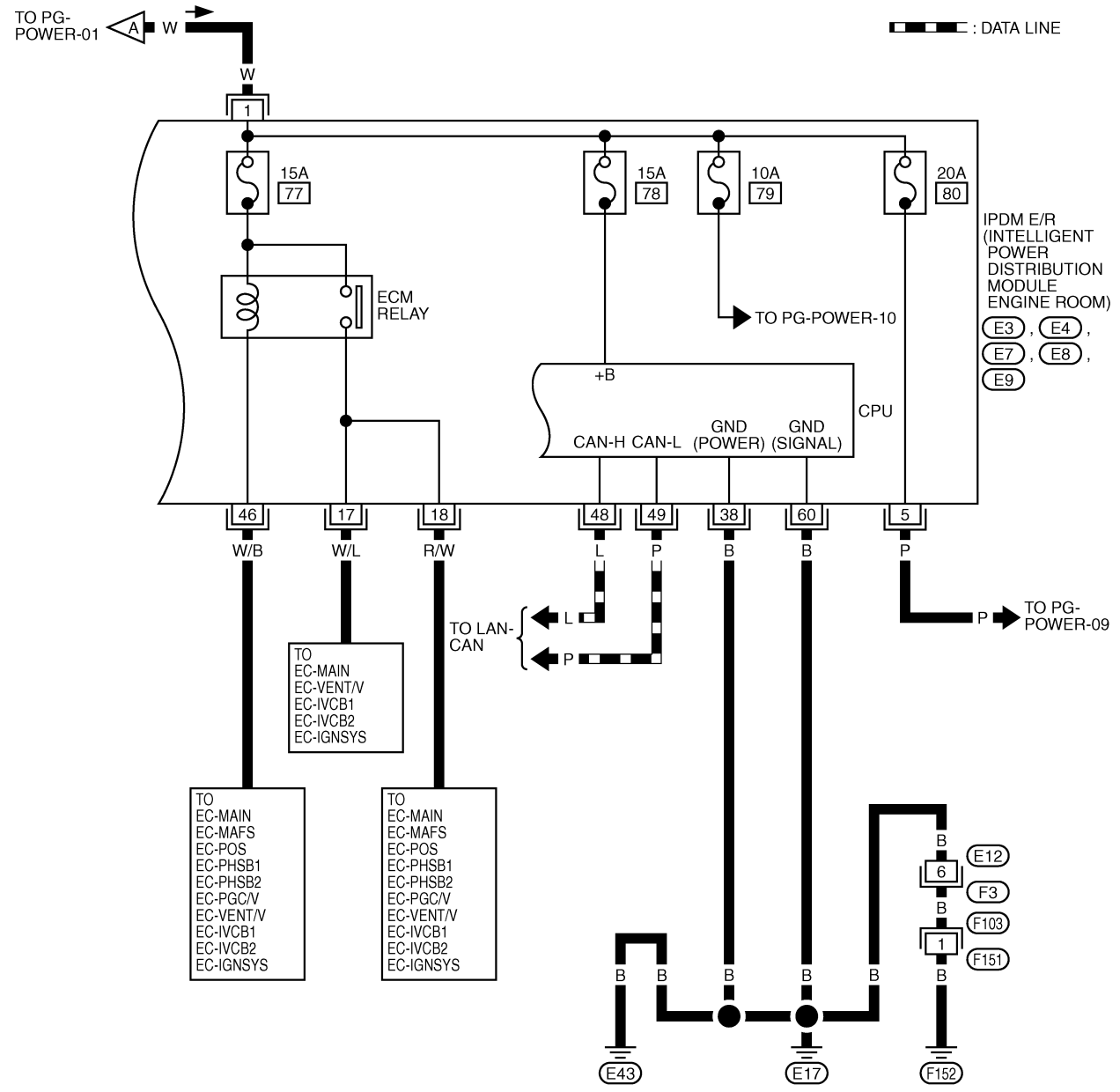
PG-POWER-04

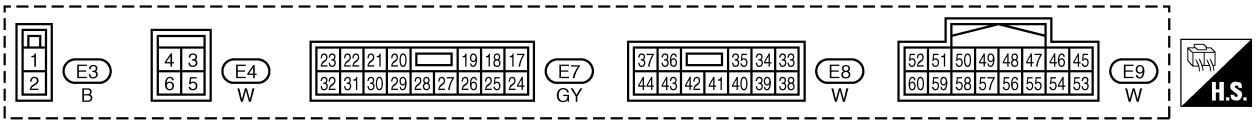


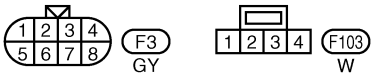


TKWT1643E

PG-POWER-05



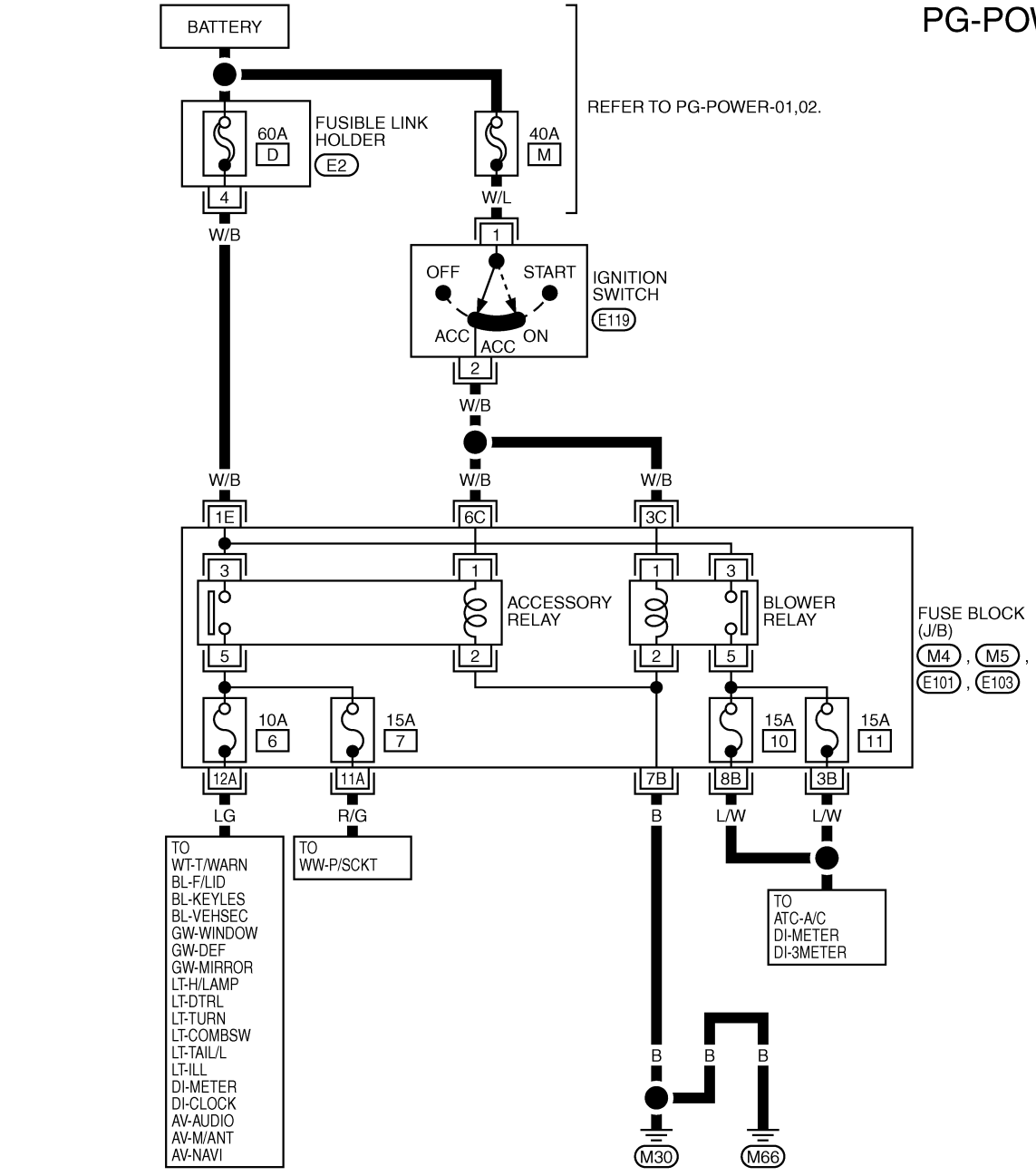


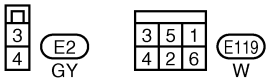


TKWT1644E

ACCESSORY POWER SUPPLY — IGNITION SW. IN “ACC” OR “ON”

PG-POWER-06





REFER TO THE FOLLOWING.

M4 , M5 , E101 , E103

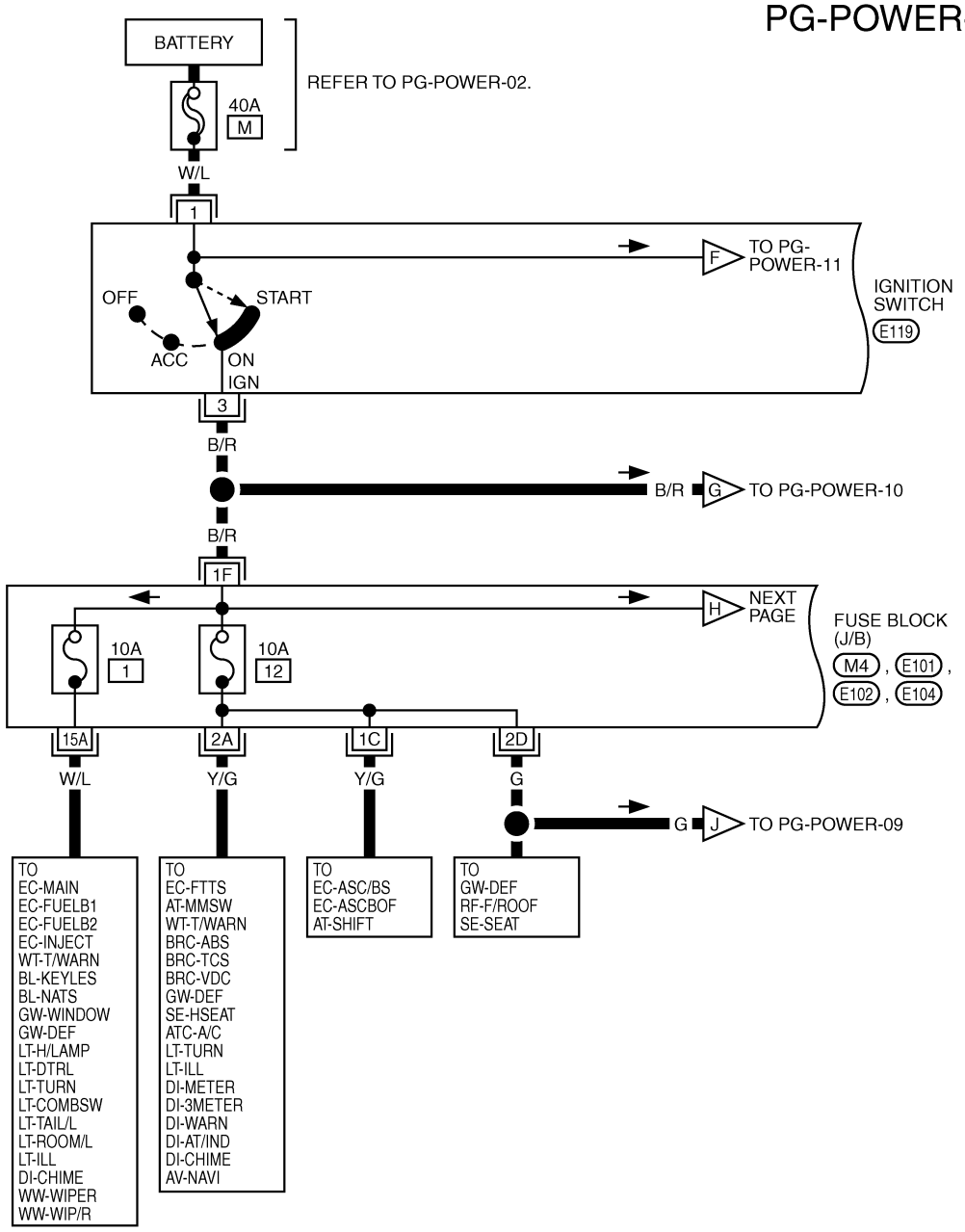
-FUSE BLOCK-JUNCTION BOX (J/B)

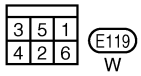
1	2	3	4	5	6	7		8	9	10	11
12	13	14	15	16	17	18	19	20	21	22	

TKWT2238E

IGNITION POWER SUPPLY — IGNITION SW. IN “ON” AND/OR “START”

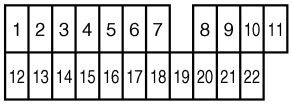
PG-POWER-07



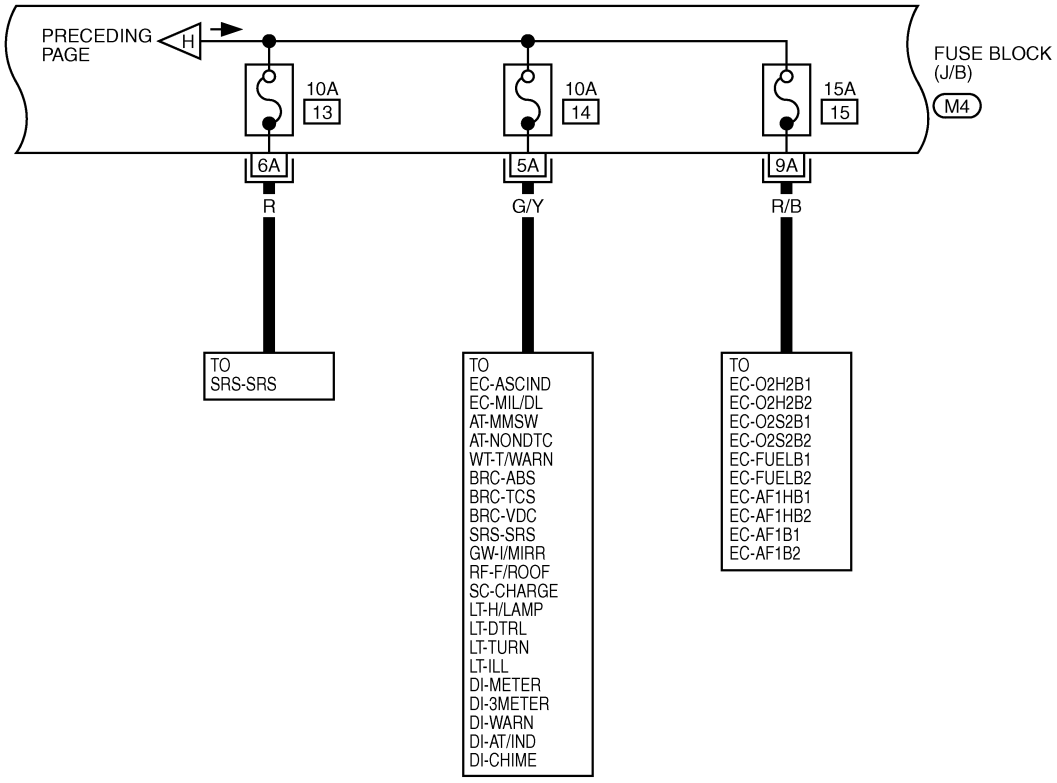


REFER TO THE FOLLOWING.

M4 , E101 , E102 , E104
-FUSE BLOCK-JUNCTION BOX (J/B)



TKWM1328E



REFER TO THE FOLLOWING.

M4 -FUSE BLOCK-
JUNCTION BOX (J/B)

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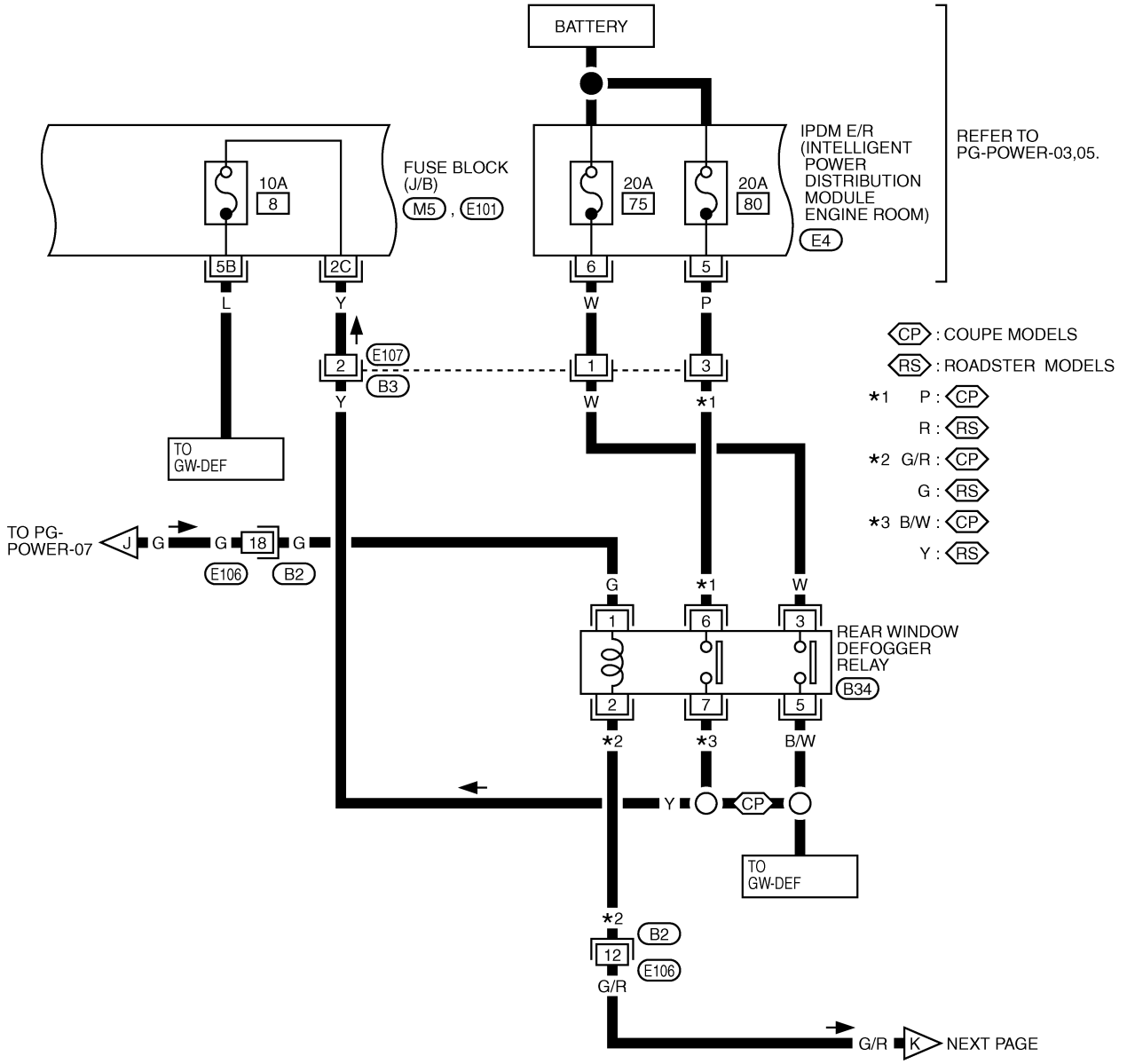
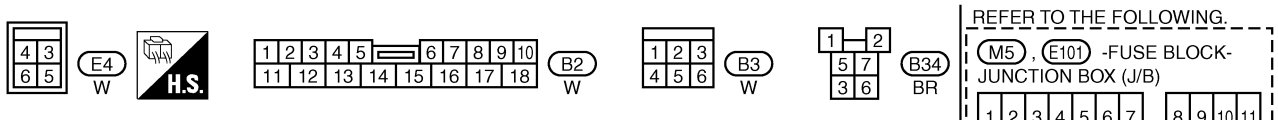
12	13	14	15	16	17	18	19	20	21	22	

TKWM1379E

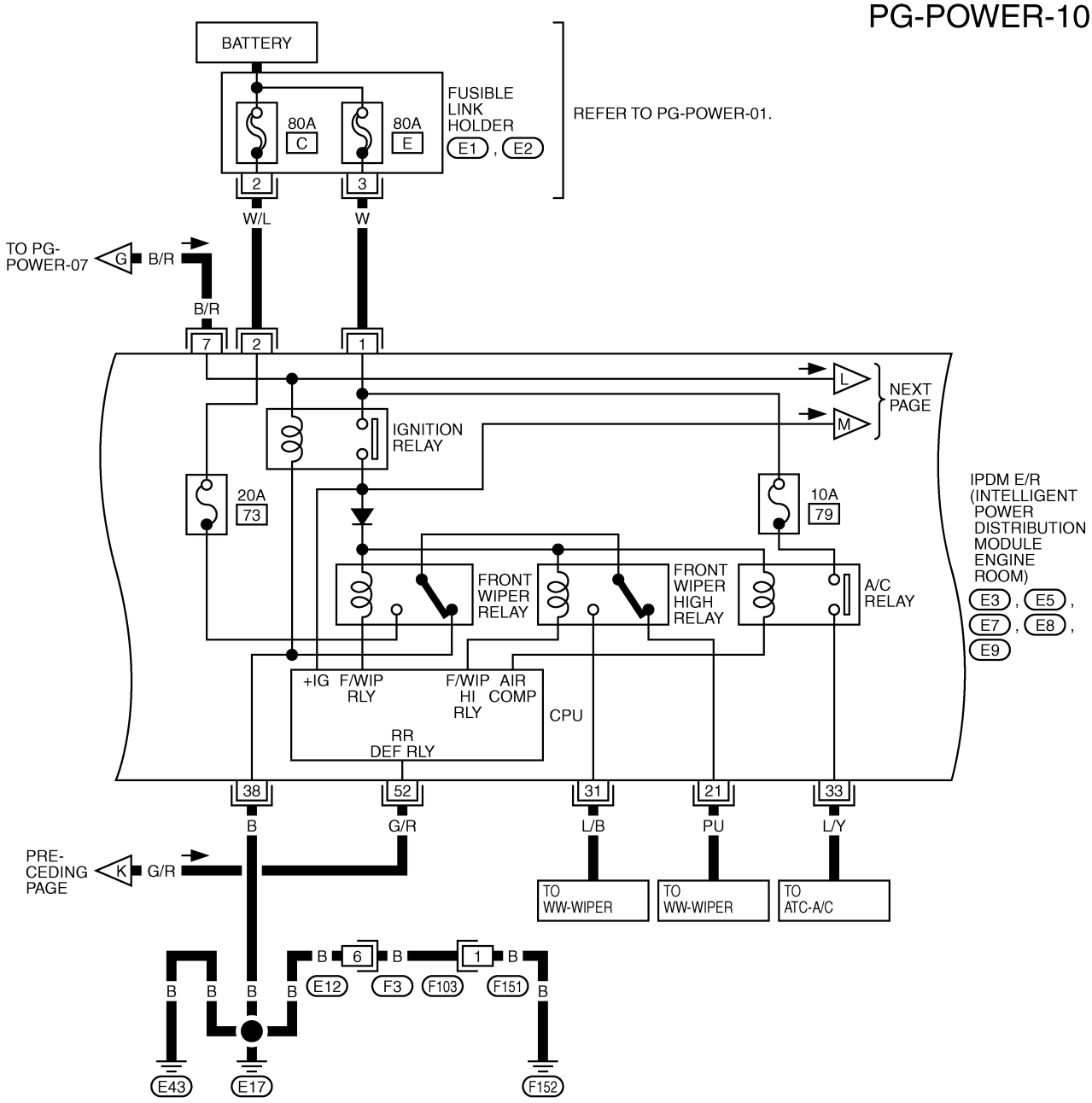
PG-POWER-09

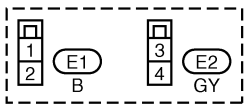


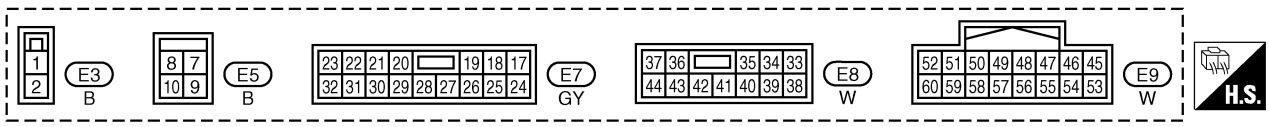


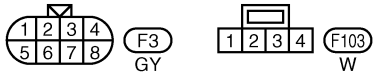
TKWT1648E

PG-POWER-10



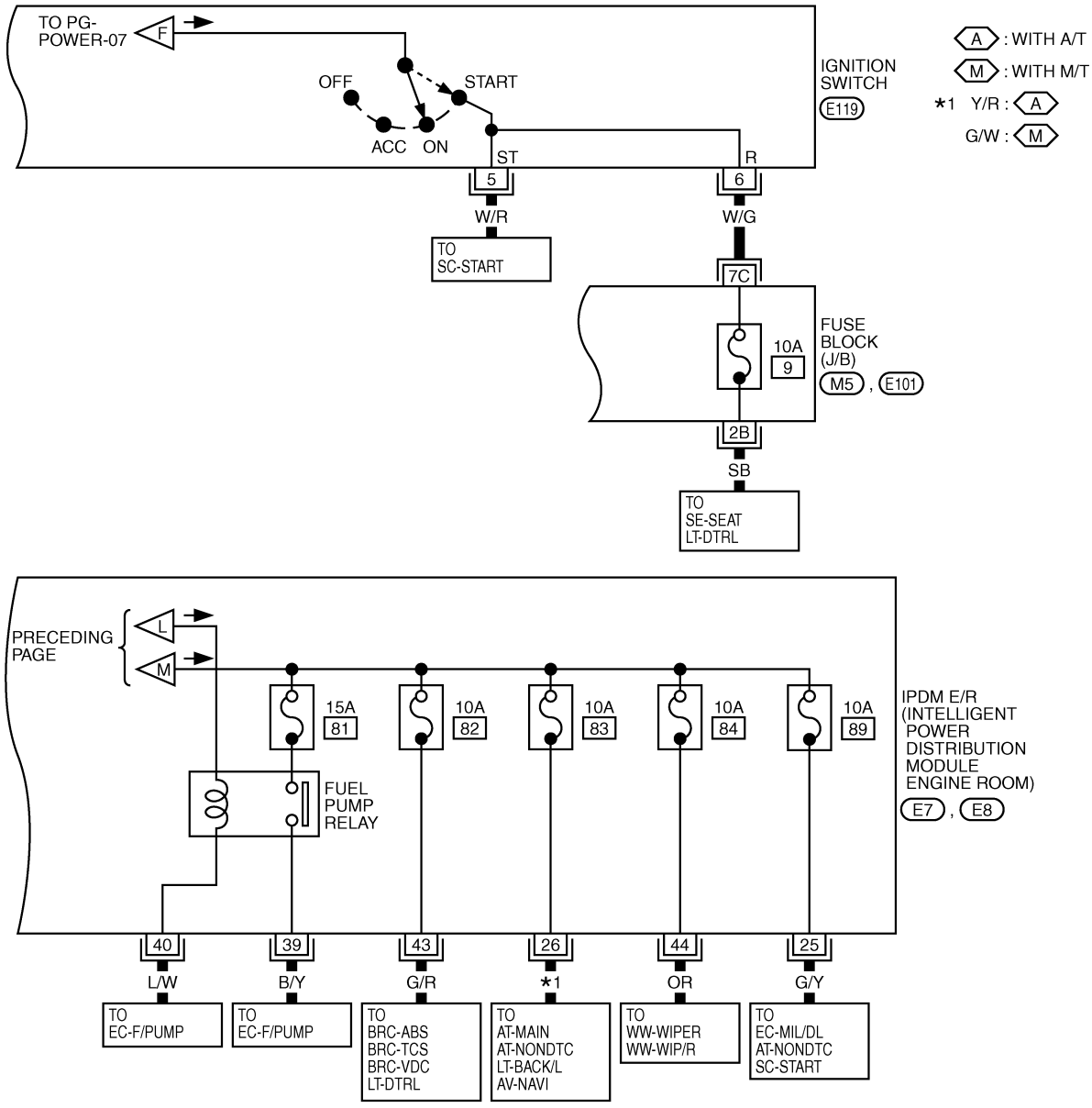


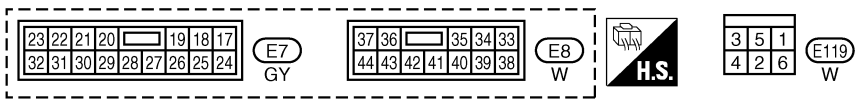




TKWT1649E

PG-POWER-11





REFER TO THE FOLLOWING.

M5 , E101 -FUSE BLOCK-JUNCTION BOX (J/B)

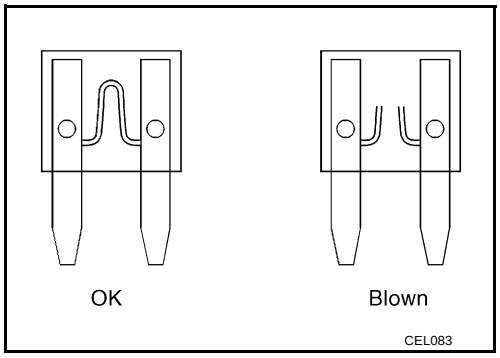
1	2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21	22

TKWB0268E

Fuse

AKS0012D

- If fuse is blown, be sure to eliminate cause of incident before installing new fuse.
- Use fuse of specified rating. Never use fuse of more than specified rating.
- Do not partially install fuse; always insert it into fuse holder properly.
- Remove fuse for “ELECTRICAL PARTS (BAT)” if vehicle is not used for a long period of time.



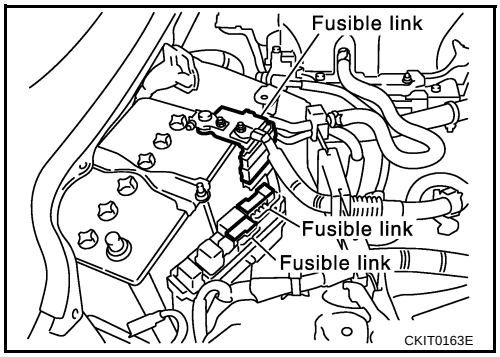
Fusible Link

AKS0012E

A melted fusible link can be detected either by visual inspection or by feeling with finger tip. If its condition is questionable, use circuit tester or test lamp.

CAUTION:

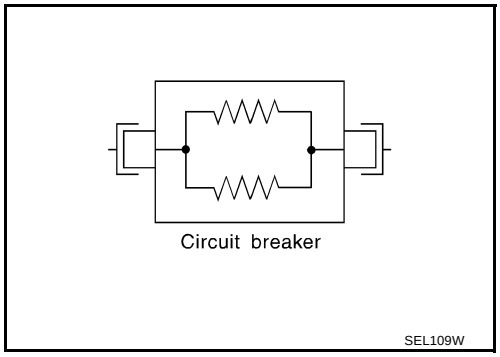
- **If fusible link should melt, it is possible that critical circuit (power supply or large current carrying circuit) is shorted. In such a case, carefully check and eliminate cause of incident.**
- **Never wrap outside of fusible link with vinyl tape. Important: Never let fusible link touch any other wiring harness, vinyl or rubber parts.**



Circuit Breaker

AKS0012F

The PTC thermistor generates heat in response to current flow. The temperature (and resistance) of the thermistor element varies with current flow. Excessive current flow will cause the element's temperature to rise. When the temperature reaches a specified level, the electrical resistance will rise sharply to control the circuit current. Reduced current flow will cause the element to cool. Resistance falls accordingly and normal circuit current flow is allowed to resume.



IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

PFP:284B7

System Description

AKS00A2H

- IPDM E/R (Intelligent Power Distribution Module Engine Room) integrates the relay box and fuse block which were originally placed in engine room. It controls integrated relay via IPDM E/R control circuit.
- IPDM E/R-integrated control circuit performs ON-OFF operation of relay, CAN communication control, oil pressure switch signal, hood switch signal reception, etc.
- It controls operation of each electrical part via ECM, BCM and CAN communication lines.

CAUTION:
None of the IPDM E/R-integrated relays can be removed.

SYSTEMS CONTROLLED BY IPDM E/R

1. Lamp control
   Using CAN communication line, it receives signal from BCM and controls the following lamps:
   - Headlamps (Hi, Lo)
   - Parking lamps
   - Tail lamps
   - License plate lamps
2. Wiper control
   Using CAN communication line, it receives signals from BCM and controls the front wipers.
3. Headlamp washer control
   Using CAN communication line, it receives signals from BCM and controls the headlamp washer.
4. Rear window defogger relay control
   Using CAN communication line, it receives signals from BCM and controls the rear window defogger relay.
5. A/C compressor control
   Using CAN communication line, it receives signals from ECM and controls the A/C relay.
6. Cooling fan control
   Using CAN communication line, it receives signals from ECM and controls cooling fan relay.

CAN COMMUNICATION LINE CONTROL

With CAN communication, by connecting each control unit using two communication lines (CAN L line, CAN H line), it is possible to transmit maximum amount of information with minimum wiring. Each control unit can transmit and receive data, and reads necessary information only.

1. Fail-safe control
   - When CAN communication with other control units is impossible, IPDM E/R performs fail-safe control. After CAN communication recovers normally, it also returns to normal control.
   - Operation of control parts by IPDM E/R during fail-safe mode is as follows:

Controlled system	Fail-safe mode
Headlamp	● With the ignition switch ON, the headlamp (low) is ON. ● With the ignition switch OFF, the headlamp (low) is OFF.
Tail and parking lamps	● With the ignition switch ON, the tail and parking lamps is ON. ● With the ignition switch OFF, the tail and parking lamps is OFF.
Cooling fan	● With the ignition switch ON, the cooling fan HI operates. ● With the ignition switch OFF, the cooling fan stops.
Front wiper	Until the ignition switch is turned off, the front wiper LO and HI remains in the same status it was in just before fail–safe control was initiated.
Rear window defogger	Rear window defogger relay OFF
A/C compressor	A/C compressor OFF

IPDM E/R STATUS CONTROL

In order to save power, IPDM E/R switches status by itself based on each operating condition.

1. CAN communication status
   - CAN communication is normally performed with other control units.
   - Individual unit control by IPDM E/R is normally performed.
   - When sleep request signal is received from BCM, mode is switched to sleep waiting status.
2. Sleep waiting status
   - Process to stop CAN communication is activated.
   - All systems controlled by IPDM E/R are stopped. When 1 seconds have elapsed after CAN communication with other control units is stopped, mode switches to sleep status.
3. Sleep status
   - IPDM E/R operates in low current-consumption mode.
   - CAN communication is stopped.
   - When a change in CAN communication line is detected, mode switches to CAN communication status.
   - When a change hood switch or ignition switch signal is detected, mode switches to CAN communication status.

CAN Communication System Description

AKS00A2I

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Modern vehicles are equipped with many electronic control units and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

CAN Communication Unit

AKS00A2J

Refer to LAN-5, "CAN Communication Unit" .

Function of Detecting Ignition Relay Malfunction

AKS00A2K

- When contact point of integrated ignition relay is stuck and cannot be turned OFF, IPDM E/R turns ON tail and parking lamps for 10 minutes to indicate IPDM E/R malfunction.
- When a state of ignition relay having built-in does not agree with a state of Ignition switch signal input by a CAN communication from BCM, IPDM E/R lets tail lamp relay operate.

Ignition switch signal	Ignition relay status	Tail lamp relay
ON	ON	—
OFF	OFF	—
ON	OFF	—
OFF	ON	ON (10 minutes)

NOTE:
When the ignition switch is turned ON, the tail lamp is OFF.

CONSULT-II

AKS00A2L

CONSULT-II performs the following functions with combination of data receiving, command and transmission using the CAN communication line from the IPDM E/R.

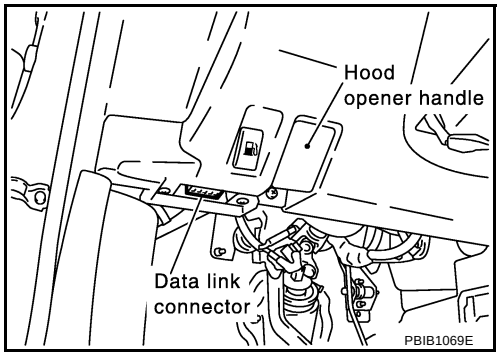
Inspection Item, Diagnosis Mode	Description
SELF-DIAG RESULTS	The IPDM E/R performs diagnosis of the CAN communication and self-diagnosis.
DATA MONITOR	The input/output data of the IPDM E/R is displayed in real time.
CAN DIAG SUPPORT MNTR	The result of transit/receive diagnosis of CAN communication can be read.
ACTIVE TEST	The IPDM E/R sends a drive signal to electronic components to check their operation.

CONSULT-II BASIC OPERATION

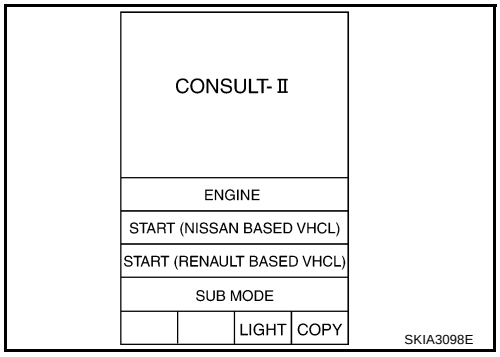
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

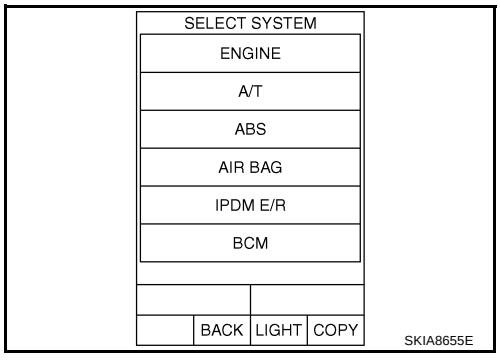
1. With the ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to the data link connector, then turn the ignition switch ON.



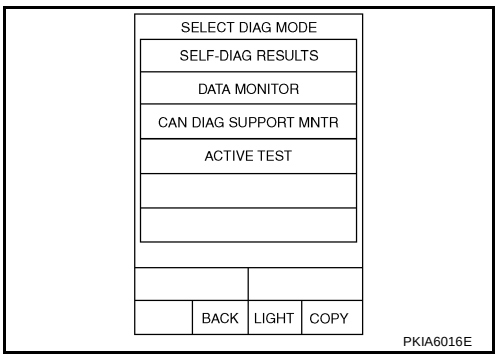
2. Touch “START (NISSAN BASED VHCL)”.



3. Touch “IPDM E/R” on “SELECT SYSTEM” screen.
   If “IPDM E/R” is not displayed, refer to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



4. Select the desired part to be diagnosed on the “SELECT DIAG MODE” screen.



SELF-DIAG RESULTS

Operation Procedure

1. Touch “SELF-DIAG RESULTS” on “SELECT DIAG MODE” screen.
2. Check display content in self-diagnostic results.

Display Item List

Display Items	CONSULT-II display code	Malfunction detecting condition	TIME		Possible causes
			CRNT	PAST	
NO DTC IS DETECTED.FURTHER TESTING MAY BE REQUIRED.	-	-	-	-	-
CAN COMM CIRC	U1000	● If CAN communication reception/transmission data has a malfunction, or if any of the control units malfunction, data reception/ transmission cannot be confirmed. ● When the data in CAN communication is not received before the specified time	×	×	Any of or several items below have errors. ● TRANSMIT DIAG ● ECM ● BCM/SEC

NOTE:
The details for display of the period are as follows:

- CRNT: Error currently detected with IPDM E/R.
- PAST: Error detected in the past and memorized with IPDM E/R.

DATA MONITOR

Operation Procedure

1. Touch “DATA MONITOR” on “SELECT MONITOR ITEM ” screen.
2. Touch “ALL SIGNALS”, “MAIN SIGNALS” or “SELECTION FROM MENU” on the “DATA MONITOR” screen.

ALL SIGNALS	All items will be monitored.
MAIN SIGNALS	Monitor the predetermined item.
SELECT FROM MENU	Select any item for monitoring.

3. Touch “START”.
4. Touch the required monitoring item on “SELECTION FROM MENU”. In “ALL SIGNALS”, all items are monitored. In “MAIN SIGNALS”, predetermined items are monitored.
5. Touch “RECORD” while monitoring to record the status of the item being monitored. To stop recording, touch “STOP”.

All Items, Main Items, Select Item Menu

Item name	CONSULT-II screen display	Display or unit	Monitor item selection			Description
			ALL SIGNALS	MAIN SIGNALS	SELECT FROM MENU	
Motor fan request	MOTOR FAN REQ	1/2/3/4	×	×	×	Signal status input from ECM
Compressor request	AC COMP REQ	ON/OFF	×	×	×	Signal status input from ECM
Tail & clear request	TAIL&CLR REQ	ON/OFF	×	×	×	Signal status input from BCM
H/L LO request	HL LO REQ	ON/OFF	×	×	×	Signal status input from BCM
H/L HI request	HL HI REQ	ON/OFF	×	×	×	Signal status input from BCM
Front fog request NOTE	FR FOG REQ	ON/OFF	×	×	×	Signal status input from BCM
Head lamp washer request	HL WASHER REQ	ON/OFF	×		×	Signal status input from BCM
Front wiper request	FR WIP REQ	STOP/1LOW/ LOW/HI	×	×	×	Signal status input from BCM
Wiper auto stop	WIP AUTO STOP	ACT P/STOP P	×	×	×	Output status of IPDM E/R
Wiper protection	WIP PROT	OFF/Block	×	×	×	Control status of IPDM E/R
Starter request	ST RLY REQ	ON/OFF	×		×	Status of input signal NOTE
Ignition relay status	IGN RLY	ON/OFF	×	×	×	Ignition relay status monitored with IPDM E/R
Rear window defogger request	RR DEF REQ	ON/OFF	×	×	×	Signal status input from BCM
Oil pressure switch NOTE	OIL P SW	OPEN/CLOSE	×		×	Signal status input in IPDM E/R
Day time light request NOTE	DTRL REQ	ON/OFF	×		×	Signal status input from BCM
Hood switch	HOOD SW	ON/OFF	×		×	Signal status input in IPDM E/R
Theft warning horn request	THFT HRN REQ	ON/OFF	×		×	Signal status input from BCM
Horn chirp	HORN CHIRP	ON/OFF	×		×	Output status of IPDM E/R

NOTE:

- Perform monitoring of IPDM E/R data with the ignition switch ON. When the ignition switch is at ACC, the display may not be correct.
- “FR FOG REQ” and “OIL P SW” items are displayed, but they cannot be monitored.
- Only the vehicle which day time light system is mounted with operates.

ACTIVE TEST

Operation Procedure

1. Touch “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Touch item to be tested, and check operation.
3. Touch “START”.
4. Touch “STOP” while testing to stop the operation.

Test item	CONSULT-II screen display	Description
Tail lamp output	TAIL LAMP	With a certain ON-OFF operation, the tail lamp relay can be operated.
Rear window defogger output	REAR DEFOGGER	With a certain ON-OFF operation, the rear window defogger relay can be operated.
Front wiper (HI, LO) output	FRONT WIPER	With a certain operation (OFF, HI ON, LO ON), the front wiper relay (Lo, Hi) can be operated.
Cooling fan output	MOTOR FAN	With a certain operation (1,2,3,4), the cooling fan can be operated.
Headlamp washer	HEAD LAMP WASHER	Push “ON” button, headlamp washer relay operates one second.
Lamp (HI, LO,FOG[NOTE]) output	LAMPS	With a certain operation (OFF, HI ON, LO ON, FOG ON[NOTE]), the lamp relay (Lo, Hi, Fog[NOTE]) can be operated.
Horn output	HORN	Push “ON” button, horn relay operates 20ms.

NOTE:

- The cornering lamp items are displayed, but they cannot be tested.
- The fog lamp items are displayed, but they cannot be tested.

Auto Active Test

AKS00A2M

DESCRIPTION

- In auto active test mode, operation inspection can be performed when IPDM E/R sends a drive signal to the following systems:

– Rear window defogger
– Front wipers
– Tail and parking lamps
– Headlamps (Hi, Lo)
– A/C compressor (magnetic clutch)
– Cooling fan

OPERATION PROCEDURE

1. Close hood front door (passenger side) and lift wiper arms away from windshield (to prevent glass damage by wiper operation).

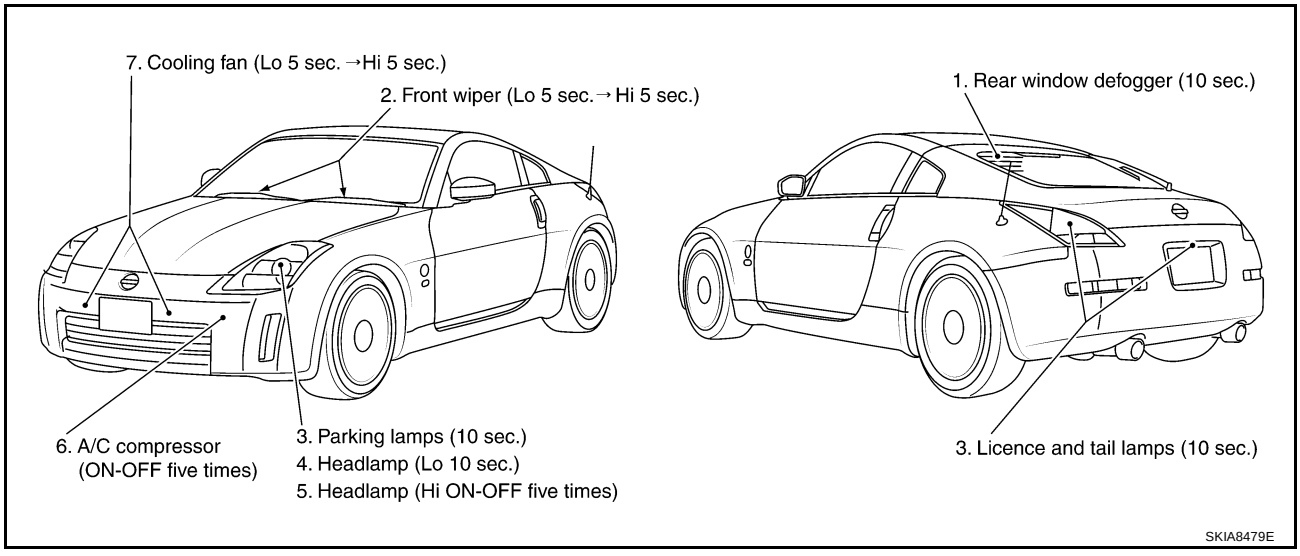
   NOTE:
   When auto active test is performed with hood opened, sprinkle water on windshield beforehand.
2. Turn ignition switch OFF.
3. Turn ignition switch ON and, within 20 seconds, press front door switch (driver side) 10 times. Then turn ignition switch OFF.
4. Turn ignition switch ON within 10 seconds after ignition switch OFF.
5. When auto active test mode is actuated.
6. After a series of operations is repeated three times, auto active test is completed.

   NOTE:
   When auto active test mode has to be cancelled halfway, turn ignition switch OFF.

   CAUTION:
   Be sure to inspect BL-39, "Door Switch Check" when the auto active test cannot be performed.

INSPECTION IN AUTO ACTIVE TEST MODE

- When auto active test mode is actuated, the following eight steps are repeated three times.



NOTE:
It will take ten seconds from 3 to 4.

Concept of Auto Active Test

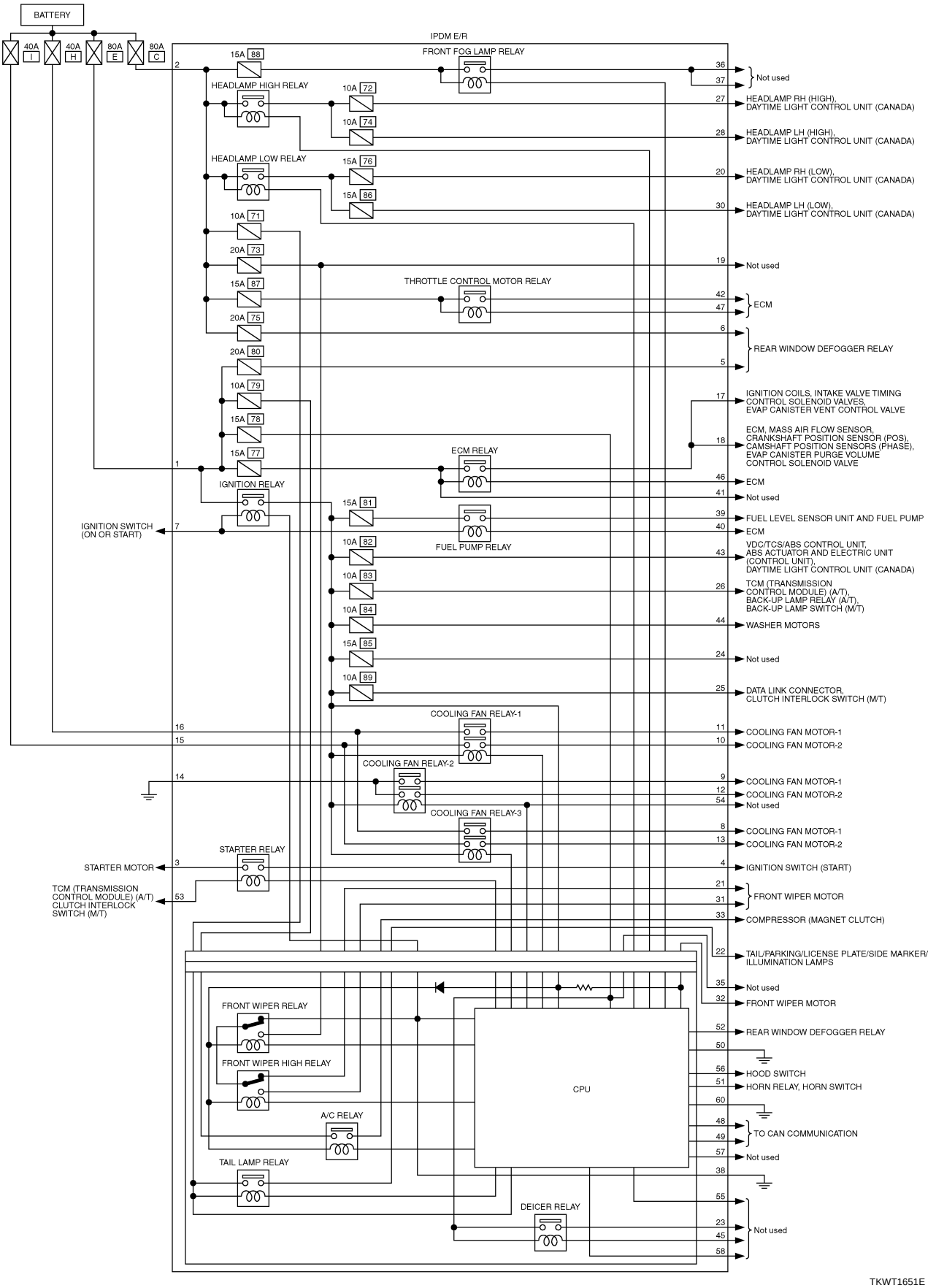
- IPDM E/R actuates auto active test mode when it receives door switch signal from BCM via CAN communication line. Therefore, when auto active test mode is activated successfully, CAN communication between IPDM E/R and BCM is normal.
- If any of systems controlled by IPDM E/R cannot be operated, possible cause can be easily diagnosed using auto active test.

Diagnosis chart in auto active test mode

Symptom	Inspection contents		Possible cause
Rear window defogger does not operate.	Perform auto active test. Does rear window defogger operate?	YES	● BCM signal input circuit
		NO	● Rear window defogger relay circuit ● Open circuit of rear window defogger ● IPDM E/R malfunction
Any of front wipers, tail and parking lamps, front fog lamps, and head lamps (Hi, Lo) do not operate.	Perform auto active test. Does system in question operate?	YES	● BCM signal input system
		NO	● Lamp/wiper motor malfunction ● Lamp/wiper motor ground circuit malfunction ● Harness/connector malfunction between IPDM E/R and system in question ● IPDM E/R (integrated relay) malfunction
A/C compressor does not operate.	Perform auto active test. Does magnetic clutch operate?	YES	● BCM signal input circuit ● CAN communication signal between BCM and ECM. ● CAN communication signal between ECM and IPDM E/R
		NO	● Magnetic clutch malfunction ● Harness/connector malfunction between IPDM E/R and magnetic clutch ● IPDM E/R (integrated relay) malfunction
Cooling fan does not operate.	Perform auto active test. Does cooling fan operate?	YES	● ECM signal input circuit ● CAN communication signal between ECM and IPDM E/R
		NO	● Cooling fan motor malfunction ● Harness/connector malfunction between IPDM E/R and cooling fan motor ● IPDM E/R (integrated relay) malfunction

Schematic

AKS00A2N



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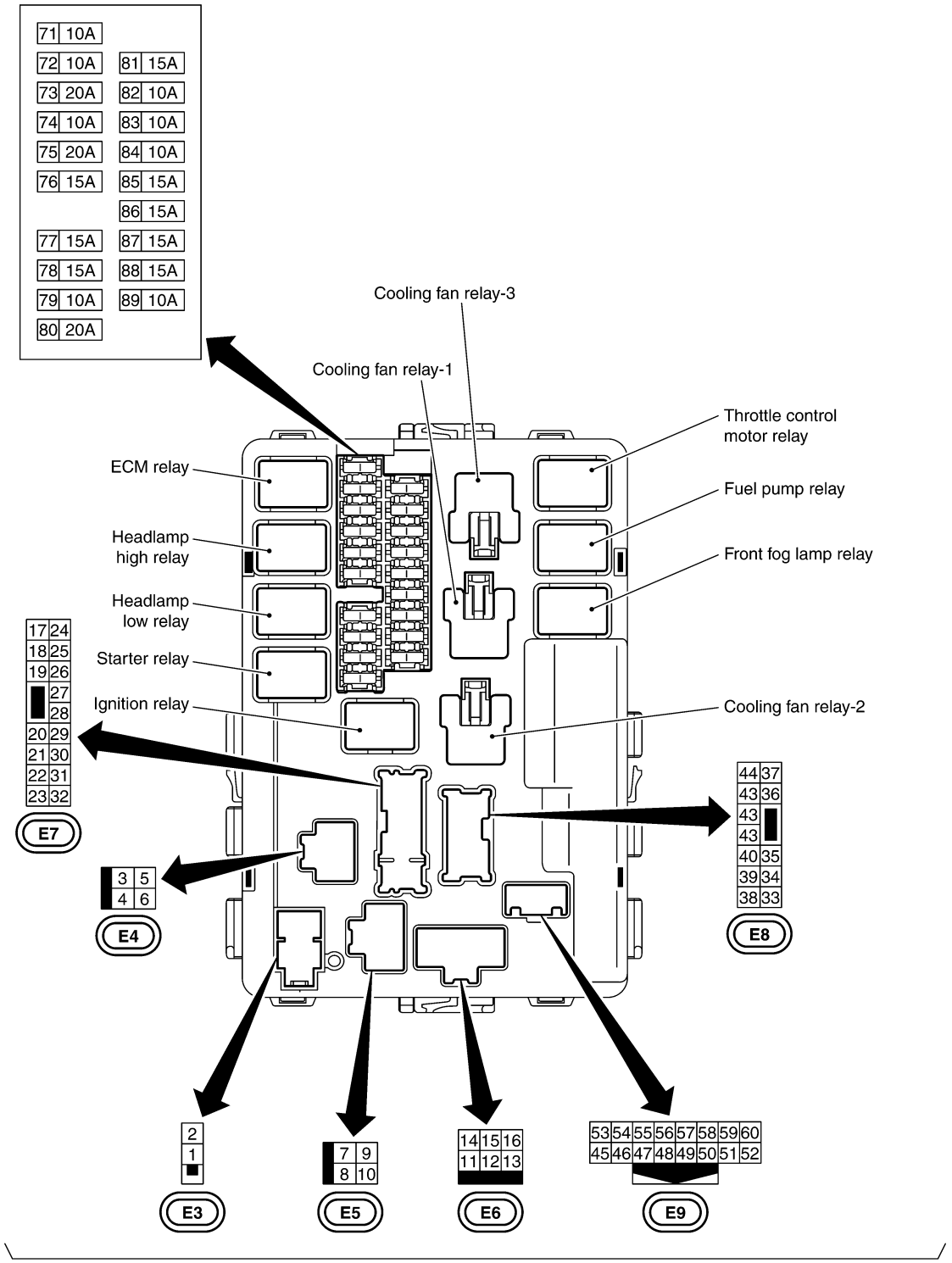
IPDM E/R Terminal Arrangement

AKS00A2O



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NOTE:
Front fog lamp relay does not used.

IPDM E/R Power/Ground Circuit Inspection

AKS00A2P

1. CHECK FUSE AND FUSIBLE LINK

- Make sure the following fusible links or IPDM E/R fuses are not blown.

Terminal No.	Signal name	Fuse, fusible link No.
1, 2	Battery power	F/L–C, F/L–E, Fuse No. 71,78

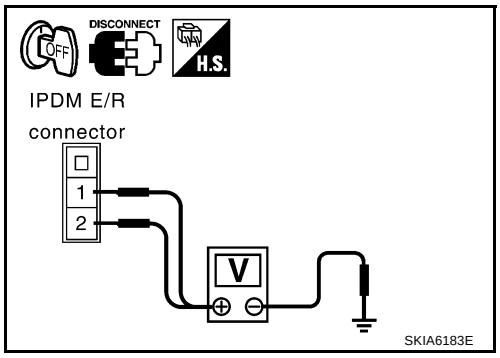
OK or NG

OK >> GO TO 2.
NG >> Replace fuse or fusible link.

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R harness connector E3.
3. Check voltage between IPDM E/R harness connector E3 terminals 1 (W), 2 (W/L) and ground.

Battery voltage should exist.



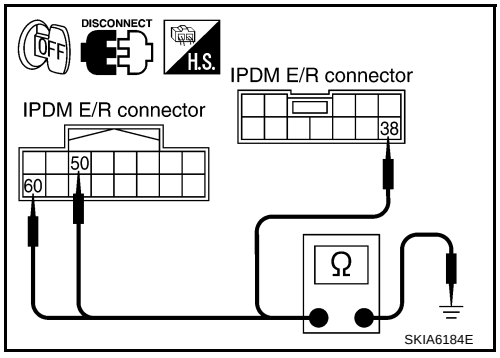
OK or NG

OK >> GO TO 3.
NG >> Replace IPDM E/R power supply circuit harness.

3. CHECK GROUND CIRCUIT

1. Disconnect IPDM E/R harness connectors E8 and E9.
2. Check continuity between IPDM E/R harness connectors E8 terminal 38 (B), E9 terminal 50 (B), 60 (B) and ground.

Continuity should exist.



OK or NG

OK >> INSPECTION END
NG >> Replace ground circuit harness of IPDM E/R.

Inspection With CONSULT-II (Self-Diagnosis)

AKS00A2Q

CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

1. CHECK SELF DIAGNOSTIC RESULT

1. Connect CONSULT-II and select “IPDM E/R” on the Diagnosis System Selection screen.
2. Select “SELF-DIAG RESULTS” on the “SELECT DIAG MODE” screen.
3. Check display content in self diagnostic results.

CONSULT-II display	CONSULT-II display code	TIME		Details of diagnosis result
		CRNT	PAST	
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	-	-	-	No malfunction
CAN COMM CIRC	U1000	×	×	Any of or several items below have errors. ● TRANSMIT DIAG ● ECM ● BCM/SEC

NOTE:

The Details for Display of the Period Are as Follows:

- CRNT: Error currently detected with IPDM E/R.
- PAST: Error detected in the past and memorized with IPDM E/R.

Contents displayed

NO DTC IS DETECTED.FURTHER TESTING MAY BE REQUIRED.>>INSPECTION END

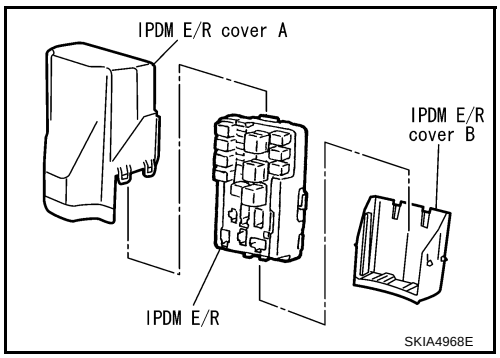
CAN COMM CIRC>>After print-out of the monitor items, refer to LAN-3, "Precautions When Using CONSULT-II" .

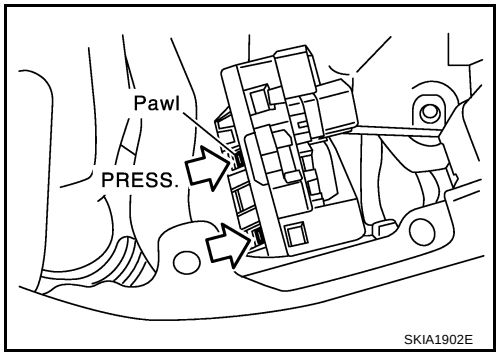
Removal and Installation of IPDM E/R

AKS00A2R

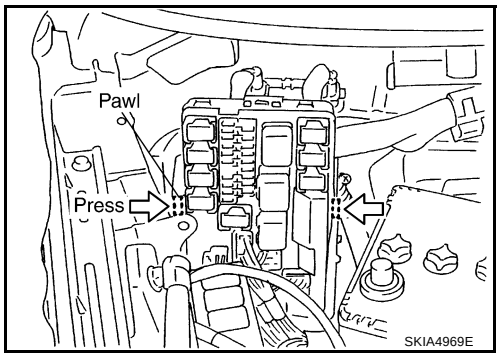
REMOVAL

1. Remove battery. Refer to SC-9, "Removal and Installation" in “Starting and Charging System (SC)” section.
2. Remove IPDM E/R cover A. While pressing pawl on backside of IPDM E/R cover B toward vehicle front to unlock, lift up IPDM E/R.





3. While pressing pawls on right and left side of IPDM E/R, remove IPDM E/R cover B from IPDM E/R.
4. Remove harness connector from IPDM E/R.



INSTALLATION

- Install in the reverse order of removal.

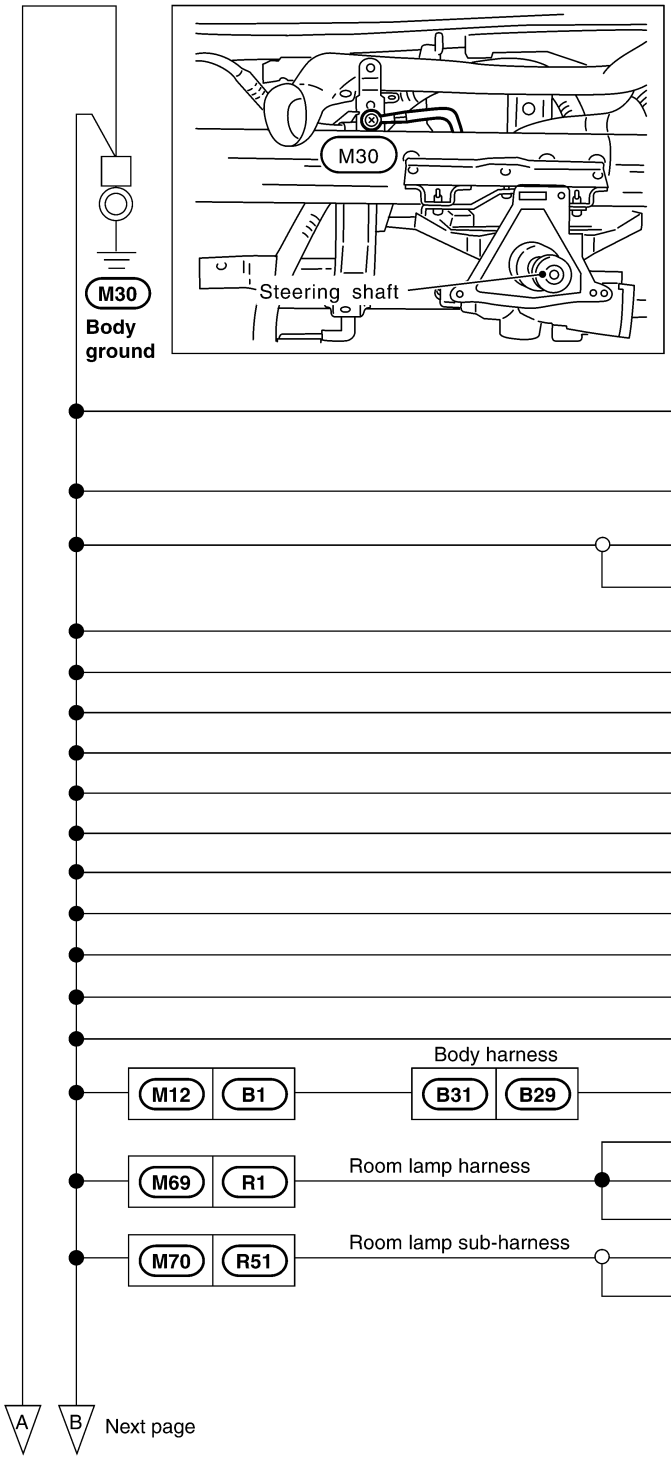
GROUND

PFP:00011

Ground Distribution

AKS0012P

MAIN HARNESS



CONNECTOR NUMBER	CONNECT TO
M5	Fuse block (J/B) (Terminal No.7B) • Accessory relay • Blower relay
M8	Data link connector (Terminal No.4)
M9	TCS off switch (With TCS Without VDC system)
M9	VDC off switch (With VDC system)
M13	Fuel lid opener switch
M14	Soft top switch
M19	Combination meter (Terminal No.10)
M19	Combination meter (Terminal No.11)
M19	Combination meter (Terminal No.12)
M29	Combination switch
M35	Display unit (Terminal No.22)
M35	Display unit (Terminal No.24)
M37	NAVI switch
M55	Air bag diagnosis sensor unit
M91	BCM (Body control module)
B11	Seat belt buckle switch (Passenger side)
R3	Vanity mirror lamp LH
R4	Auto anti-dazzling inside mirror
R5	Vanity mirror lamp RH
R52	Map lamp (Coupe models)
R53	Map lamp (Roadster models)

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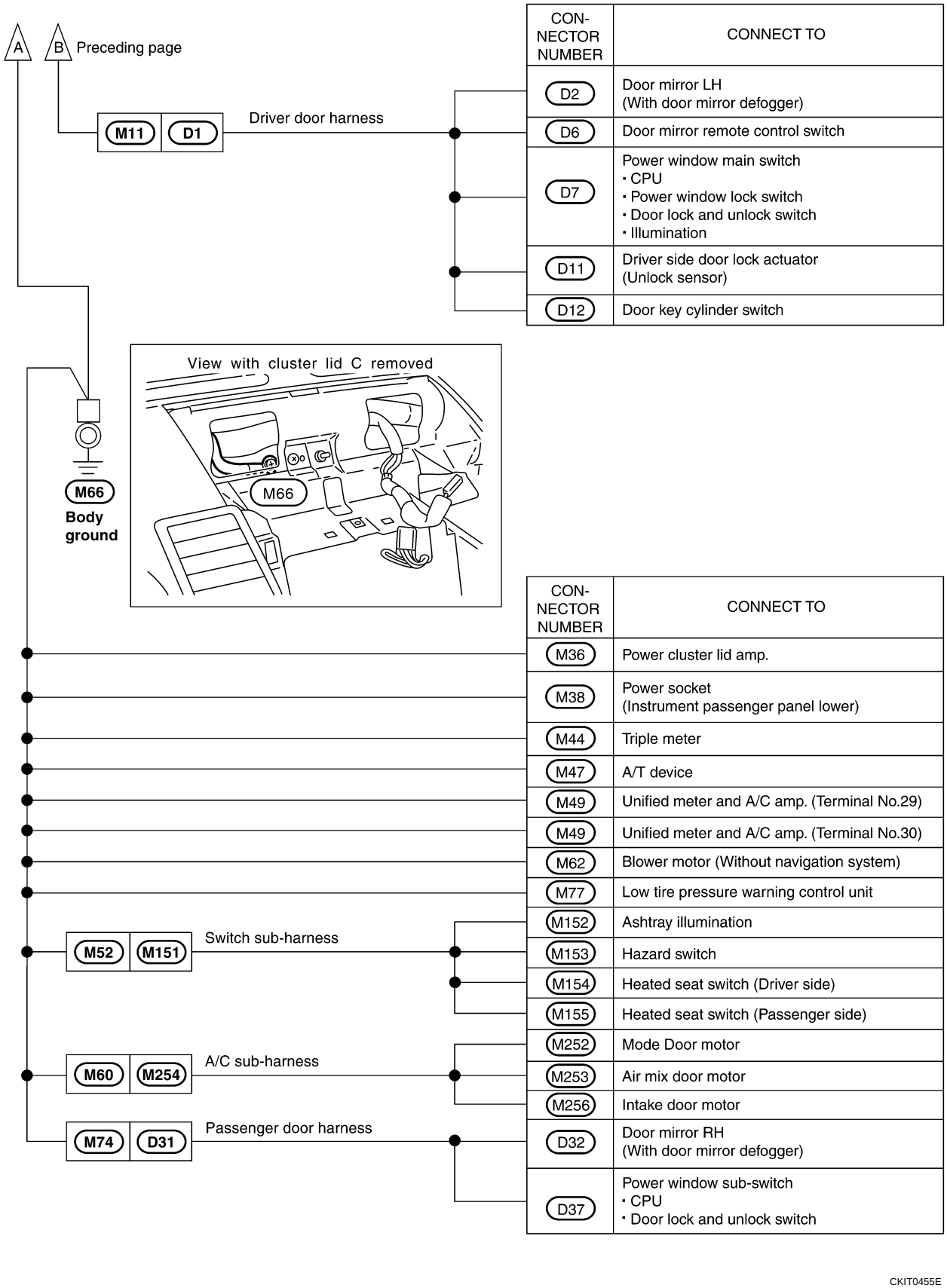

CON-NECTOR NUMBER	CONNECT TO
D2	Door mirror LH (With door mirror defogger)
D6	Door mirror remote control switch
D7	Power window main switch • CPU • Power window lock switch • Door lock and unlock switch • Illumination
D11	Driver side door lock actuator (Unlock sensor)
D12	Door key cylinder switch

CON-NECTOR NUMBER	CONNECT TO
M36	Power cluster lid amp.
M38	Power socket (Instrument passenger panel lower)
M44	Triple meter
M47	A/T device
M49	Unified meter and A/C amp. (Terminal No.29)
M49	Unified meter and A/C amp. (Terminal No.30)
M62	Blower motor (Without navigation system)
M77	Low tire pressure warning control unit
M152	Ashtray illumination
M153	Hazard switch
M154	Heated seat switch (Driver side)
M155	Heated seat switch (Passenger side)
M252	Mode Door motor
M253	Air mix door motor
M256	Intake door motor
D32	Door mirror RH (With door mirror defogger)
D37	Power window sub-switch • CPU • Door lock and unlock switch

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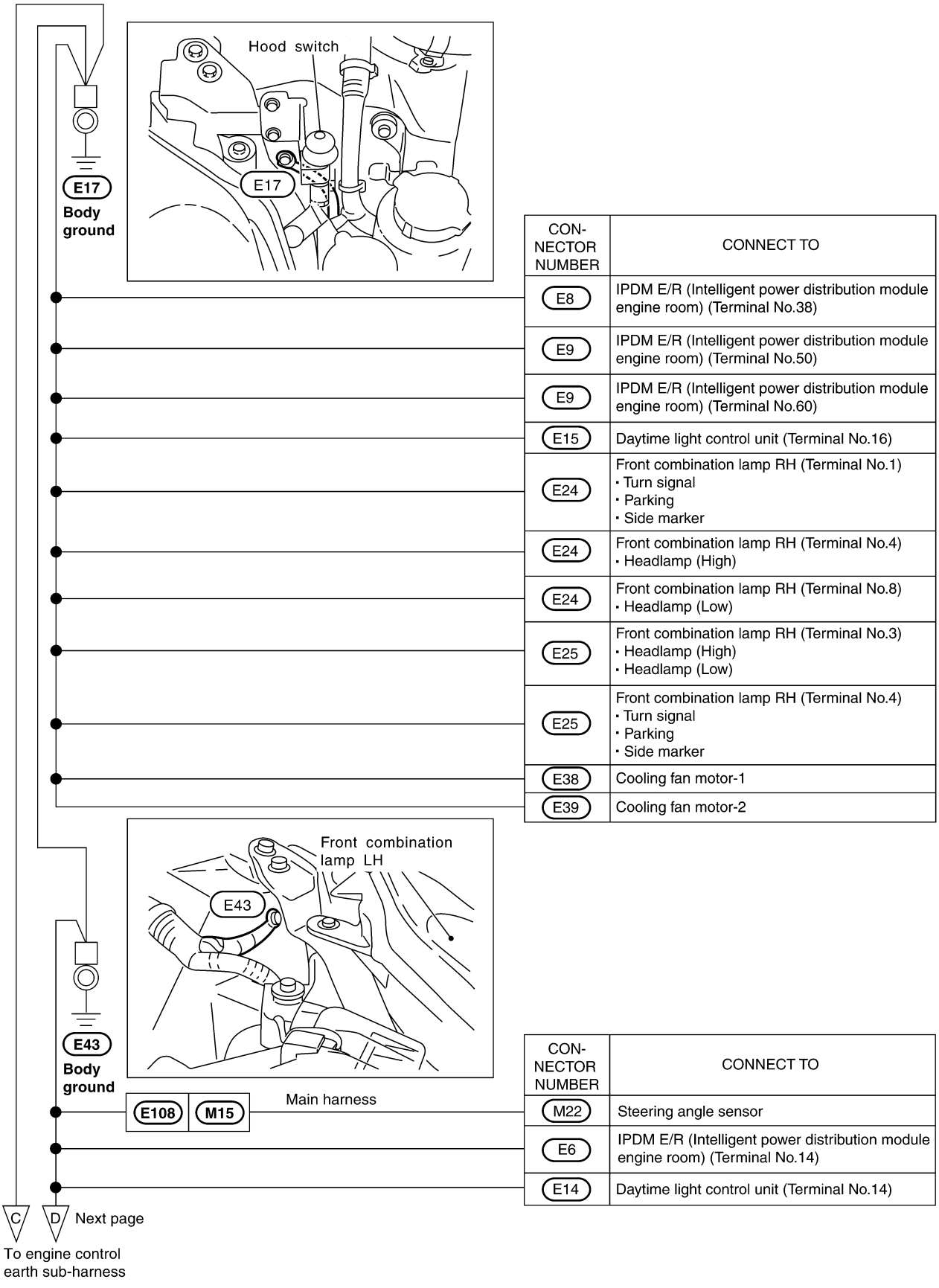
ENGINE ROOM HARNESS



CONNECTOR NUMBER	CONNECT TO
E8	IPDM E/R (Intelligent power distribution module engine room) (Terminal No.38)
E9	IPDM E/R (Intelligent power distribution module engine room) (Terminal No.50)
E9	IPDM E/R (Intelligent power distribution module engine room) (Terminal No.60)
E15	Daytime light control unit (Terminal No.16)
E24	Front combination lamp RH (Terminal No.1) • Turn signal • Parking • Side marker
E24	Front combination lamp RH (Terminal No.4) • Headlamp (High)
E24	Front combination lamp RH (Terminal No.8) • Headlamp (Low)
E25	Front combination lamp RH (Terminal No.3) • Headlamp (High) • Headlamp (Low)
E25	Front combination lamp RH (Terminal No.4) • Turn signal • Parking • Side marker
E38	Cooling fan motor-1
E39	Cooling fan motor-2

CONNECTOR NUMBER	CONNECT TO
M22	Steering angle sensor
E6	IPDM E/R (Intelligent power distribution module engine room) (Terminal No.14)
E14	Daytime light control unit (Terminal No.14)

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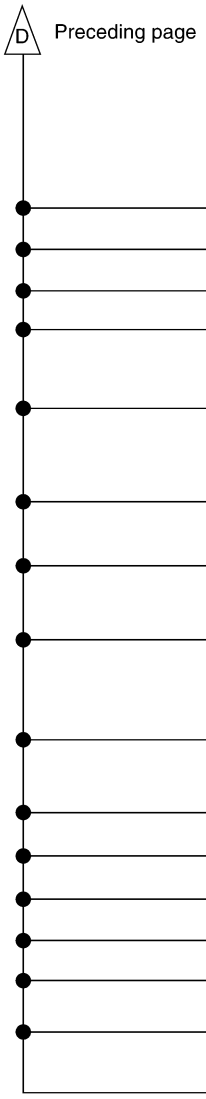

CON-NECTOR NUMBER	CONNECT TO
E23	Hood switch
E30	Washer level sensor
E33	Horn (Low)
E36	Horn (High)
E40	Front combination lamp LH (Terminal No.1) ・Turn signal ・Parking ・Side marker
E40	Front combination lamp LH (Terminal No.4) ・Headlamp (High) (For U.S.A)
E40	Front combination lamp LH (Terminal No.8) ・Headlamp (Low)
E41	Front combination lamp LH (Terminal No.3) ・Headlamp (High) (For U.S.A) ・Headlamp (Low) (For U.S.A)
E41	Front combination lamp LH (Terminal No.4) ・Turn signal ・Parking ・Side marker
E44	Brake fluid level switch
E51	ABS actuator and electric unit (Terminal No.16)
E51	ABS actuator and electric unit (Terminal No.30)
E52	Front wiper motor
E111	Stop lamp switch (With A/T)
E118	VDC/TCS/ABS control unit (Terminal No.28)
E118	VDC/TCS/ABS control unit (Terminal No.29)

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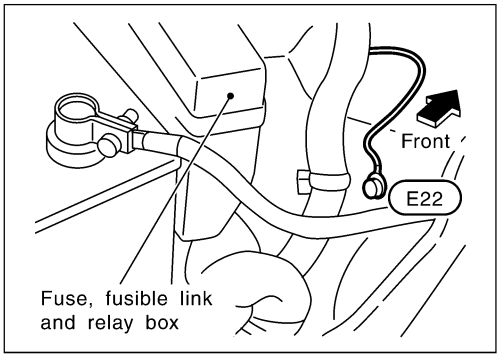
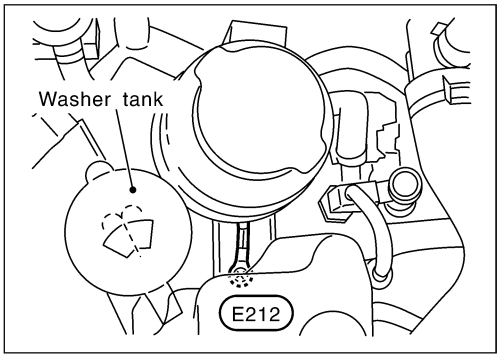
CON-NECTOR NUMBER	CONNECT TO
E37	Shield wire (Crash zone sensor)

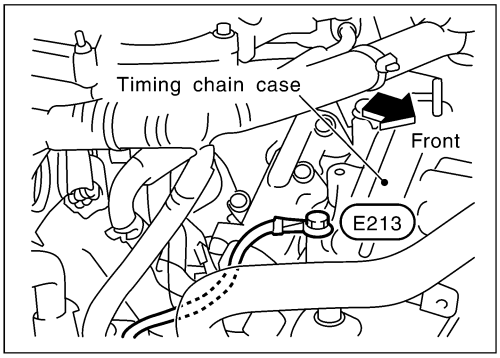
E22
Body ground



CON-NECTOR NUMBER	CONNECT TO
E211	Alternator (E)

E212
Body ground





E213
Engine ground

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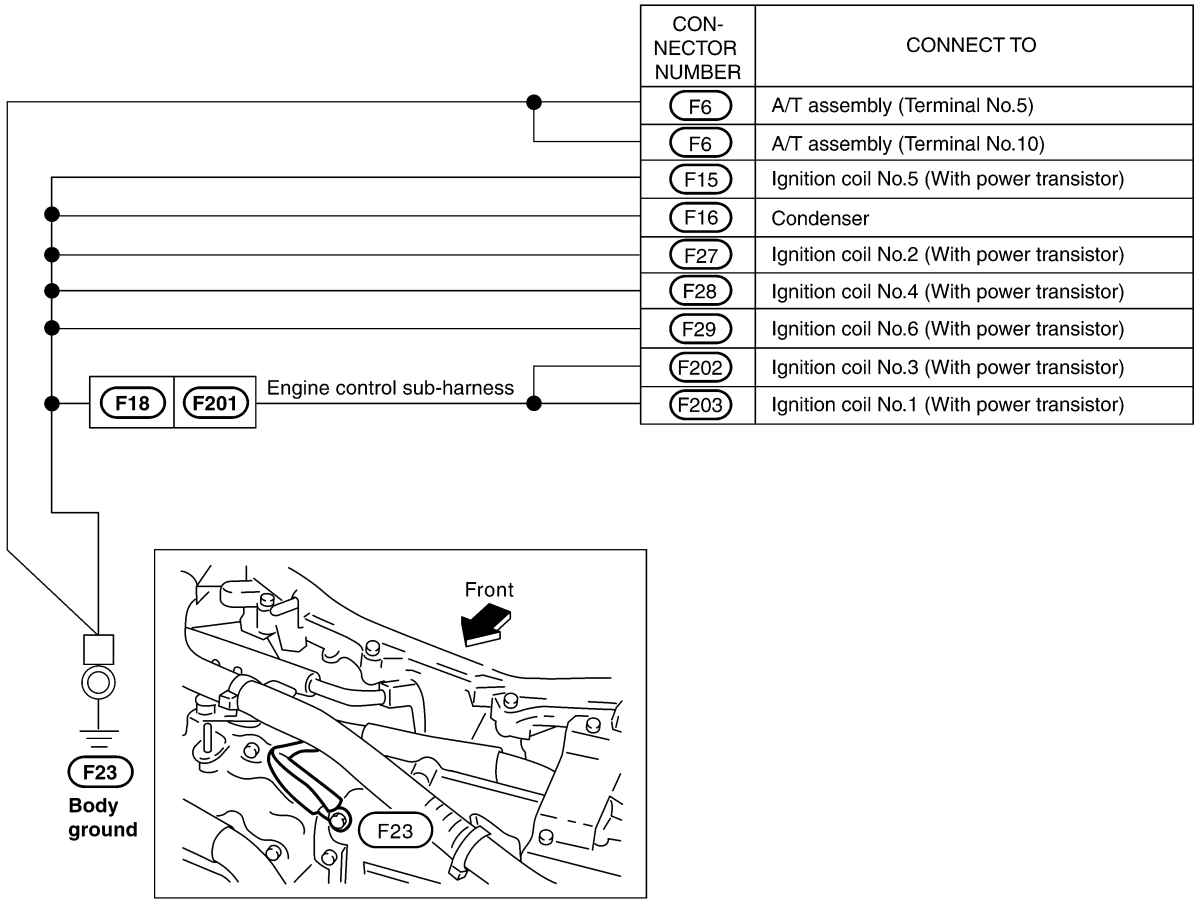
ENGINE CONTROL HARNESS



CON-NECTOR NUMBER	CONNECT TO
F6	A/T assembly (Terminal No.5)
F6	A/T assembly (Terminal No.10)
F15	Ignition coil No.5 (With power transistor)
F16	Condenser
F27	Ignition coil No.2 (With power transistor)
F28	Ignition coil No.4 (With power transistor)
F29	Ignition coil No.6 (With power transistor)
F202	Ignition coil No.3 (With power transistor)
F203	Ignition coil No.1 (With power transistor)

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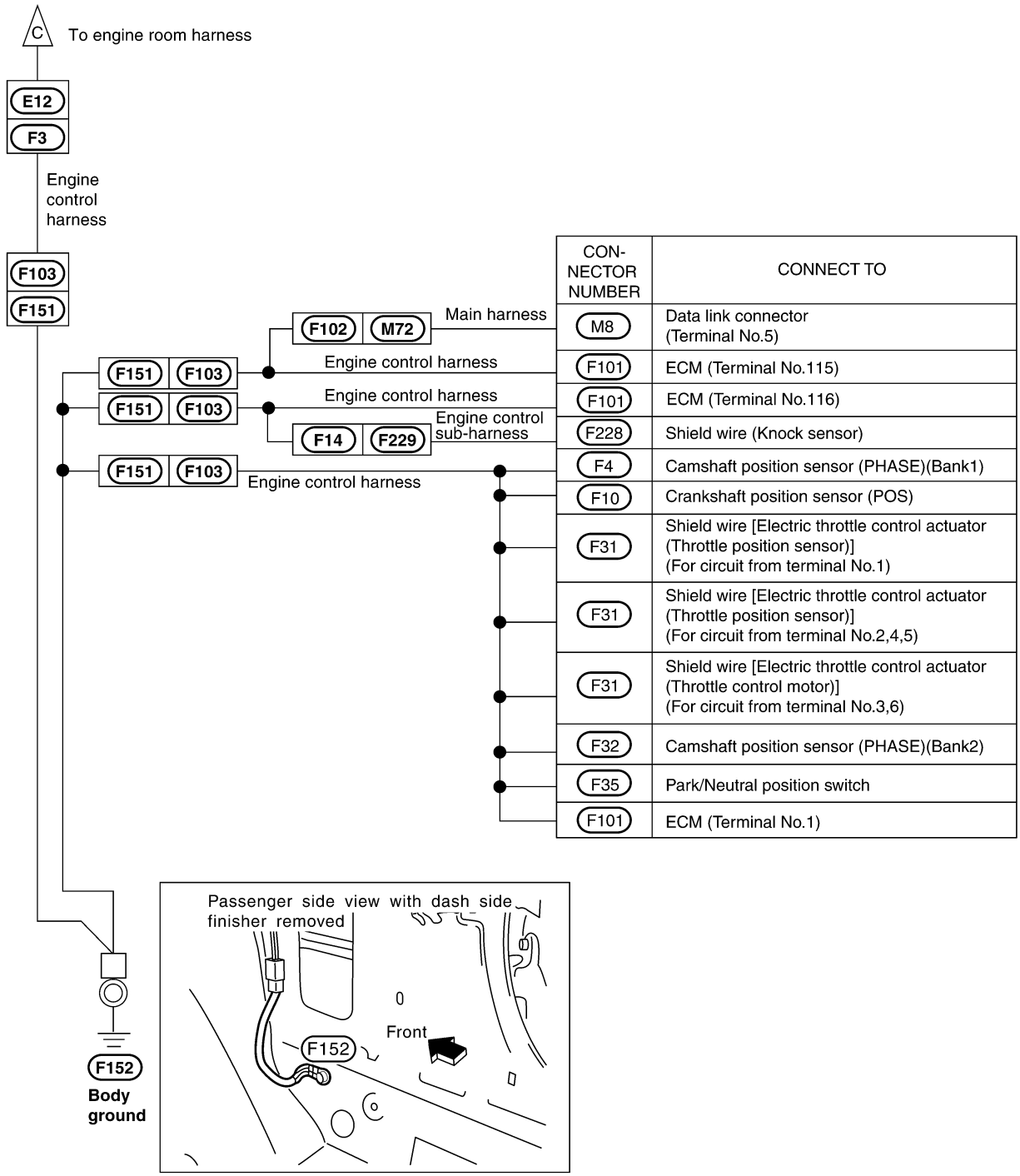
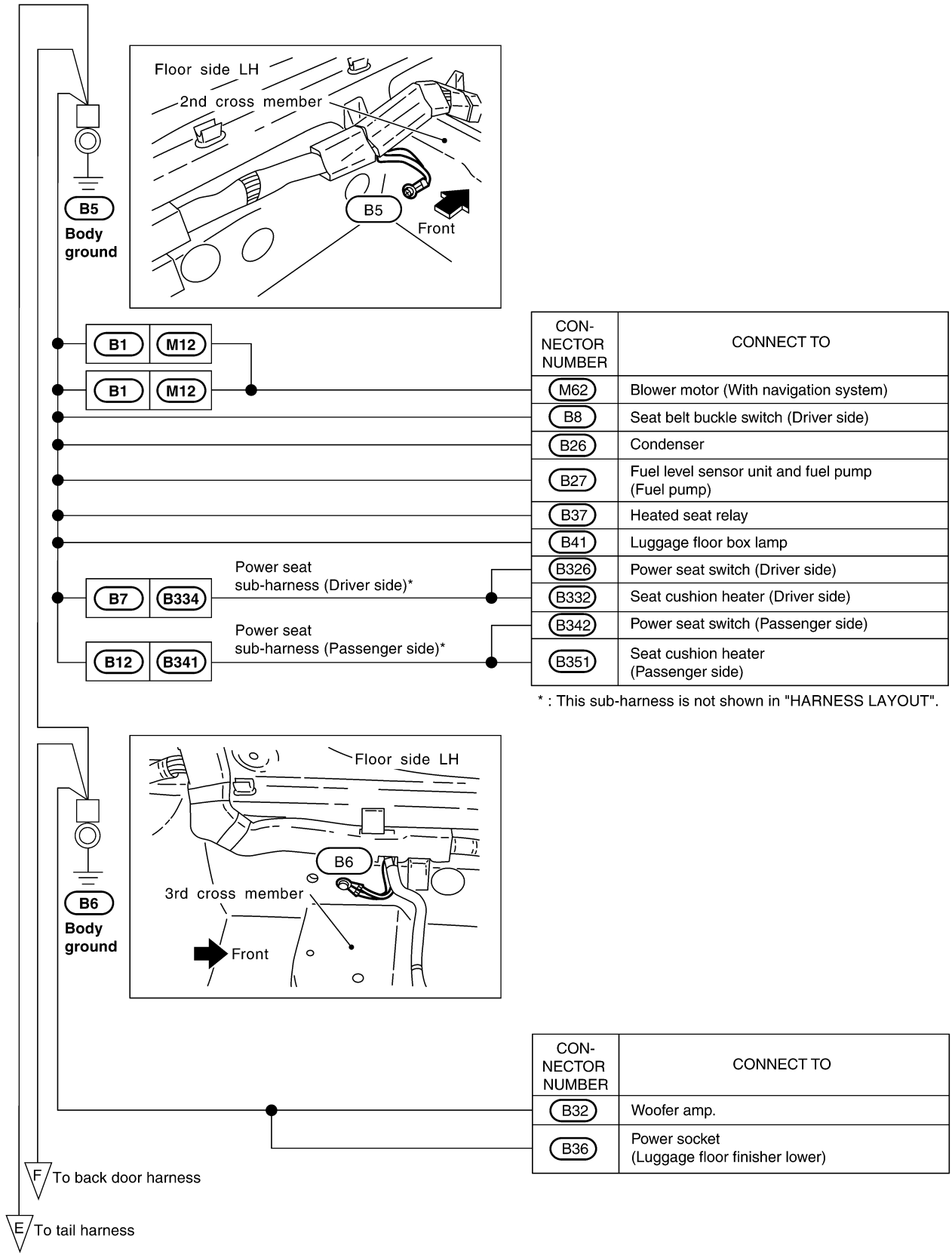


CON-NECTOR NUMBER	CONNECT TO
M8	Data link connector (Terminal No.5)
F101	ECM (Terminal No.115)
F101	ECM (Terminal No.116)
F228	Shield wire (Knock sensor)
F4	Camshaft position sensor (PHASE)(Bank1)
F10	Crankshaft position sensor (POS)
F31	Shield wire [Electric throttle control actuator (Throttle position sensor)] (For circuit from terminal No.1)
F31	Shield wire [Electric throttle control actuator (Throttle position sensor)] (For circuit from terminal No.2,4,5)
F31	Shield wire [Electric throttle control actuator (Throttle control motor)] (For circuit from terminal No.3,6)
F32	Camshaft position sensor (PHASE)(Bank2)
F35	Park/Neutral position switch
F101	ECM (Terminal No.1)

CKIT0458E

BODY HARNESS
Coupe Models



CONNECTOR NUMBER	CONNECT TO
M62	Blower motor (With navigation system)
B8	Seat belt buckle switch (Driver side)
B26	Condenser
B27	Fuel level sensor unit and fuel pump (Fuel pump)
B37	Heated seat relay
B41	Luggage floor box lamp
B326	Power seat switch (Driver side)
B332	Seat cushion heater (Driver side)
B342	Power seat switch (Passenger side)
B351	Seat cushion heater (Passenger side)

* : This sub-harness is not shown in "HARNESS LAYOUT".

CONNECTOR NUMBER	CONNECT TO
B32	Woofer amp.
B36	Power socket (Luggage floor finisher lower)

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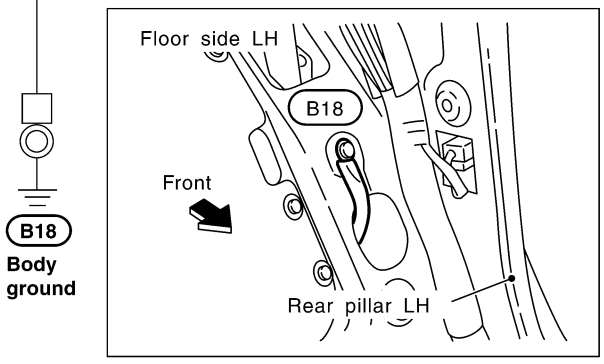
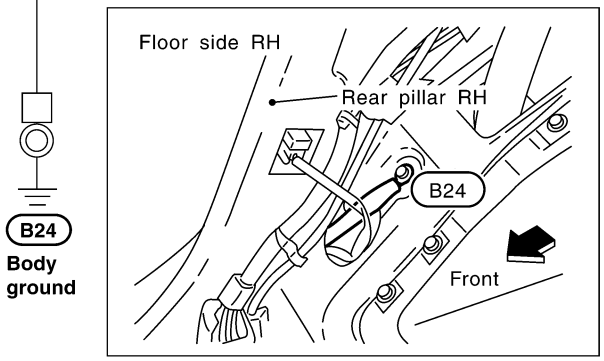
CON-NECTOR NUMBER	CONNECT TO
B15	Shield wire [LH side air bag (Satellite) sensor]



CON-NECTOR NUMBER	CONNECT TO
B21	Shield wire [RH side air bag (Satellite) sensor]



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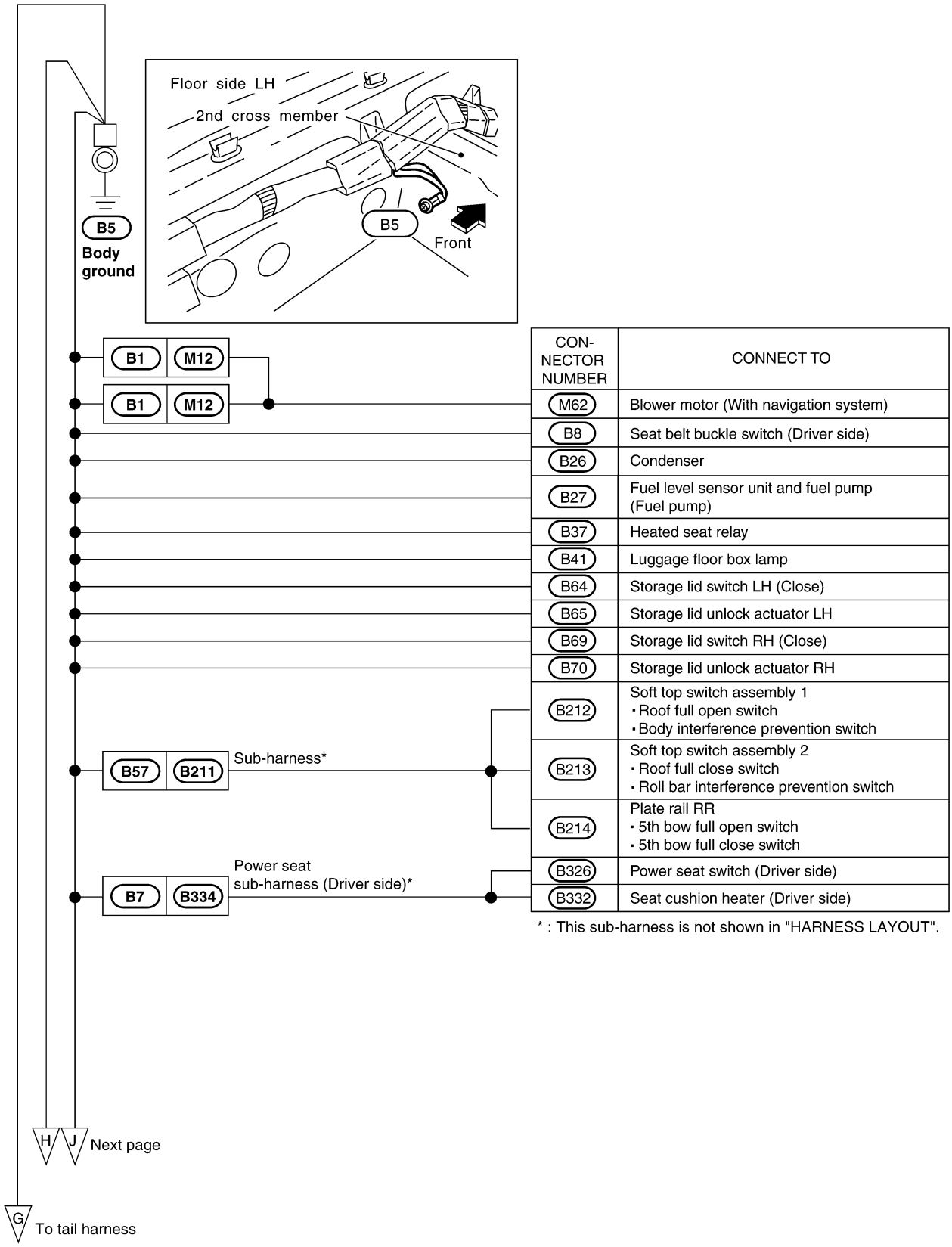
Roadster Models



CONNECTOR NUMBER	CONNECT TO
M62	Blower motor (With navigation system)
B8	Seat belt buckle switch (Driver side)
B26	Condenser
B27	Fuel level sensor unit and fuel pump (Fuel pump)
B37	Heated seat relay
B41	Luggage floor box lamp
B64	Storage lid switch LH (Close)
B65	Storage lid unlock actuator LH
B69	Storage lid switch RH (Close)
B70	Storage lid unlock actuator RH
B212	Soft top switch assembly 1 ・Roof full open switch ・Body interference prevention switch
B213	Soft top switch assembly 2 ・Roof full close switch ・Roll bar interference prevention switch
B214	Plate rail RR ・5th bow full open switch ・5th bow full close switch
B326	Power seat switch (Driver side)
B332	Seat cushion heater (Driver side)

* : This sub-harness is not shown in "HARNESS LAYOUT".

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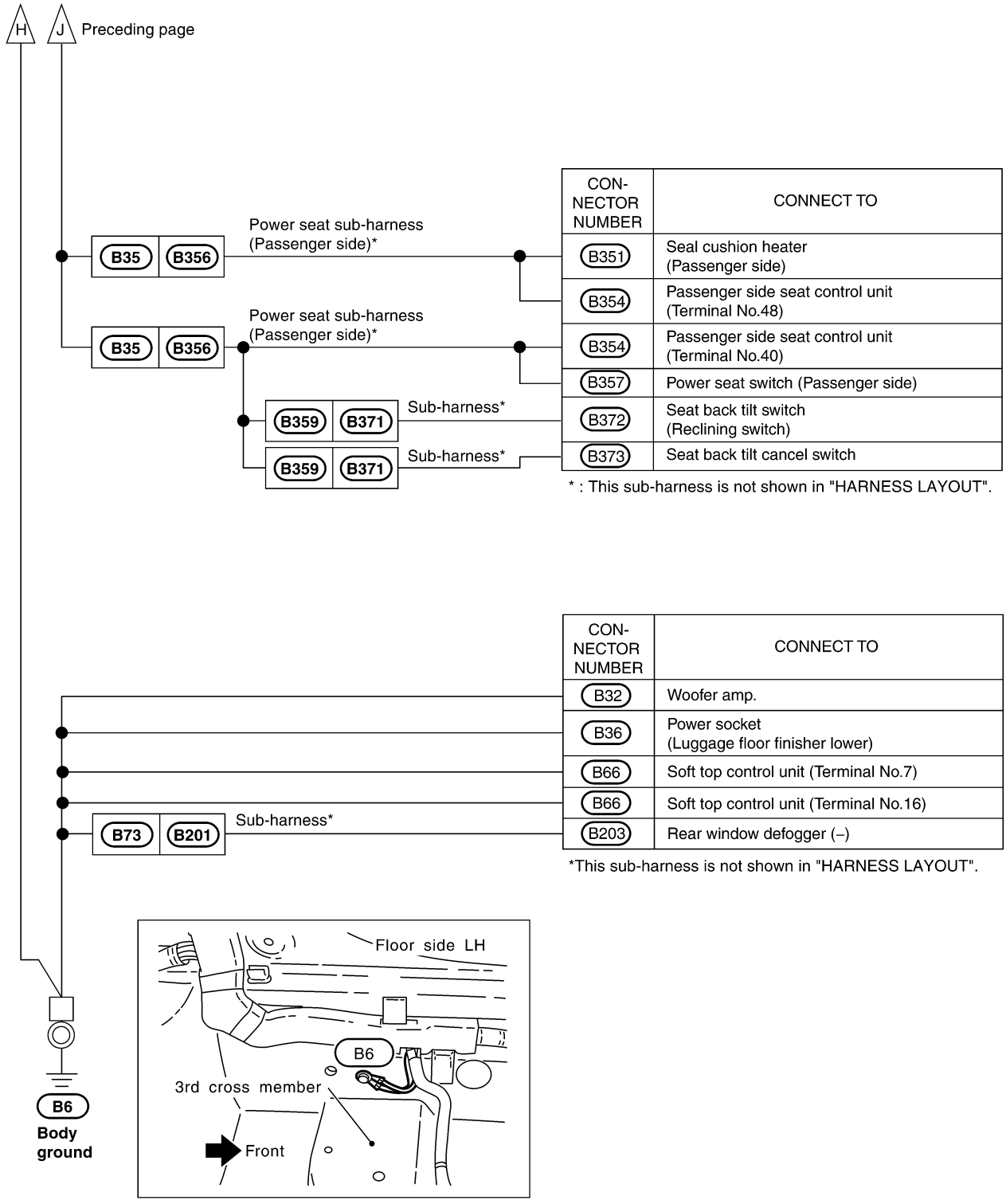


CON-NECTOR NUMBER	CONNECT TO
B351	Seal cushion heater (Passenger side)
B354	Passenger side seat control unit (Terminal No.48)
B354	Passenger side seat control unit (Terminal No.40)
B357	Power seat switch (Passenger side)
B372	Seat back tilt switch (Reclining switch)
B373	Seat back tilt cancel switch

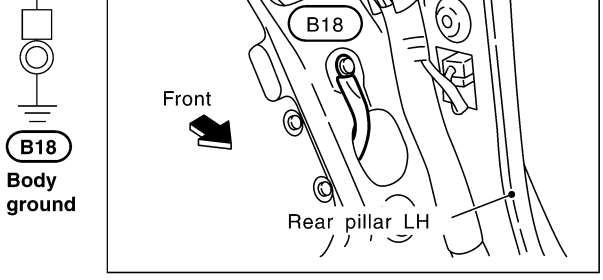
* : This sub-harness is not shown in "HARNESS LAYOUT".

CON-NECTOR NUMBER	CONNECT TO
B32	Woofer amp.
B36	Power socket (Luggage floor finisher lower)
B66	Soft top control unit (Terminal No.7)
B66	Soft top control unit (Terminal No.16)
B203	Rear window defogger (–)

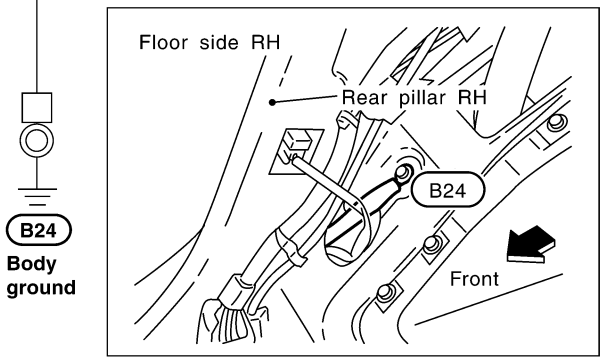
*This sub-harness is not shown in "HARNESS LAYOUT".

CKIT0470E

CON-NECTOR NUMBER	CONNECT TO
B15	Shield wire [LH side air bag (Satellite) sensor]



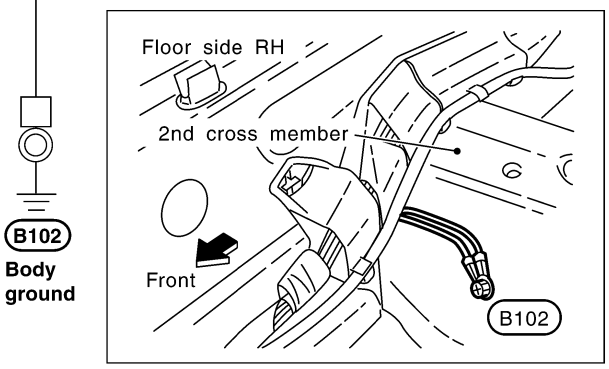
CON-NECTOR NUMBER	CONNECT TO
B21	Shield wire [RH side air bag (Satellite) sensor]



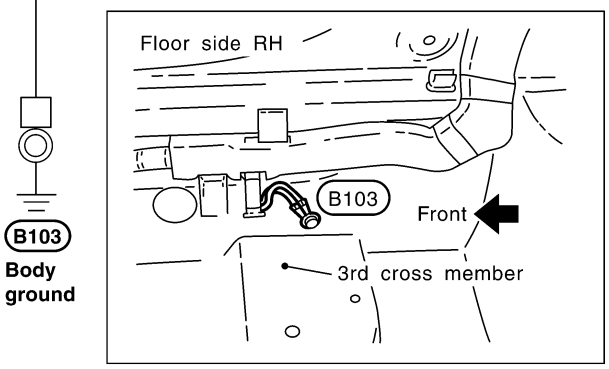
CKIT0174E

BODY NO.2 HARNESS

CON-NECTOR NUMBER	CONNECT TO
B104	NAVI control unit (Terminal No.1)
B104	NAVI control unit (Terminal No.4)

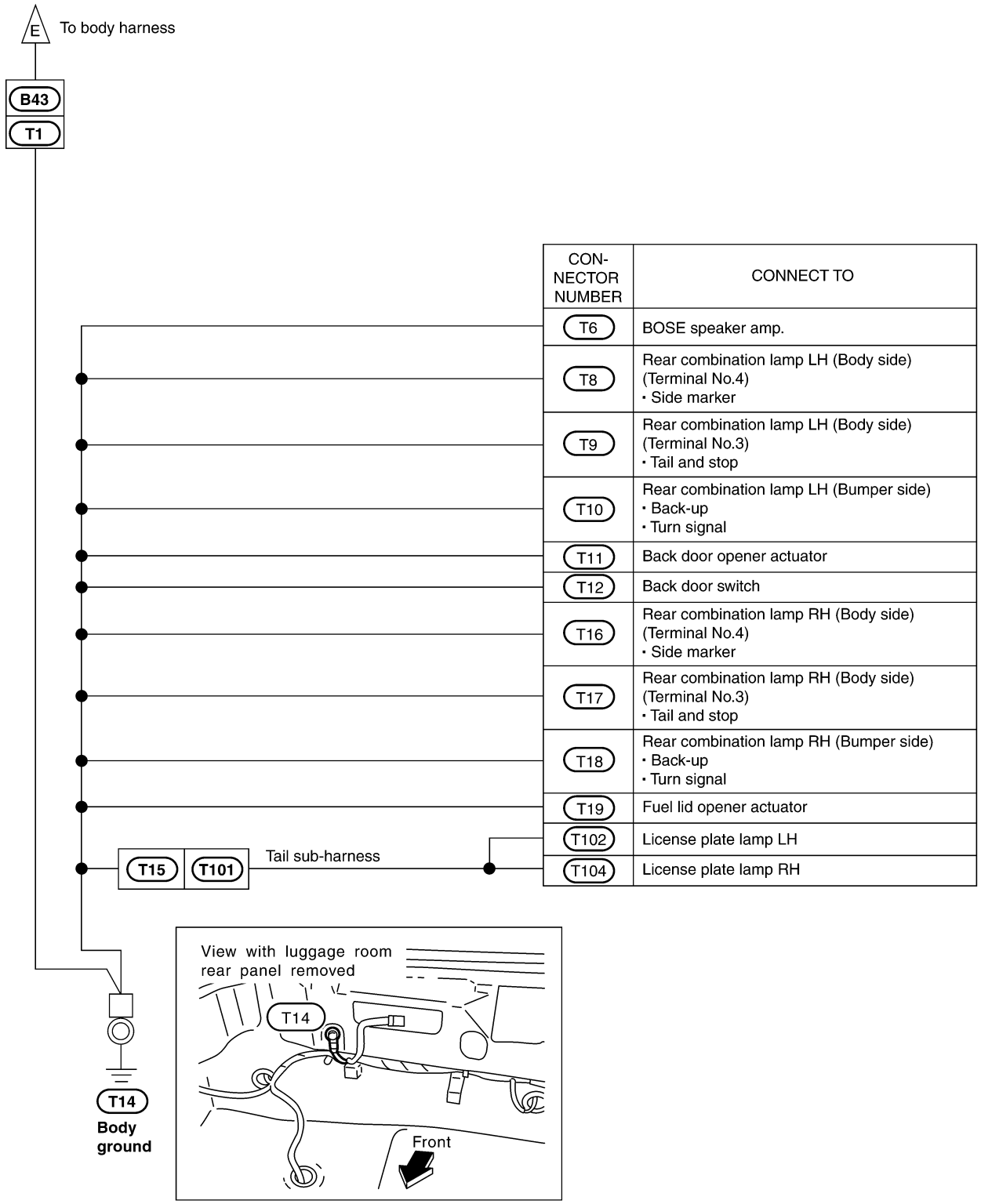


CON-NECTOR NUMBER	CONNECT TO
B104	NAVI control unit (Terminal No.5)
B105	NAVI control unit (Terminal No.32)
B105	NAVI control unit (Terminal No.34)



CKIT0360E

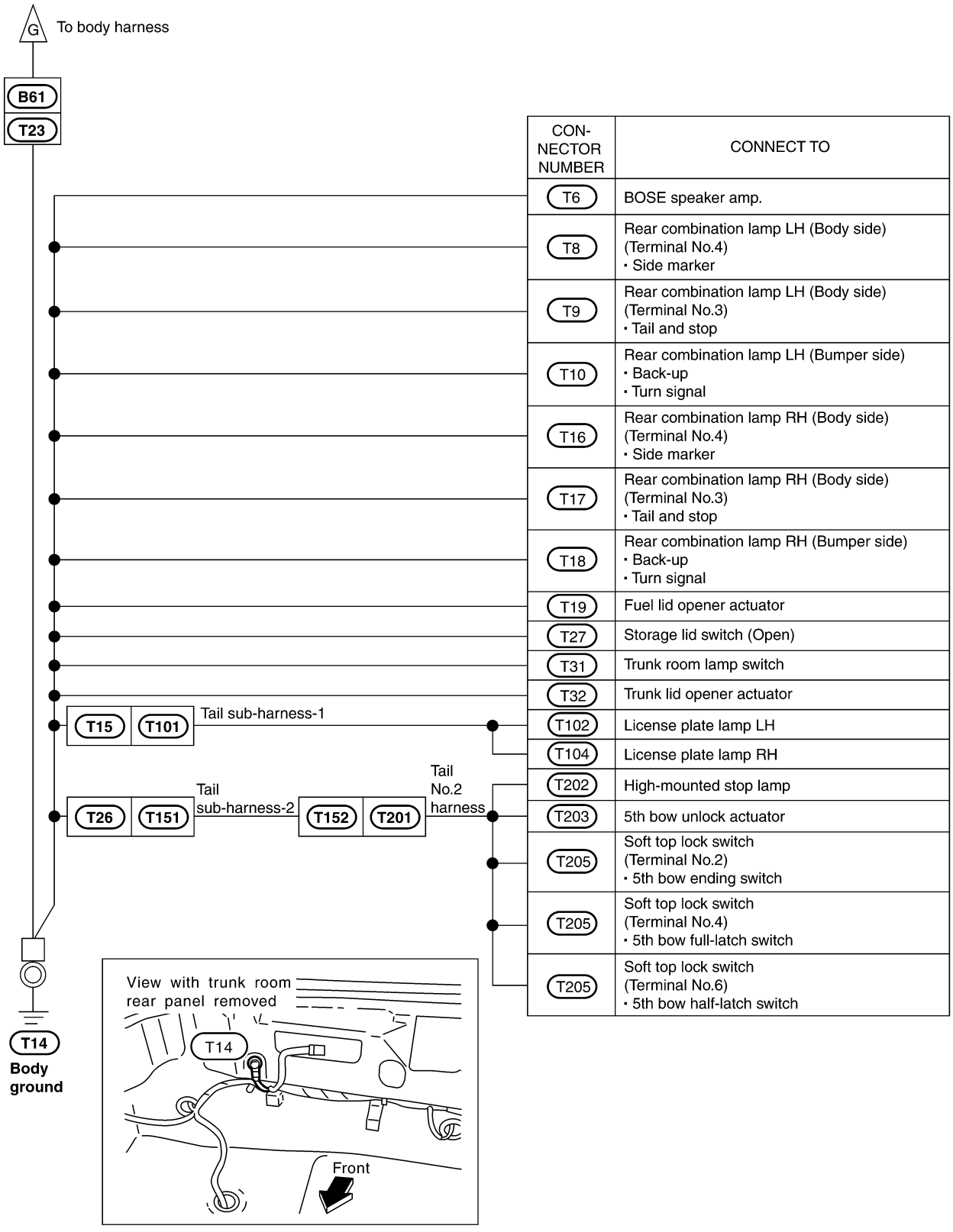
TAIL HARNESS
Coupe Models



CONNECTOR NUMBER	CONNECT TO
T6	BOSE speaker amp.
T8	Rear combination lamp LH (Body side) (Terminal No.4) ▪ Side marker
T9	Rear combination lamp LH (Body side) (Terminal No.3) ▪ Tail and stop
T10	Rear combination lamp LH (Bumper side) ▪ Back-up ▪ Turn signal
T11	Back door opener actuator
T12	Back door switch
T16	Rear combination lamp RH (Body side) (Terminal No.4) ▪ Side marker
T17	Rear combination lamp RH (Body side) (Terminal No.3) ▪ Tail and stop
T18	Rear combination lamp RH (Bumper side) ▪ Back-up ▪ Turn signal
T19	Fuel lid opener actuator
T102	License plate lamp LH
T104	License plate lamp RH

CKIT0462E

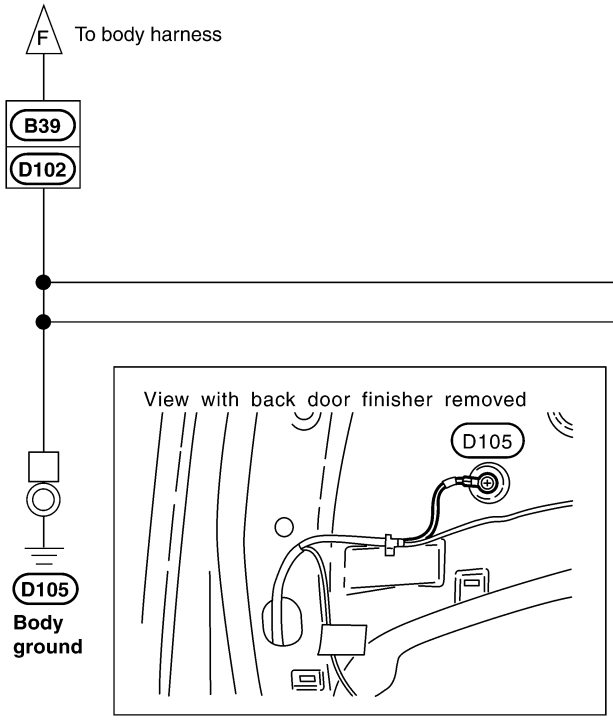
Roadster Models



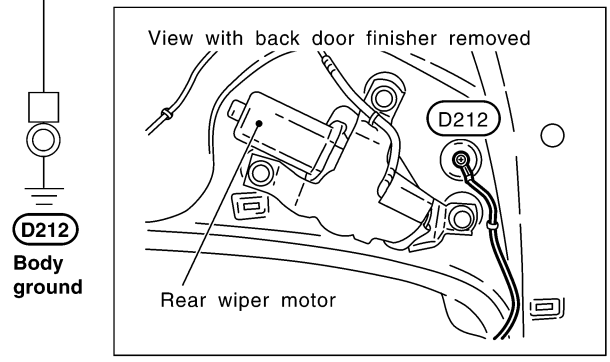
CON-NECTOR NUMBER	CONNECT TO
T6	BOSE speaker amp.
T8	Rear combination lamp LH (Body side) (Terminal No.4) ▪ Side marker
T9	Rear combination lamp LH (Body side) (Terminal No.3) ▪ Tail and stop
T10	Rear combination lamp LH (Bumper side) ▪ Back-up ▪ Turn signal
T16	Rear combination lamp RH (Body side) (Terminal No.4) ▪ Side marker
T17	Rear combination lamp RH (Body side) (Terminal No.3) ▪ Tail and stop
T18	Rear combination lamp RH (Bumper side) ▪ Back-up ▪ Turn signal
T19	Fuel lid opener actuator
T27	Storage lid switch (Open)
T31	Trunk room lamp switch
T32	Trunk lid opener actuator
T102	License plate lamp LH
T104	License plate lamp RH
T202	High-mounted stop lamp
T203	5th bow unlock actuator
T205	Soft top lock switch (Terminal No.2) ▪ 5th bow ending switch
T205	Soft top lock switch (Terminal No.4) ▪ 5th bow full-latch switch
T205	Soft top lock switch (Terminal No.6) ▪ 5th bow half-latch switch

CKIT0471E

BACK DOOR HARNESS



CON-NECTOR NUMBER	CONNECT TO
D103	High-mounted stop lamp
D106	Rear wiper motor



CON-NECTOR NUMBER	CONNECT TO
D211	Rear window defogger (-)

CKIT0464E

HARNESS

PFP:00011

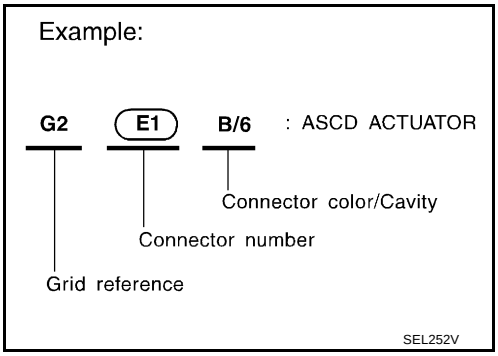
Harness Layout

AKS0012Q

HOW TO READ HARNESS LAYOUT

The following Harness Layouts use a map style grid to help locate connectors on the drawings:

- Main Harness
- Engine Room Harness (Engine Compartment)
- Engine Control Harness
- Body Harness
- Tail Harness



To use the grid reference

1. Find the desired connector number on the connector list.
2. Find the grid reference.
3. On the drawing, find the crossing of the grid reference letter column and number row.
4. Find the connector number in the crossing zone.
5. Follow the line (if used) to the connector.

CONNECTOR SYMBOL

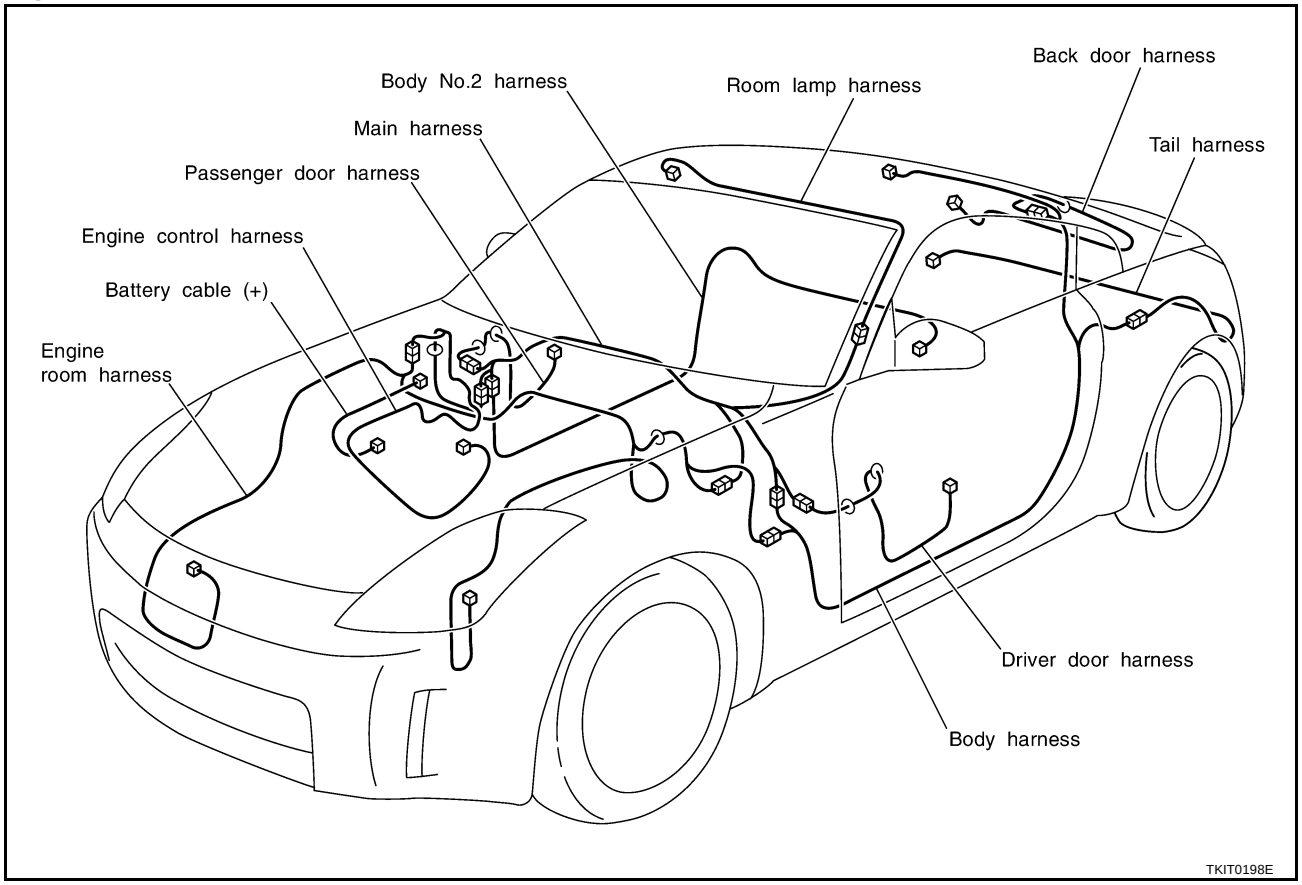
Main symbols of connector (in Harness Layout) are indicated in the below.

Connector type	Water proof type		Standard type	
	Male	Female	Male	Female
• Cavity: Less than 4 • Relay connector				
• Cavity: From 5 to 8				
• Cavity: More than 9				
• Ground terminal etc.	—			

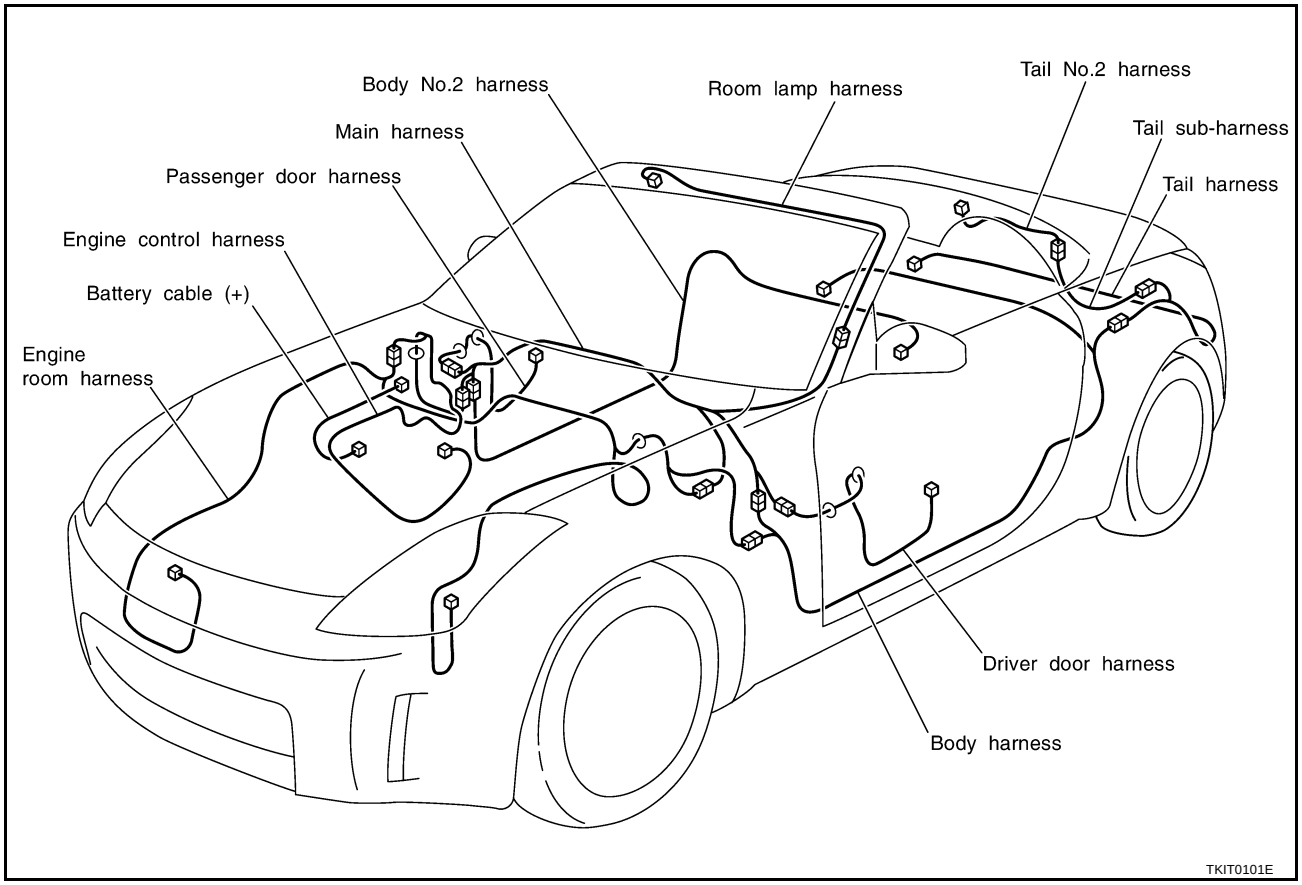
CKIT0108E

OUTLINE

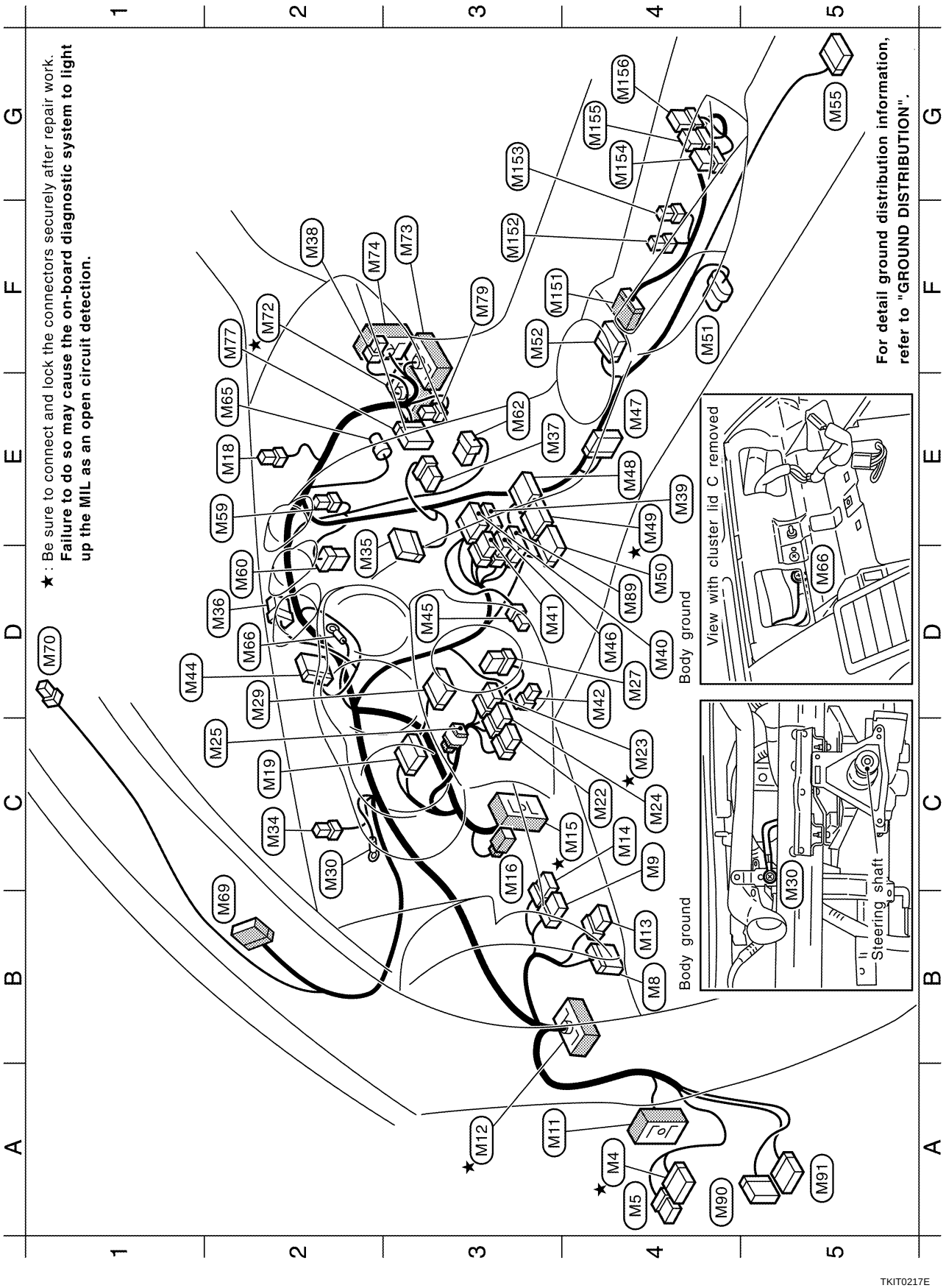
Coupe Models



Roadster Models



MAIN HARNESS



TKIT0217E

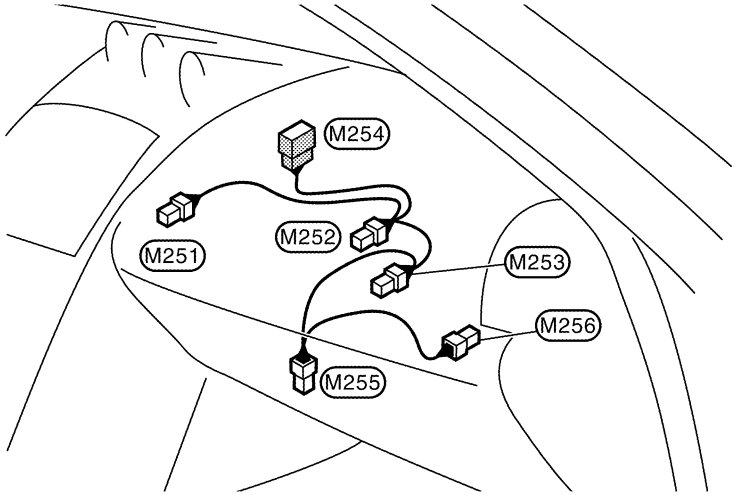
A4 ★	M4	W/16	:	Fuse block (J/B)
A4	M5	W/8	:	Fuse block (J/B)
B4	M8	W/16	:	Data link connector
C4	M9	GY/6	:	VDC off switch (With VDC system)
		GY/6	:	TCS off switch (With TCS without VDC system)
A3	M11	SMJ	:	To D1
A3 ★	M12	SMJ	:	To B1
B4	M13	GY/6	:	Fuel lid opener switch
C4	M14	W/6	:	Soft top switch (For Roadster models)
C4 ★	M15	SMJ	:	To E108
C3	M16	Y/4	:	To E109
E2	M18	B/2	:	Sunload sensor
C2	M19	W/24	:	Combination meter
C4	M22	W/8	:	Steering angle sensor (For VDC system)
C4 ★	M23	GY/8	:	Combination switch (Spiral cable)
C4	M24	Y/6	:	Combination switch (Spiral cable)
C2	M25	BR/2	:	Key switch
D4	M27	W/8	:	NATS antenna amp.
D2	M29	W/16	:	Combination switch
C2	M30	—	:	Body ground
C2	M34	BR/2	:	Security indicator lamp
D2	M35	GY/24	:	Display unit (With navigation system)
D2	M36	W/8	:	Power cluster lid amp. (With navigation system)
E3	M37	W/8	:	NAVI switch (With navigation system)
F2	M38	B/2	:	Power socket
E4	M39	W/16	:	Audio unit (With navigation system and with BOSE system)
D4	M40	W/10	:	Audio unit
D3	M41	W/6	:	Audio unit
D4	M42	W/2	:	In-vehicle sensor
D1	M44	W12	:	Triple meter
D3	M45	BR/2	:	Antenna amp. (Via sub-harness)
D4	M46	BR/8	:	Audio unit (With navigation system and without BOSE system)
E4	M47	W/10	:	A/T device (For A/T)
E4	M48	GY/20	:	Unified meter and A/C amp.
E4 ★	M49	GY/16	:	Unified meter and A/C amp.
D4	M50	W/24	:	Unified meter and A/C amp.
F4	M51	B/6	:	Yaw rate / side G sensor (For VDC system)
F3	M52	W/12	:	To M151
G5	M55	Y/28	:	Air bag diagnosis sensor unit
E2	M59	L/4	:	Fuel lid opener relay
D2	M60	W/6	:	To M254
E3	M62	W/6	:	Blower motor
E2	M65	Y/4	:	Front passenger air bag module
D2	M66	—	:	Body ground
B2	M69	W/10	:	To R1
D1	M70	W/4	:	To R51
F2 ★	M72	SMJ	:	To F102
F3	M73	SMJ	:	To B101 (With navigation system)
F2	M74	SMJ	:	To D31
F2	M77	W/24	:	Low tire pressure warning control unit
F3	M79	W/2	:	Tire pressure warning check connector
D4	M89	W/12	:	Audio unit (With BOSE system)
A4	M90	W/40	:	BCM (Body control module)
A5	M91	B/15	:	BCM (Body control module)

Switch sub-harness

F3	M151	W/12	:	To M52
F3	M152	W/2	:	Ashtray illumination
G3	M153	W/4	:	Hazard switch
G4	M154	W/6	:	Heated seat switch (Driver side) (With heated seat)
G4	M155	BR/6	:	Heated seat switch (Passenger side) (With heated seat)
G4	M156	W/6	:	Not used

A/C sub-harness

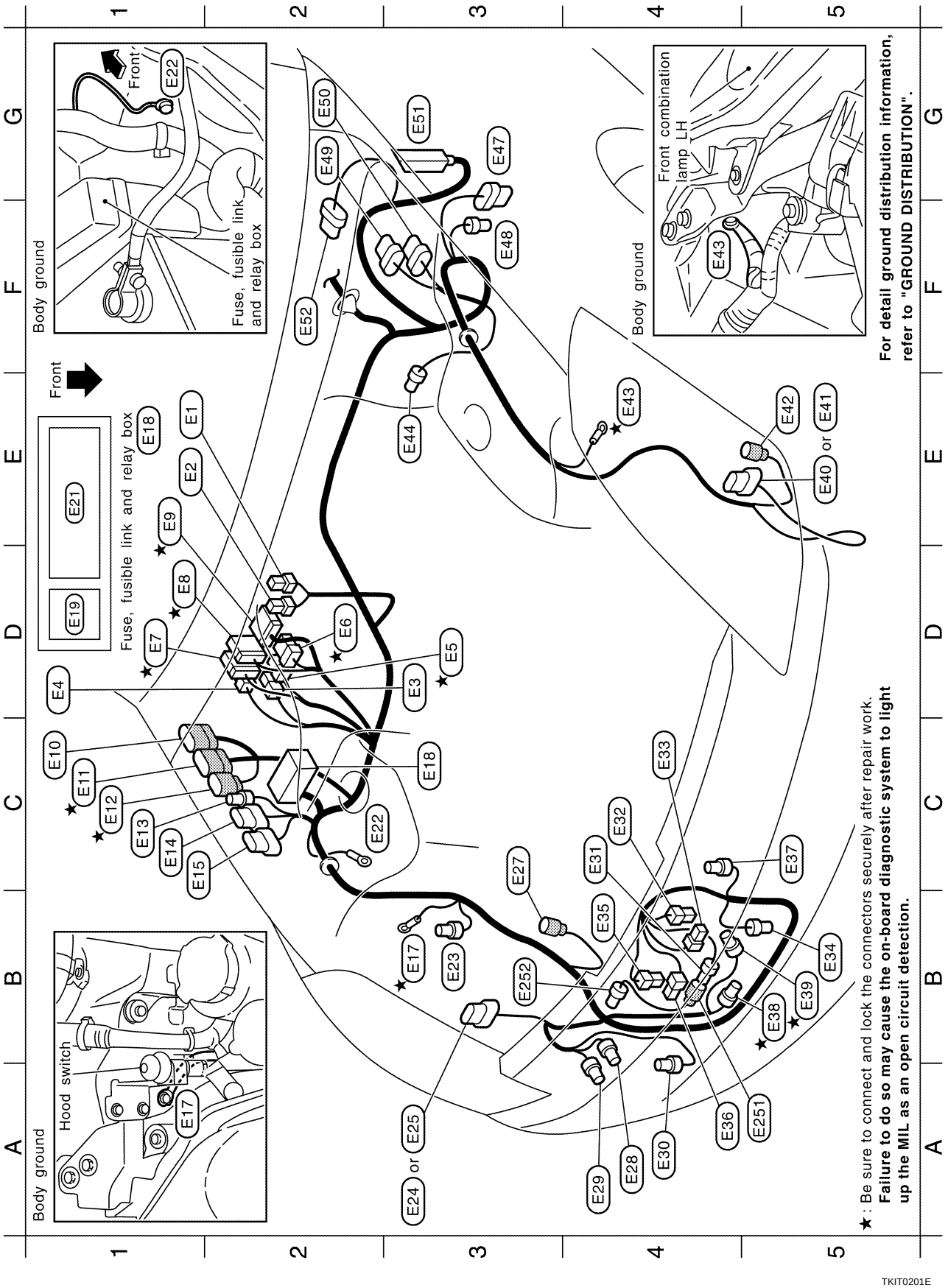
M251	W/3	:	Not used
M252	W/3	:	Mode door motor
M253	W/3	:	Air mix door motor
M254	W/6	:	To M60
M255	W/4	:	Intake sensor
M256	W/3	:	Intake door motor



★: Be sure to connect and lock the connectors securely after repair work. **Failure to do so may cause the on-board diagnostic system to light up the MIL as an open circuit detection.**

TKIT0218E

ENGINE ROOM HARNESS
Engine Compartment



TKIT0201E

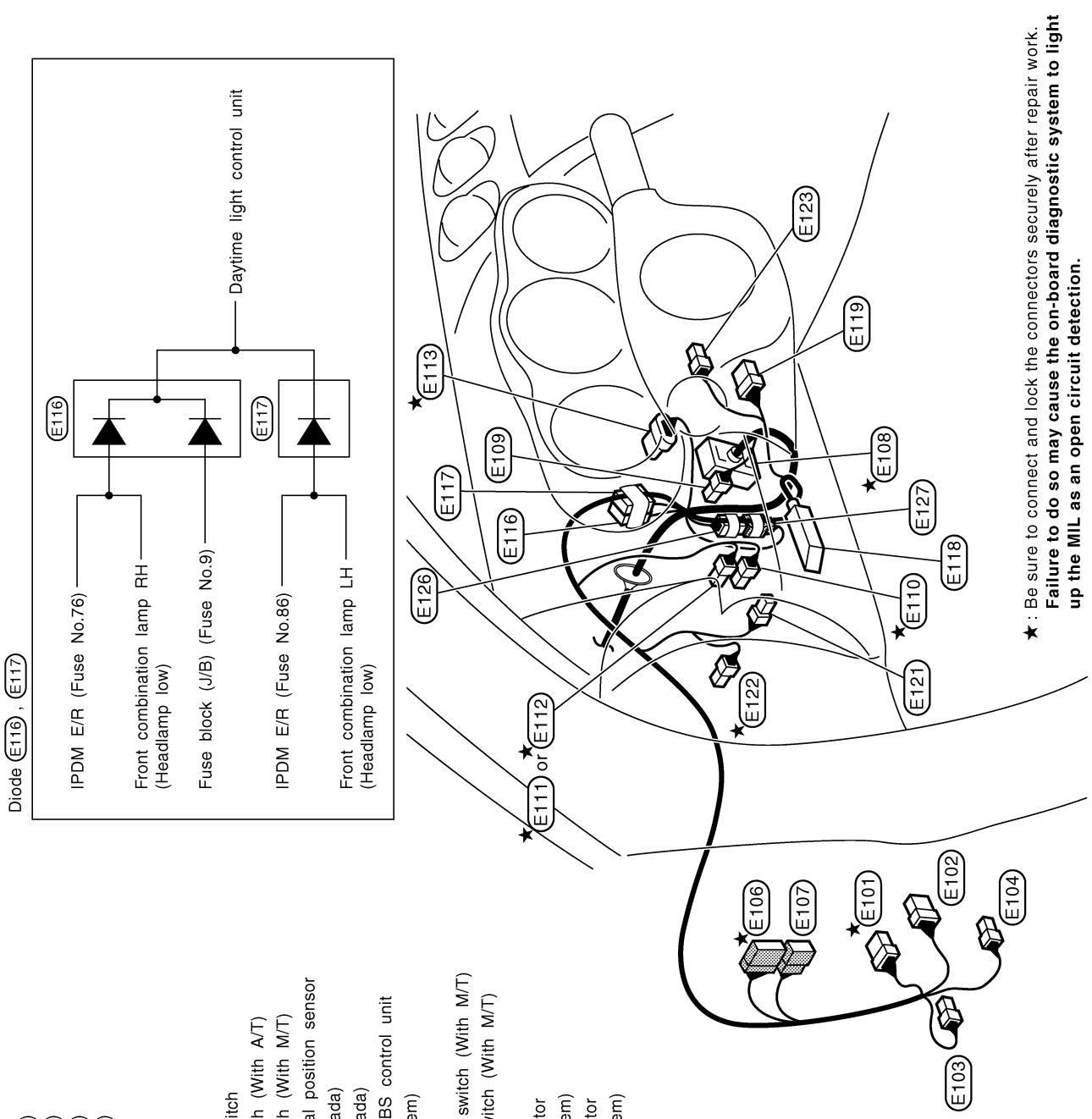
E1	(E1)	B/2	:	Fusible link holder
E1	(E2)	GY/2	:	Fusible link holder
D3	(E3)	B/2	:	IPDM E/R (Intelligent power distribution module engine room)
D1	(E4)	W/4	:	IPDM E/R (Intelligent power distribution module engine room)
D3 ★	(E5)	B/4	:	IPDM E/R (Intelligent power distribution module engine room)
D2 ★	(E6)	W/6	:	IPDM E/R (Intelligent power distribution module engine room)
D1 ★	(E7)	GY/16	:	IPDM E/R (Intelligent power distribution module engine room)
D1 ★	(E8)	W/12	:	IPDM E/R (Intelligent power distribution module engine room)
E1 ★	(E9)	W/16	:	IPDM E/R (Intelligent power distribution module engine room)
C1	(E10)	GY/9	:	To (F1)
C1 ★	(E11)	GY/10	:	To (F2)
C1 ★	(E12)	GY/8	:	To (F3)
C1	(E13)	GY/4	:	Daytime light control unit (For Canada)
C1	(E14)	GY/6	:	Daytime light control unit (For Canada)
C1	(E15)	GY/8	:	Daytime light control unit (For Canada)
B3 ★	(E17)	—	:	Body ground
C3	(E18)	—	:	Fuse,fusible link and relay box
D1	(E19)	L/4	:	Back-up lamp relay (With A/T)
E1	(E21)	—	:	Fuse and fusible link block
C2	(E22)	—	:	Body ground
B3	(E23)	GY/2	:	Hood switch
A3	(E24)	GY/8	:	Front combination lamp RH (With xenon headlamp)
A3	(E25)	GY/6	:	Front combination lamp RH (Without xenon headlamp)
C3	(E27)	GY/2	:	Front wheel sensor RH
A4	(E28)	GY/2	:	Rear washer motor
A4	(E29)	GY/2	:	Front washer motor
A4	(E30)	BR/2	:	Washer level sensor
C4	(E31)	B/3	:	To (E251)
C4	(E32)	B/1	:	Horn (Low)
C4	(E33)	B/1	:	Horn (Low)
B5	(E34)	B/2	:	Ambient sensor
B4	(E35)	B/1	:	Horn (High)
A4	(E36)	B/1	:	Horn (High)
C5	(E37)	Y/2	:	Crash zone sensor
B5 ★	(E38)	GY/4	:	Cooling fan motor-1 (Via sub-harness)
B5 ★	(E39)	GY/4	:	Cooling fan motor-2 (Via sub-harness)
E5	(E40)	GY/8	:	Front combination lamp LH (With xenon headlamp)
E5	(E41)	GY/6	:	Front combination lamp LH (Without xenon headlamp)
E5	(E42)	B/2	:	Front wheel sensor LH
E4 ★	(E43)	—	:	Body ground
E3	(E44)	GY/2	:	Brake fluid level switch
G3	(E47)	B/8	:	VDC relay box (With VDC system)
F3	(E48)	B/2	:	VDC relay box (With VDC system)
G2	(E49)	GY/8	:	VDC relay box (With VDC system)
G2	(E50)	GY/8	:	VDC relay box (With VDC system)
G3	(E51)	SMJ	:	ABS actuator and electric unit (Without VDC system)
F2	(E52)	GY/5	:	Front wiper motor

Sub-harness

A5	(E251)	B/3	:	To (E31)
B3	(E252)	B/3	:	Refrigerant pressure sensor

★ : Be sure to connect and lock the connectors securely after repair work.
Failure to do so may cause the on-board diagnostic system to light up the MIL as an open circuit detection.

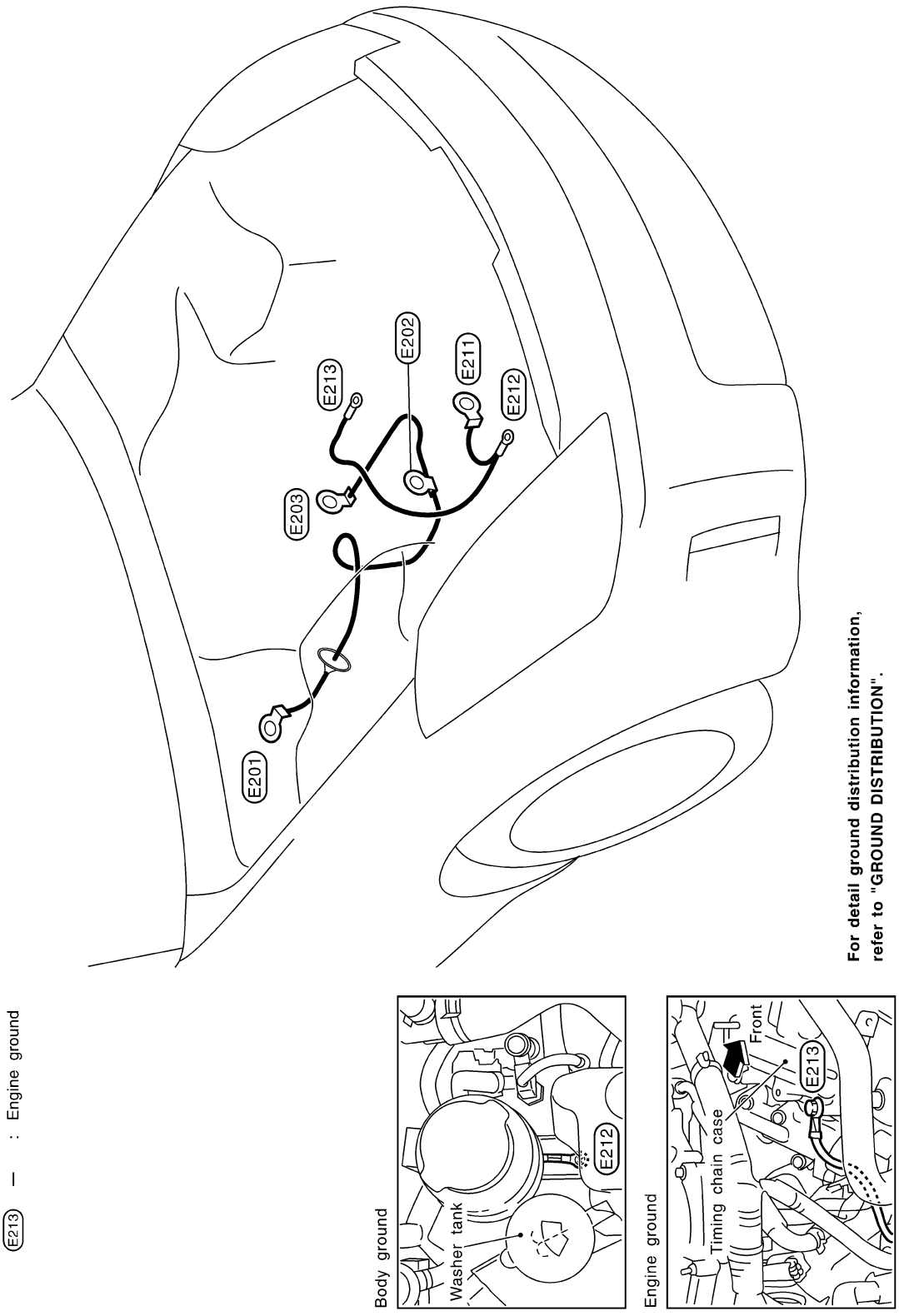
Passenger Compartment



★ E101 W/8 : Fuse block (J/B)
E102 W/6 : Fuse block (J/B)
E103 B/1 : Fuse block (J/B)
E104 B/2 : Fuse block (J/B)
★ E106 W/18 : To (B2)
E107 W/6 : To (B3)
★ E108 SMJ : To (M15)
E109 Y/4 : To (M16)
★ E110 BR/2 : ASCD brake switch
★ E111 W/4 : Stop lamp switch (With A/T)
★ E112 B/2 : Stop lamp switch (With M/T)
★ E113 GY/6 : Accelerator pedal position sensor
E116 -/3 : Diode (For Canada)
E117 W/2 : Diode (For Canada)
E118 SMJ : VDC / TCS / ABS control unit (With VDC system)
E119 W/6 : Ignition switch
E121 L/2 : Clutch interlock switch (With M/T)
★ E122 L/2 : ASCD clutch switch (With M/T)
E123 BR/2 : Microphone
E126 BR/2 : Jumping connector (With VDC system)
E127 BR/2 : Jumping connector (With VDC system)

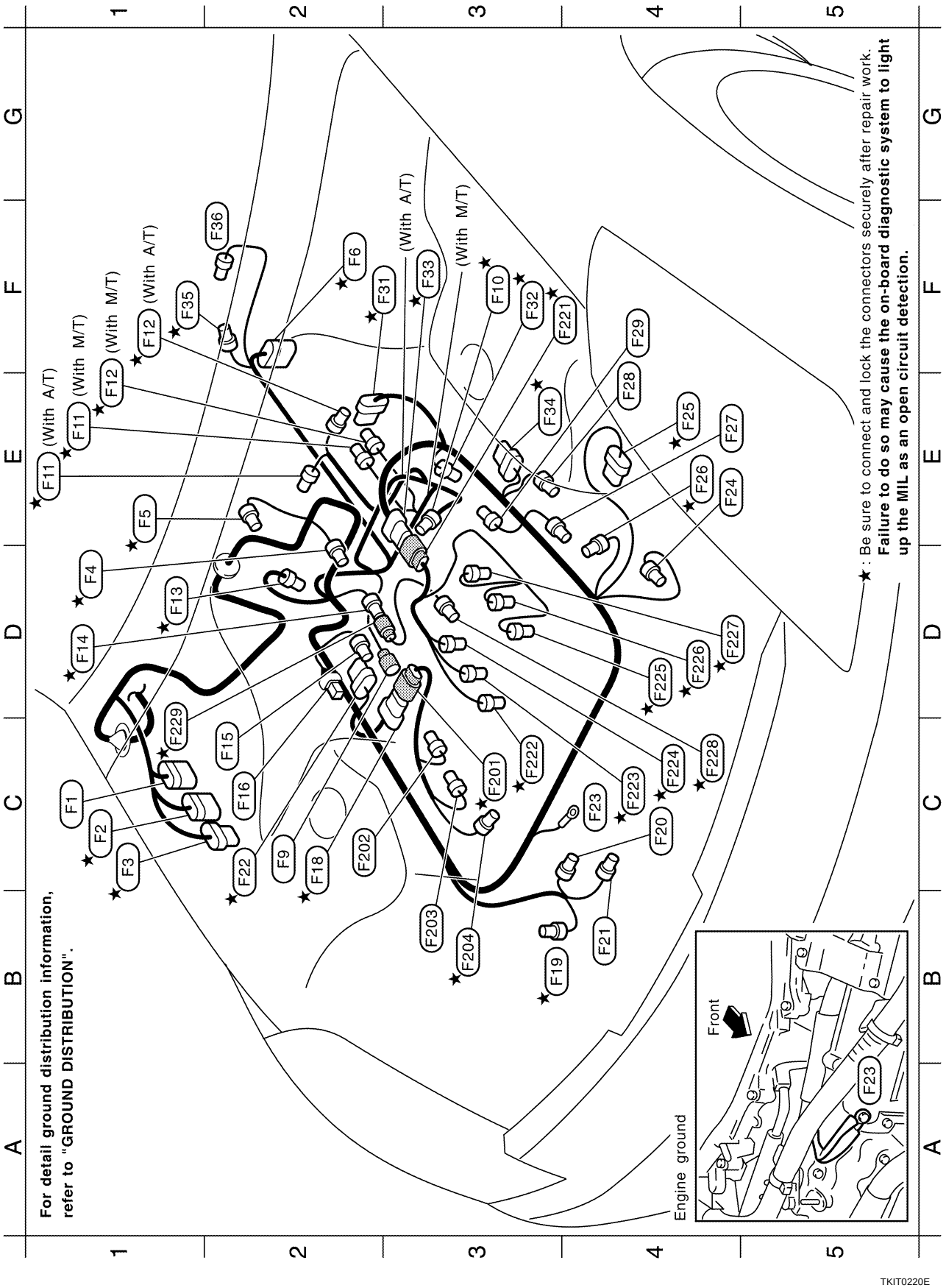
TKIM0198E

Battery Cable



CKIT0202E

ENGINE CONTROL HARNESS



TKIT0220E

C1	F1	GY/9	:	To E10
C1 ★	F2	GY/10	:	To E11
C1 ★	F3	GY/8	:	To E12
D1 ★	F4	GY/3	:	Camshaft position sensor (PHASE) (Bank1)
E1 ★	F5	GY/2	:	EVAP canister purge volume control solenoid valve
F2 ★	F6	GY/10	:	A/T assembly (With A/T)
C2	F9	GY/1	:	Starter motor
F3 ★	F10	B/3	:	Crankshaft position sensor (POS)
E1 ★	F11	B/4	:	Heated oxygen sensor 2 (Bank1)
E1,F1 ★	F12	GY/4	:	Heated oxygen sensor 2 (Bank2)
D1 ★	F13	GY/2	:	Engine coolant temperature sensor
D1 ★	F14	B/2	:	To F229
C2	F15	GY/3	:	Ignition coil No.5 (With power transistor)
C2	F16	W/2	:	Condenser
C2 ★	F18	B/6	:	To F201
B3 ★	F19	B/3	:	Power steering pressure sensor
C4	F20	GY/2	:	Alternator (S, L)
B4	F21	B/3	:	Oil pressure sensor
C2 ★	F22	B/6	:	Air fuel ratio (A/F) sensor 1 (Bank 1)
C4	F23	—	:	Engine ground
E4	F24	B/1	:	Compressor
E4 ★	F25	B/6	:	Mass air flow sensor
E4 ★	F26	GY/2	:	Intake valve timing control solenoid valve (Bank2)
E4	F27	GY/3	:	Ignition coil No.2 (With power transistor)
E4	F28	GY/3	:	Ignition coil No.4 (With power transistor)
E4	F29	GY/3	:	Ignition coil No.6 (With power transistor)
F2 ★	F31	GY/6	:	Electric throttle control actuator
F3 ★	F32	B/3	:	Camshaft position sensor (PHASE) (Bank2)
F3 ★	F33	GY/8	:	To F221
E3 ★	F34	B/6	:	Air fuel ratio (A/F) sensor 1 (Bank 2)
F1 ★	F35	B/2	:	Park/Neutral position switch (With M/T)
F2	F36	B/2	:	Back-up lamp switch (With M/T)

Engine control sub-harness-1

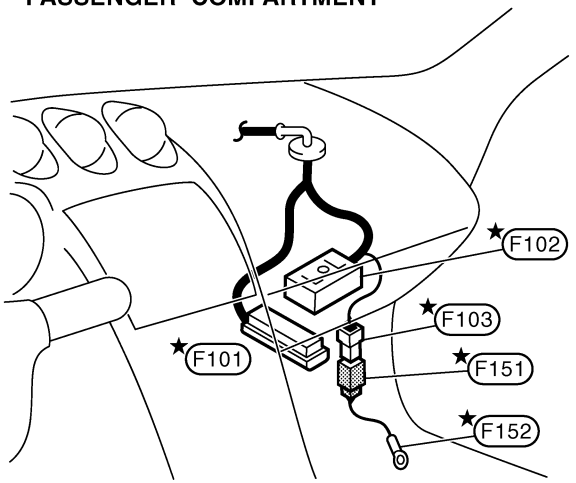
C3 ★	F201	L/6	:	To F18
C2	F202	GY/3	:	Ignition coil No.3 (With power transistor)
B3	F203	GY/3	:	Ignition coil No.1 (With power transistor)
B3 ★	F204	G/2	:	Intake valve timing control solenoid valve (Bank1)

Engine control sub-harness-2

F3 ★	F221	G/8	:	To F33
C3 ★	F222	GY/2	:	Injector No.1
C4 ★	F223	GY/2	:	Injector No.3
C4 ★	F224	GY/2	:	Injector No.5
D4 ★	F225	GY/2	:	Injector No.2
D4 ★	F226	GY/2	:	Injector No.4
D4 ★	F227	GY/2	:	Injector No.6
C4 ★	F228	L/2	:	Knock sensor
C1 ★	F229	SB/2	:	To F14

TKIM0199E

PASSENGER COMPARTMENT



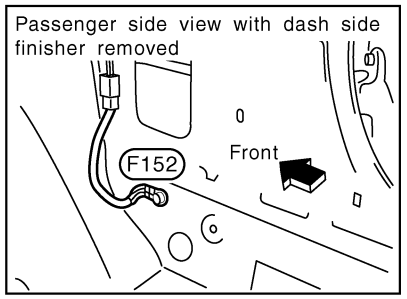
Engine control harness

★	F101	SMJ	:	ECM
★	F102	SMJ	:	To M72
★	F103	W/4	:	To F151

Earth sub-harness

★	F151	W/4	:	To F103
★	F152	—	:	Body ground

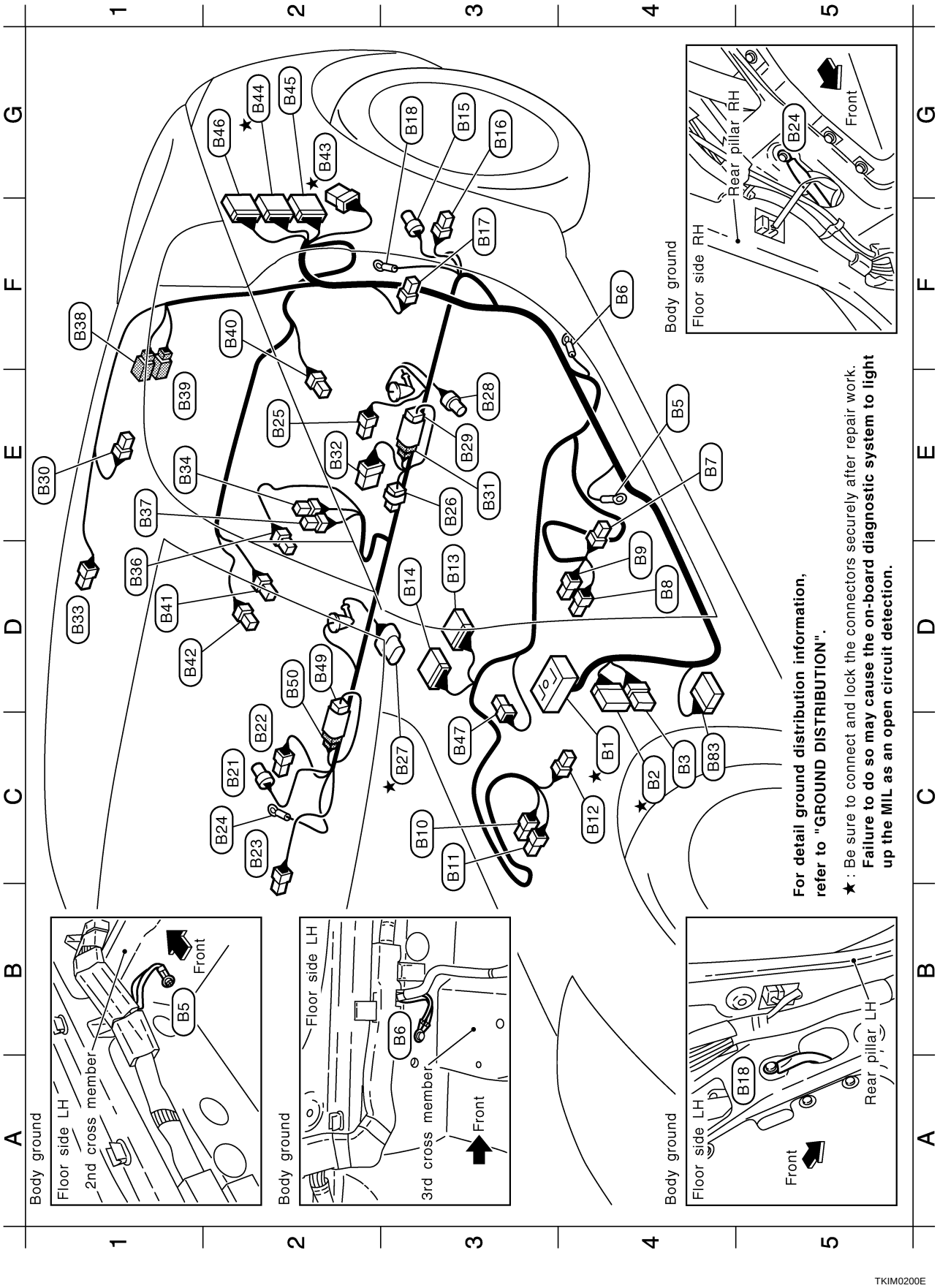
Body ground



For detail ground distribution information, refer to "GROUND DISTRIBUTION".

★: Be sure to connect and lock the connectors securely after repair work. **Failure to do so may cause the on-board diagnostic system to light up the MIL as an open circuit detection.**

BODY HARNESS
Coupe Models



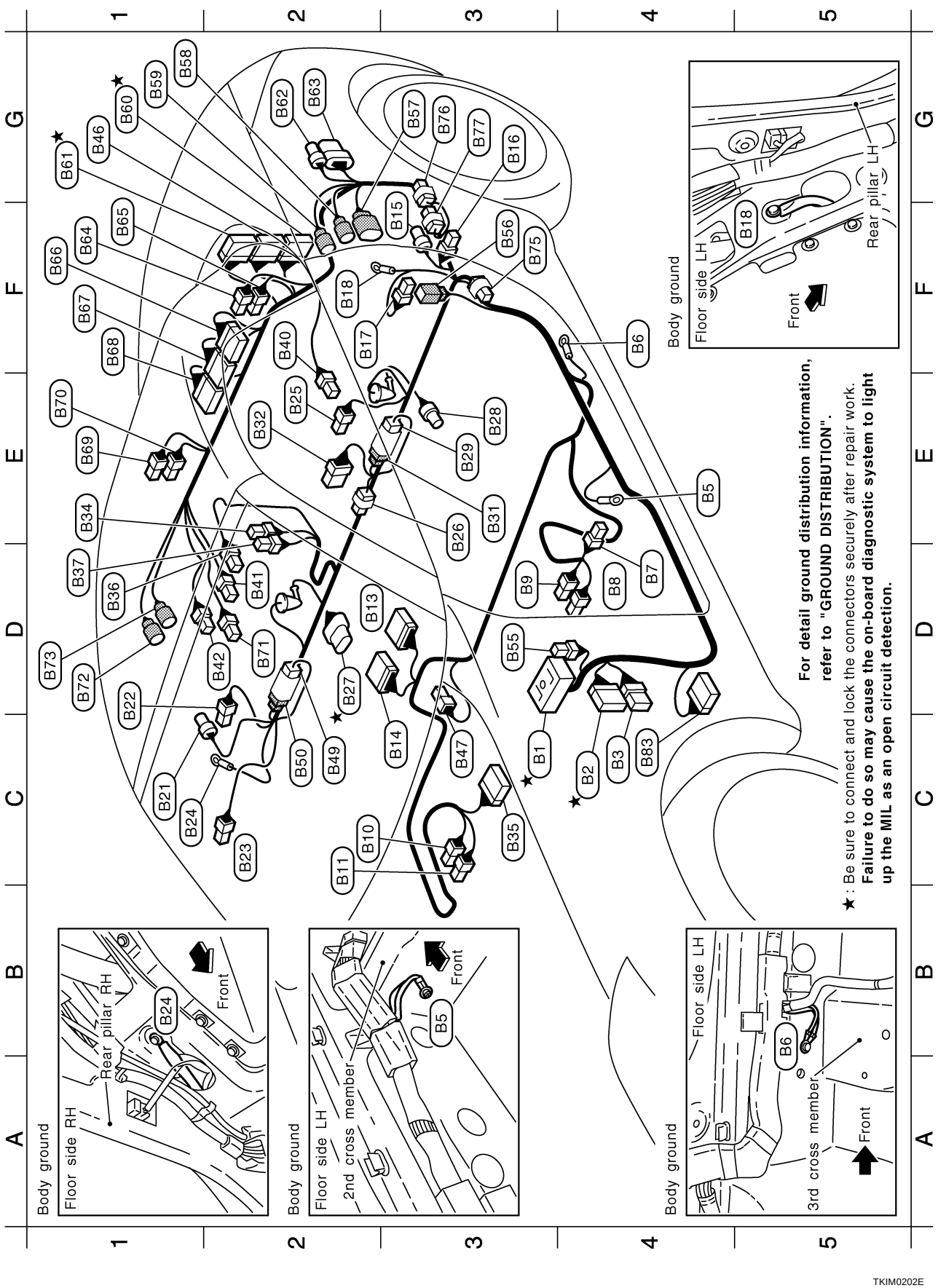
TKIM0200E

C4 ★	B1	SMJ	:	To M12
C4 ★	B2	W/18	:	To E106
C4	B3	W/6	:	To E107
E4	B5	—	:	Body ground
F4	B6	—	:	Body ground
E4	B7	W/4	:	Driver side seat (With heated seat or side air bag)
D4	B8	W/3	:	Seat belt buckle switch (Driver side)
D4	B9	Y/2	:	LH side air bag module (With side air bag)
C3	B10	Y/2	:	RH side air bag module (With side air bag)
C3	B11	W/3	:	Seat belt buckle switch (Passenger side)
C4	B12	W/4	:	Passenger side seat (With heated seat or side air bag)
D3	B13	Y/12	:	Air bag diagnosis sensor unit
D3	B14	Y/12	:	Air bag diagnosis sensor unit
G3	B15	Y/2	:	LH side air bag (satellite) sensor (With side air bag)
G3	B16	Y/2	:	Seat belt pre-tensioner LH
F3	B17	W/3	:	Driver side door switch
G3	B18		:	Body ground (With side air bag)
C2	B21	Y/2	:	RH side air bag (satellite) sensor (With side air bag)
C2	B22	Y/2	:	Seat belt pre-tensioner RH
C2	B23	W/3	:	Passenger side door switch
C2	B24	—	:	Body ground (With side air bag)
E2	B25	W/2	:	Woofer (With BOSE system)
E3	B26	W/2	:	Condenser
C3 ★	B27	GY/5	:	Fuel level sensor unit and fuel pump
E3	B28	GY/2	:	Fuel level sensor unit (Sub)
E3	B29	W/2	:	To B31
E1	B30	Y/2	:	LH side curtain air bag module (With side air bag)
E3	B31	W/2	:	To B29
E2	B32	BR/8	:	Woofer amp. (With BOSE system)
D1	B33	Y/2	:	RH side curtain air bag module (With side air bag)
E1	B34	BR/6	:	Rear window defogger relay
D1	B36	B/2	:	Power socket
E1	B37	L/4	:	Heated seat relay (With heated seat or side air bag)
F1	B38	W/3	:	To D101
E1	B39	GY/2	:	To D102
F2	B40	BR/2	:	Rear speaker LH
D1	B41	W/2	:	Luggage floor box lamp
D1	B42	BR/2	:	Rear speaker RH
G2 ★	B43	W/6	:	To T1
G2 ★	B44	W/16	:	To T2
G2	B45	W/10	:	To T3 (With BOSE system)
G2	B46	BR/20	:	To T4 (With BOSE system)
C3	B47	B/1	:	Parking brake switch
D2	B49	BR/2	:	To B50
D2	B50	BR/2	:	To B49
C4	B83	W/15	:	BCM (Body control module)

★: Be sure to connect and lock the connectors securely after repair work. **Failure to do so may cause the on-board diagnostic system to light up the MIL as an open circuit detection.**

TKIM0201E

Roadster Models

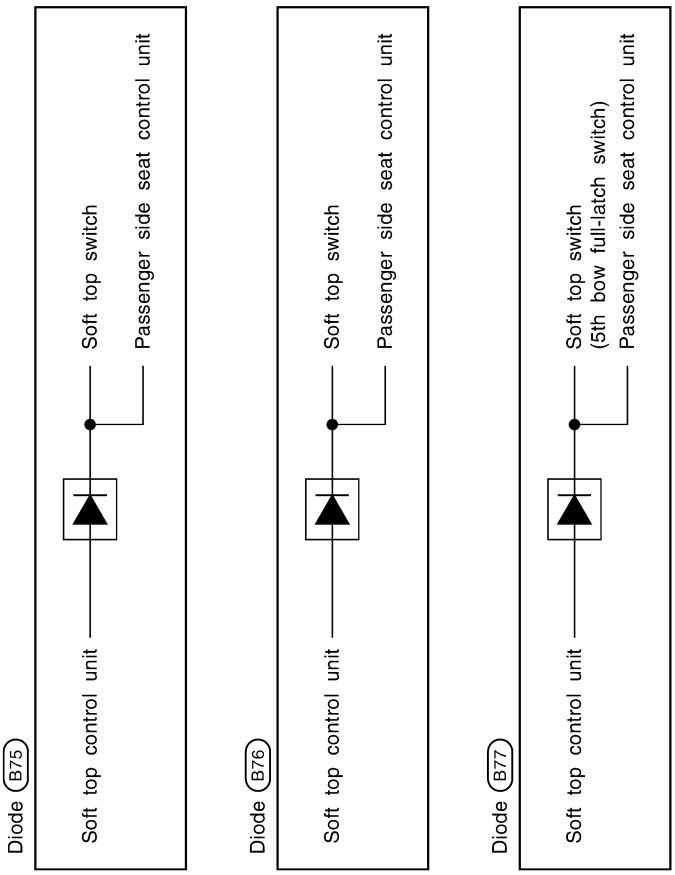


TKIM0202E

C3 ★	B1	SMJ	:	To M12
C4 ★	B2	W/18	:	To E106
C4	B3	W/6	:	To E107
E4	B5	—	:	Body ground
F4	B6	—	:	Body ground
D4	B7	W/4	:	Driver side seat
D4	B8	W/3	:	Seat belt buckle switch (Driver side)
D3	B9	Y/2	:	LH side air bag module (With side air bag)
C2	B10	Y/2	:	RH side air bag module (With side air bag)
C2	B11	W/3	:	Seat belt buckle switch (Passenger side)
D2	B13	Y/12	:	Air bag diagnosis sensor unit
C3	B14	Y/12	:	Air bag diagnosis sensor unit
F3	B15	Y/2	:	LH side air bag (satellite) sensor (With side air bag)
G3	B16	Y/2	:	Seat belt pre-tensioner LH
F2	B17	W/3	:	Driver side door switch
F2	B18	—	:	Body ground (With side air bag)
C1	B21	Y/2	:	RH side air bag (satellite) sensor (With side air bag)
D1	B22	Y/2	:	Seat belt pre-tensioner RH
C2	B23	W/3	:	Passenger side door switch
C1	B24	—	:	Body ground (With side air bag)
E2	B25	W/2	:	Woofer (With BOSE system)
E3	B26	W/2	:	Condenser
D2 ★	B27	GY/5	:	Fuel level sensor unit and fuel pump
E3	B28	GY/2	:	Fuel level sensor unit (Sub)
E3	B29	W/2	:	To B31
E3	B31	W/2	:	To B29
E2	B32	BR/8	:	Woofer amp. (With BOSE system)
E1	B34	BR/6	:	Rear window defogger relay
C3	B35	W/18	:	Passenger side seat
D1	B36	B/2	:	Power socket
D1	B37	L/4	:	Heated seat relay (With heated seat or side air bag)
F2	B40	BR/2	:	Rear speaker LH
D2	B41	W/2	:	Luggage floor box lamp
D2	B42	BR/2	:	Rear speaker RH
G1	B46	BR/20	:	To T4 (With BOSE system)
C3	B47	B/1	:	Parking brake switch
C2	B49	BR/2	:	To B50
C2	B50	BR/2	:	To B49
D3	B55	W/2	:	Circuit breaker
F3	B56	W/2	:	Short connector
G3	B57	GY/8	:	Soft top assembly
G1	B58	B/2	:	Soft top assembly
G1	B59	GY/2	:	Roof actuator LH
G1 ★	B60	W/20	:	To T22
G1 ★	B61	W/16	:	To T23
G2	B62	GY/4	:	To T24 (With BOSE system)
G2	B63	B/6	:	To T25 (With BOSE system)
F1	B64	W/2	:	Storage lid switch LH (Close)
F1	B65	B/2	:	Storage lid unlock actuator LH
F1	B66	W/16	:	Soft top control unit
F1	B67	W/20	:	Soft top control unit
F1	B68	W/12	:	Soft top control unit
E1	B69	W/2	:	Storage lid switch RH (Close)
E1	B70	B/2	:	Storage lid unlock actuator RH
D2	B71	W/2	:	Trunk opener cancel switch
D1	B72	GY/2	:	Roof actuator RH
D1	B73	B/2	:	Rear window defogger (Via sub-harness)
F3	B75	W/2	:	Diode
G3	B76	W/2	:	Diode
G3	B77	W/2	:	Diode
C4	B83	W/15	:	BCM (Body control module)

★ : Be sure to connect and lock the connectors securely after repair work. **Failure to do so may cause the on-board diagnostic system to light up the MIL as an open circuit detection.**

TKIM0203E


Diode B75
Soft top control unit
Soft top switch
Passenger side seat control unit
Diode B76
Soft top control unit
Soft top switch
Passenger side seat control unit
Diode B77
Soft top control unit
Soft top switch
(5th bow full-latch switch)
Passenger side seat control unit

TKIT0117E

BODY NO.2 HARNESS

TAIL HARNESS
Coupe Models

★ T1 W/6 : To B43
★ T2 W/16 : To B44
T3 W/10 : To B45 (With BOSE system)
T4 BR/20 : To B46 (With BOSE system)
T5 GY/4 : Rear wheel sensor
T6 GY/8 : BOSE speaker amp. (With BOSE system)
T7 B/24 : BOSE speaker amp. (With BOSE system)
T8 GY/2 : Rear combination lamp LH (Body side)
T9 GY/3 : Rear combination lamp LH (Body side)
T10 SB/4 : Rear combination lamp LH (Bumper side)
T11 W/4 : Back door opener actuator
T12 W/3 : Back door switch
T13 GY/2 : Luggage room lamp
T14 — : Body ground
T15 GY/4 : To T101
T16 GY/2 : Rear combination lamp RH (Body side)
T17 GY/3 : Rear combination lamp RH (Body side)
T18 SB/4 : Rear combination lamp RH (Bumper side)
T19 W/4 : Fuel lid opener actuator
★ T20 B/2 : EVAP canister vent control valve
★ ★ T21 GY/3 : EVAP control system pressure sensor

Tail sub-harness-1

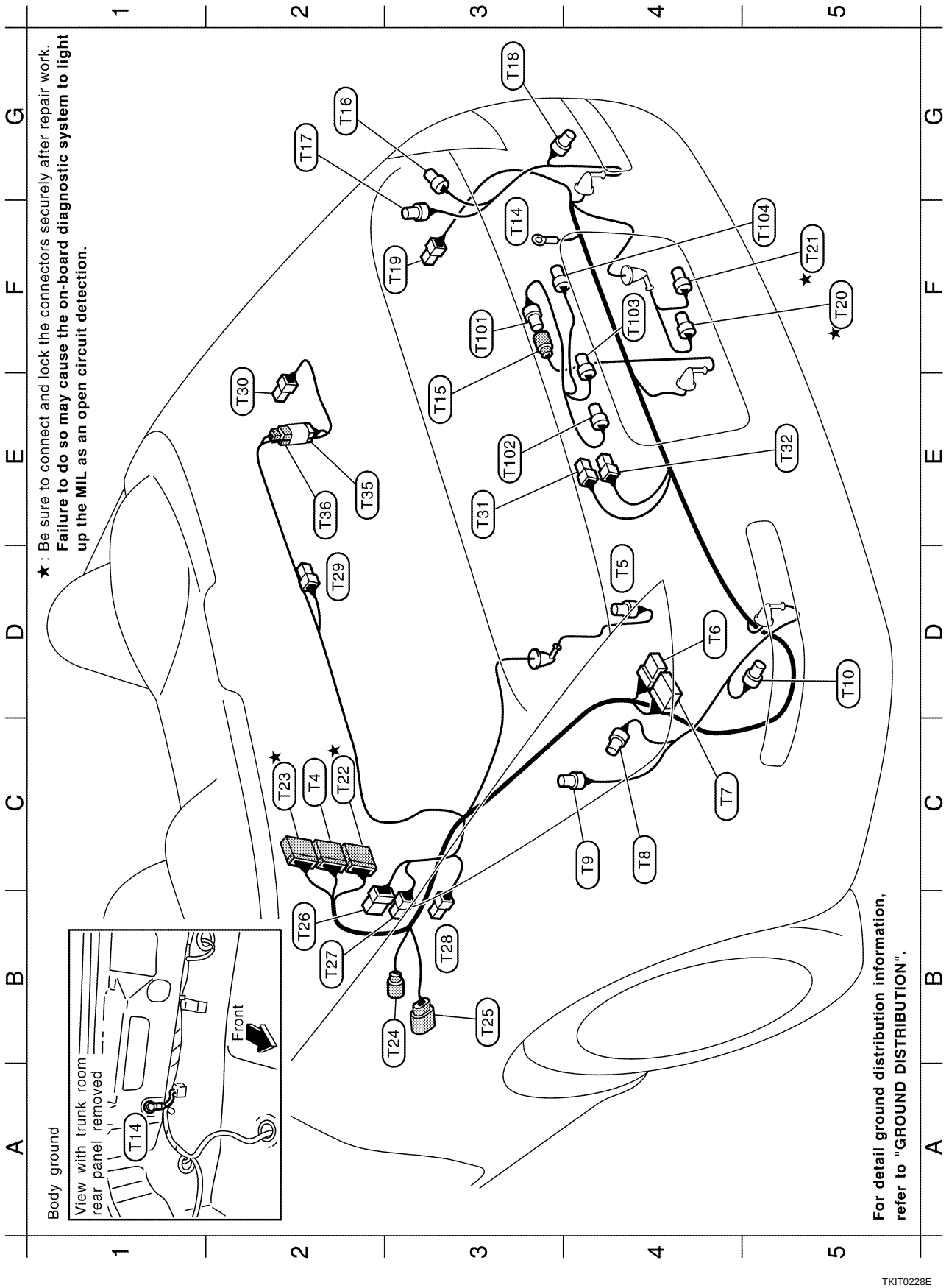
T101 GY/4 : To T15
T102 BR/2 : License plate lamp LH
T103 GY/2 : Back door opener switch
T104 BR/2 : License plate lamp RH

★: Be sure to connect and lock the connectors securely after repair work.
Failure to do so may cause the on-board diagnostic system to light up the MIL as an open circuit detection.

For detail ground distribution information, refer to "GROUND DISTRIBUTION".

TKIT0227E

Roadster Models



C2	T4	BR/20	:	To B46 (With BOSE system)
D4	T5	GY/4	:	Rear wheel sensor
D4	T6	GY/8	:	BOSE speaker amp. (With BOSE system)
C4	T7	B/24	:	BOSE speaker amp. (With BOSE system)
C4	T8	GY/2	:	Rear combination lamp LH (Body side)
C4	T9	GY/3	:	Rear combination lamp LH (Body side)
D5	T10	SB/4	:	Rear combination lamp LH (Bumper side)
F3	T14	—	:	Body ground
E3	T15	GY/4	:	To T101
G2	T16	GY/2	:	Rear combination lamp RH (Body side)
G2	T17	GY/3	:	Rear combination lamp RH (Body side)
G3	T18	SB/4	:	Rear combination lamp RH (Bumper side)
F3	T19	W/4	:	Fuel lid opener actuator
F5 ★	T20	B/2	:	EVAP canister vent control valve
F5 ★	T21	GY/3	:	EVAP control system pressure sensor
C2 ★	T22	W/20	:	To B60
C2 ★	T23	W/16	:	To B61
B3	T24	GY/4	:	To B62 (With BOSE system)
B3	T25	B/6	:	To B63 (With BOSE system)
B2	T26	W/8	:	To T151
B2	T27	B/2	:	Storage lid switch (Open)
B3	T28	W/2	:	Storage lid actuator LH
D2	T29	W/2	:	Trunk room lamp
E2	T30	W/2	:	Storage lid actuator RH
E3	T31	W/2	:	Trunk room lamp switch
E5	T32	B/2	:	Trunk lid opener actuator
E2	T35	W/2	:	To T36
E2	T36	W/2	:	To T35

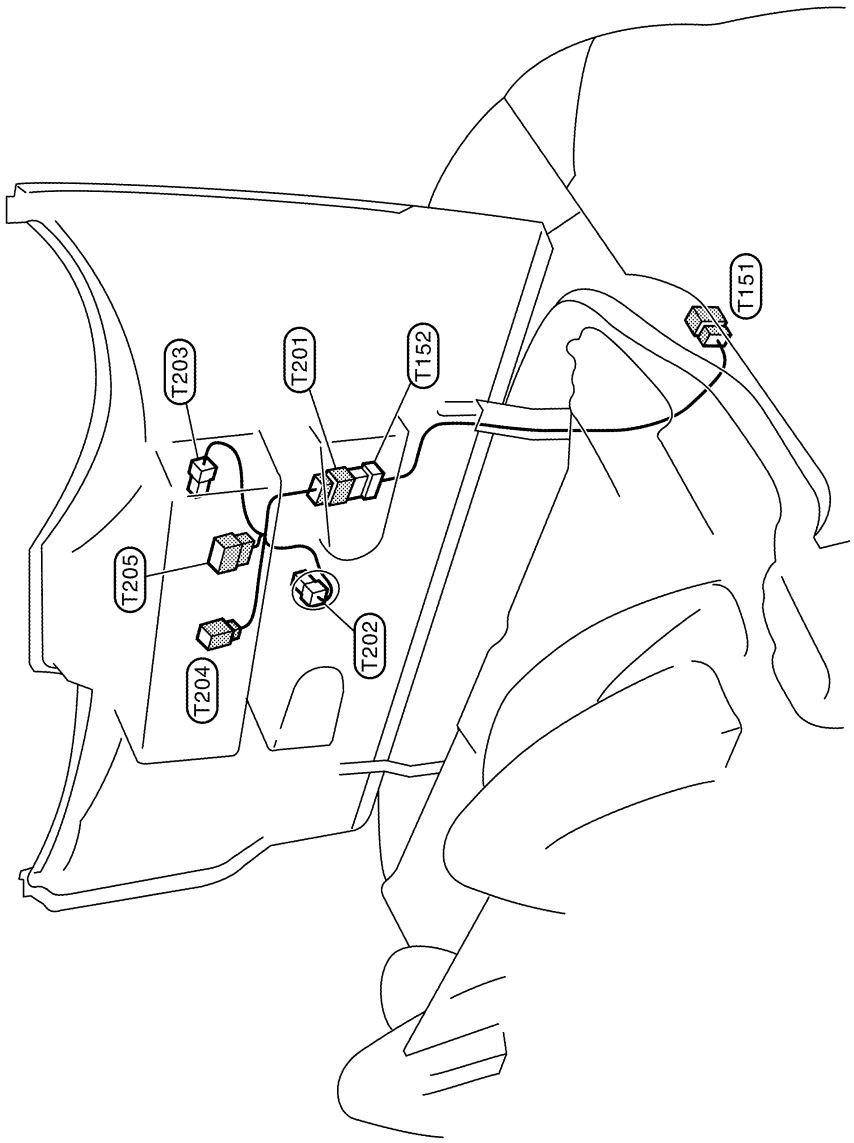
Tail sub-harness-1

F3	T101	GY/4	:	To T15
E3	T102	BR/2	:	License plate lamp LH
F4	T103	GY/2	:	Trunk lid opener switch
F5	T104	BR/2	:	License plate lamp RH

★ : Be sure to connect and lock the connectors securely after repair work. **Failure to do so may cause the on-board diagnostic system to light up the MIL as an open circuit detection.**

TKIT0229E

TAIL NO.2 HARNESS
Roadster Models



Tail No.2 harness

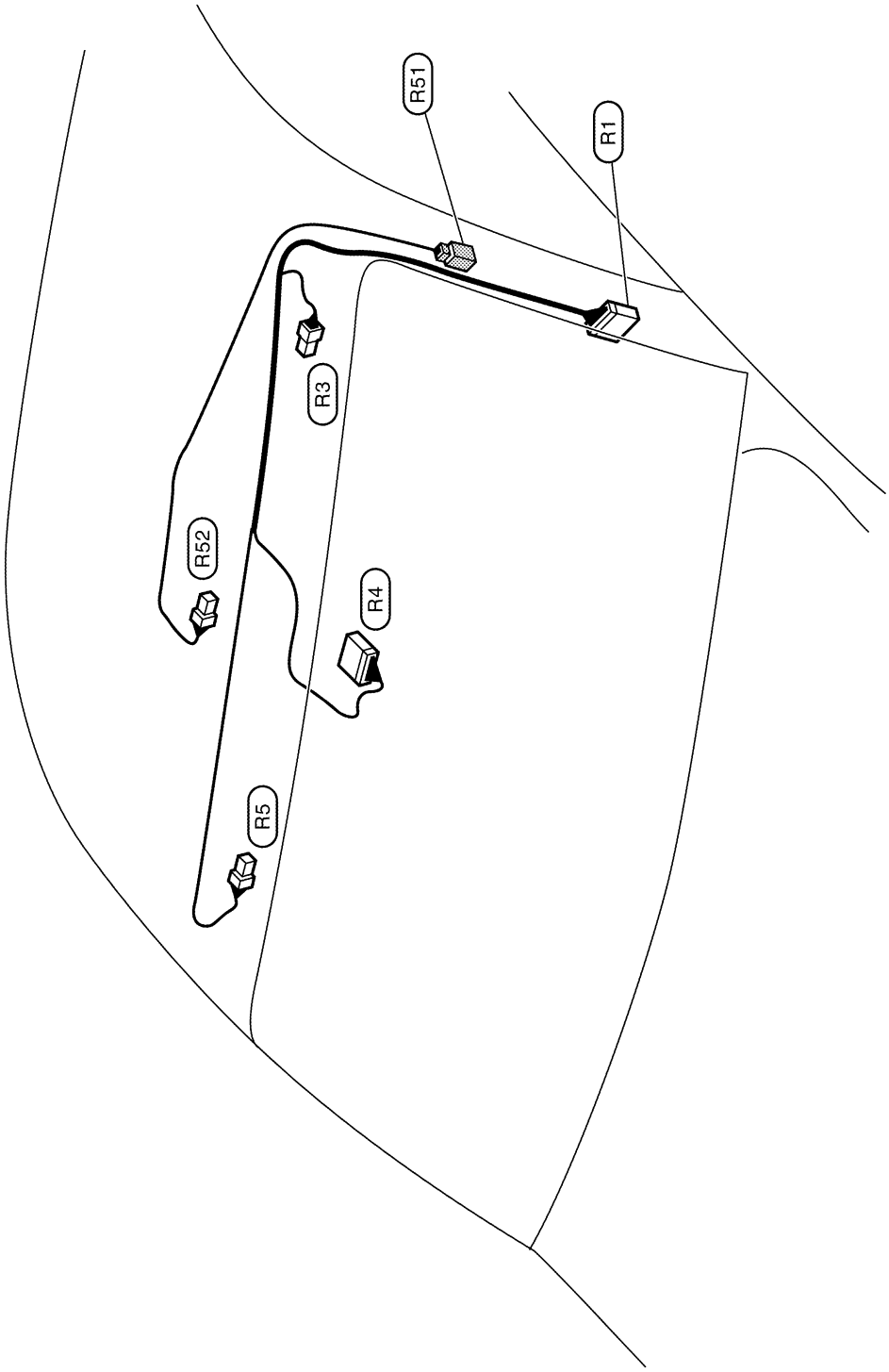
- T201 W/8 : To T152
- T202 BR/2 : High-mounted stop lamp
- T203 W/4 : 5th bow unlock actuator
- T204 B/2 : 5th bow closure motor
- T205 W/6 : Soft top lock switch

Tail sub-harness-2

- T151 W/8 : To T26
- T152 W/8 : To T201

TKIT0113E

ROOM LAMP HARNESS
Coupe Models



Room lamp sub-harness

R51 W/4 : To M70
R52 W/3 : Map lamp

R1 W/10 : To M69
R3 W/2 : Vanity mirror lamp LH
R4 B/10 : Auto anti-dazzling inside mirror
R5 W/2 : Vanity mirror lamp RH

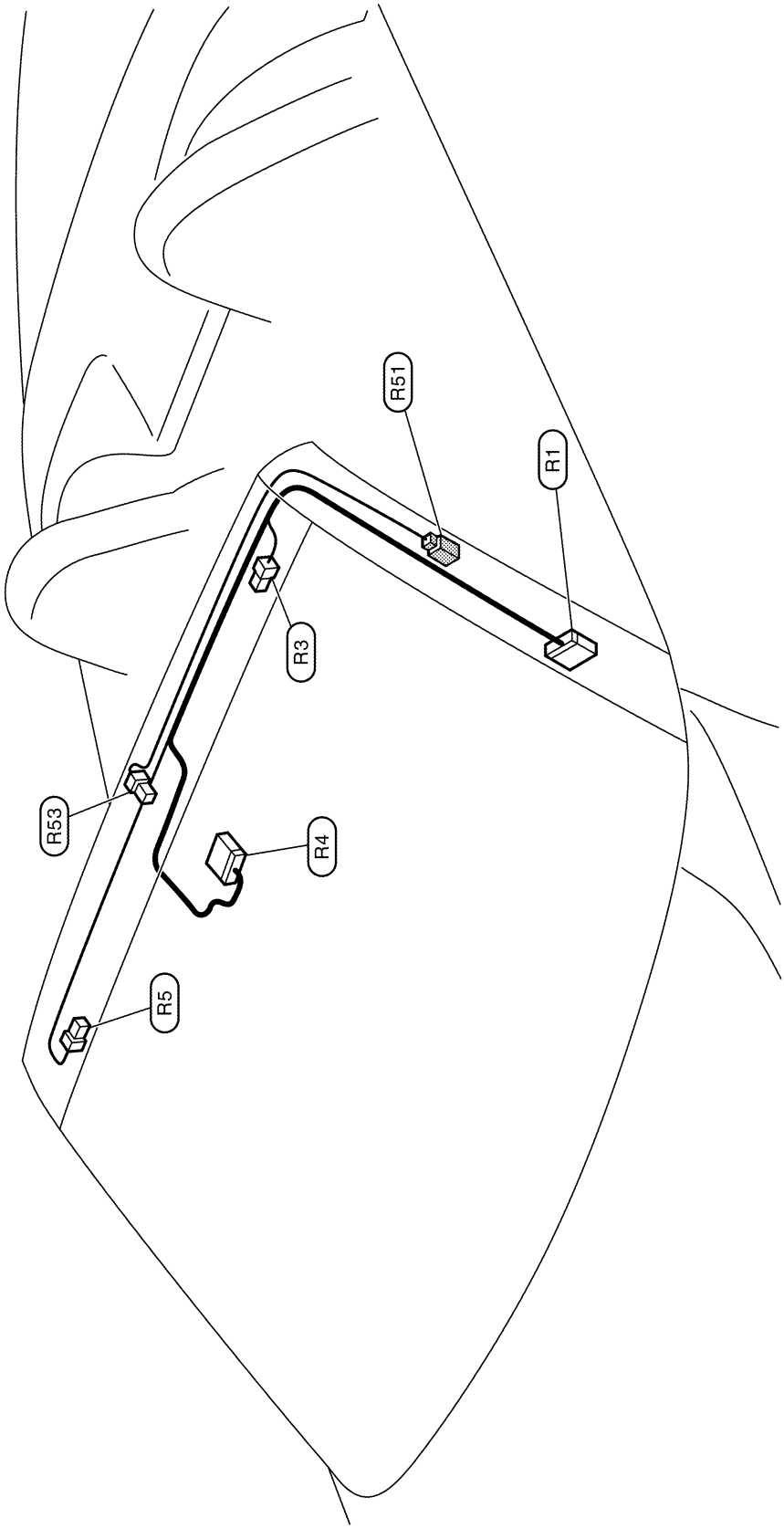
TKIT0209E

Roadster Models

Room lamp sub-harness

(R51) W/4 : To (M70)
(R53) W/4 : Map lamp

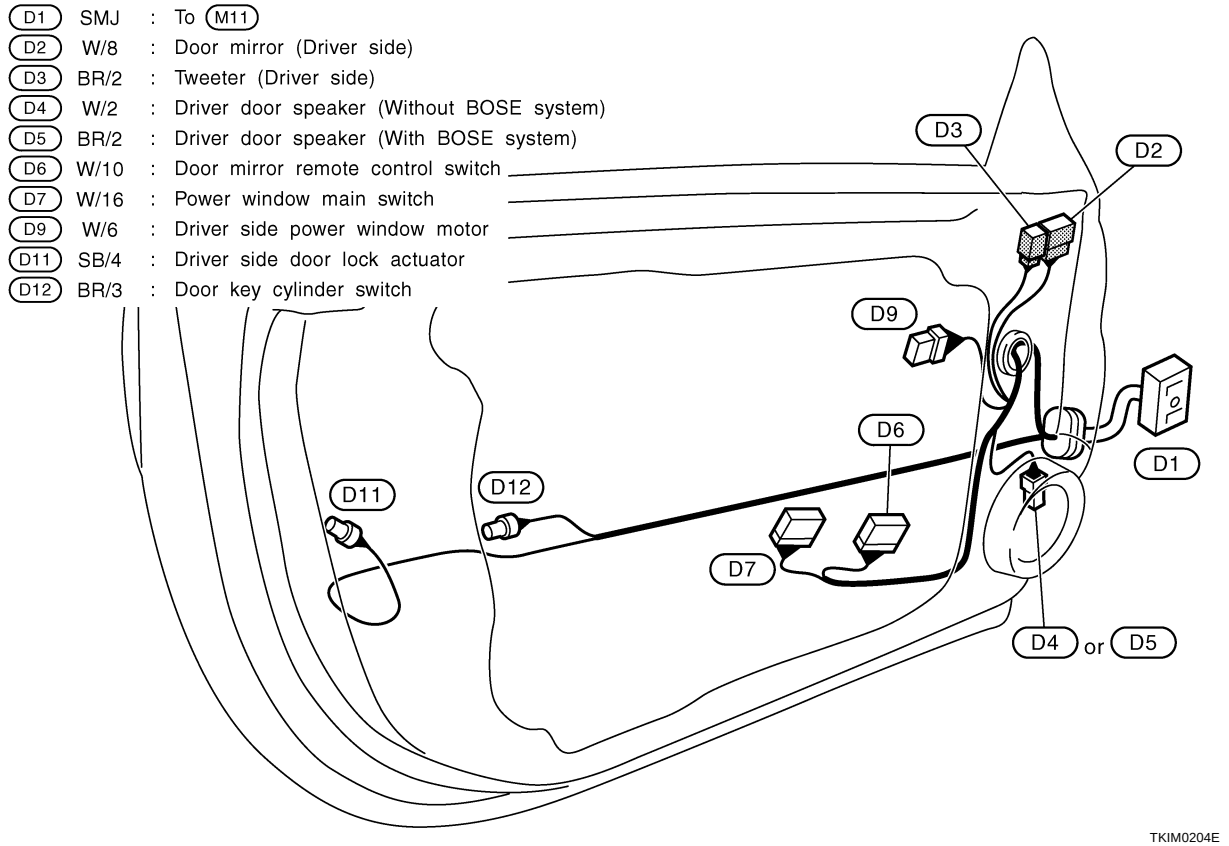
(R1) W/10 : To (M69)
(R3) W/2 : Vanity mirror lamp LH
(R4) B/10 : Auto anti-dazzling inside mirror
(R5) W/2 : Vanity mirror lamp RH



TKIT0210E

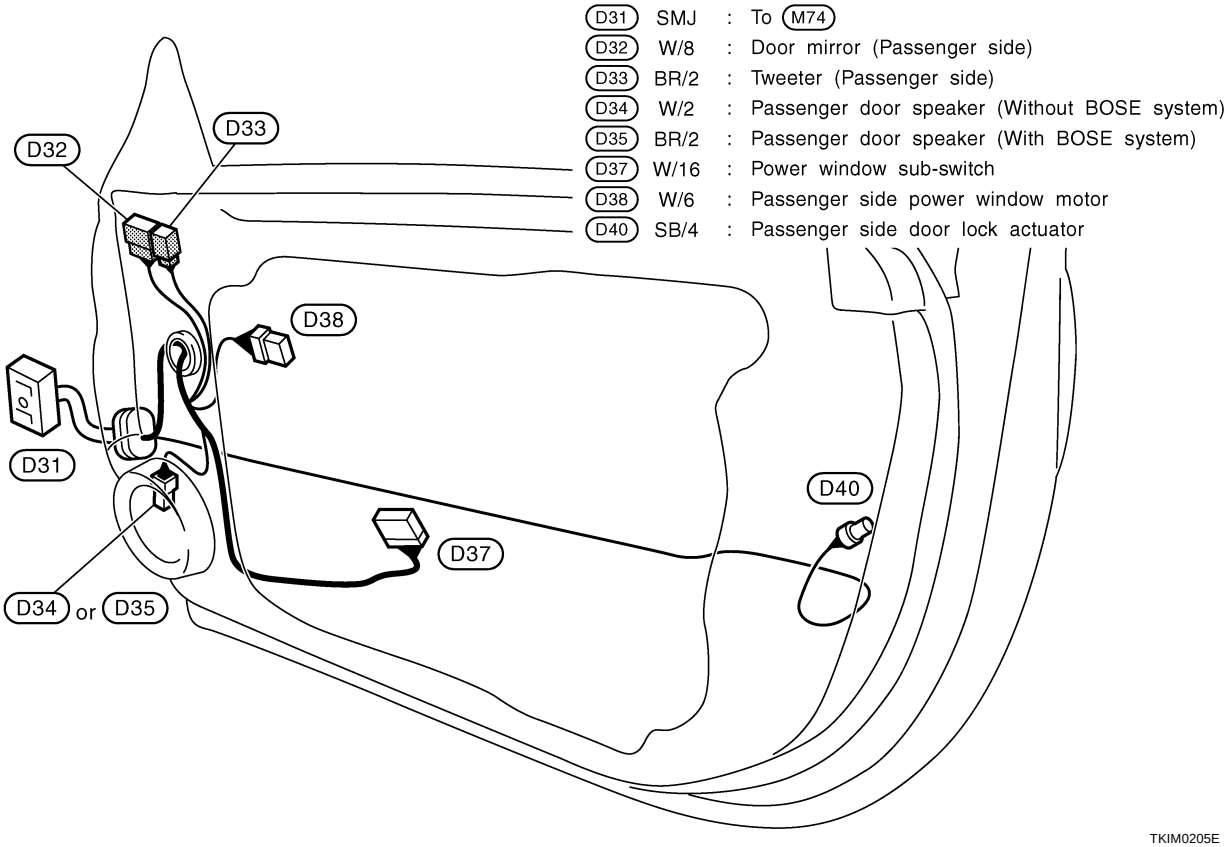
DOOR HARNESS

Driver Side Door



TKIM0204E

Passenger Side Door



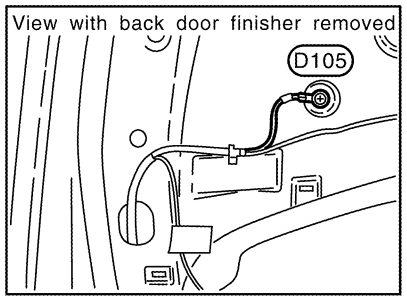
TKIM0205E

D101	W/3	:	To B38
D102	GY/2	:	To B39
D103	BR/2	:	High-mounted stop lamp
D104	B/1	:	Rear window defogger
D105	—	:	Body ground
D106	W/4	:	Rear wiper motor

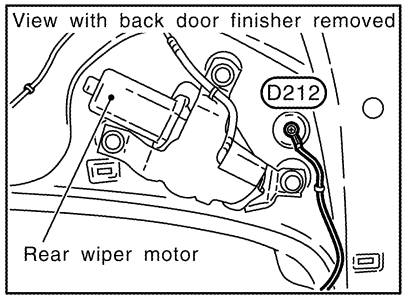
Defogger harness (-)

D211	B/1	:	Rear window defogger (-)
D212	—	:	Body ground

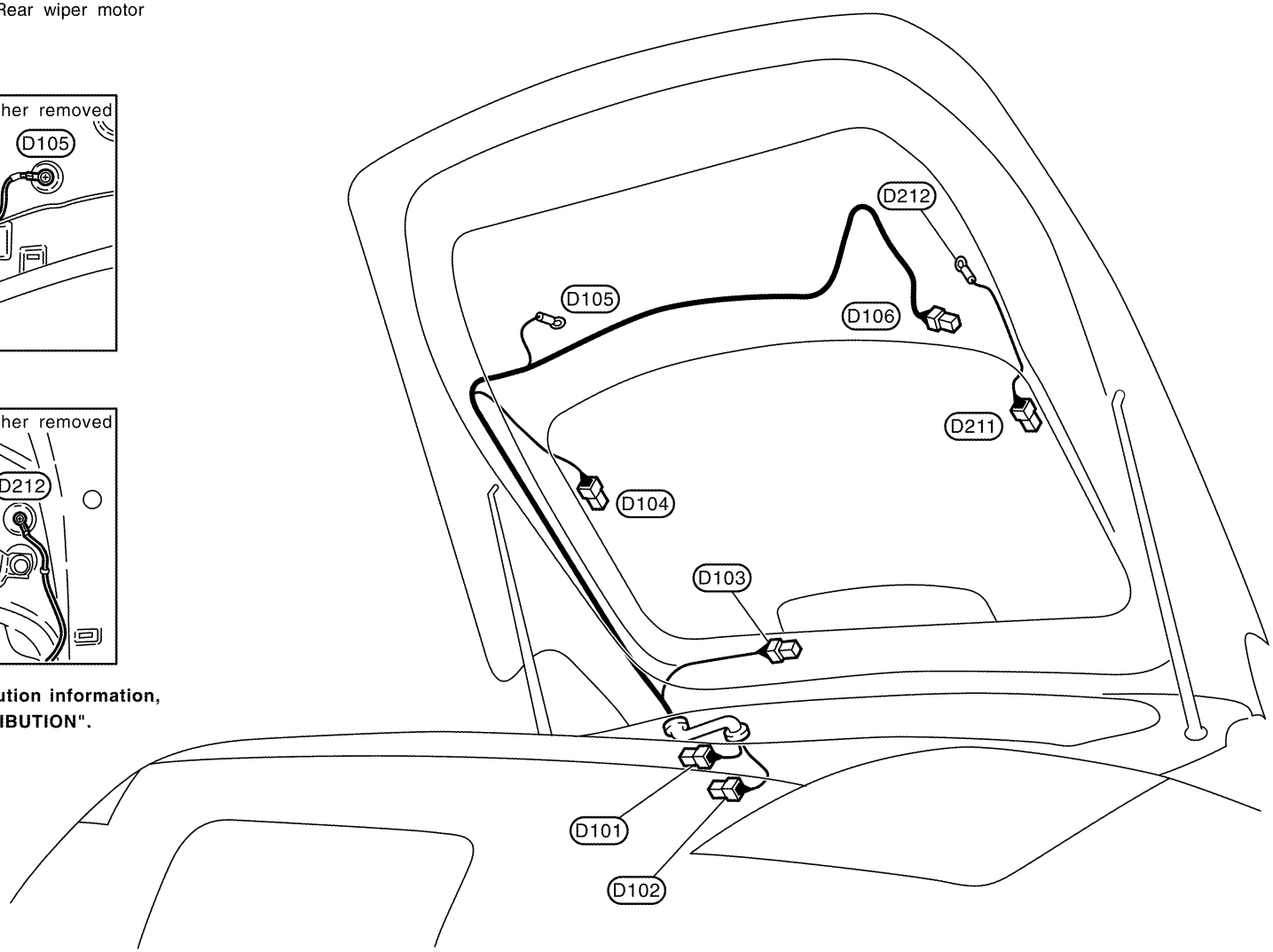
Body ground



Body ground



For detail ground distribution information, refer to "GROUND DISTRIBUTION".



TKIT0068E

Wiring Diagram Codes (Cell Codes)

AKS00A3P

Use the chart below to find out what each wiring diagram code stands for.
Refer to the wiring diagram code in the alphabetical index to find the location (page number) of each wiring diagram.

Code	Section	Wiring Diagram Name
3METER	DI	Triple Meter
ABS	BRC	Anti-Lock Brake System
A/C	ATC	Air Conditioner
AF1B1	EC	Air Fuel Ratio Sensor 1 Bank 1
AF1B2	EC	Air Fuel Ratio Sensor 1 Bank 2
AF1HB1	EC	Air Fuel Ratio Sensor 1 Heater Bank 1
AF1HB2	EC	Air Fuel Ratio Sensor 1 Heater Bank 2
APPS1	EC	Accelerator Pedal Position Sensor
APPS2	EC	Accelerator Pedal Position Sensor
APPS3	EC	Accelerator Pedal Position Sensor
ASC/BS	EC	Automatic Speed Control Device (ASCD) Brake Switch
ASC/SW	EC	Automatic Speed Control Device (ASCD) Steering Switch
ASCBOF	EC	Automatic Speed Control Device (ASCD) Brake Switch
ASCIND	EC	Automatic Speed Control Device (ASCD) Indicator
AT/IND	DI	A/T Indicator Lamp
AUDIO	AV	Audio
BACK/L	LT	Back-Up Lamp
BRK/SW	EC	Brake Switch
CAN	AT	CAN Communication Line
CAN	EC	CAN Communication Line
CAN	LAN	CAN System
CHARGE	SC	Charging System
CHIME	DI	Warning Chime
CLOCK	DI	Clock
COMBSW	LT	Combination Switch
COOL/F	EC	Cooling Fan Control
DEF	GW	Rear Window Defogger
D/LOCK	BL	Power Door Lock
DTRL	LT	Headlamp - With Daytime Light System
ECM/PW	EC	ECM Power Supply for Back-Up
ECTS	EC	Engine Coolant Temperature Sensor
ETC1	EC	Electric Throttle Control Function
ETC2	EC	Electric Throttle Control Motor Relay
ETC3	EC	Electric Throttle Control Motor
F/LID	BL	Fuel Lid Opener
F/PUMP	EC	Fuel Pump
F/ROOF	RF	Soft Top
FTS	AT	A/T Fluid Temperature Sensor Circuit
FTTS	EC	Fuel Tank Temperature Sensor
FUELB1	EC	Fuel Injection System Function (Bank 1)
FUELB2	EC	Fuel Injection System Function (Bank 2)

Code	Section	Wiring Diagram Name
H/LAMP	LT	Headlamp
HORN	WW	Horn
HSEAT	SE	Heated Seat
IATS	EC	Intake Air Temperature Sensor
IGNSYS	EC	Ignition System
ILL	LT	Illumination
I/MIRR	GW	Inside Mirror (Auto Anti-Dazzling Mirror)
INJECT	EC	Injector
IVCB1	EC	Intake Valve Timing Control Solenoid Valve Bank 1
IVCB2	EC	Intake Valve Timing Control Solenoid Valve Bank 2
KEYLES	BL	Remote Keyless Entry System
KS	EC	Knock Sensor
MAFS	EC	Mass Air Flow Sensor
MAIN	AT	Main Power Supply and Ground Circuit
MAIN	EC	Main Power Supply and Ground Circuit
M/ANT	AV	Manual Antenna
METER	DI	Speedometer, Tachometer, Temp. and Fuel Gauges
MIL/DL	EC	MIL & Data Link Connectors
MIRROR	GW	Power Door Mirror
MMSW	AT	Manual Mode Switch
NATS	BL	Nissan Anti-Theft System
NAVI	AV	Navigation System
NONDTC	AT	Non-Detective Items
O2H1B1	EC	Heated Oxygen Sensor 1 Heater Bank 1
O2H1B2	EC	Heated Oxygen Sensor 1 Heater Bank 2
O2H2B1	EC	Heated Oxygen Sensor 2 Heater Bank 1
O2H2B2	EC	Heated Oxygen Sensor 2 Heater Bank 2
O2S1B1	EC	Heated Oxygen Sensor 1 Bank 1
O2S1B2	EC	Heated Oxygen Sensor 1 Bank 2
O2S2B1	EC	Heated Oxygen Sensor 2 Bank 1
O2S2B2	EC	Heated Oxygen Sensor 2 Bank 2
PGC/V	EC	EVAP Canister Purge Volume Control Solenoid Valve
PHSB1	EC	Camshaft Position Sensor (PHASE) (Bank 1)
PHSB2	EC	Camshaft Position Sensor (PHASE) (Bank 2)
PNP/SW	AT	Park/Neutral Position Switch
PNP/SW	EC	Park/Neutral Position Switch
POS	EC	Crankshaft Position Sensor (CKPS) (POS)
POWER	PG	Power Supply Routing
PRE/SE	EC	EVAP Control System Pressure Sensor
P/SCKT	WW	Power Socket
PS/SEN	EC	Power Steering Pressure Sensor
ROOM/L	LT	Interior Room Lamp
RP/SEN	EC	Refrigerant Pressure Sensor
SEAT	SE	Power Seat

Code	Section	Wiring Diagram Name
SEN/PW	EC	Sensor Power Supply
SHIFT	AT	A/T Shift Lock System
SRS	SRS	Supplemental Restraint System
START	SC	Starting System
STOP/L	LT	Stop Lamp
STSIG	AT	Start Signal Circuit
TAIL/L	LT	Parking, License and Tail Lamps
TCS	BRC	Traction Control System
TLID	BL	Trunk Lid Opener
TPS1	EC	Throttle Position Sensor (Sensor 1)
TPS2	EC	Throttle Position Sensor (Sensor 2)
TPS3	EC	Throttle Position Sensor
TRANSCV	BL	Homelink Universal Transceiver
TURN	LT	Turn Signal and Hazard Warning Lamp
T/WARN	WT	Low Tire Pressure Warning System
VDC	BRC	Vehicle Dynamics Control System
VEHSEC	BL	Vehicle Security System
VENT/V	EC	EVAP Canister Vent Control Valve
VSSA/T	AT	Vehicle Speed Sensor A/T (Revolution Sensor)
WARN	DI	Warning Lamps
WINDOW	GW	Power Window
WIPER	WW	Front Wiper and Washer
WIP/R	WW	Rear Wiper and Washer

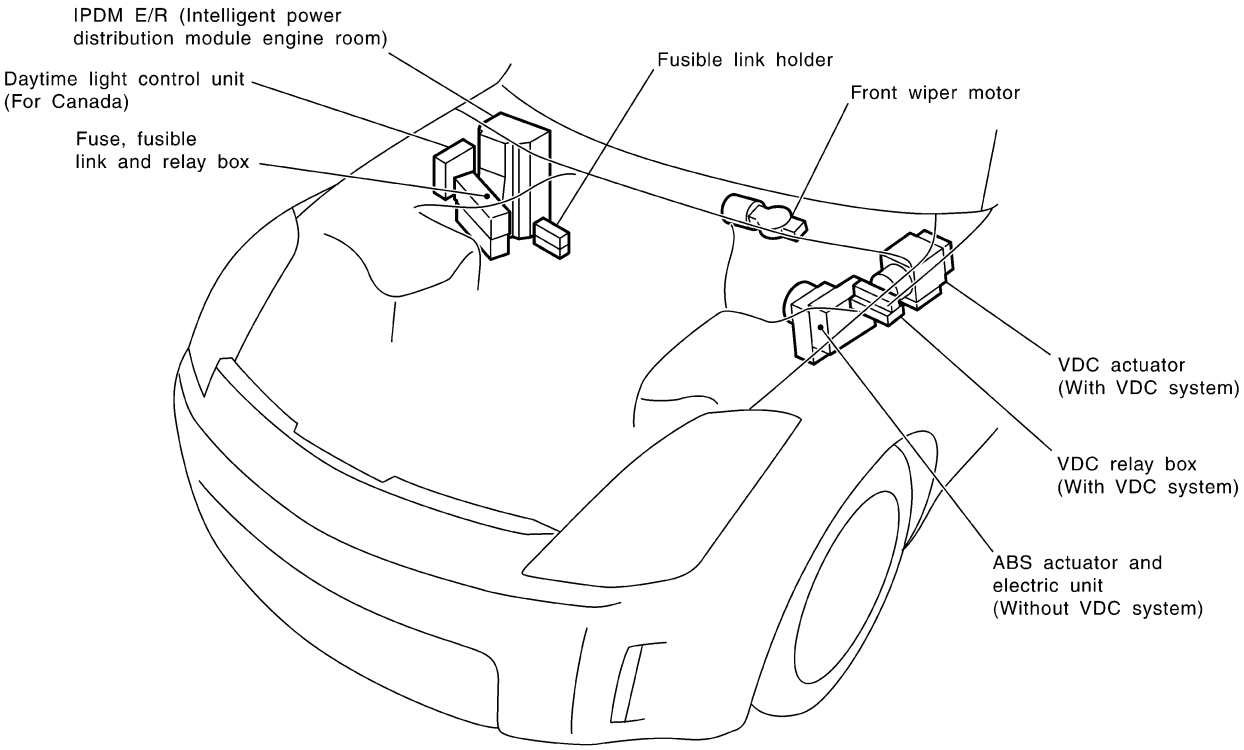
ELECTRICAL UNITS LOCATION

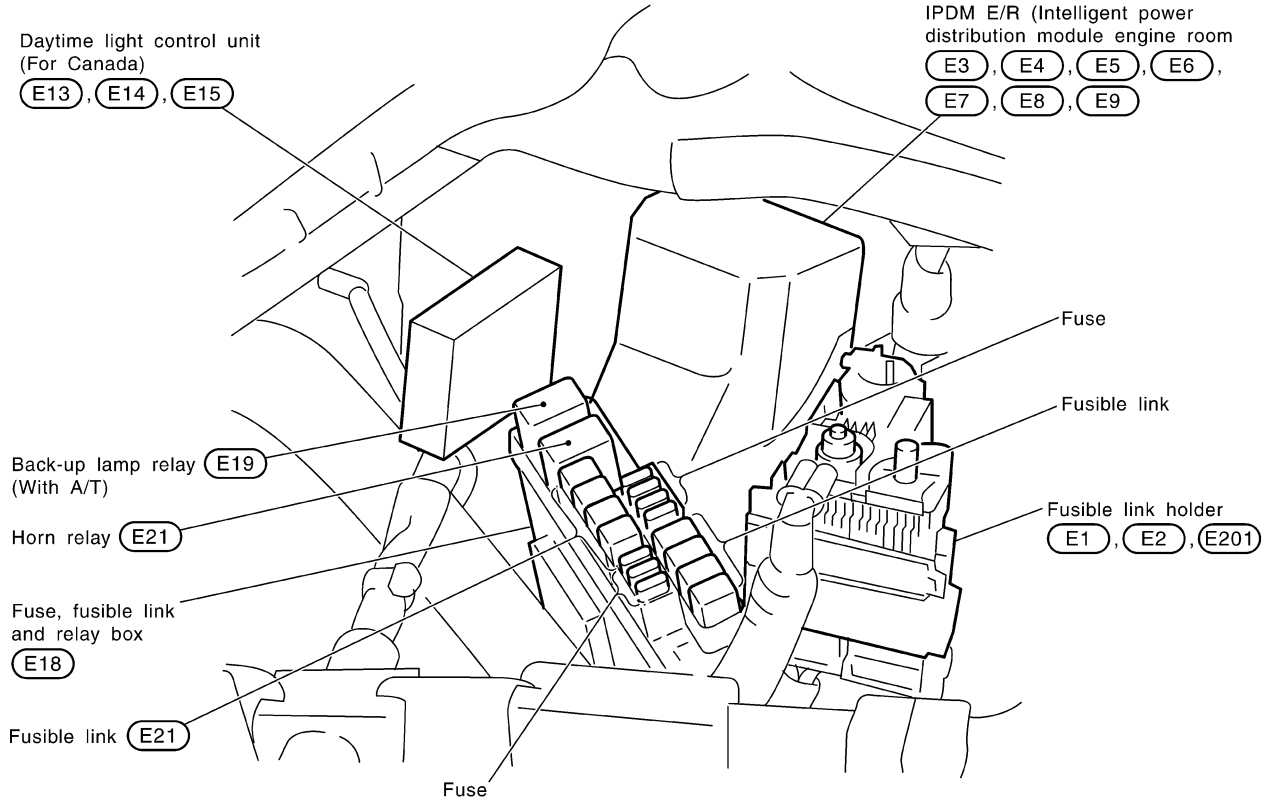
PFP:25230

Electrical Units Location

AKS0012S

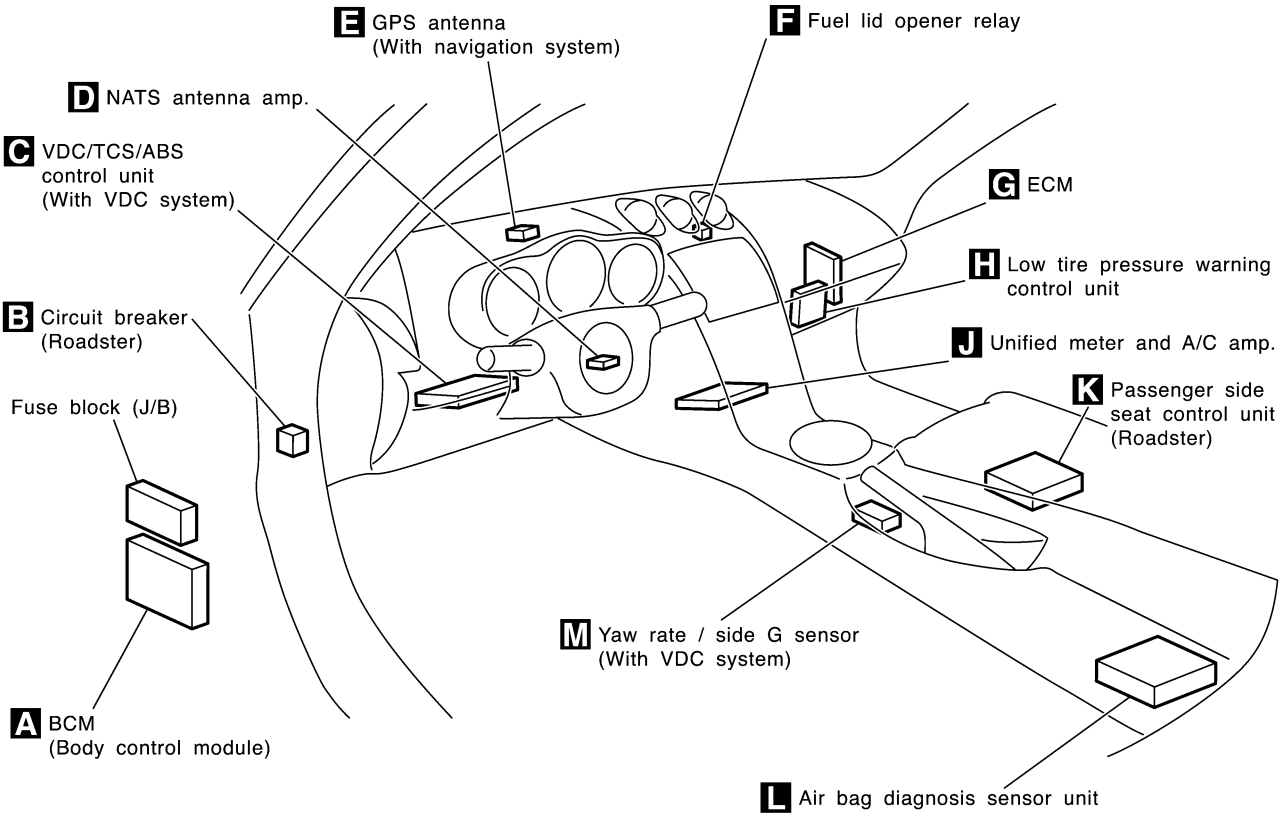
ENGINE COMPARTMENT



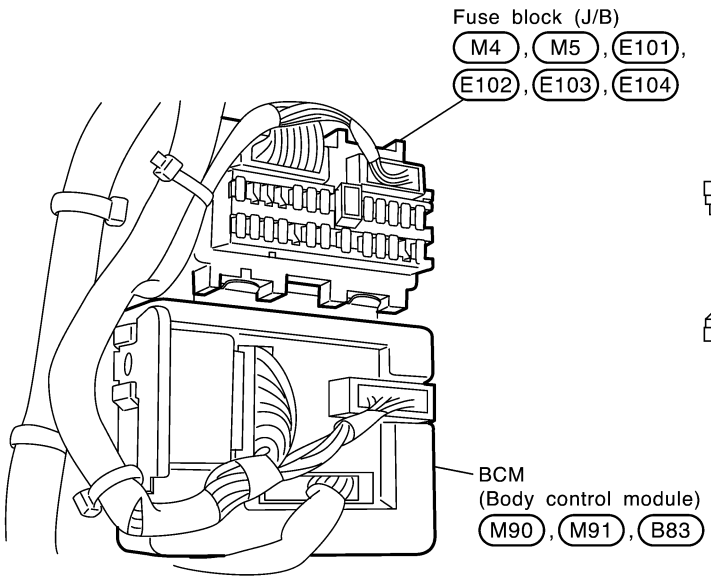


CKIT0212E

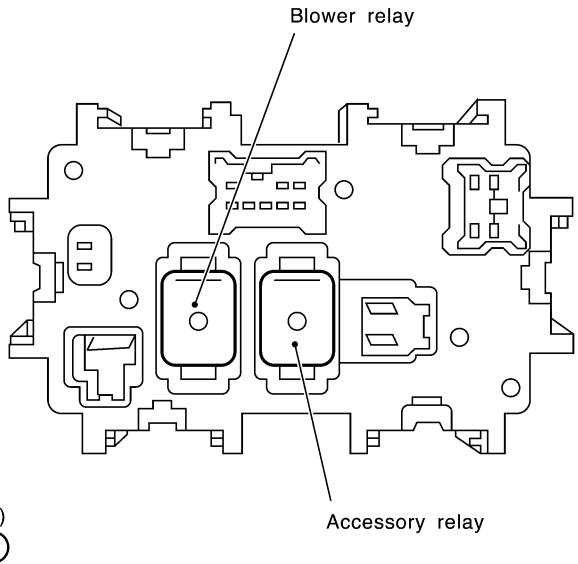
PASSENGER COMPARTMENT



A Behind the dash side lower LH finisher

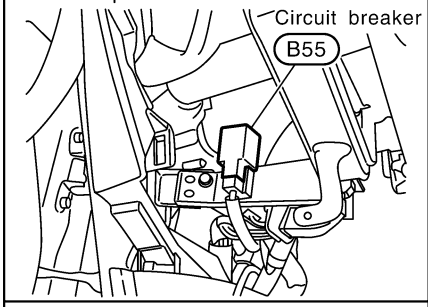


Fuse block (J/B) rear view

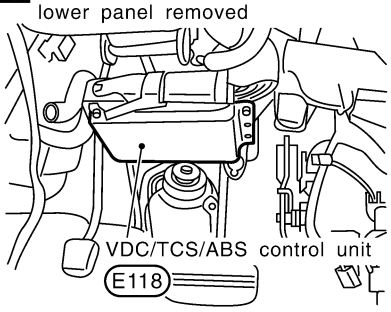


CKIT0467E

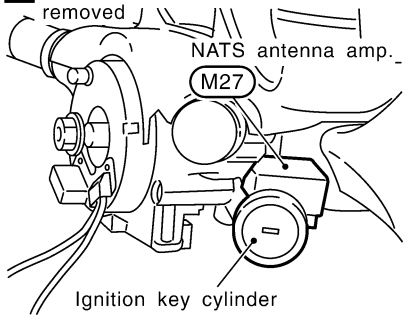
B Driver side view with instrument lower panel removed



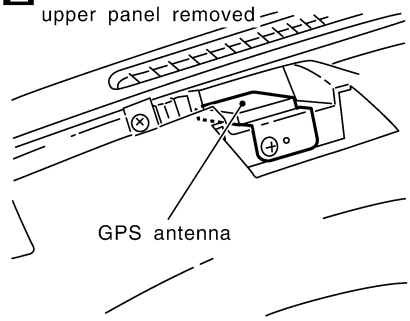
C Driver side view with instrument lower panel removed



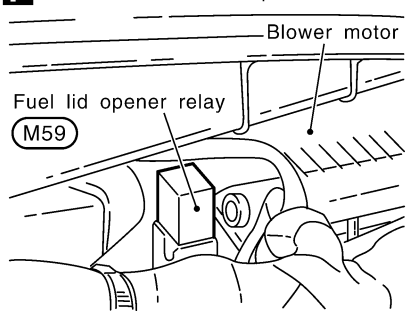
D View with steering column cover removed



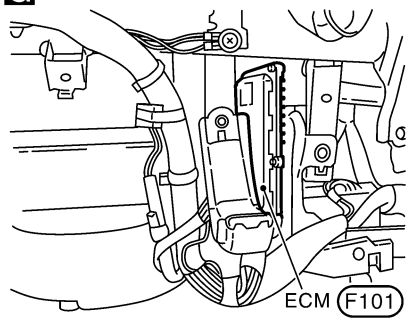
E Driver side view with instrument upper panel removed



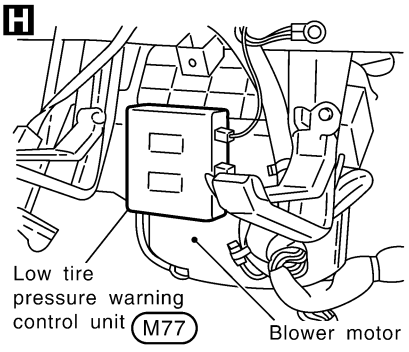
F View with instrument panel removed



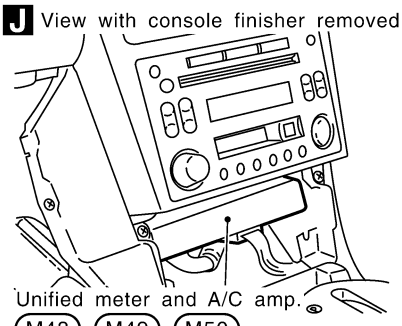
G Blower motor RH side



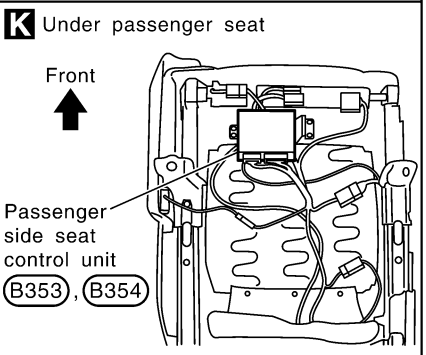
H



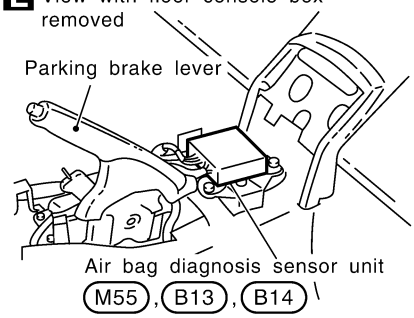
J View with console finisher removed



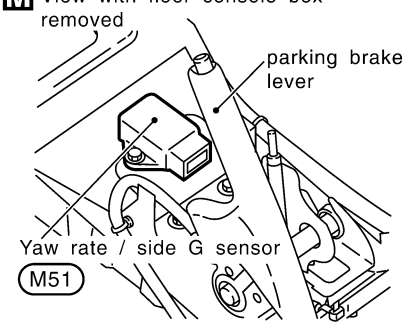
K Under passenger seat



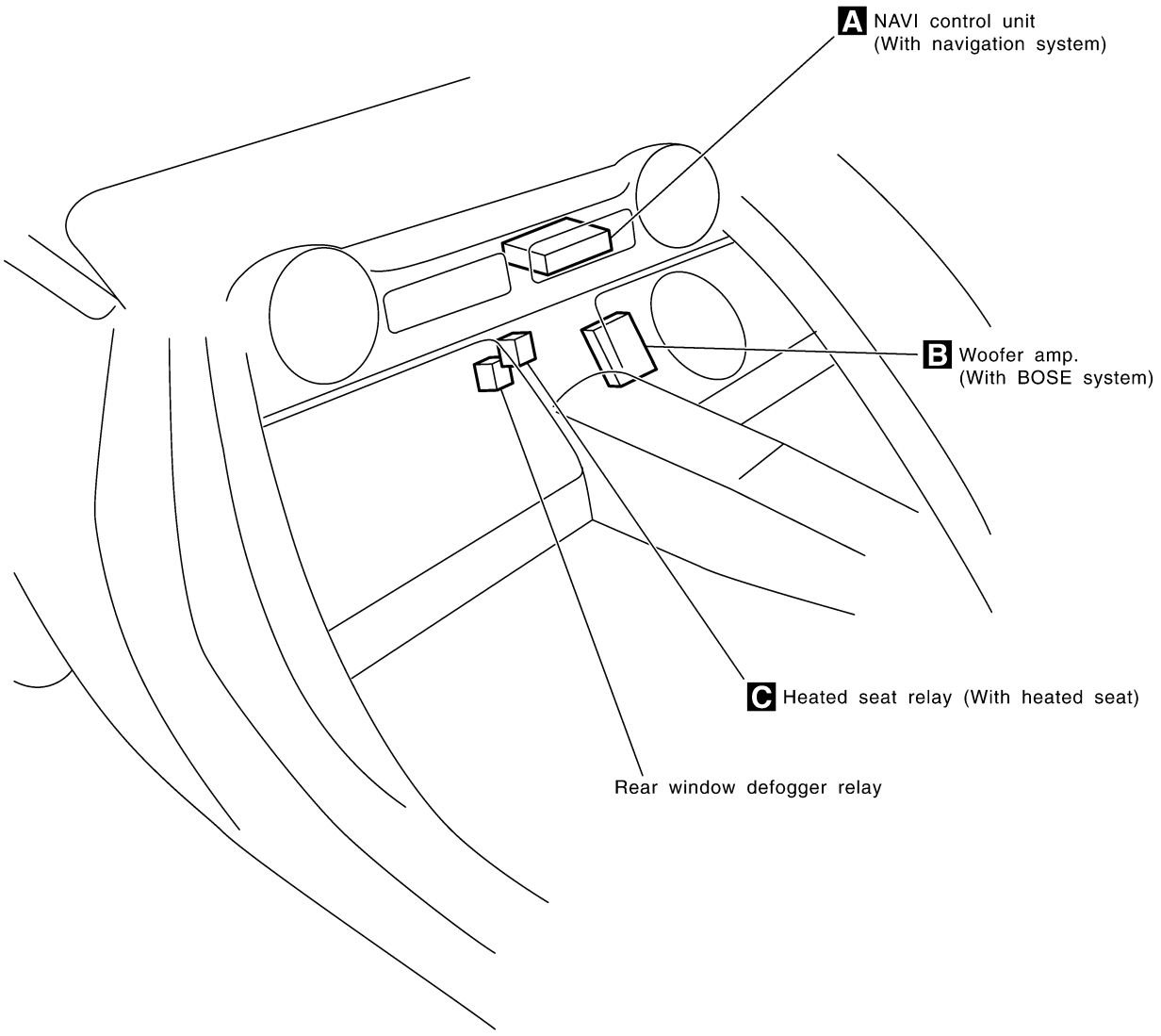
L View with floor console box removed

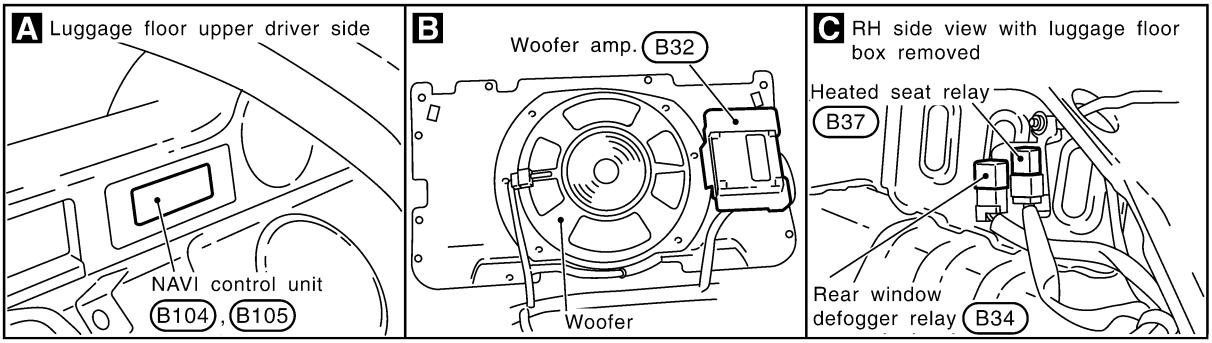


M View with floor console box removed



CKIT0436E

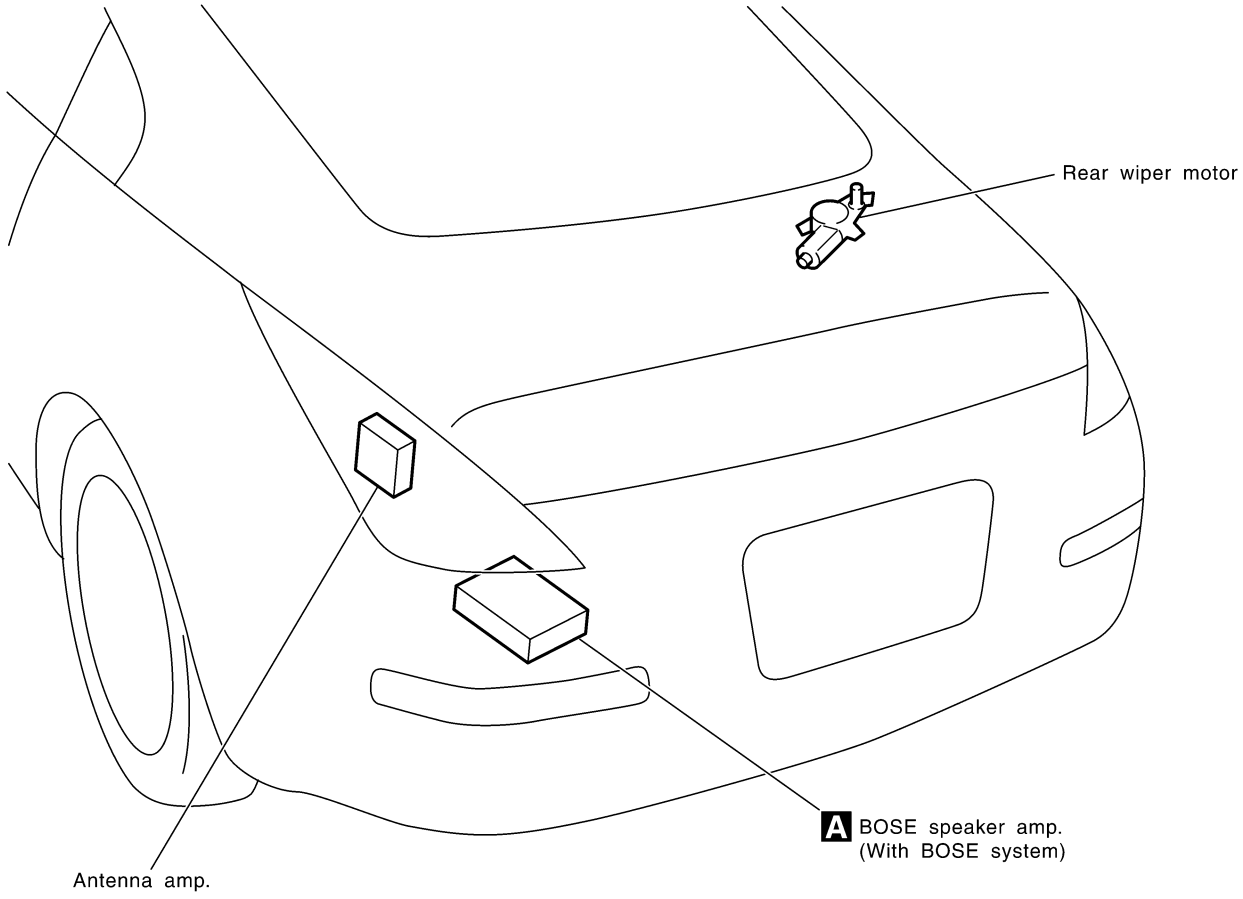

A NAVI control unit
(With navigation system)
B Woofer amp.
(With BOSE system)
C Heated seat relay (With heated seat)
Rear window defogger relay

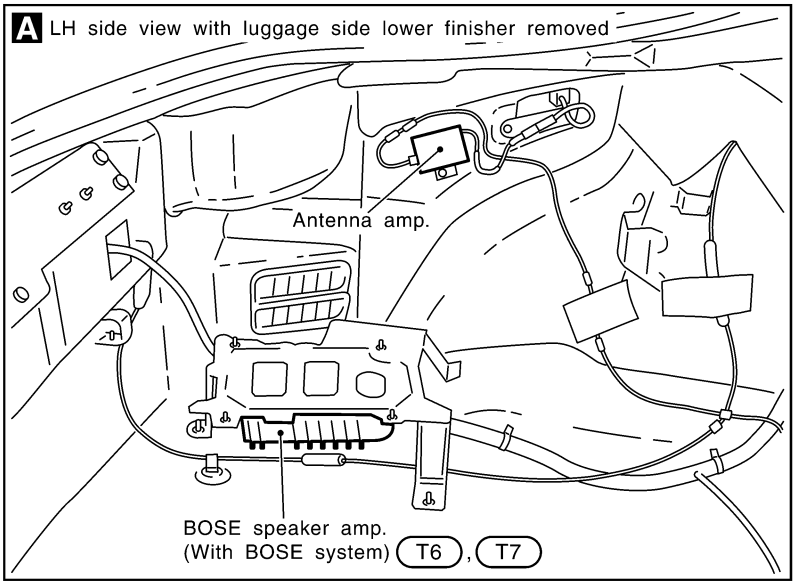

A Luggage floor upper driver side
NAVI control unit
B104, B105
B
Woofer amp. B32
Woofer
C RH side view with luggage floor box removed
Heated seat relay
B37
Rear window defogger relay B34

CKIT0349E

LUGGAGE COMPARTMENT

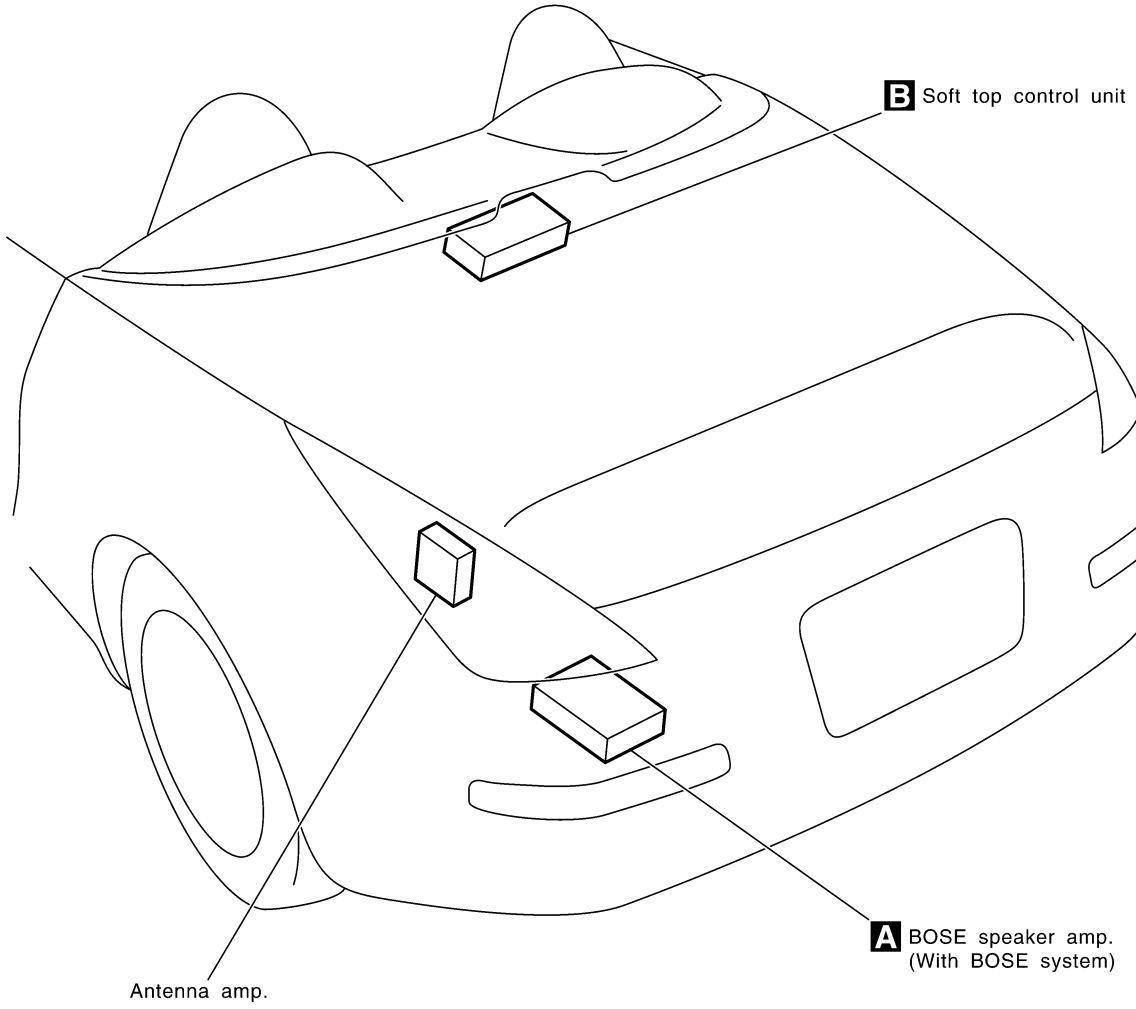
Coupe Models

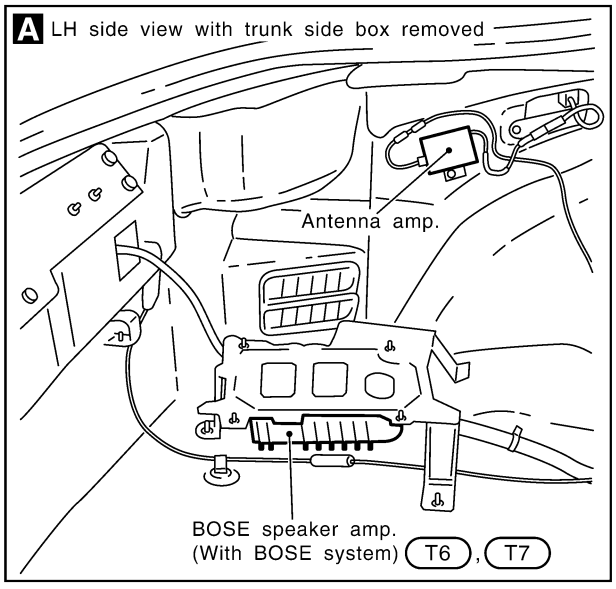


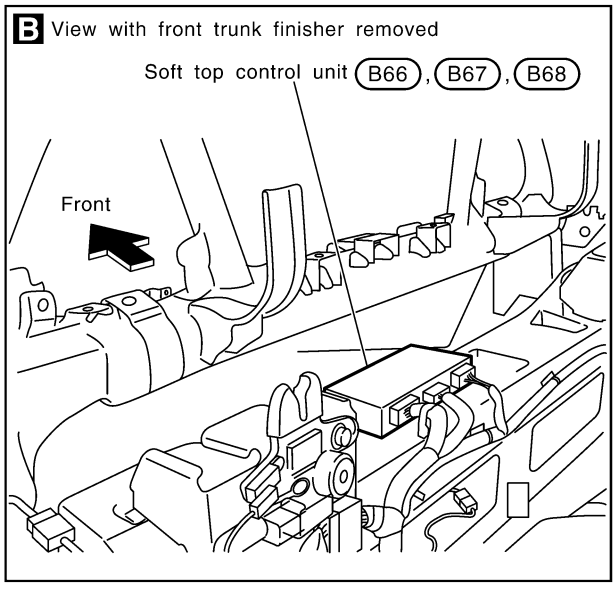


CKIT0216E

Roadster Models







CKIT0350E

HARNESS CONNECTOR

PFP:00011

Description

AKS0012T

HARNESS CONNECTOR (TAB-LOCKING TYPE)

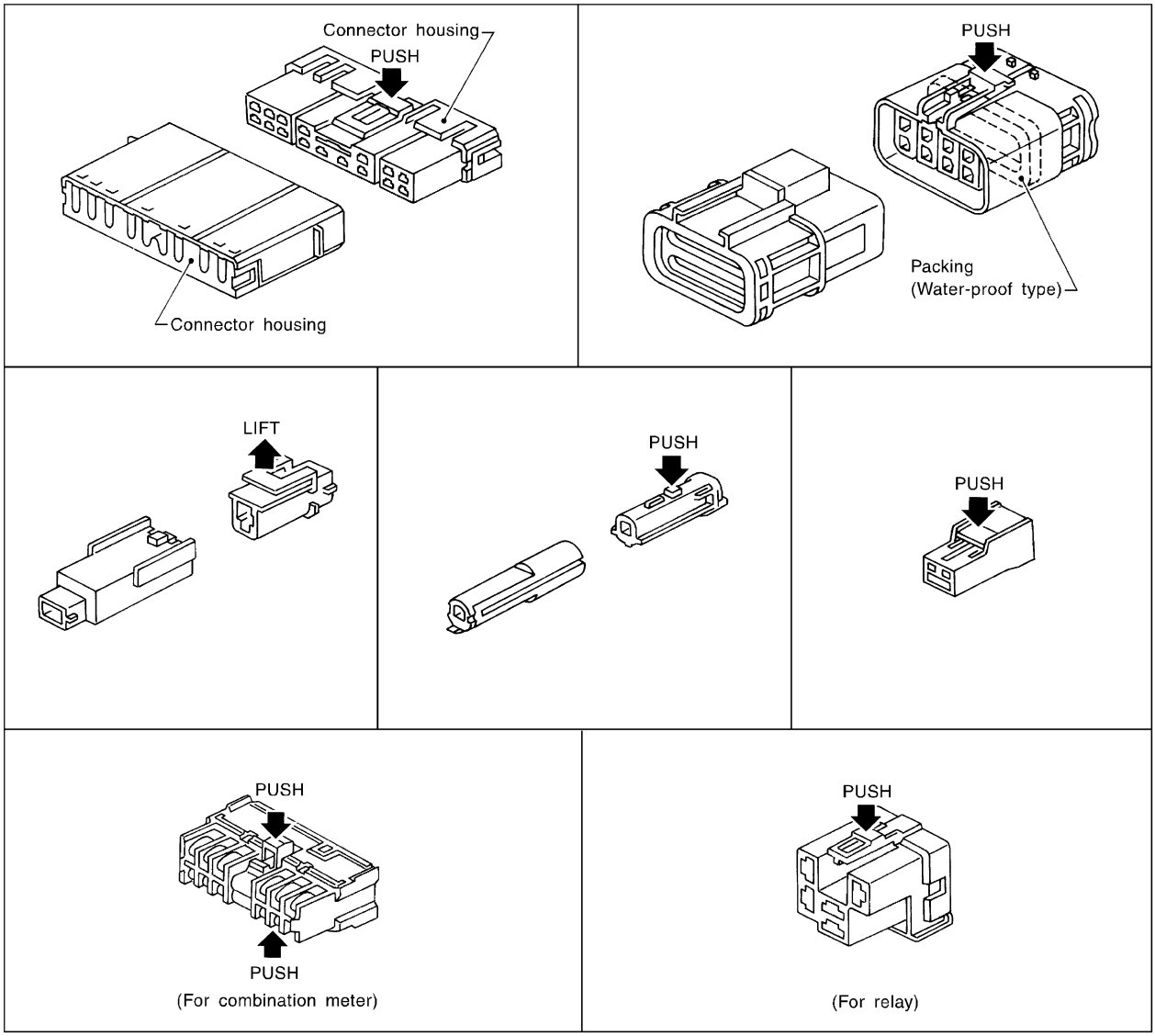
- The tab-locking type connectors help prevent accidental looseness or disconnection.
- The tab-locking type connectors are disconnected by pushing or lifting the locking tab(s). Refer to the illustration below.

Refer to the next page for description of the slide-locking type connector.

CAUTION:

Do not pull the harness or wires when disconnecting the connector.

[Example]



SEL769DA

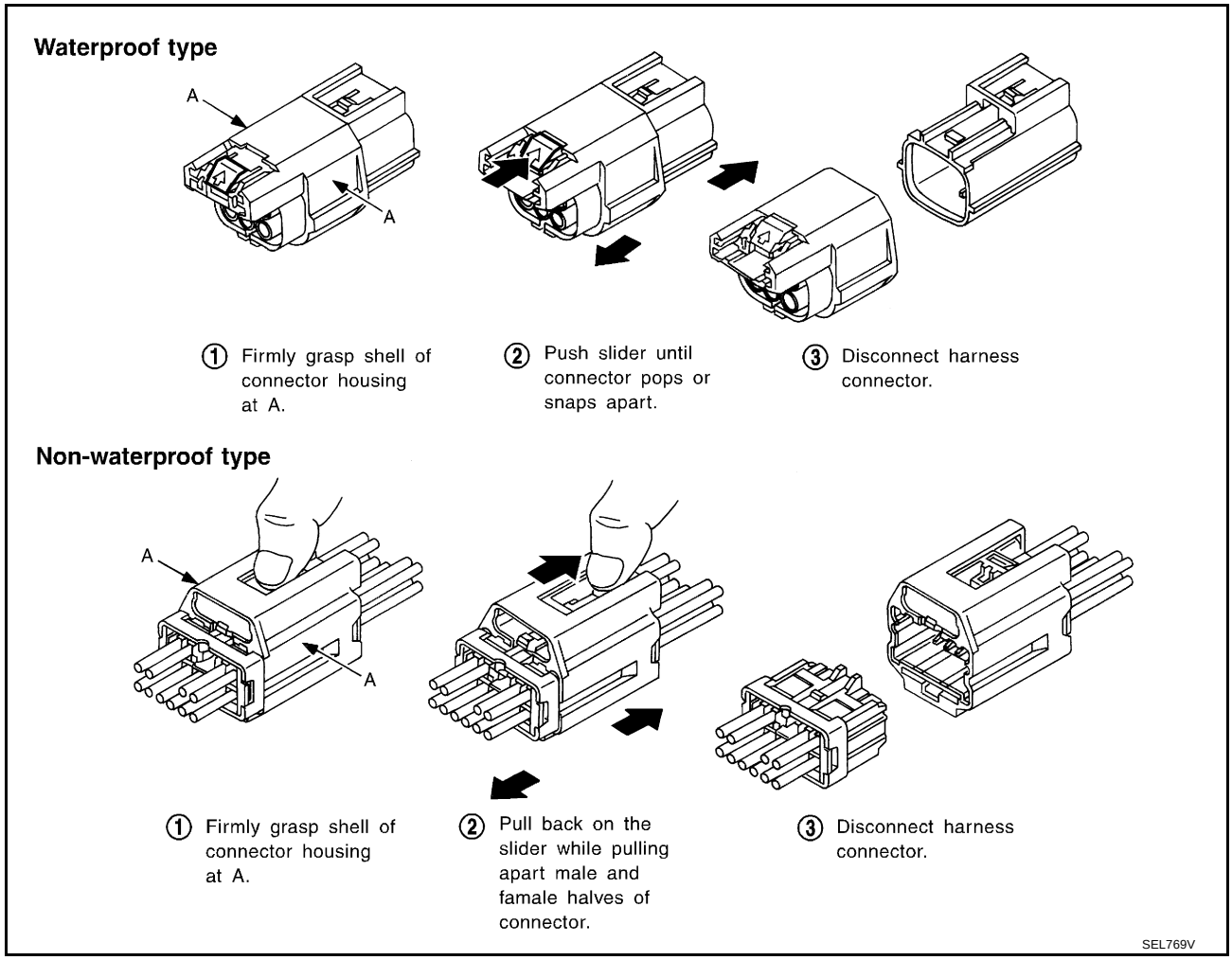
HARNESS CONNECTOR (SLIDE-LOCKING TYPE)

- A new style slide-locking type connector is used on certain systems and components, especially those related to OBD.
- The slide-locking type connectors help prevent incomplete locking and accidental looseness or disconnection.
- The slide-locking type connectors are disconnected by pushing or pulling the slider. Refer to the illustration below.

CAUTION:

- **Do not pull the harness or wires when disconnecting the connector.**
- **Be careful not to damage the connector support bracket when disconnecting the connector.**

[Example]



ELECTRICAL UNITS

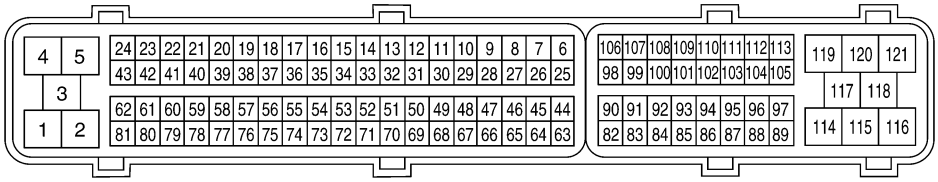
PFP:00011

Terminal Arrangement

AKS0012V

ECM

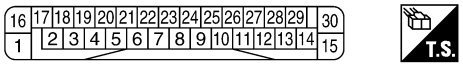
F101



(Black)

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

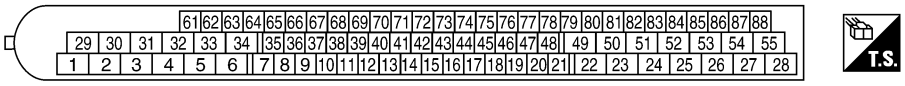
E51



(Gray)

VDC/TCS/ABS CONTROL UNIT

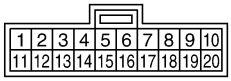
E118



(Black)

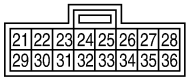
UNIFIED METER AND A/C AMP.

M48



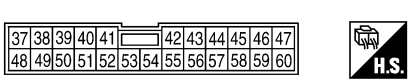
(Gray)

M49



(Gray)

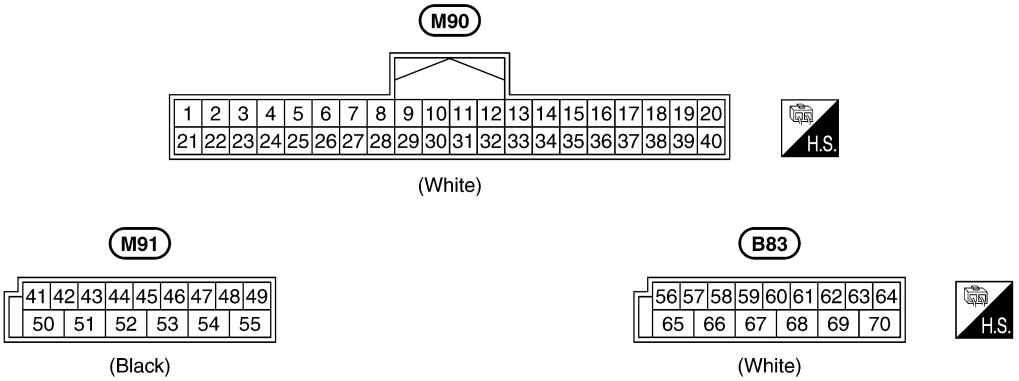
M50



(White)

CKIT0294E

BCM (BODY CONTROL MODULE)



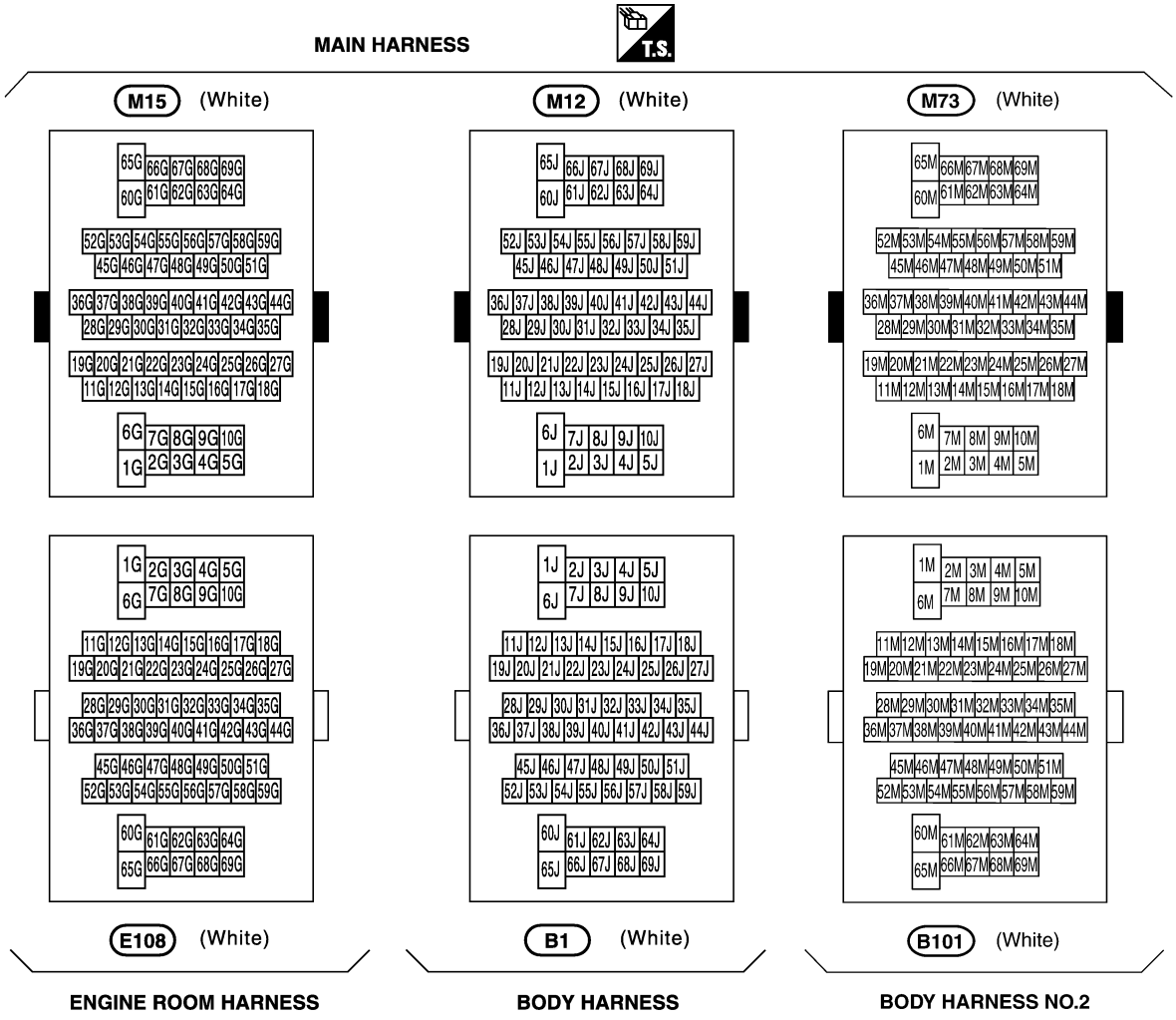
CKIT0472E

SMJ (SUPER MULTIPLE JUNCTION)

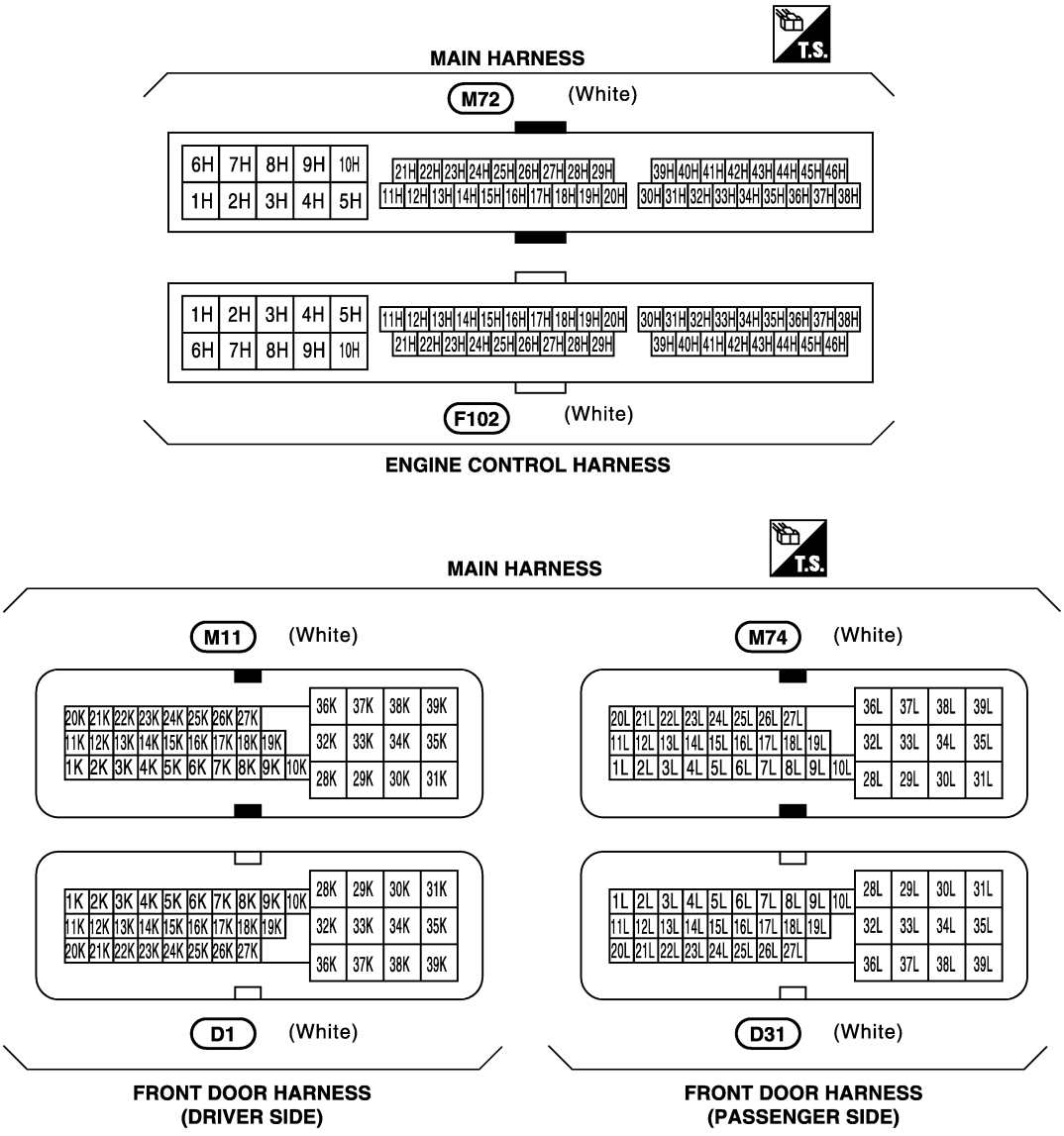
PFP:B4341

Terminal Arrangement

AKS0012W



CKIT0184E


MAIN HARNESS
T.S.
M72
(White)
6H 7H 8H 9H 10H
1H 2H 3H 4H 5H
21H 22H 23H 24H 25H 26H 27H 28H 29H
11H 12H 13H 14H 15H 16H 17H 18H 19H 20H
39H 40H 41H 42H 43H 44H 45H 46H
30H 31H 32H 33H 34H 35H 36H 37H 38H
1H 2H 3H 4H 5H
6H 7H 8H 9H 10H
11H 12H 13H 14H 15H 16H 17H 18H 19H 20H
21H 22H 23H 24H 25H 26H 27H 28H 29H
30H 31H 32H 33H 34H 35H 36H 37H 38H
39H 40H 41H 42H 43H 44H 45H 46H
F102
(White)
ENGINE CONTROL HARNESS
MAIN HARNESS
T.S.
M11
(White)
20K 21K 22K 23K 24K 25K 26K 27K
11K 12K 13K 14K 15K 16K 17K 18K 19K
1K 2K 3K 4K 5K 6K 7K 8K 9K 10K
36K 37K 38K 39K
32K 33K 34K 35K
28K 29K 30K 31K
M74
(White)
20L 21L 22L 23L 24L 25L 26L 27L
11L 12L 13L 14L 15L 16L 17L 18L 19L
1L 2L 3L 4L 5L 6L 7L 8L 9L 10L
36L 37L 38L 39L
32L 33L 34L 35L
28L 29L 30L 31L
1K 2K 3K 4K 5K 6K 7K 8K 9K 10K
11K 12K 13K 14K 15K 16K 17K 18K 19K
20K 21K 22K 23K 24K 25K 26K 27K
28K 29K 30K 31K
32K 33K 34K 35K
36K 37K 38K 39K
D1
(White)
FRONT DOOR HARNESS
(DRIVER SIDE)
1L 2L 3L 4L 5L 6L 7L 8L 9L 10L
11L 12L 13L 14L 15L 16L 17L 18L 19L
20L 21L 22L 23L 24L 25L 26L 27L
28L 29L 30L 31L
32L 33L 34L 35L
36L 37L 38L 39L
D31
(White)
FRONT DOOR HARNESS
(PASSENGER SIDE)

CKIT0158E

STANDARDIZED RELAY

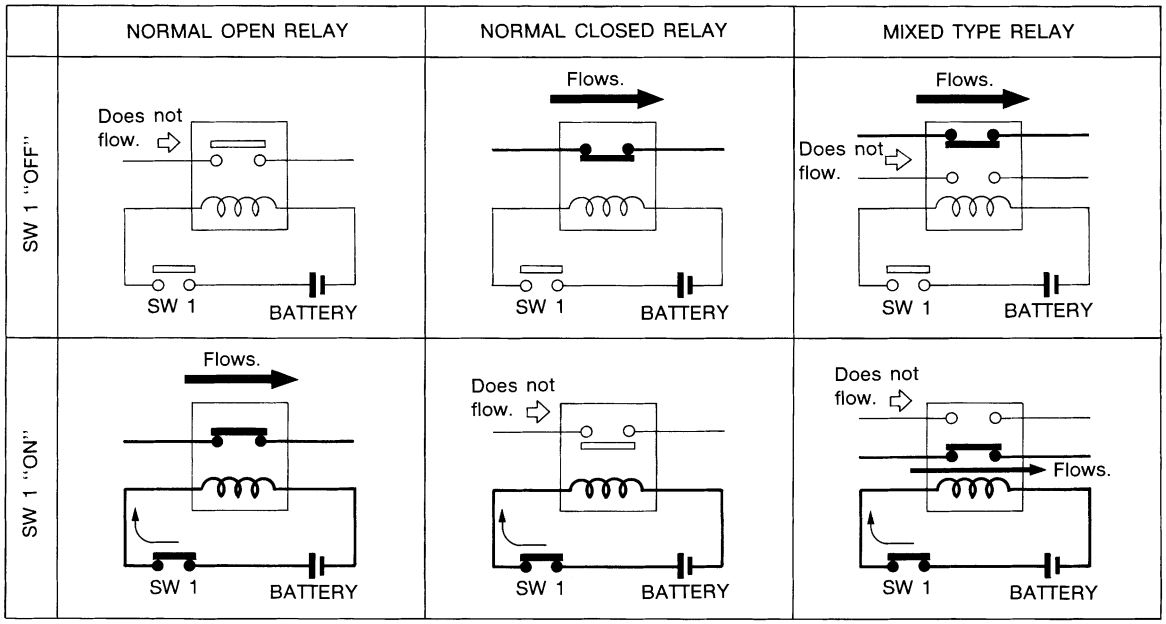
PFP:00011

Description

AKS0012X

NORMAL OPEN, NORMAL CLOSED AND MIXED TYPE RELAYS

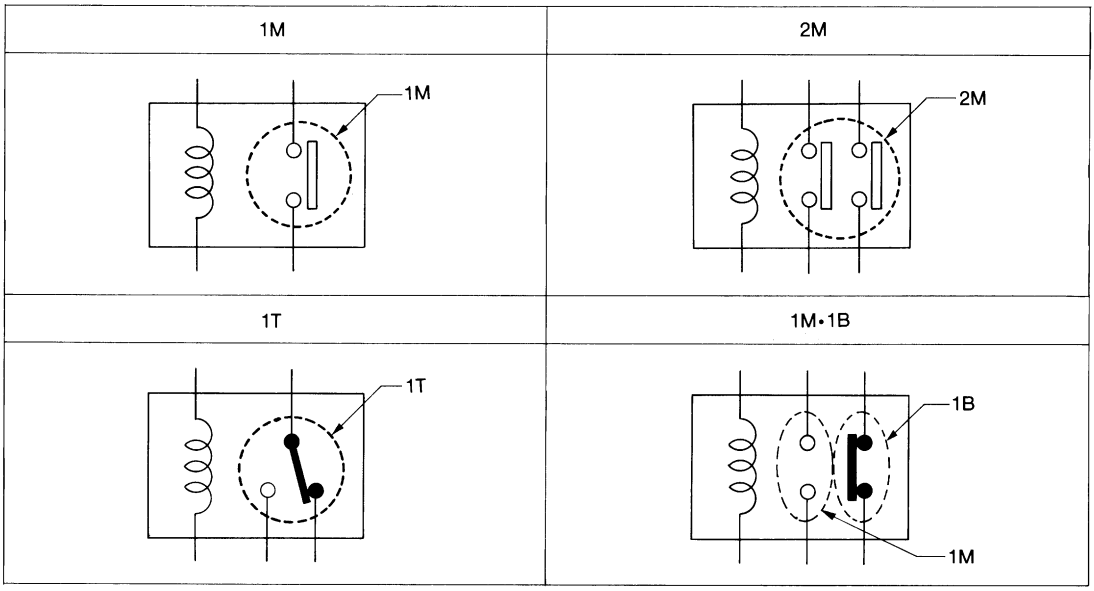
Relays can mainly be divided into three types: normal open, normal closed and mixed type relays.



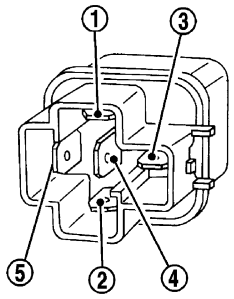
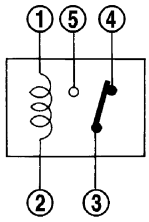
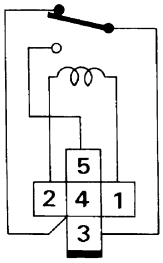
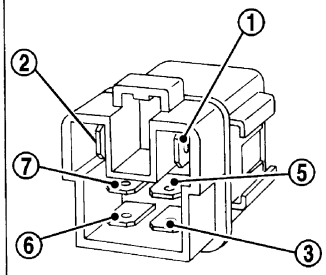
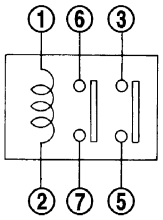
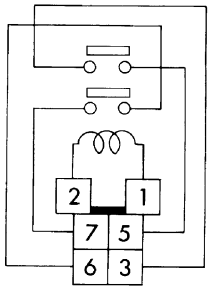
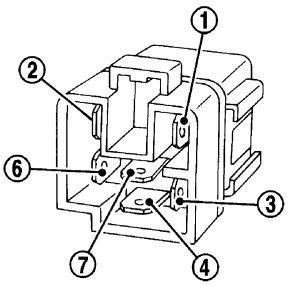
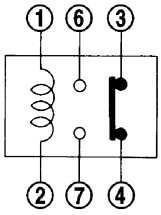
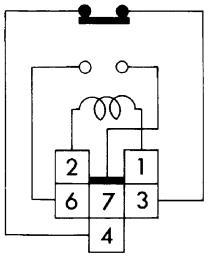
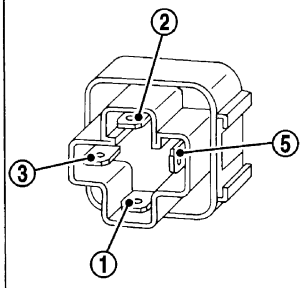
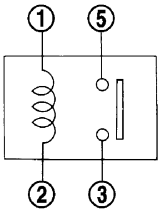
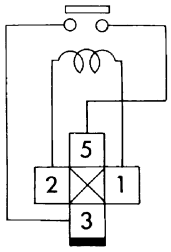
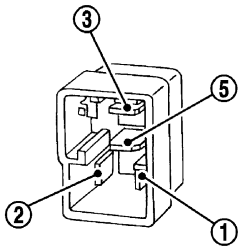
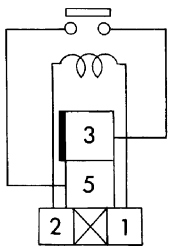
SEL881H

TYPE OF STANDARDIZED RELAYS

1M ..... 1 Make
2M ..... 2 Make
1T ..... 1 Transfer
1M·1B ..... 1 Make 1 Break



SEL882H

Type	Outer view	Circuit	Connector symbol and connection	Case color
1T				BLACK
2M				BROWN
1M•1B				GRAY
1M				BLUE
				

The arrangement of terminal numbers on the actual relays may differ from those shown above.

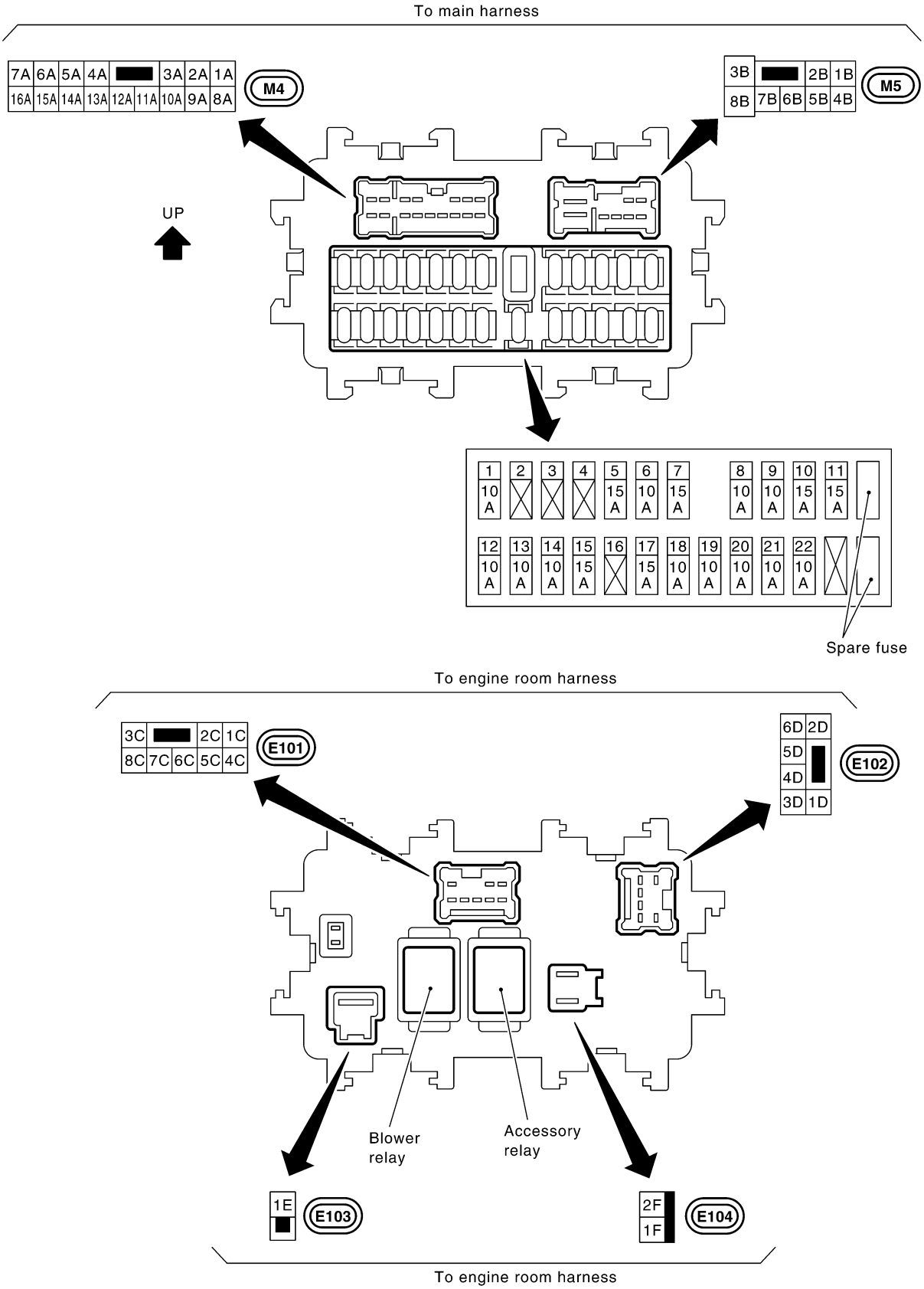
SEL188W

FUSE BLOCK - JUNCTION BOX (J/B)

PFP:24350

Terminal Arrangement

AKS0012Y



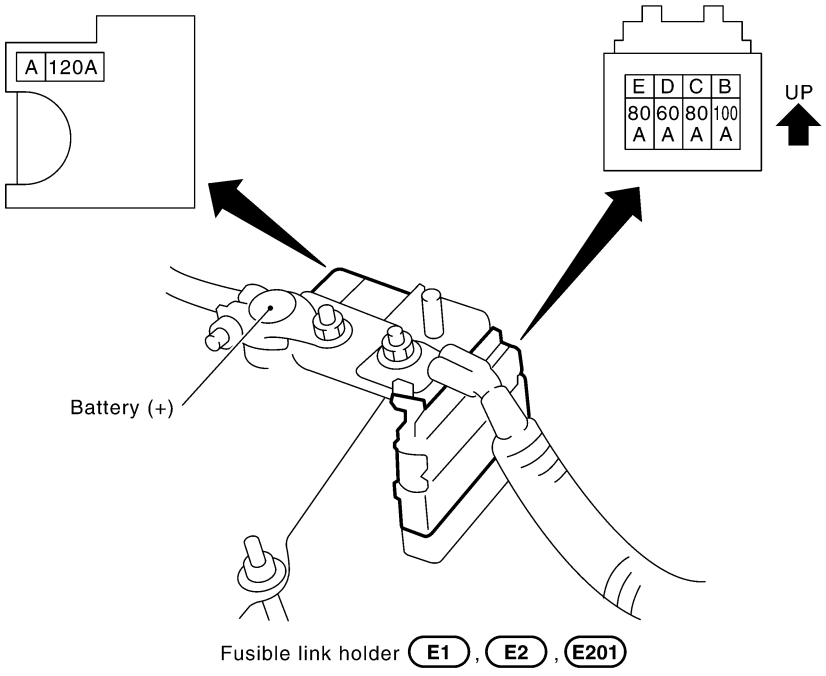
CKIT0363E

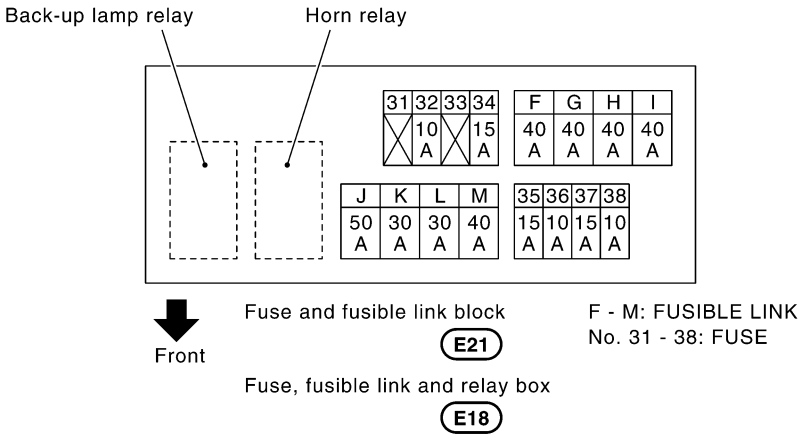
FUSE, FUSIBLE LINK AND RELAY BOX

PFP:24382

Terminal Arrangement

AKS0012Z





CKIT0186E

SECTION MA
MAINTENANCE

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PRECAUTIONS

PFP:00001

Precautions for Battery Service

ALS000MV

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

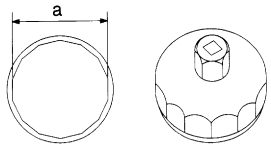
PREPARATION

PFP:00002

Special Service Tools

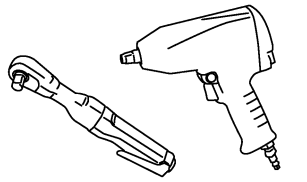
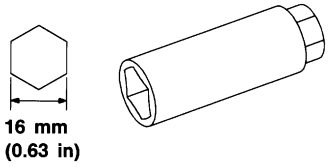
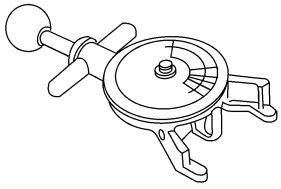
ALS000MW

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
KV10115801 (J38956) Oil filter wrench  S-NT375	Removing and installing oil filter **a: 64.3 mm (2.531 in)**

Commercial Service Tools

ALS000MX

(Kent-Moore No.) Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts
Spark plug wrench  S-NT047	Removing and installing spark plug
(BT3373-F) Belt tension gauge  AMA126	Checking drive belt tension

GENERAL MAINTENANCE

PFP:00000

Explanation of General Maintenance

ALS000MY

General maintenance includes those items which should be checked during the normal day-to-day operation of the vehicle. They are essential if the vehicle is to continue operating properly. The owners can perform checks and inspections themselves or have their NISSAN dealers do them.

OUTSIDE THE VEHICLE

The maintenance items listed here should be performed from time to time, unless otherwise specified.

Item		Reference page
Tires	Check the pressure with a gauge, including the spare, at least once a month and always prior to a long distance trips. Adjust to the specified pressure if necessary. Check carefully for damage, cuts or excessive wear.	—
Wheel nuts	When checking the tires, make sure no nuts are missing, and check for any loose nuts. Tighten if necessary.	—
Windshield	Clean the windshield on a regular basis. Check the windshield at least every six months for cracks or other damage. Repair as necessary.	—
Tire rotation	Tires cannot be rotated in this vehicle, as front tires are different size from rear tires and the direction of wheel rotation is fixed in each tire.	MA-27
Wheel alignment and balance	If the vehicle pulls to either side while driving on a straight and level road, or if you detect uneven or abnormal tire wear, there may be a need for wheel alignment. If the steering wheel or seat vibrates at normal highway speeds, wheel balancing may be needed.	MA-25, FSU-6
Windshield wiper blades	Check for cracks or wear if they do not wipe properly.	—
Doors and engine hood	Check that all doors and the engine hood operate smoothly as well as the trunk lid and back hatch. Also make sure that all latches lock securely. Lubricate if necessary. Make sure that the secondary latch keeps the hood from opening when the primary latch is released. When driving in areas using road salt or other corrosive materials, check lubrication frequently.	MA-30
Lamps	Make sure that the headlamps, stop lamps, tail lamps, turn signal lamps, and other lamps are all operating properly and installed securely. Also check headlamp aim. Clean the headlamps on a regular basis.	—

INSIDE THE VEHICLE

The maintenance items listed here should be checked on a regular basis, such as when performing periodic maintenance, cleaning the vehicle, etc.

Item		Reference page
Warning lamps and chimes	Make sure that all warning lamps and chimes are operating properly.	—
Windshield wiper and washer	Check that the wipers and washer operate properly and that the wipers do not streak.	—
Windshield defroster	Check that the air comes out of the defroster outlets properly and in sufficient quantity when operating the heater or air conditioner.	—
Steering wheel	Check that it has the specified play. Be sure to check for changes in the steering condition, such as excessive play, hard steering or strange noises. **Free play: Less than 35 mm (1.38 in)**	—
Seats	Check seat position controls such as seat adjusters, seatback recliner, etc. to make sure they operate smoothly and that all latches lock securely in every position. Check that the head restrains move up and down smoothly and that the locks (if equipped) hold securely in all latched positions. Check that the latches lock securely for folding-down rear seatbacks.	—
Seat belts	Check that all parts of the seat belt system (e.g. buckles, anchors, adjusters and retractors) operate properly and smoothly, and are installed securely. Check the belt webbing for cuts, fraying, wear or damage.	MA-31
Accelerator pedal	Check the pedal for smooth operation and make sure the pedal does not catch or require uneven effort. Keep the floor mats away from the pedal.	—

Item		Reference page
Brakes	Check that the brake does not pull the vehicle to one side when applied.	—
Brake pedal and booster	Check the pedal for smooth operation and make sure it has the proper distance under it when depressed fully. Check the brake booster function. Be sure to keep the floor mats away from the pedal.	BR-6, BR-22
Parking brake	Check that the lever has the proper travel and make sure that the vehicle is held securely on a fairly steep hill when only the parking brake is applied.	PB-2
Automatic transmission "Park" mechanism	Check that the lock release button on the selector lever operates properly and smoothly. On a fairly steep hill check that the vehicle is held securely with the selector lever in the "P" position without applying any brakes.	—

UNDER THE HOOD AND VEHICLE

The maintenance items listed here should be checked periodically (e.g. each time you check the engine oil or refuel).

Item		Reference page
Windshield washer fluid	Check that there is adequate fluid in the tank.	—
Engine coolant level	Check the coolant level when the engine is cold.	MA-15
Radiator and hoses	Check the front of the radiator and clean off any dirt, insects, leaves, etc., that may have accumulated. Make sure the hoses have no cracks, deformation, deterioration or loose connections.	—
Brake and clutch fluid levels	Make sure that the brake and clutch fluid levels are between the "MAX" and "MIN" lines on the reservoirs.	MA-27, MA-22
Battery	Check the fluid level in each cell. It should be between the "MAX" and "MIN" lines. Vehicles operated in high temperatures or under severe conditions require frequent checks of the battery fluid level.	—
Engine drive belts	Make sure that no belt is frayed, worn, cracked or oily.	MA-14
Engine oil level	Check the level on oil level gauge after parking the vehicle on a level spot and turning off the engine.	MA-18
Power steering fluid level and lines	Check the level on the dipstick with the engine off. Check the lines for improper attachment, leaks, cracks, etc.	MA-29
Exhaust system	Make sure there are no loose supports, cracks or holes. If the sound of the exhaust seems unusual or there is a smell of exhaust fumes, immediately locate the trouble and correct it.	MA-22
Underbody	The underbody is frequently exposed to corrosive substances such as those used on icy roads or to control dust. It is very important to remove these substances, otherwise rust will form on the floor pan, frame, fuel lines and around the exhaust system. At the end of winter, the underbody should be thoroughly flushed with plain water, being careful to clean those areas where mud and dirt can easily accumulate.	—
Fluid leaks	Check under the vehicle for fuel, oil, water or other fluid leaks after the vehicle has been parked for a while. Water dripping from the air conditioner after use is normal. If you should notice any leaks or gasoline fumes are evident, check for the cause and correct it immediately.	—

PERIODIC MAINTENANCE

PFP:00026

Introduction of Periodic Maintenance

ALS000MZ

Two different maintenance schedules are provided, and should be used, depending upon the conditions in which the vehicle is mainly operated. **After 60,000 miles (96,000 km) or 48 months, continue the periodic maintenance at the same mileage/time intervals.**

Schedule 1	Follow Periodic Maintenance Schedule 1 if the driving habits frequently include one or more of the following driving conditions: ● Repeated short trips of less than 5 miles (8 km). ● Repeated short trips of less than 10 miles (16 km) with outside temperatures remaining below freezing. ● Operating in hot weather in stop-and-go “rush hour” traffic. ● Extensive idling and/or low speed driving for long distances, such as police, taxi or door-to-door delivery use. ● Driving in dusty conditions. ● Driving on rough, muddy, or salt spread roads. ● Towing a trailer, using a camper or a car-top carrier.	Emission Control System Maintenance	MA-8
		Chassis and Body Maintenance	MA-9
Schedule 2	Follow Periodic Maintenance Schedule 2 if none of driving conditions shown in Schedule 1 apply to the driving habits.	Emission Control System Maintenance	MA-10
		Chassis and Body Maintenance	MA-10

Schedule 1

ALS000N0

EMISSION CONTROL SYSTEM MAINTENANCE

Abbreviations: R = Replace. I = Inspect. Correct or replace if necessary. [ ]: At the mileage intervals only

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								Reference Section - Page or - Content Title
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	3.75 (6) 3	7.50 (12) 6	11.25 (18) 9	15 (24) 12	18.75 (30) 15	22.5 (36) 18	26.25 (42) 21	30 (48) 24	
Drive belts	NOTE (1)									MA-14
Air cleaner filter	NOTE (2)								[R]	MA-18
EVAP vapor lines									I*	MA-21
Fuel lines									I*	MA-17
Fuel filter	NOTE (3)									-
Engine coolant	NOTE (4)									MA-15
Engine oil		R	R	R	R	R	R	R	R	MA-18
Engine oil filter (Use part No. 15208 31U00 or 15208 65F00 or equivalent.)		R	R	R	R	R	R	R	R	MA-19
Spark plugs (PLATINUM-TIPPED type)		Replace every 105,000 miles (169,000 km).								MA-20
Intake & exhaust valve clearance*	NOTE (5)									EM-84

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								Reference Section - Page or - Content Title
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	33.75 (54) 27	37.5 (60) 30	41.25 (66) 33	45 (72) 36	48.75 (78) 39	52.5 (84) 42	56.25 (90) 45	60 (96) 48	
Drive belts	NOTE (1)								I*	MA-14
Air cleaner filter	NOTE (2)								[R]	MA-18
EVAP vapor lines									I*	MA-21
Fuel lines									I*	MA-17
Fuel filter	NOTE (3)									-
Engine coolant	NOTE (4)								R*	MA-15
Engine oil		R	R	R	R	R	R	R	R	MA-18
Engine oil filter (Use part No. 15208 31U00 or 15208 65F00 or equivalent.)		R	R	R	R	R	R	R	R	MA-19
Spark plugs (PLATINUM-TIPPED type)		Replace every 105,000 miles (169,000 km).								MA-20
Intake & exhaust valve clearance*	NOTE (5)									EM-84

NOTE:

(1) After 60,000 miles (96,000 km) or 48 months, inspect every 15,000 miles (24,000 km) or 12 months. Replace the drive belts if found damaged.

(2) If operating mainly in dusty conditions, more frequent maintenance may be required.

(3) Maintenance-free item. For service procedures, refer to FL section.

(4) After 60,000 miles (96,000 km) or 48 months, replace every 30,000 miles (48,000 km) or 24 months.

(5) If valve noise increases, inspect valve clearance.

* Maintenance items and intervals with “*” are recommended by NISSAN for reliable vehicle operation. The owner need not perform such maintenance in order to maintain the emission warranty or manufacturer recall liability. Other maintenance items and intervals are required.

CHASSIS AND BODY MAINTENANCE

Abbreviations: R = Replace. I = Inspect. Correct or replace if necessary.

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								Reference Section - Page or - Content Title
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	3.75 (6) 3	7.50 (12) 6	11.25 (18) 9	15 (24) 12	18.75 (30) 15	22.5 (36) 18	26.25 (42) 21	30 (48) 24	
Brake lines & cables					I				I	MA-27
Brake pads & rotors			I		I		I		I	MA-27
Automatic transmission fluid, manual transmission & differential gear oil	NOTE (1)				I				I	MA-22, MA-24 , MA-22 , MA-25
Steering gear & linkage, axle & suspension parts			I		I		I		I	MA-28, RSU-5 , MA-29
Tire rotation	NOTE (2)									MA-5, MA-27
Exhaust system			I		I		I		I	MA-22

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								Reference Section - Page or - Content Title
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	33.75 (54) 27	37.5 (60) 30	41.25 (66) 33	45 (72) 36	48.75 (78) 39	52.5 (84) 42	56.25 (90) 45	60 (96) 48	
Brake lines & cables					I				I	MA-27
Brake pads & rotors			I		I		I		I	MA-27
Automatic transmission fluid, manual transmission & differential gear oil	NOTE (1)				I				I	MA-22, MA-24 , MA-22 , MA-25
Steering gear & linkage, axle & suspension parts			I		I		I		I	MA-28, RSU-5 , MA-29
Tire rotation	NOTE (2)									MA-5, MA-27
Exhaust system			I		I		I		I	MA-22

NOTE:

(1) If towing a trailer, using a camper or a car-top carrier, or driving on rough or muddy roads, change (not just inspect) oil at every 30,000 miles (48,000 km) or 24 months. **Using automatic transmission fluid other than Genuine Nissan Matic J ATF will cause deterioration in driveability and automatic transmission durability, and may damage the automatic transmission, which is not covered by the NISSAN new vehicle limited warranty.**

(2) Tires cannot be rotated in this vehicle. Refer to “Tire rotation” under the “General maintenance” heading earlier in this section.

Schedule 2

ALS000N1

EMISSION CONTROL SYSTEM MAINTENACE

Abbreviations: R = Replace. I = Inspect. Correct or replace if necessary. [ ]: At the mileage intervals only

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								Reference Section - Page or - Content Title
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	7.5 (12) 6	15 (24) 12	22.5 (36) 18	30 (48) 24	37.5 (60) 30	45 (72) 36	52.5 (84) 42	60 (96) 48	
Drive belts	NOTE (1)								I*	MA-14
Air cleaner filter					[R]				[R]	MA-18
EVAP vapor lines					I*				I*	MA-21
Fuel lines					I*				I*	MA-17
Fuel filter	NOTE (2)									-
Engine coolant	NOTE (3)								R*	MA-15
Engine oil		R	R	R	R	R	R	R	R	MA-18
Engine oil filter (Use part No. 15208 31U00 or 15208 65F00 or equivalent.)		R	R	R	R	R	R	R	R	MA-19
Spark plugs (PLATINUM-TIPPED type)		Replace every 105,000 miles (169,000 km).								MA-20
Intake & exhaust valve clearance*	NOTE (4)									EM-84

NOTE:

(1) After 60,000 miles (96,000 km) or 48 months, inspect every 15,000 miles (24,000 km) or 12 months. Replace the drive belts if found damaged.

(2) Maintenance-free item. For service procedures, refer to FL section.

(3) After 60,000 miles (96,000 km) or 48 months, replace every 30,000 miles (48,000 km) or 24 months.

(4) If valve noise increases, inspect valve clearance.

* Maintenance items and intervals with "*" are recommended by NISSAN for reliable vehicle operation. The owner need not perform such maintenance in order to maintain the emission warranty or manufacturer recall liability. Other maintenance items and intervals are required

CHASSIS AND BODY MAINTENANCE

Abbreviations: R = Replace. I = Inspect. Correct or replace if necessary.

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								Reference Section - Page or - Content Title
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	7.5 (12) 6	15 (24) 12	22.5 (36) 18	30 (48) 24	37.5 (60) 30	45 (72) 36	52.5 (84) 42	60 (96) 48	
Brake lines & cables			I		I		I		I	MA-27
Brake pads & rotors			I		I		I		I	MA-27
Automatic transmission fluid, manual transmission & differential gear oil	NOTE (1)		I		I		I		I	MA-22, MA-24 , MA-22 , MA-25
Steering gear & linkage, axle & suspension parts					I				I	MA-28, RSU-5, MA-29
Tire rotation	NOTE (2)									MA-5, MA-27
Exhaust system					I				I	MA-22

NOTE:

(1) Using automatic transmission fluid other than Genuine Nissan Matic J ATF will cause deterioration in driveability and automatic transmission durability, and may damage the automatic transmission, which is not covered by the NISSAN new vehicle limited warranty.

(2) Tires cannot be rotated in this vehicle. Refer to “Tire rotation” under the “General maintenance” heading earlier in this section.

RECOMMENDED FLUIDS AND LUBRICANTS

PFP:00000

Fluids and Lubricants

ALS000N2

		Capacity (Approximate)			Recommended Fluids/Lubricants
		US measure	Imp measure	Liter	
Engine oil Drain and refill	With oil filter change	5 qt	4-1/8 qt	4.7	● API Certification Mark*1 ● API grade SG/SH, Energy Conserving I & II or API grade SJ or SL, Energy Conserving*1 ● ILSAC grade GF-I, GF-II & GF-III*1
	Without oil filter change	4-5/8 qt	3-7/8 qt	4.4	
Dry engine (Overhaul)		5-3/4 qt	4-3/4 qt	5.4	
Cooling system	With reservoir tank	9-1/4 qt	7-5/8 qt	8.7	Genuine Nissan Long Life Antifreeze/ Coolant or equivalent
	Reservoir tank	7/8 qt	3/4 qt	0.8	
Automatic transmission fluid		10-7/8 qt	9-1/8 qt	10.3	Genuine Nissan Matic J ATF*2
Manual transmission gear oil		3-1/8 qt	2-1/2 qt	2.9	Genuine Nissan Manual Transmission Fluid (MTF) HQ Multi 75W-85 or API GL-4,Viscosity SAE 75W-85 or 75W-90
Power steering fluid (PSF)		1-1/8 qt	7/8 qt	1.0	Genuine NISSAN PSF or equivalent*3
Brake and clutch fluid		—	—	—	Genuine Nissan Super Heavy Duty Brake Fluid*4 or equivalent DOT 3 (US FMVSS No. 116)
Differential gear oil		3 pt	2-1/2 pt	1.4	API GL-5, Viscosity SAE 80W-90*5
Multi-purpose grease		—	—	—	NLGI No. 2 (Lithium soap base)
Windshield washer fluid		—	—	—	Genuine Nissan Windshield Washer Concentrate Cleaner & Antifreeze Fluid or equivalent

*1: For further details, see “SAE Viscosity Number”.

*2: **Using automatic transmission fluid other than Genuine Nissan Matic J ATF will cause deterioration in driveability and automatic transmission durability, and may damage the automatic transmission, which is not covered by the NISSAN new vehicle limited warranty** .

*3: For Canada, NISSAN Automatic Transmission Fluid (ATF), DEXRON™ III/ MERCON™ or equivalent ATF may also be used.

*4: Available in mainland U.S.A. through your NISSAN dealer.

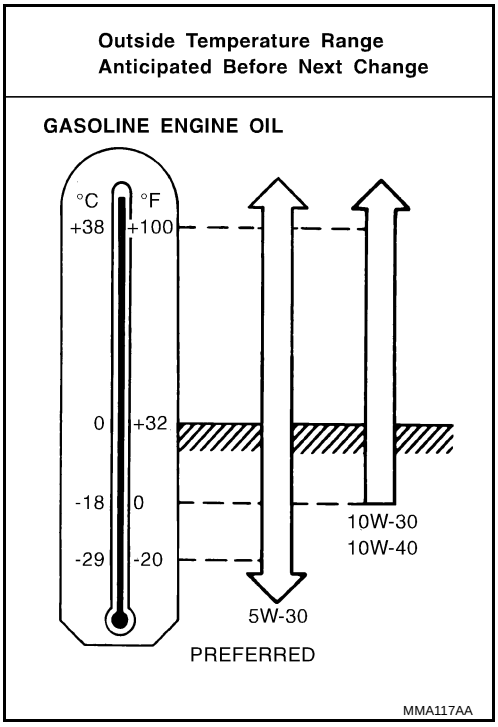
*5: For hot climates, viscosity SAE 90 is suitable for ambient temperatures above 0°C(32°F).

SAE Viscosity Number

ALS000N3

GASOLINE ENGINE OIL

SAE 5W-30 viscosity oil is preferred for all temperatures. SAE 10W-30 and 10W-40 viscosity oil may be used if the ambient temperature is above -18°C(0°F)



ANTI-FREEZE COOLANT MIXTURE RATIO

The engine cooling system is filled at the factory with a high-quality, year-round, anti-freeze coolant solution. The anti-freeze solution contains rust and corrosion inhibitors. Therefore, additional cooling system additives are not necessary.

CAUTION:

When adding or replacing coolant, be sure to use only Genuine Nissan Long Life Antifreeze/ Coolant or equivalent with the proper mixture ratio of 50% anti-freeze and 50% demineralized water/distilled water.

Other types of coolant solutions may damage your cooling system.

Outside temperature down to		Anti-freeze	Demineralized water or distilled water
°C	°F		
−35	−30	50%	50%

SMA947CA

ENGINE MAINTENANCE

PFP:00000

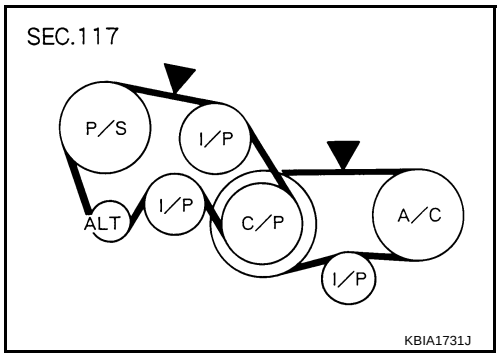
Checking Drive Belts

ALS000Q1

WARNING:

Be sure to perform when engine is stopped.

1. Inspect belts for cracks, fraying, wear and oil. If necessary, replace.
2. Inspect drive belt deflection at a point on the belt midway between pulleys.
   - Inspection should be done only when engine is cold, or over 30 minutes after engine is stopped.
   - Measure belt tension with tension gauge (BT3373-F or equivalent) at points marked ▼ shown in the figure.
   - When measuring deflection, apply 98 N (10 kg, 22 lb) at the ▼ marked point.
   - Adjust if belt deflection exceeds the limit or if belt tension is not within specifications.



CAUTION:

- **When checking belt deflection or tension immediately after installation, first adjust it to the specified value. Then, after turning crankshaft two turns or more, re-adjust to the specified value to avoid variation in deflection between pulleys.**
- **Tighten idler pulley lock nut by hand and measure deflection or tension without looseness.**

Belt deflection and tension

	Deflection adjustment		Unit: mm (in)	Tension adjustment*		Unit: N (kg, lb)
	Used belt		New belt	Used belt		New belt
	Limit	After adjustment		Limit	After adjustment	
Alternator and power steering oil pump belt	7 (0.28)	4 - 5 (0.16 - 0.20)	3.5 - 4.5 (0.138 - 0.177)	294 (30, 66)	730 - 818 (74.5 - 83.5, 164 - 184)	838 - 926 (85.5 - 94.5, 188 - 208)
A/C compressor belt	12 (0.47)	9 - 10 (0.35 - 0.39)	8 - 9 (0.31 - 0.35)	196 (20, 44)	348 - 436 (35.5 - 44.5, 78 - 98)	470 - 559 (48 - 57, 106 - 126)
Applied pushing force	98 N (10 kg, 22 lb)			—		

*: If belt tension gauge cannot be installed at check points shown, check drive belt tension at different location on belt.

Tension Adjustment

ALS000Q2

Portion	Belt tightening method for adjustment
Alternator and power steering oil pump belt	Adjusting bolt on idler pulley
A/C compressor belt	Adjusting bolt on idler pulley

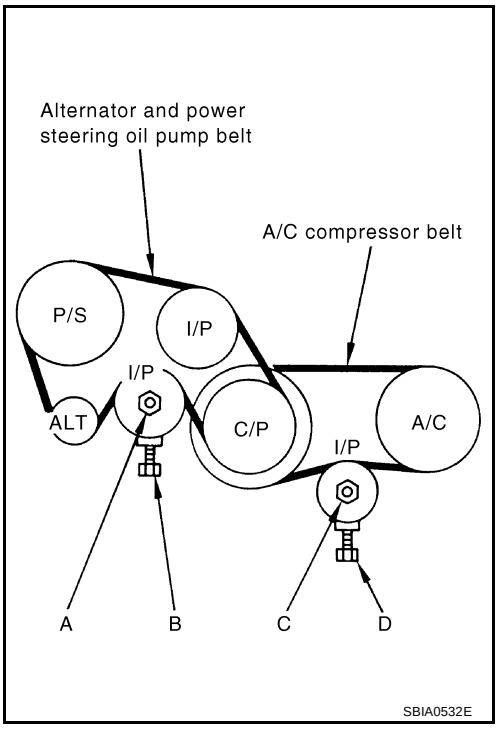
CAUTION:

- **When belt is replaced with a new one, adjust it to value for “New belt” to accommodate for insufficient adaptability with pulley grooves.**
- **When deflection or tension of belt being used exceeds “Limit”, adjust it to value for “After adjustment”.**
- **When checking belt deflection or tension immediately after installation, first adjust it to the specified value. Then, after turning crankshaft two turns or more, re-adjust to the specified value to avoid variation in deflection between pulleys.**
- **When installing belt, make sure that it is correctly engaged with pulley groove.**
- **Keep oil and water away from belt.**
- **Do not twist or bend belt excessively.**

ALTERNATOR AND POWER STEERING OIL PUMP BELT

1. Remove undercover with power tool.
2. Loosen idler pulley lock nut (A) and adjust tension by turning adjusting bolt (B).
   - For specified belt tension, refer to MA-14, "Checking Drive Belts" .
3. Tighten nut (A).

   : 31.4 - 38.2 N·m (3.2 - 3.9 kg-m, 24 - 28 ft-lb)



A/C COMPRESSOR BELT

1. Remove undercover with power tool.
2. Loosen idler pulley lock nut (C) and adjust tension by turning adjusting bolt (D).
   - For specified belt tension, refer to MA-14, "Checking Drive Belts" .
3. Tighten nut (C).

   : 30.4 - 39.2 N·m (3.1 - 4.0 kg-m, 23 - 28 ft-lb)

Changing Engine Coolant

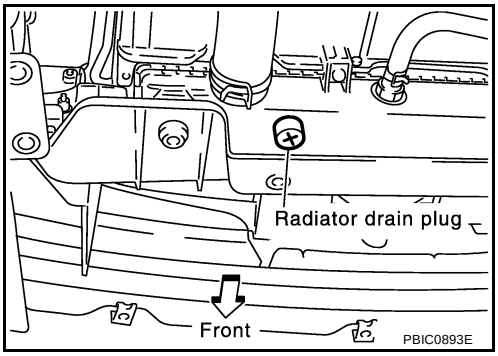
ALS000Q3

WARNING:

- **To avoid being scalded, do not change engine coolant when engine is hot.**
- **Wrap a thick cloth around cap and carefully remove cap. First, turn cap a quarter of a turn to release built-up pressure. Then turn cap all the way.**
- **Be careful not to allow engine coolant to contact drive belts.**

DRAINING ENGINE COOLANT

1. Remove undercover with power tool.
2. Open radiator drain plug at the bottom of radiator, and then remove radiator cap.



   When drain all of engine coolant in the system, open water drain plugs on engine cylinder block. Refer to EM-112, "DISASSEMBLY" .
3. Remove reservoir tank as necessary, and drain engine coolant and clean tank before installing.

4. Check drained engine coolant for contaminants such as rust, corrosion or discoloration.
   If contaminated, flush the engine cooling system. Refer to MA-17, "FLUSHING COOLING SYSTEM" .

REFILLING ENGINE COOLANT

1. Install reservoir tank, and radiator drain plug.

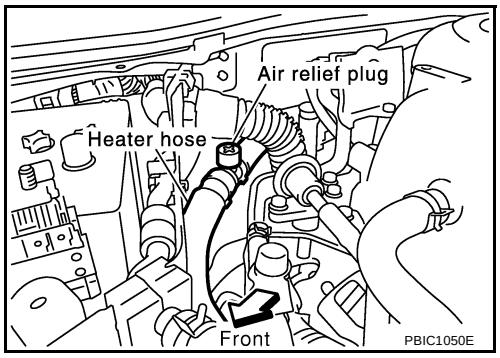
   CAUTION:
   Be sure to clean drain plug and install with new O-ring.

   Radiator drain plug:

   : 0.78 - 1.6 N·m (0.08 - 0.16 kg-m, 7 - 14 in-lb)

   If water drain plugs on cylinder block are removed, close and tighten them. Refer to EM-117, "ASSEMBLY" .

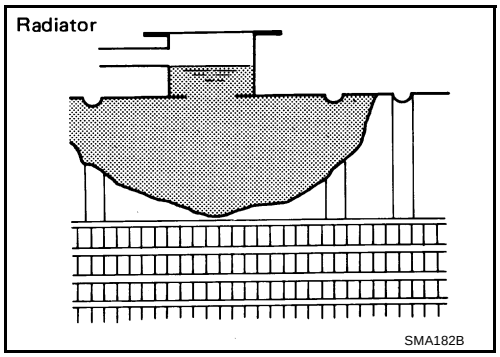
2. Make sure that each hose clamp has been firmly tightened.
3. Remove air relief plug on heater hose.



4. Fill radiator and reservoir tank to specified level.
   - **Pour engine coolant through engine coolant filler neck slowly of less than 2 ℓ (2-1/8 US qt, 1-3/4 Imp qt) a minute to allow air in system to escape.**
   - **Use Genuine Nissan Long Life Antifreeze/Coolant or equivalent mixed with water (distilled or demineralized). Refer to MA-12, "RECOMMENDED FLUIDS AND LUBRICANTS".**

     Engine coolant capacity
     (with reservoir tank at "MAX" level)

     : Approx. 8.7 ℓ (9-1/4 US qt, 7-5/8 Imp qt)



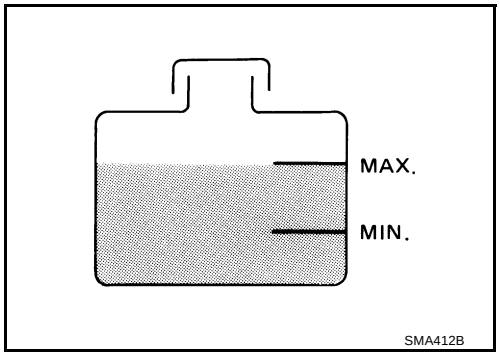
     Reservoir tank capacity (at "MAX" level)

     : 0.8 ℓ (7/8 US qt, 3/4 Imp qt)

   - When engine coolant overflows air relief hole on heater hose, install air relief plug with new O-ring.

     Air relief plug:

     : 0.78 - 1.6 N·m (0.08 - 0.16 kg-m, 7 - 14 in-lb)



5. Install radiator cap.
6. Warm up until opening thermostat. Standard for warming-up time is approximately 10 minutes at 3,000 rpm.
   - Make sure thermostat condition by touching radiator hose (lower) to see flow of warm water.

   CAUTION:
   Watch water temperature gauge so as not to overheat engine.
7. Stop engine and cool down to less than approximately 50°C (122°F).
   - Cool down using fan to reduce the time.

- If necessary, refill radiator up to filler neck with engine coolant.

8. Refill reservoir tank to “MAX” level line with engine coolant.
9. Repeat steps 4 through 7 two or more times with radiator cap installed until engine coolant level no longer drops.
10. Check cooling system for leaks with engine running.
11. Warm up engine, and check for sound of engine coolant flow while running engine from idle up to 3,000 rpm with heater temperature controller set at several position between “COOL” and “WARM”.
    - Sound may be noticeable at heater unit.
12. Repeat step 10 three times.
13. If sound is heard, bleed air from cooling system by repeating step 4 through 7 until engine coolant level no longer drops.
    - **Clean excess engine coolant from engine.**

FLUSHING COOLING SYSTEM

1. Install reservoir tank, and radiator drain plug.

   CAUTION:
   Be sure to clean drain plug and install with new O-ring.

   Radiator drain plug:

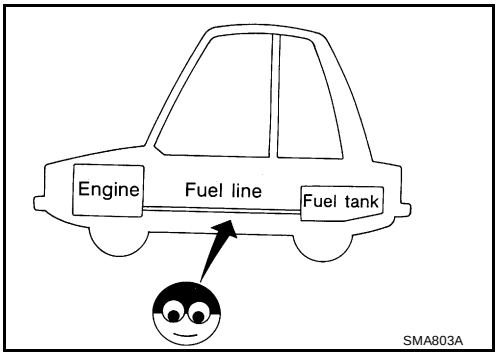
   : 0.78 - 1.6 N·m (0.08 - 0.16 kg-m, 7 - 14 in-lb)

   If water drain plugs on cylinder block are removed, close and tighten them. Refer to EM-117, "ASSEMBLY" .
2. Fill radiator with water until water spills from the air relief hole, then close air relief plug. Fill radiator and reservoir tank with water and reinstall radiator cap.
3. Run engine and warm it up to normal operating temperature.
4. Rev engine two or three times under no-load.
5. Stop engine and wait until it cools down.
6. Drain water from the system. Refer to MA-15, "DRAINING ENGINE COOLANT" .
7. Repeat steps 1 through 6 until clear water begins to drain from radiator.

Checking Fuel Lines

ALS000N7

Inspect fuel lines, filler cap and tank for improper attachment, leaks, cracks, damage, loose connections, chafing or deterioration.
If necessary, repair or replace damaged parts.

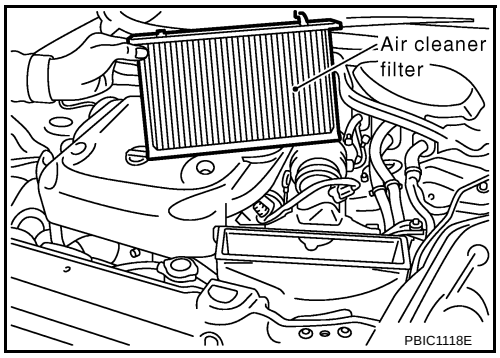


Changing Air Cleaner Filter

ALS000N8

VISCOUS PAPER TYPE

The viscous paper type filter does not need cleaning between replacement intervals. Refer to MA-7, "PERIODIC MAINTENANCE" .



Changing Engine Oil

ALS000Q4

WARNING:

- **Be careful not to burn yourself, as engine oil may be hot.**
- **Prolonged and repeated contact with used engine oil may cause skin cancer; try to avoid direct skin contact with used engine oil. If skin contact is made, wash thoroughly with soap or hand cleaner as soon as possible.**

1. Warm up engine, put vehicle horizontally and check for oil leakage from engine components. Refer to LU-6, "ENGINE OIL LEAKAGE" .
2. Stop engine and wait for 10 minutes.
3. Loosen oil filler cap and then remove drain plug.
4. Drain engine oil.
5. Install drain plug with new washer. Refer to EM-27, "OIL PAN AND OIL STRAINER" .

   CAUTION:
   Be sure to clean drain plug and install with new washer.

   Oil pan drain plug:

   : 29.4 - 39.2 N·m (3.0 - 4.0 kg-m, 22 - 28 ft-lb)

6. Refill with new engine oil.
   Engine oil specification and viscosity:
   Refer to MA-12, "RECOMMENDED FLUIDS AND LUBRICANTS" .

   Engine oil capacity (Approximate):

Unit: ℓ (US qt, Imp qt)

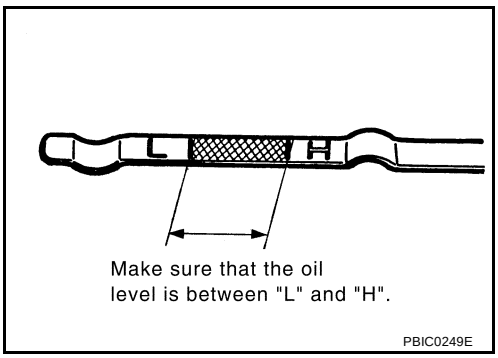
Drain and refill	With oil filter change	4.7 (5, 4-1/8)
	Without oil filter change	4.4 (4-5/8, 3-7/8)
Dry engine (Overhaul)		5.4 (5-3/4, 4-3/4)

CAUTION:

- **When filling engine oil, do not pull out oil level gauge.**
- **The refill capacity depends on the engine oil temperature and drain time. Use these specifications for reference only.**
- **Always use oil level gauge to determine the proper amount of engine oil in the engine.**

7. Warm up engine and check area around drain plug and oil filter for oil leakage.
8. Stop engine and wait for 10 minutes.

9. Check the engine oil level.



ALS000NA

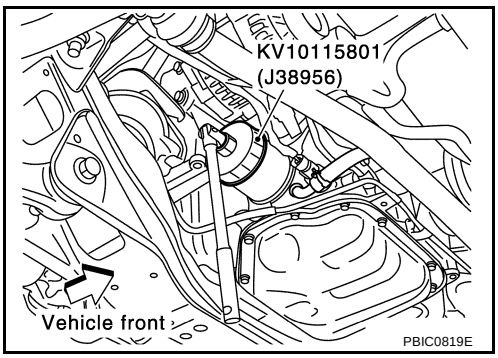
Changing Oil Filter

REMOVAL

1. Remove undercover.
2. Using oil filter wrench [SST], remove oil filter.

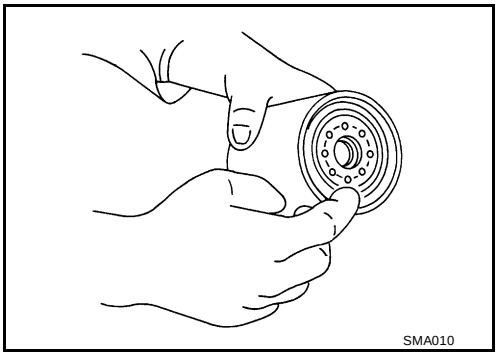
CAUTION:

- **Oil filter is provided with relief valve. Use Genuine Nissan Oil Filter or equivalent.**
- **Be careful not to get burned when engine and engine oil may be hot.**
- **When removing, prepare a shop cloth to absorb any engine oil leakage or spillage.**
- **Do not allow engine oil to adhere to drive belts.**
- **Completely wipe off any engine oil that adheres to engine and vehicle.**



INSTALLATION

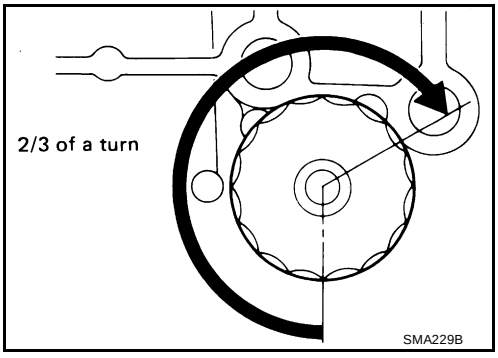
1. Remove foreign materials adhering to oil filter installation surface.
2. Apply engine oil to the oil seal contact surface of new oil filter.



3. Screw oil filter manually until it touches the installation surface, then tighten it by 2/3 turn. Or tighten to specification.

Oil filter:

: 14.7 - 20.5 N·m (1.5 - 2.0 kg-m, 11 - 15 ft-lb)



INSPECTION AFTER INSTALLATION

1. Check the engine oil level. Refer to MA-18, "Changing Engine Oil" .
2. Start engine, and check there is no leak of engine oil.
3. Stop engine and wait for 10 minutes.
4. Check the engine oil level and add engine oil. Refer to MA-18, "Changing Engine Oil" .

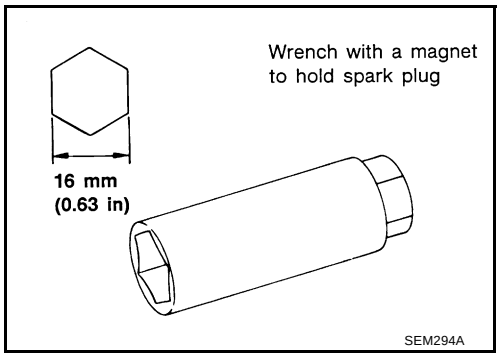
Changing Spark Plugs (Platinum-Tipped Type)

ALS000NB

REMOVAL

1. Remove engine cover with power tool. Refer to EM-16, "INTAKE MANIFOLD COLLECTOR" .
2. Remove ignition coil. Refer to EM-33, "IGNITION COIL" .
3. Remove spark plug using spark plug wrench (commercial service tool).

   CAUTION:
   Do not drop or shock it.



INSPECTION AFTER REMOVAL

Use standard type spark plug for normal condition.

Hot type spark plug is suitable when fouling occurs with standard type spark plug under conditions such as:

- Frequent engine starts
- Low ambient temperatures

Cold type spark plug is suitable when spark plug knock occurs with standard type spark plug under conditions such as:

- Extended highway driving
- Frequent high engine revolution

Make	NGK
Standard type	PLFR5A-11
Hot type	PLFR4A-11
Cold type	PLFR6A-11

Gap (Nominal) : 1.1 mm (0.043 in)

CAUTION:

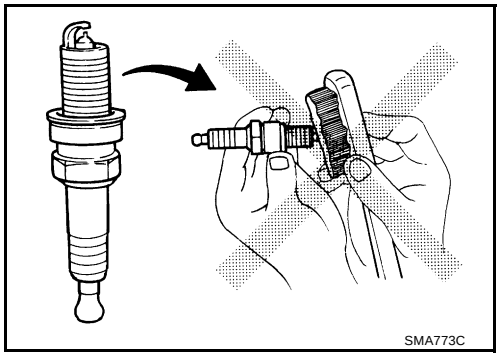
- **Do not drop or shock spark plug.**
- **Do not use wire brush for cleaning.**
- **If plug tip is covered with carbon, spark plug cleaner may be used.**

Cleaner air pressure:

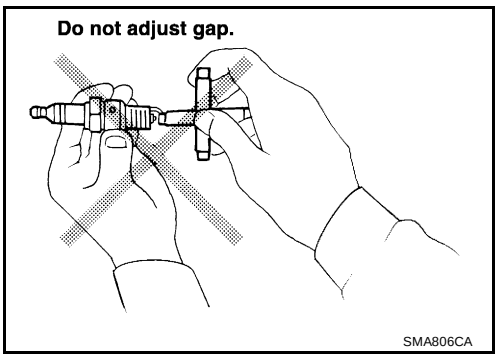
Less than 588 kPa (6 kg/cm^2 , 85 psi)

Cleaning time:

Less than 20 seconds



- **Checking and adjusting plug gap is not required between change intervals.**



INSTALLATION

Install in the reverse order of removal.

Spark plug:

: 24.5 N·m (2.5 kg-m, 18 ft-lb)

Checking EVAP Vapor Lines

ALS000NC

1. Visually inspect EVAP vapor lines for improper attachment and for cracks, damage, loose connections, chafing and deterioration.
2. Inspect fuel tank filler cap vacuum relief valve for clogging, sticking, etc.
   Refer to EC-673, "EVAPORATIVE EMISSION SYSTEM" .

CHASSIS AND BODY MAINTENANCE

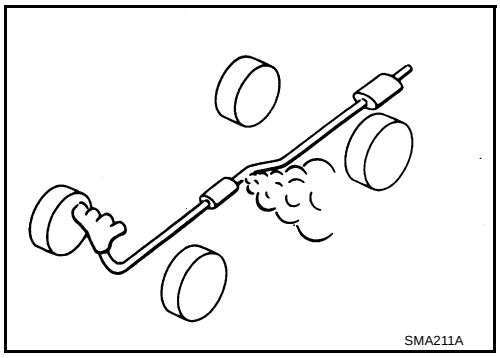
PFP:00100

Checking Exhaust System

ALS000ND

Check exhaust pipes, muffler and mounting for improper attachment, leaks, cracks, damage, chafing or deterioration.

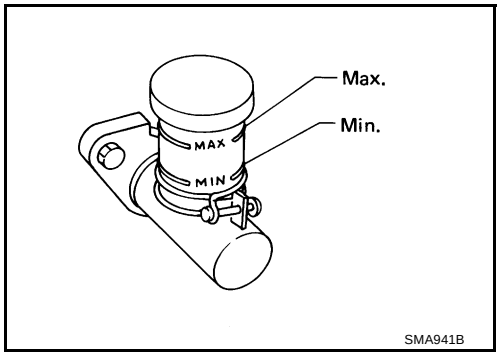
- If anything is found, repair or replace damaged parts.



Checking Clutch Fluid Level and Leaks

ALS000NE

If fluid level is extremely low, check clutch system for leaks.



Checking M/T Oil

ALS000NF

1. Check for oil leakage.

Changing M/T Oil

ALS000NG

1. Drain oil from drain plug and refill with new gear oil.
2. Check oil level.

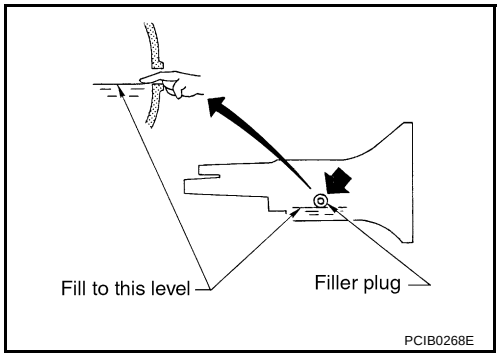
Oil grade: **API GL-4**

Viscosity: **Refer to MA-12, "RECOMMENDED FLUIDS AND LUBRICANTS" .**

Oil capacity: **Approx. 2.9 ℓ (3-1/8 US qt, 2-1/2 Imp qt)**

Filler plug and drain plug:

: 34.5 N·m (3.5 kg-m, 25 ft-lb)



CAUTION:

Do not reuse gasket.

Checking A/T Fluid

ALS000QI

1. Warm up engine.
2. Check for fluid leakage.
3. Loosen the level gauge bolt.
4. Before driving, fluid level can be checked at fluid temperatures of 30 to 50°C (86 to 122°F) using “COLD” range on A/T fluid level gauge as follows.

a. Park vehicle on level surface and set parking brake.
b. Start engine and move selector lever through each gear position. Leave selector lever in “P” position.
c. Check fluid level with engine idling.

d. Remove A/T fluid level gauge and wipe clean with lint-free paper.

CAUTION:
When wiping away the A/T fluid level gauge, always use lint-free paper, not a cloth one.

e. Re-insert A/T fluid level gauge into A/T fluid charging pipe as far as it will go.

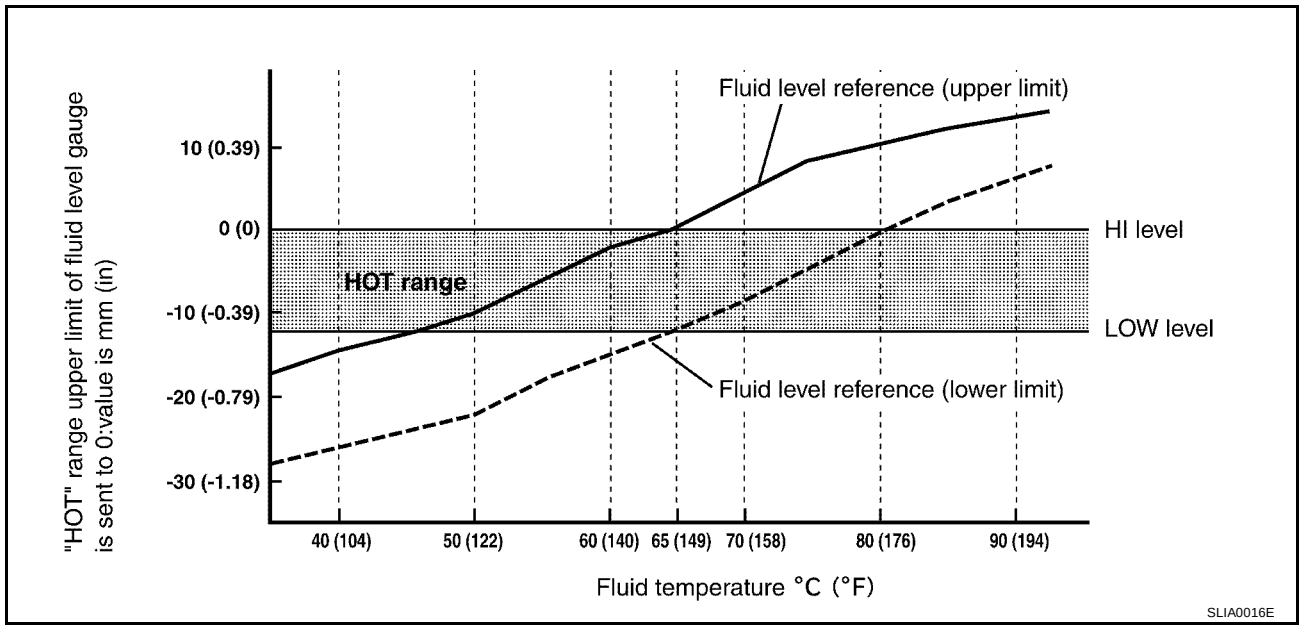
CAUTION:
To check fluid level, insert the A/T fluid level gauge until the cap contacts the end of the A/T fluid charging pipe, with the A/T fluid level gauge reversed from the normal attachment conditions.

f. Remove A/T fluid level gauge and note reading. If reading is at low side of range, add fluid to the A/T fluid charging pipe.

CAUTION:
Do not overfill.

5. Drive vehicle for approximately 5 minutes in urban areas.
6. Make the fluid temperature approximately 65°C (149°F).

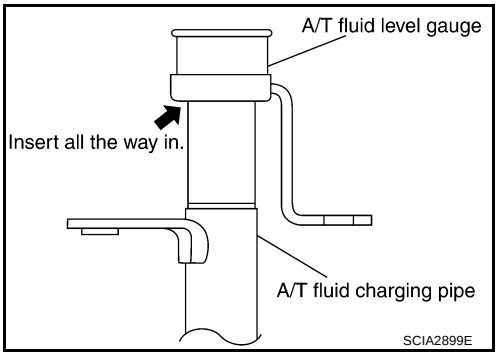
NOTE:
Fluid level will be greatly affected by temperature as shown in figure. Therefore, be certain to perform operation while checking data with CONSULT-II.



a. Connect CONSULT-II to data link connector.
b. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
c. Read out the value of “ATF TEMP 1”.

7. Re-check fluid level at fluid temperatures of approximately 65°C (149°F) using “HOT” range on A/T fluid level gauge.

CAUTION:
- **When wiping away the A/T fluid level gauge, always use lint-free paper, not a cloth one.**
- **To check fluid level, insert the A/T fluid level gauge until the cap contacts the end of the A/T fluid charging pipe, with the gauge reversed from the normal attachment conditions as shown.**



8. Check fluid condition.
   - If fluid is very dark or smells burned, refer to check operation of A/T. Flush cooling system after repair of A/T.
   - If ATF contains frictional material (clutches, bands, etc.), replace radiator and flush cooler line using cleaning solvent and compressed air after repair of A/T. Refer to CO-12, "RADIATOR" and AT-14, "A/T Fluid Cooler Cleaning" .
9. Install the removed A/T fluid level gauge in the A/T fluid charging pipe.
10. Tighten the level gauge bolt.

Level gauge bolt:

: 5.1N·m (0.52 kg-m, 45 in-lb)

Changing A/T Fluid

ALS000QJ

1. Warm up ATF.
2. Stop engine.
3. Loosen the level gauge bolt.
4. Drain ATF from drain plug and refill with new ATF. Always refill same volume with drained fluid.
   - To replace the ATF, pour in new fluid at the charging pipe with the engine idling and at the same time drain the old fluid from the radiator cooler hose return side.
   - When the color of the fluid coming out is about the same as the color of the new fluid, the replacement is complete. The amount of new transmission fluid to use should be 30 to 50% of the stipulated amount.

A/T fluid: Genuine Nissan Matic J ATF

Fluid capacity: 10.3 ℓ (10-7/8 US qt, 9-1/8 Imp qt)

CAUTION:

- **Use only Genuine Nissan Matic J ATF. Do not mix with other fluid.**
- **Using automatic transmission fluid other than Genuine Nissan Matic J ATF will cause deterioration in driveability and automatic transmission durability, and may damage the automatic transmission, which is not covered by the warranty.**
- **When filling ATF, take care not to scatter heat generating parts such as exhaust.**
- **Do not reuse drain plug gasket.**

Drain plug:

: 34 N·m (3.5 kg-m, 25 ft-lb)

5. Run engine at idle speed for 5 minutes.
6. Check fluid level and condition. Refer to MA-22, "Checking A/T Fluid" . If fluid is still dirty, repeat step 2. through 5.
7. Install the removed A/T fluid level gauge in the A/T fluid charging pipe.
8. Tighten the level gauge bolt.

Level gauge bolt:

: 5.1 N·m (0.52 kg-m, 45 in-lb)

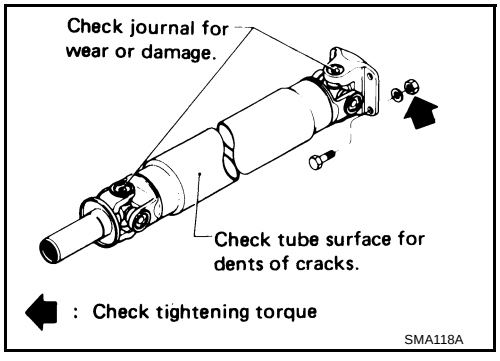
Checking Propeller Shaft

ALS000NJ

Check propeller shaft for damage, looseness or grease leakage.

Tightening torque:

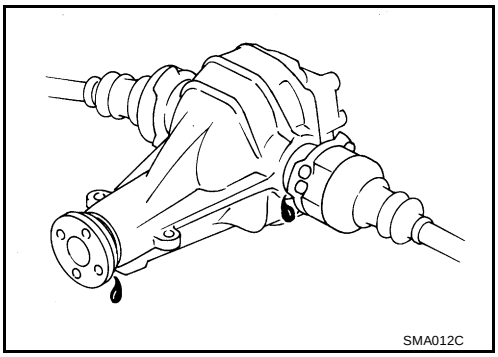
Refer to PR-5, "REAR PROPELLER SHAFT"



Checking Differential Gear Oil

ALS000NK

1. Check for oil leakage.


SMA012C

Changing Differential Gear Oil

ALS000NL

1. Drain oil from drain plug and refill with new gear oil.
2. Check oil level.

Oil grade and Viscosity:

Refer to MA-12, "RECOMMENDED FLUIDS AND LUBRICANTS" .

Capacity:

R200, R200V

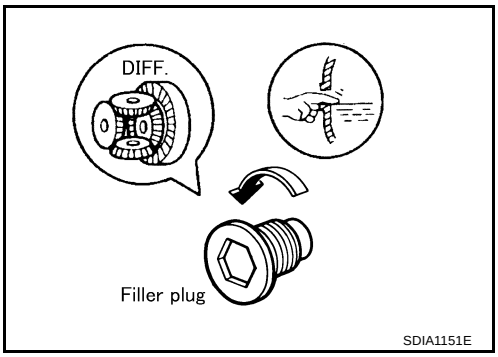
1.4 ℓ (3 US pt, 2 - 1/2 Imp pt)

Drain plug:

: 34.5 N·m (3.5 kg-m, 25 ft-lb)

Filler plug:

: 34.5 N·m (3.5 kg-m, 25 ft-lb)



SDIA1151E

CAUTION:

Gaskets are not reusable. Never reuse them.

Balancing Wheels (Bonding Weight Type)

ALS000NM

REMOVAL

1. Remove inner and outer balance weights from the road wheel.

CAUTION:

Be careful not to scratch the road wheel during removal.

2. Using releasing agent, remove double-faced adhesive tape from the road wheel.

CAUTION:

- **Be careful not to scratch the road wheel during removal.**
- **After removing double-faced adhesive tape, wipe clean traces of releasing agent from the road wheel.**

WHEEL BALANCE ADJUSTMENT

- If a tire balance machine has adhesion balance weight mode settings and drive-in weight mode setting, select and adjust a drive-in weight mode suitable for road wheels.

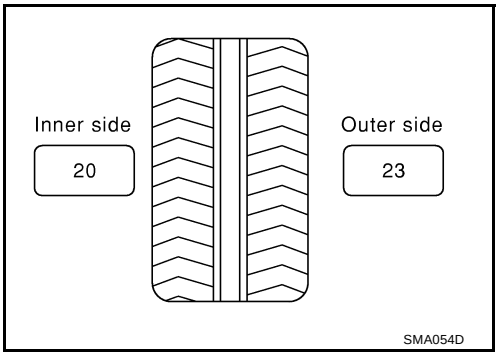
1. Set road wheel on wheel balancer using the center hole as a guide. Start the tire balance machine.
2. When inner and outer unbalance values are shown on the wheel balancer indicator, multiply outer unbalance value by 5/3 to determine balance weight that should be used. Select the outer balance weight with a value closest to the calculated value above and install it to the designated outer position of, or at the designated angle in relation to the road wheel.

CAUTION:

- **Do not install the inner balance weight before installing the outer balance weight.**

- **Before installing the balance weight, be sure to clean the mating surface of the road wheel.**

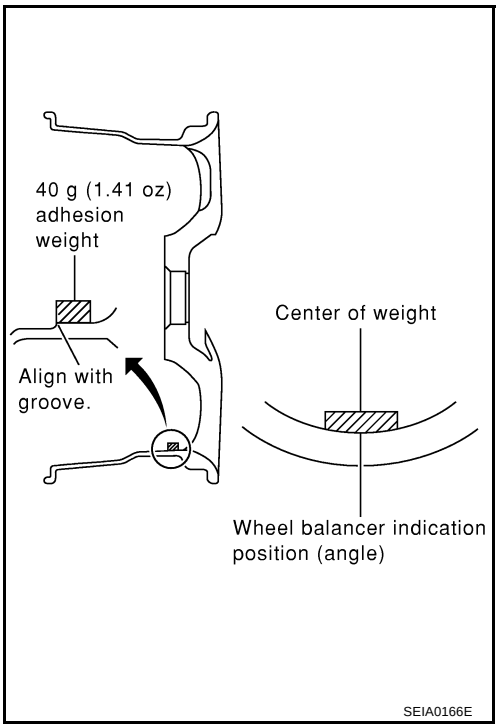
Indicated unbalance value × 5/3 = balance weight to be installed
Calculation example:
23 g (0.81 oz) × 5/3 = 38.33 g (1.35 oz) = 40 g (1.41 oz) balance weight (closer to calculated balance weight value)
Note that balance weight value must be closer to the calculated balance weight value.
Example:
37.4 = 35 g (1.23 oz)
37.5 = 40 g (1.41 oz)



a. Install balance weight in the position shown in the figure at right.
b. When installing balance weight to road wheels, set it into the grooved area on the inner wall of the road wheel as shown in the figure so that the balance weight center is aligned with the wheel balancer indication position (angle).

CAUTION:

- **Always use genuine Nissan adhesion balance weights.**
- **Balance weights are unreusable; always replace with new ones.**
- **Do not install more than three sheets of balance weight.**

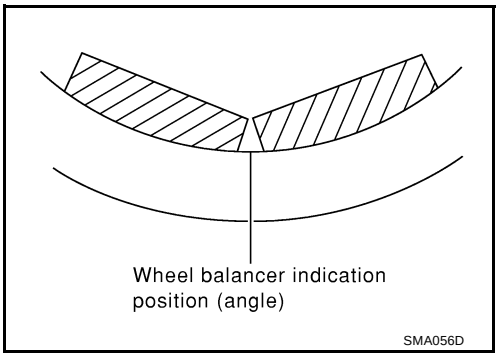


c. If calculated balance weight value exceeds 50 g (1.76 oz), install two balance weight sheets in line with each other (as shown in the figure).

CAUTION:
Do not install one balance weight sheet on top of another.

3. Start wheel balancer again.
4. Install drive-in balance weight on inner side of road wheel in the wheel balancer indication position (angle).

CAUTION:
Do not install more than two balance weights.



5. Start wheel balancer. Make sure that inner and outer residual unbalance values are 10 g (0.35 oz) each or below.
   - If either residual unbalance value exceeds 10 g (0.35 oz), repeat installation procedures.

Wheel balance (Maximum allowable unbalance):

Maximum allowable unbalance	Dynamic (At rim flange)	Less than 10 g (0.35 oz) (one side)
	Static (At rim flange)	Less than 20 g (0.70 oz)

Tire Rotation

ALS000NN

CAUTION:

Do not include the T-type spare tire when rotating the tires

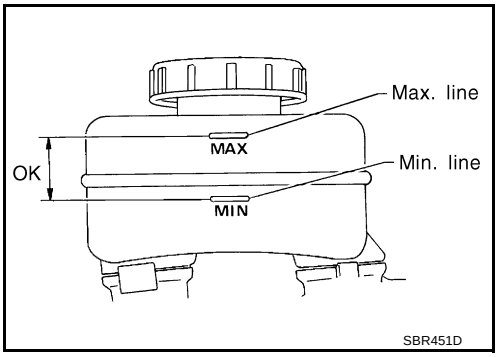
NOTE:

Tire cannot be rotated in vehicle, as front tire are different size from rear tire and the direction of wheel rotation is fixed in each tire.

Checking Brake Fluid Level and Leaks

ALS000NO

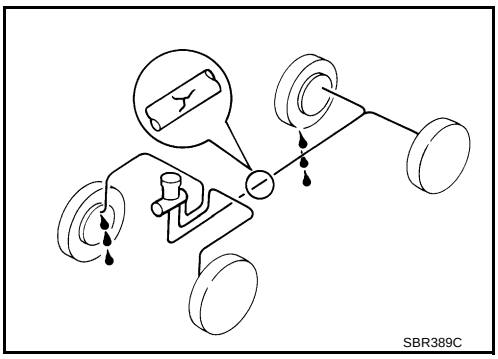
- If fluid level is extremely low, check brake system for leaks.



Checking Brake Lines and Cables

ALS000NP

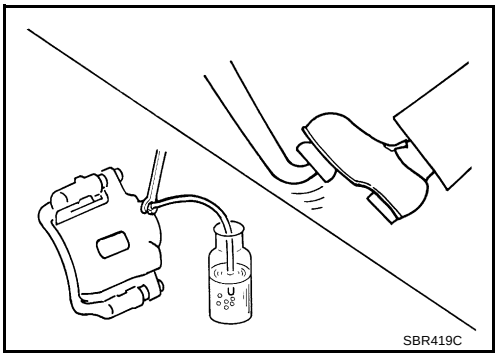
- Check brake fluid lines and parking brake cables for improper attachment, leaks, chafing, abrasions, deterioration, etc.



Changing Brake Fluid

ALS000NQ

1. Drain brake fluid from each air bleeder valve.
2. Refill until new brake fluid comes out from each air bleeder valve.
   Use same procedure as in bleeding hydraulic system to refill brake fluid.
   Refer to BR-9, "BRAKE FLUID" .
   - Refill with recommended Genuine Brake Fluid or equivalent DOT 3 (US FMVSS No. 116).
     Refer to MA-12, "RECOMMENDED FLUIDS AND LUBRICANTS" .
   - Never reuse drained brake fluid.
   - Be careful not to splash brake fluid on painted areas.



Checking Disc Brake

ALS000NR

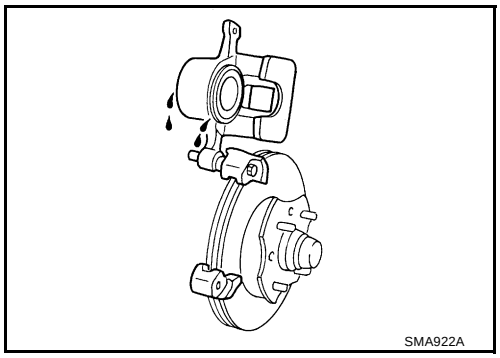
ROTOR

Check condition, wear, and damage.

	Front	Rear
Brake model	CLZ25VD	AD14VE
Standard thickness	24.0 mm (0.945 in)	16.0 mm (0.630 in)
Maximum runout	0.035 mm (0.0014 in)	0.10 mm (0.0039 in)
Minimum thickness (Wear limit)	22.0 mm (0.866 in)	14.0 mm (0.551 in)

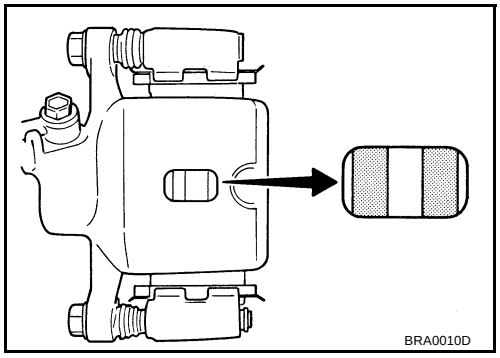
CALIPER

- Check for leakage.


SMA922A

PAD

- Check for wear or damage.


BRA0010D

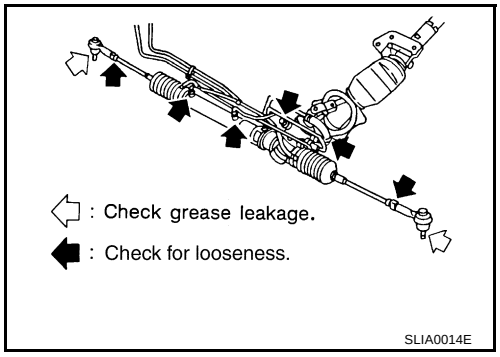
	Front	Rear
Brake model	CLZ25VD	AD14VE
Standard thickness	11.0 mm (0.433 in)	8.5 mm (0.325 in)
Minimum thickness (Wear limit)	2.0 mm (0.079 in)	2.0 mm (0.079 in)

Checking Steering Gear and Linkage

ALS000NS

STEERING GEAR

- Check gear housing and boots for looseness, damage and grease leakage.
- Check connection with steering column for looseness.



SLIA0014E

STEERING LINKAGE

Check ball joint, dust cover and other component parts for looseness, wear, damage and grease leakage.

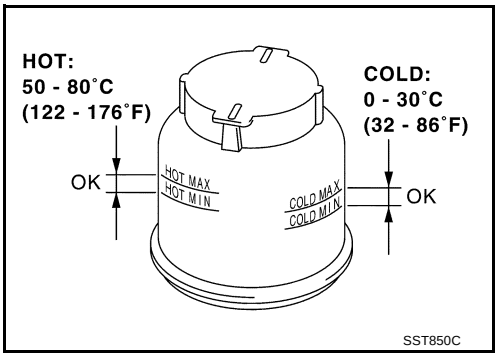
Checking Power Steering Fluid and Lines

ALS000NT

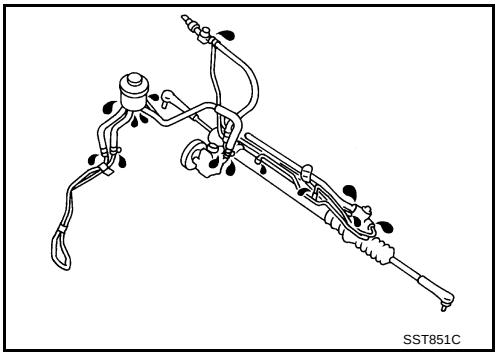
Check fluid level in reservoir tank with engine off.
Use “HOT” range at fluid temperatures of 50 to 80°C (122 to 176°F) or “COLD” range at fluid temperatures of 0 to 30°C (32 to 86°F).

CAUTION:

- **Do not overfill.**
- **Recommended fluid is Genuine NISSAN PSF or equivalent. Refer to** **MA-12, "RECOMMENDED FLUIDS AND LUBRICANTS"**



- **Check lines for improper attachment, leaks, cracks, damage, loose connections, chafing and deterioration.**
- **Check rack boots for accumulation of power steering fluid.**

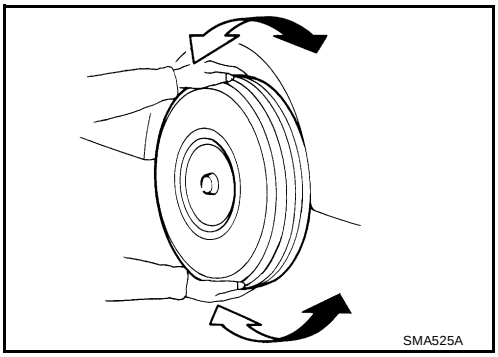


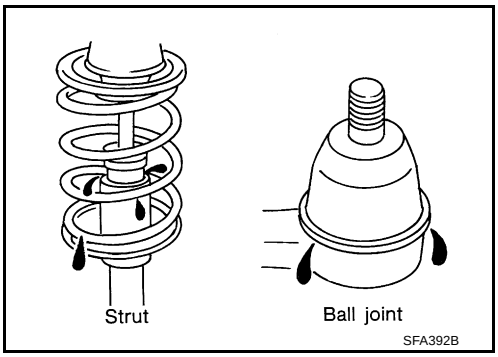
Axle and Suspension Parts

ALS000NU

Check front and rear axle and suspension parts for excessive play, cracks, wear or other damage.

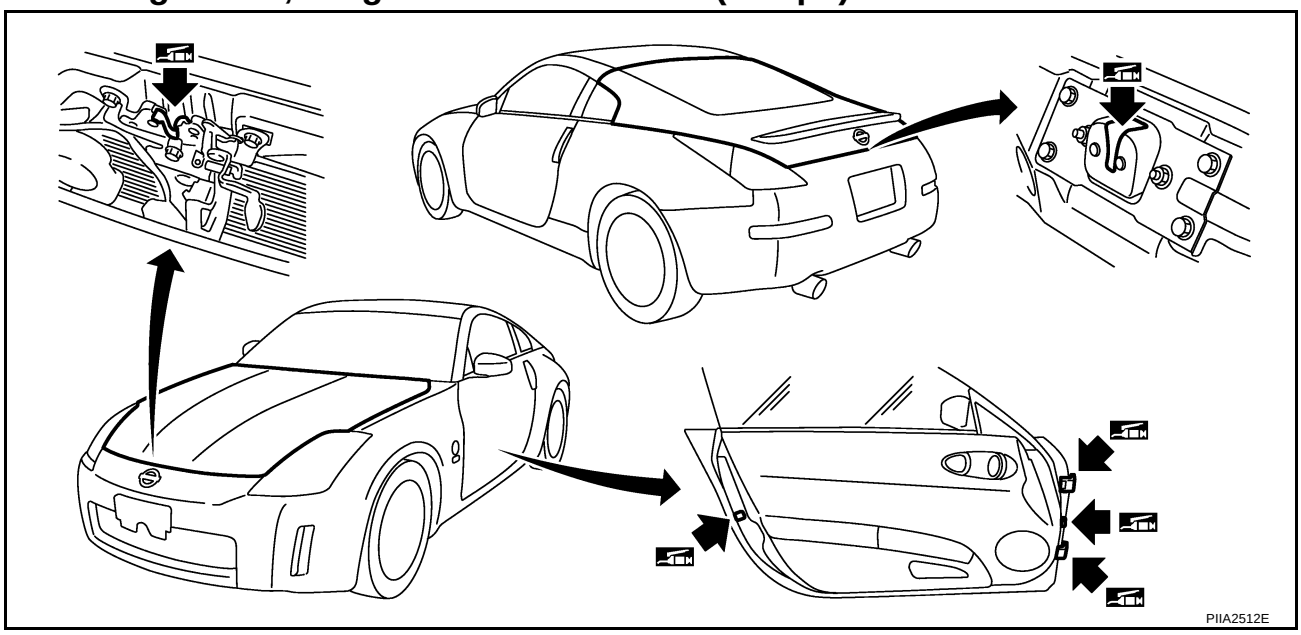
- Shake each wheel to check for excessive play.
- Check wheel bearings for smooth operation.
- Check axle and suspension nuts and bolts for looseness.
- Check strut (shock absorber) for oil leakage or other damage.
- Check suspension ball joint for grease leakage and ball joint dust cover for cracks or other damage.





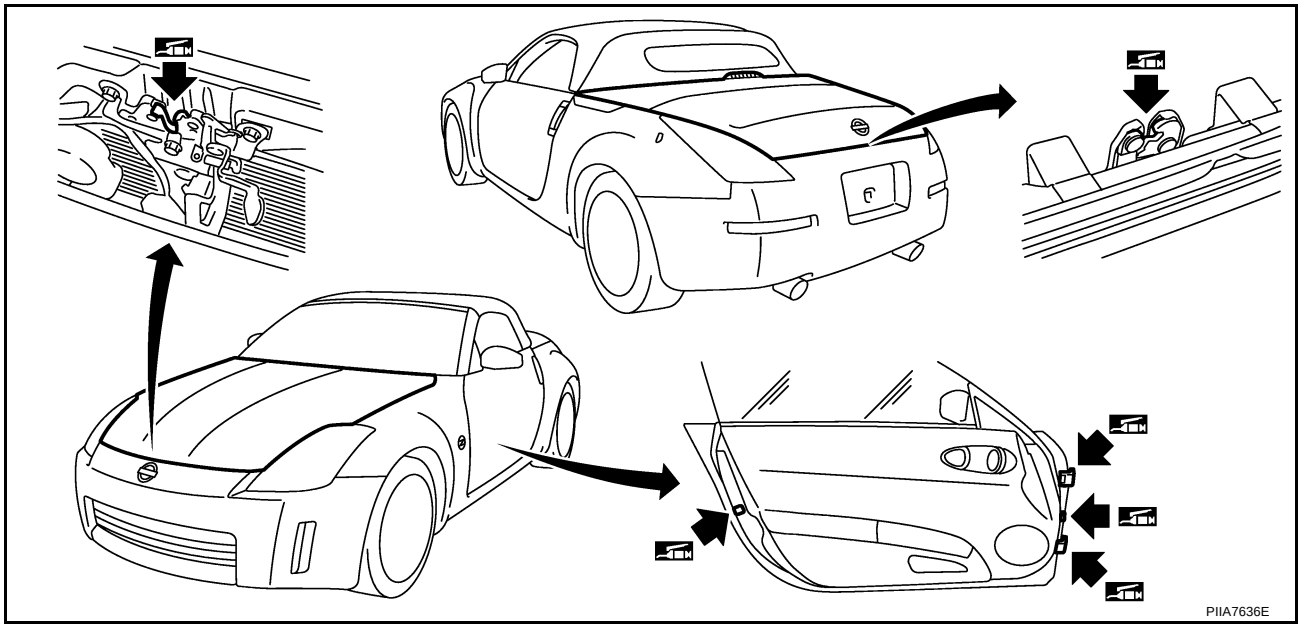
Lubricating Locks, Hinges and Hood Latch (Coupe)

ALS000NW



Lubricating Locks, Hinges and Hood Latch (Roadster)

ALS000NX



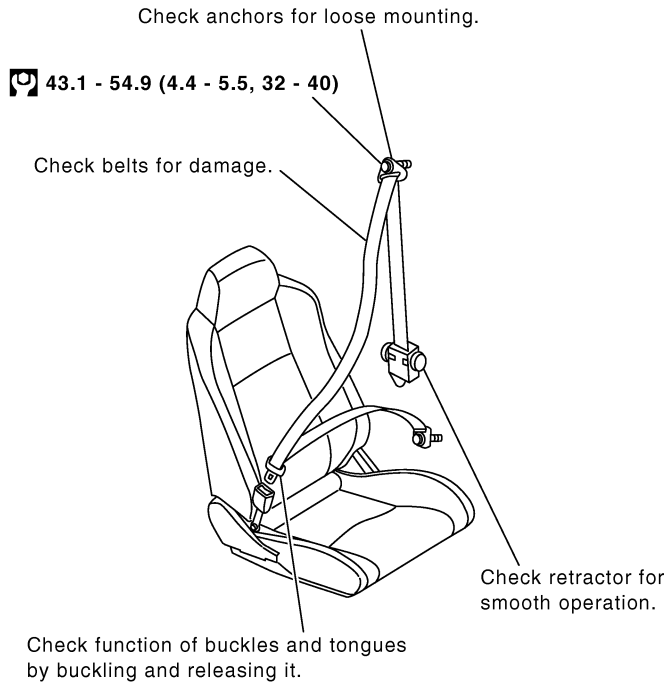
Checking Seat Belt, Buckles, Retractors, Anchors and Adjusters (Coupe)

ALS000NY

CAUTION:

- **After any collision, inspect all seat belt assemblies, including retractors and other attached hardwares (I.e. anchor bolt, guide rail set). Nissan recommends to replace all seat belt assemblies in use during a collision, unless they were not damaged and properly operate after a minor collision. Replace the seat belt assembly if any damage or improper operation were found even if the belt had not been used during a collision. Seat belt pre-tensioner should be replaced even if the seat belts are not in use during a frontal collision but the driver and passenger air bags are deployed.**
- **If any component of seat belt assembly is questionable, do not repair. Replace the seat belt assembly as a whole assembly.**
- **If webbing is cut, frayed, or damaged, replace the belt assembly.**
- **Never oil tongue and buckle.**
- **Use a genuine NISSAN seat belt assembly.**

For details, refer to “Seat Belt Inspection” in SB section.



Anchor bolt

43.1 - 54.9 (4.4 - 5.5, 32 - 40)

N•m (kg-m, ft-lb)

PIIA8896E

Checking Seat Belt, Buckles, Retractors, Anchors and Adjusters (Roadster)

ALS000NZ

CAUTION:

- **After any collision, inspect all seat belt assemblies, including retractors and other attached hardwares (I.e. anchor bolt, guide rail set). Nissan recommends to replace all seat belt assemblies in use during a collision, unless they were, not damaged and properly operate after a minor collision. Replace the seat belt assembly if any damage or improper operations were found even if the belt had not been used during a collision. Seat belt pre-tensioner should be replaced even if the seat belts are not in use during a frontal collision, but the driver and passenger air bags are deployed.**
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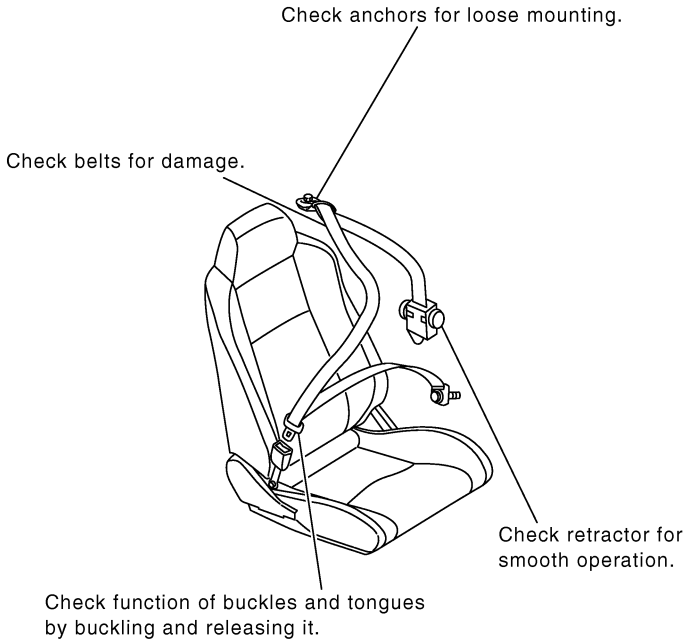


Anchor bolt

49.0 N•m (5.0 kg-m, 36 ft-lb)

PIIA7637E

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

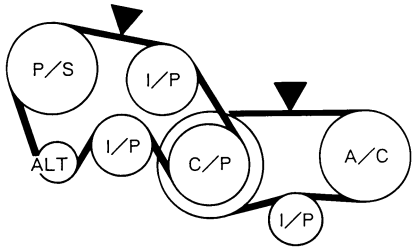
Standard and Limit

ALS000O0

BELT DEFLECTION AND TENSION

	Deflection adjustment		Unit: mm (in)	Tension adjustment*		Unit: N (kg, lb)
	Used belt		New belt	Used belt		New belt
	Limit	After adjustment		Limit	After adjustment	
Alternator and power steering oil pump belt	7 (0.28)	4 - 5 (0.16 - 0.20)	3.5 - 4.5 (0.138 - 0.177)	294 (30, 66)	730 - 818 (74.5 - 83.5, 164 - 184)	838 - 926 (85.5 - 94.5, 188 - 208)
A/C compressor belt	12 (0.47)	9 - 10 (0.35 - 0.39)	8 - 9 (0.31 - 0.35)	196 (20, 44)	348 - 436 (35.5 - 44.5, 78 - 98)	470 - 559 (48 - 57, 106 - 126)
Applied pushing force	98 N (10 kg, 22 lb)			—		

SEC.117



KBIA1731J

ENGINE COOLANT CAPACITY (APPROXIMATE)

Unit: ℓ (US qt, Imp qt)

Engine coolant capacity (With reservoir tank at “MAX” level)	8.7 (9-1/4, 7-5/8)
Reservoir tank engine coolant capacity (at MAX level)	0.8 (7/8, 3/4)

ENGINE OIL CAPACITY (APPROXIMATE)

Unit: ℓ (US qt, Imp qt)

Drain and refill	With oil filter change	4.7 (5, 4-1/8)
	Without oil filter change	4.4 (4-5/8, 3-7/8)
Dry engine (Overhaul)		5.4 (5-3/4, 4-3/4)

SPARK PLUG (PLATINUM-TIPPED TYPE)

Make	NGK
Standard type	PLFR5A-11
Hot type	PLFR4A-11
Cold type	PLFR6A-11
Gap (nominal)	1.1 mm (0.043 in)

WHEEL BALANCE

Maximum allowable unbalance	Dynamic (At rim flange)	Less than 10 g (0.35 oz) (one side)
	Static (At rim flange)	Less than 20 g (0.71 oz)

Tightening Torque

ALS000QQ

Unit: N·m (kg-m, ft-lb),
Unit: N·m (kg-m, in-lb)*

Radiator drain plug	0.78 - 1.6 (0.08 - 0.16, 7 - 14)*
Air relief plug	0.78 - 1.6 (0.08 - 0.16, 7 - 14)*
Oil pan drain plug	29.4 - 39.2 (3.0 - 4.0, 22 - 28)
Oil filter	14.7 - 20.5 (1.5 - 2.0, 11 - 15)
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ALPHABETICAL INDEX

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